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REPORT ON

NATIONAL INFORMATION NETWORK FOR SOFTWARE AND COMPUTER SERVICES

Prepared For: Supply & Services Canada

and

Communications Canada

GOSS, GILROY
& ASSOCIATES LTD.
Management Consultants

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1.0 INTRODUCTION

1.1 Purpose

The purpose of this document is to provide Supply and Services Canada and Communications Canada with a single document which draws together current government policies, initiatives and activities which either provide the context for the National Information Network for Software and Computer Services project (NINSCS), or which support or are supported by NINSCS.

1.2 Scope

Goss, Gilroy & Associates Ltd. were asked to examine existing materials, and were not charged with performing "original" research. A list of materials reviewed is attached as Appendix A.

1.3 Background

Supply and Services Canada and Communications Canada are jointly examining a proposed project to develop NINSCS, a project that looks to advance the government's agenda in the areas of science and technology and economic and regional development policy.

Goss, Gilroy & Associates Ltd. were engaged to write a report which would serve as background material to the two departments during their preparations for NINSCS.

1.4 Approach and Methodology

Following discussions with officials from Communications Canada and Supply and Services Canada, during which Goss, Gilroy & Associates Ltd. were briefed on the proposed project, a literature search was performed. The search was intended to identify statements covering science and technology, economic and regional development, and procurement policies and initiatives, that have been adopted or proposed.

The statements could represent policies or initiatives that are:

- government-wide;
- specific to Communications Canada;
- specific to Supply and Services Canada; or,
- relate to other government departments, either alone or in combination.

The report is organized under the following headings:

- The Canadian Software and Computer Services Industry;
- Policies, Programs and Initiatives;
- The Gap between what exists and what is needed;
- Filling the Gap (with the Network); and,
- Fulfilling the Government's Agenda.

The intent of this organization is to provide the reader with a sense of the industry and its needs, and what the government is now doing and plans to do. This is followed by a brief description of the areas that are not served currently, and this by a description of the National Information Network for Software and Computer Services. The concluding section describes how the network would satisfy industry needs while at the same time meeting the government's objectives.

2.0 THE CANADIAN SOFTWARE AND COMPUTER SERVICES INDUSTRY

2.1 What is Software? What are Computer Services?

Software can be defined as a set of instructions or programs which solve application problems, control the operations of the hardware devices or provide for the efficient management of the computer systems resources. When these instructions are designed for multiple use, reproduced, packaged and resold they become software products.

Software products are classified in three categories: systems programs; user tools; and application solutions. In the cases of both systems software and applications software, the trend is toward the development of software "packages". This means that instead of hiring computer programmers to develop customized software for any particular use, most consumers are buying their software on a "packaged" or "off-the-shelf" basis. Not only is this radically reducing the cost of purchasing software, it is also spurring the development of a whole new software industry, made up of firms that produce software for mass-market consumption.

Computer Services are provided by those companies that specialize in providing computer time, the services of computer programmers and analysts on a per diem basis, or the writing of custom software to meet specific needs.

2.2 Uniqueness of the Canadian Software Products and Computer Services Industry

The Canadian software sector is highly segmented. Of the 2,200 firms in existence in 1984, the top 50 accounted for approximately 75%-80% of all software revenues. These firms include the large, integrated U.S. multinationals which together accounted for 65% of all software revenues in Canada. At the other end of the scale were some 1700 small firms, with

ten or fewer employees and annual revenues of $500,000 or less; the smallest 500 firms accounted for only 2% of the total market. The bulk of the industry consists of small, technically oriented firms that are underfinanced and suffer from chronic cash-flow problems.

U.S. firms dominate the growing packaged software market, with Canadian software and computer services firms tending to occupy strong positions in the more mature data-processing and custom software markets, as well as the increasingly important area of systems integration. Some industry analysts estimate that about 80% of the software packages used in Canada originate in the U.S. Canada has internationally recognized skills in software development and general consulting, which stem both from the excellence of the education system and extensive industry experience gained in a wide variety of customized user applications. These skills provide a strong foundation not only for excellence in systems integration, but also for the future development of artificial intelligence based expert systems. This last is likely to become a key area of activity over the next 5-10 years.

The Canadian software and computer services sector faces several critical challenges. Although there are some significant exceptions, it seems clear that the small and medium sized Canadian software companies are poorly positioned to compete effectively in the packaged software market. Recent studies have stressed their needs in terms of the availability of equity and loan capital, marketing strategies, and overall management capabilities. These companies tend to be technically oriented with strong software development capabilities. They are often weak in their general management and marketing capabilities, as well as their knowledge of the packaged software market, which is both crowded and highly competitive. Due to the conservative nature of the Canadian capital markets and banking industry, these firms usually have difficulty in raising sizeable amounts of either venture capital or loans. There is a question of their continued ability to compete against the large (mostly U.S.) multinational companies now dominating this market segment.

Hardware firms are consolidating, and, in order to be able to offer their customers a more complete package and to move into areas of potential growth, they are also becoming major providers of software and data services. IBM provides a good example of this trend. Software currently accounts for some 8% its total revenues, but within a few years this is expected to increase to 25%. A company like IBM can both market its own proprietary software and distribute software developed for its hardware by third parties.

As the computer industry consolidates, fewer and fewer companies will emerge as developers of attractively priced software products and data services. Software that is essential to the usual applications of their hardware will have to be developed and sold along with their new product lines. Other applications software, and interesting databases, will be included to create an attractive sales package. Without any significant Canadian manufacturers of computer hardware, will Canada be able to guarantee access to domestic and world markets for smaller domestic niche players? Will it find the means to meet its own need for Canadian content and Canadian services while standing outside the emerging global oligopolies?

