TELECOMMISSION

Study 5(f)

Institutional Arrangements for Optimizing Developments of Databanks in the Public Interest

The Department of Communications

Study 5F

"Institutional Arrangements for Optimizing

Developments of the Data Banks in the Public Interest"

This Report was prepared for the
Department of Communications by a project team
made up of representatives from various organizations
and does not necessarily represent the views of the
Department or of the federal Government, and no
commitment for future action should be inferred
from the recommendations of the participants.

This Report is to be considered as a
background working paper and no effort has been
made to edit it for uniformity of terminology
with other studies.

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Development of Data Banks in the Public Interest"

Section I

Summary

General

This report results from a study of information needs
and the means of satisfying them in six distinct sectors of the
activities of Canadians. The study is one of a series of
Telecommission Studies announced by the Honourable, The Minister
of Communications on September 18, 1969. It is related to
Study 5(a) which deals with: the relationships between common
carriers, computing companies, and information and data systems;
concept of computer utility; long term market prospects for
computer services; and telecommunications services - present
and anticipated needs of the computer industry and its customers.
It can also contribute to the continuing work of the Canadian
Computer Communications Task Force.

Project Team

The project team included 18 members drawn from
government and the public at large. Two officers from the
department were designated as liaison officers. The names of
the members and their affiliations are included in this report
as Exhibit II. They were well fitted to investigate those
sectors of Canadian activity which eventually formed the
parameters for this study. Unfortunately, the magnitude of the
undertaking was not fully appreciated until investigations were
well underway and it then became apparent that the study was too
demanding of time and facilities to permit the original objectives
to be obtained and the terms of reference to be fully met.

*   The Telecommission, announced by Communications Minister,
    Eric Kierans, on September 18, 1969, is a comprehensive inquiry
    into telecommunications and comprisies some 50 separate studies
    into aspects such as market prospects, regulation, interconnection
    wide-band distribution systems, technological possibilities,
    social environment, etc.

Objective, Terms of Reference

The general objectives and terms of reference were established by the general agreement of a majority of the project team members and the liaison officers. The general objectives were set out as follows:

"To identify national information services in the public interest which could be supplied by large remote access data banks and to develop and analyse possible institutional arrangements for their development, implementation and operation."

To these were appended specific terms of reference. A statement of the objectives and the specific terms of reference including explanatory notes is included in this report as Exhibit No. I.

Observations

That the objectives were not fully achieved and the terms of reference not fully met becomes of less consequence when the results of the study are fully evaluated. The work done emphasizes the magnitude and importance of the field. It highlights the importance of systems evolved being on a national basis if maximum usage at minimum cost is to be achieved.

The study group concurred in the concept that information is a vital resource which is as important to productivity as land, labour, capital and management. The group believes that the quality of management relates directly to the availability and effective use of information. Co-ordination of relevant information systems and their use could increase the economic growth rate and promote the well being of all our people. On the other hand there is a great danger that should information systems grow in a disorganized and fragmented fashion or be developed extra-territorially, the potential benefits to Canada would be lost.

The study did not produce a formula which related benefits to costs. It has been suggested, however, that the benefits could include prevention of unnecessary duplication, improved planning capability, improved decision making capability, enhanced creativity, better opportunities for innovation, production improvement and diversification.

The importance of user involvement has been stressed. Users must both contribute and receive data and it is suggested that as they will be the greatest direct beneficiaries, in most instances costs should be recovered from them.

Organization of the Study Sub-group

Ideally each activity which could beneift from a data bank would fall into a recognizable category. It would then be placed in a family each member of which, in the main, would have common characteristics. A study then, of the requirements in one category would establish a prototype which could be adapted for use in all related categories.

This ideal could not be achieved for this study as the members of the group recruited to undertake it were all skilled and knowledgable in specific fields. As a result early in the discussions surrounding this study, the following six sectors were chosen for examination.

    a) Legal

    b) Industrial

    c) Urban

    d) Medical

    e) Resource

    f) Consumer

The study group was formed into sub-groups each of which was assigned a sector. Each sub-group worked within the stated objectives, but as they applied to their individual sector.

Common Conclusions of the Sub-group

Major problems and factors influencing the process of developing data banks and the institutional arrangements believed necessary to facilitate the formation and operation of these networks are the focal points of these special studies. More than anything else, these studies show us that there is no general manner in which to optimize the development of data banks, that institutional arrangements will not be mutually exclusive but that they will vary according to the nature of the sector and according to the stage of development attained in that sector.

Among the factors which will affect the development of data banks are the following:

1) awareness of informational needs

2) technological factors

3) institutional factors

4) political factors

5) legal factors

6) economic factors

7) financing data bank services

8) international considerations

From the consensus reached in these studies, it must be said that any attempt to create data bank networks is a multiphased effort which may involve differing institutional arrangements depending upon the processes as they occur in each sector. Two general processes, each involving different phases can be seen, those of planning-implementation and operation. Of certainty, the institutional arrangement most acceptable during the crucial planning-implementaiotion process must be able to integrate diverse but related interests, not the least of which is the user himself, with the purpose of emerging with a uniform policy on data banks. It is important to differentiate these processes into a phased approach. This has the effect of minimizing unnecessary features and errors since the approach implies justification at each step.

Six phases can be readily envisioned:

1) The Exploratory Phase

2) The Conceptual Phase

3) The Design Phase

4) The Implementation Phase

5) The Operational Phase

6) The Audit Phase

Generally, these phases correspond to the processes of planing, implementation and operation.

More than any other criteria, user requirements for and acceptance of the systems must be secured. Emphasis must be given to the ability of users to contribute information to the system or the end result will be a system which is predominately one-way and subject to an excessive degree of centralized control.

Extracts From Sub-group Submissions

a) Legal Sector:

The main factors likely to affect the development of legal data banks are economic and legal in nature. Technological factors only arise in relation to economic ones.

The only technological factor w hich does place restrictions on the development of a legal information system at present is the current stage of development of the appropriate computer programs.

b) Industrial Sector:

Very often, the designer, aware of technical and perhaps economic feasibilities, ignores the user's most basic problem, the defining of his information needs. Government must not impose information systems on the user before he has become aware of and attempted to define his needs. One necessary condition is user awareness.

An essential first step is a marketing
oriented familiarization campaign to aid
industry in gaining an awareness of
information as a resource and of its
economic impact on both the firm's
profits and on the Gross National Product.

c) Urban Sector

Wide variation is evident in urban functions, in
cities of different sizes and in different
parts of the country and in their dependence on
available sources of information. Mutual
aid could clearly improve the use of pertinent
urban information for all concerned.

The absence of a unified local, regional or
country-wide responsibility for the organization
of information services is a major cause of the
difficulties encountered by users of urban
information in Canada. Governmental as well as
non-governmental bodies handle various elements
of urban information, often in isolation from
one another and without explicit criteria of the
service they need to offer.

The need for comparative information is hampered
by the absence of standards and norms; data
gathered at great effort and expense in one
office cannot be used by other administrative
units because of the differences of definitions
and standards. Capability in one language only
limits possibilities for comparisons of ideas
facts and data.

Small centres could overcome many of their difficulties
by pooling their information resources in regional
co-operatives and sharing their costs. Improved
information services require more qualified staff
and the use of advanced technology. Regional
co-operatives could arrange interchange of
information among themselves and with other
levels of government.

d) <u>Medical Sector</u>:

One of the most wasteful aspects of patient
care, in hospital or outisde, is the taking
and retaking of patient histories. The
creation of a data bank of patient records
covering all treatments would probably be the
most meaningful contribution in the public
interest.

The Report recommends:

1)   That a full-scale survey of the needs
     of the health community for data banks
     be commissioned and carried out.

2)   That steps be taken to educate the
     potential users on the advantages
     of data banks. This education should
     start early and preferably at under-
     graduate level.

3)   That ways be explored to support those
     data banks which are necessary in the public
     interest.

e) <u>Resources Sector</u>:

Technological problems, while presenting major
difficulties, are not considered to be seriously
limiting. The major limitations will be in
regard to the availability of skilled manpower
and sufficient financial resources.

The Report recommends that:

1)   A national policy should be formulated with
     regard to development and operation of
     data banks in the national and public
     interest. The complex nature of the
     data banks themselves, the need for inter-
     communications among different banks,
     the problems arising from the fact that
     organizational barriers will be crossed
     and the need for protection of vital or
     sensitive information make this an urgent
     requirement.

2) A National Advisory Committee should be
   established to assist in the formulation
   of such policy, and to assess, and make
   recommendations on national priorities
   and the need for specific data banks.

3) A Central Systems Group of analysts with
   knowledge and experience in information
   retrieval systems should be established
   in Government, to provide technical advice
   and assistance to, and to act as a secretariat
   for the National Advisory Committee and to
   actively participate in the design and
   implementation of specific data banks of
   high priority.

4) Due to the complexity of assessing data
   requirements and the organization best
   suited to each data bank, it is recommended
   that standing committees with inter-
   departmental membership be set up to
   determine these requirements and present
   initial plans to the National Advisory
   Committee.

5) Planning and implementing data banks will
   involve government departments at all
   levels; federal, provincial, regional and
   municipal. To facilitate appropriate separate
   or co-operative action, it is recommended that
   studies of exising legislative requirements
   be made for all departments involved.

6) If data banks are employed efficiently
   there will be a concomitant reduction in the
   storage of redundant data. This will result
   in unique value being placed on data bases.
   In that organizations other than governments
   may be entrusted with the establishment and
   operation of such data banks in the public
   interest, it is strongly recommended that
   legislative action be taken to ensure that
   the ownership of data bases of particular
   value to the public remain with government.

and not form part of any assets that
may be sold or otherwise acquired by
another party. Essentially, a
trusteeship is advocated.

7) Data banks will become progressively cheaper
as technology advances encouraging the
storage and retrieval of original,
observational data. This is not without
its dangers for such data may never face
the scrutiny of expert referees and invalid
data, processed by inappropriate and possibly
undefined statistical programs can spread
false information harmfully. It is recommended
that considerations be given to operational
regulations to minimize such risks.

8) It is a common concern that privacy of personal
data and protection of proprietory material
may be compromised in data banks and that
system malfunction can assign incorrect
identity, to the detriment of the individual.
It is recommended that codes of ethical use of
such data bases be prepared and that the
necessary legislation to establish and protect
the rights of the individual be enacted.

9) Much of the anticipated value and efficiency
of data banks will be sacrificed if minimum
standards of coding, format and content are
not officially encouraged. It is recommended
that appropriate action be taken to develop and
support such standards and to establish a
Canadian registry, and eventually a data bank,
carrying such descriptive data as necessary
to permit access and use of all data banks
established in the public interest.

10) Centres of expertise in information retrieval
systems should be developed at two or three
Canadian universities to encourage closer
co-operation between universities and industry,
and to provide facilities for training in an
area where demand far exceeds supply.

11) Government should contract out the development
of some of the required data banks to these
univerisity centres.

12) Highest priority should generally be given
to those data banks providing information
for decision-making and planning purposes.

f) Consumer Sector:

The immediate need is for a clearing-house for
public information systems now being developed
or planned in both the private and public sectors.

Both as a final good (TV programs, radio
entertainment, education courses taken for pleasure)
and as an intermediate good which affects the speed
and effectiveness of the individual and family
decision-making (consumer information, job
opportunities, training courses), information plays
a central role in determining the welfare of
Canadians.

Recommendations:

In addition to the publication of this report, the Urban
sub-group will publish its report as will the Consumer sector. It is
recommended that these reports be referred to the CCTF to be used as
source documents respecting the various problems identified.

The Legal, Industrial, Medical and Resource sector reports
should also be referred to the CCTF for detailed study.

It is finally proposed that in any future studies full
recognition be given to the bilingual nature of Canada.

SECTION II

INTRODUCTION

Importance of the Subject

In considering the relevance of large remote access data banks it must be kept in mind that the need for information arises every time there is a task to be performed or a problem to be solved. To satisfy such needs information may have to be obtained from an information system, from person to person contacts or both. The most efficient method would be referral to an information system that could provide immediate and complete data relevant to the task or problem. Given the present state of technology, this could be in the form of a computerized data bank which stores information and includes media for input, manipulation and retrieval in a usable form.

Information storage and retrieval are not new terms to mankind; indeed, the concept has existed since prehistorical times. However, the concept has grown to include "gathering, evaluating, processing, packaging and distributing of information to serve customer needs; acquisition, editing and editorial, indexing, abstracting, programming and reproduction; all forms of dissemination including the mails, telephone, telegraph, radio, television and computer networks". (1)

This generation of Canadians is living in an age of great technological progress. This progress produces vast amounts of information which in turn becomes the raw material for future progress. The flow of this information creates a significant challenge in terms of both its quality and quantity. The challenge of the information system therefore is to rapidly convey and make accessible relevant information from the source to its user.

Since the end of World War II, Japan has made miraculous strides in its economic recovery. The following extract from the Computer White Paper published in 1969 by the Japan Computer Usage Development Institute shows the importance that nation attaches to the field of Information:

> "In the age of the industrial revolution the first countries to industrialize took the position of leadership as advanced nations. Likewise, in the present age of the information revolution the first countries to computerize will become the leaders in the information-oriented world of the future.

(1) INFO EXPO 70 Program Washington, D.C. 1970, P. 43

The spread and evolution of computer usage over
the next ten or twenty years will, beyond a doubt,
work revolutionary changes in man's world, changes
that will greatly effect every field of his
activity. It is thus the responsibility not only
of governments but also of those in finance, labour,
mass communications, and education, not to mention
many other fields, to seriously consider the pro-
blems involved from a national point of view."

In Canada a great deal has already been written and said
about the benefits to be derived from data banks and information
systems. Special Study No. 8 for the Science Council of Canada,
for example, has expounded on the value of an integrated system
for Scientific and Technical Information in Canada. Much of what
was written in that report is of direct application to data banks
in general.

It is important for all Canadians to consider the com-
munications and information services available to them. Since
information is a vital resource, it is as important to productivity
as land, labour, capital and management. In fact, one can state
that any co-ordinated acceleration of relevant information trans-
fer should increase the economic growth rate of the nation and
most likely the well-being of its people.

It is now feasible to envisage information systems
readily accessible to all segments of society including business,
government and labour, containing vastly expanded and improved
information about consumer goods, education, job opportunities,
urban affairs, the services of business and government, and the
major disciplines at large.

The presence and accessibility of improved information
will allow social institutions to more effectively monitor their
environment and increase the speed of adaptation to changing
demand patterns. It has been estimated that in 10 years, 75% of
the products manufactured in the United States will be new re-
lative to those of today. Unless the businessman applies new
techniques, processes and materials, he may be forced out of
business by these changes. Skilled manpower is necessary in these
new fields; potential workers unemployed because of job ob-
solescence must be retrained so that they may find a meaningful

social and economic role in Canada.   Unemployment, a socially
and individually degrading state, is often the result of poor
resource allocation, partially dependent upon the speedy trans-
fer of information.   Rapid movement of individuals between jobs
will go a long way towards eliminating social-psychological
resentment held by the unemployed towards our "affluent society".
Service to the individual cannot be placed low in the order of
priorities.   The existence of data banks to store information
related to employment opportunities by type, location, salary,
educational opportunities, marketing information, housing and
legal status would benefit the individual immensely.

As an example in the field of education the University
of Illinois initiated its PLATO* program in 1959.   An objective
assessment of the evolution and potential profits of this program
is contained in the serial 'Science', Volume 167, entitled "Advances
in Computer-based Education".**

The stated objectives of the PLATO program are:

1)   "Investigation of the potential role of the computer in
the instructional process.   The major objective of this
phase has been to examine the question, 'What is
educationally possible?'

2)   Design of an economical and educationally viable system
incorporating the most valuable approaches to teaching
and learning developed in the above investigation."

*   PLATO is an acronym for "Programmed Logic for Automatic
Teaching Operations".

**   Although many universities are doing work on Computer
Assisted Learning, such work on a national scale is being carried out
by the National Research Council under the direction of Mr. W.C. Brown.
The program launched in 1967 and to be tested over a period of
about 10 years, was set up to provide co-operating groups of educators
anywhere in Canada the opportunity to use a dedicated central com-
puter at NRC free of charge, accessed through remote terminals and
telephone communication channels.   Educators can then begin pre-
paring and evaluating courses written in natural language and can
exchange these through the central computer with other contributors,
for their evaluation and use.   One of the prime objectives is the
standardization of language.

By March 1970, this program had logged over 100,000 stu-
dent-contact hours (much of it for academic credits), in at least
20 fields of study at all levels of education. Achievements include
the realization of many new teaching strategies, valuable experiences
in the different institutional environments and the assessment of at-
titudes of students, teachers and educational authors.

The article provides a detailed analysis of the system
economics and concludes that a cost of 35¢ per student-contact hour
is feasible during the early 1970's. One PLATO System operating
10 hours per day could provide 10 million contact hours annually
which is equivalent to the total annual hours of instruction at a
4 year undergraduate institution with 24,000 students. It is esti-
mated that the system replaces approximately 25 per cent of current
teaching practices.

The article lists some of the potential benefits of com-
puter aided instruction:

(1) Gradual abolishment of lock-step schedules
     and narrowly specified curricula in formal
     education. Students could proceed at a pace
     determined by their own capacity and motivation.

(2) Provision of remedial instruction or tutorial
     assistance during regularly scheduled courses for
     students with insufficient preparation.

(3) Reduction in the number of large lecture
     classes at the college level in favour of small
     instructional groupings and seminars.

(4) Special instruction at home for physically
     handicapped students.

(5) Development of arithmetical or other skills
     at the elementary level, in the absence of the often
     competitive environment of the classroom.

(6) Effective job training or retraining for any
     employee group especially affected by expanding
     technology.

(7) Continuing education for professional personnel, per-
     mitting the updating of knowledge and skills in
     their own offices and on their own schedules.

In a current study on "Better Use of Information in Canadian Urban Affairs", conducted under the auspices of the Canadian Council on Urban and Regional Research, it was found that:

"The absence of a unified local, regional or country-wide responsibility for the organization of information services is a major cause of the difficulties encountered by users of urban information in Canada. Governmental as well as non-governmental bodies handle various elements of urban information, often in isolation from one another, and without explicit criteria for the service they need or offer.

Valuable time is wasted in having to scan an excessively wide and heterogeneous range of information sources, particularly as to certain municipal functions. The information delivered to the users is rarely selected for their purposes, so great amounts of information received are of little value to the user.

The great variety of information required for administrators indicates the need for a highly condensed and organized kind of presentation that is rarely available.

If the potential social benefits of the new medium are not fully developed, as for a variety of reasons they may not be, then widespread public access to improved information is unlikely to be realized. There is a great danger that should these systems grow in a disorganized and fragmented fashion the potential benefits to Canada would be threatened. Instead of improved information handling the presence and incidence of relatively poor decision-making would prevail. As a result, the public interest would be sacrificed and the potentialities unrealized. The administrative efficiency of Canadian institutions would be jeopardized and the possibility of a new Canadian Information industry, potentially one of the largest, might never materialize.

