



STUDY OF THE
SOFTWARE INDUSTRY
IN CANADA

DMR Group Inc.
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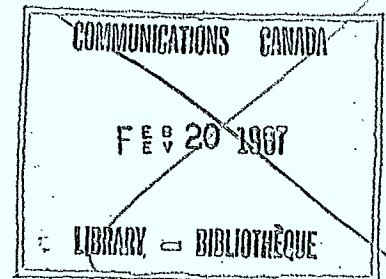
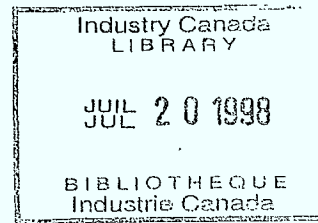
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EXECUTIVE SUMMARY

This study, performed for the Department of Communications, is intended to provide input to the Department's policy creation, project assessment and program improvement processes as they relate to programs and services in support of the Canadian software industry. The study concentrates on software developed in English Canada.

The study builds upon information available in prior reports concerning specific aspects of the Canadian software industry, with a concentration on providing conclusions and recommendations based solely on the information obtained from the software firms participating in the study.

During the course of the study over thirty firms were interviewed in order to provide a representative cross section of the problems faced by the industry in the financing of software product development and financing of commercialization (marketing) of packaged software products. In addition the industry's experience concerning existing Government support programs was noted.

In recognition of the fact that the majority of Canadian software firms are classified as small to medium-sized (staff of 5 to 20 and under \$1 million annual revenue), and that these firms are the ones most likely to require assistance as they are in their expansion stage yet lack resources available to larger firms, the study concentrated on this category of firm. All firms interviewed were involved in the development and marketing of "packaged" software products, and a number of these firms also performed custom-contract development. Traditional and leading-edge software technologies were represented within the sample studied.

Study Observations - General

The study observations do not reveal any new issues concerning the Canadian software industry, but they do provide factual information, based on the representative sample interviewed, in support of previously identified issues. This information does permit identification of problem areas within the industry and an indication of the appropriate policy direction.



The primary problems faced by the firms participating in the study were financing their product development and marketing effort and locating appropriate distributors for their products. These firms were able to obtain sufficient information for both product development and market definition and did not perceive a requirement for an "Information Clearing House".

All firms, excepting those involved in artificial intelligence product development, stated that sufficient knowledgeable technical resources could be obtained in Canada.

Study Observations - Product Development

A timeframe of seven months to five years was required to develop a product for commercialization, however the industry's opinion was that a product requiring in excess of two years to develop would not be viable as the rapidly evolving marketplace and technological changes would make the product obsolete before development was completed.

An industry-wide trend to acquire and modify or build upon existing products in lieu of development "from scratch" in order to reduce the development timeframe was observed. This trend was restricted to the "traditional" product areas, with new-technology development requiring development "from scratch" as no "short cut" methods were available.

Study Observations - Product Marketing

The majority of firms marketed primarily in the United States, targeting the Fortune 500 companies. Alliances with distributors (hardware manufacturers, value added retailers (VAR) and distribution firms) to promote and market products were used in addition to direct sales efforts. The homogeneity of the North American marketplace resulted in the use of similar marketing approaches for Canada and the United States.

Product advertising did not play a major role in product marketing as the business community rather than the consumer market was targetted.



A high level of participation in trade shows in order to contact potential product distributors was observed, and firms were of the opinion that trade shows were extremely valuable for this reason.

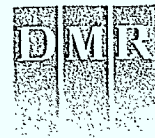
Study Observations - Financing

Financing was required by firms for the product development and product marketing aspects of the business. Product assembly/manufacturing, which involved copying of program material and packaging, was a minor aspect of the business and was generally subcontracted.

The actual financing of product development was observed to be of two types. Firms developing "traditional" software products obtained their "seed" financing from their partners/shareholders and augmented it with revenues from contract consulting and development work. The development funds available within these organizations was in almost all cases less than \$100,000. Firms developing "new-technology" software products assembled "seed" financing in excess of \$1,000,000 from partners/founders, venture capital firms and government grants, and hired staff to perform the product development.

Financing for product marketing was obtained by whatever means possible, as development costs were usually higher than anticipated and minimal funds were available for the initial marketing effort. Free advertising (press releases) and distributor/manufacturer sales forces were used to obtain initial sales, and the revenue from these sales was used to support further marketing effort.

The working capital of the firms interviewed ranged from two weeks to three months and was considered minimal to inadequate by the majority of firms as any shortfall in sales or receivables collection could result in insolvency.



Debt capital from banking sources had only been obtained by a few firms, and when obtained the amounts were generally of a personal loan nature (short term and less than \$20,000), and required personal guarantees. Firms indicated a strong preference for equity over debt capital due to the uncertain nature of their business. Lines of credit, obtained by a dozen firms, required personal guarantees and in only two cases was the line of credit in excess of \$40,000.

Venture capital, although obtained by the majority of firms with seed capital in excess of one million dollars, was obtained with difficulty and in general required considerable time (up to one year) to arrange. The smaller firms (capitalized with less than \$100,000) were unable to obtain venture capital when it was required, although offers of venture capital were made once the firm began to generate revenue from product sales and no longer required this capital in order to survive.

Conclusions Related to Study Observations

The software firms studied experienced the problems inherent to small businesses, but these problems were magnified by the higher risk associated with the software business. This high risk was due to a number of factors, but the prime factors were the constantly changing technology and an unpredictable marketplace. For this reason the firms studied were all concerned with the "time factor" and sought ways and means to reduce the duration of their development, financing and marketing efforts. Thus any government initiatives, in order to be accepted by the software industry, should not increase or be perceived to increase this "time factor".

At the product development stage there is a requirement for direct "research and development" type financial assistance, particularly for "new technology" products, as these products have a more lengthy development timeframe and require more funding than the "traditional" software products.



Once the product marketing stage is reached there is a requirement for measures other than loans or grants. Trade show/mission assistance should be continued as it is a very effective method of assisting the software marketing process. In addition methods of ensuring working capital availability through the provision of appropriate lines of credit would reduce the chances of firm insolvency due to short-term cashflow problems.

Observations - Current Government Programs

The primary programs accessed by the software industry were:

- . Scientific Research Tax Credit (SRTC)
- . Industrial Research Assistance Program (IRAP administered by NRC)
- . Program for Export Market Development (PEMD - DRIE/External Affairs)
- . Industrial and Regional Development Program (IRDP - DRIE)

and firms were in general very satisfied with these programs.

Firms interviewed that did not make use of government programs were the smaller firms (under \$100,000 capitalization) and many of these firms avoided government programs due to perceived restrictions or workload associated with the programs.

Firms interviewed perceived that current government programs are oriented towards traditional manufacturing processes, that the funding lacks flexibility, and that the software industry knowledge and expertise available within the government is not sufficient to permit effective administration of programs applicable to the software industry.

Information concerning government programs was considered to be available but required time and effort to locate. Firms were more aware of Provincial government programs than Federal programs.



Strategies

The expectations of the English software industry in Canada as expressed by the firms interviewed were as follows:

Options - Software Development

Continue government funding of software development as funds from company founders/partners augmented by Canadian venture capital is not sufficient.

Target this funding toward the development of new or leading-edge software development, as opposed to traditional software development.

Provide government funds in support of software development directly via grants and venture capital, and indirectly through the government procurement process.

Select funding candidates based on published criteria through evaluation of the candidate's business plan and any other information that indicates the potential for success.

Award funds on an installment basis over the total development period (not to exceed a two year timeframe), with each installment keyed to project progress reports prepared by the funded company, as this method is acceptable to the industry and provides for implementation of the necessary control mechanisms.

Given the technical risk and market uncertainty involved, view the development of software as a research and development (rather than a manufacturing) process when evaluating funding requests, business plans and project progress reports for funding allocations.

Ensure that government procurement policies provide Canadian software firms with fair access to custom software development contracts when these contracts could result in a product with market potential.



Improve the dissemination of information regarding the availability, applicability and means of access to Federal Government programs that assist the software industry.

Options - Software Commercialization

Discuss with Government financial institutions (eg. FBDB) methods of ensuring that appropriate lines of credit can be made available to firms in the software industry once these firms have a marketable product.

Continue funding of trade shows and trade missions increasing the availability of this funding in order to provide enhanced opportunity for Canadian software firms to meet with representatives of other firms in the software business and form marketing alliances. Investigate methods of increasing the flexibility of this funding.

Strengthen the existing "buy Canadian" policy through increasing government employee awareness of Canadian software products available in the marketplace and the benefits that accrue to the industry through government purchase of these products.

Increase efforts to assist Canadian Software producers in the marketing of their products to the government through the provision of information and advice.

Suggested Approach

The software industry in Canada is composed primarily of small business enterprises that are experiencing the problems common to all small businesses. In addition, however, software firms, because of the intangible nature of their product, have a problem financing product development and marketing activities.

For this reason, Government assistance for product development and marketing is required to foster the growth of the industry.



The software industry differs from the identified cultural industries (film, sound recording, book publishing, etc) which fall under the DOC mandate in that software products are being developed for an identified commercial market and there is a high potential for profit. For this reason existing and potential Government support programs and cultural activities may not necessarily be applicable to the software industry.

In DMR's opinion, based on the needs of the sample firms studied, the suggested approach that the Department should follow in order to support the software industry in Canada is to discuss with the appropriate Federal Government Departments methods of providing the following:

- . the availability of increased software industry expertise (development and marketing requirements) within the Federal government,
- . product development support in the form of direct grants and product procurement policy that provides for retention of product marketing rights by the software firms,
- . lines of credit to software firms that have a marketable product,
- . product marketing support in the form of trade show/mission assistance.

Other assistance as suggested in this document will likely be of lesser benefit and should be studied subsequent to action on the four points listed above.



1.0 INTRODUCTION

1.1 Background

The Department of Communications is involved in policy initiatives concerned with the cultural and communications aspects of the Canadian cultural industries including the development of discussion papers for policy formulation purposes. The Canadian software industry, although considered to be similar in nature to other cultural industries, has many unique aspects, and for this reasons is subject to separate study.

This study was commissioned in order to gather specific information concerning the financial and marketing issues faced by the Canadian software industry. This information, and similar information from studies performed on other cultural industries (book publishing, film, recording, etc) will form the basis for policy formulation, project assessment and program improvement within the Department.



1.2 Objectives and Scope

The stated study objectives were to:

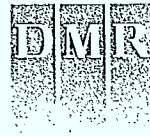
- . identify the problems associated with financing the development and commercialization (marketing) of software, and
- . identify strategic options related to government support and aid programs.

The stated scope of study was to obtain information through review of existing material and interviews with a representative cross-section of the computer software industry.

During discussions at the commencement of the study, the Department recognized that there were inherent difficulties in restricting the scope of the study to communications and cultural software as virtually all software could be classified as cultural if it were used for a cultural purpose, accessed cultural data, or had cultural content added to the basic software. A software product is in itself only the framework, as it is the data or content and the purpose or use of the software which provides the cultural aspects.

For this reason the scope of the study was defined to include all software produced in English Canada. (A separate study was commissioned to investigate the software produced in French, mainly in the province of Quebec).

