Industry, Science and Technology Canada

Information Technologies Industry Branch

A Competitive Assessment Of The Canadian Software Products Industry

October, 1991

The Coopers & Lybrand Consulting Group

INDUSTRY, SCIENCE AND TECHNOLOGY CANADA INFORMATION TECHNOLOGIES INDUSTRY BRANCH

A COMPETITIVE ASSESSMENT OF THE CANADIAN SOFTWARE PRODUCTS INDUSTRY

October, 1991

Submitted to: **Ms. Renata Borysewicz**
Senior Commerce Officer

Submitted by: **Erik Rule**
Brett Knowles

C&L

TABLE OF CONTENTS

LIST OF APPENDICES

EXECUTIVE SUMMARY

Overview of this Project

Industry, Science and Technology Canada (ISTC) has identified a number of sectors in the Canadian economy which show high potential for growth and development. The software products sector is one of those sectors. ISTC is sponsoring several initiatives to better understand the industry and to identify effective Government and industry initiatives to strengthen the sector's competitiveness.

This project, A Competitive Assessment of the Canadian and U.S. Software Products Industry, was undertaken in order to establish a better understanding of the strengths and weaknesses of the Canadian software products industry in the global marketplace. The U.S. software products industry was used as the basis for comparison because of its dominant role in the industry.

This analysis was completed using three techniques; analysis of "shelf data" available on the industry in Canada, the U.S. and selected foreign countries, quantitative questionnaires sent to a representative sample of successful Canadian and U.S. software products companies and, lastly, a series of personal interviews with American and Canadian software products companies.

The study was conducted by The Coopers & Lybrand Consulting Group. The project team was guided by a Special Advisory Panel (see Appendix II) comprised of Canadian software products industry leaders and experts.

Summary of Findings

Our analysis identified eight factors critical to success in the software products industry. These factors represent dimensions of the business on which companies can compete. Competitors allocate resources around different factors in an attempt to achieve performance leadership over their rivals. The eight factors are:

- Adequate capital financing.
- Management competency.
- Human resource competency.
- Effective product development and quality.
- Superior customer service.
- Effective marketing and distribution.
- Focused competitive strategy.
- Strategic alliances and relationships.

Canadian software products companies appear to compare favourably to firms in the U.S. on a number of these factors including product development and

quality, focused competitive strategy and superior customer service.

In other areas, we believe Canadian software products companies are at a competitive disadvantage. These include adequate capital financing, management competency, effective marketing and distribution, and strategic alliances and relationships.

The competitiveness gaps observed fit into three general categories:

Competitiveness gaps we can control

These are gaps generally caused by or influenced by government policy and legislation.

Competitiveness gaps caused by a lack of skills and techniques

These are gaps which would be narrowed if Canadian management approaches were better developed or more consistent with U.S. techniques. Strengthening these areas will call for management development through networking, education and example.

Competitiveness gaps due to weak industry structure

These gaps are caused by major environmental differences between Canada and the U.S. These gaps can only be closed within Canada through major investment and time. In most cases, a more cost-effective solution may be to develop stronger, more integrated relationships with the U.S. software/hardware industry.

Overall, the Canadian software products industry is well-positioned for rapid growth once the identified impediments to competitiveness are dealt with.

The Way Forward

There are a variety of initiatives available to the industry, associations and government to assist in enhancing the software industry's competitiveness. The Advisory Panel will need to decide on what is an appropriate level of intervention in the industry, drawing upon these initiatives.

Based on our understanding of the industry, associations and ISTC, we have developed our own set of assumptions about their likely involvement, and from there, identified three groups of initiatives to strengthen the industry's competitiveness. These are:

Group I - Rectify Competitive Disadvantages Caused by Government Policies

A number of competitive disadvantages can be removed by changing current government legislation, policies and administrative guidelines. For example, relaxing immigration guidelines for skilled software marketing personnel or easing the liability exposure for Boards of Directors.

Group II - Support the Industry's Core Competencies

This group of initiatives focuses on closing a number of critical competitiveness gaps that are indigenous to the industry. These include management competency and strategic alliances and relationships. In addition, we believe that further strengthening human resource competencies should also be considered as part of this group of initiatives.

Group III - Stimulate Industry Expansion

These initiatives call for more aggressive intervention in the industry to stimulate rapid expansion.

Government and industry initiatives encompassed in this group include efforts to support global market expansion, more aggressive and effective marketing and distribution for existing products, and support for new product development following initial beta site testing.

1.
THIS STUDY SEEKS TO STRENGTHEN COMPETITIVENESS IN THE SOFTWARE PRODUCTS INDUSTRY

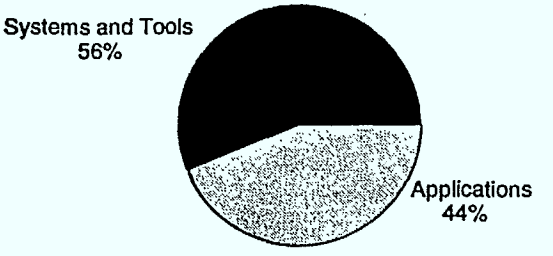
The software products industry is in its infancy. For all practical purposes, the industry started in the mid-1960's with the introduction of the IBM 360 series of computers and IBM's associated unbundling of software and services. This event was reinforced by the hardware focus of Digital Equipment Corporation, which encouraged the emergence of independent software suppliers and OEM's, and more recently by the personal computer revolution.

Software products, as defined by Industry, Science and Technology Canada (ISTC) are "*standard software products designed to serve as operating systems, user tools or end-user applications*". These are products which are not, by design, modified or custom-coded for each installation.

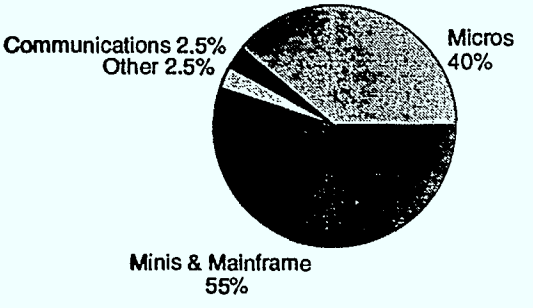
Global sales of software products were estimated at about $60 billion (U.S.) in 1989. Approximately 60%, or $36 billion, of those sales were in North America (27% Western Europe, 5% Japan and 8% the rest of the world).

Canada is a small but viable player in the software products industry. Canadian domestic demand is currently estimated at about $1.5 billion (Canadian). The profile of the Canadian software product industry as of 1988 (Statistics Canada's most recent data) is as follows:

SOFTWARE REVENUES BY USE (1988)



SOFTWARE SALES BY HARDWARE PLATFORM (1988)



Source: ISTC

U.S. companies are the dominant global software product suppliers. The U.S. is

the only major global software producer which has a significant positive software products trade balance.

The competitiveness of the U.S. industry has been attributed to the availability of strong domestic market demand, sophisticated and demanding domestic buyers, and the global competitive advantage enjoyed by U.S. hardware suppliers (including IBM, Digital Equipment, Apple, Hewlett Packard, etc.), skilled knowledge workers, an aggressive and flourishing venture capital market, and attractive capital gains tax structure.

The Canadian software products industry has produced some notable successes (Cognos, Bedford, Alias, Corel Systems). But of the over 2,500 software products producers in Canada, only about 130 have grown above the $2 million revenue level, and fewer than 30 are above the $10 million level.

The low barriers to entry in this industry allow for the emergence of many new start-ups. But failure rates are extremely high and few companies emerge to a level of critical mass with a sustainable competitive advantage. Industry observers feel that the sustainable threshold for Canadian software products is approximately $2 million is sales per annum.

ISTC estimates that 60% of the software products sold by Canadian suppliers is exported, and most of this is to the U.S. It is clear that the U.S. represents the largest customer of the Canadian industry, as well as its greatest competitor.

Industry, Science and Technology Canada is sponsoring a Software Products Industry Sector Campaign to further the competitiveness of this strategically important industry.

Sector campaigns are special initiatives targeted to selected business sectors which have demonstrated strong domestic capabilities and international opportunities. These sectors must also appear to face some current limitations to reaching their potential.

The goal of sector campaigns is to develop practical measures to assist the target industry. The campaign is delivered through three phases:

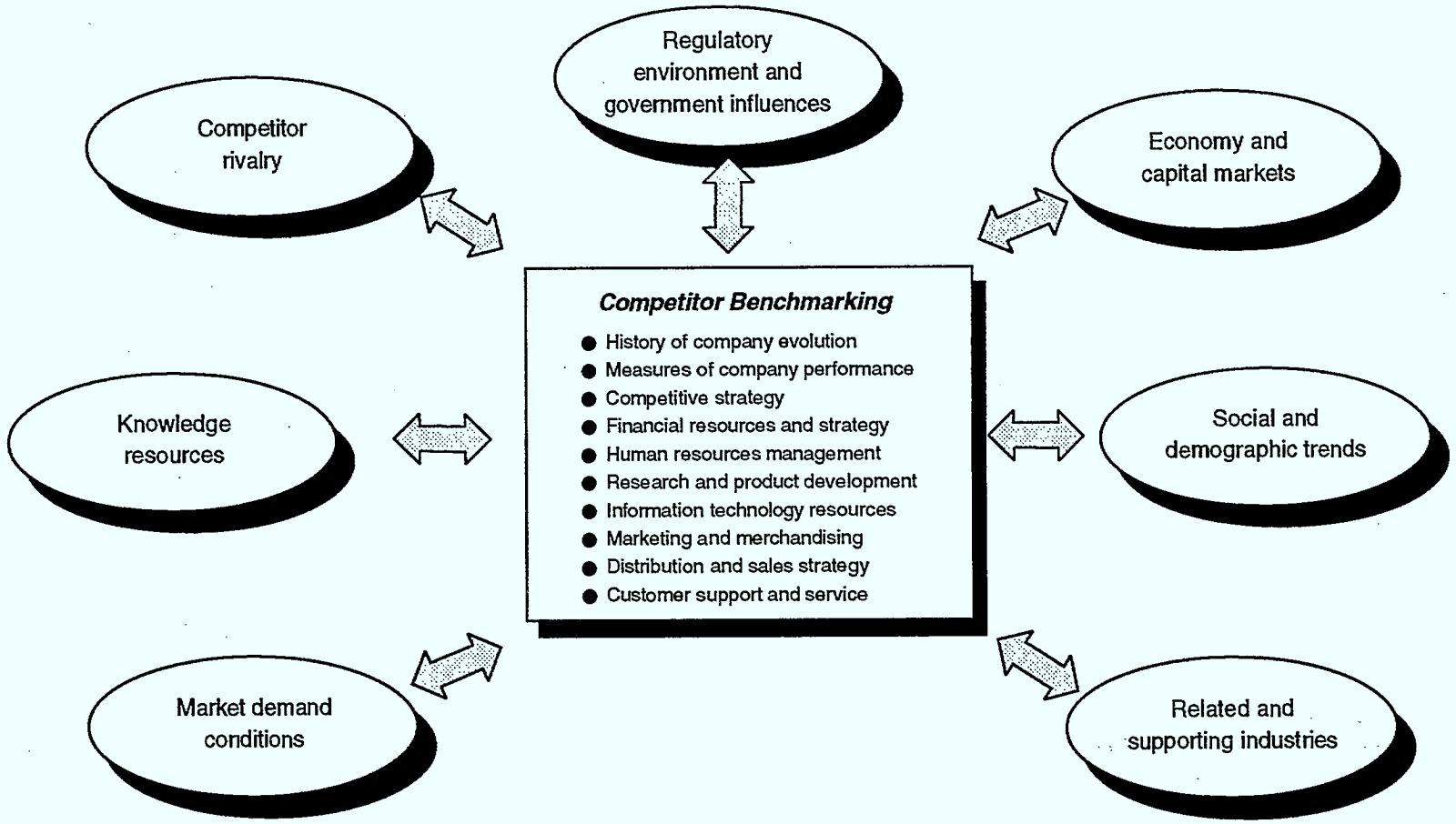
- identification of the target sector, its problems and issues;
- study of the opportunity and further analysis of the problems; and
- delivery of the initiatives.

This study is part of ISTC's Phase II initiatives.

This Assignment Had Four Principle Objectives

ISTC's principle objective in commissioning this study is to identify ways and means of furthering the competitiveness and continuing success of the Canadian software products industry. Specifically, this study had four primary objectives:

The Comparison Encompassed Both Environmental and Competitor Benchmarking



- To briefly profile the U.S. and Canadian software products industries to understand their respective competitive positions.

- To examine and analyze the major factors which may affect the development and performance of a software products company in the U.S. and Canada.

- To isolate the factors contributing to the success of software products companies in the U.S.

- To examine these factors in a Canadian context to develop a set of "lessons learned" and initiatives to strengthen the Canadian software products industry.

A Four-Phase Work Program Was Completed

Our study approach was designed to gain in-depth insights into the factors that shape the software products industry in Canada and the U.S. An overview of these factors is shown in Exhibit 1.

