PROFILE OF THE CANADIAN

SOFTWARE PRODUCTS INDUSTRY

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September 1987

INTRODUCTION

This Profile of the Canadian Software Products Industry is a working paper issued on behalf of the National Software Working Committee by the Department of Regional Industrial Expansion. The Committee was established by the Minister of Regional Industrial Expansion, the Honourable Michel Côté and includes members of industry and federal and provincial governments. The document is being published for discussion with a view to establishing a national strategy for the software products industry.

Comments on this profile should be addressed to members of the National Software Working Committee.

EXECUTIVE SUMMARY

This industry profile has been prepared under the guidance of the National Software Working Committee established by the Minister of Regional Industrial Expansion, to identify the issues affecting the Canadian Software Products Industry. Information about the National Software Working Committee and the methodology adopted is provided in the appendices to this report. It is intended that this profile will establish a basis for the development of a national software strategy which will include policies and programs to foster development of the industry.

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

- The formation of the National Software Working Committee
- The establishment of the new Information Technologies Industry Branch and a division dedicated to the software industry
- The Canadian Strategy for Science and Technology
- The announcement of the Microelectronics & Systems Integration Program

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 defense systems.

Canadian academic and industrial software developers are recognized the world over for producing leading edge software products that are both extremely innovative and of a very high quality. These include operating systems, language compilers, fourth generation languages, and fifth generation artificial intelligence and applications development tools, and numerous business applications and office automation systems.

Many of Canada's premier technology products such as the Canadarm, communications satellites and digital switching systems, transportation control systems and simulators and our application of advanced steel making and manufacturing technologies would be impossible without the leading edge software technology developed by Canadian companies.

However despite these strengths, the industry has been slow to develop and is not meeting its full potential for employment, technology development, import replacement or export sales.

In order to remain internationally competitive and reduce our massive high-tech deficit, Canada must develop and maintain a dynamic, healthy and innovative software industry.

Without an internationally competitive software industry, our natural resource, manufacturing and service industries will not remain competitive through the 1990's and beyond.

Canada has the potential to be a world leader in the development, marketing and support of advanced software products. This can be achieved with modest resources compared to the billions of dollars required to develop and maintain competitive manufacturing and natural resource based industries.

It is recommended that a national strategy for the development of the Canadian software industry is required to address the following issues:

- developing an effective infrastructure;
- attracting financial support;
- international competition;
- support from government;
- research and development;
- marketing;
- market intelligence;
- commercial expertise; and
- barriers to trade.

It is further recommended that this initiative should be sponsored by both the industry and government and should encourage the participation of all interested parties, eg. commercial lending institutions, investors, users, foreign trade associations etc.

It is believed that failure to develop and support a national strategy for the software industry will affect the international competitiveness of the Canadian economy and significantly reduce the effectiveness of the National Microelectronics Strategy.

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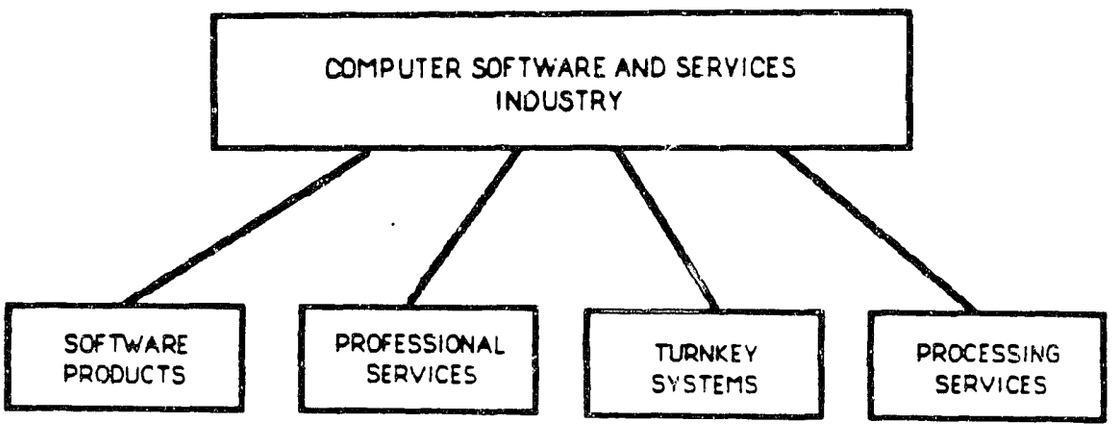
1.0 THE CANADIAN COMPUTER SOFTWARE PRODUCTS INDUSTRY

1.1 Overview

The Software Products industry is one of four principal components which together comprise the Computer Software and Services Industry, as illustrated below:

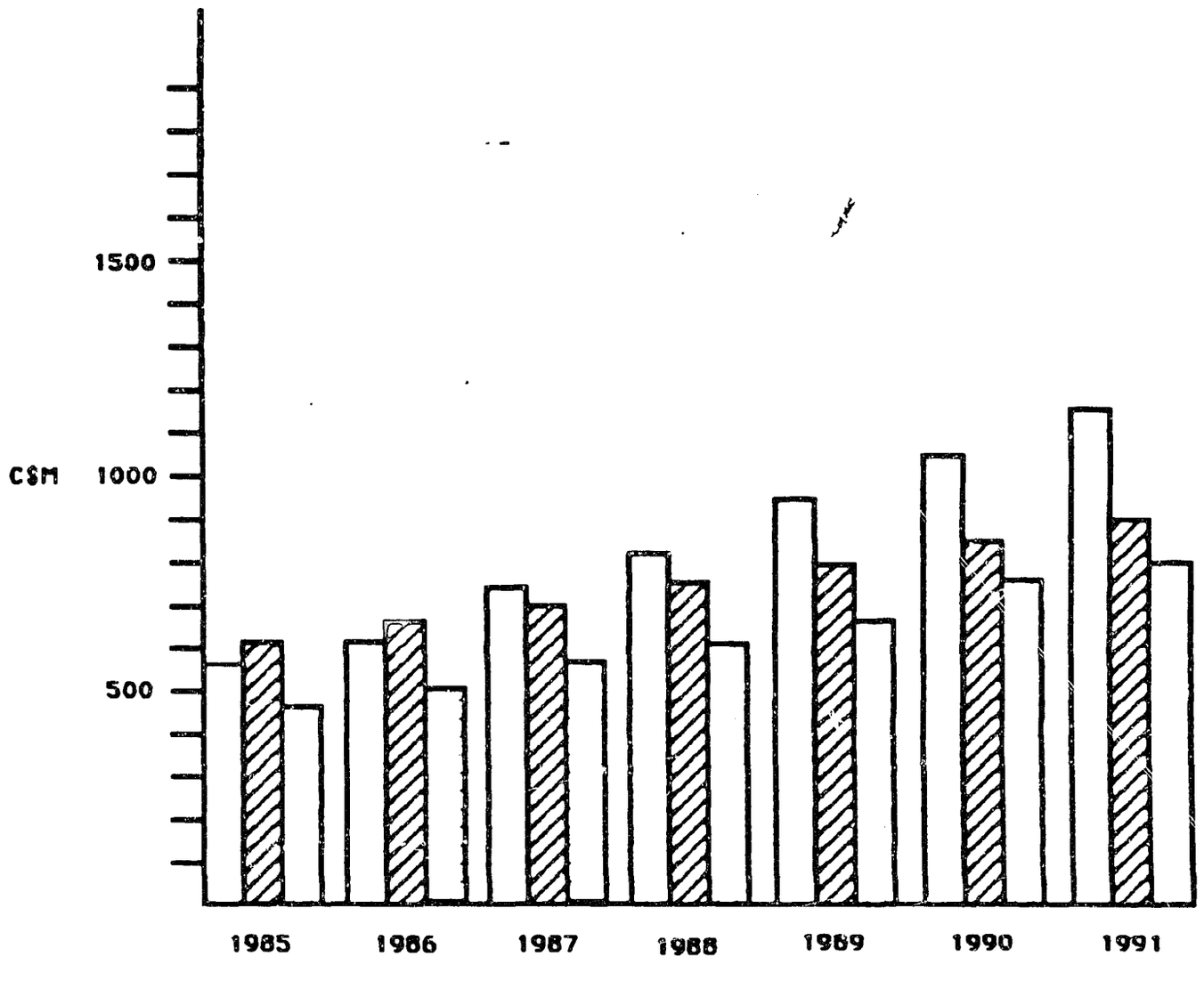


In the past Processing Services have dominated the industry in terms of business volumes. However, the last five years or so have indicated a change in this trend as Professional Services and especially Software Development have begun to emerge as the leading forces in the Computer Software and Services Industry. At present the Software Products sector of the industry is the largest and most rapidly advancing segment of the CSSI.