A key Government objective should be to ensure that Canadians have a role to play in an increasingly globalized and consolidated industry, and in what appears to be a single but complex market for information products and services. These include many needs in special social and cultural priority areas, as described above, which would not be met purely by market forces due to small market size and high risks. Any industry support initiatives should be sensitive to the special needs of the small and medium sized firms which constitute the bulk of the Canadian software and computer services industry.

2.3 Current Market Situation

In the past ten years the software products and computer services industry has seen phenomenal annual growth rates, at times approaching 40% per annum, but this exceptional growth dropped dramatically in 1984. However, it is predicted (by International Data Corporation (Canada) Ltd.(IDC)) that the growth of this sector will recover for the remainder of this decade and stabilize at levels of 10-20% growth per annum.

Appendix B contains empirical data on the size and composition of Canadian Software and Services market place.

Analysis of the industry statistics indicates that:

- less than one percent of Canadian software developers are large, internationally successful firms;
- this small number of large firms account for 75% of domestic sales of Canadian software;
- the average sales of Canadian software producers is less than $200,000 per year; and,
- the average Canadian software developer employs less than five people.

In 1986, IDC forecast that in 1987 the software and computer services market place in Canada would be approximately $2 billion. Of this amount some $722 million would be spent on packaged software, $712 million on processing services, and $560 million on professional services.

If estimates that 80% of software packages come from the U.S. are correct, $144 million would be spent on Canadian or other country packages. With the top 50 firms accounting for 75% Canadian revenues (approximately $108 million), some 2100 companies would share the balance of $32 million.

2.4 Current Industry Situation

The following is a brief analysis of the current situation in the software products industry:

(i) **Poor Record of Success:**

Despite the technical strengths that Canadian software developers are believed to possess, Canada has produced few resounding commercial successes in a market where there are many opportunities. The Canadian industry has been slow to develop and is not meeting its full potential for employment, technology development, product development, import replacement or export sales.

(ii) **Industry Consolidation:**

With intense competition in the marketplace, there is a trend towards less well established firms collapsing or being absorbed into larger firms. It is expected that this consolidation will continue throughout the medium term, leading to an industry with an increased proportion of larger firms with an enhanced ability to compete for market share and skilled personnel.

(iii) **Strategic Partnering:**

As the industry moves towards delivering vertically integrated systems solutions, software products developers have to consider tactical and strategic alliances with companies that can help sell their products. Strategic partnering is becoming an increasingly important corporate activity in this industry, as it allows companies to combine expertise and other resources to improve market penetration.

(iv) **Vertical Market Orientation:**

The dominance of the U.S. industry in the "horizontal" applications market (eg. spreadsheet, database management programs, etc.) has led many Canadian firms to concentrate on vertical markets. While these specialized markets are much smaller in many cases than horizontal markets, they are well defined, thus making market research and marketing efforts easier and less expensive. This vertical marketing strategy will be of growing importance in the face of an increasingly competitive international marketplace.

(v) **Global Marketing:**

Historically, Canadian software firms have looked to the international marketplace to generate viable sales revenues. The penetration of products from the U.S. has made it extremely difficult for Canadian software developers to capture a significant share of the domestic market. In addition, the entrenched position of American products in their domestic marketplace has made it difficult for more than a small number of Canadian firms to compete successfully in the U.S. Therefore, Canadian companies are expanding their marketing initiatives beyond the U.S. market. This trend will likely cause an increase in strategic partnering, joint ventures and international licensing arrangements.

2.5 Outlook for the Industry

Given current projections for the economy as a whole, the Canadian market for software should continue to show high growth rates through to the 1990's. The fastest growing market will be for user tools followed by application solutions.

There will be continued strong growth in the micro-computer software area. This growth is based on the expected 20% growth per year in numbers of business systems installed, including replacements of existing systems with more sophisticated products. To exploit this potential, software developers must produce sophisticated multi-user, multi-tasking software capable of competing with products from foreign vendors.

The greatest opportunity for the software and computer services industry is the rapidly expanding world market for software products and services, which is estimated to reach almost $90B by 1990. Canadian firms have an opportunity to take advantage of this growing market due to the world class software expertise and innovative products for which the industry is recognized.

However, if the Canadian software industry is to establish a strong position within the international marketplace, it must be capable of continuing innovation to exploit rapid advances in technology and to satisfy the increasing demands of the user community.

Independent Canadian software activity is a public policy issue for other reasons besides jobs and revenue. Even if software market conditions were generally favourable, many needs in special social and cultural priority areas would not be met due to small market size and the high risks associated with these markets. Three examples illustrate this situation. Francophone users in Quebec and elsewhere in Canada have very few French-language products to choose from. Special support is required to make private software development commercially viable. Domestic educational courseware has difficulty matching the unit price of American products (which have captured roughly 90% of the elementary and secondary school market). Government and private needs for more efficient translation services might be met in part by development of more advanced

technological aids, but initial R&D investment needs in this leading-edge area are very high.

Canada cannot afford not to have a lively and vigorous software industry; it will be central to our economic, social and cultural life.

2.6 Issues Affecting the Canadian Software Products Industry

This section introduces certain issues which are considered to be major factors in the development of the industry.