As only a limited number of firms could be interviewed due to funding constraints, it was agreed at the commencement of the project that the study would focus on small and medium sized Canadian-owned firms with less than \$1 million in annual sales revenue, whose major business was package software development.



1.3 Methodology

The study was conducted in three phases.

In the **Project Initiation** phase, the project scope was reviewed with the Project Authority, agreement was reached concerning the representative cross-section of software firms to be interviewed, and a detailed project plan and schedule were drafted and approved.

In the **Information Gathering** phase, a number of prior studies relating to the software industry were reviewed to obtain background information, firms within the defined category were identified and interviews arranged. A comprehensive questionnaire was drafted and subsequent to approval by the Project Authority interviews were performed. The President or Chief Financial Officer of 23 firms in the Toronto/Ottawa area and 8 firms in various major cities across Canada were interviewed. Toronto/Ottawa interviews were conducted through visits to the firms' premises, while interviews in other cities were conducted over the telephone.

In addition, two other countries (Britain and Australia) were contacted to determine government policy as it affected their respective software industries.

This phase was completed with the delivery of an interim report in the form of a presentation.

In the **Analysis** phase, the interview results were examined, correlated and analysed and conclusions drawn. Results were compared with information presented in prior reports and differences noted. A draft report was prepared for review by the Project Authority, requested changes were performed and a final report delivered.



1.4 Selection of Representative Sample

The published statistics (Evans 1985) for software firms in Canada state that:

- . 52% of software firms employ less than 5 staff, 39% employ between 6 and 20 staff, and the remaining 8% have over 20 staff,
- . 85% of the software firms have less than one million dollars in sales, and
- . 47% of the software firms are located in Ontario, 18% are in Quebec, and the remaining 35% are in the other provinces, chiefly Alberta and British Columbia.

In order to select a representative sample that would reflect the characteristics of the majority of software firms the following criteria were applied when selecting firms for interviews:

- . Canadian-based software development,
- . in business 1 to 5 years,
- . major product is packaged software,
- . involved in software development as well as marketing,
- . employ 5 to 20 staff, and
- . 1985 revenues less than one million dollars.

In addition, the firms were selected to provide a representative cross-section of the various categories of software including:

- . systems,
- . business,
- . automation,
- . application development,
- . education, and
- . entertainment.

A brief definition of each of these categories is included in Appendix C.



Figure 1.4

REPRESENTATIVE SAMPLE CHARACTERISTICS

Firm Interviewed	Location	1985 Sales	Current Staff	Software Category
Alias Research Incorporated	Toronto	\$ 500,000	40	Business
Alphatel Videotex Directories Ltd.	Edmonton	\$ 600,000	10	Bus/ED
Arrix-Logic Systems Inc.	Toronto	\$ 150,000	6	Development
Capa Software Corporation	Saskatoon	\$ 190,000	8	Business
Computer Associates Limited	Vancouver	N/A	70	Business
Comrpis Incorporated	Ottawa	\$ 137,000	6	Education
Corel Systems Corporation	Ottawa	\$ 7,000,000	20	Business
Datem Limited	Ottawa	\$ 500,000	12	Automation
D.W. Associates Incorporated	Victoria	\$ 1,800,000	16	Business
Fulcrum Technologies Incorporated	Ottawa	\$ 1,000,000	16	Business
Houghton-Mifflin Canada Limited	Toronto	\$ 175,000	2	Education
Human Computing Resources	Toronto	\$ 5,000,000	40	System
Interactive Technologies Limited	Toronto	\$ 650,000	17	Education
Logicware Incorporated	Toronto	\$ 1,000,000	30	Development
Microbyte Research Incorporated	Toronto	\$ 150,000	4	Business
Mindflight Technology Incorporated	Toronto	\$ 1,000,000	25	System/ED
Mystic Developments Limited	Saskatoon	\$ 160,000	7	Business
Nexa Corporation	Ottawa	\$11,000,000	70	Business
Novatron Corporation	Halifax	\$ 1,500,000	23	Business
Pelada Informatica Incorporated	Ottawa	\$ 1,000,000	7	Business
Petite-Lawrence Limited	Toronto	\$ 250,000	6	Engineering
Quantic Laboratories Limited	Winnipeg	\$ 120,000	8	Engineering
Softquad Incorporated	Toronto	\$ 100,000	15	Business
Softkey Software Products Incorporated	Toronto	\$ 600,000	3	Business
Softwords/Press Porcpic Incorporated	Victoria	\$ 1,000,000	20	Education
Systems Interface Limited	Ottawa	\$ 500,000	16	Business
Technetronic Incorporated	Ottawa	\$ 1,000,000	25	System
Tricore Systems and Consulting Limited	Toronto	\$ 1,000,000	16	Business
Versaterm Systems Limited	Ottawa	\$ 800,000	11	Business
Xicom Technologies Corporation	Ottawa	\$ 500,000	20	System
York Central Health Services Incorporated	Toronto	\$ 1,200,000	15	Business



Large firms (1985 revenues in excess of one million dollars) were not interviewed as these firms were considered to have the resources necessary to obtain development financing, have marketing professionals on staff, are established in the marketplace, and thus are not in need of assistance in order to survive.

The small and medium sized firms on the other hand were considered to be in the high risk stage of their existence, as they were experiencing rapid growth of their product market but had limited resources to address this market demand, and would likely benefit from any assistance that could be provided.

The selection of firms was made more difficult by the lack of up-to-date information on software firms with less than one million dollars of annual revenue. Over 100 firms that met the required cross-section characteristics were identified in order to perform the 31 interviews. Many firms, particularly those listed in 2-year old directories and those involved in the educational software field, no longer existed.

Meetings were held with a total of 23 firms in the Ottawa/Toronto area, and an additional 8 firms at major cities across Canada were interviewed by telephone. Figure 1.4 indicates the characteristics of these firms. Only the major category of software produced by the firm is indicated on the chart. A brief description of each firm is included in the Appendix A. For reasons of confidentiality, the source of information other than that illustrated in Figure 1.4 provided by these firms for this report will not be identified.

A number of firms that were interviewed do not completely meet the characteristics stated for the representative cross-section. These exceptions are explained as follows:

- Alias Research Incorporated (staff of 40). The staff of Alias was 4 two years ago, 18 last year, thus their high risk period was very recent and information of value to the study could be obtained.

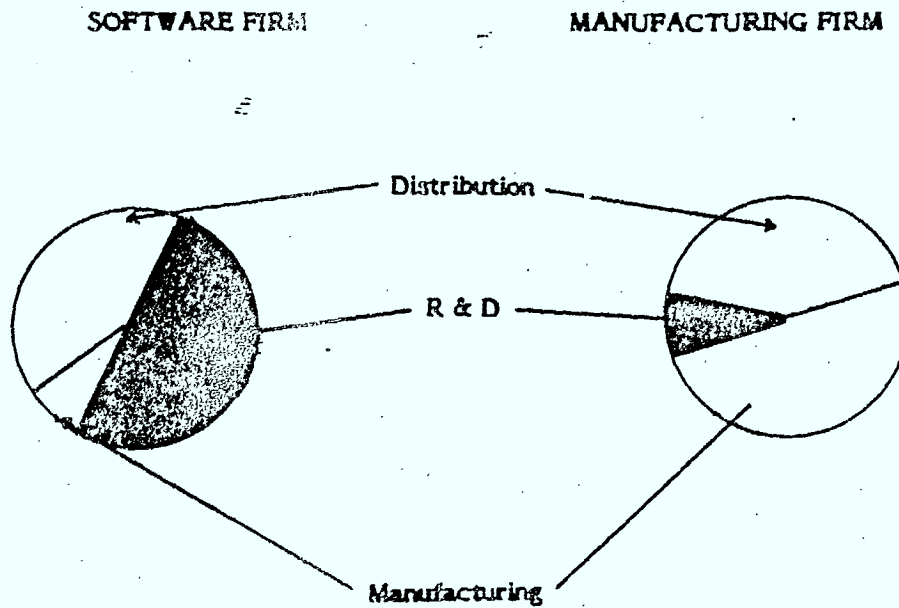


- Corel Systems Corporation (\$7 million in sales) is a ten month old firm whose sales are well above the one million dollar mark as they sell repackaged hardware/software, recognizing significant revenue (\$50,000 and up) from each sale, and have achieved extremely rapid growth.
- Computer Associates (70 staff) was selected as representative of the second growth stage of a successful small/medium sized firm involved in the packaged software product business. Their success is based solely on the success of their packaged software products.
- Houghton - Mifflin Canada Limited (subsidiary of a U.S. firm) was selected because of its relative independence from the U.S. parent and its success in the educational software field.
- Human Computing Resources (\$5 million sales/40 staff) was interviewed to gain insight into the demise of a packaged software product called Chariot. Reference Appendix A for further information.
- NEXA Corporation (\$11 million revenue, 70 staff) is a management and investment company with nine subsidiary companies, with each of the subsidiaries meeting the firm selection criteria established for the study.
- Other firms with over a million dollars in sales (D.W. Associates, Mindflight Technology Incorporated, Novatron Corporation, York Central Health Services Inc., and Xicom Technologies Corporation) were included in the study as they were in the evolutionary or growth stage usually associated with firms having under one million dollars in revenue, and had reached the one million dollar mark in the 1985 year.

It should be noted that only "successful" firms, that is those still in existence, could be contacted and thus the firms that have failed are not represented in the sample.

Figure 2.0

SMALL BUSINESS SOFTWARE FIRMS
COMPARED TO
TYPICAL SMALL MANUFACTURER



Note: The relative size of the pie shaped sections indicate the relative expenditure of effort and dollars towards each of the three aspects of the business - R & D, manufacturing, and distribution.



2.0 OBSERVATIONS

2.1 The Software Manufacturing Industry

The firms interviewed, representative of the small to medium size firms involved in the development of packaged software, were all of the "small business" category. These firms, although involved in the "manufacture" of software, were not true manufacturing companies as their primary effort was of a research and development nature in most cases, and a distribution or marketing nature in other cases. Figure 2.0 indicates pictorially the observed difference between the small businesses involved in software development and typical small manufacturing organizations.

2.1.1 Business Aspects

The three aspects of the software business observed during the interview process were:

1. Research and Development

The development of software, a creative process, in almost all cases was of a research and development nature as the resulting programs or set of programs might not function as required (reference the experience of Mindflight) or there could be no market for the resultant product (reference the experience of Apprix).

2. Manufacturing

The manufacturing phase included some aspects of software assembly and the assembly of the product for distribution.

Software assembly included all non-creative program writing tasks of a repetitive nature. An example was the writing of "driver" programs for each type of computer printer available in the marketplace, a repetitive process requiring patience, not creativity.



The process of product assembly, which includes making copies (on diskette or computer chip) and packaging was of a minor nature when compared to the R & D phase in all instances. This work was typically subcontracted or assigned to the distributors.

3. Distribution

This comprises the marketing or commercialization activities for a developed software product. These activities did not differ from those for a typical manufactured product.

2.1.2 Ownership

All firms interviewed were private and closely held, with only a few partners, shareholders or venture capital organizations owning the firm. As a result, balance sheet figures were not available, although most firms provided verbal estimates of their firm's capitalization source and amount along with an estimate of their current (1985) revenues.