Our assessment was built upon the knowledge base that has already been documented on the software industry in North America. This knowledge base was supplemented by in-depth personal interviews with a structured sample of software companies in Canada and the U.S. to provide strategic insights into sources of competitive advantage of the U.S. industry, and competitive disadvantages that the Canadian industry must overcome. This work was complemented by a review of government policies that support the software products industry in twelve selected countries, to provide ISTC and the industry with insights into initiatives that Canada could consider.

Our work program was organized into four phases, diagrammatically represented in Exhibit 2.

Phase I - Profile the Competitive Environment of the Software Industry in Canada and the U.S.

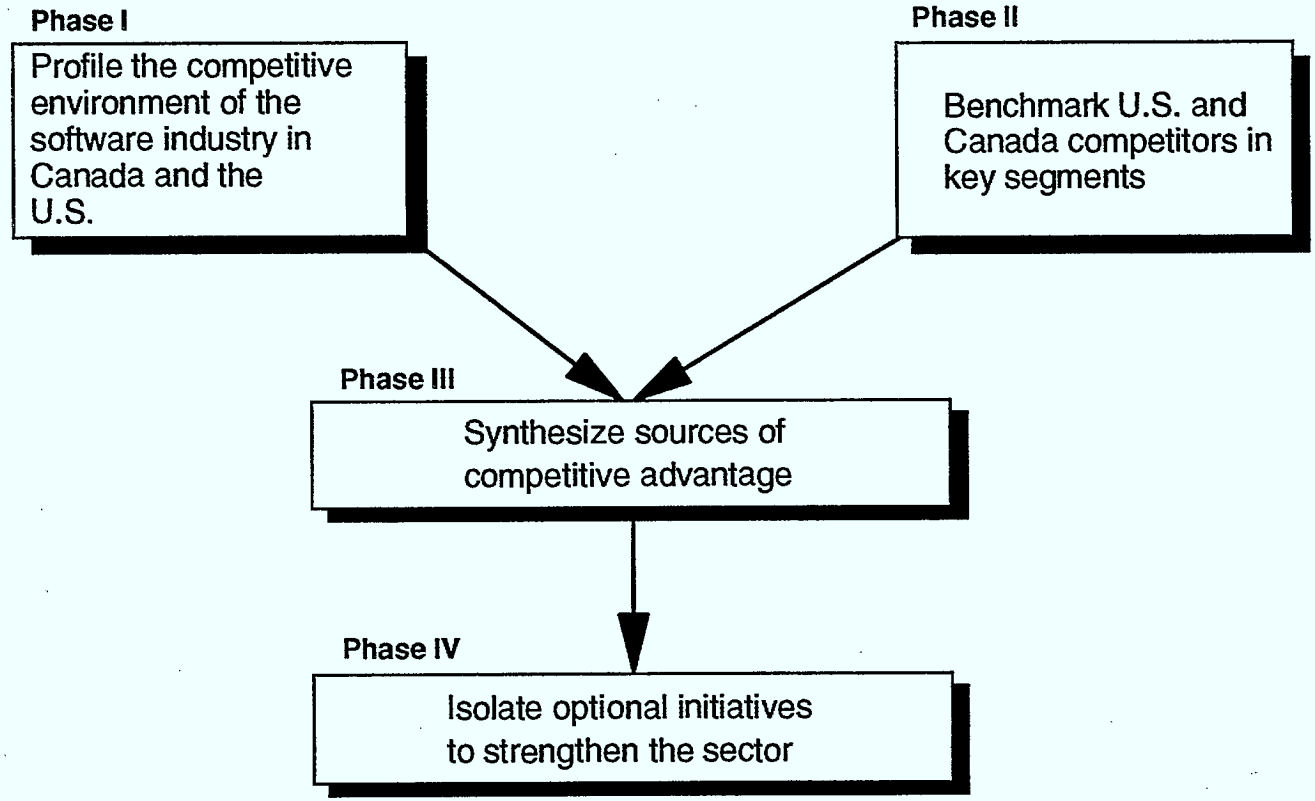
In this phase we profiled the software products sector in both the U.S. and Canada from an industry-wide perspective. This profile made use of numerous published sources of information, Coopers & Lybrand's own information base on the industry, custom research carried out by Venture Economics on the supply of venture capital to this industry in Canada, and proprietary information provided by Dataquest and Input.

The deliverables from this first phase included:

- A position paper (see Appendix V) entitled: "An Overview and Competitive Assessment of the U.S. and Canadian Software Products Industries", prepared by Zavis Zeman.

- A position paper (see Appendix VI) entitled: "Financing Considerations in

The Study Consisted of Four Phases



the Creation and Development of Software Products Companies in Canada", prepared by Denny Doyle.

In addition, we prepared a position paper (see Appendix VII) that summarizes the initiatives undertaken to support the software products industry in selected other countries as input to ISTC regarding policy and program options for supporting this sector.

Phase II - Benchmark U.S. and Canadian Competitors in Key Segments

In the second phase we surveyed a structured sample of Canadian and U.S. software companies to understand their sources of competitive advantage. For Canadian firms, we examined the barriers faced in reaching sufficient size to generate scale advantages and in achieving profitable growth.

The Advisory Panel directed that only post-threshold companies be surveyed. For the purposes of this project "threshold" was defined as over $2 million in annual sales. It was recognized that although this value was somewhat arbitrary, it allowed us to focus our efforts given the small sample size provided for in the study.

We directly interviewed 41 U.S. and 22 Canadian software enterprises. Questionnaires designed to obtain quantitative data and to complement the personal interviews, were completed by 37 of the 63 companies surveyed. Appendix II contains a summary description of the survey procedures and the companies surveyed in Canada and in the U.S. and the questionnaire used in the survey.

The insights gained from these comparisons contributed to an understanding of the gap that Canadian firms must close to compete with successful firms in the U.S., and ways in which government and industry initiatives can strengthen the Canadian sector.

Phase III - Synthesize Sources of Competitive Advantage

The industry profile (Phase I) and comparative benchmarking survey results (Phase II) were integrated in this third phase to identify:

- Sources of competitive advantage enjoyed by U.S. software products suppliers.

- Sources of competitive advantage and disadvantage of the Canadian industry, and the underlying reasons for these shortcomings.

Phase IV - Isolate the Range of Available Government and Industry Initiatives to Strengthen the Sector

This final phase translated the findings into potential initiatives available to the Federal Government and to the industry, to strengthen the industry's competitiveness. Initiatives primarily focus on support to firms with revenues

above $2 million. However, we believe that the core competencies required for a software product's success are similar for either emerging or established software companies. As such, many of the initiatives could apply to the entire industry regardless of company size.

Inputs to this phase of the assignment were developed in two industry strategy workshops: one on financing considerations and the other focusing on marketing and distribution channel management issues.

Participants in these workshops included members of our consulting team and industry experts. Attendees and conclusions of each workshop are summarized in Appendix II and IV, respectively.

A Participative Consulting Process Was Used

Throughout the study, Coopers & Lybrand maintained regular contact with the Advisory Panel members, using the following avenues.

- The consulting team met with members of the Advisory Panel at the outset of the study (February 4, 1991) to:
  - review the study objectives;
  - establish a framework for assessing competitiveness;
  - review the work plan and schedule, and;
  - agree on the role of the Advisory Panel.
- Status reports were issued to panel members on a regular basis, keeping them up to date on the progress of the study.
- Various panel members were interviewed to provide further insights into issues affecting the software products industry.
- A second meeting with the Advisory Panel members was held on May 6 to review the findings to date and agree on the next steps.
- A third Advisory Panel meeting was held on June 21 to review the draft report and finalize the recommendations.

This process enriched the analysis and built consensus regarding the current competitive position of the Canadian and U.S. software products industry and laid the foundation for discussions on initiatives to strengthen the industry.

Summary of Deliverables

In summary, the deliverables from this assignment include the following:

- Position papers characterizing the software products industry in Canada and the U.S. and program and policy initiatives implemented in selected

other countries to support domestic software product industries.

- A survey data base (quantitative and qualitative) for a selected sample of about 60 U.S. and Canadian software products companies.

- Insights into the marketing and financing issues facing software companies in Canada.

- A framework for understanding the key determinants of success in the software products industry, and how Canadian software products companies compare to U.S. companies along these dimensions.

- The identification of alternative industry and/or government initiatives that could contribute to further strengthening the Canadian software products industry.

The remainder of this report is organized into four sections. Section II describes our conclusions regarding the critical success factors that drive the software products industry in North America. In Section III, we integrate our profile of the industry and the survey of companies into a comparison of the Canadian versus the U.S. software products industry.

Section IV describes the options available to ISTC and the industry to further strengthen this sector. Finally, in Section V we offer suggestions for guiding the future activities of the Software Industry Sector Campaign.

2.
THE SOFTWARE PRODUCTS INDUSTRY HAS A COMPLEX SET OF CRITICAL SUCCESS FACTORS

National industries prosper when a number of factors are in place and actively reinforce each other. Human, physical, knowledge and capital resources must be available in sufficient depth to support industry growth. Domestic demand (or easy access to other large markets, such as the U.S.) must be of sufficient scale and sophistication to enable companies to quickly reach critical mass and to drive innovation to achieve first mover advantages. Related and supporting industries must be strong enough to provide competitive advantage in critical areas of the industry value chain. Lastly, a rivalry must exist among domestic competitors to stimulate excellence.

The Software Product is the Core Building Block of the Industry

The software product and the core competencies required for product success are the primary determinants of company structure, resource needs and managerial complexity.

For emerging software product companies developing a single product, the capabilities required by the organization evolve with the progression of the product from initial development to on going product management.

Established software companies face the same product development cycle and inherent capability demands as that faced by emerging companies with a single software product. Established companies, however, have a number of software products within their product portfolio, at different stages of development. A key issue for established software companies is providing the breadth of core competencies to support each of the different products at any point in time. A second challenge is co-ordinating and controlling the mix of capabilities needed to ensure success for each product in the portfolio. This provision of resources must be balanced by the potential for leverage and cost synergies across multiple products.

The major difference between emerging and established companies is in the options that are available to each company to acquire the core competencies needed for a product's success. For example, while both emerging and established software companies need adequate financial resources, an established company could meet the financing requirements from current revenues and/or external financing

Critical Success Factors for Software Products Companies

Adequate capital financing

- Availability of 1st round and venture capital
- Availability of bank lines of credit
- Competitive cost of capital

Management Competency

- Demonstrable track record
- Ability to manage rapid growth
- Ability to attract/retain critically-skilled people
- Ability to manage multiple product portfolio

Human resource competency

- Technical leadership
- Blend of marketing, sales, service and administration skills

Effective product development and quality

- Product quality ("error free" functional performance)
- Rapid time-to-market
- Continuous new product development and improvement
- Cost effective project management
- Compatability with existing and/or emerging standards

Superior customer service

- Responsiveness to customers
- Customer support structured to customer needs/product usage

Effective marketing and distribution

- Access to large (e.g., U.S.) markets
- Ability to anticipate and understand user needs
- Channel management
- Direct distribution to existing customers

Focused competitive strategy

- Product-market selection
- Scope of product-market coverage
- Hardware/operating system selection
- Ability to achieve market leadership in targeted niches

Strategic alliances and relationships

- Early access to emerging hardware platform and operating system advances
- Geographic clusters of industry concentration for critical mass

while an emerging company has only the external financing option.

Therefore, in considering the determinants of success in the software industry, we have first focused on the requirements to be successful with a single software product. The requirements for **product** success do not change between single and multi-product companies. The requirements for **company** success do, however, change. Success for single product companies is synonymous with product success. For larger companies, however, there are additional requirements related to the managerial complexity of a larger organization, the cost efficiency of multi-product operations and the balancing of large organization inertia with the innovation and speed required for product-market success.

Eight Factors are Critical to Product and Company Success

Entry and continued participation by a company in the software products industry requires specific core competencies whose relative importance changes with product success and company growth. These required competencies are driven by product needs in a single product company, and, in addition, for a multiple product company, by the managerial and organizational requirements of multiple products at different stages of development.

The competencies that enterprises require to participate in an industry are often termed critical success factors. **Critical success factors (CSF's) are not, however, a prescription for success. Rather, CSF's are the dimensions of the business on which companies can compete.** Competitors deploy their resources around different business dimensions in an attempt to achieve performance leadership over rivals. Performance leadership, in turn, contributes to shareholder value growth and customer satisfaction, two comprehensive measures of business success.

Our analysis identified eight general factors in the software products industry that are critical to success. Exhibit 3 summarizes the eight factors and details the specific competencies required.

These factors are common to the North American software products industry. Their importance will, however, vary somewhat based upon the stage of development of a product (and its market) or the product category (systems, user tools, applications) in which the company is competing.

In describing these critical success factors below, we also comment on how the importance of each CSF varies with the stage of development of the software product, or the type of software product (systems, user tools, applications).

The eight factors are, in no particular order, as follows:

- **Adequate capital financing** - Securing sufficient venture capital financing as well as supporting lines of credit from banks and other financial institutions,

at competitive rates, is critical at different stages in the product development cycle. Depending on the software product (e.g. complexity, installed user hardware compatibility, etc.), financial requirements in start-up could be significant. Meeting the financial requirements of market rollout is of critical importance to product success.