At present no definitive formulae can be associated with the monetary benefits from information systems and services. However, benefits have been shown to include prevention of duplication, improved planning capability, improved decision- making

capability, enhanced creativity, innovation, and production improvement and diversification. It is extremely difficult, however, for members of industry to appreciate the potential value of more integrated information systems since they are rarely aware of their current information expense nor of the real value of appropriate information used wisely.

The importance of information technology is seen more clearly in the areas of social impact and regulation. Nowhere are the winds of change blowing more briskly than in the area of regulation. Regulated industries are moving into unregulated areas and unregulated industries are attempting to move into regulated areas. On the social side it is not yet clear whether the merger of computers and communications will link us all together in a "global village", (as suggested by McLuhan and others), or will splinter society into individuals supported by individualized information systems.

It is clear that technology only tells us what is possible. The technology of today exceeds by far our ability to make efficient use of it. It is becoming more evident daily that without co-ordination and leadership chaos could easily result. This could nullify the many benefits this new technology could bestow if intelligently applied.

Economist Leo Cherene stated the problem well when he wrote:

"The computer is incredibly fast, accurate and stupid.
Man is unbelievably slow, inaccurate and brilliant.
The marriage of the two is a force beyond calculation."

The importance of this study lies in the contribution it may make in the implementation of a cohesive policy to optimize and speed the devlopment of data banks and information systems. As mentioned above without such a policy in Canada, the potential benefits to be derived form this resource (information industry) will not be achieved.

Purpose of the Study

        As stated above in the general comments on the importance
of data bank networks, it is abundantly clear that the scope for the
development of data banks is extremely wide and diverse. Because
of the key role information will play in Canada and because of the
potential national income to be realized by the orderly development
of this "new" industry, the purpose of this study is to discover and
grasp the future potential information needs of society and to de-
velop a policy which will maximize the benefits to all. There are
almost infinite possibilities for the design and institutional
arrangements of data banks. It is believed that there is no one
satisfactory approach to the establishment of institutional arrange-
ments for such a diversity of data banks. The nature and function
of the data banks, determined by the user, will directly influence
the ultimate institutional arrangement which evolves.

        This study was designed to determine some of the many
possible institutional arrangements. With this purpose in mind,
group meetings referred to in the next section were held. From
these discussions a proposal and/or format for the analysis of
alternative institutional arrangements was generated. This ap-
proach to the problem is discussed at some length in the section
entitled "Analysis of Institutional Arrangements".

        The purpose of the study goes further; it incorporates
some of the long-range goals defined by public agencies, par-
ticularly, the Economic Council of Canada which has set out a
number of economic objectives and concomitant social goals towards
which the Canadian Government should move. The Annual Reviews of
the Council chart a pathway towards accomplishing these goals. A
number of sub-goals or strategies have also emerged and it is
these which have social implications. As pointed out by most of
the sub-groups, there is an increasing awareness of the economic
value of information and its potential role in contributing to the
realization of these goals. Inflationary trends have often been
attributed to a slow response from the economy due to the poor
transfer of economic information.

        In recent months the Government has been reviewing the
problems of foreign ownership and Canadian sovereignty. An inter-
national boundary does not stop the flow of data regardless of
how it is transmitted. Consideration must be given to developing
Canadian systems for the storage and retrieval of data to ensure

that our citizens do not have to turn to extra-territorial organizations for the services they require. This and many other aspects of information services require priority.

Only by relating this study to those of public institutions at large can we develop a cohesive policy approach to minimize inefficiencies caused by duplication and an overall lack of communication. For example, the economic and social value of information to Canadians must be related not only to themselves, but also to the socio-economic goals defined by Government organizations. The ordering of these priorities will largely determine those policy options open to the Government.

Our purpose is also to aid in stimulating public discussion of these most important priorities as well as their relation to the concepts and implications of information networks in Canada. Information networks can and will play an integral role in the achievement of objectives so set.

Organization of the Study

This study was carried out by a project team whose members were drawn from universities, industry, trade associations, government agencies, the Consumers Association of Canada and the Canadian Council on Urban and Regional Research. All members of the project team were recruited for their knowledge and experience in information systems generally as well as their individual professional expertise. A list of the members of the project team is shown in Exhibit II of this report.

Because of the professional expertise of the members of the team six sub-groups were organized: Consumer, Industrial, Legal, Medical, Resources, and Urban Affairs. The study group considered that in each of these sectors data bank systems may be expected to develop in the near future.

Meetings were held to develop the Terms of Reference, included as Exhibit I, and to clarify the approaches to be taken by each sub-group. All sub-groups were represented and played a role in formulating the terms of reference of this study. However, it became increasingly evident that the nature of the information defined by the user will, to a large extent, determine the institutional arrangement utilized in each instance. For this reason, special meetings were held with the chairman of each sub-group to discuss a format for analysing optimal institutional arrangements. The approach adopted for this report is developed below in the section entitled "Analysis of Institutional Arrangements".

It should be noted that the report submitted by the
Consumers Association of Canada is part of an on-going study to
be utilized also for purposes other than this study. As such,
their report does not strictly follow the Terms of Reference
set out by our group. The following quotation explains this:

"This document is designed to serve serveral purposes.
The entire document, and a covering policy state-
ment, constitutes a submission to the Government of
Canada through the Honourable Mr. Eric Kierans,
Minister of Communications. The submission deals
with the subjects of communications and public in-
formation. Part I of the document is also designed
for general distribution to encourge public debate
and participation in the formulation of communi-
cations policy. Part II of the document contains
elaboration of the idea of a community information
network and will be used as a basis for discussions
with other interested organizations and government
agencies. It will also be used in connection with
the Telecommission studies of the Department of
Communications, and in particular Study 5(f) on the
development of large scale data banks in the public
interest.

Copies of this document are available from the
Consumers' Association of Canada, 100 Gloucester
Street, Ottawa 4, Ontario.

. . . . "

The report submitted by the Canadian Council on Urban
and Regional Research is also an intermim statement of an on-going
study concerned with the informational problems faced in the realm
of urban governments. It is entitled, "Better Use of Information
in Canadian Urban Affairs". dated 31 July 1970.

To quote the Urban Information Exchange Service Project:

"The Council has for some time been engaged in a
project to improve the accessibility and trans-
fer of urban information in this country. We
have now come to the closing phase of our project
and our Expert Team will shortly be writing their
final report.

At this point, they invite the objective assessment
of experienced and competent people in this field;

they ask your views on the urban information
situation uncovered and particularly on their
proposals for solutions.

The enclosed Interim Statement was prepared as a
basis for your comments. It is neither complete
nor comprehensive; rather it is meant to out-
line as briefly as possible the experts' thoughts
on the problems discovered and on ways to solve
them. Detailed findings and explanations have
been reserved for the final report, of which
this Statement can be considered as an outline."

The Industrial Sector study was carried out by members
drawn from industry and two trade associations under the leadership
of Mr. J.P.I. Tyas of the Federal Department of Industry, Trade
and Commerce. The names and organizational relationships of the
participants in this sub-group are shown in Exhibit II. A question-
naire was sent to 41 industrial associations asking for views
and opinions on the type of information services that would best
serve industry. The questionnaire and distribution list is shown
in Exhibit III.

The Medical Sector study was carried out solely by
Dr. A. Sherrington of the Department of National Health and Welfare.
Dr. Sherrington collected views and opinions by personal interviews
of leaders in the field of medical information systems.

The Legal Sector study was carried out by members drawn
from three universities under the direction of Mr. J.W. Ryan of the
Department of Justice. Members of this committee are shown in
Exhibit II. A questionnaire, shown in Exhibit IV, was mailed by
the Department of Justice, to all lawyers in Canada except those
in the Province of Quebec. Lawyers in the Province of Quebec were
excluded from this survey as the results requried were available
from another survey recently concluded for that Province. The
Province of Quebec questionnaire is also included in Exhibit IV.

The Resources Sector study was carried out by members
drawn from industry and the government under the leadership of
Mr. W.C. Brown of the National Research Council. The study was
conducted by a combination of:

- questionnaire and distribution list (shown in
Exhibit V)

- correspondence

- telephone discussions

- visits to a number of persons

- attendance at conferences on data banks

- review of relevant briefs previously submitted
  for other federal studies.

The Resources Sector sub-group followed closely the
Terms of Reference established by the project team. Since this
report was a comprehensive examination of the problems in question,
their study provides a very useful framework for the final report.
This framework has been adapted and altered as a result of the con-
tributions of other sub-groups and, as such, provides much of the
final report.

Exhibit VI lists the "table of contents" of the separate
reports of the individual sub-groups.

Because all the sub-group reports included common areas,
we have been able to integrate them into the present framework.
This report represents a consensus of opinions and statements found
in all sub-group studies. We are deeply indebted to all those who
took part and who contributed their opinions and suggestions, while
giving so freely of their time.

Organization of the Final Report

Section I of this report is a summary which brings to-
gether the conclusions common to all sub-group reports. Section II,
the Introduciton, has been sub-divided into four sections:
Importance of the Subject, Purpose of the Study, Organization of
the Study, and Organization of the Final Report. In general, the
last two sub-divisions describe how the work was organized, imple-
mented and the report written. Section III, Summary of Special
System Designs, is a synopsis of each sub-group's contribution to
this Study. These synopses are simply short presentations and
summaries of the main trend of thought contained in each of the
six reports submitted to the Telecommission.

In Section IV we have brought together all those factors
which were considered common and which would influence the develop-
ment of data banks. The factors identified were: awareness of in-
formational needs, technological, institutional, political, legal,

economic, financial and international. Therefore this Section is an integration of the work carried out by the sub-groups.

As mentioned above, Section V, Analysis of Institutional Arrangements, presented special problems which had to be reconciled before this Report could be written. The sheer diversity of possible data bases necessitates a matrix approach to the presentation of alternative institutional arrangements. This approach is in part, the result of a series of special meetings with the sub-group chairmen and of an integration of the views expressed by their contributions. For purposes of organization, three phases were identified: planning, implementation and operation. The institutional arrangement utilized will not necessarily be the same throughout the three phases leading to an operational data bank.

SECTION III

Summary of Special System Designs

This section presents a synopsis of the major findings set out by each of the six sub-groups. One should keep in mind the summary nature of this section and refer to it while reading later sections. The purpose of Section III is simply to present the main arguments brought out by the sub-groups so that one may relate these reports to the final report.

A) Legal Sector Report:

The objectives of this study were to investigate the need for a legal data bank, to discuss its requirements and suggest how these requirements might most economically and efficiently be met.

In the appendices to the study are set out copies of two questionnaires, one sent to all members of the legal profession in the Common Law provinces and the other to all members of the legal profession in the province of Quebec, together with the replies to these questionnaires. (In the case of the Common Law questionnaire, only a sampling of approximately 1200 replies was possible in the time available). These questionnaires are included in this report as Exhibit IV.

The lawyer is more dependent on recorded information than any other professional man. This is best illustrated by the following paragraph from a talk given by Mr. W.B. Eldridge at Queen's University Conference on "Computers and the Law" in May 1968.

> "In my view, literature has a role in law quite
> different from the role of literature in any other
> discipline. Many disciplines refer to "primary" and
> "secondary" sources. In the natural sciences, primary
> sources might be defined as the reports by experimenters
> of observed physical phenomena under controlled con-
> ditions in accordance with scientific literature that
> presents analysis, evaluation, and rationalization of
> the results of experimentation could be defined as
> secondary sources. Law also has primary and secondary
> literature. Secondary literature is functionally much
> like that of sciences. It is composed of the analysis
> evaluation and rationalization of the primary literature.

At the level of primary literature, however, a critical difference exists. Primary literature, is not descriptive of the phenomena of law, it is the phenomena."

The long life of legal information and the phenomenal increase in legal relations between people -- an increase which, over the last few years, has been paralleled by the growing socialization of human activities has brought about an increase in the volume of legal data. A brief look at the long list of material available for legal research reveals the difficulty of the task. The primary sources of the law are:

1 - the cases before an increasing number of courts of justice (The Supreme Court of Canada, the Exchequer Court of Canada, Courts of Apepeal, Superior Courts, Provincial, District and County Courts, Criminal Courts and others).

2 - the Codes, which try to regroup under one heading, material pertaining to one particular subject, (The Civil Code, Codes of Procedure for the province·of Quebec, the Criminal Code).

3 - the statutes.

4 - the statutory orders and regulations or by-laws of the three levels of government.

5 - the ruling of special tribunals such as arbitration boards, administrative boards, etc.

The secondary sources of law are treatises, restatements, periodicals, commentaries and encyclopedias.

Since none of the current research tools cover the entire legal field, a lawyer frequently needs days or even weeks to make sure he has traced all relevant documents. Needless to say, the cost of such research is very great. Sometimes because of inadequate organization the same legal problem is researched several times by different lawyers.

The judge must also be certain that the arguments presented to him in court contain all of the relevant authorities before he can decide upon the outcome of the case. Considerable time may be required for this.

In addition to these circumstances which affect the entire profession, examination reveals a fundamental inequality between

practitioners. Large firms clearly have advantages with regard
to legal research. Often they have extensive library facilities,
clerks or professional researchers, and well prepared case files
as well as a comprehensive filing system built up over the years.
With such resources these lawyers, who are often highly specialized,
are in a distinctly advantageous position to handle the most com-
plex problems which their clients may submit to them. The type
of justice obtained may depend upon what a client can afford to
spend on legal services.

The main factors likely to affect the development of legal
data banks are economic and legal in nature. Technological
factors only arise in relation to economic ones.

The main legal problem is likely to arise in the area of
copyright. The bulk of reported cases are published by private
companies who hold the copyright for that material. If no
arrangement can be made with regard to this copyright, recourse
would have to be made to the original typewritten manuscript of
the judgment.

The economic factors relate to such things as the cost of
large scale data storage, the cost of data input, the cost of
long distance communications and the cost of terminal equipment.
These could be reduced by improvements in the technological area.

The only technological factor which does place restrictions
on the development of a legal information system at present is
the stage of development of the appropriate computer programs.
The shortcoming is not the computer's but lies in the present
inability to express in a logical fashion to the computer, the
process it is to follow in retrieving information.

The report states that unlike some potential industrial
systems a legal information system can not readily be created and
administered by its users. Canadian legal practitioners are
scattered through a very large number of partnership firms or
individual practices across the whole country. There are about
17,000 practising lawyers in Canada. In addition there are 7,000
students and professors in law schools. The very largest law
firms in Canada have about 100 members but there are very few of
these large firms. The likelihood of persuading this scattered
group to make the necessary decision for the planning, financing
and implementing of a major system is small.

Although the views of this large body of lawyers and other
potential users have been hard to assess, some steps must be
taken to involve them in the planning of a system. This might
be done through law societies and bar associations, etc.

It might also be possible to involve the National Council on the
Administration of Justice in Canada in the planning of the system.
This body includes the Provincial Deputy Attorneys-General or
their representatives thereby involving the provincial governments
in the process.

Ideally the conceptual planning stage should involve the
Federal Government, Provincial Governments, members of the legal
profession and other special interest groups, such as universities.

Three steps are involved in the implementation phase.
These are:

1 - the establishment of the organization which is to handle
    the operation of the system;

2 - the creation of a data base consisting of:
         a) statutory type materials which might be converted
at a central location or copies obtained from provincial governments
or a combination of these two,
         b) Case Law, the input of which should be co-ordinated
through a central organization.

The implementation process should be regulated and supervised
by the organization which is eventually to operate the system.
However, special interest groups, such as universities, might well
be involved in the implementation stage either in the area of
systems development or of data conversion.

The responsibility for the operation of the retrieval
system can be assigned to any one of a large number of types of control
groups. For example, it could be assigned to a crown corporation, a
department or agency of government, an intergovernmental body, some form
of consortium, a special interest group (e.g. universities) or private
enterprise generally. Some of the advantages and disadvantages are set
out as follows:

(a) Crown Corporations:

A crown corporation, whether Federal or Provincial,
has certain tax advantages, no dividend allocations, no debentures, no
trust deed arrangements. It does report to a parliamentary body,
face the committees and accept government direction.

(b) Government Department:

It is difficult to see how a government department could be employed to operate a national information retrieval system since a department is not really organized for this kind of function. Government Departments are more closely associated with government policy than are either the Crown Corporation or the Government Agency.

(c) Government Agency:

A government agency can be given powers to act on behalf of the government in a certain specified field. This has the advantage over a government department as its sole function can be to operate within a specific field e.g., to operate a legal information storage and retrieval service. It has greater freedom than the crown corporation as the legislation creating it may give power to the Minister to extend its shpere of influence by regulation rather than resorting to further legislation as would be required in the case of a crown Corporation.

(d) Intergovernmental Body:

An intergovernmental body would have the merit of involving both the Federal and the Provincial Governments in the operation. This could lead to co-ordination in other types of legal information systems e.g. property information systems.

(e) Consortium or Syndicates:

A consortium or syndicate of Governments, Law Societies, Universities, etc., might offer a solution to the problem of insuring that the system was developed and used to provide the maximum benefit to the general public and the legal profession.

(f) Special Interest Groups:

Special interest groups, such as universities, seem better involved in offering service in the implementation and development phase. They are not designed and set up to administer an operational system. Their facilities are intended for research and training purposes.

(g) Private Organization:

The system could be operated by a private organization although some difficulty might be experienced in raising the capital required for the large scale data conversion required.

Government regulation of the industry, as well as financial support in at least the initial stages of the development of public service data banks may be necessary.

B) Industrial Sector Report:

The Industrial sector sub-group has taken an "information" approach to the decision-making and problem-solving processes. A data bank is essentially a storage and retrieval system for information. Regardless of the data bank family, e.g., consumers, urban affairs, etc., information contained within the system is used in a problem-solving or decision-making manner. The most significant use of information lies in its potential to aid and enhance these processes. The user of an information system must play the key role for it is he who defines the nature and form of the information contained in the system. Survey efforts by the sub-group demonstrate the present low awareness of a large segment of the business community with respect to the use of relevant information in their day-to-day activities. Economists and students of business administration are aware of the relation-ship of information to improved decision-making and problem-solving. But the user, at the same time as he demands performance from his staff, is not fully conversant with the needs of an effective information system to achieve efficient operations.

Policy-makers often have a tendency to accept those views which further develop and reinforce existing ideas but in the field of information processing, interaction between the user and the designer must be considered of primary inportance. It is well to point out that neither party alone is both necessary and sufficient to the successful planning and implementation of an information system. It therefore becomes very important that the designer, who may be in the policy-making area, never separate himself from the users. Only the user can attempt to define the nature and form of the information he believes to be of use. Since form is generally determined through user knowledge of information problems, the user is in a position to influence the feasibility of a data bank by properly defining needs or problems. The role of the designer should be to provide the hardware and software of the system in a way which will maximize the use of the contained information.

Because of his awareness of the technical and perhaps economic feasibilities, the designer of a system may often ignore the users most basic problem which is defining his information needs. The Industrial Sector Report indicates that this is in-deed the major problem facing industry today. Small firms and

firms serving less developed markets lack knowledge of informa-
tion gathering and retrieval. Government, in view of the facts
presented, must not impose information systems on the user before
he has become aware of his needs and has attempted to define them.
In the implementation of an information system the necessary con-
dition is user awareness.