This profile will concentrate on the Software Products Sector which represents a tremendous growth opportunity for Canadian companies.

The software products sector is concerned with the delivery of packaged software which includes application packages, user tools and systems software packages. The development of Custom Software is considered a professional service and is covered in the Professional Services Profile.

Figure 1 illustrates the projected market share distribution for three of the computer software and services sub-sectors from 1985 to 1991. Note that figures are not available for turnkey systems and it is not possible to determine what proportion of software used in turnkey systems is also included in the software figures in Table 1.



SOFTWARE PRODUCERS

PROCESSING SERVICE FIRMS

PROFESSIONAL SERVICE FIRMS

PROJECTED MARKETSHARE DISTRIBUTION

SOURCE: INTERNATIONAL DATA CORPORATION CANADA

1.2 Software Products

The software products industry is a component of the Standard Industrial Code (SIC) 772*, Computer and Related 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. This is in contrast to custom software which is designed for one specific user who generally purchases complete rights to the finished product.

In the classification structure developed for DRIE, software products are classified in three categories: systems programs; user tools; and application solutions. These categories are briefly described below:

> **Systems Programs** - manage the resources of a computer (eg. operation systems); manage data resources (eg. operating systems); and provide machine level program development environments (eg. second and third generation language compilers such as assembler, Basic, Fortran, and Cobol).

User Tools - are software products designed for use specifically by people who are not data processing professionals. The definition of products included in this subcomponent of the industry is constantly changing, due to the rapid technological advancements within the industry. Notwithstanding, the major types of user tools currently in use include office automation products such as word processors, spread sheets, and desktop publishing systems, etc.

Application Solutions - address specific business problems and are generally divided into two categories:

(a) Industry-specific (vertical) applications software which refers to programs written for a unique industry application, (eg. inventory control, legal billing, airline scheduling, factory automation etc.); and

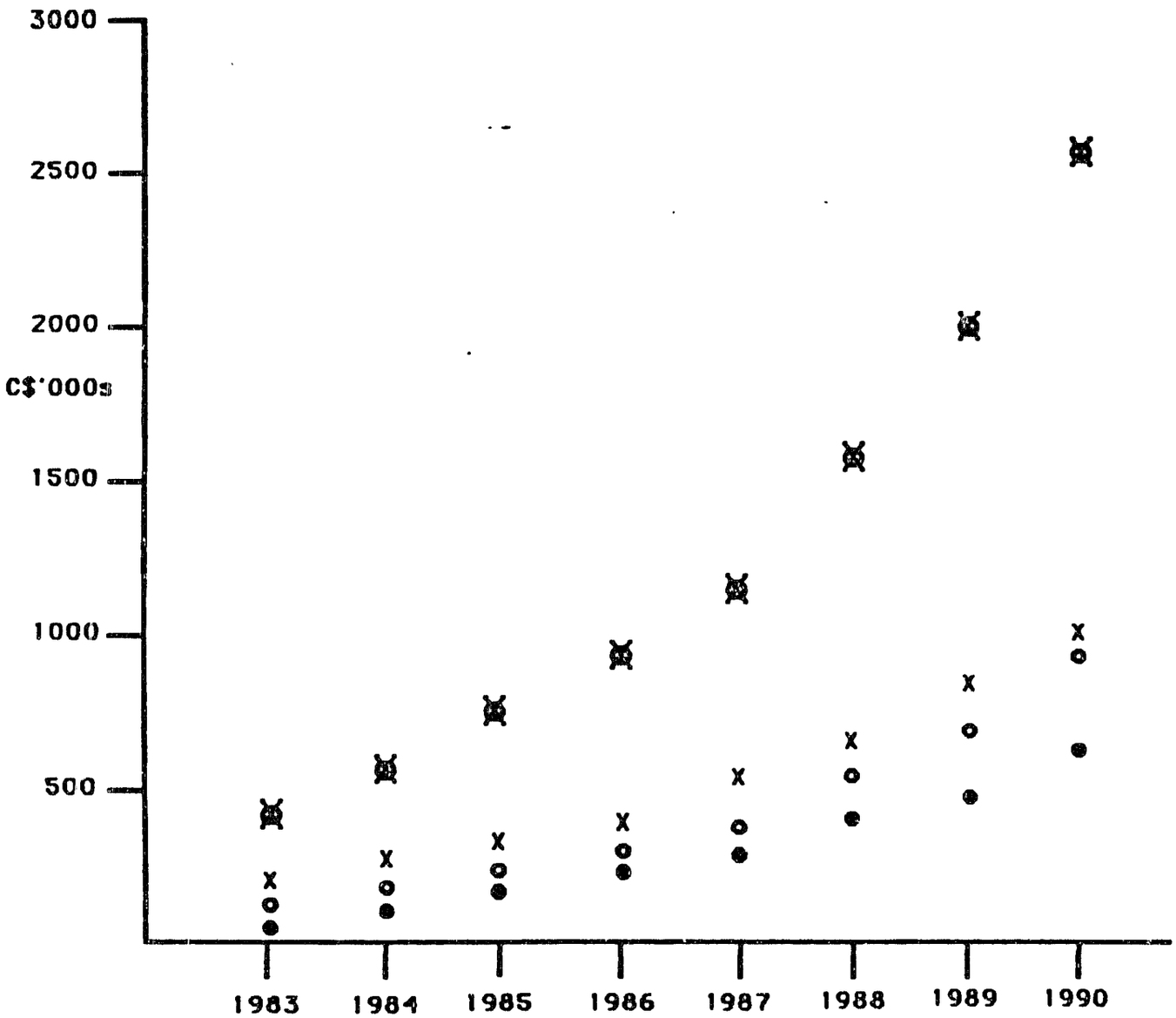
(b) Cross-industry (horizontal) applications which are general purpose programs targetted to a wide variety of users (eg. payroll, general accounting, personnel, etc.)

The following chart illustrates this classification of software products.

SOFTWARE PRODUCTS		
SYSTEMS PROGRAMS	**USER TOOLS**	**APPLICATIONS**
E.G. PERFORMANCE MEASUREMENT OPERATING SYSTEMS SECURITY SYSTEMS DIAGNOSTICS INPUT/OUTPUT HANDLERS ASSEMBLERS COMPILERS EDITORS SIMULATORS INTERPRETORS UTILITIES DATA MANAGEMENT INFORMATION SEARCH REPORT GENERATION	E.G. DBMS DATA DICTIONARY 4GL SPREADSHEETS CODE GENERATORS SCREEN FORMATTERS AI/EXPERT SYSTEM SHELLS	E.G. ACCOUNTING BILLING CAM CIM PAYROLL PERSONNEL ROBOTICS SCHEDULING CAD ECONOMETRIC MODELLING MATHEMATICS NUMERICAL CONTROL PROCESS CONTROL SIMULATION STATISTICAL ANALYSIS TEXT PROCESSING RECORDS MANAGEMENT

The following graph illustrates the growth trends in each of these categories compared to each other and to the total software products market.

GROWTH TRENDS BY SOFTWARE CATEGORY



X = SYSTEMS SOFTWARE

o = USER TOOLS

● = APPLICATIONS

⊠ = TOTAL PACKAGED SOFTWARE

SOURCE: INTERNATIONAL DATA CORPORATION CANADA

1.3 Characteristics of The Canadian Software Products Industry

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

- The establishment 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 by the Honorable Michel Côté, The Minister of Regional and Industrial Expansion in mid 1986.

- The Canadian Strategy for Science and Technology announced March 24, 1987 by the Honorable Michel Côté and the Honorable Frank Oberle, Minister of Science and Technology.

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 defense systems.