2.6.1 Infrastructure

The software industry suffers because of its lack of an acknowledged industry association to voice its concerns and to provide a conduit for communications between member firms and with other organizations. This is primarily because of the fragmented nature of the industry and the small size and volatility of the average software company.

This has several consequences:

- companies do not effectively share information or other resources;
- the formation of strategic partnerships between complementary organizations is not encouraged;
- the industry cannot make joint representations to the financial community or government; and,
- marketing efforts in Canada and abroad are not coordinated.

2.6.2 Finance

Many participants in the Canadian software industry identify the difficulty of obtaining adequate financial support as their principal

problem. This money is required to support research and development and marketing efforts.

A lack of financial support represents a serious impediment to the software industry in Canada.

2.6.3 Competition from Abroad

For the most part, government agencies procure so as to minimize cost and risk with the frequent result that American suppliers of general purpose software, especially for microcomputers, are favoured over Canadian firms.

The penetration of products from the U.S. has made it extremely difficult for Canadian software developers to capture a significant share of the domestic market. However, to be competitive in international markets, Canadian firms need a strong domestic base. This provides them with the revenues needed to support international sales efforts, and provide them with the credibility needed to penetrate international markets.

While Canadian software firms have historically looked to the international marketplace in an effort to generate viable sales revenues, the entrenched position of American products in their domestic marketplace has made it difficult for more than a small number of Canadian firms to compete successfully in the U.S.

Canadian companies are, therefore, expanding their marketing initiatives beyond the U.S. market and are seeking new markets on an international basis.

2.6.4 Government Support

Software is a strategic industry the importance of which has been recognized and emphasized by the following initiatives:

- the establishment within Industry, Science and Technology Canada (ISTC) of the Information Technologies Industry Branch, which has a specific mandate for the software industry and includes a division dedicated to the development of the software industry;
- the formation of the National Software Working Committee; and,
- the Canadian Strategy for Science and Technology announced March 24, 1987.

In each of these cases, it was recognized that software is one of the basic building blocks of advanced communications, micro-electronics, office automation, manufacturing and defence systems.

2.6.5 Marketing

The Canadian software industry has the potential to meet most domestic requirements, and can be a world leader in software technology development and application specific solutions. However, Canadian software developers do a very poor job of marketing themselves and their products.

The lack of marketing ability and focus has resulted in poorly developed channels for software distribution. The existing distribution channels are often of an ad hoc nature and are not capable of handling the quantity and diversity of software products being developed. Without access to markets, the Canadian software industry will never develop to its full potential.

2.6.6 Industry Intelligence

Industry intelligence is not currently available to Canadian software developers and financial institutions in a form that permits the quick evaluation of proposed software R&D and product development projects. Such intelligence should provide information on competitors, market conditions, other development initiatives, market opportunities and the cost and availability of support services.

This information is critical to making informed strategic decisions regarding the development of the industry as a whole and specific decisions relating to the positioning of individual products.

2.7 Industry Comments

Although it was stated earlier that no single organization represents the views of all companies, there are, nevertheless, industry associations which represent large segments of the industry.

2.7.1 The Canadian Association of Data Processing Service Organizations

The Canadian Association of Data Processing Service Organizations (CADAPSO), in a brief to the Standing Committee on Government Relations in April 1988, made the following recommendations, inter alia, concerning government support for the Canadian software and computer services industry:

- develop a system to promote and monitor Canadian software acquisition in government;
- encourage and promote partnering and sub-contracting;
- co-ordinate the availability of information on government programs under one department or agency; and,
- encourage regional procurement.

2.7.2 Information Technology Association of Canada (ITAC)

In its submission to the House of Commons Standing Committee on Regional Industrial Expansion, April 1988, ITAC said:

> " Information Technology (IT) is all-pervasive; it is a key enabling technology. Important by itself as an industry sector, it is also the horizontal enabling technology for all other sectors.

> We have no alternative but to seize the opportunities for innovation and productivity improvement which IT provides. We must use IT to create a competitive advantage.
>
> The term "international competitiveness" is referred to so often that it has almost taken on a life of its own and yet it is key to Canada's long term success as a developed economy and a world trader.
>
> ... the central objective of domestic policy must be to improve the ability of Canadian industry to compete on a global scale.
>
> Canada has produced some excellent software products. This is where the fastest growth in the information industry is taking place and it is an area where Canada has some competitive advantages.
>
> Governments are in the environment-creating business. It can and should foster those things that are in the national interest but which industry is either unable or unwilling to provide."

2.8 Other Comments

Goss, Gilroy & Associates Limited recently completed a investigation into Supply and Services Canada's Supplier Relations Programs which involved discussions with industry associations, including CADAPSO, and, in the past, has conducted other investigations which dealt with companies in the high technology field.

Some of the main findings of these investigations are :

- companies need to know :
  - if procurement specifications are such that pre-determined (U.S.) packages are the only ones that will be considered
  - will development funds be available
  - what is the likelihood of the procurement actually going ahead;
- companies would like to be informed earlier of the anticipated procurement requirements;

- location is felt to present a real barrier to winning contracts, particularly in the area of professional services; and,
- small companies are usually founded by technical experts who are inexperienced and/or who have no capability in marketing, as distinct from sales.

2.9 Summary

Although, as described in Section 2.6.1, the Canadian Software and Computer Services industry does not speak with a single voice, from the foregoing discussion it is clear that the views expressed by CADAPSO and ITAC can readily be adopted as the views of the industry at large, and can be summarized in the following manner :

- improve access to government markets;
- raise the profile of Canadian products;
- promote the sharing of industry intelligence; and,
- encourage regional procurement.