When the goal of an information network is decided upon,
an analysis of the present state must be carried out. At this
point in time the first step should not be to commence systems
design but rather to familiarize the user with methods of gather-
ing and differentiating the information he considers useful.
Designer and user must then work together in the design of a
system which will maximize usage of the information contained in
it. Pilot projects can be initiated to refine the design of the
system in line with the operating criteria established earlier
by user and designer. Simultaneously with the design stage
private and public sector officials can establish final institu-
tional arrangements and financing for the system. It is the
opinion of the Industrial Sector sub-group that a co-ordinating
authority, financed by government, should initiate the early
familiarization stage. The financing of this step will have to
be considered separately from that of the design and implementa-
tion of the banks.

Only by following the sort of progression discussed above
can the policy-maker avoid the pitfalls of premature commitments
of resources to inadequate systems. Not only could the system
be chaotic and expensive in the sense that it would contain
irrelevant and little used information but also it would be
expensive to industry and the individual Canadain taxpayer.

The logical first step is a marketing oriented familiar-
ization campaign to aid industry in gaining an awareness of
information as a resource and its economic impact on both the
firm's profits and on the Gross National Product. Governments'
responsibility at this stage is to work at this most fundamental
level. Only then can management become fully conversant and
experienced with the uses of information systems.

From the above discussion, it is evident that the major
criteria for deciding upon data bank pilot studies lie in the
particular families' ability to differentiate the useful from

the useless. Some families are obviously more prepared to establish information networks in certain aspects of their field than is the Industrial Sector.

C)   Urban Sector Report:

         The Canadian Council on Urban and Regional Research in conjunction with agencies of the Federal and Provincial Governments and Municipal Administrations have made a study of the accessibility and transfer of urban information in Canada.

         The Council set up a team of three experts to direct the project. This team was assisted by an Advisory Panel consisting of knowledgeable persons from many urban governments and information services. Under their direction a consulting organization was hired to carry out a survey of urban information users and sources in Canada and abroad.

         The survey of user requirements involved interviews in a structured sample of over 120 Canadian units of urban administration; of these 90 were in municipal offices distributed across the five major regions of Canada and using both official languages while the others were in provincial and federal governments, in municipal associations and in universities. The responses of urban information users revealed their habits and difficulties and, particularly in the few cases where possible, showed something of current costs of searching for, interpreting, processing and transferring urban information in Canadian governments. The chief difficulties and defects in present practice are clear enough from this survey to enable performance specifications for a Canadian Urban Information Exchange Service to be set out.

         The surveys of sources in Canada and abroad were conducted with expert knowledge of the field including attention to the sources mentioned by urban information users in the other survey. Wide variation is evident in urban functions in cities of different sizes and in different parts of the country in their dependence on available sources. Mutual aid can clearly improve the use of pertinent urban information sources for all concerned.

         From these surveys of users and sources and with the help of the Advisory Panel and others a sketch design has been drawn of a Canadian urban information exchange network. It is meant to offer those in every branch of urban affairs the benefits of quicker, more complete and pertinent information on which to base discussions affecting millions of Canadians. It will offer this

benefit in communities of all sizes, in every region of Canada and using both official languages.

On July 31, 1970, the Council released an interim statement on the findings of their study entitled, "Better Use of Information in Canadian Urban Affairs". This statement outlines the experts' thoughts on the problems discovered and on ways to solve them. It invited an objective assessment of the study findings by experienced and competent people in the field. The detailed findings and explanations of the proposed Urban Information Exchange Service, together with the views expressed on the interim statement, will be incorporated into a final report which is scheduled to be published in the spring of 1971.

The project findings expressed in the interim statement are:

(a) The absence of a unified local, regional and country-
    wide responsibility for the organization of informa-
    tion services is a major cause of the difficulties
    encountered by users of urban information in Canada.
    Governmental as well as non-governmental bodies handle
    various elements of urban information, often in isola-
    tion from one another, and without explicit criteria
    of the service they need or offer.

(b) Valuable time is wasted in having to scan an exces-
    sively wide and heterogeneous range of information
    sources particularly as to certain municipal functions.
    The information delivered to the users is rarely
    selected for their pruposes so great amounts of
    information received are of little value to the user.

(c) The need for comparative information is hampered by
    the absence of standards and norms; data gathered
    at great effort and expense in one office cannot be
    used by other administrative units because of dif-
    ferences in definitions and standards. Capability
    in one language only limits possibilities for com-
    parisons of ideas, facts and data.

(d) Urban policy and administration in general suffers
    from a shortage of people qualified in information
    handling. As a result there can be little or no
    systematic inquiry into the efficiency of current
    information processes with and among administrative
    units and available methods of information handling
    are not put to effective use.

(e) Those interviewed in surveying information practices
     had little cost-data. Thus there is very little
     objective assessment of information handling costs
     at any level of use. In all probability municipal-
     ities are spending too little for the information they
     need but too much for the quality of what they are
     getting. A more penetrating study is needed on this
     question.

(f) Small centres could overcome many of their difficul-
     ties by pooling their information resources in
     regional co-operatives and sharing their costs.
     Improved information services will still require
     more qualified staff and the use of advanced tech-
     nology. These regional co-operatives could arrange
     interchange of information among themselves and
     with other levels of governments.

(g) Urban information users and producers across the
     country need to define their roles more clearly,
     increase their resources, co-ordinate their efforts
     in a network of urban information and establish a
     clearing-house to ensure the operation of the whole
     system. Responsiveness to the constant evolution
     of urban affairs and capability of the clearing-
     house in both French and English are essential pre-
     requisites. The network must take advantage of
     up-to-date technology and tie in with related
     Canadian and foreign information systems.

D) <u>Medical Sector Report</u>:

     The terms of reference of this study set down "medicine"
as a particular area of study. This was widely interpreted to
cover the whole health professional field.

     The main purpose of the study was to identify national
information services in the public interest which could be
supplied by large, remote-access data banks. The necessary
support was discussed. Some conceptual designs are described
and statistics of user numbers, bank size, type of data stored,
frequency of use, and finanacial arrangements are given to place
these designs in perspective. Advantages and disadvantages to
be considered in finding an optimum solution are noted.

     The relationship between the data bank and other banks,
users, governments and international systems are explored.
Particular attention was paid to the role of government.

The limited time available for the study made it necessary to concentrate on the broad outlines of the problem. This was done by:

- telephone discussions

- visits to a number of interested individuals and leaders in the field

- attendance at conferences on computers and data banks

- review of relevant literature

Data banks would result in increased productivity among scarce and expensive health professional manpower, providing needed information to apply new techniques more speedily and more effectively and to make better use of existing facilities. Ideally data on the incidence and prevalence of all diseases, injuries, disabilities, and impairments in Canadians would be available, providing a starting point for identifying health problems and the requirements of the population. Medical planners need to know the availability of health facilites, the number of hospitals of all kinds, the services provided, and the number of beds. Constant updating of such information is mandatory. Indeed it is with regard to planning for medical needs that a data bank may serve in the most useful way. Up-to-date and relevant data may make the difference to a medical programme and determine whether it is economic and viable.

One of the most wasteful aspects of patient care, in hospital or outside, is the taking and retaking of patient histories. The creation of a data bank of patient records covering all treatments would probably be the most meaningful contribution in the public interest.

Data banks also serve a useful purpose in maintaining up-to-date records of research in all medical fields as well as current information on existing drugs, poisons and diseases. This information is invaluable not only to the practitioner but also to the medical school.

The Medical Sector Report discusses technological institutional, political, legal and economic factors. Problems faced in establishing a medical data bank relate to such functions as federal-provincial co-operation, the conservatism of the medical profession, liability for record errors, right of access to files and the need for federal government financial support.

Like the Resources sector Report the medical report follows the conceptual design format that is discussed in Section V of

this final report. Briefly, these steps are:

- exploratory phase

- conceptual phase

- design phase

- implementation phase

- operational phase

- audit phase

The report recommends:

(a) That a full-scale survey of the needs of the health
     community for data banks be commissioned and carried
     out.

(b) That steps be taken to educate the potential users
     on the advantages of data banks. This education
     should start early and preferably at undergraduate
     level.

(c) That ways be explored to support those data banks
     which are necessary in the public interest.

E) Resources Sector Report:

     In considering requirements for data banks for various
facets of Canada's resources one is faced with an almost inex-
haustible list of possible banks which could serve the national
and public interest. Major broad areas include:

Agriculture	Mineral resources
Communications	Pollution
Education	Tourism
Energy Resources	Transportation
Fisheries	Water Resources
Forestry	Weather
Land Use	Wildlife
Manpower	
Pests and diseases of plants and animals	

     Advances in computer and communications technology permit
the creation of central data storage banks allowing access by
users from remote locations. This facility has great potential
for benefits to the individual and to the nation but, at the
same time it raises a number of difficult problems if benefits

are to be maximized and costs minimized. It also gives rise to
a number of fears and anxieties on the part of the individual.

In order to solve the difficulties, resolve the conflicts,
and protect the individual, the Government must develop a co-
hesive and comprehensive policy on data banks and set up pro-
cedures for optimizing their development and use.

In the time available for preparing the resources report,
it was not possible to conduct an extensive survey of requirements
nor to elicit comments and suggestions from all those who could
have contributed to the study but a broad cross-section of indivi-
duals was queried by personal contact, correspondence, and telephone
conversation. An Appendix to the resources report includes speci-
fic comments made by some individuals who were contacted.

Data banks will have value only in so far as they are used
and used effectively. Section III of this sub-group report dis-
cribes briefly different uses of data banks with comments on
their importance to the national and public interest. These
uses include such functions as planning, control, research,
archival storage and general public service.

Section IV of the Resources Report considers some of the
problems which will arise in the development and implementation
of data banks and their attendant information systems. Techno-
logical problems, while presenting major difficulties, are not
considered to be seriously limiting. The major limitations will
be in regard to the availability of skilled manpower and sufficient
financial resources. Probably the most critical problems will
arise from the fact that present organizational barriers will be
crossed; these problems will be resolved only if there is a genuine
will to co-operate. These are informal policical factors with a
dynamic character.

The importance of use and user-orientation in the development
of data banks is stressed throughout the report and Section V of
the Resources report considers user involvement from concept to
operation. Without this emphasis a great deal of money and
effort can be wasted. It must also be emphasized that users'
requests for inclusion of data must be kept within bounds of
actual use requirements and that any attempt to include every-
thing which _might_ be used must be strongly resisted. Section V
also suggests ways and means of developing a comprehensive
Government policy on data banks and suggests procedures for
assessing priorities and requirements.

A summary of recommendations is given in Section VI, followed by a cautionary note on avoiding "band wagon" fever and indiscriminate use of data in the banks which will be created.

The appendices contain background information and suggested terms of reference for a National Advisory Committee and other Specialist groups recommended.

By permission of the authors substantial amounts of material from Section IV and V of the Resources report have been incorporated into the final overall report. This has been done because of the general applicability of the approach taken to the planning, implementation and operation of data banks.

The report recommends that:

(a) A national policy should be formulated with regard to a development and operation of data banks in the national and public interest. The complex nature of the data banks themselves, the need for inter-communications among different banks, the critical problems of jurisdicational responsibilities, the problems arising from the fact that organizational barriers will be crossed, and the need for protection of vital or sensitive information make this an urgent requirement.

(b) A National Advisory Committee should be established to assist in the formulation of such policy, and to assess, and make recommendations on national priorities and the need for specific data banks.

(c) A Central Systems Group of analysts with knowledge and experience in information retrieval systems should be established in Government to provide technical advice and assistance to, and to act as a secretariat for the National Advisory Committee and to actively participate in the design and implementation of specific data banks of high priority.

(d) Due to the complexity of assessing data requirements and the organization best suited to each data bank it is recommended that standing committees with inter-departmental membership be set up to determine these requirements and present initial plans to the National Advisory Committee.

(e) Planning and implementing data banks will involve
    government departments at all levels, federal, pro-
    vincial, regional and municipal. To facilitate
    appropriate separate or co-operative action, it is
    recommended that studies of existing legislative
    requirements be made for all departments involved.

(f) If data banks are employed efficiently there
    will be a concomitant reduction in the storage of
    redundant data. This will result in unique value
    being placed on data bases. In that organizations
    other than governments may be entrusted with the
    establishment and operation of such data banks in
    the public interest it is strongly recommended that
    legislative action be taken to ensure that the owner-
    ship of data bases of particular value to the public
    remain with government and not form part of any assets
    that may be sold or otherwise acquired by another
    party. Essentially a trusteeship is advocated.

(g) Data banks will become progressively cheaper as tech-
    nology advances encouraging the storage and retrieval
    of original observational data. This is not without
    its dangers for such data may never face the scrutiny
    of expert referees and invalid data processed by
    inappropriate and possibly undefined statistical pro-
    grams can spread false information harmfully. It is
    recommended that consideration be given to operational
    regulations to minimize such risks.

(h) It is a common concern that privacy of personal data
    and protection of proprietary material may be com-
    promised in data banks and that system malfunction
    can assign incorrect identity to the detriment of
    the individual. It is recommended that codes of
    ethical use of such data bases be prepared and that
    the necessary legislation to establish and protect
    the rights of the individual be enacted.

(i) Much of the anticipated value and efficiency of data
    banks will be sacrificed if minimum standards of
    coding, format and content are not officially encouraged.
    It is recommended that appropriate action be taken to
    develop and support such standards and to establish
    a Canadian registry, and eventually a data bank, carrying
    such descriptive data as necessary to permit access and
    use of all data banks established in the public interest.

(j) Centres of expertise in information retrieval systems should be developed at two or three Canadian universities to encourage closer co-operation between universities and industry and to provide facilities for training in an area where demand far exceeds supply.

(k) Government should contract out the development of some of the required data banks to these university centres.

(l) Highest priority should generally be given to those data banks providing information for decision-making and planning purposes.

F) Consumer Sector Report:

This study was conducted under the auspices of the Consumers Association of Canada and, as stated, is intended to serve a number of purposes as well as being a submission to the Telecommission. Because of the nature of the Consumer's Association this report is more directly concerned with consumer access to relevant and useful information to the individual. Both as a final good (TV programs, radio entertainment, education courses taken for pleasure), and as an intermediate good which affects the speed and effectiveness of individual and family decision-making (consumer information, job opportunities, training courses), information plays a central role in determining the welfare of Canadians. This theme is found throughout the Consumer Sector Report.

Of utmost importance and stressed by the Consumer's Report, is the role served by information in the achievement of the social and economic goals of society. As this role for information increases and becomes more clear, modern means of telecommunications with storage and retrieval capabilities of computers improve to the point where it is now possible to envisage information systems readily accessible to the public. The CAC stresses the potential importance of these services for the well-being of Canadians and Canadian Society.

To maximize these advantages the Consumer's Report envisages a network of information systems under non-profit sponsorship organized in such a way as to remain sensitive to the needs of the users and particularly to users whose financial resources are limited in relation to needs. The information contained in these networks would be as unbiased as possible. To achieve these ends more readily participation by the public in both design and operation should be encouraged.

The Report examines technological features which can facilitate the achievement of these goals by asking a series of questions which must be presented to the public at large to more readily access the impact of communications technology. The tremendous changes in society which will emerge due to the application of this technology must be understood by Canadians.

The report concludes that:

The possibility of creating in Canada a non-profit community information network (a set of linked data banks containing information for use by the general public) should be explored.

A network to link together a set of data banks containing information for general public use would have the following merits:

(a) It would make possible a very great improvement in the efficiency of resource allocation by its effect on household decision-making.

(b) A non-profit system would help to compensate for the deficiencies of the free market in providing adequate information to consumers.

(c) Unlike all other proposals for the creation of data banks its social and economic benefits are made available directly and would not have to rely upon a process of "trickle down" before they could be realized.

(d) Its indirect benefits in the form of experience and initiative generated among those who work on it are at least as great as those associated with the creation of any other data bank.

(e) The early creation of data banks for public use is likely to speed the widespread installation of a two-way communications capability in Canada with the desirable social effects which this would have.

(f) Its benefits would be widely distributed among different age groups, different income groups, different regions and different cultures.

(g) It would be an essential base and tool for citizens' advisory bureaux.

(h) It would serve as a positive mechanism in the market place to provide a yardstick against which competing domestic and foreign systems could be assessed by the public.

(i) The improvements in public information which it may make possible would reduce the costs of other government programmes.

(j) It would improve the efficiency of the market place by complementing competition policies.

(k) It would provide a vehicle through which essential elements of standardization could be assessed and introduced.

(1) Its creation need not await the resolution of the privacy issue because the data on the system does not consist of records of individuals. Privacy of access for individual users is sufficient.

(m) It could be built upon a number of component parts already existing in the public sector and in the voluntary non-profit field.

The immediate need is for a clearing-house for public information systems now being developed or planned in both the private and public sectors.

The initiative in establishing such a clearing-house which is being undertaken by the Consumers' Association of Canada and with which other organizations are being invited to collaborate should receive co-operation and support from governments.

In terms of conceptual design, the CAC proposes a five phased approach:

Phase I   - Clearing-house for Existing and Planned Systems.

Phase II   - Feasibility Study - composed of three studies

         i) Systems - technical equipment, financial needs.

         ii) Data Base e.g. appropriate data base and how to obtain it.

         iii) Legal e.g. contractual relationships liability, patents.

Phase III   - Demonstration Project

Phase IV   - Operational Systems in selected
                    locations.

Phase V   - National network of operational
                    systems.

SECTION IV

<u>Factors Affecting the Development</u>
<u>and Implementation of Data Banks</u>

Though the term 'data banks' has become a familiar one
only in the past few years of this computer age, the realization
that they have been with us from time immemorial is of some im-
portance. The collection, indexing and collating of data in con-
ventional files, if properly organized, offer virtually the same
facilities and services as computer-operated data banks, although
less efficiently. Because the orientation of this study is to-
wards national information services in the public interest,
which can be supplied by large remote-access data banks, this re-
port will center on factors influencing only the computer-based
data banks, which may be planned to meet national needs economi-
cally.

Such data banks differ in principle from manually-operated
files only in that they permit:

(1) Higher speed input and output of data.

(2) A facility for the storage and manipulation of
origninal data in any combination of variables
without requiring the establishment of individual
files.

(3) Efficiency unattainable by manual methods when
volume of entries is large.

(4) Diminuition of artificial organizational barriers
or restraints to data interchange through the use
of electronic means for collecting, storing, re-
trieving, disseminating and printing information.

In the following parts of this section are the factors
brought out by the project team that may influence the develop-
ment and implementation of data banks. These factors are:

(1) Awareness of informational needs

(2) Technological

(3) Institutional

(4) Political

(5) Legal

(6) Economic

(7) Financial

(8) International considerations

1. Awareness of Information Needs:

One of the most essential factors memtioned by the study groups as influencing the development of data banks was the actual realization by users and suppliers of the decisional importance of information. As cited in the Industrial Sector Report, due either to a lack of awareness of what types of information are actually available or merely to lack of precedent for explicit definition of information requirements, few businessmen approach their decision making activities in terms of the specific information needed to answer particular questions and most businessmen experience considerable difficulty in trying to articulate specific information needs.