The process of consolidation (grouping together of small firms) was not observed during the twenty-three personal interviews in the Ottawa/Toronto area. However, difficulties were encountered when contacting firms in the smaller centres (Halifax and Saskatoon) for telephone interviews, as a high degree of consolidation had taken place and there were few software firms of a small or medium size.

2.1.3 Perception of the Industry

The perceived high failure rate of the software industry, in particular failures involving the loss of millions of dollars, have resulted in an image problem for the industry.

Both the business community and the consumer are becoming wary of dealing with software firms due to this "negative" image. During the interviews mention was made of landlords refusing to lease to firms involved in software development, banker skepticism, and loss of sales to U.S. firms which were perceived to be more "stable".



2.2 The Software Development Process

Thirteen of the thirty-one software firms studied were involved in the development of new or leading edge technology including:

- . Artificial Intelligence (2 firms)
- . Computer Assisted Engineering (2 firms)
- . Networking (2 firms)
- . Document Exchange (2 firms)
- . Interactive Videodisc (2 firms)
- . Electronic Publishing (3 firms)

The remaining eighteen firms either performed minimal to no actual development themselves (using contractors) or were involved in the development of more traditional applications (accounting, patient management, courseware, etc.).

2.2.1 Development Approach

Within the thirty-one firms studied, a number of approaches to product development were observed. Sixteen firms developed the complete product "from scratch", nine firms developed their basic product(s) during the performance of a contract, retaining the rights to the product, and six firms acquired their product, enhancing it before marketing.

Many firms that had developed the product(s) from scratch expressed the opinion that they would not do so again if they could acquire and modify a product. They further stated that the risk of developing a product from scratch was extremely high and in order to minimize this risk, they would only develop products from scratch if the development timeframe was under a year, preferably just over six months. Risk, in the view of the firms interviewed, was directly proportional to the length of time required to develop the product as longer timeframes required more financing and the rapid evolution of the marketplace along with technology changes could result in development of an obsolete product.



2.2.2 Development Timeframe

A minimum of six months was required to acquire and modify a product and prepare it for distribution. A timeframe of two years was judged by the firms as the maximum for product development as the technology and the marketplace were evolving so rapidly. The development time of a software product for the firms interviewed ranged from six months to 5 years.

Firms indicated that they would reduce development timeframes by seeking to acquire/modify products and by building upon existing products.

A number of firms indicated that the product was marketed as soon as possible in the development cycle in order to obtain revenue to finance the enhancement of the product to make it truly competitive in the marketplace. Those firms that perfected their product (sometimes over a 5-year period) indicated that they would also market their next product as early in the development cycle as possible.

2.2.3 Product Maintenance

Only a few of the thirty-one firms offered true product support, with online fault diagnosis (4 firms) or regional offices (3 firms). All firms provided "hotline" service. This service was considered invaluable for providing information on potential product improvements. Most firms (24/31) would provide enhanced releases of their product to customers for a fee.

2.2.4 Development Resourcing

Technical Staff and Information

Firms noted that an adequate supply of competent technical staff was available in Canada (30 out of 31 firms) and that adequate technical information relating to the development process was available in the public domain (all 31 firms).



Associations

Although 18 of the 23 firms belonged to associations, only 3 firms considered themselves active in these associations. (This question was not posed to the 8 firms interviewed by telephone.)

Development Alliances

For the 31 firms surveyed, few alliances for software development were in place. One firm worked closely with the University where their product was developed and three other firms regularly subcontracted portions of their development work to other firms or individuals. Other firms (3) liaised with firms or organizations involved in similar development work but did so on an informal basis.



2.3 Financing of the Development Process

The largest single problem faced by firms was financing, both of the development effort (16 out of 31) and the marketing effort (17 out of 31). All firms were of the opinion that equity financing was preferable to debt financing.

2.3.1 Equity Financing

The source of equity financing within the 31 firms surveyed was as follows:

<u>Source of Equity</u>	<u>No. of Firms</u>
Partner/Founding shareholders	27
Venture Capital Organizations	11*
Government Grants	18
Government Loans (\$100,000 or greater)	3
Parent Company	4
Supplier Equipment Advance	2

* Includes 2 firms obtaining venture capital from FBDB

The amount of equity financing for development purposes for the 31 firms surveyed was as follows:

<u>Amount of Equity</u>	<u>No. of Firms</u>
Less than \$100,000	15
\$100,000 to \$1,000,000	4
More than \$1,000,000	12

These dollar amounts are estimated funds expended on the development process and include some administration/initial marketing related expenses. In the case where a firm had developed more than one related set of products, the development cost has been estimated for their first set of products.

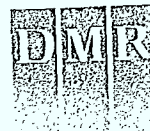
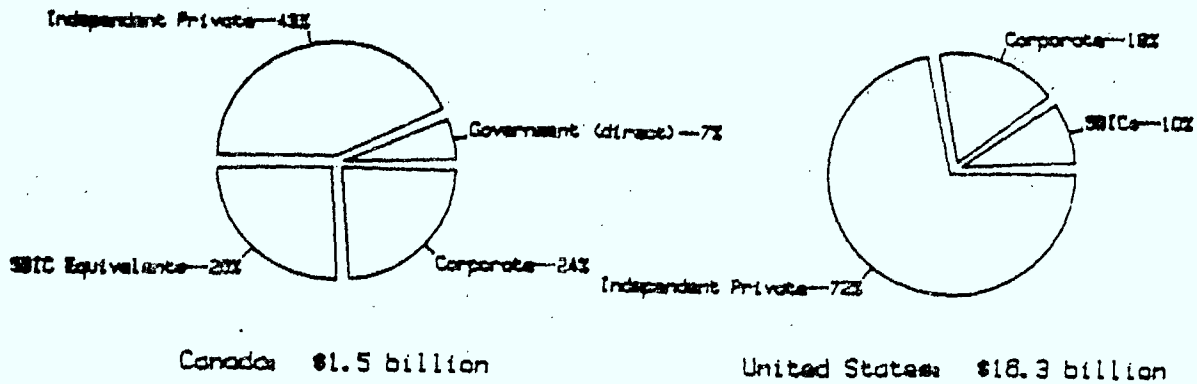


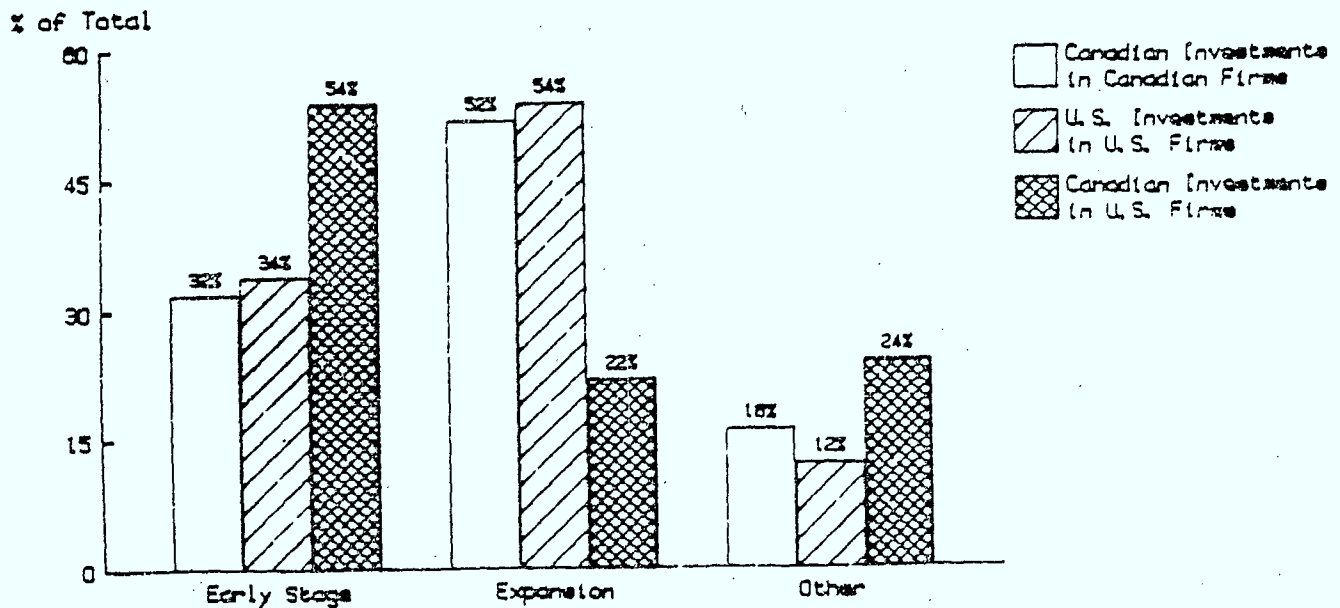
Figure 2.1.3

CANADIAN VENTURE CAPITAL

Capital Under Management By Source: 1984



Venture Capital Disbursements By Stage of Development: 1984



Reprinted from Venture Capital Journal
December 1985



The firms capitalized with less than \$100,000 obtained their seed financing from a small number of partners/shareholders and the remainder from consulting or custom software development contracting and developed their product(s) with a minimal cash outlay, in many cases retaining rights to a custom developed product in order to market the product as a software package.

Firms capitalized with more than \$1,000,000 (total of 12) were the recipients of government grants (in 11 cases) and venture capital (in 9 cases). These funds were used to develop a new technology or leading edge product (AI, Electronic Publishing, Network Communications, etc.) from scratch, using development resources hired specifically for the project.

Venture Capital

The firms interviewed expressed a number of opinions concerning the accessibility and availability of venture capital for equity financing. Comments made by these firms included the following:

- venture capital is very difficult or impossible to obtain until you are perceived to be on the road to success (first sales of product made),
- venture capitalists in Canada are conservative and place their funds in American firms because they perceive that these firms have a greater chance of success, and
- venture capitalists look to place large sums of money at one time, and are not interested in the smaller software businesses.

These observations are supported by information available concerning venture capital in Canada. Figure 2.1.3A indicates that on a percentage basis less venture capital is categorized as independent-private in Canada compared to the United States, and thus Canadian venture capitalists would be expected to be more conservative. Figure 2.1.3B indicates that Canadian venture capitalists are more willing to invest in the early stages of development of U.S. firms than Canadian firms. A total of 45% of Canadian venture capital was invested in the U.S. in 1984.



However, despite these negative views, nine of the firms interviewed had acquired Venture capital.

2.3.2 Debt/Line of Credit Financing

Minimal debt capital was available to the firms surveyed as they could not qualify for bank loans when evaluated by the traditional lending criteria (assets, cash flow), particularly during the development timeframe. This subject will be addressed further in Section 2.4.6 as loans/line of credit financing is an important component of a firm's operation once a product has been developed.

2.3.3 Government Funding of Development

Federal government funding of software development was utilized in 18 of the 31 firms surveyed. This funding was an essential component of the development funding in 2 cases.

The Federal government programs involved (for development funding) were as follows:

<u>Program</u>	<u>No. of Firms</u>
Scientific Research Tax Credit	11
Industrial Research Assistance Program	4
Industrial and Regional Development Program	3

In addition three firms had obtained funding through the Federal Business Development Bank.