3.0 POLICIES, PROGRAMS AND INITIATIVES

3.1 Economic and Regional Development through Procurement

In 1984, the government introduced the concept of the Annual Strategic Acquisition Plan (ASAP). This is an annual process aimed at examining how best to pursue industrial and regional benefits from major government procurement.

This initiative was followed in 1986 by the **Atlantic Opportunities Program**, which defined Atlantic Canada as a primary target for regional development through procurement and industrial benefits.

The **Western Diversification Initiative**, announced by the Government in August 1987, seeks to promote economic expansion and diversification in Western Canada in a manner that provides added influence for the West in national policy and decision-making. Within this Initiative, Western Diversification recognizes that government procurement can make a contribution to the economic diversification of the West.

Supply and Services Canada has two major initiatives under development as a result of the above that, while they apply to procurement opportunities in general, could be used more specifically for the software and computer services industry:

- Western Procurement Initiative under the Western Diversification Initiative, and
- Atlantic Canada Supplier Development Program under the Atlantic Opportunities Program.

The 1986 First Ministers Conference called for a Federal-Provincial-Territorial Conference on Procurement. This Conference established three Task Forces which reported to the First Ministers Conference in November 1987. Specific Structural and Procedural Changes were identified:

- continue the development of electronic systems to disseminate procurement information;
- undertake a feasibility study of electronic bidding systems for the transmission and reception of tenders;
- continue and expand procurement under the co-operative agreements already established between Supply and Services Canada and individual provinces; and,
- use a variety of low-cost means to distribute general business opportunity and specific tender information to small suppliers, by means such as a national gazette, facsimile, telecommunications networks and local cable stations.

Underlying these Structural and Procedural changes were certain key findings of the Task Forces:

> "Canadian suppliers need more complete and timely information on procurement opportunities, policies and procedures;
>
> the level of information-sharing among jurisdictions on sources of supply needs to be raised;
>
> the cost of doing business with centrally-located procurement groups are significant enough for the distant suppliers that it diminishes their competitiveness. These costs include the time and cost of travel, long distance telephone costs and courier charges."

3.2 Science and Technology

In addition to the above initiatives on procurement, the federal government, over the same time frame, has developed and promulgated policy in the area of science and technology which specifically recognizes the part that the software and computer services industry can play in Canada's future development.

Specific initiatives that relate to the computer services industry are :

- Task Force on Informatics, 1983;
- Neilsen Task Force, 1986;
- Information Management Policy Overview, TBS, 1987; and,
- National Conference on Technology and Innovation, 1988

3.3 Communications Canada

Communications Canada has major corporate thrusts which it is seeking to achieve in support of the government's agenda. Two of these are specifically addressed by the proposed initiative :

- promote as a national priority the use of information technology for regional development; and,
- encourage innovative applications of information technologies.

The department has several activities underway that relate to the implementation of the government's science and technology policies, and which also relate to the support of the computer software and services industry. Through the Information Industry and Economic Development Branch, the department actively supports technology development in the areas of informatics equipment and services, communications equipment and software. The Software '88 Symposium, January, 1988, co-sponsored by Communications Canada and the Government of Ontario, was a specific initiative aimed at the software and computer services industry.

Communications Canada has embarked on a major policy development exercise through the promulgation of its Discussion Paper, **"Communications for the Twenty-First Century: Media and Messages in the Information Age"**.

In analysing the challenges facing Canada, Communications Canada is focussing on four main questions:

- the development of the new information industries and their software and database products;
- the evolution of the networks that carry these products;
- ways in which these products and networks can be used more effectively to meet Canada's goals for economic, social and cultural development; and,
- the national research effort required to underpin all these objectives.

The Discussion Paper concludes :

> " The application and use of communications and information technology must become a national priority."
>
> " The use of information technology for regional development must become a national priority. It is here that the 'distance-insensitive' character of the technology offers the greatest potential for revitalizing traditional industries and creating new opportunities. But it is also here that the challenges are greatest, since it is the disadvantaged regions that are taking up the technology most slowly."

3.4 Supply and Services Canada

In defining its objectives aimed at the implementation of the government's agenda in the area of economic and regional development through procurement, Supply and Services Canada has identified the following thrusts:

- identify and pursue opportunities for cooperation with provincial and territorial governments;
- ensure that all regions of Canada participate to the fullest possible degree in SSC contracting;
- furnish pro-actively to Canadian industry information about business opportunities in the federal public sector market;
- assist Canadian advanced-technology firms; and,
- promote participation for small businesses in SSC procurement.

The following was included in SSC's Annual Procurement Plan and Strategy :

Software Industry:

The Canadian software industry has gained increased importance in the Canadian economy and has been identified as one industry having outstanding domestic and international growth potential. As a consequence, SSC, in the context of the 1984-85 Annual Procurement Plan and Strategy (APPS), undertook a major endeavour to support the development of Canada's software industry in line with efforts being made by other federal departments.

Extensive consultations were held with Canadian software firms to identify procurement-related initiatives which could be undertaken to assist in the development of this industry. As a result of this activity, plans and strategies were identified for inclusion in the 1984-85 APPS under three main headings: i) Market Organization, ii) Marketing Assistance Measures, and iii) Make/Buy Review.