As a result of this lack of a clear definition of information needs planning for efficient use of information or effectively using information which has been randomly attained is extremely difficult. Potentially valuable information is worthless if it is not used, either alone or in conjuncion with other information, in the right context and in the most appropriate way. Where information is not considered a resource its use is haphazard. This only adds to the confusion of decision-making; industry wants less information not more. Similarly, in the urban sector, the different levels of administration involved in urban affairs seems hardly aware of the ways in which the growth of information will complicate the major decisions they must take. The rapid growth of larger centres, the novelty of the phenomenon (barely 15% of our population was urban in 1867) often leave those in authority without adequate tools for decision-making in such fields as housing and urban renewal, urban transportation, pollution, etc.

Efficiency depends not only on numbers and qualifications of staff, but also on optimum exercise of their professional competence, including detailed knowledge of the problems to be solved, of available resources and solutions, and of criteria to assess results. It is apparent that a great part of the working time of most administrators is spent trying to organize their information base for decision-making. It is therefore particularly

important to eliminate waste (time spent looking in the wrong place of for non-existent information, time spent by different people in collecting or processing the same information, or time spent on independant and contradictory efforts so that related information is collected and processed in compatible forms).

The study on scientific and technical information, found that most information was obtained through very informal channels. This appears to be true for qualitative and quantitative data including scientific and technical information. While organizations of all types do now have, or are developing, quite advanced systems for obtaining internal information in such areas as finance and control, marketing, production and personnel, there are few formal methods used to obtain external information on a regular basis. With the large quantities of informaion and data that are required and used today, these informal information channels or systems are far from ideal and their effectiveness is often very low. This tends to undermine user confidence in suggestions for new or different information services. In addition, the fear among industrial users of being inundated with even more information leads many businessmen to believe that modern information systems would add to their dilemma as well as raising overhead costs. But it is possible that as firms and commercial organizations see the use being made by their competitors of more advanced information services, they will demand improved services in their sector. There is an increasing desire for more timely information of a better quality, and an awareness of its social and economic importance.

2. Technological Factors:

Data banks will serve the public interest and meet with public acceptance only if they conform to required standards of efficiency, reliability, economy and user orientation. The ultimate aim is the total recall of all useful data in response to a query, without any irrelevant entries, with the minimum expenditure of the user's time, money, and effort, and in the form that he specifies.

This requirement places a great deal of emphasis on systems considerations, especially in those cases where data banks, containing different specialized data bases, will serve the user through remote-access facilities. Factors which justify special attention are the organization, availability and validity of data and continual maintenance and updating of such systems.

While emphasizing the importance of good systems de-
sign and the selection of appropriate equipment, the present
technology is not considered a major limiting factor in the devel-
opment of data banks. However, technological aspects do pre-
sent major problems some of which are covered in this part.

One factor of far-reaching importance to efficiency and
economy of operation is standardization of data codes and formats
to allow ready exchange of information between data banks, nation-
ally and internationally. The need for action must be endorsed
to achieve workable standards for format, coding, system lan-
guage and continuing Canadian support for groups involved in this
effort. Since use of standards is voluntary it will require
government and industry collaboration to make them effective.
Compatibility was one of the features most commonly noted in all
sub-group reports.

In order to achieve co-operation and interchange of
information, standardization is required. This matter represents
the most urgent and pressing problem within the broader context
of achieving compatibility. The urgency arises out of the
accelerating trend toward intergovernmental co-operative arrange-
ments in solving public problems the increasing pressures for
integrated and comprehensive planning at national, provincial
and local levels, and the consequent need for frequent exchanges
of information.

The standardization of data elements in common use,
and of the codes used to represent these data elements, will pro-
mote a better understanding among governments of the information
being processed, improve its reliability, and enable it to be
exchanged among users and suppliers and summarized without expen-
sive and time-consuming translation processes. The over-all
usefulness of the information will therefore, be enhanced immea-
surably, irrespective of whether the data are processed by elec-
tronic, mechanical or manual means.

It is therefore extremely important that in setting up
information systems full attention be paid to the manner in
which interchange can take place between the different informa-
tion systems. This is particularly important when machine-based
systems are used but is equally important for systems based on

conventional methods.

An area in which standardization is possible, as stated in the Urban Sector report, is in the use of compatible equipment which allows for ready interchange of the materials stored.

Technological factors are of importance to each step involved in data bank operation, acquisition of data, its classification and indexing, storage, retrieval, dissemination and reproduction. Some of these factors identified during this study include:

Acquisition

(1) Importance of acquiring evaluated data to prevent pollution of data bases with data unsuitable for decision functions. Error checking can be expensive.

(2) As storage becomes cheaper pressure will increase for storage of individual original records rather than aggregate statistics to permit correct relationship of data to be maintained for time series.

(3) Timely collection and updating are required to avoid obsolescence of data. Delays up to four years in some data compilations were determined by some of the sub-group reports. Projections and simulation studies of dynamic situations can be sensibly based only on evaluated up-to-date data.

(4) Although remote data banks may be controlled by computers of different type and size an exchange language can permit data interchange. The use of intermedia process computers was mentioned.

(5) As electronic editing and publication trends progress most published data will be made available on magnetic tape for data bank entry. Optical character recognition equipment will supply input from microforms and the printed page.

(6) Use of the data bank can itself generate statistics of value and planning should take this into account.

Classification and Indexing

(1) The system for classification and indexing of the source material in a data base is progressively becoming more mechanized and automatic using digital computers both in the construction and operation.

(2) The efficiency of such systems may make centralized classification and indexing advantageous.

(3) The filing of data can be simplified through such computer operations on its surrogates.

Storage

(1) For some time to come data bases as a collection of documents will exist as printed material or microform reproductions.

(2) Storage should be organized to allow progressive narrowing of the area of search so that information requests may progress successively from title through abstract to text retrieval with higher relevancy and lower cost.

(3) Availability and cost of communications will be an important factor in determining the extent of an area serviced through remote terminals and hence the balance between regional and central storage of data.

Retrieval

(1) Ability to direct the retrieval operation by remote access distinguishes data banks of the future.

(2) The data bank must permit a wide variety of access methods appropriate to user need -- telephone request, teletype, automatic selective dissemination of information by individuals or group profile, retrospective search by batch or interactive terminal inquiry, grouped data for statistical or simulation studies, exchange of data between data bases.

(3) Retrieval of data by natural language inquiry will be a feature of data banks of the future and these inquiries will also be used to modify acquisition and classification operations.

(4) Denial-of-access coding will be required for data affecting national security and personal privacy.

(5) Interchange with established data banks in industry, business and government will require adoption of an exchange language.

Dissemination

(1) Data banks can be a medium for the exchange of data between users.

(2) Data banks may be required to provide outputs in printed, image, audio or coded form.

(3) Accounting facilities are an obvious requirement where charges are made.

(4) Telecommunication channels and suitable interface equipment are available to connect virtually any type of on-line terminal.

(5) Channels having capacities from about 100 words per minute to 60,000 or more words per minute are available, both on private line basis and for random access on a pay-as-you-use basis. Computers can dial distant centres automatically under program control.

(6) When computers are connected by satellite channels consideration must be given to the long propagation time delays in establishing the channel connections.

(7) Less sophisticated systems not employing on-line terminals may be entirely adequate where response times are relatively unimportant.

Reproduction

(1) Output means can influence organization through availability of certain reproduction devices. e.g., Computer-Output-Microfilming (COM) may be required for higher efficiency in major centres. COM operation costs about 15% of impact printing, operates at about 40 times the speed, and the product occupies about 2% of paper printed volume. One hundred pounds of paper output can be stored on 60 standard microfiche.

3. Institutional Factors

Although technological problems will present themselves it is believed that political and personnel difficulties in dealing with governments and institutions will be the greatest barrier to the establishment of data banks. Typical problems foreseen are the following:

(1) Security of data will dictate the degree of co-operation by many users. Sensitivity of apparently simple data is of real concern; even purchasing records and information requests can be assessed to determine plans of an institution. This problem can be corrected by using average statistics rather than raw data.

(2) Extent of access will likewise affect co-operation. If only institutional groups share the bank they can be expected to support it for their own benefit (this in some cases might be considered to be in the public interest) and may indeed undertake its complete support. Once set up however, would the public ever achieve access directly? This

problem may dictate some minimum degree of government involvement in any bank that should have present or future public access.

(3) Source of data can be an influencing factor of some importance. The depositing of publicly-provided resource data in banks can accelerate the growth of resource industries such as oil, gas, mining, forestry, fisheries, etc. and could be expected to bring ready support from industry. Such is not likely to be the case when private industry is expected to provide such inputs however. A free enterprise system requires that free choice remain with the source of such data.

(4) Institutions normally process data which is pertinent to the needs of their organization. Other arrangements would be a compromise and would result in increased costs. They may be reluctant to modify their data banks to participate in the national or public interest unless there is some tangible form of compensation. Simplification of reporting required by government might prove a useful incentive.

(5) The autonomy of institutions is a barrier to data bank networks particularly where they must provide input. The advantage of data banks is that they will enable resources of all kinds to be shared. However, many institutions will have their own banks of information and will need to be persuaded that it is in their interest to share these data. Greater exposure of management to external issues of national concern will assist in lowering such barriers in time.

(6) The uses to which the contents of data banks will be put can be expected to be as varied as the number of users. To maintain efficiency generality of the data stored is desirable with sufficient flexibility of retrieval for meeting the particular needs of the individual user.

(7) The manner of institutional use can influence the data bank design greatly. Continual reference

to large volumes of factual information, particul-
arly if graphics are involved, can be more economi-
cally provided by microform libraries locally
maintained or updated by service contract. A com-
puter-maintained and manipulated index can be em-
ployed where the volume is large. Fully automated
data banks are not the only answer to mass storage
and retrieval but become preeminent where high
speed and remote access make conventional methods
uneconomic.

(8) A very generally expressed opinion is that pilot
projects are required initially to obtain exper-
ience and that the gradual addition of data banks
will tend to lessen risk of failure. Initial
subsidy by government is an anticipated necessity
but the assessment of development charges later
to using institutions in favoured as well as oper-
ating charges to ensure that data banks are self-
sustaining.

(9) The avoidance of redundancy in data banks through
either government co-ordination or a co-ordinating
agency of special interest groups and effective
standards therein is given wide support by re-
spondents.

4. Political Factors:

Although political factors may outweigh others in establishing
and operating data banks it is encouraging to note examples in Ex-
hibit VII of data bases that are being supported through the joint,
co-ordinated action of many agencies. Resource data files abound
within the federal government and provincial governments and a
sincere desire exists to reduce duplication and increase their
usefulness for planning and decision-making. Making such files
common in machine-controlled data bases however requires de-
tailed study and co-ordination. Urgent problems of our environ-
ment (such as pollution) have shown the necessity and value of
data co-ordination.

Typical of political factors raised during the study
are the following:

(1) The user of data banks will directly or indirectly control the input for he can best evaluate the costs and benefits. Errors could inflict injuries upon individuals and organizations. Therefore, governments may have to specify limitations and controls.

(2) Lack of recognition of the need will be a major impediment and user education as to advantages may be needed.

(3) Institutions may be unwilling to place data in a bank that serves a large number of unknown users. This factor might favor small, specialized banks so that economies of scale would be denied; alternatively expensive security measures may limit the operation. In the Industrial Sector considerable fear was expressed that corporations might be forced to supply proprietary information which would be available to competitors. This fear was especially pronounced when industry assumed that government would be controlling the data banks. Quite aside from proprietary informtion, however, much information and data of a common or general nature arise from industrial activity and it is this information which industry should recognize as being an important input to a data bank and information system. Once this is recognized and accepted industry has the responsibility of supplying quality information.

(4) Variety and conflict of interests will tend to expand the number of data banks to the economic limit. This may not be in the public interest.

(5) In case of proprietary data computer monitoring and reporting of any use may be better than current copyright protection.

(6) The contribution made by a data bank will be a function of its management and objectives rather than size. This places a premium upon accurate methods of defining the required needs. Problems of propriety information could again play a role here.

(7) The co-ordination of physical and socio-economic data is of increasing importance. For instance the relating of physical and socio-economic data in a geographically based system such as the Canadian Land Inventory System appears to be a promising direction in which to proceed.

(8) The value of federal and provincial government co-ordination and standardization is considerable even for data banks to be operated institutionally if efficient data collection and exchange is to be effected.

(9) Data banks' methodology is a marketable commodity at the international level.

(10) International data banks will require standards and co-ordination. Canada should support such efforts actively so that we can influence the decisions made rather than through default, be forced to rely on and conform to decisions made by other governments.

(11) The government should ensure that Canadian resource, industrial, and consumer data bases remain resident in Canada.

5. Legal Factors:

Data banks are not new but computerized data banks raise new problems. Just as new laws were required when the mode of transportation changed from the horse and buggy to the automobile, new laws are required as we change from the manual data bank to the computerized data bank.

Since the economy of modern computers is now making it possible to retain and identify original data the possibility of obtaining more comprehensive statistical analyses will increase. But with this comes the possibility of associating names with the individual data. Limitation of access to such raw data to the originating group by legislation could provide some protection of privacy. Alternatively a requirement to submerge the data in a sample large enough to ensure anonymity but small enough to preserve valuable statistical information may be an adequate answer. For those data banks created in the national

or public interest it is essential to recognize that the data they contain will be used to foster general well-being in Canada. Legislation is necessary in this regard to avoid unauthorized sale of information in these data banks and to prevent it from being transferred by sale or otherwise to other parties in the event that the operating institution fails or changes ownership.

In addition to the overall requirement that data should be guarded from unauthorized use through legislative means, the following points should be considered:

(1) The need to delineate clearly responsibility for the different facets of operation and maintenance of an information system, including:

- collection of data
- validity of data and their up-dating
- validity of the programs used in a computerized system
- hardware operation and physical storage of data

(2) Under what conditions access to the system is available for uses other than those specified when creating the bank.

(3) Procedures for obtaining authorization to acces the data-base or parts of it.

(4) Methods for ensuring security of parts of, or all, data in a bank.

(5) In formulating policy for dealing with the different legal problems which could arise, a prerequisite is a classification scheme for data banks to help in identifying those types which have special requirements. A classification scheme should therefore include a breakdown according to use.

6. Economic Factors:

Economics will more than likely be a limiting factor in the development and growth of data banks. Any economic evaluation should take into consideration the value of information to decision-making and the concepts of economy of scale.

Additional costs over existing or alternative information systems must result in additional benefits to the users and must be based on an evaluation of genuine requirements.

Representative of the economic factors introduced during this study are the following:

(1) The higher the traffic density the lower the overhead costs per unit of handling information. Since communication costs are directly related to volume each data bank requires a specific study of the proper balance between manual and automatic measures.

(2) The larger the data bank the greater the probability that the data store will be more complete.

(3) The costs associated with the acquisition and evaluation of data can be a major economic factor. Procedures for error checking and for obsolete data removal must receive full consideration.

(4) Timely data quickly used for decision-making purposes can be of extreme value; data stored but never used have a "negative" value due to costs of acquisition and storage.

(5) The process of resource allocation, central to the economic theory of pricing systems, depends to a large degree on an efficient communications system to reflect changes in consumer demand. The ability of industry to measure and respond to demand depends upon access to accurate data. The role of information systems of both the industrial and consumer type will facilitate this.

(6) To ensure that data is up-to-date and its availability known, announcement services for volatile data are essential and the scheduling of acquisition for efficient input and use is important.

(7) Machine-independent computer programming will lead to workable compatibility of systems, and hence the efficient interaction of information

systems to the economic betterment of
society. An agreed exchange language
between data banks is a less desirable
alternative.

(8) User experience with on-line interactive terminals
to data banks is showing that such terminals
can be operated at lower cost than batch inquiry.
This is particularly true where the speed of
accessing relevant answers is important.

(9) The cost of output services vary widely with type
and volume of data. Accounting practices must
reflect these differences in order to avoid
"cream-skimming".

(10) The high cost of implementing data banks will
militate against their development. Economic
priorities must therefore be determined. Co-
ordination of activity is a prerequisite to es-
tablishing a system which avoids the costs associa-
ted with such occurrences as duplication of effort
and data bases, the lack of interchangability of
data, overcentralization, and excessive hardware
and software systems.

(11) All efforts must be directed toward attaining
a system whose economic return exceeds the cost.
One must remember that all benefits are not
necessarily measurable.

7. <u>Financing for Data Bank Services</u>:

A business initially expects to charge users within
limits established by operating costs and what customers are
willing to pay. This provides a measure of elasticity to make
a profit. It creates incentive and allows for innovation and
adjustments in the way services are priced. In the early
years of a new business, especially one involving heavy capital
outlay, it is unlikely that revenues will cover all expenses,
depreciation, etc. It is normal to draw on reserves during
this period.

Where the services are judged to be in the public interest it was suggested that the government may undertake to provide the services to the public knowing that revenues will remain inadequate at least during the initial stages. A service area in which the government could be expected to be the sole provider regardless of profit includes data banks operated in the national interest and containing sensitive, secure, or vital public information. Access might be on a "need to know" basis.

In order to encourage usage of data banks, the view was advanced that information about a service should normally be free but that information from the service itself should be for a fee. Preliminary consultations and estimates, all sales and technical service, literature and training of system personnel might be provided free. Charges could apply to terminal usage, on-line and search effort by the computer system or the staff, and the data retrieved.

Careful consideration should be given to how a service is priced. A valuable service feature could be inhibited by an unimaginative price structure. Some obvious parameters that should be considered for remote access service are, volume, urgency, distance, time of day, and value of service. Value of service is related to the probabilities of reducing errors in decision-making by the user. The worth of a decision based on adequate facts is high. The alternatives mean additional risks to the user. Pricing and customer education are of paramount importance.

8. International Considerations:

The following considerations regarding the use of data bank services between nations form part of this study:

(1) We cannot hope to build enough data banks to house all the useful data available at the international level. Canadian users ought to buy such data outside the country as required. An alternate source for some of this outside data is obviously necessary in times of trouble. This type of data could be housed in a manual data bank in Canada where costs are minimized at the expense of access time.

(2) Canadian data of national interest, such as
resources, should be accessible within the
country regardless of international economics.
Concern here is not that other nations possess
our data but that we might jeopardize control
of our environment by not storing it ourselves.

(3) Consideration should be given to the support
of international organizations which would be
financed by various governments and groups,
to study, to set standards, and generally
promote the development of data banks on a
global scale. This would minimize duplication
of national effort, provide access to data
hitherto unavailable, and promote the exchange
of ideas.

Resource, urban and medical data are of considerable interest
internationally. It can be anticipated that foreign access will be a
factor requiring study and possibly legislative action to ensure
protection of national data where necessary while maintaining all
possible co-operative links.

While expressing concern here and elsewhere in this report
about the misuse and abuse of data, and recognizing the increasing
opportunities for this in computerized data banks, it was recognized
that in the words of the Glassco Royal Commission "good mangement
consists in more than the avoidance of sin". Thus legislation or
other measures of control should not be such that unnecessary barriers
are placed in the way of legitimate use and that, every help and
encouragement be given to the exploitation of these data for the
benefit of the nation and the individual.