Fourteen firms had utilized provincial programs to assist development. In four of these fourteen cases the provincial government program provided a development grant, and in the remaining ten cases assistance was provided in the form of employee salary assistance payments.



Many firms (9), all within the \$100,000 or less capitalization category, stated that they did not apply for government funding (other than job creation/portion of salary programs) because of the perceived restrictions that would be placed not only on their expenditure of the funds but on their business operations.

The SRTC program, used by eleven firms within the sample of thirty-one, was considered to be an excellent method of providing development funding.

Among the comments made by firms concerning government programs, the more frequent were as follows:

- "Government funding appears to be directed to the more traditional manufacturing industries" (5 firms)
- "Government funding is too restrictive and inflexible" (6 firms)
- "The Government does not understand software or the software development process" (5 firms)
- "Information concerning Government programs is available, the Government is helpful, but it takes too long and too much of our time to locate and obtain this information". (8 firms)

These comments become more pertinent when the nine firms that had not dealt with the government, nor intended to deal with the government, are subtracted from the total of firms interviewed.

Over half of the firms interviewed (17) indicated that they underestimated the costs of product development, leaving themselves with less funds to market the product than anticipated.

Although only thirteen of the thirty-one software firms interviewed were actively involved in the development of leading-edge software (Section 2.2) the majority of firms interviewed were of the opinion that government support should be provided only for leading-edge software development.



2.4 The Software Marketing Process

The elements of the software marketing process that were studied are as follows:

- . Staffing
- . Market Research
- . Distribution
 - target market
 - distribution methods
- . Advertising
- . Trade Shows/Missions
- . Debt/Line of Credit
- . Marketing Expenditure
- . Constraints

2.4.1 Staffing

A minority of firms employed staff solely for the sales function. Firms utilized hardware vendor sales staff, retailers and distributors to reduce their marketing costs. The primary sales resource utilized by firms were:

- . Professional sales staff (9)
- . A distributor, manufacturer or value added retailer (5)
- . Development staff on a part-time basis (8)
- . Owner/president (9)



In general, the more marketing oriented firms tended to utilize their own sales staff; firms with a blend of marketing and development skills utilized distributors/VAR's/manufacturers; and firms that were development oriented utilized their development staff on a part-time basis to perform the sales function.

2.4.2 Market Research

The opinion was expressed by all firms that sufficient information was available to identify the marketplace for their product. The sources of this information were as follows for the 23 firms interviewed in person:

<u>Source</u>	<u>No. of Firms</u>
. Use of professional research organizations	6
. Partners' knowledge of the target industry	6
. Review of available public literature	6
. Purchase of market study reports	3
. Purchase of mailing list information	5

Only one firm had directly approached the Canadian Government seeking market research information, and although the particular information required had been collected (Statscan), it was not readily available.

One firm utilized the resources of the U.S. Government to regularly obtain up-to-date (6 month old) information concerning the sales of the firm and competing firms on a worldwide (including Canada) basis. The firm's president stated that he was unable to obtain information of this nature from Canadian Government sources.



2.4.3 Distribution

Target Market

The primary target market for the firms surveyed was as follows:

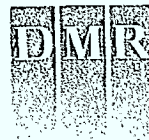
<u>Primary Market</u>	<u>No. of Firms</u>
Business	21
Education	2
Government	5
Manufacturer/VAR	3
Consumer	0

The reasons cited for not approaching the consumer market were as follows:

- . the high cost of advertising a product targetted towards the consumer marketplace,
- . the difficulty in financing this advertising in addition to the start-up costs of providing sufficient quantities of product, brochures, etc.,
- . the high potential for a competing product to appear as there are relatively few products that will be widely used by the consumer,
- . the impossibility of competing against other products that already have a large share of the available market, and
- . the view that the overall risk associated with producing a consumer product is far higher than the risk associated with a business product.

The target market was located primarily in the United States, with a number of firms (5) stating that they did not actively market in Canada. Marketing activity was as follows:

<u>Location of Primary Marketing Activity</u>	<u>No. of Firms</u>
United States	14
Canada	16
Europe	1



A number of firms (5) not already marketing in the United States intended to do so once they had established themselves in Canada.

No impediments or restrictions to product marketing activity in other countries were observed during the study.

Product Price Range

The products marketed by the firms studied ranged from \$29.95 to \$100,000.

<u>Product Price</u>	<u>No. of Firms</u>
Under \$100	3
\$100 to \$500	4
\$500 to \$5,000	4
\$5,000 to \$10,000	6
\$10,000 to \$25,000	9
\$25,000 to \$50,000	2
\$50,000 to \$100,000	3

Distribution Methods

The distribution methods utilized to reach this market were:

<u>Distribution Method</u>	<u>No. of Firms</u>
Distributor	8
Manufacturer	7
Value Added Retailer	4
Direct Only	12

A total of 20 firms used some direct marketing to reach their target market, where direct marketing is defined to include personal contact, referrals and repeat business. Products priced below \$100 were not direct marketed.

No correlation between the success of a firm and its marketing approach was observed. Firms marketing products with a unit price under one



hundred dollars utilized distributors exclusively, those marketing products over the one hundred dollar price range used distributors, VAR's, manufacturers and sold directly to key accounts.

2.4.4 Advertising

Paid media advertising, if utilized, involved expenditures of approximately \$25,000 annually (5 firms) or in excess of one half million dollars (4 firms). Ten of the firms surveyed had minimal (less than \$1,000 annually) or no media advertising expenses as they utilized free publicity (i.e. press releases) as their sole media advertising method. The various media were utilized as follows:

<u>Media</u>	<u>No. of Firms</u>
Magazines including trade journals	17
Newspapers	2
Radio	1

A total of 11 firms used direct mailings to potential clients as their prime method of obtaining new businesses and two firms utilized staff to perform telemarketing. Seminars as a primary method of reaching new clients with product information were used by two firms.

2.4.5 Trade Shows/Missions

A high level of participation was noted, with 27 of the 31 firms indicating trade show/mission involvement, and a number of firms stating that these shows/missions were essential. Attendance at a trade show, whether or not a firm operated a booth, was considered to be the optimum method of making contacts for product distribution purposes and negotiating product deals as all the key players were available in one location (16 out of 23 firms personally interviewed). If direct sales of the firm's product resulted from trade show exposure, this was considered to be a bonus. A number of the development oriented organizations expressed disappointment with trade shows as they had anticipated that this exposure would increase product sales yet no effect on sales was noted. The four firms that did not attend trade shows were observed to be of a stable or failing nature.



Participation in government sponsored missions/foreign trade fairs was not regarded by a number of firms as beneficial for the following reasons:

- attendance at trade shows that had a strong nationalistic flavour with Canadian flags, buttons and shoulder bags was considered detrimental to product sales, particularly in the United States. Firms were of the opinion that Americans want to "do business", and the product and associated services are far more important than the products' origin. Two firms went so far as to state that they would not again participate in this type of show.
- participation in European/Asian missions/trade shows was a disappointment to 2 of the 5 firms that participated, as appropriate people were not met in the foreign countries and no direct sales or distributor contacts were made.

Program for Export Market Development (PEMD)

The assistance provided by the PEMD program was praised by all firms who had utilized the program (11 of 31 firms). The only negative comment was that the "50% of trade show cost" funding offered was in reality 12% as only specific expenses could be claimed.

2.4.6 Debt/Line of Credit

The firms surveyed had little if any debt, primarily because it was not available, and minimal lines of credit. No debt/equity ratio for the small/medium size firms could be calculated for these reasons. The firms' experience with the Canadian banking system is illustrated below:

<u>Activity</u>	<u>No. of Firms</u>
Approached bank for loan/line of credit	21
Rejected	5
Provided, but only with personal guarantee	11
Provided, but required parent firm to co-sign	2



Provided, based on business plan only	1
Provided, based on hi-quality receivables	2

In most cases, the loan amounts were under \$20,000 and secured by computer equipment, and the line of credit was under \$40,000. A number of firms (4) would not approach a bank as they were aware of the necessity of providing personal guarantees. Six firms did not intend to secure loans/lines of credit.

Loans were short term in nature and were repaid as soon as possible by the firm. Lines of credit were not utilized unless absolutely necessary as the firm's financial officer to personally guarantee repayment in most cases.

In most cases, the traditional evaluation criteria were applied by the bank (tangible assets, business plan, cash flow, etc.) and receivables were not recognized. In a few cases, the firm had a close personal working relationship with the bank manager and was able to circumvent these lending restrictions.

The banking community was perceived by the software industry as lacking an understanding of software, the industry and its requirements, and oriented towards providing loans of a personal or large corporate nature.

One firm had the experience of being turned down by every major Canadian bank; and the day after approaching a U.S. bank (the Mellon Bank, an institution well versed in venture capital financing of leading-edge enterprises), receiving a half million dollar loan.



2.4.7 Marketing Expenditure

The funds available for marketing were considered insufficient (marketing effort severely restrained) by seven firms within the sample of 23 firms interviewed on a personal basis and most others (12) stated that they could increase product sales if more market funding were available. The actual percentage of funds expended for the ten firms that were able to provide figures was as follows:

	<u>R & D%</u>	<u>Marketing %</u>	<u>Support %</u>	<u>Admin %</u>
High	80	50	20	20
Low	15	0	10	2
Average	50	32	15	10

Firms, in general, stated that the ratio of R & D to marketing expenditure should be 30/60 with 10% for support/administration, indicating that they recognized the need for marketing funding to be equal or in excess of development funding.

In instances where a product had been developed for under \$100,000 the number of unit sales of the product to reach the "break even" point was minimal. This permitted firms to achieve profitability on local or regional sales and provided funds for an expansion to national or international marketing.

2.4.8 Constraints

In addition to the constraints noted regarding marketing of consumer products, a number of firms commented on constraints originating within Canadian government.



Eight firms were of the opinion that the Government, as the largest single market for their products, should be playing a more active role in the purchase of Canadian software. Firms noted that the Government procurement cycle is lengthy and discourages firms from doing business with the government. Only two firms interviewed were actively marketing to the Federal government, although a number (in excess of five) were marketing to their Provincial government.

They further noted that many government officials perceived Canadian software to be inferior to American software, and expressed this opinion each time an equal or inferior American product was selected over a Canadian product.

Four firms had experienced difficulties including lengthy delays at Canadian Customs with product shipments. These problems appeared to be due to a lack of information/experience on the part of the firm with export regulations, as other firms stated that they had not experienced these problems.

Six other firms commented on the Canada Customs paper burden necessary to ship their product to foreign markets, stating it was excessive, particularly for small businesses.

One firm's president had to personally visit Ottawa Customs headquarters to ensure that his product was correctly categorized for customs duty purposes, and was of the opinion that this trip should not have been necessary.

Firms outside the Ottawa area were not in general aware of the procedures to be followed in marketing to the Federal government (DSS registration) nor did they know who would be responsible in their region for procurement of their product, nor were they able to identify the actual individual who would be the potential user of their product, and for these reasons did not attempt to market to the Federal government.



3.0 ANALYSIS AND CONCLUSIONS

The Canadian software industry, with only a minor portion of its resources directed towards the manufacture of software, is not a typical manufacturing industry and does not require the same assistance provided the more traditional manufacturing firms. The Canadian software industry requires assistance for the aspects of R & D and distribution (marketing), and not for the manufacturing process.