In summary, these initiatives involved strengthening the industry's marketing posture; providing advance notice of requirements through annual software briefings to industry, publishing selected software procurement; the possibility of making available to industry, provincial governments and federal departments, a database containing all available Canadian software; unbundling requirements to allow for the sourcing of requirements to both hardware and software suppliers; transfer of Crown-owned software to the private sector; and using the Source Development Fund to encourage the development of specific software applications.

Representations made by the Canadian software industry during the 1985-86 APPS consultations process called for a continuation and

strengthening of plans and strategies identified in the 1984-85 APPS.

Supply and Services Canada has a number of current initiatives that relate to both science and technology and procurement policy, two of which are:

- Annual Procurement Plan and Strategy (APPS)

The APPS is an annual process for examining how to best pursue industrial and regional benefits from major government procurement and includes recommendations to Ministers.

The expected results of the APPS, with respect to the software industry, include the following:

- encouraging both hardware and software producers to be primary contractors on large contracts.

- encouraging foreign companies to design hardware systems compatible with Canadian software;

- encouraging innovation by allowing software developers the opportunity to participate in major contracts at earlier stages of development;

- encouraging the use of software that meets world standards, thereby opening the way for increased exports of Canadian software;

- encouraging the private sector to use and sell software development by/for the government;

- encouraging government departments to purchase Canadian software; and,

- compiling a comprehensive list of Canadian software companies, their products, services, and comparative capabilities as a reference for use by federal government departments.

- **Office Automation Services and Information Systems Directorate (OASIS)**

As part of the development of a marketing plan designed to increase user awareness of Canadian (office application) software products, the following actions were taken by OASIS:

- Participated in a National Software Workshop in May, 1985 to undertake further market research relative to the software industry's marketing concerns.

- A pilot "Software Market" show was presented Oct. 29-30, 1985 in the NCR with the following objectives:

  a) stimulate the competitive process by exposing users to new Canadian products;

  b) assist Canadian software developers with their marketing efforts by providing a forum to meet decision-makers in government and discuss their needs;

  c) educate clients on comparable Canadian technology.

  Subsequent "Software Markets" have been offered in the NCR in 1986 and 1987, but of a greater magnitude.

- In concert with these efforts, the Canadian software industry has taken advantage of additional marketing assistance measures offered by the Directorate for its suppliers, including:

- annual Procurement Outlook Conference across Canada;
- one-on-one marketing consultations; and,
- publication of an annual "Requirements Forecast", depicting, on a regional basis, the needs (including software) of the largest 25 client departments.

3.5 Interdepartmental Activities

The Interdepartmental Task Force on Industry/Corporate Databases was originally established as the Sourcing Networking Databases Committee at the request of the Strategic Technologies Committee. It has been re-named and its scope broadened, under the chairman of Communications Canada, to include corporate information held by several departments. The Task Force's goal is to share interdepartmentally quality industry/corporate data in order to:

- provide better service to the public; and,
- reduce duplicate tasks and resources in departments.

Existing databases being reviewed by the Task Force, all of which contain information on software and computer services suppliers, include:

- Worldwide Information Network/Export (WIN/Export) - External Affairs
- Corporate Registry System - Consumer and Corporate Affairs
- Business Opportunities Sourcing System (BOSS) - DRIE
- National Sourcing Information System (NASIS) - SSC

4.0 THE GAP BETWEEN WHAT EXISTS AND WHAT IS NEEDED

4.1 Current Policies, Programs and Activities

Section 3.0 of this report clearly shows that the government has several policies either in place or under development, and that departments have programs and activities that demonstrate the government's recognition of the strategic importance of technology to Canada's continued development as an industrialized nation, and that government procurement can play a large part in the economic and regional development of Canada.

Some of these policies, programs and activities acknowledge the importance of software and computer services in this development. The activities being undertaken by SSC in general, and OASIS in particular, by Communications Canada, and by the Interdepartmental Task Force on Industry/Corporate Databases are steps in the right direction.

4.2 Industry Needs

Restating industry needs, as described in Section 2.0 and as summarized in Section 2.9 :

- improve access to government markets;
- raise the profile of Canadian products;
- promote the sharing of industry intelligence; and,
- encourage regional procurement.

4.3 The Gap

The programs implemented to date only scratch the surface of what the industry says it needs, and what the government acknowledges is required.

Technology is obviously a key focus of this government, and software and computer services are part of this technology, but while current programs

foster the development of software a gap remains, in that there are no specific programs in place to evaluate and promote Canadian software products.

More specifically, programs are needed to support and develop the marketing capabilities of Canadian software and computer services firms. This can be achieved by providing a domestic market base through which these companies can enhance their credibility in international markets, and a revenue base to ensure the financial viability necessary to support international selling activities.

This proposal suggests providing one means of reducing this gap.

5.0 FILLING THE GAP

5.1 The National Information Network for Software and Computer Services

A National Information Network for Software and Computer Services implemented initially on a **prototype** basis, will contribute to meeting the needs as described in this paper.

5.1.1 Purpose

The purpose of this Network is to promote the development of the Canadian software industry by expediting flows of information between users in government and software and computer services suppliers in the private sector.

5.1.2 Objectives

The objectives of this network are:

- to provide industry and government with a current list of SCS suppliers;
- to provide industry and government with a current list of software products and computer services;
- to provide a common method of evaluating products and a common source of evaluation data;
- to provide a vehicle for the exchange of custom developed solutions;
- to provide industry and government with a current list of procurement opportunities;
- to provide industry with a vehicle to promote products and services;
- to provide industry and government with a common communications network;
- to provide industry with a source of potential partners; and,

- to provide a vehicle for linking to other key data bases.