SECTION V

Institutional Arrangements

The academic and research communities have been extremely active in the development of information systems by supplying system designers for many of the services now operating in Canada and by supporting their development and operation. Because of the potential for continuing technological advancement within the industry it is likely that academic and research interest will be maintained. The universities have an important role to play in establishing national data banks primarily in regard to providing scientific and technical expertise but with more direct involvement in those banks related to education. They will also be large users of established data banks for carrying out specific research projects. These statements are not intended to denigrate the role which has been played by commercial suppliers of computers and data processing systems.

A major influence on the development of an industry (or new industry segment) is the attitude to development within the industry itself. A highly competitive industry, while allowing some duplication of effort, tends to develop not only itself but also its markets much more quickly than a non-competitive, highly regulated industry. By encouraging entrepreneurs in the development of needed banks and by contracting out requirements for development and maintenance a strong industry in marketable software could be developed. But it can be argued that it is not feasible to leave to industry the major role in developing most data banks for this could lead to fragmented development and excessive redundancy while at the same time leaving gaps in the nation's requirements.

Government departments and organizations have played a very active role in the development of computer-based information services to date in addition to their normal one of general industry support and control. They provide not only financial support in the establishment of such services but can help the industry generally by overcoming some of the initial problems involved in developing, operating and marketing a new product or service.

Reports and studies, especially in the area of STI, recommend increased government involvement -- at least from a co-ordinating viewpoint -- in data bank development and information access control. There seems to be general agreement that there must be some kind of control over the integrity of information collected, the kinds of information stored in data banks and the access to that information (especially with regard to information

on individuals).

A factor to be considered if there are few government controls on the computer-based information services is the influence of foreign information systems on the development of the Canadian industry. There are no physical barriers to the transporting of information (via electronic devices or in the mail) across the U.S. -- Canada border. It is possible for U.S. information services to serve markets in Canada and possibly to inhibit the development of similar Canadian services. In fact there are now some SDI and information tape services from the U.S. serving Canadian customers. In addition, the Federal Government will, by definition, have a strong interest in all data banks serving the national interest, and must have direct control over all those banks containing 'sensitive' data with a national security risk, it is essential that it provide catalytic assistance, guidance and leadership.

In Canada, the National Library, National Research Council and the Dominion Bureau of Statistics have all been delegated a measure of statutory general institutional responsibility in the field of information collection, storage, retrieval and dissemination.

The National Library Act, which came into force on September 1, 1969, provides that:

Subject to the direction of the Governor in Council the National Librarian may co-ordinate the library services of departments, branches and agencies of the Goverment of Canada including:

(a) the acquisistion and cataloguing of books;

(b) the supply of professional advice, supervision and personnel; and

(c) The provision of modern information storage and retrieval services including photocopying and microfilming services, electronic and other automated data processing services and facsimile or other communication of information services.

A Task Force established within the National Research Council approved the principal recommendations contained in the Science Council of Canada's Report No. 6 entitled "A Policy for Scientific and Technical Information Dissemination". A resulting NRC memorandum to Cabinet recommended that the NRC:

(a) Be assigned the responsibility for promoting
the further development of a national network
of scientific and technical information services
to be built on existing resources.

(b) Create an Advisory Board to formulate general
policies for scientific and technical information
services and to provide guidance toward their
implementation.

(c) Seek approval from the Treasury Board for a
separate parliamentary vote to provide funds for
the STI activity.

These requirements were approved by both the Cabinet
Committee on Science Policy and Technology and the Cabinet Committee
on Culture and Information. On December 19, 1969, the Cabinet
stated that:

(a) pursuant to subsection 2 of section 7 of the National
Library Act, the Governor in Council direct that the
National Research Council, under the general direction
of the National Librarian, develop in concert with
existing information organizations, a national scien-
tific and technical information system, to encom-
pass the natural sciences and engineering:

(b) the National Research Couuncil be given approval to
appoint for the above purposes an Advisory Board of
Directors responsible for formulating general
policies for scientific and technical information
services in Canada and for guidance toward their
implementation and that the National Library be
given adequate representation on the Board;

(c) subject to the approval of Treasury Board, the STI
operations of the National Research Council be
funded through a separate parliamentary vote.

In July 1970, the National Research Council announced the
appointment of an Advisory Board on Scientific and Technological
Information to formulate broad policy guidelines for the continuing
development of a national STI System in Canada. A special news re-
lease announcing the appointment of this Advisory Board is shown in
Exhibit 8.

In compliance with the Statistics Act 1948 (an Act Respecting the Domion Bureau of Statistics) the duties of the Bureau include:

"(a) to collect, compile, analyse, abstract and publish statistical information relating to the commmercial, industrial, financial, social, economic and general activities and conditions of the people;

(b) to collaborate with other departments of the government in the collection, compilation and publication of statistical records of administration according to any regulations;

(c) to take the census of Canada as provided in this Act; and

(d) generally to organize a scheme of co-ordinated social and economic statistics pertaining to the whole of Canada and to each of the provinces thereof."

Obviously there is a wealth of data now available from the Bureau. Much of it would be invaluable if it was in data banks and could be utilized for social, economic and industrial planning by the private sector without infringement upon the confidential nature of data supplied by private persons or establishments or upon proprietary rights.

Because one of the major roles of the Federal Government is that of stimulating development a general approach was considered by the project team for the overall co-ordination and development of specific data banks. Various institutional arrangements were generated and examined by the team in respect to each particular sub-group. A number of significant thoughts must be posed as a result of these deliberations. Policy formulation must depend on as broad a base as possible for it is those generalities which provide a framework in which to develop the particular system. The alternative institutional arrangements generated by the project team are based on the following stated requirements:

(i) Overall planning and co-ordination

(ii) Federal catalytic leadership

(iii) Participation by related organizations in the private and quasi-private sectors

(iv) Participation wherever possible by the
     ultimate user.

In light of the above, three phases towards the actual
establishment of data bank networks have been identified: planning,
implementation, and operation. However one must recognize planning
and implementation, although perhaps involving separate structures,
are basically inseparable in terms of process. Operation may very
well be considered as a separate function and process because dis-
tinct input-output processess must occur in order for the system to
maintain itself and operate. In this light operation is conceptually
distinct from planning and implementation.

As mentioned above structure may, within the two processes
of planning-implementation and operation, vary according to the
needs of each particular bank at each of the three phases. With
this framework in mind it is possible to hypothesize a number of
possible institutional structures which could be utilized at each
of the three phases. This would not exclude the possibility of a
monolithic structure which would carry out all three phases. The
alternative structures are identified below:

(a) Status Quo-Laissez-faire

(b) Government Department(s)   (Federal or Provincial)

(c) Intergovernmental Bodies (Federal, Provincial,
    Regional and/or Municipal)

(d) Crown Corporations (Federal or Provincial)

(e) Government Agency (Federal or Provincial)

(f) Government with Specialized Interest Groups
    (utilities, professions, etc.)

(g) Co-ordinating Agencies (Federally sponsored with
    interest group participation)

(h) Intergovernmental bodies and special interest groups

(i) Non profit groups

None of these structural alternatives are mutually ex-
clusive. The resulting instituitional arrangement could well be a
variant of any number of the structures posed. For example, no federal
crown corporation would plan and implement data banks without re-
gard for provincial governments or various interested groups whose
actual support through participation is essential.

        In the context of the Terms of Reference which set out
the six major areas covered by this study, the matrix shown in
Exhibit IX locates each area in terms of the most likely structure
and process. Planning is of paramount importance, and one must
consider in broad terms the degree of success which each of the
nine proposed institutional arrangements might achieve in meeting
a number of essential and desirable objectives of the planning
phase as set out in this matrix. From the table it would
appear that a Federal Government Agency (somewhat similar to the
Science Secretariat) together with a national Advisory Committee
(somewhat similar to the Science Council) would appear the most
appropriate choice from the alternatives considered. Crown cor-
porations offer conceptual advantages but, in terms of planning
as opposed to operation, it is doubtful that a crown corporation
would maximize this function. For example, crown corporations enjoy
tax advantages and are operationally oriented. But since the
accent is on operations the planning function may not be carried
out as well as under an alternative institutional arrangement such
as a government agency. In terms of a government department it is
difficult to see how it could operate a national information retrieval
system since it is so closely dependent upon government policy. It
is clear from our sub-group reports that both planning and or-
ganizational autonomy are key elements in deciding upon institutional
arrangements. Furthermore the selected institutional arrangements
must also be able to accommodate a diversity of particular interest
groups in order to implement systems with general support from those
interests. This militates against the direct use of government de-
partments. Therefore a body which can group the various interests
is necessary. A consortium or group of interests organized along
the lines of a government agency would seem to combine these desir-
able elements. Reference is made to this most important problem in
the Resources Sector Report - that requirements will cut across
present organizational barriers - resulting in their recommendation
for a National Advisory Body with senior representation from all
levels of government, from industry, and from the universities.
Exhibit X, Hypothetical Organization Structure, presents a dia-
grammatic flow of the relationships surrounding the concept of a

National Advisory Body and includes terms of reference for the various committees shown in the structure. The left hand side of the chart pictures environmental influences on data bank planning and implementation while the right side shows the work flow resulting from these environmental inputs. It is essential to note that most arrows must be two-way, because at least informally, the data banks which emerge will have been profoundly influenced by environmental factors through such mechanisms as inter-departmental committees and the National Advisory Committee itself. The importance of the user, emphasized by all sub-groups, is maximized in this concept. Further desirable elements such as autonomy and integrative policy-making capabilities are also emphasized under such a proposed structure.

There is no question of the importance of the maximum interaction among the organizations affected in any plans to establish data banks. The role of a National Advisory Body would be to integrate these views as much as possible. However regardless of whether it is a specific government department or an agency which implements data banks the role of government is to stimulate and advise rather than solely to control. For example, Industry, Trade and Commerce has been involved in the establishment of the BEAM* construction information system. The processes involved in BEAM show very clearly the phases involved in bringing these systems into operation as well as indicating a possible role for government. The first step in this development was to undertake a feasibility study to identify the existing methods of storing, retrieving and disseminating information and to define the needs and requirements of both users and suppliers of construction data. The results of this study were to either justify the establishment of a data network or to indicate its excessive cost rather than saving. Economic efficiency was a prime criterion. The following conclusions were arrived at after an analysis of this information by officers of the Department of Industry, Trade and Commerce.

(a) The role of the Department of Industry, Trade and Commerce should be that of a catalyst exhibiting initial leadership, guidance and assistance in the development and establishment of a comprehensive construction information system.

* BEAM – Building Equipment Accessories and Materials.

(b) The Department should develop the performance specification for the system.

(c) The Department should actively seek, in association with industry, the formation of an independent, non-profit, financially responsible corporation (or similarly constituted body) having a board of directors representative of the various industry sectors and government.

(d) This corporation should have the authority and financial ability to establish, operate and provide for the continued development of the construction information system.

In effect, through the planning and implementation phases government participation in the enterprise is emphasized. However, the institutional arrangement alters as the operations phase begins the result being an independent co-ordinating body.

Once a need has been established for a specific data bank the approach to be taken in its development and implementation will depend on several factors, including:

(a) User requirements

(b) User acceptance

(c) Present state of the art in the particular field

(d) Resources available

(e) Benefits to be derived

(f) Costs and revenue

(g) Co-ordiantion with other data banks

(h) Problems of data collection and validation.

In spite of the wide variety of problems and requirements historically there appears to be a general pattern in those systems presently operational or under development. The pattern follows from an initial exploratory phase through a conceptual phase and a design phase to the implementation phase. The degree of success achieved by this pattern recommends it as one to be followed in future developments.

There will be many competing demands for resources in the development of data banks. Some effective organizational structure must exist for assessing relative priorities on a national scale. The concept of the National Advisory Body, since its role is to integrate competing demands, deserves further discussion in the context of the above noted pattern of development. Six phases have been noted through past experience:

(1) The Exploratory Phase

(2) The Conceptual Phase

(3) The Design Phase

(4) The Implementation Phase

(5) The Operational Phase

(6) The Audit Phase

Generally, these six phases correspond to the process approach discussed above.

Planning ⟶ Exploratory Phase
                      Conceptual Phase
Implementation ⟶ Design Phase
                      Implementation Phase
Operation ⟶ Operational Phase
                      Audit Phase
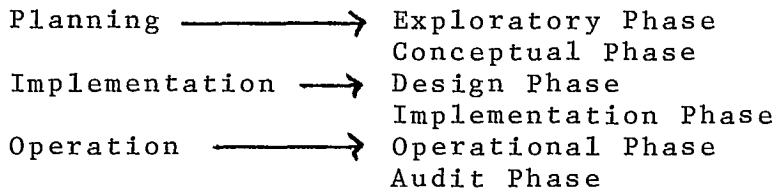
1.   The Exploratory Phase

The importance of user-orientation of a data bank cannot be over-emphasized. It is therefore essential at the outset to ascertain the interest of potential users and to discuss requirements and the desirability of a national or regional system with them. The national body recommended above would stimulate initial discussions of this type.

Full user support and participation is essential to the success of most ventures and this is especially true in information systems if we are to develop a volume market. In areas of significant national importance it may be necessary to expend considerable resources, time and effort in advertising, explaining and possibly demonstrating the individual and collective benefits to be derived before it is possible to proceed with the development of a particular bank. The exploratory stage could conceivably be quite broad and extensive for the early data banks but should

become more specific and less extensive as the public become aware of and accepts the concepts of information systems.

2.   The Conceptual Phase

          A formalized conceptual phase follows the ad-hoc exploratory phase. In this second step there is need for a senior Coordianting Committee for resolving problems of a 'strategic' nature including, for example, those related to Federal-Provincial jurisdictions and those related to financial requirements. In addition there should be a Working Committee at the 'tactical' level for considering problems of a more technical and social nature.

          The Working Committee should consist of persons vitally and directly concerned with making use of information from the proposed data bank and should include at least one person with technical knowledge and experience in computing and systems design or, at least, have such people available as consultants. This Committee must define the specific requirements for the proposed data bank including consideration of the following points:

          - User requirements in regard to file processing
            capability.

          - Allocation of responsibilities for data content,
            data structure, data validity, file maintenance,
            program development and maintenance, etc., and
            recommendation as to management and responsibility
            for the complete system.

          - Standardization and compatibility of data files.

          - Standards for programming and systems compatibility.

          - Data security and authority for access.

          - Types of access, communications requirements and
            response time.

          - Staff requirements for development and maintenance.

          - Costs of development and operation

          - Implementation schedule of the total program.

          Any temptation to include everything which might be useful should be strongly resisted. Objectives should be kept to a realistic level so that a working system may be obtained in a

reasonable time frame. It is however important to provide sufficient flexibility for future growth.

Responsibility and authority, for development through this phase should reside in a small "kernel" group -- possibly headed by a member of the Co-ordinating Committee. Acceptance of the general plan of the data bank program is essential prior to proceeding to the next phase.

3.   The Design Phase

An important problem here is lack of sufficient staff with the necessary high level of expertise and experience in government and other organizations which may assume responsibility for developing and operating "national" data banks. The problem may be resolved by the use of commercial consultants. However, with increasing demands for data banks this may not be the most economical and effective method of using available resources. Consideration should be given to establishing in government a group of high calibre systems analysts specifically for this work. This group could form part of the permanent staff to support the national advisory body recommended above. Terms of reference are suggested in Exhibit X.

Some or all of the members of these technical goups may be drawn, part-time, from operating computer facilities and related systems groups in government and industry to ensure retention of active contact with this highly technological industry.

The systems group would evaluate generalized data base management systems on the market in terms of the specific requirements of individual systems. A pool of this type of expertise would be extremely valuable and would tend to reduce development time on specific systems. In designing different specific systems common problems and their solutions would become evident and "building block" components could be developed with fairly general utitlity.

Attempts to achieve generality of this type must not detract from the overriding user-orientation of the system, nor should they reach a level of importance where there are resulting delays in system implementation.

In cases where access to the system is frequent and where there are a large number of widely scattered users particular attention must be given in this phase to modes of input and output.

If insufficient consideration is given to this problem the
economics of the system could be seriously affected.

In addition to setting up a systems group to provide a
high level of expertise in government on information retrieval
systems consideration should also be given to encouraging growth
of centres of excellence in this field in Canadian universities by
giving government contracts to these centres. This procedure has
met with success in the United States.

This would result in a number of important side benefits.
One of these would be to encourage closer co-operation between in-
dustry and universities because industry would follow with con-
tracts in this area. It would also provide increased training for
skilled personnel where demand far exceeds supply.

4.   The Implementation Phase

This is the phase which proves the systems designed in
phase 3; it includes the conversion from a manual method to an
automated one, the education of operators and users, etc. It is
in the implementation phase that wider differences in approach are
liable to arise. The approach will depend largely on the use that
will be made of the data bank -- for planning, service, control or
research -- and on the type of users -- Federal, Provincial,
Municipal Administrations, industry, universities or individuals.
Any special security requirements will also place restrictions on
the approach to be taken.

It is desirable that at least one of the analysts in
the design phase of a given system should retain some responsibility
and authority for the implementation phase. Many problems will
be eliminated by maintaining this link.

Lack of sufficient trained staff to meet requirements
is again a problem. The problem could be lessened by pooling pro-
gramming resources from a number of interested users, by early re-
cruitment of many additional permanent staff recommended by the
Working Committee, or by use of commercial consulting services.

It is important in this phase to attempt to make the
system as machine-independent as possible. This will provide
greater flexibility by permitting extension of the system to
other hardware configurations and by allowing relatively easy up-
dating of the system to take advantage of new improvements in
hardware capabilities as they become feasible.

5.   The Operational Phase

In the systems now operating or in the final stages of
implementation where Federal Government financing is involved
there are few definite plans to transfer operations to non-govern-
ment agencies. The project team is of the opinion that there
could be considerable merit in taking this approach under certain
conditions.

Criteria have not been established for assesssing the
most appropriate means of operating a data bank nor for assessing
the effectiveness and efficiency of the operational phase. It is
suggested that the national body should develop such sets of
criteria and further suggest the following points for consideration:

(a) The data bank should be run economically on a
cost accounting basis. If the data are required
under regulatory acts of Parliament or for some
other special purpose where charges for services
cannot be made the economics of the system may be
difficult to assess. Minimization of costs, com-
mensurate with providing adequate and accurate
data in the necessary time frame, is perhaps the
major consideration.

(b) Costing should include all overheads, such as
office space, lighting, heating, etc., as well
as salaries (part-time as well as full-time),
and computer/communications costs.

(c) Where data does not present a security risk
consideration should be given to the operation
of national data banks by non-government agen-
cies, such as industry, or trade associations,
to be run on a profit basis.

In such circumstances it would be necessary to
ensure that the data and the software developed
by the government for the operation of the infor-
mation systems would remain the property of the
government.

(d) Measures to encourage use of the bank should be
considered, for example, lower charges initially

during the educational and user build-up phase
of operations. This would probably require
government subsidy in the early stages.

(e)   Appropriate procedures for allowing access to
the data bank and for protecting privacy.

(f)   Measures for ensuring continuity of service and
for monitoring the system's performance.

6.   The Audit Phase

Audit as it applies to a data bank is part of the Operational
Phase and must be a function of management. It envisages internal rather
than external responsibility. The audit should ensure that the system
does not become clogged with data unsuitable for decision-making in the
current environment; that unused data is re-evaluated and taken out of
the system if it is not relevant; that users have not perverted the
programs in the system and used them to further unaceptable activities;
and that the system is in fact being used.