This section of the report identifies the categories of assistance required based upon the observations made during the course of the study for the aspects of software development assistance and software marketing assistance.

3.1 Software Development Assistance

3.1.1 Development Trends

The observed preference of firms to acquire and modify existing products or develop products on a custom contract basis, retaining product marketing rights rather than internally developing their products from scratch will reduce the resource (staff and funding) requirements for development and thus the risk. The overall effect will likely be a more stable software industry.

This approach, however, does not apply to new technology software development as products are not available to acquire/modify and private industry will rarely contract for leading-edge (unproven) custom software development work.

These facts lead to the conclusion that there is a role the government can play in the development process and that role is the financing of new technology (recent, leading edge or innovative) software development through both the procurement process and the provision of grants.

As software that requires in excess of two years to develop has a high risk of obsolescence prior to release, any development funding should be limited to a maximum of two years.



3.1.2 Development Resources

Based on the representative cross-section of firms studied, development resources are sufficient:

- Canada has the technical resources available to support software product development,
- Canadian firms have access to sufficient technical information to support their software development projects, and
- Alliances and associations are not in general important in the software development process.

3.1.3 Development Financing

Equity capital, in excess of one million dollars, is required to develop a leading-edge or hi-tech product. Approximately 15% of Canadian venture capital is invested in Canadian firms during their start-up period, and this level of investment will only finance a few software development organizations. There is thus a definite requirement for other forms of equity capital including government grants and incentives to adequately finance new-technology development projects in Canada.

The more traditional software does not, in general, require an investment exceeding \$100,000 and can be financed by owners and partners in combination with revenue from consulting or contracting work. Thus, government financial assistance to these firms is not as essential.

Government programs in general appear at this time to be providing the equity capital to the appropriate firms (new technology firms requiring over a million dollars of "seed" money) but there is a need for a larger pool of funds.

One of the methods of increasing the available funds is the contracting-out of custom development projects required by government, particularly if the results will be a marketable product.



Grant type funding should be provided for the duration of product development, provided the firm's business plan indicates that the product will be developed within a two year timeframe. Grants should be provided to firms developing products that have true market potential. (An evaluation of the true market potential of a firm's product will require market data and a degree of market analysis expertise). In addition these firms should be capable to demonstrating their "commercial viability". These criteria will reduce, but not eliminate, the chance that funds will be provided to unsuccessful firms.

As the firms applying for grants in support of development are the larger ones (15 to 20 staff), any government accounting/reporting requirements associated with the grants should not pose a burden to these firms as they should have sufficient administrative resources and expertise.

It is noted, however, that the government should take steps to make information on federal government programs more accessible to the software industry.



3.2 Software Marketing Assistance

3.2.1 Advertising

Smaller Firms (Capitalized with less than \$100,000)

Media advertising is not critical to the success of the products produced by small Canadian firms as the business market rather than the consumer market is the target. However, the potential for success of these smaller firms is increased if they are able to utilize manufacturers, distributors and value added retailers to advertise and market their products.

Medium Sized Firms (Capitalized with more than \$1 Million)

Media advertising assists the sale of the product by providing the firm with a higher profile in the business community as these firms prefer to use their own sales force to market their products.

In conclusion it would appear that direct government assistance for advertising is not required as the smaller firms require minimal media advertising to succeed and the medium sized firms are capable of financing their own advertising campaigns.

3.2.2 Sales Contacts

As a method of distribution for half of the firms surveyed was the use of distributors, manufacturers and value added retailers, any action that increases the opportunity for Canadian software firms to meet these people will have a beneficial effect.

Locating potential distributors for developed products was a primary concern for all firms interviewed. Distributors, whether within Canada, the U.S., or abroad were considered essential by all firms marketing beyond a "local" area. Distributors could be manufacturers of computer hardware, value added retailers (VAR's) or distribution firms (consumer or business oriented). These distributors have to possess specific skills or characteristics that would enable them to effectively market the product. Thus many contacts have to be made to locate a distributor that "fits" the product.



The value of trade show/mission participation in terms of providing an opportunity to make contacts and deals suggests that continued and increased government sponsorship of trade shows/missions would be of value. In addition an emphasis on "business" and not "national aspirations" (flag waving) at trade shows, particularly in the United States, would encourage more software firms to participate.

3.2.3 Information

The marketing information available within the public domain is adequate, and methods of assisting or providing additional information are not required.

3.2.4 Foreign Markets

The primary foreign market is the United States. There are no barriers to this marketplace other than the flow of physical goods across the Canadian border.

Some actions are required to alleviate the problems currently experienced by software firms when moving goods across the border as even minor delays can be critical in this industry.

3.2.5 Canadian Market

The Canadian government, the largest market for software products in Canada, does not buy sufficient Canadian software products. Action is required to facilitate the marketing of Canadian software products to the Canadian government by Canadian software firms. These actions could include changes in procurement policy, reduction in procurement time and information dissemination within the Canadian government itself regarding Canadian software products.



3.2.6 Working Capital

The minimal working capital (2 weeks to three months) and lines of credit (usually \$40,000 or less) coupled with the unavailability of debt capital means that software firms are extremely susceptible to fluctuations in their cash flow.

A firm's failure could be brought about by a relatively brief interruption in cash flow caused by a reduction in sales, late client payments or development expenses that do not result in a saleable product.

Firms do not want debt capital at the marketing stage, preferring equity, however equity cannot be raised in the short timeframe (less than 3 months) available to a firm that has cash flow problems.

Thus measures to provide adequate lines of credit would reduce the possibility of failure due to short-term cash flow problems for software firms.



4.0 STRATEGIES

The expectations of the software industry in Canada as expressed by the firms interviewed are presented in this section of the report. A number of these expectations lie beyond the mandate of the Department and are presented for information purposes only.

Options - Software Development

Continue government funding of software development as funds from company founders/partners augmented by Canadian venture capital is not sufficient.

Target this funding toward the development of new or leading-edge software development, as opposed to traditional software development.

Provide government funds in support of software development directly via grants and venture capital, and indirectly through the government procurement process.

Select funding candidates based on published criteria through evaluation of the candidate's business plan and any other information that indicates the potential for success.

Award funds on an installment basis over the total development period (not to exceed a two year timeframe), with each installment keyed to project progress reports prepared by the funded company, as this method is acceptable to the industry and provides for implementation of the necessary control mechanisms.

Given the technical risk and the market uncertainty involved, view the development of software as a research and development (rather than a manufacturing) process when evaluating funding requests, business plans and project progress reports for funding allocations. The development and use of an evaluation methodology tailored for evaluating R & D oriented firms would be the first step in implementing this strategy.



Improve and modify existing government procurement policies to ensure that Canadian software firms have effective access to custom software development contracts when these contracts could result in a product with market potential.

Improve the dissemination of information regarding the availability, applicability and means of access to Government programs particularly Federal that assist the software industry.

Options - Software Commercialization

Discuss with Government financial institutions methods of ensuring that appropriate lines of credit can be made available to firms in the software industry once these firms have a marketable product.

Continue funding of trade shows and trade missions increasing the availability of funding in order to provide enhanced opportunity for Canadian software firms to form marketing alliances. Investigate methods of increasing the flexibility of this funding.

Strengthen the existing "buy Canadian" policy through increasing government employee awareness of Canadian software products available in the marketplace and the benefits that accrue to the industry through government purchase of these products.

Increase efforts to assist Canadian software producers in the marketing of their products to the government through the provision of information and advice.



APPENDICES



APPENDIX A

DESCRIPTION OF FIRMS INTERVIEWED

These brief descriptions are provided with the intent of illustrating the representative cross-section of firms interviewed in terms of their size, product and marketing approach.



ALIAS RESEARCH INCORPORATED

This firm, located in Toronto, was formed in 1983 and had 1985 sales of approximately one half a million dollars. The staff has increased from twelve one year ago to over forty today.

Product

The sole product is Alias/1 a 3D graphic design system. This product is packaged and sold on a turnkey basis using computer workstations manufactured by Silicon Graphics.

Financing

The two year development of the Alias/1 software was financed with a one and a half million dollar SRTC, one million dollars of venture capital, and the loan of two million dollars of computer hardware by Silicon Graphics.

Marketing

Alias utilize Silicon Graphics to locate prospects in the U.S. and directly market to these firms. Approximately one million dollars was spent marketing the Alias product in its first year of availability.



ALPHATEL VIDEOTEX DIRECTORIES LIMITED

This six year old Edmonton firm currently has a staff of 10. Sales in 1985 were \$600,000.

Products

Current products are based on videotex/videodisc technology and include an electronic directory (CADIS), driver training courses, telidon routines, control systems and interactive exhibits. Consulting in computer use and education/training courses are offered in support of the product line.

Financing

All equity financing has been supplied by the firms partners/associates. Government grant monies from IRDP and SRTC programs (\$150,000) were used to partially finance product development.

Marketing

Direct sales methods are used to market the products in the U.S. and Canada (U.S. rates are relatively minor at this point in time).



ARRIX LOGIC SYSTEMS INCORPORATE)

Arrix, located in Toronto, has been in existence for six years and currently has a staff of six. The 1985 sales were a quarter of a million dollars.

Products

The firms current product is a set of integrated development tools for the IBM-PC workstation that perform functions equivalent to existing IBM mainframe programmer development tools at far less cost.

Financing

All financing during the life of the firm has been from the owner, product sales and consulting. The firm is currently in a deficit position.

Marketing

The product is marketed directly through direct mailing, calls and seminars. Although the industry demonstrates considerable interest in the product sales have not materialized.



CAPA SOFTWARE CORPORATION

This two year old firm, located in Saskatoon, currently has a staff of eight. Sales in 1985 were \$190,000.

Products

The firm produces and markets microcomputer software for small business including vertical market packages for farm accounting and hospitality industries.

Financing

Equity capital of approximately \$1 million was provided by the firms shareholders through a project specific venture capital corporation. Half this capital was directed at research and development, half at marketing.

Marketing

The products are marketed in Canada through extensive advertising and use of Radio Shack/Computerland as product distributors. Direct sales approaches are also performed.



COMPRIS INCORPORATED

Compris, located in Ottawa, was formed in 1977 and currently has a permanent staff of six. The 1985 income of the firm, \$137,000, was derived from consulting work.

Products

The firm produces courseware of an advanced nature based on their own authoring language. This courseware is not based on textbook learning styles. Income from consulting in 1985 was used to rewrite all courseware to operate on IBM-PC microcomputer systems.

Financing

All financing during the firm's existence has been from the shareholders, consulting and courseware sales.

Marketing

All marketing activity has been direct. Sales are made through direct contact, mailings and referrals.



COMPUTER ASSOCIATES LIMITED

This 7 year old Vancouver firm has a staff of 70 (50 programmers/analysts/documentors), and was formerly known as Basic Software Group. Sales figures were not available.

Products

ACPAC, an accounting system, and Easywriter, a word processor, are the two main products of the firm.

Financing

All product development was internally financed by the shareholders/partners. Banks were not approached at any time. Government assistance programs were not investigated or utilized.