- **Management competency** - For emerging companies, having skilled senior management in place, able to plan for and control rapid growth, increases in importance as the product development cycle progresses. For established companies, managerial competency in handling the diverse requirements of multi-product portfolios is critical.

  Attracting needed capital and human resources, and influencing the early adoption of new software products, requires leaders with a track record of experience and success in either the industry or the market.

  Investor relationship skills are important to secure the initial and ongoing external capital required.

  The rapid pace of industry change requires responsive and flexible management in order to quickly respond to competitor initiatives and/or technology changes.

- **Human resource competency** - Having a balance of critical human skills in place, appropriate to the stage of development of the enterprise, furthers product and company success. Marketing and technical leadership is critical in the early development stages of emerging software products companies. Skills in sales, financial planning and control, user service and support, are more important in established software companies or in the later development stages of emerging companies.

- **Effective product development and quality** - Because of the short life of a specific version of a software product, continuous product development is needed to establish and maintain market leadership. Minimizing the time required to develop, beta test and "roll out" the new product/version is also important to maintain the product's technical currency with emerging products and standards.

  Product quality, in terms of functional performance, packaging, documentation, and defect rates, emerged in the 1980's as a minimum customer expectation. In launching new products, superior product functional performance is essential to achieve initial trial usage. Technical compatibility with existing/emerging hardware and systems software is also critical.

- **Effective marketing and distribution** - Marketing success requires an accurate understanding of user needs. Securing access to appropriate channels of distribution (such as a direct sales force, direct mail, trade shows, OEM's, distributors, manufacturers representatives) and securing strong

channel support for software products is also critical to success given the high cost of distribution and sales in this industry. Developers of operating systems and user tools require the strong support of vendors of the hardware platform or operating system, respectively. Applications software vendors typically use independent channels of distribution initially and increased direct distribution for product revisions and upgrades.

Effective marketing also means the ability to effectively package and price products for distribution by third parties. Finally, success also requires that the company achieve a position whereby it exercises some control over the channel of distribution employed in order to raise barriers to entry for competitors.

- **Superior customer service** - After sales service has emerged as a critical requirement for initial and ongoing product acceptance. Such customer support, available to meet the customer's requirements, can assist in resolving technical issues which arise during the initial selling process, whether direct or third party channels (such as distributors) are utilized. The costs of an effective customer support capability are significant and the efficiency/ effectiveness of this function is critical to continued sales of new product versions to current users. The resources necessary to meet the customer's expectation of a minimum service and support level has created a major entry hurdle for emerging companies.

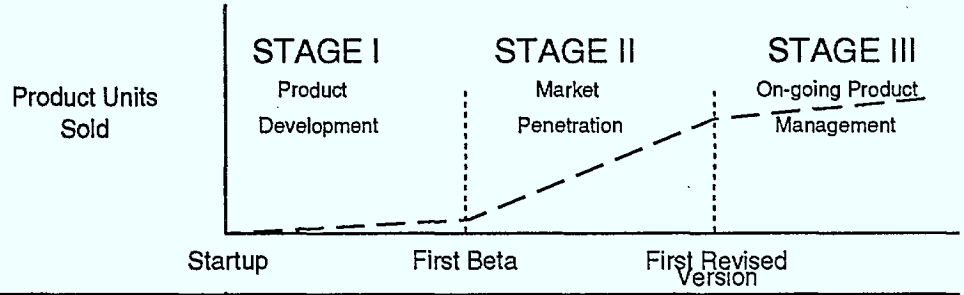
- **Focused global competitive strategy** - For emerging companies, a strategic focus on a well-defined product-market niche is a key to success. Successful vendors achieve leadership positions in the market niches in which they participate. Managements, with limited resources, must carefully balance the number of product-market niches in which they compete with the need for continued revenue growth. Spreading limited resources in the pursuit of success in too many product-market niches often leads to failure.

Evidence indicates that success requires that software product companies adopt an international perspective at a very early stage in their development. For all practical purposes, this means a North American perspective, since this market accounts for roughly 60% of the global market at the present time. An international orientation is especially important for suppliers of operating systems and user tools targeted at horizontal markets. An international strategy can be more difficult when targeting vertical markets with applications products, due to regional differences in user needs (e.g., personal tax preparation software programs).

Lastly, successful competitive strategies require that the company clearly differentiate its products, in terms of

Importance of These CSF's Vary by Software Produce Life Cycle

PRODUCT LIFE CYCLE



CSF	STAGE I	STAGE II	STAGE III
FINANCING	CRITICAL	CRITICAL	
MANAGEMENT		CRITICAL	CRITICAL
HUMAN RES.	CRITICAL	CRITICAL	
PRODUCT DEV.	CRITICAL	CRITICAL	CRITICAL
MKTG/DIST.		CRITICAL	CRITICAL
FOCUSED STRATEGY	CRITICAL		CRITICAL
ALLIANCES/RELAT.	CRITICAL		CRITICAL
CUSTOMER SERVICE		CRITICAL	CRITICAL

user benefits, from competitors in the market.

- **Strategic alliances and relationships** - The industry's fragmentation and rapidly changing technical nature requires that companies form strategic alliances to achieve competitive advantage. For the developers of operating systems, this means establishing strong relationships with developers of hardware platforms to ensure early information on evolving specifications and access to prototypes to permit minimum time-to-market cycles for new operating system software. For developers of user tools, alliances must often be established with developers of operating systems, for similar reasons, especially when capitalizing on the release of new operating systems products. For developers of applications software, relationships with key user tools developers (e.g. Microsoft) may be important.

CSF Importance Varies by Stage of Product Development

There are three stages in the software product cycle. Each stage has a different strategic focus and objective. The importance of the "success" factors differs across the stages of the product cycle.

The three stages of the software product cycle and the critical factors in each stage are summarized in Exhibit 4 and discussed below.

Stage I - Product Development - Start-up to Beta Test

This stage involves primarily product concept development and design, code generation, preliminary in-house testing, debugging, and revisions, up to the beta testing of the product.

The strategic focus of this stage is product development and the objective is maximum quality/minimum development time. Revenues are minimal in this stage. Development costs can vary greatly depending on the type of software product developed.

The critical capabilities required for product success in this stage are as follows:

- technically current product development resources,
- product development in minimum time,
- strong product quality control,
- efficient, cost effective project management capability,
- strong alliances with hardware developers for new system software and user tool developers,
- market research, profitability analysis, entry strategy development, and
- financial resources are important in this stage depending on the particular software product - systems, tools, applications - being developed.

Stage II - Market Penetration - Beta Test to First Revision Release

The strategic focus of this stage is market penetration. The objectives are market saturation and the creation of tangible entry barriers to competitors. Organizational growth is significant in this stage as marketing and sales staff are expanded and customer service capability is established. Distribution relationships are key in this stage. Financial requirements increase significantly to cover working capital needs during this stage.

The critical capabilities for product success in this stage are as follows:

- working capital financing,
- management's "track record" and reputation to facilitate external financing,
- marketing and sales staff to ensure rapid market penetration and dominance,
- distributor relationships in the case of a new software product, or direct distribution capability in the case of a revised version, upgrade or add-on to an existing product, and
- managerial capability to efficiently/effectively control and co-ordinate the company during this rapid growth period.

Stage III - Product Management - Ongoing Revision to Product Replacement

The strategic focus in this stage is on continued market expansion and solidifying customer relationships. The objective is to maximize the per customer revenues from the sale of product revisions, upgrades or add-ons. Total market growth typically has slowed in this stage and competitor pressure is increasing.

Critical issues in this stage are maintaining the product's technical currency, customer service, and possibly, product line expansion with related products ("look and feel" similarity) as both a defensive and revenue expansion strategy. At this stage, successful software products have established a customer franchise with significant ongoing revenue potential. Maintaining this dominance against competitive attacks is a critical challenge.

The critical capabilities for product and company success in this stage are as follows:

- in a multi-product firm, the capability to manage the different requirements of a variety of products efficiently and cost effectively,
- establishing a cost effective direct distribution system to reach existing customers for ongoing product revisions, upgrades or add-ons,
- project management capability to generate technically current product

Critical Success Factors by Product Segment

	Systems	User Tools	Applications	Comments
ADEQUATE CAPITAL FINANCING	H	H	H	Financing demands for applications are far higher and sustained through the product's life cycle.
MANAGEMENT COMPETENCY	L	H	H	The product complexity and larger company size of applications companies drives the need for better management skills.
HUMAN RESOURCE COMPETENCY	H	H	H	
EFFECTIVE PRODUCT DEVELOPMENT AND QUALITY	H	H	H	Low fault/highly reliable products are the cornerstone to success.
EFFECTIVE MARKETING AND DISTRIBUTION	H	H	H	Access to the channels is key. Alliances with major hardware or software companies greatly aids success.
FOCUSED GLOBAL COMPETITIVE STRATEGY	H	H	H	Select markets offering critical mass of potential users.
STRATEGIC ALLIANCES AND RELATIONSHIPS	H	M	L	Hardware alliances are critical for systems developers. Alliances with O/S developers are key for user tools when new O/S being introduced.
SUPERIOR CUSTOMER SERVICE	H	H	H	

Relative Importance = H (High), M (Medium), L (Low)

upgrades, in the minimum development time required,

- financial resources to fund the establishment of a direct distribution system and the customer support system,

- a cost effective customer support system available to meet customer requirements, and

- strategic alliances with hardware and/or systems developers can be critical in this stage in order to ensure ongoing product revisions/development are compatible with development trends

CSF Importance Varies with the Type of Product

The factors critical to product and company success also vary with the type of software product: system, user tool or application, as summarized in Exhibit 5.

Management's strategic decisions influence the relative importance of the factors across the three product types. For example, products, whether targeted at horizontal or vertical markets, can be technically compatible with **some or all** of the installed hardware platforms.

"Product-market positioning" decisions determine the complexity of the product development activity and the product, the technical currency required in product development resources, and the strength of strategic alliances needed with hardware and other software developers.

It is possible that the barriers to developing new operating systems are so high that it is impossible for all but the largest firms to enter the market. In this case company size (financial, and human resources) may be a requirement for success.

The importance of a number of the factors is common irrespective of product type. Human resource competency, effective product development and quality and superior customer service are equally important to system, user tool and application software products.

Strategic alliances and relationships can be equally important regardless of the type of software product. Tight relationships with hardware environment/platform developers is critical to systems software developers. Developers of applications software need equally strong relationships with developers of user tools e.g. Microsoft. The relative importance of these strategic alliances does, however, change for applications software developers depending on the product-market strategy selected. Strategies focused on the installed base of user tools do not require as strong a relationship as strategies focused around user tools targeted at new operating systems.

Management competency requirements increase with the complexity of a company's product portfolio. Multi-product companies are more difficult to manage than single product companies.

As such, developers of systems software with a more focused product portfolio are likely to require less sophisticated management skills than companies developing user tools and applications. These latter companies typically pursue continued growth by broadening their portfolios with related products distributed directly to their existing user franchise. Leveraging off of this customer franchise with other tools or applications is a more difficult management task versus companies following a more focused product strategy.

Capital financing requirements are similar irrespective of the product type. However, the necessarily close relationship of systems software developers with hardware manufacturers reduces the financial risk to lenders to these companies, versus more independent user tool and applications software developers.

The need for a focused global competitive strategy varies with the type of product. For systems and user tool products targeting horizontal markets, an international strategy, beginning with North America is critical to success. Applications software developers target vertical markets such as the process chemical industry or the tax compliance function within corporations. Because these vertical markets tend to be very regional in character, international strategies are generally not feasible.

This section has set out what we believe are the critical success factors for the software products industry. In the next section, this framework of CSF's is used to assess the relative competitiveness of the Canadian software product industry with that of the U.S.

3.
THE U.S. SOFTWARE PRODUCTS INDUSTRY IS THE WORLD LEADER

The U.S. accounts for the major portion (60%) of global software product demand. Software is a global industry, dominated by U.S. software products companies which account for 70% of the global products produced.

Virtually all industrialized countries have strong nationally based software products companies meeting vertical market requirements. Canada has a few established global competitors (such as Cognos and Corel).

Continued success for the Canadian software industry can only come by competing successfully with U.S. competitors in penetrating the U.S. market.

This section discusses the sources of competitive advantage enjoyed by U.S. software products companies, and the competitive disadvantages facing the Canadian sector.

Although Smaller, the Canadian Industry Exhibits Many Characteristics of the U.S. Industry

During the study we surveyed a representative sample of successful U.S. and Canadian software products companies and established a comparative benchmark table (Exhibit 6). Appendix IV provides a more detailed set of survey findings.

Observations from this survey include:

Company Features

Canadian companies, on average, are smaller than U.S. software products companies. Our sample shows Canadian companies to be less than half the sales volume and staffing of their U.S. counterparts, on average. Management, though, appears to have roughly the same experience level.