Canadian academic and industrial software developers are recognized the world over for producing leading edge software products that are both extremely innovative and of a very high quality. These include operating systems, language compilers, fourth generation languages, and fifth generation artificial

intelligence and applications development tools, as well as numerous business applications and office automation systems.

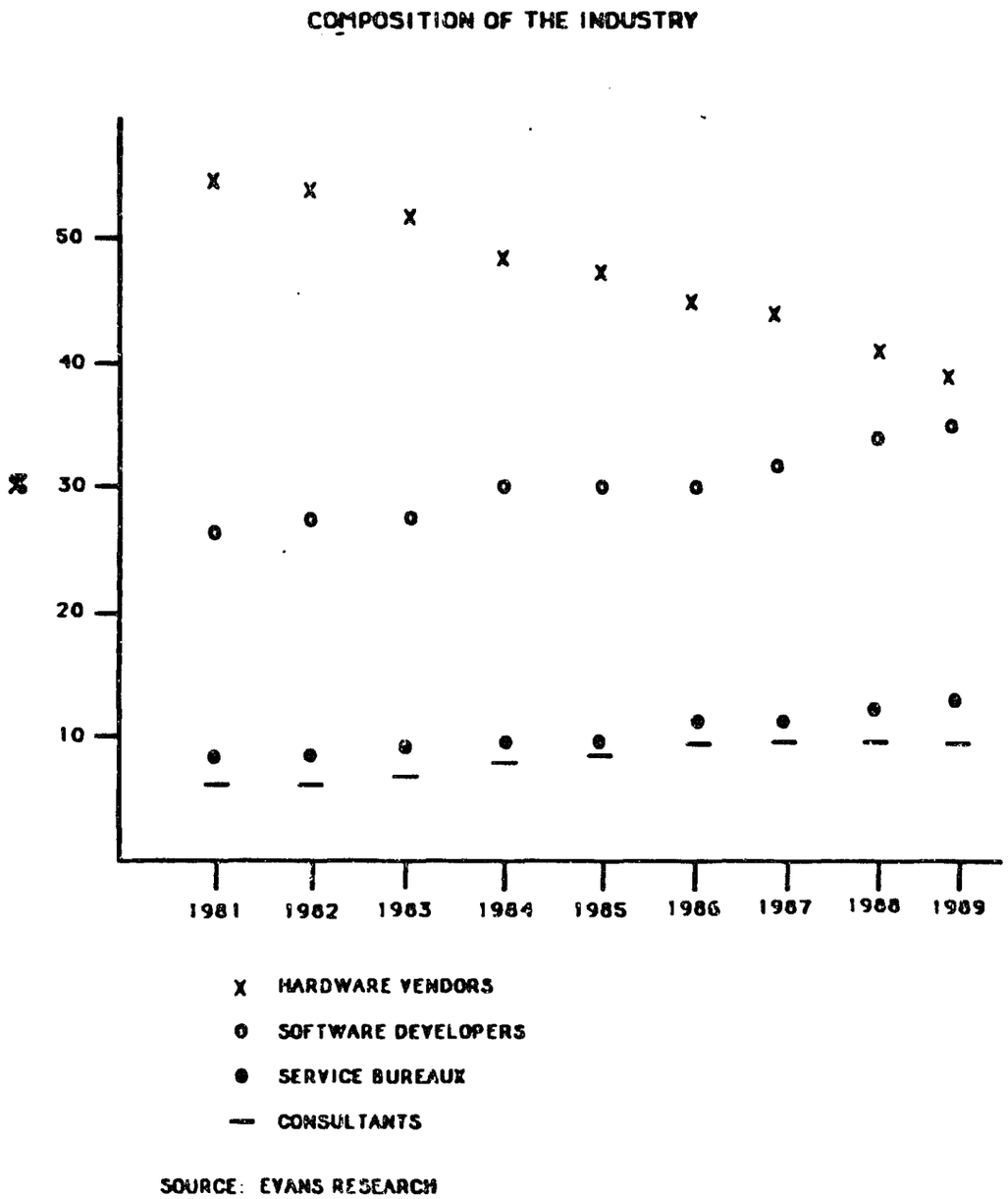
Many of Canada's premier technology products such as the Canadarm, our communications satellites and digital switching systems, transportation control systems and simulators and our application of advanced steel making and manufacturing technologies would be impossible without the leading edge software technology developed by Canadian companies.

This section presents various statistics to illustrate the characteristic features of the industry. It should be noted that statistics for this industry have been somewhat erratic in the past due to inconsistent definitions of the industry and its components. Absolute statistics about the industry should, therefore, be treated with caution when used in isolation, although they may be reliable indicators of industry trends.

When computers were introduced, software was generally developed by the hardware vendors for use on the machines they supplied. The software was usually very costly to produce and buy and the installed base was very limited. There was, therefore, little opportunity for the independent software developer unless he undertook software development specifically for a hardware vendor.

The introduction of mini and micro-computers led to a much larger and diversified installed base of computer equipment and, as a consequence, the demand for software has grown to a level where significant opportunities exist for the independent software developer. The following graph illustrates this trend towards a decreasing hardware vendor market share in favour of other sources of software products.

(i) Composition of The Industry



(Refer to Appendix E, Table 3 for statistics).

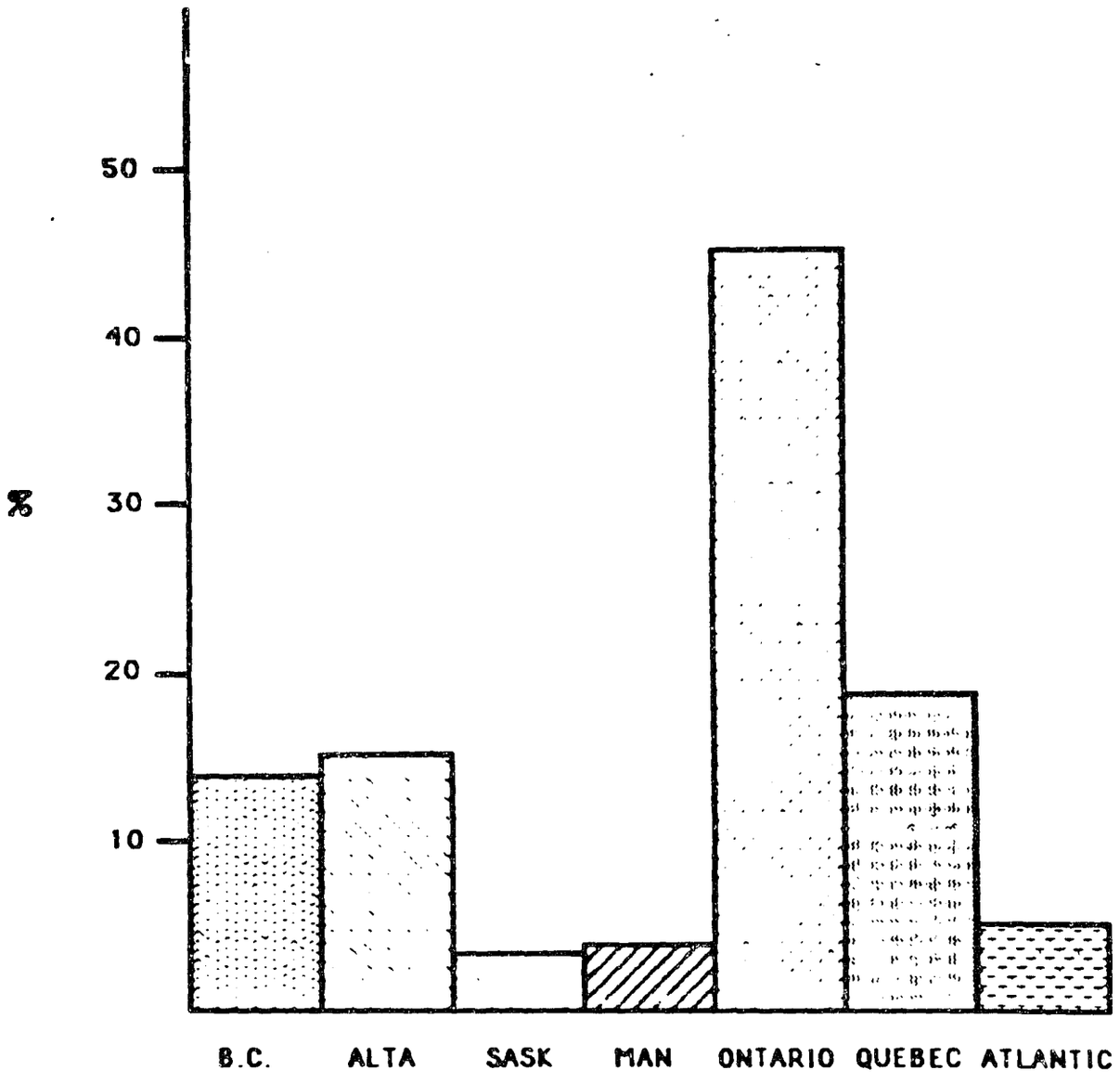
Other industry statistics indicate that:

- 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 turnover of Canadian software producers is less than $200,000 per year; and
- the average Canadian software developer employs less than five people.