A consideration of these points will lead to a need for legis-
lation to cover certain aspects of the operation of data banks. Recom-
mendations on the required legislation would be one of the first res-
ponsibilities of the Advisory Body in order to prevent misuse and misap-
propriation of government property.

In an attempt to construct an overview of what has been said
above two themes come clearly to mind. The actual process of creating
data bank networks is a multi-phased effort which may involve differing
institutional arrangements, at least between the planning -- implemen-
tation process and the operations process. Secondly, the institutional
arrangement most acceptable during the curcial planning -- implementation
process must be able to integrate diverse affected interests with the
purpose of emerging with a uniform national policy on data banks.
Exhibit X attempts to portray such a relationship among these interests within
a proposed institutional structure, that of a government agency taks force
composed of representatives from government, industry and the universities.
In this sense there is a consortium of interests able to integrate the views
of these affected groups or individuals to develop coherent approaches.

In terms of data bank development it is very important to apply
an approach similar to the one summarized above. This is because of the

potentially high expenditures of resources in such an undertaking.
Unnecessary features and errors must be minimized in these endeavours
and the phased approach, since it implies justification at each stage, is
more able to minimize the effects of these possible events.

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                 Institutional Arrangements for
                 Optimizing the Development of Data
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Exhibit II   -   Project Team

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                 Distribution List and List
                 of Respondents

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                 Technological Information

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                 Arrangements

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                 and Terms of Reference

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TERMS OF REFERENCE FOR A STUDY OF THE
INSTITUTIONAL ARRANGEMENTS FOR OPTIMIZING
THE DEVELOPMENT OF DATA BANKS IN THE
PUBLIC INTEREST

GENERAL OBJECTIVES

To identify national information services in the public interest
which could be supplied by large remote access data banks and to
develop and analyse possible institutional arrangements for their
development, implementation and operation.

SPECIFIC TERMS OF REFERENCE

The numerical ordering of the following items does not imply
that the studies will be performed sequentially. Obviously item 3
must proceed in parallel with item 2 and portions of item 6, although
item 6 really represents the final output of this study.

(1)   To identify families of areas where data banks could
        serve in the public interest:

        For example:-

        - transfer of knowledge

        - resources

        - professional

        - financial

        - urban affairs

        - etc.

(2)   Identify technological, institutional, political, legal,
        and other factors and characteristics which may influence
        the development and implementation of these systems.

(3)   Examine the need for and analyze conceptual designs of
        possible systems capable of providing services for each
        of the family areas chosen. These will include but will
        not necessarily be confined to law, medicine, industry,
        and resources.

(4)   Consider the economics of such systems.

(5)   Identify the support necessary to establish and maintain
        these data banks.

(6)   Identify, describe, and examine critically the international
        arrangements for developing, acquiring, and operating
        these systems.

Notes:

(a)   Project team members will attempt to coordinate the
        activities of this study with existing studies relative
        to this area.

(b)   The Scientific and Technical Information (STI) Study
        has been assigned to the National Research Council (NRC).
        Information relevant to the Telecommission Data Bank
        Study 5f will be requested from the NRC Board of
        Directors responsible for the implementation of the STI
        System.

(c)   The following definitions form part of the Terms of
        Reference for this study:

Data

        Data is defined as a record of observations or
        notations which have common characteristics.

Data file

        The data file is defined as a set of data.

Data base

        Is a set of related data files.

Data bank

        A data bank is a system by which the data in the data
        base can be easily stored, maintained, retrieved and
        manipulated.

In the public interest refers to

        the concern the public of Canada has that any
        matter or thing be open to the common or general
        use, enjoyment, knowledge or view of all Canadians
        in the national interest.

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In the national interest refers to

>   the concern of Canadians with matters or things
>   that affect institutions, customs or objectives
>   of the body politic, and the mutual interests of
>   Canadians as an independent state in the Community
>   of Nations.

Institutional means

>   anything pertaining to an organization, establishment,
>   foundation, society, or the like, devoted to the
>   promotion of a particular object, especially one
>   of a general, public, educational or charitable
>   character.

Institutional arrangements

>   Institutional arrangements refers to the organizational,
>   management and financial structures required for
>   promoting, developing and administering data banks
>   in the public interest. It also includes consideration
>   of the appropriate policies and roles of relevant
>   government, professional and private organizations.

EXHIBIT II

PROJECT TEAM

TELECOMMISSION STUDY 5F

Resources: - W.C. Brown, National Research Council

- R.F. Bullen, Representing the National Librarian

- Dr. L.A.E. Doe, C.I.D.A.

- Dr. H. Kaufman, Science Council of Canada

- Dr. P. Robinson, Department of Agriculture

- U.C.P. Strahlendorf, Bell Canada

Medical: - Dr. A. Sherrington, Department of National Health & Welfare

Urban: - Miss M. Ouellette, Canadian Council on Urban
and Regional Research (liaison officer only)

Consumers: - Mrs. G. Stewart, Consumers Association of Canada

Legal: - J.W. Ryan, Department of Justice

- Prof. J. Boucher, University of Montreal

- Prof. G. Forget, Laval University

- Prof. H. Lawford, Queen's University

- S. Skelly, Department of Justice

Industry: - J.P.I. Tyas, Department of Industry, Trade and Commerce

- H.F. Hannay, Northern Electric Company Limited

- Miss C. Kirsh, Canadian Manufacturers Association
(Southam Press)

- G.D. Wynd, Canadian Business Equipment
Manufacturers Association

Departmental Liaison Officers:

- J.S. Crowson   (Chairman)

- W.R. Melbourn

- D.F. Parkhill

EXHIBIT III
Page 1 of 4

DEPARTMENT OF COMMUNICATIONS   MINISTÈRE DES COMMUNICATIONS

CANADA

IN REPLY QUOTE:
RÉF. À RAPPELER:

Dear Sir:

  With a view to furthering the concept expressed in Mr. Gotlieb's letter, I would like to ask your association to assist this study.

  There are three major types of information services which it is thought could be extremely useful to industry.

  (1) Development of a referral service, accessible from any part of Canada, through which industry could identify sources of information and of expertise on specific scientific, engineering, technical and economic matters. ("The Yellow Pages").

  (2) Development of industrial mission-oriented information services for specific industrial sectors operated by the industries concerned, e.g. the Construction Industry Information System included in the BEAM Program. (see attached sheet)

  (3) Development of technology transfer services through which industry could seek information and advice locally on the availability and application of new technology. This would include, wherever desirable, special field services similar to those presently supplied by the Technical Information Service of N.R.C.
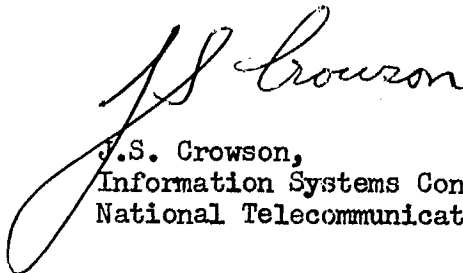
EXHIBIT III
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It would be of great assistance to this study if your association would:

(a) Indicate the usefulness of such services.

(b) What priority and importance do you attach to the setting up of such services?

(c) Would your association be prepared to support such services?

Due to our tight time schedule, a reply would be appreciated by the end of April 1970.

Yours sincerely,

J.S. Crowson,
Information Systems Consultant,
National Telecommunications Branch.

Att.

EXHIBIT III
Page 3 of 4

Questionnaires were sent to the following:

* Allied Boating Association

* Apparel Manufacturers Council of Canada

  Association of Canadian Distillers

  Association of Consulting Engineers of Canada

* Automotive Parts Manufacturers Association (Canada)

  Bakery Council of Canada

* Brewers Association of Canada

  Canadian Carpet Institute

  Canadian Chemical Products Association

* Canadian Council of Furniture Manufacturers

  Canadian Council of Professional Engineers

  Canadian Electrical Manufacturers Association

  Canadian Farm and Industrial Equipment Institute

* Canadian Gas Association

  Canadian Institute of Plumbing and Heating

  Canadian Paint Manufacturers Association

* Canadian Paper Box Manufacturers Association

  Canadian Pharmaceutical Association

  Canadian Pulp and Paper Association

  The Canadian Seed Growers Association

* Canadian Shipbuilding and Ship Repairing Association

  Canadian Truck Trailer Manufacturers

  Canadian Textiles Institute

EXHIBIT III
Page 4 of 4

Canadian Toy Manufacturers Association

Canadian Wood Council

The Chemical Institute of Canada

Childrens Apparel Manufacturers Association

Confectionery Association of Canada

* Electronic Industries Association of Canada

* The Engineering Institute of Canada

Glass Containers Council

* Graphic Arts Industrial Association

* Machine and Equipment Manufacturers Association

Motor Vehicle Manufacturers Association

Packaging Association of Canada

Pharmaceutical Manufacturers Association of Canada

The Rubber Association of Canada

Shoe Manufacturers Association

Society of Industrial Cost Accountants of Canada

The Society of Plastic Industry of Canada

Wood Textile Association of Canada

* Replies were received from these associations.

EXHIBIT   IV

Page 1 of 16

QUESTIONNAIRE ON THE METHODS OF SEARCHING CASE LAW AND STATUTE LAW

1.   AT THE MOMENT, IN WHICH ONE OF THE FOLLOWING AREAS OF THE
      LAW ARE YOU PRINCIPALLY ENGAGED?

      (1)   BARRISTER
      (2)   SOLICITOR
      (3)   FULL-TIME PROFESSOR
      (4)   POST GRADUATE LAW STUDENT

2.   DO YOU PRACTICE LAW

      (1)   FOR THE FEDERAL GOVERNMENT?
      (2)   FOR A PROVINCIAL GOVERNMENT?
      (3)   IN A COMPANY?

      IN PRIVATE PRACTICE

      (4)   ALONE?
      (5)   IN AN OFFICE OF 2 TO 4 PRACTITIONERS?
      (6)   IN AN OFFICE OF 5 TO 9 PRACTITIONERS?
      (7)   IN AN OFFICE OF 10 to 19 PRACTITIONERS?
      (8)   IN AN OFFICE OF 20 OR MORE PRACTITIONERS?

3.   WHERE IS YOUR OFFICE SITUATED?

      (1)   METROPOLITAN AREA
      (2)   SUBURBS (RADIUS OF 10 MILES) OF A METROPOLITAN AREA
      (3)   CITY
      (4)   TOWN

4.   IS YOUR PRACTICE

      (1)   GENERAL?
      (2)   SPECIALIZED?

5.   WHETHER YOUR PRACTICE IS GENERAL OR SPECIALIZED INDICATE AT
      THE MOST THREE CATEGORIES WHICH YOUR PRACTICE PRINCIPALLY INCLUDES.

      (1)   DIVORCE AND MATRIMONIAL AFFAIRS
      (2)   AUTOMOBILE ACCIDENTS
      (3)   CRIMINAL
      (4)   CORPORATIONS
      (5)   TAX
      (6)   LABOUR
      (7)   INSURANCE
      (8)   PATENTS AND COPYRIGHT
      (9)   TRANSPORTATION
      (10)   MUNICIPAL, SCHOOL.
      (11)   ADMINISTRATIVE
      (12)   EXPROPRIATIONS

EXHIBIT IV
Page 2 of 16

5.   Continued....

(13)   BANKRUPTCY
(14)   REAL PROPERTY
(15)   ESTATES (INCLUDING TRUSTS AND WILLS)
(16)   COLLECTION
(17)   OTHER

6.   FOR HOW MANY YEARS HAVE YOU PRACTICED YOUR PRESENT PROFESSION?

(1)   0 - 2
(2)   3 - 5
(3)   6 - 10
(4)   11 - 20
(5)   21 - or more

7.   WHERE DID YOU OBTAIN YOUR FIRST DEGREE IN LAW?

(1)   IN THE PROVINCE IN WHICH YOU PRACTICE
(2)   IN ANOTHER PROVINCE
(3)   OUTSIDE CANADA

8.   AT THE PRESENT MOMENT, IN WHAT PROPORTION OF YOUR FILES DO
YOU CONSULT CASES, STATUTES, REGULATIONS (MUNICIPAL, PROVINCIAL,
FEDERAL), AND TEXTS (INCLUDING ABRIDGEMENTS, DIGESTS, ETC)?

Cases   Statutes   Regulations   Texts

(1)   IN LESS THAN 10%
OF THE FILES

(2)   BETWEEN 10 and 25%

(3)   BETWEEN 25 and 50%

(4)   MORE THAN 50%

9.   IF THE RELEVANT INFORMATION WERE IMMEDIATELY ACCESSIBLE
WOULD YOU CONSULT THESE SOURCES MORE FREQUENTLY?

(1)   YES   Cases   Statutes   Regulations   Texts
(2)   NO

10.   DURING WHICH HOURS OF THE DAY DO YOU USUALLY CARRY OUT YOUR LEGAL
RESEARCH (FILL IN MORE THAN ONE BOX, OR LEAVE EMPTY BOXES IF
NECESSARY)

(1)   8h - 9h
(2)   9h - 10h
(3)   10h - 12h

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10. continued

    (4)   12h - 14h
    (5)   14h - 15h
    (6)   15h - 16h
    (7)   16h - 17h
    (8)   17h - 19h
    (9)   AFTER 19h

11 INDICATE WHICH OF THE FOLLOWING INDEXES YOU CONSULT MOST OFTEN
IN THE ORDER OF FREQUENCY CONSULTED (FILL IN MORE THAN ONE BOX
OR LEAVE EMPTY BOXES IF NECESSARY)

    (1)   A provincial statute citator   MOST FREQUENTLY
    (2)   The Canada Statute Citator
    (3)   The Canadian Abridgment
    (4)   Index to Revised Statutes of Province
    (5)   Index to Revised Statutes of Canada   LEAST
    (6)   Index to Canada Gazette, Part II   FREQUENTLY
    (7)   Index to Official Gazette of the Province

12. HOW MANY HOURS A WEEK DO YOU PERSONALLY SPEND ON LEGAL RESEARCH?

    (1)   LESS THAN FIVE HOURS
    (2)   BETWEEN 6 AND 10 HOURS
    (3)   BETWEEN 11 and 20 HOURS
    (4)   MORE THAN 21 HOURS

13. DO YOU DELEGATE SOME OF YOUR LEGAL RESEARCH TO OTHER PERSONS?

    (1)   YES

    (2)   NO

14. WHO AND HOW MANY PERSONS CARRY OUT THIS LEGAL RESEARCH FOR
YOU (INDICATE THE NUMBER OF PERSONS IN THE APPROPRIATE BOX)

COLLEAGUES ....
LAW STUDENTS...
OUTSIDE COUNSEL ....
OTHERS (LIBRARIANS, ETC.) ....

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15. HOW MANY HOURS A WEEK DO THESE PERSONS SPEND ON AN
AVERAGE CARRYING OUT THIS LEGAL RESEARCH?

(1) NIL
(2) LESS THAN 5 h.
(3) BETWEEN 5h and 10h.
(4) BETWEEN 10h and 20 h.
(5) MORE THAN 20h.

COLLEAGUES .... ☐
LAW STUDENTS .... ☐
OUTSIDE COUNSEL .... ☐
OTHERS (LIBRARIANS, ETC.) .... ☐

16. IN WHAT LIBRARY IS MOST OF THIS LEGAL RESEARCH CARRIED OUT?

(1) PRIVATE OR OFFICE LIBRARY
(2) UNIVERSITY LIBRARY
(3) PUBLIC LIBRARY (BAR, SUPREME COURT, LEGISLATURE, ETC.)

17. DO YOU HAVE YOUR OWN LIBRARY?

(1) YES

(2) NO

18. IF YES, DOES YOUR OWN LIBRARY INCLUDE THE FOLLOWING SERIES:
(1) YES, COMPLETE
(2) YES, COMPLETE FROM 1950
(3) YES, INCOMPLETE
(4) NO

ECR (EXCHEQUER COURT REPORTS) .... ☐

SCR (SUPREME COURT REPORTS) .... ☐

DLR (DOMINION LAW REPORTS)........................... ☐

CCC (CANADIAN CRIMINAL CASES) .... ☐

C.R.(CRIMINAL REPORTS) .... ☐

C.T.C. (CANADIAN TAX CASES) .... ☐

T.A.C. (TAX APPEAL BOARD CASES) .... ☐

Canadian Bankruptcy Reports .... ☐

CBR (CANADIAN BAR REVIEW) .... ☐

R.S. (REVISED STATUTES OF CANADA).................... ☐

EXHIBIT   IV
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18.   Continued .....

       R.S.C. (Revised Statutes of Canada) .... ☐

       THE CANADA STATUTE CITATOR .... ☐

       THE CANADIAN ABRIDGMENT .... ☐

       OFFICIAL GAZETTE OF PROVINCE .... ☐

       CANADA GAZETTE, PART I .... ☐

       CANADA GAZETTE, PART II .... ☐

19.   IN ANY REPLY FURNISHED BY AN AUTOMATED LEGAL RESEARCH SYSTEM
     IN JURISPRUDENCE, WHICH OF THE FOLLOWING DETAILS WOULD YOU
     CONSIDER INDISPENSABLE?

     (1)   YES
     (2)   NO

     THE EXACT REFERENCE (E.G. 1966 SCR 343)   ☐

     THE NAME OF THE PARTIES   ☐

     THE KEY-WORDS FRAMEWORK AS PUBLISHED IN THE SCR   ☐

     THE NAMES OF THE JUDGES AND DATE OF JUDGMENT   ☐

     THE NAMES OF THE COUNSEL WHO PLEADED THE CASE   ☐

     INDICATION IF JUDGMENT RENDERED IN DEFAULT,
     EX PARTE OR CONTESTED ACTION   ☐

     THE PAGE AND PARAGRAPH WHERE THE REQUESTED
     INFORMATION IS FOUND   ☐

     THE SUMMARY OR "HEADNOTE" OF THE CASE AS
     PUBLISHED IN THE REPORTS   ☐

EXHIBIT IV
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20. IN ANY REPLY FURNISHED BY AN AUTOMATED LEGAL RESEARCH
    SYSTEM IN LEGISLATION, WHICH OF THE FOLLOWING DETAILS
    WOULD YOU CONSIDER INDISPENSABLE?

    (1)   YES
    (2)   NO

           THE REFERENCE TO THE CHAPTER, SECTION
           AND PARAGRAPH OF THE ACT

           THE OFFICIAL TITLE OF THE ACT

           THE FULL TEXT OF THE ACT

           THE TEXT OF THE ACT AS REVISED TO DATE

           THE REFERENCES TO REGULATIONS

           THE FULL TEXT OF THE REGULATIONS

21. ARE YOU INTERESTED IN FOLLOWING SYSTEMATICALLY THE
    BILLS INTRODUCED IN ANY LEGISLATURE STARTING FROM FIRST
    READING?

    (1)   YES

    (2)   NO

                 TITLE SEARCHING IN THE REGISTRY OFFICES

22. DO YOU CARRY OUT TITLE SEARCHING IN THE REGISTRY OFFICES?

    (1)   YES

    (2)   NO

IF YOU ANSWERED QUESTION 22 IN THE AFFIRMATIVE, PLEASE REPLY TO
QUESTIONS 23 TO 26.