Exhibit 6

Best Practices Benchmarking Findings

(Canadian $)

PERFORMANCE INDICATOR	CANADIAN SOFTWARE COMPANIES	REPRESENTATIVE U.S. SOFTWARE COMPANIES
Company Features		
• Gross Sales ($000)	$19,500 →	$85,895
• Number of employees	162 →	383
• Average years experience of Senior Managers	10 —	11
Financial Performance		
• % average annual revenue growth (1987-90)	21% →	26%
• Sales/employee ($000)*	$105 →	$169
• Debt/Equity	1.00 →	0.5
• Average number of rounds of financing	2 →	3
Operations		
• Total personnel costs/person/year ($000's)	$48 ←	$80
• Average unit price ($000) of major product	$17 →	$28
• Average order size ($000) of major product	$49 →	$90
• No. releases since 1st launch of major product	8 ←	6
• % annual employee turnover*	32% —	30%
Sales and Marketing		
• % Sales from own sales force*	63% —	65%
• % Sales from distributors*	39% —	41%
• Export sales % of total sales*	80% ←	23%
• Average years experience of sales staff	5 —	5
• Current market share	34% —	25%
• Rank relative to competition	3 —	3
• 1=Market Leader, 5=Follower	2 —	2
Expenses as % of Total Sales		
• Finance*	10%	10%
• Marketing*	20%	35%
• R & D*	25%	22%
• Customer Service*	8%	6%

* - Ratios marked are calculated by averaging each company's average.

Source: 1991 Coopers & Lybrand Survey

fao-001/294e(fl)

Financial Performance

American companies significantly outperform Canadian software firms in sales growth and sales per employee.

The small sample frame does not provide a clear view of industry profitability. Even after the exclusion of outliers (both extremely profitable and high loss companies), country profitability does not show any clustering or trend. For example, the calculated Canadian industry profit before tax, based on the survey data, can range between 1.5% and 22% depending on the method of calculation.

Based on this survey, the key lesson learned is that the Canadian software products industry is very niche oriented. The wide spread in profits is likely the result of competition, or the lack thereof, in targeted niches.

Canadian companies reported significantly lower average salary ($48K vs. $80K per employee) and selling expenses (20% of sales vs. 35%) but higher overall overhead expenses.

Canadian companies face a much higher debt to equity level (1.0 debt to equity versus 0.5 for U.S.). Average funds from each round of financing was lower in Canada and none of the surveyed Canadian firms have made it past the third round of financing (see Appendix IV-1).

As one respondent described it "*Canadian companies must generate more profits than American companies to attract the same level of investment, quality of personnel and achieve the same level of market penetration*".

Operations

Canadian and U.S. firms are roughly on a par with expenses relating to finance, R&D and customer service. Although Canadians, on average, appear to be paid significantly less, employee turnover is roughly the same as in the U.S.

Canadians practice continuous product improvement at a similar rate to the U.S. (as benchmarked through the number of releases since first launch, averaging approximately one per year). Both American and Canadian companies use the same mechanisms for providing customer support and reported their customer satisfaction levels to be roughly the same.

Canadian companies tend to sell lower priced software, which likely means these software products are less complex and of a smaller size (fewer modules or lines of code) than the U.S. average. This affects the average order size, which is slightly over half of the U.S.'s average (Appendix IV-2).

Sales and Marketing

The benchmarks which relate to sales and marketing structure indicate that Canadian companies operate on par with U.S. firms. Use of distribution channels, salesperson experience and market position are all comparable. There is, however, a significant performance gap with the average full time U.S. sales

person achieving $1,160K in sales compared to $680K for their Canadian counterpart. In addition, representative U.S. companies reported an average annual compound sales growth from 1987 to 1990 of 26% compared to Canada's reported 21%.

Export Activity

The Canadian companies surveyed reported that over 80% of sales were generated through exports as opposed to 23% from the U.S. firms (see Appendix IV-3). This difference is obviously driven by the need for Canadian companies to access the larger American market, which has forced us to develop export capabilities. Canadian and U.S. firms are roughly equivalent in sales activity beyond North America.

The U.S. Software Industry Has Developed Many Competitive Advantages

Differentiation between the competitiveness of U.S. and Canadian firms has occurred through several environmental factors, the most significant of which are:

America's high tech hardware sector

The U.S. has established North American manufacturing dominance of computer hardware manufacturing. This dominance, in fact, is global except for the recent penetration of the personal computer and peripherals markets by the Japanese during the latter half of the 1980's.

The U.S. software products industry reaps the benefits of the technical synergies, strategic alliances and inter-dependencies that flow from its strong hardware sector. This competitive advantage is becoming more significant through the emergence of co-developed technologies such as Apple's MacIntosh, NeXT and GO's pen based hardware platforms where software is an integral and bundled portion of the end product.

The survey of representative U.S. and Canadian companies showed a much higher U.S. activity in the systems software and user tool area (31% of responding companies compared to 10% of Canadian respondents). This likely reflects the U.S.'s strong hardware sector.

Over 47% of the U.S. companies surveyed reported only micros as their primary development and first release platform. Only 20% of the Canadian firms were primarily micro-based.

There could be a number of reasons for the significant difference in type of software products developed and software platform used, including:

- the U.S. software product industry's close proximity to the hardware clusters, and Canada's corresponding lack of a micro computer hardware manufacturing sector,
- a lag in Canada's adoption of micro computer technology, and

- a corresponding lack of experienced micro computer programmers in Canada.

Of these, survey interviews generally indicated the personal network and "cottage industry" development of the micro computer software products industry to be the contributing factor. As a current example, the bulk of the participating software developers for GO's pen-based personal computer are clustered around the company on the west coast. Since Canada has virtually no indigenous developers of personal computers, it is not surprising that this market is not as well served by Canadian software firms.

Some of the survey participants felt that the lack of a Canadian hardware sector has contributed to other significant gaps. For example, it was felt in the U.S. that the movement of professionals and managers between hardware and software firms not only provided closer ties and information flows but developed better skills and market awareness.

As Richard Rabins, President of Alpha Software said, "*You wonder whether regional differences exist because hardware companies spin out software start-ups with insider information on the next product, because of proximity to capital, or because regional hardware companies provide a critical mass of development activity and a talent pool.*"

First Mover Advantage

The U.S. has been the first-to-market with the computer, the operating system and all major software and software package innovations. Our survey of the software products industry indicates that companies which are first to market with products generally emerge as the market leaders. This leadership position is established through rapid distribution and acceptance of the product which, by virtue of the strong user base, becomes the defacto standard. High switching costs to users and dominance of the channel tend to raise barriers to entry to followers.

America's dominant role in hardware and software development has firmly established U.S. firms as the first-to-market and therefore, the source of most current defacto standards.

Unseating the established market leader (typically the first-mover) requires several conditions to be met:

- effective marketing, promotion and advertising,
- clearly visible technical superiority,
- low switching costs, and
- a reputation that will lead to trial usage and market acceptance.

This does not mean that successful market entry strategies cannot be undertaken by companies which were not first-to-market. But the challenges are formidable. Lotus' dominance in the microcomputer spreadsheet market over

the first-to-market product, Visicalc, is a classic example of market leader succession. In addition to a significant investment in product development, Lotus was the first company to launch a million dollar advertising campaign.

Entrepreneurial, Risk Taking Mentality

The software products industry is ideally suited to risk-taking entrepreneurs. There are low barriers to entry and the opportunity for exceptional profits. Both the Canadian and U.S. industry leaders surveyed feel strongly that Americans, on the whole, are more risk-taking and entrepreneurial.

In fact, the majority of Canadian software companies surveyed did not view themselves as being particularly risk-averse or risk-taking. By contrast, the surveyed U.S. firms had strong consensus about being "risk-taking" companies. American also rated their management style as more participative and delegative than the Canadians.

The survey participants felt that this risk-taking spirit benefits America's software products industry in that software consumers are disposed to try new products, especially given the relatively low price point of many personal computer software products.

The risk taking spirit was also felt to be evident in U.S. financiers who are more willing to make high-tech (higher risk) software investments.

In addition to these U.S./Canada differentiating features, there are several other features that contribute to the U.S.'s world-leading position which are generally shared by Canadian firms. These include:

- a substantial educational infrastructure with strengths in the high-tech/software areas;
- research and development facilities and government incentives to encourage research and development; and
- an extensive telecommunications and logistical network.

These factors, along with a selection of other influencing factors - not the least of which is chance - firmly established the U.S. as the world software products leader. Over three-quarters of software products sold were developed in the U.S. and most of the top 50 world-wide software companies are American firms.

Because of the ease in accessing foreign markets and the lack of critical market mass in Canada, Canadian software products companies must penetrate the U.S. market to achieve sustaining size. In order to effectively compete with U.S. companies, Canadian companies must deal with the disadvantages of functioning under a different tax and legislative structure as well as other real and perceived barriers.

Estimated Ranking of Canadian and U.S. Software Companies Against Critical Success Factors

	Representative US Companies	Canada Companies	Comments
ADEQUATE CAPITAL FINANCING	++	-	Canadian companies, on the whole, have not been accessing American capital markets.
MANAGEMENT COMPETENCY	++	+	Canadians have a weaker position than the Americans because of immigration, personal taxation and cost of living barriers.
HUMAN RESOURCE COMPETENCY	++	+	Canadians have a weaker position than the Americans because of immigration, personal taxation and cost of living barriers.
EFFECTIVE PRODUCT DEVELOPMENT AND QUALITY	++	++	
EFFECTIVE MARKETING AND DISTRIBUTION	++	+	There are some real and perceived barriers to Canadians in accessing established US channels of distributiion.
FOCUSED GLOBAL COMPETITIVE STRATEGY	+	++	Canadian companies are substantially more export oriented than U.S. firms. Our multi-cultural environment is an advantage in competing multi-nationally.
STRATEGIC ALLIANCES AND RELATIONSHIPS	++	0	Canadian - US alliances are somewhat harder to form than US - US alliances because of distance and perceived weaker technical skills of Canadians.
SUPERIOR CUSTOMER SERVICE	+	+	Canadians face some minor barriers caused by high communication costs.

Scale: Very Strong (++), Strong (+), Average (0), Weak (-), Very Weak (--)

Critical mass of software products industry sector

The U.S. software products industry and indigenous companies are impressive in their size:

- the world's three largest firms, Computer Associates, Microsoft, and Oracle, all with over U.S. $1 billion in revenues, are American;
- over 30 U.S. software products companies have over U.S. $100 million in sales revenues.

The U.S. software industry is also strongly concentrated in California and in the Route 128 region of Massachusetts.

The Canadian Software Industry Has a Number of Competitive Disadvantages

Canada is in a unique position in the global software products industry. Although our industry is significantly weaker than the U.S.'s we have a number of advantages relative to other industrialized countries (see Exhibit 7). These include:

- proximity to U.S. distribution channels, and high-tech hardware sector;
- common language;
- common time zones;
- closely integrated infrastructures including telecommunications, transport and airways; and
- the Free Trade Agreement, which has allowed us to develop a closer relationship with the U.S. than other countries.

Canada has also established a reputation for developing high-quality software products. For example, Paul Robichaux, CEO of Frame Technology, expressed his high regard for Canadian software as follows: "*Canadians produce some of the most functionally-rich, bug-free products on the market. Their (Canadian) strength is in product development.*".

The Canadian software products industry differs from the U.S. industry in a number of ways. Some of these differences clearly lead to competitive disadvantages, whereas others have a less clear impact. The observed differences are caused by a mix of government/environmental and self-created problems. The key differences, identified below, include some analysis of root cause and competitive impact.

Weak capital financing

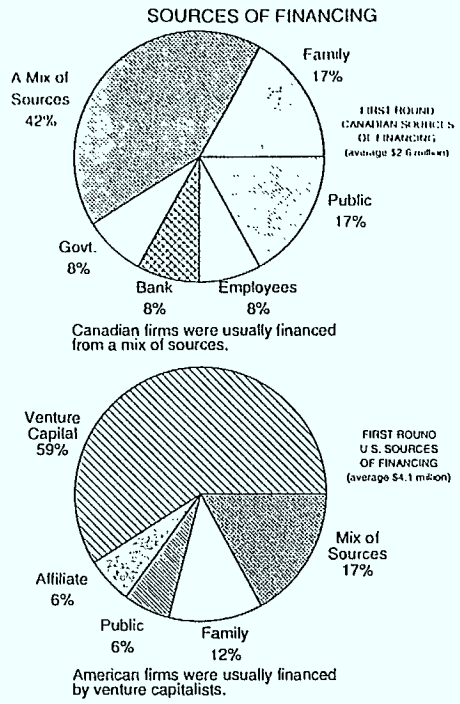
Canadian investors have proven themselves to be risk averse and generally uninterested in high tech investment opportunities. America's high tech investment track record is far more impressive than Canada's and most other countries'.