(ii) Regionality

According to Evans Research, there are approximately 1100 Canadian companies whose primary business activity is software products development. Of these, approximately 45% are resident in Ontario. The regional distribution by number is illustrated on the following page.

DISTRIBUTION OF SOFTWARE COMPANIES BY PROVINCE



SOURCE: STATISTICS CANADA/EVANS RESEARCH

(iii) Relation of Software Products with Other Industry Sectors

Software has become a ubiquitous product in the Canadian economy. Software has an impact on practically all industrial and social sectors in Canada as well as the private lives of many individuals. There is no doubt that the continuing competitiveness of all western economies is dependent upon the efficiencies generated by the use of computers and that the continued growth of the software industry relies on an evolving and expanding demand from the enterprises it serves.

2.0 EVOLUTION OF THE MARKET

2.1 Historical Trends

In the past ten years the software products industry has seen phenomenal annual growth rates, at times approaching 40% per annum. However, this exceptional growth dropped dramatically in 1984.

The slowdown of this sector was influenced primarily by an overall retrenching in the computer industry. The number of mini and mainframe computers bought as information centre systems in 1985 declined from 1984 levels. Each such system typically had $200,000 to $400,000 of software from independent companies associated with it. Consequently the decline in computer system sales had an immediate and proportional effect on software sales.

In the microcomputer area, this resulted in extensive discounting represented by the "bundling" of products, straight discounts and the emergence of less expensive compatible products.

There was also heavy discounting in the mainframe/minicomputer software market. This was not the result of strategic policies but rather these were real price cuts offered in the field in order to make sales. Many sales managers confronted by a slowing industry frantically pushed sales people to "make deals". Unfortunately, this resulted in unnecessarily lower revenues and profits because price was rarely the issue that was slowing the process down or which could influence the decision.

Some industry observers have attributed the slowdown in the software products market to the problems vendors continue to experience with meeting design criteria and delivery schedules, not to mention the difficulty developers face in keeping up with the fast-paced evolution of the changes in technology. Further compounding this problem is the lack of awareness of international standards in the development of software products.

One view has also been expressed that the quantity of new products released in 1985 had a slowing effect by saturating the market's ability to absorb new developments.

Despite these factors, it is predicted (by International Data Corporation (Canada) Ltd.) that the growth of this sector will recover for the remainder of this decade and stabilize at levels of 10-20% growth per annum.

2.2 Current Market Situation

The following factors are considered to illustrate the current situation in the software products industry:

(i) Poor Record of Success

Despite the technical strengths that Canadian software developers are believed to have, 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 shakeout 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. spread sheet, data base 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

Canadian software firms have historically looked to the international marketplace in an effort to generate viable sales revenues. The penetration of products from the U.S.A. in Canada has made it extremely difficult for Canadian software developers to capture a significant share of the small 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.A. Canadian companies are, therefore, expanding their marketing initiatives beyond the U.S.A. market and are seeking new markets on an international basis. This trend will likely precipitate an increase in strategic partnering, joint ventures and international licensing arrangements.

2.3 Future Outlook for the Industry

The Canadian market for software should continue to show high growth rates through to the 1990s given current projections for the economy as a whole. The fastest growing market will be for user tools followed by application solutions. It is expected that systems packages will show a declining growth rate. This is illustrated by Table 2, Appendix E.

INPUT, a publication of the U.S. Association of Data Processing Services Organizations, predicts that in the 1990s the development process will tend to become the assembly of software and systems from pre-established modules using very high-level "languages" or integrating software.

There will be continued strong growth in the micro 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 facing the software industry is the rapidly expanding world market for software products and services which is estimated to reach almost $90B by 1990. Canadian firms currently have an opportunity to take advantage of this growing market due to the world class software expertise and innovative

products the industry is recognized for in both horizontal and vertical markets. Products should be developed to conform to international standards to maximize their export potential.

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.

3.0 GOVERNMENT POLICY AND PROGRAMS

As with many services sectors, the software subsector has proved to be a challenge for federal and provincial policy makers to fit sector needs within nominal program guidelines.

There is currently a number of federal and provincial programs and policies which impact in some way on the Canadian software industry. An inventory of these programs is maintained by the Federal Business Development Bank on a database accessible through any of their regional offices. However, these measures were not developed with the software industry as their explicit target and their usefulness to the industry is questionable.

The assistance that government does provide includes:

(a) Market Research

The Federal Business Development Bank (FBDB) provides access to well qualified professional resources at reasonable rates. Market intelligence collected by government is, however, too general in nature to be relevant to the specific business needs of software producing companies.

(b) Research and Development Incentives

Canadian government R&D funding for software has been intermittent and unfocused, resulting in large amounts of money being spent on basic research programs, while applied research and product development have been starved for funding.

Potential sources of funding for software R&D are split between five federal government departments none of which has a clear mandate to fund software through a complete cycle to finished product status. There is no funding for the development of commercial software that is not "Innovative" or in some way connected to the transfer of technology from government and university research labs.

In the past, tax based R&D incentive programs have been nightmares for many legitimate software developers due primarily to the delay in defining what is software research and development. Despite Revenue Canada's efforts to define eligible software R&D, serious interpretation problems are still being encountered by many of the companies that are having their projects reviewed by academic scientific advisors. This situation ignores the commercial reality of the software industry.

(c) Government Procurement

The Supply and Services Canada Annual Procurement Plan and Strategy (APPS) now represents a systematic, planned attempt to use the department's purchasing power to benefit domestic industries. This will include the Canadian software industry. 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. In the past only hardware suppliers, many of which were foreign owned, usually received such 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 developed by/for the government;

- encouraging government departments to purchase Canadian software;

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

In addition, SSC has launched a series of annual industry briefings and procurement conferences. The conferences, held in the first quarter of the fiscal year, will provide industry with a forecast of the government's purchasing requirements, thereby giving firms sufficient lead time to plan development, production and marketing strategies.

4.0 ISSUES AFFECTING THE CANADIAN SOFTWARE PRODUCTS INDUSTRY

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

4.1 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:

- member 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;
- marketing efforts in Canada and abroad are not coordinated.

4.2 Finance

Many participants in the Canadian software industry identify the difficulty of obtaining adequate financial support as their principal problem. This money is required in large quantities to support research and development and marketing efforts.

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

A very low proportion (less than 20%) of Canadian venture capital is directed to the high-tech industry as a whole and to the software industry specifically. Of this a very small amount (again less than 20%) goes to startup high-tech companies. The amount of venture capital actually invested in startup software companies could be as low as $20 million a year. This is hardly enough money to finance the startup costs for two or three serious software products; let alone to meet the needs of the industry.

The total pot of venture capital in Canada is very small, especially considering the massive amount of venture capital investment that is absorbed by the resource based industries. However, due to the extremely conservative lending practises of Canadian banks a high proportion of business financing needs have to be directed to the venture capital market. It appears that many potential investors are impressed with the potential of Canadian software products, but are very skeptical about the management and marketing skills demonstrated by the industry.

Consequently a high proportion of the available Canadian venture capital funds goes into relatively less risky businesses than would be the case, say, in the U.S.

4.3 Competition from Abroad

The opinion has been expressed that Canadian software developers have a disadvantage over some of their foreign competitors, particularly from the United States. This is because it is believed that some U.S. products have been developed under government contract, with the vendor only having to finance the commercialization of the finished product.