23. ON AN AVERAGE, HOW MANY TIMES PER MONTH DO YOU PERSONALLY ATTEND
    THE REGISTRY OFFICES?

    (1)   2 OR LESS HOURS
    (2)   3 TO 5
    (3)   6 TO 10
    (4)   MORE THAN 11

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24. HOW MANY HOURS PER MONTH DO YOU SPEND AT THE REGISTRY OFFICE?

   (1)   1 TO 5 HOURS
   (2)   6 TO 10
   (3)   11 to 20
   (4)   MORE THAN 21

25. APPROXIMATELY HOW FAR FROM YOUR OFFICE IS THE REGISTRY OFFICE
    OF YOUR DISTRICT?

   (1)   BETWEEN A RADIUS OF 10 MILES

   (2)   BETWEEN 10 and 25 MILES

   (3)   MORE THAN 25 MILES

26. WHAT PROPORTION OF YOUR TITLE SEARCHING DO YOU CARRY OUT AT THE
    REGISTRY OFFICE IN YOUR DISTRICT?

   (1)   100% IN YOUR DISTRICT

   (2)   BETWEEN 100 AND 75%

   (3)   BETWEEN 75 AND 50%

   (4)   LESS THAN 50%

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QUEBEC BAR QUESTIONNAIRE

Questionnaire sur les méthodes de consultation de la jurisprudence et de la législation.

QUESTIONNAIRE ON THE METHODS OF SEARCHING CASE LAW AND STATUTE LAW.

1. Quelle est présentement votre principale activité juridique?
    AT THE MOMENT, IN WHICH ONE OF THE FOLLOWING AREAS OF THE LAW
    ARE YOU PRINCIPALLY ENGAGED?

    (1)   Juge   JUDGE
    (2)   Avocat   LAWYER
    (3)   Notaire   NOTARY
    (4)   Professeur de carrière   FULL-TIME PROFESSOR
    (5)   Etudiant post-gradué en droit   POST GRADUATE LAW STUDENT

                     . . . .

2. Si vous êtes avocat ou notaire, exercez-vous le droit?
    IF YOU ARE A LAWYER OR NOTARY, DO YOU PRACTICE LAW?

    (1)   pour le gouvernement fédéral
          FOR THE FEDERAL GOVERNMENT

    (2)   pour le gouvernement provincial
          FOR THE PROVINCIAL GOVERNMENT

    (3)   dans une corporation
          IN A COMPANY

    dans une étude privée
    IN PRIVATE PRACTICE

    (4)   seul
          ALONE

    (5)   dans un bureau de 2 à 4 juristes
          IN AN OFFICE OF 2 TO 4 PRACTITIONERS

    (6)   dans un bureau de 5 à 9 juristes
          IN AN OFFICE OF 5 TO 9 PRACTITIONERS

    (7)   dans un bureau de 10 à 19 juristes
          IN AN OFFICE OF 10 TO 19 PRACTITIONERS

    (8)   dans un bureau de 20 juristes et plus
          IN AN OFFICE OF 20 OR MORE PRACTITIONERS

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3. A quel endroit se situe votre bureau?
    WHERE IS YOUR OFFICE SITUATED?

    (1)   Montréal, centre-ville
           MONTREAL, CENTRE OF TOWN

    (2)   Montréal, banlieue (rayon de 10 milles)
           MONTREAL, SUBURBS (RADIUS OF 10 MILES)

    (3)   Région de Québec (rayon de 10 milles)
           QUEBEC CITY AREA (RADIUS OF 10 MILES)

    (4)   Ailleurs
           ELSEWHERE

4. Votre pratique est-elle
    IS YOUR PRACTICE

    (1)   générale
           GENERAL

    (2)   spécialisée
           SPECIALIZED

. . . .

5. Que votre pratique soit générale ou spécialisée, indiquez au plus
    les trois domaines sur lesquels elle porte principalement.
    WHETHER YOUR PRACTICE BE GENERAL OR SPECIALIZED INDICATE AT THE
    MOST THREE CATEGORIES WHICH YOUR PRACTICE PRINCIPALLY INCLUDES

    (1)   civil
    (2)   accidents d'automobiles   AUTOMOBILE ACCIDENTS
    (3)   criminel   CRIMINAL
    (4)   compagnies   COMPANIES
    (5)   fiscal   TAX
    (6)   travail   LABOUR
    (7)   assurances INSURANCE
    (8)   brevets et droits d'auteurs   PATENTS AND COPYRIGHT
    (9)   transports   TRANSPORTATION
    (10)   municipal, scolaire, fabricien MUNICIPAL, SCHOOL, PARISH
    (11)   administratif   ADMINISTRATIVE
    (12)   expropriations
    (13)   faillite   BANKRUPTCY
    (14)   transactions immobilières   IMMOVEABLE PROPERTY
    (15)   droit successoral   SUCCESSIONS
           (y compris de fiducie)   (INCLUDING TRUSTS)
    (16)   perception de comptes   COLLECTION
    (17)   autres   OTHER

EXHIBIT IV
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6. Depuis combien d'années exercez-vous votre profession actuelle?
   FOR HOW MANY YEARS HAVE YOU PRACTICED YOUR PRESENT PROFESSION?

   (1) 0 - 2
   (2) 3 - 5
   (3) 6 - 10
   (4) 11 - 20
   (5) 21 - et plus
            OR MORE

   . . . .

7. Quelle est votre langue maternelle?
   WHICH IS YOUR MOTHER TONGUE?

   (1) anglais ENGLISH
   (2) français   FRENCH
   (3) autre   OTHER

8. Où avez-vous obtenu votre premier diplôme en droit?
   WHERE DID YOU OBTAIN YOUR FIRST DEGREE IN LAW?

   (1) Montréal
   (2) Laval
   (3) McGill
   (4) Sherbrooke
   (5) Ottawa
   (6) autres   OTHER

   . . . .

9. Actuellement dans quelle proportion de vos dossiers
   consultez-vous la jurisprudence, les statuts, les règlements
   (municipaux, provinciaux, fédéraux), et la doctrine?
   AT THE PRESENT MOMENT IN WHAT PROPORTION OF YOUR FILES DO
   YOU CONSULT JURISPRUDENCE, STATUTES, REGULATIONS (MUNICIPAL,
   PROVINCIAL, FEDERAL), AND DOCTRINE?

	Jurisprudence	Statuts Statutes	Réglements Regulations	Doctrine
(1) dans moins de 10% des dossiers IN LESS THAN 10% OF THE FILES				
(2) entre 10 et 25% BETWEEN 10 AND 25%				
(3) entre 25 et 50% BETWEEN 25 AND 50%				
(4) plus de 50% MORE THAN 50%				

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10. Si tous les renseignements utiles étaient immédiatement
    disponibles, consulteriez-vous ces sources plus fréquemment?
    IF THE RELEVANT INFORMATION WERE IMMEDIATELY ACCESSIBLE
    WOULD YOU CONSULT THESE SOURCES MORE FREQUENTLY?

		Jurisprudence	Status Statutes	Doctrine
oui	YES			
non	NO			

11. A quelles heures de la journée faites-vous surtout votre
    recherche (indiquez plus d'une case, laissez des cases
    vides si nécessaire)
    DURING WHICH HOURS OF THE DAY DO YOU USUALLY CARRY OUT YOUR
    LEGAL RESEARCH (FILL IN MORE THAN ONE BOX, OR LEAVE EMPTY
    BOXES IF NECESSARY)

    (1)   8h - 9h
    (2)   9h - 10h
    (3)   10h - 12h   1   2   3
    (4)   12h - 14h
    (5)   14h - 15h
    (6)   15h - 16h
    (7)   16h - 17h
    (8)   17h - 19h
    (9)   aprés 19h
          AFTER

12. Indiquez, dans l'ordre, les index que vous consultez le
    plus fréquemment (indiquez plus d'une case ou laissez des cases
    vides si nécessaire)
    INDICATE WHICH OF THE FOLLOWING INDEXES YOU CONSULT MOST OFTEN IN
    THE ORDER OF FREQUENCY CONSULTED (FILL IN MORE THAN ONE BOX OR
    LEAVE EMPTY BOXES IF NECESSARY)

    (1)   Gagnon Index Gagnon

    (2)   Annuaire de jurisprudence du Québec
           (Lévesque, St-Cyr, Beauchamp)

    (3)   The Canada Statute Citator

    (4)   The Canadian Abridgment

    (5)   Index des statut refondus du Québec
           Index to Revised Statutes of Quebec

    (6)   Index des statuts revisés du Canada
           Index to Revised Statutes of Canada

    (7)   Index de la Gazette du Canada partie 2
           Index to Canada Gazette, Part 2

    (8)   Index de la Gazette Officielle du Québec
           Index to Quebec Official Gazette

EXHIBIT   IV

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13. Combien d'heures par semaine consacrez-vous à la recherche légale?
     HOW MANY HOURS A WEEK DO YOU <u>PERSONALLY</u> SPEND ON LEGAL RESEARCH?

     (1)   moins de cinq heures   LESS THAN FIVE HOURS
     (2)   entre 6 et 10 heures   BETWEEN 6 AND 10 HOURS
     (3)   entre 11 et 20 heures BETWEEN 11 AND 20 HOURS
     (4)   plus de 21 heures   MORE THAN 21 HOURS

14. Déléguez-vous certaines de vos recherches à d'autres personnes?
     DO YOU DELEGATE SOME OF YOUR LEGAL RESEARCH TO OTHER PERSONS?

     (1)   Oui   YES
     (2)   Non   NO

     . . . .

15. Qui et combien de personnes effectuent pour vous ces recherches?
     (Dans la case correspondante, indiquez le nombre de personnes.)
     WHO AND HOW MANY PERSONS CARRY OUT THIS LEGAL RESEARCH FOR YOU?
     (INDICATE THE NUMBER OF PERSONS IN THE APPROPRIATE BOX)

     collegues   COLLEAGUES .... [_____]
     stagiaires et étudiants   LAW STUDENTS .... [_____]
     consultants   OUTSIDE COUNSEL .... [_____]
     autres (bibliothécaire, etc.) OTHERS (LIBRARIANS, ETC.).. [_____]

     . . . .

16. Combien d'heures par semaine ces personnes ou groupe de personnes
     consacrent-elles en moyenne à faire vos recherches?
     HOW MANY HOURS A WEEK DO THESE PERSONS SPEND ON AN AVERAGE
     CARRYING OUT THIS LEGAL RESEARCH?

     (1)   nil
     (2)   moins de 5h   LESS THAN 5h
     (3)   entre 5h et 10h   BETWEEN 5h AND 10h
     (4)   entre 10h et 20h   BETWEEN 10h AND 20h
     (5)   plus de 20h   MORE THAN 20 HOURS

          collègues   COLLEAGUES .... [_____]
          stagiaires et étudiants   LAW STUDENTS .... [_____]
          consultants   OUTSIDE COUNSEL .... [_____]
          autres (bibliothécaires, etc.) OTHERS (LIBRARIANS,ETC. [_____]

EXHIBIT IV

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17. Dans quelle bibliothèque ces recherches sont-elles
    principalement faites?
    IN WHAT LIBRARY IS MOST OF THIS LEGAL RESEARCH CARRIED OUT?

    (1)   bibliothèque privée
           PRIVATE OR OFFICE LIBRARY

    (2)   bibliothèque universitaire
           UNIVERSITY LIBRARY

    (3)   bibliothèque publique (Barreau, Cour Suprême, Législature,etc)
           PUBLIC LIBRARY (BAR, SUPREME COURT, LEGISLATURE, ETC.)

18. Avez-vous une bibliothèque privée?
    DO YOU HAVE YOUR OWN LIBRARY?

    (1)   Oui   YES
    (2)   Non   NO

           ....

19. Si oui, votre bibliothèque privée comprend-elle les séries
    suivantes:
    IF YES, DOES YOUR OWN LIBRARY INCLUDE THE FOLLOWING SERIES:

    (1)   Oui, complète   YES, COMPLETE
    (2)   Oui, complète depuis 1950   YES, COMPLETE FROM 1950
    (3)   Oui, incomplète   YES, INCOMPLETE
    (4)   Non, NO

           RCS/SCR (Cour Suprême - SUPREME COURT)............. ☐

           BR/QB (Banc de la Reine - QUEEN'S BENCH) .... ☐

           CS/SC (Cour Supérieure - SUPERIOR COURT) .... ☐

           RP (Rapports de Pratique) .... ☐

           RL (Revue Légale) .... ☐

           CE/EC (Echiquier - EXCHEQUER COURT) .... ☐

           DLR (Dominion Law Reports) .... ☐

           C.C.C. (Canadian Criminal Cases) .... ☐

           C.R. (Criminal Reports) .... ☐

EXHIBIT **IV**

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R.D.T. (Revue de droit du Travail) .... ☐

C.T.C. (CANADIAN TAX CASES) .... ☐

T.A.C. (TAX APPEAL BOARD CASES) .... ☐

Canadian Bankruptcy Reports .... ☐

C.B.R. RBC (Revue de Barreau Canadien - CANADIAN
BAR REVIEW .... ☐

Revue du Barreau .... ☐

Revue du Notariat .... ☐

S.R.Q./R.S.Q. (Statuts refondus du Québec 1964 ....
            REVISED STATUTES OF QUEBEC 1964 ..... ☐

S.R.C./R.S.C. (Statuts revisés du Canada 1952 .....
            REVISED STATUTES OF CANADA 1952 ..... ☐

Gagnon Index Gagnon .... ☐

Annuaire de jurisprudence du Québec ....
(Beauchamp, St-Cyr, Levesque) ☐

The Canada Statute Citator .... ☐

The Canadian Abridgment .... ☐

Gazette Officielle du Québec ....
Quebec Official Gazette ☐

Gazette du Canada, partie I ....
Canada Gazette, Part I .... ☐

Gazette du Canada, partie II ....
Canada Gazette, Part II ☐

         ....

EXHIBIT IV

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20. Dans une réponse fournie par un système de recherche automatisé
en jurisprudence, quels sont les éléments d'information que
vous croyez indispensables?
IN ANY REPLY FURNISHED BY AN AUTOMATED LEGAL RESEARCH SYSTEM IN
JURISPRUDENCE, WHICH OF THE FOLLOWING DETAILS WOULD YOU
CONSIDER INDISPENSABLE?

(1) Oui   YES

(2) Non   NO

la référence exacte (ex. 1966 BR 343)
THE EXACT REFERENCE (EG. 1966 QB 343)

le nom des parties
THE NAMES OF THE PARTIES

le résumé en mots clés publié dans les rapports
judiciaires
THE KEY-WORDS FRAMEWORK AS PUBLISHED IN THE
JUDICIAL REPORTS

le nom des juges, la date de l'arrêt
THE NAMES OF THE JUDGES AND DATE OF JUDGMENT

le nom des avocats qui ont plaidé la cause
THE NAMES OF THE ATTORNEYS WHO PLEADED THE CASE

jugement par défaut, ex-parte ou après contestation
INDICATION IF JUDGMENT RENDERED IN DEFAULT'
EX-PARTE CONTESTED ACTION

la page et le paragraphe où se trouve
l'information demandée
THE PAGE AND PARAGRAPH WHERE THE REQUESTED
INFORMATION IS FOUND

l'arrêté ou jugé de l'arrêt publié dans les
rapports judiciaires
THE SUMMARY OR "JUGE" OF THE CASE AS PUBLISHED
IN THE JUDICIAL REPORTS

EXHIBIT   IV

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21.   Dans une réponse fournie par un système de recherche automatisé
      en législation, quels sont les éléments d'information que vous
      croyez indispensables?
      IN ANY REPLY FURNISHED BY AN AUTOMATED LEGAL RESEARCH SYSTEM IN
      LEGISLATION, WHICH OF THE FOLLOWING DETAILS WOULD YOU CONSIDER
      INDISPENSABLE?

      (1)   Oui   YES
      (2)   Non   NO

      La référence au chapître, à l'article et au
      paragraphe de la loi
      THE REFERENCE TO THE CHAPTER, ARTICLE AND
      PARAGRAPH OF THE ACT

      Le titre officiel de la loi
      THE OFFICIAL TITLE OF THE ACT

      Le texte intégral de la loi
      THE FULL TEXT OF THE ACT

      Le texte de la loi revisée en tenant compte
      des derniers amendements
      THE TEXT OF THE ACT AS REVISED TO DATE

      Les références aux arrêtés en Conseil
      THE REFERENCES TO ORDERS IN COUNCIL.

      Le texte des arrêtés en Conseil
      THE FULL TEXT OF THE ORDERS IN COUNCIL

                  . . . .

22.   Etes-vous intéressé à connaître systématiquement l'existence
      des projets de loi déposés devant la législature dès leur
      première lecture?
      ARE YOU INTERESTED IN FOLLOWING SYSTEMATICALLY THE BILLS
      INTRODUCED IN THE LEGISLATURE STARTING FROM FIRST READING?

      (1)   Oui   YES
      (2)   Non   NO

EXHIBIT – V

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RESOURCES QUESTIONNAIRE

DISTRIBUTION LIST &

LIST OF RESPONDENTS

Present

1.0   What kind of data bank do you use to-day?

1.1   How are the present systems being used?

1.2   Are they used as conceived?

1.3   How is the data obtained and updated?

1.4   How much effort is required to obtain and update the data? Manhours, dollars, etc.

1.5   Are the systems economical?

1.6   What kind of support is necessary to establish and maintain such data banks? For example, facility, community, industrial, or government, and internal support such as programmers, machine supplies, students, etc.

1.7   How are users charged for data bank services?

Future

2.0   What system (regardless of communication means) concepts are you currently pursuing?

2.1   Are these concepts being co-ordinated on a larger scale with other organizations?

2.2   What kind of data bank systems do you believe are needed within the coming decade? Why? Examples might be computerized data banks, audio retrieval systems, video retrieval systems, etc.

EXHIBIT V

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RESOURCES QUESTIONNAIRE

Future

2.3   Do you envisage regional, national, or international
           access to such data banks? How?

2.4   Do large data bank networks necessarily mean special
           types of retrieval services? What form of output do
           you need?

2.5   Who should have access to such data bank systems?

2.6   Which services do you feel should be free?
           Which ones for a fee?

2.7   What is your opinion of the economics of such systems?
           What support (financial, personnel) do you consider
           necessary to establish and maintain them?

2.8   How would you go about developing and establishing
           data bank systems on a national scale?

2.9   Would you identify technological, institutional, legal,
           political and other factors which you feel may influence
           the implementation of these needed systems?
           Is legal certification a problem?

3.0   Who should decide what information should be placed
           on these systems?

3.1   Are you concerned about privacy of information?
           Copyright? Security?
           How would you like to see these issues handled?

3.2   Will these data bank systems promote national interests?

3.3   To what extent will the existence of national data banks,
           such as, Canadian statistics, meteorology, agronomy,
           pollution, water resources, patents, etc., be of direct
           benefit to your organization, or affect your long term
           plans for educational data banks?

EXHIBIT V

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RESOURCES QUESTIONNAIRE

Future

3.4   Do you think large scale data banks will contribute
        significantly in producing better informed Canadians?
        If not, do you see any alternatives?

Note: Additional views and recommendations are welcome.