Existence of Foreign Government Policy Initiatives To Support the Software Industry

	JAPAN	ECC	GERMANY	FRANCE	ITALY	UK	NETHERLANDS	KOREA	TAIWAN	SINGAPORE	INDIA	CANADA
Regulatory Environment												
• Director's liabilities												X
• Copyrights	X											
Competition/Anti-Trust												
• Competition act, strategic alliance restrictions.												
• Harmonization of anti-trust laws with trading partners.												
Trade												
• Free Trade Agreements.		X	X	X	X	X						X
Fiscal/Taxation												
• R&D tax credits and definitions.	X			X	X							X
• Tax credit for product development costs.	X					X						X
• Corporate/personal taxation.	X			X		X	X		X	X		
• Capital gains tax.			X			X						
• Personal investment incentives.			X			X				X		X
Labour												
• Immigration (free movements of skilled workers)												
Science and Technology												
• Industrial research programs	X	X	X	X		X	X		X	X	X	X
• Industrial innovation programs	X	X	X	X	X	X	X					X
• Development of Centres of Excellence	X			X			X					X
• Technology personnel support programs	X		X	X	X	X	X	X	X	X	X	X
• National research centres	X		X					X				X
• Product development programs.	X		X	X	X	X	X	X	X	X	X	X
Industry Initiatives												
• Industry "networking"	X	X	X	X	X	X	X					X
• Marketing trade shows				X						X	X	
• Consortia	X	X	X	X	X	X	X					
• Vertical industry relationships				X	X					X	X	
• Equity exchanges												
• Technology development agreements	X	X	X	X		X						
• Cross licensing												
Monetary												
• Exchange rates												
• Interest rates	X	X	X	X	X	X	X	X	X			
• Banking regulations												
• Stock exchange regulations				X		X						
Education/Training												
• Programs to support post-graduate research and engineering studies and alliances with industry.			X	X		X	X	X	X			X

Source: Analysis of report prepared by Dr. Zavis Zeeman (see Appendix VI)

The survey identified several major differences in how U.S. and Canadian firms were first financed.



Source: ISTC

The survey results indicate that the significantly higher American use of venture capital continues during round-two financing (79% U.S. vs 14% Canadian) but Canadians tend to secure more capital during round two ($5.9 million on average vs $5.0 million for U.S. firms).

The survey, personal interviews, and Advisory Panel discussions all lead to the conclusion that during the critical early period, Canadian firms:

- tend to be under-capitalized, and
- are financed through a broad mix of naive investors.

It is believed that these financial arrangements make it more difficult for Canadian companies to overcome the typical challenges faced by growth companies: the need to adequately finance new product launches, and the need to spend excessive time managing investor relations.

Canada is fortunate in having fairly easy access to the American investment pools, but perceived barriers have left these as a largely untapped resource. The Canadian companies who have secured funds from the U.S. such as Cognos, Corel, Alias and others have, on the whole, found the process less difficult than expected with far greater return on the invested time and costs than attempting to secure funds in Canada.

Of the companies surveyed, the U.S. companies all secured their venture capital through the U.S. Only 75% of the Canadian companies secured their venture capital in Canada.

As shown in Exhibit 8, most other industrialized countries have investment incentives which assist the high technology sector in general, and often the software products industry in particular (see Appendix VII). Other than the limited application of R&D tax credits, it is felt by the industry that Canada has no significant mechanisms to encourage investment in the software products industry.

Management competency

The survey indicates that the management skills and expertise developed in the Canadian industry appear to be very comparable to those in the U.S. Generally, though, the Canadian firms are not performing as well as U.S. companies in terms of most indicators of financial performance (see Exhibit 6).

We believe that the underlying weakness is the "brain drain" to the U.S. Survey participants from both U.S. and Canada felt that this exodus was occurring for four key reasons:

- Superior financial rewards for working in the U.S. (higher pay, lower cost of living and lower tax rates).
- The risk-taking mentality of the U.S. is attractive to entrepreneurs who wish to start a software products firm.
- Canada is not considered part of the main stream software products industry - there are more synergies, greater acceptance, in-depth resources and more personal esteem related to establishing in one of the U.S. software clusters, such as California's Silicon Valley or Boston's Route 128 area.
- As Canadian companies are acquired or form strong strategic alliances with U.S. companies, the skilled employees are frequently moved to the U.S. corporate offices or development facilities.

Canada benefits in a number of ways from its proximity to the U.S. industry and market. But one of the major downsides to our location is the tendency for Canadian software industry managers to relocate to the U.S. However, many of the Canadian companies surveyed feel that over time these executives will return to Canada, so the long term effects of this movement are unknown.

Human Resources competency

"*Writing code is like having a baby: you cannot put nine women on the task to get it done faster. You need one talented person to write it one line at a time. The right people will give you the right product.*" Sandra Kurzig, Founder, Chairman and CEO, ASK Computer Systems.

Our ability to develop technically skilled personnel is felt to be roughly equivalent to the U.S. The University of Waterloo, in particular, has established a North American reputation as an outstanding institution for educating software engineers. (Bill Gates, Founder and CEO of Microsoft, is frequently quoted as saying "We get our best young developers from The University of Waterloo".)

Quantitatively, Canadian firms experience roughly the same amount of turnover of personnel as U.S. companies. However, Canadian management is concerned about trends underlying this turnover. They typically experienced a net loss of developers with 1 or 2 years experience to U.S. firms and were forced to replace them with new graduates. Companies in the U.S. noticed personnel movement

between the firms, but made few references to a net decline in entrant skill levels and experience.
Reasons for technically skilled personnel to move to the U.S. were similar to those noted previously for management. An added concern of management about their ability to retain technically skilled personnel focused on some of the constraints (both real and perceived) in offering stock options to development staff.

The survey highlighted another interesting trend: Canadian software products companies tend to pay significantly less than U.S. firms. As the survey data in Appendix IV-4 shows, the Canadian average salary is approximately 60% of American compensation levels on an equivalent dollar basis. The average personnel cost for the American companies was $80K vs $48K for the Canadian companies. This compensation difference alone may contribute to the loss of skilled people.

Two opinions were generally expressed during the interview process: either "*In Canada we can offer them the chance to be part of the product - part of the breakthrough - not just another cog in the process*" *(Alias)* or "*Even with comparable stock options, we have lost good candidates to the U.S. powerhouses.*" *(Corel)*

Several U.S. firms said that the main benefit of being close to the key distribution channels was access to key personnel. As expressed by one participant, "*We have had no problems filling our marketing and promotion vacancies ever since we developed a close relationship with our distributor. Their people are superbly experienced and are keen to try life in the software industry.*"

Survey participants noted the irony that they could not easily bring qualified candidates into Canada at the same time as Canadian immigration policy was preventing foreign students who were educated in our schools, from obtaining Canadian work visas.

Effective marketing and distribution

"*The trick to getting a ball into the right pocket is knowing which ball to use and where the right pocket is.*" Bruce Elliott, NISSI Technologies.

Effective marketing and distribution is an important success factor. Increasingly, success requires careful market positioning and achieving scale in marketing and distribution. Recent examples of this trend include:

- ASK's critical mass/dominance in manufacturing systems through their recent acquisition program, including Maxim and Data 3, as well as major investments in new releases including their process manufacturing package.

- Lotus's public statements recognizing that they will never come across another "1-2-3" breakthrough product, but through their focus and differentiation they will continue to dominate the spreadsheet market.

- Microsoft's phenomenal growth through acquisition within their strategic product-market focus.

- Corel's rapid penetration of the personal computer drawing applications market through saturation advertising strategies.

In the personal computer market, in particular, software is becoming an intensely competitive industry, due to the large number of competing suppliers. Achieving prime shelf space is becoming an important contributor to success. Promotion funds and other distribution incentives are becoming commonplace and are emerging as barriers to smaller companies penetrating the market. Brand name recognition, such as Microsoft's, adds substantial value in itself.

The majority of companies surveyed discussed the importance of having effective access to distribution channels. This need is more obvious with low-end products, although increasingly complex software products are using third party distribution channels such as retail chains and VAR's.

As Karen Brothers from Inmagic said, "*Distributors play a larger, more value-added role ... There are opportunities for developers to ally with distributors who can help them obtain much-needed resources in international markets, from user support and marketing to localization and capital.*"

The Canadian companies, with a few exceptions, expressed frustration at gaining access to U.S. distribution channels. Their observations include:"*The effective, stable and large distribution channels are rooted in the U.S. Every meeting with our channels are after challenges at the U.S. border. Every transaction is nestled in exchange rate uncertainty, and every receivable is only 50% financed even if the terms are net 30 or better.*"

Penetration of the U.S. market and acceptance into the U.S. distribution infrastructure is greatly aided through the use of experienced U.S. software marketing professionals. The Canadians surveyed indicated that it was virtually impossible to acquire or develop the marketing skills in Canada fast enough to support the required growth and market penetration for company success.

The majority of the Canadian companies surveyed said that it was difficult to hire and effectively use these experienced U.S. marketing professionals for several reasons, including:

- Canadian immigration laws which make it difficult to secure landed immigrant status for personnel.

- Lower Canadian compensation levels and a higher tax structure and costs of living, that result in a lower standard of living in Canada.

- A natural reluctance on the part of marketing professionals to relocate to Canada, which is perceived to be outside the main stream of the North American software industry.

- The difficulties relating to managing a software products company with the

marketing professionals physically separate from the development staff - as would be the case if the marketing department were located in the U.S.

This is not to say that only way to market and sell software is through third party U.S. distribution channels with experienced U.S. marketing professionals. Corel and Bedford are examples of the success that Canadians can have with our own people and channel infrastructure. Corel, for example, uses a strategy of creating product "pull" through direct and joint advertising in trade journals as opposed to a "push" approach through independent, third party distribution channels to the users. It is estimated that over 90% of Corel's sales are exported but they have no Americans in the marketing/promotions department and no employees outside of Canada.

Sales and Marketing

As Jack Grushcow, the former president and owner of Consumer's Software said, "*I can sell twice as much software twice as fast to a room full of Americans - and they won't whine if there are bugs in it.*"

On average, U.S. companies spend 75% more money on marketing and sales than Canadian companies and also reported that 10% of their work force were in marketing and 27% in sales versus Canada's 5% and 11% respectively.

These survey results indicate that Canadian firms are being significantly out spent by U.S. firms in the sales and marketing area. This finding is somewhat mitigated by two related observations.

First, it is likely that the Canadian companies, who have established a portion of their customer franchise in the Canadian marketplace, are experiencing less competitive rivalry than their American counterparts.

Second, Canadian companies are more focused on vertical markets and, as such, require less mass marketing and promotional support.

All indications are that both Canadian and U.S. companies are using the same mix of distribution channels and have the same mix of sales through these channels. If these numbers are correct, then there is concern that Canadians are not investing in market development to the same extent as U.S. companies. If this trend continues, Canadian firms may potentially experience an erosion of their market position in promotion-sensitive market segments.

There also appears to be a significant performance gap in sales productivity. The U.S. respondents averaged $1,160,000 sales per full-time sales representative per year; the Canadians averaged only $680,000. This significant spread is likely to be the result of several factors, such as the American consumer's risk taking attitude, etc., but the net effect of both the activity (spending) and performance gap is serious.

We Identified Three Types of Competiveness Gaps

Competitiveness gaps we can control

- **Adequate capital financing**
  - tax credits
  - gov't. and hybrid V.C. pools
  - corporate tax rates
  - exchange rates
  - interest rates
- **Effective product development**
  - technology development ctrs.
  - national research centres
  - gov't. sourcing
- **Management and human resource competency**
  - director's liabilities
  - personal tax rates
  - immigration barriers

Competitiveness gaps caused by a lack of skills and techniques

- **Management and human resources competency**
  - mentorship programs
  - technology development support programs
- **Effective marketing and distribution**
  - alliances and licencing
- **Effective product development**
  - innovation programs
  - vertical industry relationships

Competiveness gaps due to weak industry structure

- **Related and supporting high-tech sector**
- **Effective product development**
  - national research centres
  - incubation centres
- **Adequate capital financing**
  - private sector venture capital pools

Strategic alliances and relationships

"*Find someone who has reason to see you succeed for their own selfish reasons. Make them your alliance.*" David S. Rebak, Director, Chancery Software Ltd.

Canada is at a disadvantage when establishing strategic alliances for several reasons. Among those commonly referred to in the survey are:

- Restrictive Canadian legislation concerning company ownership and Board of Director liability issues.

- The popular press's portrayal of Canada's political instability accented by the recent failure of constitutional reform, the potential for Quebec separation, a trend towards extreme political parties and legislation such as pay equity and employment equity.

  As Jean Belanger, President of Canada's Micro Tempus Inc. said, "*Being a Canadian was an advantage everywhere outside the U.S. until the last few years of constitutional, economic and cultural in-fighting which has badly tarnished our international reputation*".

- Higher Canadian personal and corporate tax rates can discourage personnel transfers and minority equity positions.

- Canada's virtually non-existent hardware and micro electronics industry, offering few opportunities for forming strategic alliances.

Although we enjoy a close proximity to major U.S. software and high tech corporations, this same proximity makes our domestic issues clearly visible to American corporate offices, which in turn, may affect their decisions to invest in Canada.

Summary

"*The government will not see the fruits of their R&D initiatives because of all the other issues identified in this study and their effect on Canada's software products industry infrastructure.*" Ellen Godfrey, President, Softwords.

In summary, on a number of benchmarks, such as product development and quality, focused competitive strategy and superior customer service, Canadian software products companies appear to compare favourably to firms in the U.S.