Marketing

The products were marketed for a number of years in the United States before being introduced in Canada. Distributors are utilized to market the products to the business community (Computerland, Compuserve) and agreements with Tandy/Radio Shack (OEM) and IUS (publisher) are in effect.



COREL SYSTEMS CORPORATION

Corel, based in Ottawa, was formed in October of 1985. Total sales of seven million dollars have been made since the company's inception. Staff currently total 20.

Products

In order to rapidly enter the growing field of office publishing Corel offers a variety of hardware and software produced by others and enhanced/repackaged by Corel. The product line includes microprocessors, laser printers and office publishing software.

Financing

Venture capital of two to four million dollars was provided by one entrepreneur to finance the company's start-up.

Marketing

Initial marketing has been direct to large clients in Ottawa and Toronto and via a distributor in Montreal.



DATEM LIMITED

This firm, located in Ottawa, has a staff of 12 and approximate 1985 sales of half a million dollars. The firm has been in business for five years and has concentrated on the production of their BITBUS product for the past two years.

Products

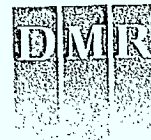
BITBUS is a distributed control network for use in a manufacturing complex. It includes firmware modules (plug-in), host software that communicates to the modules and software development tools.

Financing

The one year development cycle of the BITBUS product was financed internally from revenue obtained from consulting and custom design work.

Marketing

The product is marketed directly and through distributors primarily in Europe.



D.W. ASSOCIATES INCORPORATED

This 5 year old Victoria firm has a staff of 16 and sales in the 1985 year were approximately \$1.8 million.

Products

Current software products include a number of "vertical" market software packages:

- . hospital/medical centre account
- . printer's accounting/inventory/costing
- etc.

The firm is an IBM Value Added Retailer and markets turnkey systems based on IBM hardware and D.W. Associates software.

Financing

The firm was started with \$35,000 in equity seed capital from the founders and has grown at a 60% annual rate, with this growth constrained only by the availability of capital. Loans from the bank based on receivables and hardware inventory have assisted the firm in attaining this growth.

Marketing

Products are marketed solely in B.C., primarily Vancouver, using direct sales techniques including mailings and sales calls.



FULCRUM TECHNOLOGIES INCORPORATED

This firm, based in Ottawa, was formed in 1983 and currently employs 16 staff. The 1985 sales were approximately one million dollars.

Products

Fulcrum developed and market one product, a full-text information retrieval software packages that operates in UNIX and MS-DOS environments.

Financing

The development of the product was financed by the five founders of the company.

Marketing

The product is not marketed to end-users, but to organizations and manufacturers in the U.S. and Canada who will integrate the product within other software products where the ability to manage unstructured text is required.



HOUGHTON-MIFFLIN CANADA LIMITED

This firm, based in Toronto, is a subsidiary of an American firm. They operate independently from their parent organization in terms of software development and marketing. The firm has been developing courseware for four years with a permanent staff of two and two co-op student positions. Sales of courseware in Canada were \$175,000 in 1985.

Products

Sixty different courseware packages are presently marketed to elementary and high schools. The courseware is based on and complements the textbooks marketed by the company.

Financing

The parent firm and book sales finance the development of all courseware.

Marketing

The courseware is marketed by the firm's sales force along with their textbooks to school boards and individual schools throughout Canada.



HUMAN COMPUTING RESOURCES (HCR)

HCR, based in Toronto, is a ten year old firm with a current staff of 40 and 1985 sales of five million dollars. This firm was interviewed to gain an insight into the demise of a packaged software product, Chariot.

Products

The current line of products include an operating system (Unity), a compiler (Pascal), and a productivity tools (Hi) that operate under the Unix operating system. The Chariot product was a Unix based 4th generation language.

Financing

Two million dollars of venture capital was raised to finance the development and marketing of Chariot. A larger than anticipated development time and higher than forecast costs required that a second round of financing be obtained to prepare the product for the market. Based on the projected management time requirements to raise the necessary funds and effectively manage the project, management decided to cancel the Chariot product as there would be insufficient management time available to ensure ongoing operation of the remainder of HCR's business.

Marketing

The planned marketing strategy for Chariot differed from the marketing of the existing product line, as HCR would have had a greater involvement in the marketing effort and sales staff would have been hired for direct sales to key organizations in the U.S. and Canada. Prior to Chariot HCR's marketing strategy was to utilize VAR's and computer manufacturers to perform the primary marketing of their products.



INTERACTIVE TECHNOLOGIES LIMITED

This four year old Toronto firm, in association with International Cinemedia Centre Limited (under the same ownership) had 1985 sales of approximately \$650,000. The firms presently employ a total of seventeen staff.

Products

The firms specialize in research concerning new applications of technology in the education and training fields and produce courseware that incorporates video/film and laser disk technologies with computer assisted learning.

Courses - english, accounting, CAD, geometry, history, etc

Training - IBM-PC, EMAIL, VisiCalc, Wordstar, etc.

Financing

The company is internally financed from revenues and is wholly owned by the founder. Major contracts with the Ontario Ministry of Education provide a significant portion of current revenue.

Marketing

The products are directly marketed, primarily in Ontario but also in the United States, by the company President (founder).



LOGICWARE INCORPORATED

Logicware, based in Toronto, is a subsidiary of G&B Automated Equipment Limited, and was formed in late 1983. The firm currently has a staff of 30 in three locations (Toronto, Boston, Orange County, Calif.) and had annual sales in 1985 of approximately one million dollars.

Products

MPROLOG, an advanced implementation of the logic programming language PROLOG is the firm's current software offering. MPROLOG is suited for expert systems and other applications of artificial intelligence. Logicware also offer scheduled courses and consultations in support of their product.

Financing

The parent company provided the funds for the development of the MPROLOG product and initial marketing effort.

Marketing

The MPROLOG product is marketed in the United States directly by Logicware through seminars and hi-profile advertising and worldwide through distribution agreements with a dozen firms.



MICROBYTE RESEARCH INCORPORATED

This three year old Toronto firm has 4 employees. Sales in 1985 were \$150,000.

Products

The firm provides turnkey multi-user system software, performs custom design of boards, software and firmware, and offers accounting and pharmacy packages.

Financing

The firm has been financed through revenues from consulting and sale of turnkey systems.

Marketing

All marketing activity is direct within the Toronto area.



MINDFLIGHT TECHNOLOGY INCORPORATED

This three year old firm with a total staff of 25 has its marketing organization located in Toronto and its development staff in Dunnville, Ontario. Sales for the 1985 year were over one million dollars.

Products

Mindflight currently market a variety of products including educational software at the primary level, voice based learning systems, and a number of system communication software products.

Financing

Initial funding for the firm was provided by the NEXA corporation, company principals, SRTC, and FBDB venture capital.

Marketing

The current marketing strategy is to distribute the products by joint venture marketing arrangement. The firm does not market the product itself but seeks qualified joint venture partners. Products are currently marketed in the U.S., Japan and Europe as well as in Canada.

Mindflight developed a software product to operate on the DBM-PC for the consumer market but discovered after research and development were complete that the marketplace would not accept the product as it would not run concurrently with other IBM-PC products in "background" mode. A competitor's product with similar functionality, introduced a year later (Sidekick) has had wide market acceptance.



MYSTIC DEVELOPMENTS LIMITED

This two year old Saskatoon firm has a current staff of seven. Sales in 1985 were \$157,000.

Products

The firm produces and markets an IBM-XT "clone" microcomputer system. The "clone" incorporates hardware, firmware and software developed over a two year period in Saskatoon. Assembly, testing and packaging of the components is performed by the company.

Financing

The development of the product was financed by the firm's owners along with a \$20,000 bank loan.

Marketing

Direct marketing of the product to small businesses in Saskatoon and the rest of the province is used to sell the microcomputer system.



NOVATRON CORPORATION

This Halifax firm founded in 1976 had 1985 sales of \$1.5 million. Current staff number is 23. The firm has branch offices in Toronto, Calgary and Victoria the present time.

Products

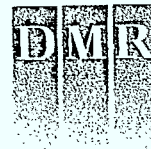
The firm, originally in the business of package software development/marketing has evolved into a provider of information. They currently offer electronic information retrieval of "strategic" information (e.g. electronic catalogues), based on software developed over the past three years.

Financing

Equity financing was obtained from shareholders, venture capital (tax sheltered limited partnerships), and government grants (SRTC and DRIE applied research). A total of approximately \$4 million has been invested to this point in time.

Marketing

The product, as sales are in the \$100,000 range, is marketed directly by the firm. At the present time only the Canadian market has been addressed.



NEXA CORPORATION

Nexa corporation is a management and investment company specializing in starting, acquiring and developing information technology companies. At the present time, NEXA controls nine subsidiary companies. The total staff of NEXA and its subsidiary companies is 70. Sales in 1985 totaled eleven million dollars.

Products

Current products are either turnkey, artificial intelligence products or off the shelf products such as RAMIS II software.

Financing and Marketing

Nexa offers financial, marketing and administrative expertise to complement the development organizations that it acquires. Financing is through venture capital and marketing in Canada and the U.S. is primarily direct as each sale is of the \$100,000 variety.



PELADA INFORMATICA INCORPORATED

This three year old firm had 1985 sales of just under one million dollars. The seven staff are located in Ottawa. The firm commenced operation as a consulting-custom software operation and recently focused on the word processing niche.

Products

The firm markets a bilingual word processing software package.

Financing

One million dollars in venture capital financed the company start-up. An additional \$600,000 was obtained through an SRTC.

Marketing

Direct marketing techniques are employed with an emphasis on the Ottawa/Toronto/Montreal triangle and sales of multiple copies of software.



PETTITT-LAWRENCE LIMITED

This fifteen year old Toronto engineering firm has developed, over the past four years, software to assist in the drafting process and now markets this software. The firm employs 6 staff and had 1985 sales of over a quarter of a million dollars.

Products

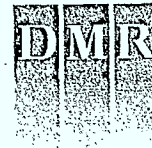
Half of the firms revenue is derived from traditional drafting services, the other half from the sales of their computer assisted drafting product Steelcad II which is sold as a turnkey system operating on an IBM-PC.

Financing

The company is internally financed through sales of drafting services and their software product. No financing was involved in the development of the Steelcad II product as this product was developed by one individual over a two-year period while unemployed.

Marketing

The Steelcad II product is directly marketed to engineering firms in Canada and the United States by Pettitt-Lawrence and through a distributor of engineering software in the U.S.



QUANTIC LABORATORIES LIMITED

This one year old Winnipeg firm has a staff of eight and sales during the first year of the company's existence were \$120,000.

Products

The firm was formed to complete the development of a unique product-an Electric Field Solver package, and market this product to the engineering community. Basic research for the product had taken place at the University of Manitoba over the previous twelve years.

Financing

The development of the product was financed by University of Manitoba grants, SRTC's, and sales of early product versions. The total development expenditure of approximately \$250,000 would have been in the millions of dollars if this R & D had been performed in a business rather than a university environment.

Marketing activity is performed by the firm's founder/president to major firms (Intel, Craig, Rayethon etc.) in the United States and Europe. Marketing has been assisted by hi-profile magazine articles concerning the product.