5.1.3 Information

In order to be able to fulfill the above objectives, the information to be contained in the network will consist of two parts : government demand for software and computer services, and the supply capability of companies in the industries.

Demand information will be made up of historical data from OASIS on awarded contracts and from departments via their materiel management activities, information on current "bid" opportunities, and information on anticipated future needs of government departments.

Supply information would be an inventory of software and computer services available from Canadian companies in those industries.

It is the intent to have the information in the system as accurate and up-to-date as possible, with both government and industry being responsible for the maintenance of their respective areas. The information would be used by governments, industry, and industry associations in procurement, software and computer services development, industry intelligence, and other activities critical to this industry.

5.1.4 Software Evaluation Centre

Associated with the information inventory described above will be a software evaluation "facility". This "facility" would validate the technical and performance specifications of Canadian software products by testing them using predefined standard methodologies. The assessments would be made available to all government procurement officers via a database within the NINSCS.

The availability of these assessments would raise the profile of Canadian software companies that have difficulty marketing their products because of their small size or location. The result from the government perspective would be more informed purchasing decisions because of the exposure to more Canadian software packages, all of which, of a particular type, have been subjected to identical testing criteria.

5.1.5 Software Exchange

The purpose of the Software Exchange is to promote the sharing of software investment among government departments. This will reduce the cost of developing systems which have similar functions across a wide base of users. The current investment in software that falls into this category is estimated at $2 billion.

In addition to the software developed in government for government, industry developed software will also be identified on the database. An objective of the software exchange will be to isolate software which could be transferred to industry and commercially exploited. This initiative will further enhance the economic benefits of government software development activities by creating jobs, promoting exports and increasing the general wealth within the industry.

Initial data for the software exchange would be supplied by SSC. However, the intent is to gather information from all completed government contracts on a government-wide basis. Users int he government and private sectors will be able to match needs with products and services.

6.0 FULFILLING THE GOVERNMENT'S AGENDA

6.1 Meeting Industry's Needs

Industry needs, as identified by two industry associations and by investigations by Goss, Gilroy & Associates Ltd., were described in Section 2.0 of this report. In addition, government policy objectives in the areas of economic and regional development, procurement, and science and technology have been identified.

The objectives of NINSCS have been formulated to contribute to meeting these needs and policy objectives.

In achieving the objectives as set out in the previous section, the benefits of the National Information Network for Software and Computer Services are expected to be :

- a cost effective procurement vehicle for government and industry;
- maximized exposure of the Canadian software and computer services industry;
- increased partnering of both government and industry resulting in more competitive products and services;
- more effective use of government incentive and assistance programs;
- shorter procurement cycle for off-the-shelf products;
- rapid dissemination of new product and service offerings;
- provision, to industry and government, of a current list of software products and computer services;
- provision of a common method of evaluating products and a single source of evaluation data;
- provision of a vehicle for the exchange of custom developed solutions;
- provision, to industry and government, of a current list of procurement opportunities:

- provision to industry of a vehicle to promote products and services;
- provision to industry of a method of identifying potential partners; and,
- provision of a vehicle for linking to other key databases.

6.2 Implementing government policies

The development of software packages can be undertaken in any location, once it is known what is required. Thus, the implementation of NINSCS will not only facilitate the "principles of geographic neutrality", as agreed to by First Ministers, in that it will allow companies in all regions of the country access to the government's procurement intentions, but the opportunity to bid will allow for greater diversity in procurement sources, which will, in turn, foster economic and regional development.

The participation of provincial governments in the system would facilitate the breaking down of interprovincial trade barriers, a major goal of the Task Force established to examine this issue, and of the Free Trade Agreement.

The development of this system would respond to the Structural and Procedural Changes enunciated by First Ministers, and hence the key findings of the Task Forces on Procurement.

NINSCS clearly supports SSC thrusts as stated earlier, and since the department's objectives are derived from government-wide policies on procurement and economic and regional development, it can be stated that Supply and Services Canada's, and hence the government's, objectives would be furthered with the development of NINSCS.

Fostering the development of the Canadian software products industry through the implementation of NINSCS will further the government's agenda with respect to science and technology by permitting high technology

companies in all regions of Canada to have earlier access to information on software procurement.

In addition, NINSCS will:

- facilitate and increase technology transfer;
- support innovation and the development of new technology;
- facilitate the strategic partnering trend taking place in the industry to achieve the critical mass necessary for Canada to increase its competitiveness in the world market; and,
- increase awareness, domestically and internationally, of Canadian software products.

NINSCS clearly supports the Communications Canada's thrusts stated earlier, and since the department's objectives are derived from government-wide science and technology policy, it can be stated that Communications Canada's, and hence the government's, objectives would be furthered by the development of NINSCS.

APPENDIX A:

DOCUMENTS REVIEWED

APPENDIX A: DOCUMENTS REVIEWED

The following documents were provided to the consultant and form the basis for the report.

1. Memoranda to Cabinet guidelines.

2. Report on Public Sector Procurement Initiatives, Annual Conference of first Ministers, Toronto, November 26-27, 1987.

3. Appendix "A" to the Analysis to the Western Procurement Initiative MC.

4. Computer Service Industry, Statistics Canada, 1985.

5. National Conference on Technology and Innovation, January 13-15, 1988.

    - Proceedings
    - Technological Change and Innovation in Canada: A Call for Action
    - Educating for Technology and Innovation: A Canadian Report Card
    - The Changed World Economy
    - Canada in the World: The Competitive Challenge

6. CADAPSO Influences of Government on Canada's Information Services Industry, Standing Committee on Government Relations, April 1988.