In other areas, we believe Canadian software products companies are at a competitive disadvantage. These include adequate capital financing, management competency, effective marketing and distribution and strategic alliances and relationships.

The competitiveness gaps observed fit into three general categories (see Exhibit 9):

Competitiveness gaps we can control

These are gaps generally caused by or controlled through government policy and legislation.

Competitiveness gaps caused by a lack of skills and techniques

These are gaps which would be narrowed if Canadian management approaches were better developed or more consistent with U.S. techniques. Strengthening these areas will call for management development through networking, education and example.

Competitiveness gaps due to weak industry structure

These gaps are caused by major environmental differences between Canada and the U.S. These gaps can only be closed within Canada through major investment and time. In most cases, a more cost-effective solution may be to develop stronger, more integrated relationships with the U.S. software/hardware industry.

In the next section we examine the range of initiatives that are available to close these competitiveness gaps.

4.
CHOICES ARE AVAILABLE TO STRENGTHEN THE CANADIAN SOFTWARE INDUSTRY

Canada's software product industry, in general, is performing significantly below its potential. The perceived high quality and functionality of Canadian software products and our disproportionately low market share point to an industry which will respond well to policy initiatives.

The industry, though, is somewhat delicate. It does not fit into the Canadian norm of national resources or fixed asset intensity. Its dependence on a skilled base of personnel, communication infrastructure, and high risk capital make if vulnerable to many government policies and initiatives catering to more traditional Canadian firms.

There are a number of industry, association and government initiatives which could help strengthen the industry along a number of the critical success factors where we are already performing well and close the competitive gaps identified where we are underperforming.

Overall, the mix of initiatives chosen will strongly influence the context in which Canadian software products companies will operate both within Canada and internationally. The objective of influencing these critical success factors - and the industry's willingness to participate in the direction setting - is to develop an environment where the Canadian software products industry can thrive.

These initiatives need to be structured and developed in such a way so as to help the Canadian software products industry:

- rapidly accumulate specialized skills, knowledge and proven abilities,
- develop better insights into market needs and bring superior products to market faster and promote them better than other global competitors, and
- develop intense investor, owner and employee support towards sustained (re)investment.

The most effective government and industry initiatives will emanate from an understanding of the industry's vision, relative to the competitiveness gaps that have been discussed previously.

Achieving the Goals Will Require Significant Expansion

Vision Component		1991 (Now)	1996 Goal	Implications
Global market share		1.4%	3%	Establish Canada's natural economic share
No. of companies by revenue category (1991 $ million):	$2 to $9	80	160	Double
	$10 to $99	30	60	Double
	Over $100	1	8	Develop 7 winners
Exports (1991 $)		$300 million	$1 billion trade balance	27% compounded growth
Orientation		Product/ technical	Improved marketing orientation	
Product quality		Good	High	
Personnel		"Brain drain" reducing skilled people	Reduce drain; increase number of skilled people	

A Proposed Vision for the Canadian Software Industry

Identifying priorities for industry and public policy initiatives to support an industry, requires an understanding of how the industry intends to evolve. When combined with an understanding of the sector's current competitive position, competitiveness gaps can be identified, and priorities for bridging these gaps established.

At a joint client-consulting team workshop held during Phase II of the study, one of the agenda items discussed was the "vision" for the software products industry in Canada. For discussion purposes, a time horizon of 1996 (five years into the future) was assumed.

The discussion highlighted the following vision for the Canadian software products industry (summarized in Exhibit 10):

- Canada's share of the global software products industry will have increased to 3% of the global market from the current level, estimated at 1.4%.
- There will be 60 Canadian companies having sales of more than $10 million (in 1991 dollars, up from 30 companies today), and 8 companies with sales of more than $100 million (up from 1 today).
- 160 software products companies would have sales in the range of $2 to 10 million in 1991 dollars.
- Total exports would exceed $1 billion (up from about $300 million in 1988).
- Canada would have balanced trade in software products (improved from a deficit position today).
- The majority of leading companies in the industry will have reached levels of sustained profitability.
- A trend towards industry consolidation is expected, which would enhance the stability and economies of scale and scope of the remaining firms. This greater scale of operations will be needed to launch products on multiple hardware platforms (e.g., DOS, Windows, Unix).
- Companies will be significantly more marketing-oriented and skilled.
- Canadian firms would have a distinct reputation for producing quality software products.
- There will be an increased number of skilled software professionals and managers, and reduced loss of human resources to the U.S.

While many of the above factors are general in nature, they nevertheless indicate that the expectation is for substantial growth and improved prosperity of the software products industry in Canada. In particular, this will require companies to participate aggressively in global markets either through export, out-licensing, strategic

There are a Number of Projects that could Improve our Competitiveness

Key Success Factors	Individual Companies/Associations	Joint ISTC/Industry	ISTC Business Advocacy Tasks	Broad Government Initiatives
Adequate Capital Financing	• mentorship/training in effective financial arrangements • promote Canadian success stories	• encourage private sector venture capital pools	• provide investment tax credits • government and hybrid venture capital pools/ funds matching, etc.	• reduce corporate tax rates to be more consistent with U.S.'s • adjust exchange rates adjust to be more competitive • adjust interest rates to be more internationally competitive • redefine "R&D" tax credits to encompass more of the software product development costs
Management and Human Resources Competency	• establish mentorship programs • support for university chairs, and curriculum in software company managment • support entrepreneurship forums	• sponsor technology development support programs • training support and initiative programs	• adjust immigration regulations to ease immigration of U.S. marketing professionals to Canada	• ease Board of Director's liabilities • reduce personal tax rates to be more consistent with U.S. costs of living • allow foreign students to work in Canada
Assessing Related and Supporting High-Tech Industries	• development of specialist professional support firms	• support for cross border research consortia	• facilitate high-tech relationship programs	• target sector development programs
Effective Product Development	• pro-active clustering of software companies • hardware and software alliances/support	• establish incubation centres • establish technology development centres/ clusters	• develop national research centres/clusters • sponsor innovation programs	• adjust government sourcing techniques to better support Canadian software product companies
Effective Marketing and Distribution	• alliances and licensing education and arrangements	• training support and initiative programs		

alliances or direct investment in foreign markets.

A Range of Options is Available to the Panel

There is a broad mix of government and industry initiatives which could help improve the Canadian software products industry. Based on the mix of competitive advantages and disadvantages identified in this study, sector improvement will require a mix of policies and initiatives, rather than one simple mechanism. Programs must reinforce the industry's established strengths and reduce the competitive gaps that currently exist.

One of the over-riding gaps is Canada's extremely weak high-tech hardware manufacturing sector. This sector generates many first mover opportunities as well as personnel with a complement of technical skills not available in Canada. It appears that there is little opportunity to develop this related industrial base for the purposes of supporting the software products industry. Therefore, policies and initiatives must be developed to access the U.S. pool of knowledge, resources and first mover opportunities.

The competitiveness of the Canadian software products industry would be improved by addressing five of the eight critical success factors in this industry. These include:

- adequate capital financing,
- management competency,
- human resources competency,
- strategic alliances and relationships,
- effective product development and quality, and
- effective marketing and distribution.

Within each of these key success factors there are roles for individual companies and associations, joint ISTC and industry initiatives and ISTC/government activities which are either software industry specific or broader in nature (see Exhibit 11).

Below we describe the types of initiatives that should be considered for strengthening this industry.

Development of More Industry Information

It has become clear during this study that little is known about Canada's software products industry. Even the most basic data, such as the number of companies over $10 million, is not available. Statistical information that is available is often inaccurate.

This study has identified the key elements to success and developed an understanding of how the industry fares against these success factors. A broader based survey and performance analysis will provide each company a better understanding of how to succeed, and give government the benchmark to evaluate the effectiveness and industry performance.

Mentorship Programs

Programs designed to encourage access to and linking with experienced software industry managers. Both the MIT/York Enterprise Forum and the Massachusetts Software Council are examples of organizations which provide forums.

The Massachusetts Computer Software Council's mission is to attract capital, customers and employees to the state's software industry. Programs and activities focus on bringing member CEO's information and contacts that can help them manage, grow and make better decisions for their companies.

Through membership in the Council, software company executives can have access to industry leaders, meet potential strategic partners, and talk with their peers about common issues and problems in the software industry. They also receive information on business topics and trends, technical developments, industry practices, and legal and financial guidelines.

Training Programs

Seminars and courses designed to educate and train managers in skills unique to the software products industry. Topics could include financing, product marketing, channel management and the development of strategic relationships and alliances.

Incubation and Product Development Centres

This study has identified a number of competitiveness issues related to effective product development. For sub-threshold companies the success of their development program will determine their ability to survive. For small and medium sized companies who have one established product, the development of the second is crucial for continued growth. Effective product development can be more difficult in established firms because the management skills needed to manage a portfolio of products are more complex.

Development and incubation centres would provide the appropriate climates and resources for supporting new product development.

Development of Specialist Professional Support Firms

One of the problems identified in the Canadian software products sector is a lack of supporting suppliers of professional services in Canada. Where appropriate, through focused purchasing, the industry could encourage the development of indigenous suppliers with critical mass. In this way Canada could develop resident expertise in marketing, advertising, legal and professional consulting support specific to the software products industry.

Proactive Clustering of Software Products Companies

Incentives such as relocation assistance and tax benefits could be used to encourage company clustering on a geographic basis where capabilities already exist.

Support for Hardware and Software Alliances

Development of effective alliances requires a one-time investment in identifying alliance candidates, learning the intricacies of developing and maintaining alliances as well as leveraging off of the relationship. Organizing a central pool for identifying alliance opportunities or facilitating matches through alliance related trade fairs may help.

Promote Canadian Success Stories

The Canadian success stories, such as Cognos, Corel and Consumers Software are not well-known in the U.S. and international venture capital markets. Success stories in the Canadian software products industry need to be broadly promoted, in Canada as well as internationally, in order to increase the awareness of investment opportunities in the Canadian industry.

Encourage Private Sector Capital Pools

This and other studies have identified a significant gap in venture capital investment in the high technology sectors in Canada versus the United States. Appendix VI, Financing Considerations in the Creation and Development of Software Products Companies in Canada, discusses this issue in the software products industry. Many have advocated increasing the knowledge of venture capitalists about the software industry, and providing investment incentives for existing private venture capital pools. Specific suggestions include such things as investment tax credits, funds matching or minimum high tech investment levels for financial institutions.

Adjust Immigration Regulations

One response to the human resources competency issue would be to change existing immigration regulations. If software professionals were given fast track immigration opportunities it would be easier for Canadian-based companies to attract skilled professionals from foreign countries.

Redefine "R&D" Tax Credits

A number of the companies surveyed felt that the Federal Government's current definition of "Development" did not encompass many of the expenses incurred by software companies during product development. A redefinition of allowable costs would improve cash flows for established software products companies.

Reduce the Liability Exposure of Boards of Directors

The liabilities associated with being on the board of a Canadian company are significantly higher than those experienced in the United States. By reducing these potential liabilities Canadian software products companies will be better able to access experienced and skilled professionals as business advisors serving on the Board of Directors.

Allow Foreign Students to Work in Canada

Each year thousands of foreign students are trained through Canadian university programs. These students, here on student visas, are prohibited from working in Canada after graduation. Adjustments to the immigration and work visa regulations would allow students trained as software professionals to gain employment in Canada.

There are Distinct Roles for Industry, Associations and Government to Play

The competitiveness of the software products industry can be strengthened by changing selected government policies and legislation. Other initiatives can be taken by individual companies, associations, and industry consortiums. None of these stakeholders has the resources or capability to overcome all of the industry's competitive weaknesses. A team effort is required.

Individual companies and associations can best contribute to programs where they can share their collective knowledge and experience or where, by banding together, they create critical mass.

Associations such as the Massachusetts Software Council or MIT/York Enterprise Forum, whose mandates are to provide a networking mechanism for entrepreneurs, have proven to be tremendously successful. The Software Council in particular has a reputation for providing an outstanding network which can assist in most elements of a software products company's life cycle.

Joint ISTC and industry initiatives are necessary in areas where Canada's software products industry cannot provide critical mass to achieve the goal. Areas where this industry/government relationship may prove fruitful include encouraging venture capital pools, technology centres, training programs or establishing incubation centres. The government may supply some funding, but its key role is in stimulating networking within the industry.

There is also a role for ISTC to play in advocating the software industry's position with other government departments. There are several legislative and policy issues which can be addressed in a manner specific to the software products industry. For example, immigration allowances for software marketing and sales professionals or investment tax credits.

These initiatives will need industry support but their implementation must be led by ISTC.

Lastly, there are some legislative and policy issues which affect a broad range of Canadian industry and environmental factors which are particularly disruptive to the software products industry. Included in this category are Canada's interest and exchange rates, personal and corporate tax rates, directors liabilities, etc. The software products industry is particularly affected by these factors because of its international market orientation and the mobility of its human resources. ISTC can also perform an industry advocacy role around these issues.