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LIST OF RESPONDENTS TO QUESTIONNAIRE

- Arctic Institute of North America
  3458 Redpath
  Montreal, Quebec

  Miss N.T. Corley
  Librarian

- Canadian Aeronautics and Space Institute
  77 Metcalfe Street, Room 416
  Ottawa 4, Ontario

  Mr. H.C. Luttman
  Secretary

- Canadian Council of Resources Ministers
  620 Dorchester Blvd. W., 8th Floor
  Montreal 2, Quebec

  Mr. C. deLaet
  Secretary

- Canadian Printing Ink Manufacturers' Association
  67 Yonge Street
  Toronto, Ontario

  Mr. W.M. Griffith

- Canadian Teachers' Federation
  320 Queen Street
  Ottawa, Ontario

  Dr. G. Richert
  Executive Assistant

- City of Ottawa Public School Board
  330 Gilmour Street
  Ottawa, Ontario

  Mr. A.P. Hanwell
  Superintendent

EXHIBIT V
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- Dalhousie University
  Halifax, Nova Scotia

  L. Vagianos
  Professor & Director of University Libraries

  Miss Susan Whitside
  Librarian

- Energy, Mines & Resources
  Ottawa, Ontario

  Dr. A.K. Biswas
  Resource Management Studies Section

  Dr. C.F. Burk
  National Coordinator
  Geological Survey of Canada

  Mr. J.A. Gilliland
  Hydrologic Sciences Division

  Mr. A. Kuhn
  Head, Resource Data Section

  Mr. B.A. McGee
  Index Supervisor
  Geological Survey of Canada

  Dr. L.W. Morley
  Director, Program Planning Office

  Mr. A.W. Muir
  Fiancial and Management Advisor

  Mr. W.J. Ozga
  Head of Data Control Section

  Mr. A.E. Peterson
  Head, Special Studies

  Mr. P.J. Reynolds
  Chief, Resource Research Centre

EXHIBIT V

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- Falconbridge Nickel Mines Ltd.
  7 King Street, E
  Toronto, Ontario

  Mr. S. Collett
  Information Supervisor

- Forest Ranger School
  Fredericton, New Brunswick

  Mr. E.T. Owens

- Garde-Hansen, Mr. H.
  3049 Linden Drive SW
  Calgary, Alberta

- Machinery and Equipment Manufacturers Association of Canada
  116 Albert Street
  Ottawa, Ontario

  Mr. C.A. Peck

- Manitoba Government
  Department of Mines and Natural Resources
  310 Legislative Building
  Winnipeg, Manitoba

  Dr. K.A. Phillips
  Chief Geologist

- National Research Council
  Ottawa, Ontario

  Mr. L.G. Coté
  Chief, National Research Council
  Computation Centre

  Mr. S.G. Jones
  Radio and Electrical Engineering Division

EXHIBIT V

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- National Science Library
  Ottawa, Ontario

  Dr. J.E. Brown
  Chief Librarian

- New Brunswick Research and Productivity Council
  College Hill Road
  Fredericton, New Brunswick

  Dr. C. Bursill
  Executive Director

- Nova Scotia Government
  Nova Scotia Research Foundation
  5182 Prine Street, P.O. Box 1027
  Halifax, Nova Scotia

  Dr. J.E. Blanchard
  Vice-President

- Ontario Government Department of Lands & Forests
  Queen's Park
  Toronto, Ontario

  Mr. G.H. Bayly
  Deputy Minister

- Ontario Research Foundation
  Sheridan Park, Clarkson, Ontario

  Dr. W.M. Campbell
  Director of Research

  Mr. C.R. Holmes
  Supervisor, Information Services

- Public Service Commission of Canada
  Ottawa, Ontario

  Mr. H. Woods
  Manager, Planning Information Management Centre

EXHIBIT V

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- Pulp and Paper Research Institute of Canada
  570 St. Johns Road
  Pointe Claire, Quebec

  Mr. K.E. Vroom
  Secretary

- Regional Economic Expansion
  Ottawa, Ontario

  Mr. J.J. Foster
  Director of Information Systems

- Symbionics Systems Ltd.
  544 - 550 Berry Street
  Winnipeg 21, Manitoba

  Dr. B.A. Hodson
  President

- University of Alberta
  Education Building
  89 Ave. & 114 Street
  Edmonton, Alberta

  Dr. S.M. Hunka
  Educational Research

- University of Calgary
  Calgary, Alberta

  Mr. F.T. Dolan
  Data Center

- University of British Columbia
  Vancouver 8, British Columbia

  Professor James M. Kennedy
  Computer Science Department

  Professor J.H.G. Smith
  Canadian Institute of Forestry

EXHIBIT V

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- University of Guelph
  Guelph, Ontario

  Mr. L.F. MacRae
  Chief Librarian

- University of Manitoba
  Winnipeg 19, Manitoba

  Dr. D.A. Young
  Associate Professor
  Department of Computer Science

- University of Toronto
  167 College Street
  Toronto, Ontario

  Mr. W.J. Kurmey
  Associate Professor
  School of Library Science

- Watts Griffis & McOuat Ltd.
  159 Bay Street
  Toronto, Ontario

  Mr. R.B. Lawrence

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    i. What would it cost?

    j. How would it be financed?

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    l. What institutional factors would affect its development?

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SOME EXISTING CANADIAN DATA BANKS

Information Service	Science/Technical			Quantitative			Qualitative		
	Prim.	Sec.	Tert.	Prim.	Sec.	Tert.	Prim.	Sec.	Tert.
(a) Mission-Oriented Data Banks:									
BEAM (Construction Industry)	V		X	V		X	V		X
(b) Subject-Oriented Data Banks:									
CANSIM				X					
FRI				X					
FTS				X					
Labour Agreements				V	X				
Cdn. Geosci. Index			X						
CAN/ADI	V	X	X						
TIS	V	V	X						
SOCRATES	V	X	X						
AIRA		X	X						
QUICLAW							X		
PROJECT DATUM								X	

Notes:
1) Primary Information - the original form of the information as the original article, book, or group of statistics.

2) Secondary Information - the abstracts, summaries, excerpts or highlights of the original information.

3) Tertiary Information - reference indexes to either secondary or primary information.

X - Within computer-based system.

V - Auxiliary to the computer-based system.

- Taken from Industrial Sector Report -

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NEWS RELEASE ON

NATIONAL RESEARCH COUNCIL ADVISORY BOARD

ON SCIENTIFIC AND TECHNOLOGICAL INFORMATION

The National Research Council of Canada today announced the appointment of a 20-member Advisory Board on Scientific and Technological Information to formulate broad policy guidelines for the continuing development of a national Scientific and Technological Information (STI) system in Canada.

The announcement follows a January decision of the Federal Government to designate NRC to develop, under the general direction of the National Librarian and in cooperation with existing informational organizations, an STI system encompassing the natural sciences and engineering. The January decision was based on recommendations made in the fall of 1969 by the Science Council of Canada.

Dr. W.G. Schneider, President of NRC, announced that Dr. G.W. Holbrook, President, Nova Scotia Technical College, Halifax, has been appointed Chairman of the Board. The Vice-Chairman is Dr. Lionel Boulet, Directeur, Institut de Recherches de l'Hydro-Québec, Varennes, Québec. The Board will advise NRC on the activities and priorities necessary to undertake, assist or promote the dissemination of scientific and technological information in Canada.

Expenditures for this purpose will be recommended by the Board under a separate Parliamentary vote. Among other things, funds will be earmarked for grants in aid of research, scholarships to promote the training of information specialists and contracts to further a national STI System.

The Board will make recommendations with respect to the activities of Council committees dealing directly with scientific and technological information, participation in the activities of international organizations in the field of STI, and arrangements for international collaboration. It will also recommend methods for the best use of existing STI resources in Canada and for the development of existing and, where necessary, new scientific and technological publications and other means of disseminating information.

The Board will have power to create certain committees of its own to assist in its work. Membership on these committees will not necessarily be restricted to Board members. The participation of the libraries of Federal government departments and

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agencies which have extensive holdings in science and technology will be coordinated by the National Librarian, and it is expected that a committee will be created with representation from departments and agencies to facilitate their participation.

Expansion of Canadian STI dissemination services is necessary in order to cope with the current "information explosion". It will be the role of NRC to see that all areas of science receive adequate coverage and to see that the STI system is integrated as fully as possible with information systems covering other fields of knowledge.

Other members of the Board are:

Mr. Raymond Beaudoin, Vice-président aux communications, Université de Québec, Québec City

Dr. John C. Beck, Physician-in-Chief, Royal Victoria Hospital, Montreal

Dr. Robert Blackburn, Chief Librarian, University of Toronto

Dr. J.E. Brown, National Science Librarian, National Research Council of Canada, Ottawa

Dr. D.A. Chisholm, Vice-President, Research & Development, Northern Electric Company Limited, Ottawa

Dr. L.A. Cox, Director of Research, MacMillan Bloedel Limited, Vancouver

M. Guy Forget, Directeur, Centre de documentation, Université Laval, Québec

Dr. Norman S. Grace, Dunlop Research Centre, Sheridan Park, Ontario

Dr. H.W. Habgood, Chief, Fuels Branch, Research Council of Alberta, Edmonton

Dr. Leon Katz, Director, Accelerator Laboratory, University of Saskatchewan, Saskatoon

Mr. L.F. MacRae, Associate National Librarian, National Library, Ottawa

Dr. J.A. Morrison, Director, Institute for Materials Research, McMaster University, Hamilton, Ontario

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Dr. W.A. Riddell, Assistant to the President, University
of Saskatchewan, Regina Campus, Regina

Dr. Pierre Robert, Directeur, Département d'informatique,
Université de Montréal, Montréal

Dr. Samuel Rothstein, Director, School of Librarianship,
University of British Columbia, Vancouver

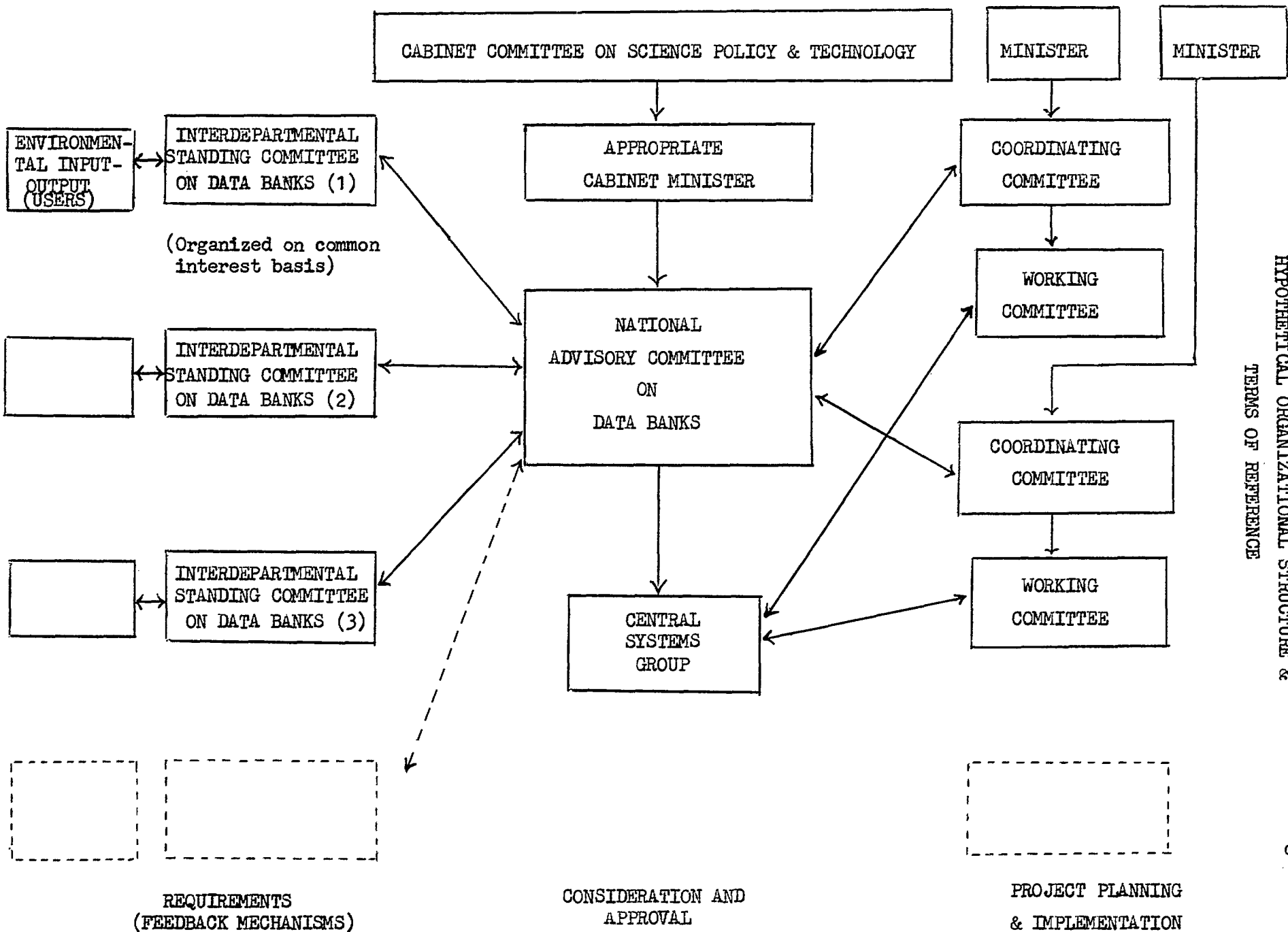Dr. J.G. Sylvestre, National Librarian, National Library,
Ottawa

Dr. K.F. Tupper, Vice-President (Administration),
National Research Council of Canada, Ottawa

Dr. Louis Vagianos, Director of Communications, Computer
Centre, Dalhousie University, Halifax

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MATRIX SUMMARY OF INSTITUTIONAL ARRANGEMENTS

Type of Bank	Institutional Arrangements Phase	Non Profit Groups	Inter Gov. Bodies	Agency Fed. Prov.	Gov. Int. Groups	Coord. Agencies	Inter Gov. Bodies & Special Groups
Resources	Planning			x			
	Implementation					x	
	Operation					x	
Legal	Planning			x			
	Implementation			x			
	Operation					x	
Medical	Planning		x				
	Implementation		x				
	Operation					x	
Urban	Planning						x
	Implementation						x
	Operation						x
Consumer	Planning	x					
	Implementation	x					
	Operation	x					
Industry	Planning				x		
	Implementation				x		
	Operation					x	

Legend: Int. - Interest
         Coord. - Coordinating

CABINET COMMITTEE ON SCIENCE POLICY & TECHNOLOGY

MINISTER

MINISTER

ENVIRONMENTAL INPUT-OUTPUT (USERS)

INTERDEPARTMENTAL STANDING COMMITTEE ON DATA BANKS (1)

(Organized on common interest basis)

INTERDEPARTMENTAL STANDING COMMITTEE ON DATA BANKS (2)

INTERDEPARTMENTAL STANDING COMMITTEE ON DATA BANKS (3)

APPROPRIATE CABINET MINISTER

NATIONAL ADVISORY COMMITTEE ON DATA BANKS

CENTRAL SYSTEMS GROUP

COORDINATING COMMITTEE

WORKING COMMITTEE

COORDINATING COMMITTEE

WORKING COMMITTEE

REQUIREMENTS (FEEDBACK MECHANISMS)

CONSIDERATION AND APPROVAL

PROJECT PLANNING & IMPLEMENTATION

HYPOTHETICAL ORGANIZATIONAL STRUCTURE & TERMS OF REFERENCE

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TERMS OF REFERENCE

National Advisory Committee

The National Advisory Committee on Data Banks shall assess the requirements for, and the problems associated with, data banks in promoting national and public well-being, and shall advise an appropriate Minister on:

    (a)   the adequacy of existing data banks in serving the national and public interest;

    (b)   the priorities which should be assigned to specific requirements for data banks;

    (c)   the effective development, operation and utilization of data banks;

    (d)   the best means of developing and maintaining cooperation between different organizations for the development of data banks;

    (e)   criteria for deciding on the choice among various government and non-government agencies to operate a 'national' data bank;

    (f)   the information necessary to provide a proper basis for the formulation of government policy in regard to data banks;

    (g)   the requirements for, and means of obtaining, standardization in data structure and programming;

    (h)   the appropriate cooperation with international and foreign agencies concerned with data banks;

    (i)   problems which may require special legislation.

In addition, this Committee shall advise the Coordinating Committee for a specific data bank on problems referred to it.

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Central Systems Group

The Central Systems Group shall be responsible for:

A. Assisting the National Advisory Committee on the Data Banks
    by providing them with technical information, and by
    alerting them to existing and potential problems related
    to data banks; and

B. Providing assistance in the conceptual, design and implemen-
    tation phases of the development of specific data banks

    In particular they will:-

    (a) make recommendations to the National Advisory Committee
         (N.A.C.) on standards associated with data bank develop-
         ment and operation, for ensuring compatibility of data
         structure in related data banks, and for achieving as
         great a degree of machine independence as possible;

    (b) appraise the N.A.C. of problems requiring its attention;

    (c) provide technical information and advice on technical
         matters to the N.A.C. when requested;

    (d) evaluate general data base management systems available
         on the market;

    (e) develop general utility programs for data management;

    (f) keep abreast of software and hardware developments
         (including telecommunications) related to the efficient
         and effective operation of data banks;

    (g) when requested, take responsibility for specified
         aspects of the development and implementation of a
         particular data bank.

        The permanent staff in the Group should be augmented by
a small number of 'experts' appointed on contract, or by special
arrangement, for periods up to two years.

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The Coordinating Committee (of a specific data bank)

The Coordinating Committee for a specific data bank shall facilitate the development of the data bank by:

(a)   resolving problems of a "strategic" nature, such as those related to possible conflicts of interest

(b)   referring such problems to the National Advisory Committee for guidance if deemed desirable

(c)   making representations to the appropriate quarters for funds to cover development

(d)   allocating funds to the various activities

(e)   establishing specific terms of reference, and general guidelines for the Working Committee

(f)   monitoring progress of the Working Committee

(g)   assessing the final recommendations of the Working Committee to ensure that all user requirements have been listed in the specifications

(h)   recommending to the appropriate authority* the procedures to be adopted in the design and implementation phases.

* In many cases this will be the Minister (or his deputy) of the particular Federal Government department primarily responsible for the subject matter of the data bank. In some cases the recommendations will be forwarded to the National Advisory Committee for consideration and forwarding to the Minister responsible for the NAC.

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The Working Committee (of a specific data bank)

Specific terms of reference and general guidelines will be drawn up in each individual case by the Coordinating Committee for that data bank. In general the functions of the Working Committee will include the following:

(a) definition of input and output requirements

(b) assessment of standards, and necessity for compatibility with related data banks

(c) assessment of requirements for staff, money and other resources in the design phase, and projection of such requirements in the implementation and operation phases

(d) definition of responsibilities of the various cooperating organizations in the development and operation of the data bank

(e) assessment of security requirements

(f) preparation of an implementation schedule, together with recommendations for monitoring progress

(g) recommendations for monitoring operations to ensure effective and equitable service

(h) assessment of growth requirements