7. Profile of the Manitoba Software Industry, November 1987, Manitoba Industry, Trade and Technology.

8. Profile of the Canadian Software Products Industry, September 1987, DRIE.

9. A Decision Framework for Science and Technology, March 1987, MOSST

10. Background Paper, March 1987, The National Science and Technology Policy.

11. Communications for the Twenty-First Century, 1987, Communications Canada.

12. Annex to Communications Canada's Memoranda to Cabinet "Building on Strengths".

13. INNOVACTION/The Canadian Strategy for Science and Technology, March 1987.

14. The Challenge of the Information Age: The Canadian Response, a Submission to the House of Commons Standing Committee on Regional Industrial Expansion, April 1988, Information Technology Association of Canada.

15. DRIE Paperwork Reduction Study, April 1988.

16. SSC's Small Business Program.

17. Principles Governing the Use of Procurement in Support of Technology (Draft), April 1988.

18. Information Technology for Users: Exploring Procurement as a Policy Instrument Plus Drafts of Network Proposal.

19. The Government of Canada's Support for Technology Development 1987, A Summary of Federal Programs and Incentives, MOSST.

20. Memorandum to Cabinet, Atlantic Canada Supplier Development Program, April 1988.

21. The Government of Canada's Support for Technology Development 1987.

22. An Information Network for Software and Computer Services - Concept Paper, May 1988.

23. Strategic Technologies Committee - Corporate Information Sharing Activities.

24. Initiatives in Support of the Canadian Software Industry - OASIS, April 1988.

25. Government Initiatives in Science and Technology and Procurement.

26. Final Report on Supplier Development - ITAC, February 1988.

27. Annual Procurement Plan - Strategy 1984-85 - SSC.

APPENDIX B:

THE CANADIAN MARKETPLACE

TABLE 1

THE CANADIAN SOFTWARE AND SERVICES MARKETPLACE

MARKET SIZE

The Canadian software and service marketplace grew 12 per cent in 1986 with revenues increasing to $1,789 million in 1986 from $1,597 million in 1985

While 12 per cent for most businesses is considered to be a healthy growth rate, it is substantially less than the software and services industry has become accustomed to over the last ten years.

THE CANADIAN SOFTWARE AND SERVICES MARKETPLACE

1985-1991
(C$M)

	1985	1986	1987	1988	1989	1990	1991
PACKAGED SOFTWARE	530	621	722	830	943	1,058	1,168
Percent Change		17	16	15	14	12	10
PROCESSING SERVICES	620	666	712	761	804	841	871
Percent Change		7	7	7	6	5	4
PROFESSIONAL SERVICES	447	502	560	617	675	731	786
Percent Change		12	12	10	9	8	8
TOTAL SERVICES	1,597	1,789	1,994	2,208	2,422	2,630	2,825
		12	11.5	10.7	9.7	8.6	7.4

SOURCE: International Data Corporation (Canada) Ltd.

There are several causes for this slowdown. The first is a general uncertainty about the Canadian economy. Economic growth has been slow in 1986 (approximately 2.5 per cent real increase in the GDP).

INTERNATIONAL DATA CORPORATION CANADA
December 1986

TABLE 2

THE CANADIAN PACKAGED SOFTWARE MARKETPLACE

MARKET SIZE

Packaged software will continue to be the strongest growth area in the Canadian software and services industry. It consists of systems/utilities software, applications tools and applications solutions. Exhibit shows that these segments generated $530 million in 1985 and $621 million in 1986, an increase of 17 per cent.

THE CANADIAN SOFTWARE AND SERVICES MARKETPLACE

THE CANADIAN PACKAGED SOFTWARE MARKET
(C$M)

	1985	1986	1987	1988	1989	1990	1991
Systems/Utilities	237	275	316	358	402	445	485
Percent Change		16	15	13	12	11	9
Applications Tools	166	197	232	270	310	352	394
Percent Change		19	18	16	15	14	12
Applications Sol'ns	128	149	174	202	231	261	289
Percent Change		17	17	16	14	13	11
TOTAL MARKET	530	621	722	830	943	1,058	1,168
		17	16	15	14	12	10

SOURCE: International Data Corporation (Canada) Ltd.

One main reason for continued growth in this area is the ongoing development and specialization of packaged software for vertical markets which will allow an increased number of users to use "off the shelf" products as opposed to designing their own system. The importance of vertical markets still cannot be overlooked. The respondents to IDC Canada's software and services survey listed manufacturing, distribution and the financial markets as the three most common vertical markets at which they are currently targeting their packaged software.