Initiative Group I - Rectify Competitive Disadvantages Caused by Government Policies

Overview	• A number of competitive disadvantages can be removed by simple changes to current policies
Government Initiatives (alternatives available)	• Avoid prohibitive liability exposure for Board of Directors • Relax immigration guidelines for skilled software technical/ marketing personnel • Corporate and personal tax rate reduction to equate to U.S. • Redefine "R&D" to better encompass software products • Adjust government sourcing approaches • Encourage clustering of software products companies • Exchange and interest rate intervention • Correct conflicting federal/provincial legislation • Adjust tax regulations affecting capital gain treatment of stock sales to facilitating acquisitions by U.S. firms • Replace government involvement in venture capital pools • Develop a more detailed understanding of the industry.
Industry Initiatives (alternatives available)	• Gain concensus on areas of disruptive government policy

5.
THE WAY FORWARD

Based on the effectiveness of other countries' programs and the opinions expressed by survey participants and the Advisory Panel, there is no clear consensus on the appropriate level of intervention for this industry.

The software products industry is one that could be easily disrupted by government or industry programs which are not focused and effective. The ease of industry entry and high failure rate suggests the programs could be abused by investors hoping to "get rich quick".

Three Groups of Initiatives to Strengthen the Sector

We have identified three groups of initiatives to strengthen this sector. Each represents a bundle of policy initiatives that provide different levels of intervention and support. The three groups of initiatives are:

- Rectify competitive disadvantages caused by government policies.
- Support the industry's core competencies.
- Stimulate industry expansion.

Group I - Rectify Competitive Disadvantages Caused by Government Policies

Initiatives included in this group would change current policies, legislation or administrative guidelines that inhibit the competitiveness of the industry. (See Exhibit 12). This group relies heavily on ISTC to act in an advocacy role for the industry with various government bodies.

Group II - Support the Industry's Core Competencies

This group of initiatives focuses on closing a number of competitiveness gaps that are indigenous to the industry. These include management competency and strategic alliances and relationships. In addition, we believe that further strengthening human resource competencies should also be considered as part of this group of initiatives.

Exhibit 13 summarizes additional initiatives that should be considered as part of supporting core competencies within the software products industry. In addition, we have indicated which

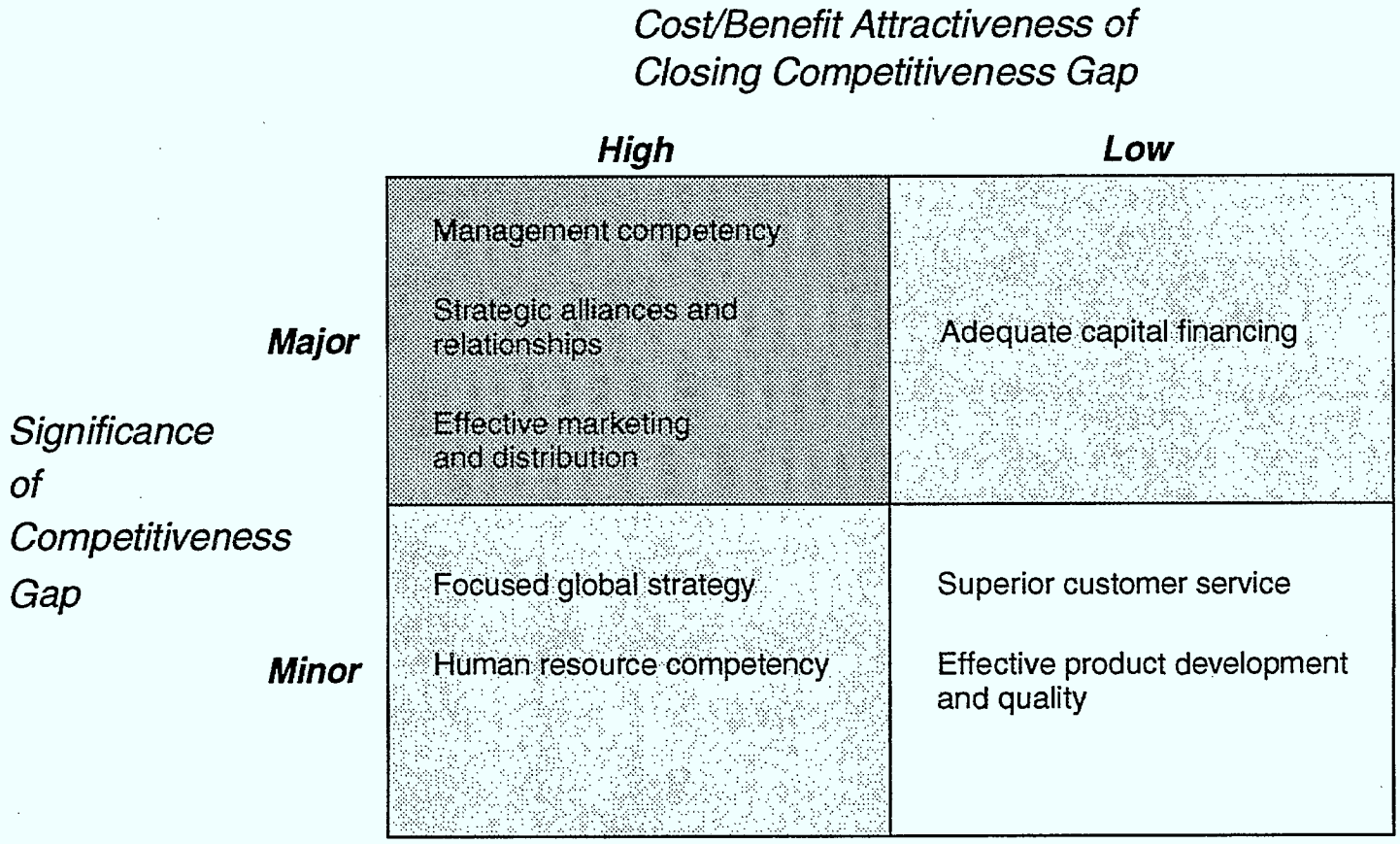
Initiative Group II - Support the Industry's Core Competencies

Overview	• Addresses the minimum support needed to continue success • Focus on closing the most critical competitiveness gaps including: - human resources competency - strategic alliances - management competency
Government Initiatives (alternatives available)	• Training incentives in marketing, sales, finance and management • Support research in core technologies • Support for university co-op programs such as marketing and business management • Encourage industry hardware/software leaders to form technology clusters in selected geographic areas • Encourage and support cross-border research consortia and U.S./ Canadian R&D projects • Support participation in U.S. industry committees • Encourage hardware manufacturers to increase their R&D value-added in Canada
Industry Initiatives (alternatives available)	• Industry councils - networking, mentorship programs, entrepreneurship forums • Work closer with universities for R&D • Establish a product advisory mechanism • Build image by publishing success stories and capabilities • Encourage Canadian companies to source software from companies adding value in Canada

Initiative Group III - Stimulate Industry Expansion

Overview	• Aggressive intervention to stimulate growth in order to reach the 1996 vision • Focus on the growth inducing success factors including: - new product development - financing - marketing and distribution
Government Initiatives (alternatives available)	• Software products R&D and marketing tax credits • Reduce effective cost of capital and increase venture capital availability • Support for export marketing research, trade show participation • Support technology development parks
Industry Initiatives (alternatives available)	• Strategic alliances/equity exchanges/consortia, etc. • Vertical industry alliances • Venture capital fairs • CEO training programs • Educate financial institutions to improve financing of foreign receivables

Priorities for Narrowing Competitiveness Gaps



initiative would typically be led by government versus the private sector.

Group III - Stimulate Industry Expansion

The previous group of initiatives is unlikely to accelerate growth in the Canadian software industry sufficiently to reach the vision as articulated by the Advisory Panel. Group III initiatives provide for more aggressive intervention in the industry to accelerate expansion.

Policy and industry initiatives encompassed in this group include efforts to increase the availability of low cost capital, support global market expansion, more aggressive and effective marketing and distribution for existing products, and support for new product development following initial beta site testing (see Exhibit 14).

The bulk of the programs in this phase will be led by industry or industry associations but still require the support of ISTC and other government institutions.

Key Assumptions In Selecting Industry Initiatives

In developing recommendations we have made the following assumptions regarding the involvement of the industry, associations and ISTC government:

- The required investment by any one of the parties must be relatively low. Recent policy trends in the Canadian government are to reduce rather than increase financial investments and inducements to specific industries. Likewise, industry associations typically have negligible financial resources.
- The recommended projects must be focused on the software products industry such as adjusting the immigration regulations for software personnel versus broad-based initiatives such as interest or exchange rate levels.
- The bulk of the initiatives should be targeted to companies in the two to twenty million dollar range.
- The programs should generate fairly quick, visible improvements and once established, be fairly self-sustained.
- The programs should be focused on the most significant competitiveness gaps.
- Initiatives should be consistent with current government policies.
- Programs should be relatively easy to implement.

The priorities established for strengthening the Canadian software products industry (see Exhibit 15) are similar to those established by 12 other major software producing nations (see Exhibit 8). Of particular interest is the concentration of effort applied to financing and strategic alliances.

Priorities for Action

Our analysis has determined that the initiatives that warrant the highest priority in order to move the software products towards the 1996 vision, include four principle thrusts:

- Stimulate management skill development through mentoring programs, and education and training programs focused on securing venture capital, marketing and technology management.

- Support the establishment of strategic alliances and linkages between Canadian and U.S./European software and hardware firms by supporting Canadian participation in the U.S./European industry committees, by providing seed funding for international R&D consortia, and by building Canada's information technology image abroad.

- Strengthen the effectiveness of marketing through appropriate training, upgrading the quality of Canada's participation in international trade shows, and continuing to financially support international market research and market development efforts.

- Provide incentives that substantially increases the availability of cost-competitive venture capital, ideally accompanied by business advice and counsel.

Together, initiatives in these four areas have the potential to significantly increase the growth rate of this industry, resulting in the creation of a substantial number of sustainable, high quality, knowledge-worker jobs.


C&L

APPENDIX I

STATEMENT OF WORK/WORK PLAN FOR BENCHMARKING THE CANADIAN AND U.S. SOFTWARE PRODUCTS INDUSTRIES BY ASSIGNMENT PHASE

Phase I - Benchmark the Competitive Environment of the Software Products Industry in North America

Objective: To prepare a detailed project plan for the assignment and to gain insights into how the U.S. and Canadian software industry environments differ.

Tasks:

1. Prepare detailed project plan for all Project phases. Meet with ISTC to review and gain agreement.
2. Review and receive comments from ISTC and the Advisory Panel (meeting No. 1) on the proposed outline for a position paper comparing the U.S. and Canadian industry environments.
3. Assemble industry information from published sources to complement internal working paper files of ISTC and the consultants.
4. Complete a review of initiatives implemented by other selected countries to gain insights into policy options that Canada may wish to consider.
5. Carry out a comparative assessment of the financial markets in the U.S. and Canada including:
   - An historical review of venture capital funds flowing into the software products sector (to be supplied by Venture Economics) from 1985 to present.
   - Interviews with a total of fifteen banks and/or venture capital pools in North America to determine their attitudes towards investing in the software industry.
6. Summarize key differences in personal and corporate tax structure between Canada and the U.S. as it affects venture capital and the software products industry.
7. Draft findings paper comparing the U.S. and Canadian software industry business environments and review with ISTC secretariat and the Advisory Panel (meeting No. 2).

Phase II - Benchmark Selected Companies in Key Segments of the Software Products Industry

Objective: To understand the basis for competitive advantage enjoyed by U.S. software firms to provide insights into how to strengthen the Canadian software products sector.

Tasks:

1. Meet with Professor Harry Lane at the Canadian Centre for Management Research and Development. Receive briefing on his team's study direction and research to ensure overlap does not occur with the current assignment.
2. Review the industry statistics assembled in Phase I and recommend a sampling frame of 50 companies. Sampling frame should ensure coverage of each product segment (systems software, user tools, and applications software), companies of varying size and geographic coverage. Gain agreement on this sampling frame with the ISTC secretariat.
3. Prepare a detailed interview guide/questionnaire to be used during interviews with U.S. and Canadian software companies.
4. Prepare a briefing package for all consultants who will be carrying out field interviews, and review same with each to ensure consistency and quality in field interviews.
5. Carry out Wave 1 of the field interviews with targeted companies. Collect readily available information in the public domain on targeted companies. Complete survey questionnaire for each company.
6. Summarize the results of Wave 1 of the field interviews and highlight specific issues and challenges that have emerged for Canadian firms.
7. Propose a sampling frame for Wave 2 which will focus on assessing in further depth challenges that have been identified, and possible policy options that might be considered by ISTC. Gain agreement on this sampling frame with ISTC to include 15 companies.
8. Carry out Wave 2 of field interviews and summarize results.
9. Prepare a paper summarizing the results of the field interviews. Paper will include a description of the methodology followed, sampling frame and a summary of the findings.
10. Review paper with ISTC and Advisory Panel (meeting No. 3.).

Phase III - Synthesize Sources of Competitive Advantage Enjoyed by the U.S. Software Products Industry

Objective: To identify the underlying factors that contribute to the world class competitiveness of U.S. software products firms, and the performance gap of Canadian firms in this sector.