SOFTKEY SOFTWARE PRODUCTS INCORPORATED

This three year old Toronto firm has a staff of eight and utilizes a number of contracted resources (4) to assist with development. Total 1985 sales were \$600,000.

Products

Keychart, a graphics package, was the firms first product with approximately 20,000 copies sold to date. Other products of a related nature are in development or have been released and include Keymailer, Keylibrarian and others.

Financing

The firm financed the development and marketing of their Keychart product with funds from the founding members and venture capital. Although the firm is now profitable more capital is required to effectively market new products and for this reason the firm intends to go public through a share issue.

Marketing

The Keychart product is marketed through alliances with other vendors who include Keychart in their offerings and directly by mail to customers who learn of the product through press releases. The primary market is the United States.



SOFTWARES/PRESS PORCPIC INCORPORATED

This Victoria publishing firm, founded in 1975 began developing and marketing software in 1982 and in 1985 software sales accounted for 80% of the firm's \$1 million in revenues.

Products

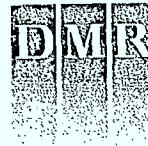
Courseware, videodisc, graphics and other related educational material make up the current software product line. The firm also markets educational products produced by others.

Financing

The firm's two principals provided all equity financing, and loans were obtained from banks (based on equipment assets), the Federal Government (IRDP) and the B.C. Government to assist in the firm's growth.

Marketing

Direct marketing by the firm's principals is the sole marketing method. Marketing is primarily in Canada (80% of the firms revenue is derived from government sources) but the U.S. and overseas (Japan, China, England and France) markets do account for a small portion of sales.



SOFTQUAD INCORPORATED

This two year old firm, located in Toronto, has a current staff of fifteen permanent and eight part-time employees. At this point in time the firm has sold approximately \$100,000 of their product and anticipate becoming profitable by the end of 1986.

Product

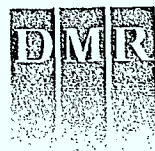
Their product is in-house publishing software that was developed based on an existing 10 year old AT&T product.

Financing

Total financing to develop the product and perform initial marketing was three quarters of a million dollars. These monies were obtained from the company principals, associates and venture capitalists.

Marketing

This product is being directly marketed to the 360,000 organizations that utilize the 10 year old AT&T product.



SYSTEMS INTERFACE LIMITED

This six year old Ottawa firm has a staff of sixteen. Sales in 1985 were approximately one-half a million dollars.

Products

The firms revenues are obtained through consulting and the sale of a number of software products including security control, communications and protocol emulation packages.

Financing

All financing for the operation of the firm has been provided by the founders and revenue from consulting services and products.

Marketing

Systems Interface is allied with a number of hardware vendors, and the sales representatives of these vendors identify prospective clients for the software packages produced by Systems Interface. The target market in the U.S. fortune 500 companies.



TECHNETRONIC INCORPORATED

This seven year old Ottawa firm with 1985 sales of approximately one million dollars has a staff of twenty-five.

Product

EXPLICIT, capacity planning and performance measurement software for IBM mainframes that operates on an IBM AT or XT is the sole offering of the firm.

Financing

The firm has been financed through a number of infusions of capital since its inception. Venture capital was obtained in 1981 and 1983 and SRTC financing in 1984. The company has used its existing capital to upgrade its product and expects to become profitable in 1986.

Marketing

The product is marketed directly in the U.S. by a wholly owned subsidiary set up for this purpose.



TRICORE SYSTEMS AND CONSULTING LIMITED

This nine year old Toronto firm has a current staff of sixteen. Sales in 1985 were approximately one million dollars.

Products

The firm offers two in-house developed packages, VESTLAW a legal package and PERSONNEL a personnel placement agency package. In addition the firm distributes software products produced outside the firm in the personnel and legal marketplace.

Financing

The development of the firms products was financed from consulting and custom development revenues.

Marketing

The products have been sold (3 copies of each) only in the Toronto area. Direct marketing outside of Toronto through legal association trade shows has yet to produce clients.



VERSATERM SYSTEMS LIMITED

This nine year old firm located in Ottawa currently has a staff of 11 down from 15 last year. 1985 sales were approximately \$800,000.

Products

The firm offers three major product packages. Vital, an applications development tool, an X.25 communications utility and public safety (police/fire) applications.

Financing and Marketing

Initial development of the products was financed from general consulting revenues and custom development of prototype products with retention of marketing rights.

A decision has been made to concentrate on marketing the public safety applications, using the monies from the sale of the other two product lines to finance marketing/development activities.



XICOM TECHNOLOGIES CORPORATION

Located in Ottawa, this five year old firm has 20 employees. The 1985 sales were approximately one and a half million dollars.

Products

The firm markets a communications software package that provides emulation of IBM SNA communications.

Financing

The five year development of the product was financed at first by the founders and Comterm, later through a change in ownership, and recently from payments made by American companies for future product licencing rights.

Marketing

The emulation software has been licenced for use in SNA gateways (software and board combination) produced by a number of companies. It is currently marketed by a distributor in the United States and by XICOM in Canada.



YORK CENTRAL HEALTH SERVICES INCORPORATED

This 7 year old firm, located in the northern Toronto area, has fifteen employees and had one and a quarter million dollars in sales of products and services in 1985. The firm is wholly owned by York Central Hospital.

Products

The firm has an existing client base of a dozen hospitals across Canada utilizing York's Patient Care System on large mainframe computers. The firm maintains this installed base.

Recently developed microcomputer products including a Client Tracking system for Doctor's offices and a Scheduling System for business offices are presently being offered.

Financing

The firm was established by York Central Hospital and fully funded by the hospital through payments made to support the installed Patient Care System. The revenues obtained from installing and supporting other Patient Care Systems has provided the funding for the development of the microcomputer software products.

Marketing

The firm is in the process of determining how to best market their microcomputer software. Initial turnkey systems have been sold on a direct basis within the Toronto area.



APPENDIX B

SUGGESTED SOFTWARE FIRM

EVALUATION CRITERIA



SUGGESTED SOFTWARE FIRM EVALUATION CRITERIA

Evaluation of a firm's chances for success can be made using the criteria that follow.

Review of the four categories of firms described on the following page suggests that "business" firms be targetted for assistance programs.

Review of the "Success" criteria indicates that these firm's chances for success can be evaluated using standard small business evaluation provided the research and development orientation is recognized when reviewing the balance sheet.



OBSERVED
CATEGORIES OF FIRMS

• **STABLE**

- slow to no growth staff/sales
- proven products
- close customer relationships
- full service provider

• **MARKETING**

- emphasis on marketing a product
- rapid growth in sales
- product is "assembled" and sold
- attractive to investors

• **DEVELOPMENT**

- creative personnel
- emphasis on developing a perfect product
- minimal knowledge of marketing

• **BUSINESS**

- blend of business skills
- emphasis 60% marketing/40% development
- access to funding
- controlled growth



Observed Success Criteria

Essential

1. Expertise in managing and financing a business in addition to marketing and product development knowledge.
2. A product that is targeted to an identified market niche.
3. Availability of adequate financing for both product development and product marketing.

Desirable

1. Alliances with manufacturers or VAR's.
2. An intimate knowledge of the target industry if a vertical market is being addressed.
3. Competence in development project control.
4. A sound business plan including a marketing component assembled in a professional manner.
5. Effective administration.
6. Contacts - bank, venture capitalists.
7. Awareness of applicable government programs.



Desirable (Cont'd)

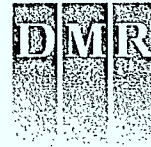
8. Use of market research, professionals, material, etc.
10. Use of distributors for the product.
11. Good "image".
12. Use of available free publicity.
13. Prior experience, business maturity.
14. Rapid move to market product when the first release is ready.



Summary of "Problem" Criteria

1. Lack of a product niche.
2. A wide range of products that are not targeted toward a common market.
3. Targeting too large a market.
4. High expenditure on product development relative to product marketing.
5. Administrative problems including high number of outstanding receivables.
6. Lack of a marketing plan.
7. Product in development for an excessive timeframe (over 2 years).
8. High technical expertise, low marketing expertise.
9. Failure to create an image for the company.
10. Large marketing expenditures prior to any product sales.

NOTES: Engineering oriented firms will be more "technically oriented" than the average. this is acceptable.



APPENDIX C

SOFTWARE CATEGORY DEFINITION



SOFTWARE CATEGORY DEFINITION

Systems Software

The basic software required to operate a computer system.

- Operating Systems
- Telecommunications/Network Management
- Data and Terminal Access
- Installation Management

Business Management Software

Software in the form of applications packages designed to perform specific business functions.

INDUSTRY SPECIFIC

- Arts
- Banking/Finance
- Engineering
- Scientific
- Insurance
- Real Estate
- Legal
- Legal
- Medical & Health Care
- Publishing
- Etc.



SOFTWARE CATEGORY DEFINITION (Cont'd)

INDUSTRY NON-SPECIFIC

- Accounting/Financial
- Payroll
- Personnel
- Sales/Distribution
- Inventory
- Office Automation Components
- Etc.

Automation Software

Specialized software used in conjunction with automated equipment for real-time process control, design, assembly, etc.

- CAD/CAM
- Process Control
- Robotics

Application Development Software

Software utilized to develop applications systems.

- Languages
 - programming aids
 - dictionaries
 - database

Education Software

Software designed to teach or train an individual.

- Computer Learning
- Expert Systems
- Computer Based Training (CBT)

Entertainment Software

Software with a primary emphasis on leisure activity.

- video games



APPENDIX D

LIST OF DOCUMENTATION REVIEWED

DOCUMENTATION REVIEWED



<u>Document Title</u>	<u>Source</u>	<u>Date</u>
Study of the Financing Problems of the Cultural Industries of Canada	Woods Gordon	
The Canadian Software Industry Opportunities and Challenges	DOC	1986 Feb
Étude des Opportunités et de la Stratégie de Développement dans l'Industrie du Logiciel au Québec	SECOR	1985 Mar
An Overview of the Canadian Software Industry	Evans	1983 Sept
Software - An Emerging Industry Study Done for DRIE	WESCOM	1985 Feb
Comité Canada - L'Industrie Québécoise du Logiciel: Problématique et Options Stratégiques	CEGIR	
Annual Report 1986 - 87 Estimates Culture and Communications Publication	DOC	
Venture Capital Journal	Venture Economics Canada Ltd.	1985 Dec
Towards a National Policy for a CAL Industry	NRC	1984 May
Proposed Classification Structure for the Computer Services Sector	Laurier Group	1986 June



APPENDIX E

PERCEPTION OF THE SOFTWARE INDUSTRY



This appendice lists thirty statements extracted from the literature reviewed (Appendix D) and categorizes these statements based on the observations made during the course of the study. The intention of this appendice is to highlight some misconceptions concerning the software industry in Canada.

A "yes" or "correct" indicates that the survey results support the statement.