To the extent that this is occurring it obviously puts Canadian firms who have to service expensive venture capital to finance the entire product development cycle at a significant financial disadvantage. This is then reflected in the prices that have to be charged to recover development costs with the result that competitive bids in which price is a significant factor will favour the foreign product.

4.4 Government Support

It appears that some level of government support is necessary to ensure the continued development of the industry. As noted earlier, no specific programs exist to assist software development alone. However, companies have received support from both federal and provincial governments, particularly IRDP and PEMD. One concern expressed by the industry is that government support programs tend to focus or product development and basic research to the detriment of applied development. There is also a feeling that marketing support under PEMD does not provide the sort of comprehensive assistance which is required by companies which tend to have weak marketing organizations. The recent announcements by DRIE of the Microelectronics and Systems Integration Program indicates a change in emphasis in federal government support programs, moving towards support which is specifically targeted to the needs of a particular subsector.

A potentially powerful and largely unexploited source of government support is government procurement policy. 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 developing more specialized packages.

4.5 Research and Development

Historically, total R&D expenditures in Canada have been low compared to this country's major competitors. To illustrate, in 1984 the ratio of gross expenditures on R&D (G.E.R.D.) to gross domestic product was established to be 1.2 per cent for Canada whereas the German, American and Japanese values were 2.8, 2.7 and 2.6 per cent respectively. Unfortunately, a comparative analysis of the Canadian software industry's R&D effort vis-a-vis its competitors is not possible as industry-specific measures of R&D expenditures are not available. However, it could be argued that the generally low level of R&D being conducted throughout the Canadian economy will impact in an indirect manner on the level of innovation in the software sector.

Basic Research Programs

Most of the basic research that is done in software field in Canada is undertaken at Canadian universities.

Due to a lack of time and resources, much of the work that is being done is piecemeal and is undertaken over extended periods of time. This is both ineffective and wasteful, when the requirements for state of the art software are changing very quickly due to increasingly shorter hardware development cycles.

Additionally, we are losing some of our best software researchers to the U.S. because of the limited resources at many Canadian universities.

The shortage of senior software researchers is compounded by the fact that, compared to American universities, we have a very low number of masters level graduate students working full time on research. In the U.S., a large body of master level students and graduates provides the staff to undertake larger and more complex design and programming tasks involved with making major advances in software technology. In Canada, masters graduates leave university for lucrative jobs in private industry because the demand outstrips the supply for software engineers.

Applied Research and Product Development Programs

Most applied research and product development in software is undertaken by industry. Major software applied research projects require at least twenty and sometimes hundreds of specialists to make significant advances in the commercial state of the art. Few Canadian software companies have the critical mass of research staff or the resources to successfully undertake significant applied research programs.

A major factor in this respect is the severe shortage of qualified and experienced software engineers. These are the people who write systems level programs such as operating systems, data bases, applications generators, compilers and communications software. The number of software engineers graduating from Canadian universities is well below 1,000 a year, a level which is considered inadequate.

There is an even more serious shortage of experienced R&D managers. This shortage includes senior product and interface designers, senior software architects to actually design complex system level, R&D project managers, and R&D project administrators. To fill these roles, the industry needs people with a number of years of on the job training, beyond a masters or honours level degree before they can effectively manage complex applied research projects. Without such personnel the industry cannot meet its potential for growth.

4.6 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, the software industry does a very poor job of marketing itself and its 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.

Less than 5% of the world market and less than 10% of the English speaking market for software are in Canada. The bulk of Canadian software developers do not have the resources to address these markets. There is virtually no Canadian software publishing industry and there are no major Canadian players in the international software distribution business. Until Canadian software publishers and distribution channels are developed Canadian software developers will be denied access to the vast markets of the world. Without access to these markets, the Canadian software industry will never develop to its full potential.

4.7 Market Intelligence

Market 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, marketing 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. A lack of market intelligence makes it difficult to spot unique projects with a great potential for commercial success or to avoid markets that are already saturated. This situation clearly contributes to the reluctance of government and private agencies to invest heavily in the industry.

A lack of competitive information also contributes significantly to the wasting of scarce technical and financial resources on the development of redundant products and research programs.

One factor in the absence of adequate market intelligence is the lack of consistent definitions of terminology. The same terms are defined differently by different suppliers of market information and by organizations such as Statistics Canada.

(This problem has been addressed by DRIE which has commissioned and refined a classification structure for the computer software and services industry although some work still remains in this area. This structure has been adopted by Statistics Canada for its 1987 survey questionnaire as well as by Evans Research for the same year. It is also fairly close to the classification being used by International Data Corporation and INPUT.)

The problem in this area is further compounded by the lack of effort that has so far been devoted to gathering intelligence on vertical markets. Some vendors of market information have selected certain vertical markets to address but it is not cost effective for any market research firm to deal with all such markets. Small to medium-sized firms therefore have difficulty in obtaining affordable market intelligence regarding their specific market niches.

4.8 Human Resources

The Canadian software industry has tended to be driven by technical developments. However, to develop an industry to exploit technical advances, suitably qualified and experienced marketing and management staff are required.

The software industry has suffered a noticeable shortage of high quality commercially-oriented personnel. This is particularly true in the case of the smaller companies who experience great difficulty in attracting and keeping qualified people in the face of competition from the large multi-national corporations.

4.9 Barriers to Trade

The use of tariffs to impose duty on software crossing barriers does not constitute a barrier to trade since duty is only assessable on the value of the medium eg. the disk, as opposed to its content. However, two other practises are considered to constitute barriers.

The first concern is with respect to the employment and immigration restrictions which can diminish a producer's ability to sell and support Canadian products in foreign jurisdictions.

The second concern is the implementation by several countries of a withholding tax on royalties due to developers in a foreign country.

5.0 RECOMMENDATIONS

The following recommendations address the issues that were discussed in the previous section. It appears that the initiative to adopt or implement any of these recommendations will have to come from government, since the industry has not demonstrated any ability to significantly address these issues on its own.

5.1 Infrastructure

It is necessary to create a focal point for industry matters which is recognized both by all participants in the industry and by all levels of government. This will provide a network within the industry at home and abroad, a channel for communicating with regulators and users, and a marketing mechanism.

Government may have to play a role by encouraging the adoption and development of a single organization to represent the software industry.

5.2 Finance

For the industry to appear attractive to potential investors it should take steps to ensure that firms are set up on a business-like basis with rational business plans and adequate resources. It will then be necessary to educate software firms to present credible proposals and to educate financiers to overcome their reluctance to support this unfamiliar business.

Again, some central direction or encouragement from government may be necessary to achieve this.

5.3 Competition from Abroad

It is obviously not possible to influence the support received by foreign software companies. However, Canadian procurement policies could be developed so as to provide Canadian software producers with a compensatory advantage in the domestic market.

Supply & Services Canada (SSC), through OASIS, has shown some interest in helping the development of the industry, and has taken some preliminary steps towards identifying problems with current procurement practises for packaged and custom software.

It is recommended that a joint effort by DRIE, SSC and the industry could establish a new approach to purchasing so as to lever the development and marketing of new and innovative products in a similar manner to the United States. Such an initiative is required to create a level playing field for the Canadian software industry.

5.4 Government Support

It is believed that government support is vital to the nurturing of this industry and that current levels of support are inadequate.

In this regard it is recommended that a National Software Strategy should be developed to coordinate and provide adequate resources for a comprehensive and coherent program of support. The recommendations presented in this study could form a starting point for this strategy.

5.5 Research and Development

Action is necessary to encourage investment in the complete product development process in order to maximize the chance of generating commercially viable software products. Current programs for supporting R&D should be reviewed and updated to ensure that incentives are directed only at feasible projects and that the resources allocated are sufficient to ensure the development of marketable products by firms capable of competing in the international marketplace.

This should encourage the emergence of more commercially viable software developers who will in turn attract better research staff and generate funds for future development activities.

5.6 Marketing

The absence of adequate marketing support should be dealt with at an industry level. This would best be achieved through a mechanism such as an industry organization which could propose appropriate marketing methodologies and establish comprehensive marketing and distribution channels.