Table 3

Estimated Per cent of Software Revenues Generated by Vendor Type in 1987

Vendor Type	1981	1982	1983	1984	1985	1986	1987	1988	1989
Hardware Vendor (%)	54	53	51	48	47	45	44	41	39
Software Designer and Developer (%)	26	28	28	30	30	30	32	34	35
Service Bureau (%)	8	8	9	10	10	11	11	12	13
Consultant (%)	6	6	7	8	9	10	10	10	10
Other (%)	6	5	5	4	4	4	3	3	3
TOTAL (%)	100	100	100	100	100	100	100	100	100
TOTAL $ Millions	464	606	775	970	1215	1495	1845	2275	2720

Source: Evans Research Corporation

TABLE 4

CANADA'S COMPUTER INDUSTRY TO TOP $12.2 BILLION BY 1990

Exhibit 1: 1985 Canadian Information Processing Industry Review & Forecast Industry Forecast to 1990

	1983	1984	1985	1986	1987	1988	1989	1990
HARDWARE								
Sales, Lease, Rental	3,756	4,282	4,404	4,685	5,029	5,469	5,847	6,195
Percent Change		14	3	6	7	9	7	6
SERVICES								
Hardware Maintenance	825	914	941	988	1,048	1,132	1,211	1,283
Percent Change		11	3	5	6	8	7	6
PACKAGED SOFTWARE								
Systems/Utilities	203	264	330	419	528	660	818	998
Percent Change		30	25	27	26	25	24	22
Applications Tools	125	172	231	311	420	563	749	975
Percent Change		38	34	35	35	34	33	30
Applications Solutions	103	138	178	233	305	396	511	651
Percent Change		34	29	31	31	30	29	27
Total Packaged Software	431	574	739	963	1,253	1,619	2,078	2,624
Percent Change		33	29	30	30	29	28	26
PROCESSING SERVICES								
Batch	166	174	181	189	196	202	208	213
Percent Change		5	4	4	4	3	3	2
Remote Problem Solving	89	93	96	99	102	105	108	110
Percent Change		4	3	3	3	3	3	2
Remote Automated Transaction	413	467	523	585	650	715	779	845
Percent Change		13	12	12	11	10	9	8
Total Processing Services	668	734	800	873	948	1,022	1,095	1,168
Percent Change		10	9	9	9	8	7	7
PROFESSIONAL SERVICES								
Contract Programming	182	219	258	299	344	393	440	485
Percent Change		20	18	16	15	14	12	10
Facilities Management	23	28	32	36	42	47	53	59
Percent Change		18	15	15	14	14	13	11
DP Consulting	67	80	95	113	134	157	182	206
Percent Change		19	19	19	18	17	16	13
Total Professional Services	272	327	385	448	520	597	675	750
Percent Change		20	18	17	16	15	13	11
TOTAL SERVICES	2,196	2,549	2,865	3,272	3,769	4,370	5,058	5,825
Percent Change		16	12	14	15	16	16	15
TOTAL HARDWARE/SERVICES REVENUES	5,952	6,831	7,269	7,957	8,798	9,839	10,905	12,020
Percent Change		15	6	9	11	12	11	10

Source: International Data Corporation (Canada) Ltd.: Datasystems Aug./86, p.p. 38-39.

TABLE 5

Companies Involved In Canadian Software Market
(Includes only Companies whose major product is packaged software)
Establishments By Region

Province	1984 Estimate	% of Total	1985 Estimate	% of Total	1986 Estimate	% of Total
Atlantic	34	3.3	36	3.4	39	3.5
Quebec	188	18.3	196	18.3	205	18.4
Ontario	469	45.8	488	45.6	507	45.4
Saskatchewan	25	2.4	27	2.5	28	2.5
Alberta	149	14.5	156	14.6	162	14.5
Manitoba	27	2.6	28	2.6	30	2.7
British Columbia	133	13	140	13.1	146	13.1
TOTAL	1,025	99.9	1,071	100.1	1,117	100.1
Canadian %	90		90		91	

Source: Statistics Canada and Evans Research Corporation estimates.

TABLE 6

Software Products
Producers By Province
(Includes Hardware, Processing Services, etc.)

Province	Total Computer Services 1984		Total Computer Services 1985		Total Computer Services 1986	
	# Companies	% of Total	# Companies	% of Total	# Companies	
Atlantic	65	3.0	69	3.0	73	3.0
Quebec	402	18.7	414	18.2	433	17.9
Ontario	1,012	47.0	1,072	47.2	1,147	47.3
Saskatchewan	50	2.3	53	2.3	57	2.4
Alberta	303	14.1	327	14.4	360	14.8
Manitoba	50	2.3	54	2.4	58	2.4
British Columbia	269	12.5	280	12.3	297	12.2
TOTAL	2,151	99.9	2,269	99.8	2,425	100.0
% Canadian owned	88%		88%		89%	

Source: Statistics Canada and Evans Research Corportion estimates, January 16, 1987.

TABLE 7

Software Products Employment By Region
(Number of Employees Directly Involved In Software Development

Province	Software Producers	Hardware Vendors	Total
Atlantic	132	14	146
Quebec	1,005	177	1,182
Ontario	2,467	791	3,258
Saskatchewan	197	27	224
Alberta	466	70	536
Manitoba	177	24	201
British Columbia	489	54	543
TOTAL	4,933	1,157	6,090

Source: Statistics Canada and Evans Research Corporation estimates.

TABLE 8

Packaged Software Expenditures By Region
(MSC)

Province	1984 Expend.	% of Total	1985 Expend.	% of Total	1986 Expend.	% of Total
Atlantic	12.6	1.80	17.5	1.85	23.9	1.95
Quebec	135.1	19.30	182.4	19.35	237.8	19.40
Ontario	403.2	57.60	544.3	57.10	695.1	56.70
Saskatchewan	16.1	2.30	21.7	2.40	31.9	2.60
Alberta	53.2	7.60	71.8	7.80	96.9	7.90
Manitoba	16.8	2.40	22.7	2.50	31.3	2.55
British Columbia	63.0	9.00	85.1	9.00	109.1	8.90
TOTAL	700.0	100.0	945.5	100.0	1,226.0	91.10

Goss, Gilroy & Associates Ltd., Ottawa, Canada (613) 230-5577