1. **The growth market for software is the U.S.**
Yes
2. **Marketing skills are required to be successful in the commercialization of a software product.**
Yes
3. **Few government programs are specifically designed to aid the software industry.**
Yes
4. **Canadian firms to succeed must have a market niche.**
Yes
5. **The Canadian software industry is a cottage industry made up primarily of companies having 10 employees or less.**

All firms studied were of a small business nature, even though some had annual sales barely in excess of \$100,000. An individual person can write software and can sell this software to a limited set of clientele. As an example, a software package to support dental accounting or inventory could be written by one person in less than a year and could be installed in a dental office in a month or two by this individual. The marketplace for this product will most likely be local in nature, usually restricted to the city where the individual resides. This example of a "cottage" industry suggests that firms of less than 5 individuals, who may indeed be very numerous, are in reality consultants who have a product offering in addition to their consulting skills. The more successful of these consultants will build their customer base, hire more staff to service these customers and expand their area of operation. At this point, they will require an office, perhaps additional funding, etc., and they have become a true software business entity.



Other individuals who just "dabble" in software development of an uncontracted nature are more akin to inventors than the typical cottage industry individual.

The numbers of "consultants" or "inventors" involved on an individual basis with software development will rapidly decrease as:

- buyer sophistication is increasing with a recognition that support sources and a "big business" guarantee are necessary to ensure ongoing product operation,
- product development resource requirements (equipment and technical knowledge in particular) are increasing as products become more complex, and
- there is a trend towards related/compatible products in the marketplace.

Thus while there may be a "cottage" industry producing some software products at the present time, this industry is not viable and will rapidly decrease in size. The small businesses producing software however, are well positioned to meet the changing market conditions and will survive.

6. Canadian consumers perceive Canadian products to be inferior unless tested/recognized in the U.S.

Yes

7. The cost of software development may be only 20% of the cost of commercializing software.

Yes

8. Canadian software developers continually experience difficulty in financing their endeavours.

Yes



9. **Bankers do not consider software to be satisfactory collateral for loans, it is not tangible.**

Correct

10. **Canadian software firms lack adequate marketing knowledge and skills.**

Only the smaller software firms lack marketing skills. Once a firm exceeds 20 employees, its infrastructure includes administration, finance and marketing skills. The reason the smaller firms lack marketing skills is that they evolved from small consulting firms who dealt with a very limited marketplace to sell their products, and were not required to develop marketing skills to survive. Once a small firm reaches the stage of its evolution where sales must be made in a much broader marketplace, they acquire (hire or learn) marketing skills or they do not succeed.

11. **Small software firms are often comprised of highly technical people that are product oriented.**

Yes

12. **A shortage of technical programmers and analysts is being experienced among Canadian software companies.**

Only one firm indicated that there was any problem in obtaining staff with the necessary technical skills. In this case, a blend of very specific skills that could only be acquired by experience was required and the field was so recent there were few of these individuals available.

13. **National borders are not as significant in the software industry as they may be in other industries.**

Yes

14. **Software vendors are more frequently specializing in industry specific software (vertical markets).**

Yes



15. Software vendors are looking to hardware manufacturers to aid in advertising, support and distribution.

Yes

16. The fact that the Canadian software industry is primarily a cottage industry should have no bearing in the viability of exporting software.

Yes

17. Canadian software exporters experience difficulty in obtaining critical market research information for the remote markets they wish to reach.

All firms indicated that sufficient market information was available for Canadian, American and foreign markets.

18. The estimated life cycle of a software product can be as short as six months.

No firm will develop a product if its anticipated life is only six months. A version of a product could possibly have a life of only six months. An average two year product life would be a better estimate, based on the firms surveyed.

19. Canada, unlike many other industrialized companies, does not have an overall coordinated industrial program to stimulate the microelectric industry (i.e. AI in Japan, etc.).

Correct

20. Computer Assisted Learning (CAL) is now a very small, endangered industry in Canada.

Yes

21. Government grants are given to producers not marketers.

Yes



22. Software writing more resembles the process of creation in the arts rather than engineering. It doesn't follow the normal rules governing other production processes.

Yes

23. The government tax structure is more appropriate to the traditional manufacturing industry than the software industry.

Yes

24. The content based applications software (Educational and Entertainment) represents cultural software.

Only if the content is truly cultural. Much educational and entertainment software has no inherent cultural content. In actual fact, any software product could be used for cultural related purposes. As an example, videodisc data storage and access software could be used to store/retrieve Canadian history, news, city street information, etc. The important point is that the software itself is merely the framework, it is the data or content and the purpose or use of the software which provide the cultural aspects.

25. Venture capital in Canada is only invested in relatively secure organizations with a variety of projects/products to minimize risk.

Yes

26. A substantial number of developers are still attempting to take the product all the way to the market themselves.

Yes

27. With few exceptions, Canadian software vendors have relied extensively on the domestic market, and have made little determined effort to penetrate the U.S. market.

The study results indicated that the U.S. is the preferred target market, and only a small minority of firms studied (those whose markets were very local in nature) relied exclusively on the Canadian market.



28. **Canadian software developers believe that their product must achieve success in the domestic market before it can succeed abroad.**

In fact, the reverse is true, particularly when selling to the Canadian government. Products that have been accepted in the U.S. are more readily accepted in Canada.

29. **Small and medium size Canadian software firms tend to be chronically under capitalized.**

Yes

30. **One of the major problems is access to Canadian venture capital.**

Yes



APPENDIX F

GOVERNMENT POLICY IN OTHER COUNTRIES
REGARDING SOFTWARE DEVELOPMENT



GOVERNMENT SOFTWARE SUPPORT

United Kingdom

In the United Kingdom, the government Trade and Industry Department provides financial support for the development phase of new software products. Focus is given to "software engineering" products that promote or enhance productivity improvements. Direct grants totalling up to \$80M have been allocated since 1982.

Support of a marketing nature is provided by the British Overseas Trade Board which provides loans and grants towards the setting up of subsidiaries in the United States, for market research, and in support of product exhibits. Up to \$9M has been provided in these programs in 1984/85. However, these initiatives are not restricted to the software or information technology business. Export IT, a non-government body, assists member companies in setting up overseas exhibits, developing distribution channels, and locating and monitoring overseas agents. Export IT is funded by member companies and is non-profit making.

The following sections summarize the three programs.

A. Department of Trade and Industry

- "Support for Software Products"
 - . Has been running since 1972, revamped in 1982.
 - . Emphasis on products that support or use "software engineering".
 - . Support takes form of a grant (not a loan) of up to 25% of cost of development of a product; can include some marketing costs up to time of product launch.
 - . Assessment criteria:
 - . should increase UK international competitiveness,
 - . enhance other areas of industrial productivity,
 - . should enhance productivity of the user, and
 - . should use resources efficiently.
 - . Since 1982, the program has provided 40M pounds (about C\$80M).



B. British Overseas Trade Board

a) Market Entry Guarantee Scheme

- . Provides loans up to 300,000 pounds for setting up a US subsidiary; 50% of cost of office accommodation, training, etc.
- . Program has run out of money - this year's commitment fully taken up.
- . Amount funded in this program:
 - 84/85 - 1.6M pounds (C\$3.2M)
 - 85/86 - 2.3M pounds (C\$4.6).

b) Export Market Research Scheme

- . This is a grant to allow a company to do market research.
- . Grants are for 40K pounds per company per year (up to two market research projects).
- . Amount funded:
 - 84/85 - 2.8M pounds (C\$5.6M)
 - 85/86 - 3.0M pounds (C\$6.0M)

c) Exhibit Scheme

- . This provides a 200 pound (C\$400) grant to cover air fare to attend a trade fair.

C. Export IT

- . This body was originally sponsored by the Government; now non-profit making and funded by member companies.
- . Companies pay 250 pounds (C\$500) per year membership; they have 200 member companies.



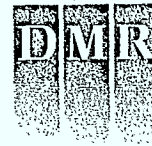
Two programs:

1. Exhibitions

- . Export IT help companies and organize their exhibit
- . Actual subsidy comes from British Trade Board.

2. Distribution

- . Export IT have staff who will locate a local distribution agent.
- . Aimed at helping small software companies obtain a foothold in United States.
- . Export IT will monitor the agents performance.
- . Charge is a flat rate fee plus commission on sales.



GOVERNMENT SOFTWARE SUPPORT

Australia

In Australia, there are four methods by which the government assists the software industry. Only one of these methods, the tariff policy, is directed specifically at the software industry. The four policies described below are implemented under the Department of Industry, Technology and Commerce.

A. Research and Development Incentives Scheme

This scheme provides 150% tax concession for eligible research and development and relates to existing profitable companies. Software development qualifies as research and development if the products are for multiple sale to multiple clients. The assistance operates from conceptual design to beta test phase.

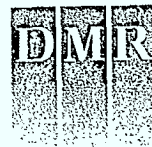
B. Grants for Industry Research and Development

These grants apply to companies in the "start-up" stage and provide up to 50% of the research and development costs, as long as companies spend at least \$50,000 annually on in-house research and development. A sliding scale of payments is applied for expenditures between \$20,000 and \$50,000 (Australia dollars). Grants are payable for a maximum period of three years. Computer software is eligible under criteria stated in "A" above.

C. Offsets Purchasing Policy

All government departments, most statutory authorities and some companies with Australian government bestowed protective advantage, must negotiate offsets on all large purchases with high import components, including computer and software. These offsets apply under the following conditions:

- . import content is greater than 30% of the purchase price
- . the value of one purchase is greater than \$2.5 million (Australian), or orders to this value are accumulated in one financial year.



Offsets can take the form of local hardware or software development funded by the selling company. A formula is used to calculate the value of the offset required and companies are allowed to build credits from which future offsets may be deducted. The formula may also be altered online with economic circumstances.

D. Tariff Policy

Computer software imported on media is duty free. Local producers of software are however eligible for a bounty of up to 25% of the value added. Bounties are paid on all production whether for domestic or export sale.



APPENDIX G

GLOSSARY OF TERMS



GLOSSARY OF TERMS

This glossary is included to explain the intent of terms used within the document.

Software (Package vvs Custom)

Package software is developed with the intent of marketing the software to a number of different organizations, while custom software is usually developed for one specific organization. Package software is usually financed by the firm developing the software, while custom software is normally developed on a contract basis. In many instances the marketing rights to custom software are retained by the developing firm and a version of this software is packaged and marketed to other organizations.

Development (Traditional vvs Leading Edge)

Leading-edge software development is development of software using recently developed tools and techniques for automating manual processes. At the present time artificial intelligence, some forms of computer assisted learning, and the use of recently developed technology (laser disk, CDROM) are regarded as leading-edge. Traditional software is software developed with well known tools and techniques, and includes software developed in traditional languages (Cobol, Fortran, etc) and fourth generation languages (Focus).

Industry (Manufacturing vvs R & D)

The major expenditures within a manufacturing industry are for the manufacture/assembly of a product. In an R & D industry, such as the software development industry, the major expenditure is for research and development to create a product that will be marketed. The intangible nature of the product while it is in the development stage (ideas, non-working code) versus the tangible assets of the manufacturing process (subassemblies, inventory) differentiate the software industry from other manufacturing industries.



GLOSSARY OF TERMS
(cont'd)

Time Factor

The term time factor has been utilized in this document to refer to the length of time required to develop a software product to the stage where it is a marketable commodity.

Software (System vvs Application)

System software is the software that is essential to the basic operation of a computer system. Application software is software that operates in conjunction with the system software to automate a particular function (i.e. accounting, payroll, training).