5.7 Market Intelligence

Again, the issue of market intelligence should be approached at an industry level, using the combined authority of an industry organization to press government and private agencies to provide the required information.

5.8 Human Resources

A major step is for the industry to recognize the importance of complementing technical expertise with the other skills required for commercial success.

The presence of competent management and marketing functions should be a condition of support from investors and sponsoring government agencies. This would ensure that support is given to organizations most likely to succeed and who, by succeeding, will be able to attract high calibre peronnel.

5.9 Barriers to Trade

The industry should oppose barriers to trade at an industry level through a recognized industry association by a process of consultation and lobbying.

TABLE OF APPENDICES

APPENDIX A

SOFTWARE PRODUCTS PROFILE

METHODOLOGY

The dynamic nature of the canadian computer software and services industry dictated the use of an interactive approach to the preparation of this profile. The National Software Working Committee met at specific and meaningful intervals to provide input and feedback on the report. This generated an ongoing review and intelligence network for the preparation of the profile and a network of individuals across the country with a common understanding and approach to the software products industry.

The advantages to this approach were multi-faceted. First and foremost the final product is more current, tested and sound, but just as important, if not more so:

1) This process has developed awareness and has been an education process for all concerned.

2) There are individuals across the country speaking a common language and operating from the same information base thus narrowing the communication gap normally fostered by a quickly evolving field of knowledge.

3) The input provided to the study at each phase was founded and not reactive because there was a forum for discussion and resolution of issues.

4) There was a wider network for the collection of information as well as a commitment from those individuals providing the information.

5) Participation by industry has resulted in a product which is much more useful for industry in terms of making decisions.

The overall result is a profile that can be used as an instrument of change. The profile provides a basis for the development of a national strategy on software.

APPENDIX B

Composition of Software Working Committee

1) Coordination initially by Service Industries Branch succeeded by Information Technologies Industry Branch, DRIE, Ottawa.

2) Representatives from provincial governments

3) Representatives from DRIE regional offices

4) Industry representatives

This committee met at agreed upon intervals to discuss the profile and there was also ongoing liaison between the project coordinator and the individual members and between the members and their alternates.

Annex I is the list of Committee members and their alternates. Each provincial member has a federal DRIE alternate and correspondingly each federal DRIE member has a provincial government alternate.

Any of the individuals on the Working Committee may be contacted for further information.

ANNEX I

NATIONAL SOFTWARE WORKING COMMITTEE

MEMBERS **ALTERNATES**

COORDINATOR

Mr. David Paterson
Information Technologies Industry Branch
Department of Regional Industrial Expansion
235 Queen Street, 7th Floor East
Ottawa, Ontario
K1A 0H5

Tel.: (613) 954-3294

INDUSTRY

Monsieur Yvon Léveillé
Micro Tempus Inc.
440 ouest, boulevard Dorchester
Bureau 300
Montréal (Québec)
H2Z 1V7

Tel.: (514) 397-9512

Mr. J. Wayne Gudbranson
Marketing Manager, Data General Products
Cognos Incorporated
3755 Riverside Drive
Ottawa, Ontario
K1G 3N3

Tel.: (613) 738-1440 Ext: 5086

Mr. Terry Stanhope
President, Genex Technology Group
Software Development Association of Ontario
224 King Street West
Hamilton, Ontario
L8P 1A9

Tel.: (416) 527-2191

Mr. Peter Jordon
President
Microstar Software Ltd.
34 Colonade Road N., Suite 100
Nepean, Ontario
K2E 7J6

Tel.: (613) 727-5696

MEMBERS	ALTERNATES
ALBERTA	
Mr. James W. Hoffmeyer Director, Computers and Software Technology, Research and Telecommunications Government of Alberta 11th Floor, Pacific Plaza 10909 Jasper Avenue Edmonton, Alberta T5J 3M8 Tel.: (403) 422-0561	Ms Ruth Girard Program Officer Capital & Industrial Goods Department of Regional Industrial Expansion The Corporate Building Suite 505 10179-105th Street Edmonton, Alberta T5J 3S3 Tel.: (403) 420-2944
BRITISH COLUMBIA	
Mr. John Wiebe, Commerce Officer Department of Regional Industrial Expansion Bentall Centre, Tower IV 1055 Dunsmuir Street, Suite 1101 P.O. Box 49178 Vancouver, British Columbia V7X 1K8 Tel.: (604) 661-2228	Mr. Peter MacLean Industrial Development Officer Ministry of Economic Development 315-800 Hornby Street Vancouver, British Columbia V6Z 2C5 Tel.: (604) 660-3900 Facs: (604) 660-3917
MANITOBA	
Mr. Rod Sprange Director InfoTech Industry, Trade & Technology 1970 Ness Avenue Winnipeg, Manitoba R3J 0Y8 Tel.: (204) 896-2212	Ms Christine Wiecek Industrial Officer Department of Regional Industrial Expansion 608 - 330 Portage Box 981 Winnipeg, Manitoba R3C 2V2 Tel.: (204)
NEW BRUNSWICK	
Mr. Mike Urquhart Development Officer Department of Regional Industrial Expansion Assumption Place, P.O. Box 1210 770 Main Street Moncton, New Brunswick E1C 8P9 Tel.: (506) 857-6455	Mr. Otis Phinney Electronics and Software Sector New Brunswick Department of Commerce & Technology P.O. Box 6000 Fredericton, New Brunswick F3B 5H1 Tel: (506) 453 2790

MEMBERS	ALTERNATES
NEWFOUNDLAND	
Mr. Laurence Cashin, Manager Consumer Goods Services and Resource Processing Department of Regional Industrial Expansion Parsons Building, P.O. Box 8950 90 O'Leary Avenue St. John's, Newfoundland A1B 3R9 Tel.: (709) 772-4871	Mr. Doug Moody Director Technical Services Division Department of Development and Tourism Government of Newfoundland & Labrador P.O. Box 4750 St. John's, Newfoundland A1C 5I7 Tel: (709) 576-5061
NOVA SCOTIA	
Mr. Vince Santilli Development Planner Program & Evaluation Branch Policy Planning Division Department of Development World Trade and Convention Centre P.O. Box 519 Halifax, Nova Scotia B3J 2R7 Tel.: (902) 424-3932	Mr. Charles Shau Development Officer Development Section Department of Regional Industrial Expansion P.O. Box 940, Station M Halifax, Nova Scotia B3J 2V9 Tel.: (902) 426-9474
ONTARIO	
Mr. Robin Braithwaite Commerce Officer Department of Regional Industrial Expansion P.O. Box 98 1 First Canadian Place, Suite 4840 Toronto, Ontario M5X 1B1 Tel.: (416) 365-3719	Mr. Mark Nelson Project Manager Policy & Technology Ministry of Industry, Trade & Technology 3rd Floor Hurst Block 900 Bay Street Toronto, Ontario M7A 2E1 Tel: (416) 963-1373
PRINCE EDWARD ISLAND	
Mr. Fraser Dickson Commerce Officer Department of Regional Industrial Expansion P.O. Box 1115 Charlottetown, P.E.I. C1A 7M8 Tel.: (902) 566-7416	Mr. Harold Parker Business Development Officer P.E.I. Department of Industry P.O. Box 2000 Charlottetown, P.E.I. C1A 7N8 Tel.: (902) 892-5445

MEMBERS	ALTERNATES
QUEBEC	
Madame Lucie Marmen Agente de développement industriel Service du logiciel et des équipements bureaucratiques et informatiques Ministère de l'Industrie, du Commerce et du Tourisme 710, Place d'Youville Québec (Québec) G1R 4Y4 Tel.: (418) 643-1924	Mr. Michel Teasdale Commerce Officer Department of Regional Industrial Expansion Stock Exchange Tower 800 Victoria Square P.O. Box 247 Montreal, Quebec H4Z 1E8 Tel.: (514) 283-8815
SASKATCHEWAN	
Mr. R.G. Mills A/Executive Director Department of Science and Technology 3475 Albert Street Regina, Saskatchewan S4S 6X6 Tel.: (306) 787-9482	Mr. Del Bacon Development Officer Department of Regional Industrial Expansion 6th Floor 105-21st Street East Saskatoon, Saskatchewan S7K 0B3 Tel.: (306) 975-4422
OBSERVERS	
Frank Symons Manager Industry Programs Information Industries Division Department of Communications 300 Slater Street Ottawa, Ontario K1A 0C8 Tel.: (613) 990-4284	Dr. Prabir Neogi Senior Analyst Industry Programs Information Industries Division Department of Communications 300 Slater Street Ottawa, Ontario K1A 0C8 Tel.: (613) 990-4264

APPENDIX C

DEPARTMENT OF REGIONAL INDUSTRIAL EXPANSION

SERVICE INDUSTRIES BRANCH

NATIONAL SOFTWARE WORKING COMMITTEE

TERMS OF REFERENCE

Primary Objectives

1. To promote, encourage and assist the industrial development of the Canadian software industry.

2. To advise and provide input into the development of a profile of the software products industry.

3. To develop an action plan for industrial development of the software products industry.

4. To develop a network between federal and provincial governments and industry to serve as a vehicle through which industrial development initiatives can be undertaken.

Government

CHAIR

DRIE Service Industries Branch (succeeded by Information Technologies Industry Branch):

1. Will chair and provide secretariat services to the software working committee.

2. Responsible for the coordination, preparation and publication of the Software Products Profile.

3. Coordinate industrial development efforts.

MEMBERS

DRIE regional offices & provincial governments:

1. Provide input and advice on the software products industry in their provinces.

2. Undertake, organize and implement agreed upon industrial development projects to further the goals of the industry.

Industry

1. Industry will perform an advisory role bringing to the table direct experience from the point of view of their own companies. They will also be asked to profile their own companies.

2. Assist where possible in the organization of industrial development projects.

3. Assist where possible in the provision of statistics and other information.

Membership of the Software Working Committee will be limited to the attached membership list. Special guests may be invited to participate from time to time at the invitation of the Committee.

APPENDIX D

COMPUTER SERVICES ASSOCIATIONS

NAME: Canadian Association of Data and Professional Service Organizations

ADDRESS: 280 Albert Street, Suite 804
Ottawa, Ontario
K1P 5G8

OBJECTIVES:

- To promote the computer-based information services industry in Canada.
- To represent and speak for the Canadian information services industry: software, computer and professional services.
- to promote business increase through membership.
- To monitor and where necessary influence government rules and regulations which affect our industry.
- To monitor the structure of our industry so as to adapt to change.
- To foster increased international trade for members and to maintain and strengthen liaison with other national computer services associations.
- To provide a forum for members to exchange views on industry trends, opportunities, problems and solutions through regular regional chapter and sectoral committee meetings.

NUMBER OF MEMBERS: 90

NAME: Canadian Independent Computer Services Association

ADDRESS:
296 Garry Street
Winnipeg, Manitoba
R3C 3H8
(204) 947-9600

OBJECTIVES: Canadian Independent Computer Services Association (C.I.C.S.) was formed in 1980. There are approximately 50 member companies across Canada. The general objectives of the Association are as follows:

- To promote the interest of Canadian independent computer related service organizations with respect to matters dealing with legislation, regulation, and public understanding of the data processing industry.
- To encourage co-operation among its members and the exchange of ideas and services, in the interest of better service to the public.
- To inform members of opportunities and developments in the data processing industry.

WHO CAN JOIN: A company which:

- Receives at least 50% of its revenue from computer related services. (Computer related services includes data processing services, software service and OEM's supplying both hardware and software).
- Receives no more than 25% of above revenue from any one client.
- Is more than 50% Canadian owned.

NUMBER OF MEMBERS: 50

NAME: Canadian Information Processing Society (CIPS)

ADDRESS: 243 College St., 5th Floor
Toronto, Ontario
M5T 2Y1
(416) 593-4040

OBJECTIVES:

1) To advance the theory and practice of information processing in Canada.

2) To promote the free interchange of information about the theory and practice of information processing in Canada and elsewhere.

3) To determine, develop and maintain the integrity and competence of individuals active in information processing in Canada.

4) To establish a public awareness of the potential impact of information systems and to protect the public and individuals against the misuse of information systems.

NUMBER OF MEMBERS: 5,000

NAME: Electronics Industry Association of Manitoba

ADDRESS: 305 - 191 Pioneer Avenue
Box 2206
Winnipeg, Manitoba
R3C 3R5
(204) 943-7533

OBJECTIVES: Develop and maintain an association which will assist in the promotion and growth of the electronics manufacturing, distributing and software industry in the Province of Manitoba, Canada.

More specifically, the objectives are:

1. to provide a united voice to effectively communicate the industry's needs and requirements to the provincial and federal governments in a co-operative manner;

2. to enhance an awareness among industry members of each others products, capabilities and services;

3. to create a climate which will enhance the sales and profitability of member firms;

4. to work actively with industry, educational institutions, and government bodies to assure the availability of qualified people to meet the market's needs to develop a strong electronics industry in Manitoba; and

5. to help make available non-competitive information, data and educational services to members that will assist in the conduct and operation of their individual businesses.

NUMBER OF MEMBERS:
- 39 corporate members
- 13 affiliate members
- 1 associate member

NAME: Electronic Manufacturers Association of B.C. (EMABC)

ADDRESS: P.O. Box 80062
South Burnaby, B.C.
V5H 3X1
Allan Liggins, President

OBJECTIVES:

- To assume a leadership position in furthering the aims of the industry and to represent member organizations throughout B.C.
- To provide a united voice to effectively communicate the industry's requirements and needs to the provincial and federal governments.
- To sustain an interactive relationship between industry, the universities and institutes; and help to uplift the level of technical literacy in secondary and post secondary schools.
- To work to keep B.C.'s electronic industries competitive in the international marketplace.
- To distribute public information and increase general awareness of the high standards of made-in-B.C. products.
- To make available resource people, counsel or data as an aid to the financial and investment community.

NUMBER OF MEMBERS: 110

NAME: Manitoba Software Association

ADDRESS:
Manitoba Software Association
c/o Infotech Manitoba
1970 Ness Avenue
Winnipeg, Manitoba
R3J 0Y9
(204) 896-2269

MISSION STATEMENT:

To encourage, promote and stimulate the development and growth of the Manitoba software industry.

OBJECTIVES:

- To promote an awareness of products, skills and services within the membership.
- To encourage members to utilize each others strengths.
- To assist in the development of managerial, marketing and technical skills of its members.
- To keep members informed of opportunities, developments and other areas of interest.
- To assess industry standards and provide guidelines for the membership to enhance the quality of their products and services.
- To promote and further the best interests of the industry and its members in all reasonable and proper ways.
- To provide a united voice to effectively communicate and represent the industry's needs and requirements.

NUMBER OF MEMBERS: 70

NAME: New Brunswick Electronic and Computer Industries Association

ADDRESS:
Roger Williams, President
Marysville, New Brunswick
Tel: (506) 458-5909
c/o New Brunswick Department of Commerce & Technology
P.O. Box 6000
Fredericton, New Brunswick
E3B 5H1

OBJECTIVES: The objectives of the Association shall be:

(a) Unite in making representation to government and other bodies, on questions of common interest to its members.

(b) To stimulate the growth of the industry through mutual recognition of its possibilities, and to secure a wider market for its products.

(c) To assist in the development of managerial, technical and skilled trades training programs, appropriate to its needs.

(d) Collect, analyze, and distribute statistical, technical and management data to its members.

(e) Provide a forum for the exchange of legally exchangeable information on all subjects of common interest to its members.

(f) To promote and further the best interests of the industry and its members in all reasonable and proper ways.

NUMBER OF MEMBERS: 34

COMPUTER ACCESS: IBM-XT Micro
with Hayes Smartmodem and Crosstalk
at (506) 857-6423

COMMENTS:

NAME: Ontario Software Development Association

ADDRESS: 212 King Street West
Toronto, Ontario
M5H 1K5
(416) 591-1707

OBJECTIVES: To identify and implement programs to promote Canadian software in export markets and strengthen the industry domesticly.

NUMBER OF MEMBERS: Approximately 100 - 50 of which are individuals and 50 companies.

COMMENTS: The association has not been very active in the last year. Plans are in works to revive the association. The membership drive is targeting for 280 members, 130 companies and 150 individuals.

NAME: Software Industry Development Association (SIDA)

ADDRESS: 300-1190 Melville Street
Vancouver, B.C.
V6C 3W1
Dave Nicol, President
669-9800

OBJECTIVES:

- To advance the development of a Canadian computer software industry for association members who conduct research, develop or manufacture, and market or distribute software products.

- To promote and facilitate the interchange of information between the association and other groups such as government, investor bankers, financial institutions and hardware manufacturers relating to the software industry in general.

- To encourage and facilitate the growth of existing business; the entrance of new enterprises and the use of productive joint ventures within the software industry.

- To collect and disseminate information relative to member of the association.

- To provide programs which advance the professionalism and business development of members of the association.

- To develop, disseminate and encourage the use of association guidelines for quality control of software.

NUMBER OF MEMBERS: 200

NAME: The Microelectronics Centre

ADDRESS: 550 Engineering Building
University of Manitoba
Winnipeg, Manitoba
R3T 2N2
(204) 261-9620

OBJECTIVES: The Microelectronics Centre is dedicated to providing support to electronics manufacturers and users of electronics throughout industry.

1. To transmit knowledge of the applications of microelectronics to industry through our industrial training programs, with courses, seminars and workshops as well as our company oriented programs aimed at upgrading the skill levels of technicians/technologists;

2. To develop and consult with industry on product development and productivity enhancement projects; and

3. To conduct basic and applied research to stimulate advanced applications of microelectronics.

NUMBER OF MEMBERS: 17 staff members.

NAME: TIEM Centre

ADDRESS: 1450 - 155 Carlton Street
Winnipeg, Manitoba
R3C 3H8
(204) 947-2822

OBJECTIVES: The TIEM Centre provides a state-of-the art working environment and prepares a business to establish its self successfully. The TIEM centre, the qualified staff guide the new business in developing the practical business skills a company needs to get up and running.

Some of these services include:

- business opportunity identification
- business plan development
- cash flow budgeting
- market assessment analysis
- personal office space and business address

At TIEM, there are no upfront charges. If a business joins the TIEM Program, it pays a small royalty (2%) on its sales for five years while TIEM provides ongoing advice and assistarce.

NUMBER OF MEMBERS: TIEM has office facilities for 24 companies.

NAME: Independent Computer Consultants Association (ICCA)

ADDRESS: P.O. Box 34185
Vancouver, B.C.
V6J 4N1
(604) 682-2747
Meke Creswell, President

OBJECTIVES:

The B.C. chapter of ICCA is a non profit organization dedicated to the promotion of professionalism in the industry and to the provision of support for independent consultants and their firms.

More specifically their objectives are:

- To increase awareness within the community of the industry.
- To provide support services and benefits to members.
- To provide a netwroking group for the movement of information and contacts within the consulating community.

NUMBER OF MEMBERS: 75

APPENDIX E

EMPIRICAL DATA

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 (see Exhibit 4.1).

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.

EXHIBIT 4.1

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	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 5.1 shows that these segments generated $530 million in 1985 and $621 million in 1986, an increase of 17 per cent.

EXHIBIT 5.1

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.)

	Total Computer Services 1984		Total Computer Services 1985		Total Computer Services 1986	
Province	**# 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

MINUTES
National Software Working Committee
3rd East Lobby Boardroom
235 Queen Street
Ottawa, Ontario
9:30 a.m. - 1:30 p.m.
September 14, 1987

Attendees:

Mark Nelson - Ontario
Terry Stanhope - OSDA
Rod Sprange - Manitoba
Michel Teasdale - DRIE-Montreal
John Wiebe - DRIE- Vancouver
James Hofmeyer - Alberta
Charles Shaw - DRIE-Halifax
Julia Giggey - ITIB
Frank Symons - DOC
Ron Watkins - DG (ITIB)
Andrew Siman - ITIB
Bill Cowley - ITIB
David Paterson - ITIB

Update on Department and the Microelectronics and Systems Development Program (MSDP)

Andrew Siman, Director, Industry Development Directorate and Bill Cowley, A/Manager, Systems and Software Division gave a brief description of the organization of the Information Technologies Industry Branch (ITIB). Bill Cowley introduced David Paterson who has recently joined the Branch.

Andrew Siman gave an update on the Microelectronics and Systems Development Program. The program is expected to come into effect. This program is a four year program with a budget of $60,000,000. The budget for the first year has been estimated at $2,000,000. The key contacts will be in the DRIE regional offices with DRIE headquarters being responsible for management, control and approval of projects.

Mr. Siman fielded questions on the MSDP and general questions one the Department.

Provincial updates

The representatives from the provinces who were present provided a brief update on what had been happening in their respective provinces.

British Columbia -John Wiebe

- The province still regards software as an important sector.
- The Software Industry Development Association (SIDA) has approximately 130 members and is conducting talks with Alberta concerning the establishment of a chapter in Alberta.
- The Vancouver Software Centre has been established to provide office space for software developers in one location. It is self financing

- The Advanced Systems Institute is doing research into AI, advanced systems, and robotics.
- The Discovery Enterprise Program matches funds for hi-tech companies. There is no upper limit on amount however they don't normally consider any project under $50,000.
- A study funded by SIDA, the province and the federal government will evaluate the American perception of BC software and provide recommendations on actions to be undertaken to improve perceptions.

Nova Scotia - Charles Shaw

- New technology transfer sub-agreement in place
- Implementing a program to assist companies in going public

Alberta - James Hofmeyer

- Province currently evaluating the directions to be taken in information technologies
- Industry association not yet very developed

Ontario - Mark Nelson, Robin Braithwaite

- Ontario Software Industry Profile being prepared based on a distribution of 1,200 to 1,500 questionnaires (copy attached) Copies of the directory will be available at Software '88.
- Centres of Excellence - primarily for basic and applied research

Quebec - Michel Teasdale

- Directory of Software Distributors in Quebec, Ontario, Alberta, and B.C. to be published by end of September
- Quebec Software Industry Profile to be ready soon.

Manitoba - Rod Sprange

- Business Development Program - to assist small emerging companies

° Educational Technology Program - to educate teachers in the use of computers

° Manitoba Software Profile - 75 companies, which comprise total industry in Manitoba were surveyed and the results analyzed

° An electronic directory has been established

° Incubator areas equipped with micros have been established for the development of Software

° Vertical marketing seminars have been and are being organized.

Rod Sprange expressed a concern that it is difficult for Manitoba companies to partner strategically with manufacturers because of their location.

Plan of Action

Profile:

° Revised profile is being sent to Committee with minutes

° Committee will provide personal comments on profile and action plan

° Provincial and regional DRIE representatives are to solicit comments from provincial associations and key companies. They will consolidate comments and send a provincial view to Bill Cowley, A/Manager, Systems and Services by November 30, 1987.

° ITIB will solicit comments from the national associations and consolidate provincial input by end of December 1987

° The NSWC will meet in January 1988 to review results and discuss further actions

Other Business

1) Software Marketing Handbook - copies of the report will be provided to committee

2) National Software Council (NSC) - Terry Stanhope will be submitting a proposal to DRIE for the establishment of a NSC and the restructuring of the NSWC. Copies of the proposal will go to the NSWC for comment.

3) Ron Watkins, Director General, ITIB joined the committee for lunch and thanked the committee for its work to date.

4) BOSS/WIN Systems - BOSS, the DRIE Business Opportunities Sourcing System and WIN, the External Affairs system are currently compatible, however, WIN will be adopting the harmonized system. John Wiebe expressed concern about maintaining consistency with the two systems.

5) DOC/DRIE Mandates- There was some discussion about the respective mandates of these two departments. DRIE as well as the proposed new department clearly has the industrial development mandate but DRIE and DOC will continue to work together in areas of overlap.

Next Meeting

Proposed for January

Julia Giggey
September 17, 1987

AGENDA
National Software Working Committee
September 14, 1987
9:30 a.m. - 1:30 p.m.
Conference Room 3E Lobby
235 Queen Street
Ottawa

1. Up-date on DRIE and Microelectronics and Systems Integration Program.

2. a) Final Draft of Software Products Profile.

   b) Plan of Action.

3. Lunch (to be provided) and Informal Discussions.

4. Adjournment: 1:30 p.m.