Tasks:

1. Assess the results of the field interviews (Phase II) within the context of the comparative assessment of the U.S. and Canadian business environments (Phase I).

2. Prepare a position paper summarizing the:

   - competitive performance of U.S. software products firms and the underlying basis for their competitive advantage; and
   - sources of competitive disadvantage of Canadian software firms.

3. Organize an internal workshop of the consulting team (at which ISTC and Advisory Panel representatives will be welcomed to participate) to discuss the position paper and to:

   - identify a vision for the Canadian software products sector as to its potential by the year 2000;
   - confirm the issues and challenges facing the Canadian software products industry; and
   - begin to identify programs and initiatives which may be undertaken by the Canadian industry and Government

Phase IV - Isolate Pragmatic Initiatives to Strengthen the Sector

Objective: To recommend approaches that ISTC should consider in the next phase of the Special Initiative for the software industry.

Tasks:

1. Organize a series of up to 3 Strategy Workshops, each of which will focus on a major issue area facing the software industry in Canada. Arrange for attendance at the workshops by members of the consulting team from Canada and the U.S., as well as client and panel representatives (at their discretion).
2. Prepare briefing materials for workshop participants including background reading, workshop objectives and agenda.
3. Facilitate each workshop.
4. Summarize tentative conclusions from the workshops and share with the participants.
5. Prepare draft Table of Contents for final report which includes the findings from Phase I, II and III and gain ISTC agreement.
6. Prepare draft of final report and review with ISTC secretariat and Special Advisory Panel (meeting No. 4).
7. Receive comments on draft report from client and finalize.


C&L

APPENDIX II

THE ADVISORY PANEL AND PARTICIPANTS IN FOCUS GROUPS

THE ADVISORY PANEL

ADVISORY PANEL		
Alias Research Inc.	Stephen Bingham	President
Alis Technologies Inc.	Claude Lemay	Chief Executive Officer
CADAPSO/Software Ontario	Nancy Mancini	
CADAPSO	Fruji Bull	President
Canadian Advanced Technology Association	Roy Woodbridge	President
Centre de recherche informatique de Montreal	Dr. Renato de Mori	Vice-President R&D
Cognos Incorporated	Michael Potter	Chairman and Chief Executive Officer
Delrina Technology Inc.	Dennis Bennie	Chief Executive Officer
IBM Canada Ltd.	Larry Achtemichuk	Director, IBM Canada Laboratory
ITAC	Janice Moyer	President and C.E.O.
Keyword Office Technology Inc.	Robert Blackshaw	President
Softwords	Ellen Godfrey	President
University of Toronto	Dr. Ken Sevcik	Chairman, Dept. of Computer Science
Ventures West	Ted White	Partner
Walker Sinclair Consulting Group	Barry McKee	Managing Director

ISTC REPRESENTATIVES AND COOPERS & LYBRAND PROJECT TEAM		
Amarok Systems	Gordon Harris	President
Coopers & Lybrand	Brett Knowles	Principal
Coopers & Lybrand	Lucie Guertin	Senior Consultant
Coopers & Lybrand	Erik Rule	Partner
Coopers & Lybrand, San Jose	Robert Stavers	Partner
Coopers & Lybrand, Boston	Cheryl Suchors	Partner
Doyletech Corporation	Denny Doyle	President
ISTC	Renata Borysewicz	Senior Commerce Officer
ISTC	Jocelyn Ghent Mallet	Director General
ISTC	John Hagan	Deputy Director General
ISTC	Keith Parsonage	Director
ISTC	David Paterson	Senior Project Officer
ZZ International	Zavis Zeman	President

PARTICIPANTS IN MARKETING/CHANNEL MANAGEMENT STRATEGY SESSION

Name	*Title*	*Company*	*Phone*	*Fax*
Richard Huot	Manager	Coopers & Lybrand	(416) 941-8428	(416) 863-0926
John Taylor	Chairman of the Board	Taylor & Sprules	(416) 461-9214	(416) 461-5206
Robin Braithwaite	Senior Industry Development Officer	ISTC	(416) 973-5156	(416) 973-8714
Ron Nordin	Senior V.P. Marketing	Cognos	(617) 229-6600	(617) 229-8047
Marc Sievers	President	IPRO	(416) 496-0977	(416) 492-4108
Richard Rabins	President	Alpha Software	(617) 229-2924	(617) 272-4876
Peter Goldie	V.P. Marketing	Alias Research	(416) 362-9181	(416) 362-0630

Additional Sources

Norm Francis	President	Pen Magic!
Michael Cowpland	President	Corel

PARTICIPANTS IN CAPITAL AND FINANCING STRATEGY SESSION

Name	*Title*	*Company*	*Phone*	*Fax*
Ted White	Partner	Ventures West	(416) 233-3411	(416) 233-3411
Denny Doyle	President	Doyletech	(613) 592-0110	(613) 592-4296
David Paterson	Senior Project Officer	ISTC	(613) 954-3294	(613) 952-8419
Erik Rule	Partner	Coopers & Lybrand	(416) 941-8248	(416) 863-0926
Kevin O'Leary	President	Softkey	(416) 602-5500	(416) 602-0239
Mike Slaunwhite	Chief Financial Officer	Corel	(613) 728-8200	(613) 761-9350
Barry McKee	Managing Director	Walker Sinclair Consulting Group	(416) 639-5111	(416) 634-6731

Additional Sources

Tom O'Flaherty	President	Richmond Software
Jack Grushcow	President	Consumers Software


C&L

APPENDIX III

DESCRIPTION OF SURVEY METHODOLOGY AND PROCEDURES FOLLOWED

III-1 - Summary of The Survey Methodology

III-2 - Survey Participants

III-3 - Interview Guidelines and Questionnaires

III-1 - Summary of The Survey Methodology

Survey Methodology

The approach adopted in undertaking the survey involved two major sets of tasks. One was the conduct of in-depth personal interviews and the second was the compilation of quantitative surveys.

The criteria for the selection of companies were as follows:

- type of software product (systems, applications, or user tools),
- sales in excess of 2 million dollars,
- reasonable measure of success in their industry,
- a mix of private and publicly traded companies, and
- coverage of niche markets.

Study Frame

Through the formal survey process, Advisory Panel participation and Wave 2 interviews we have received input from over 20% of Canadian software products companies over the threshold of $2 million in sales. The full range of companies within the threshold group have been included within the categories of products (applications, user tools and operating systems), major size breaks ($2-10 million, $10-$40 million, $40 million+ and over) and geographic location.

In-Depth Personal Interviews

In-depth personal interviews were conducted with a structured sample of software companies in Canada and the U.S.

The U.S. companies selected were believed to represent "best-in-class" companies within their respective sectors. Canadian companies were selected to be representative of the software industry as a whole.

We targeted 36 companies in the U.S., with half in the San Francisco area and the other half in the Boston area. In Canada, 16 companies were selected across the country. A list of participating companies can be found in Appendix II-2. The questionnaire can be seen in Appendix III-3.

Quantitative Surveys

A three part survey was developed to gather data on software products companies in Canada and the U.S. The three parts were a Chief Executive Officer (C.E.O.) section, a Chief Financial Officer (C.F.O.) section and a Marketing/Sales section. Examples of the questionnaire can be seen in Appendix III-3. All companies participating in the in-depth personal interviews were asked to complete the surveys. A list of participating companies can be found in Appendix III-2.

III-2 - Survey Participants

List of Companies who Participated in the Survey

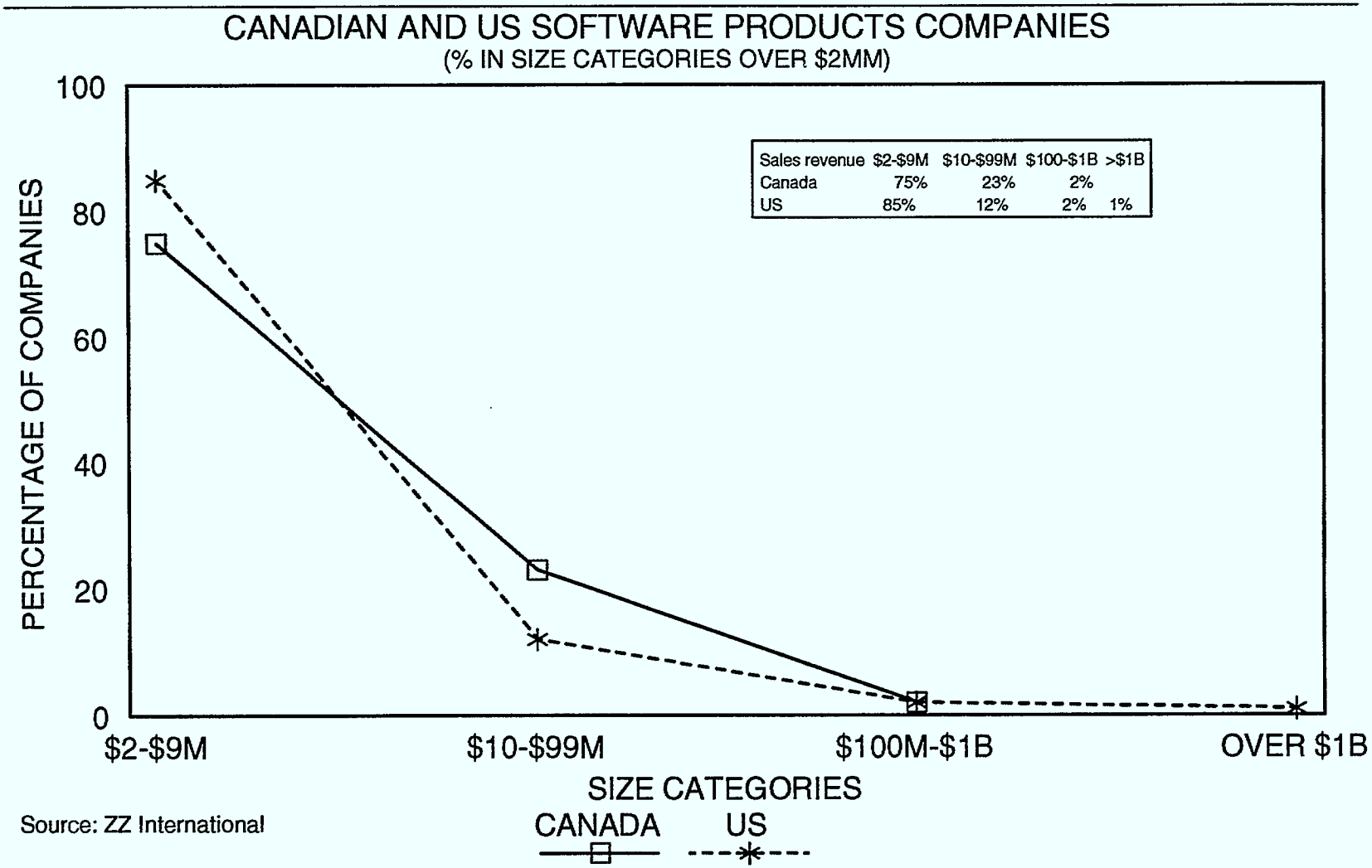
Canadian Companies

	Personal Interview	Completed Questionnaire Survey
Chancery Software Ltd.	✓	✓
Cognos Inc.	✓	✓
Corel Systems Corporation	✓	✓
Consumers Software Incorporated	✓	✓
Delrina Technology Inc.		✓
Empress Software Inc.	✓	✓
Fulcrum Technologies Inc.	✓	✓
HCR	✓	
IBM Canada Ltd.		✓
Intera-Tydac Technologies Inc.	✓	✓
Micro Tempus Inc.	✓	✓
Mortice Kern Systems Inc.	✓	✓
NISSI Technologies, Inc.	✓	✓
Numetrix	✓	✓
Pen Magic	✓	
PROMIS Systems Corporation	✓	✓
Quantum Software Systems Ltd.	✓	✓
Richmond Software	✓	✓
Rockwood Informatics		✓
Simware Inc.	✓	✓
Softwords Research International Ltd.		✓
Virtual Prototypes Inc.	✓	✓
WATCOM Group Inc.	✓	✓

U.S. Companies

	Personal Interview	Completed Questionnaire Survey
AHA! Software Corporation	✓	✓
ASK Computer Systems, Inc.	✓	✓
Bachman Information Systems Inc.	✓	✓
BBN Software Products Corporation	✓	✓
Boole & Babbage	✓	
Broderbund Software, Inc.	✓	✓
CADRE Technologies Inc.	✓	✓
Claris Corporation		✓
Computer Corporation of America	✓	
Consilium Inc.	✓	✓
Corporate Software Inc.	✓	
Electronic Arts Inc.	✓	✓
Frame Technology Corp.	✓	✓
IMC Systems Group Inc.	✓	
Index Technology Corp.	✓	
Insignia Solutions	✓	✓
Intellicorp	✓	✓
Interleaf, Inc.	✓	✓
Kean Inc.	✓	✓
Liant Softwrae Corp.	✓	✓
Lotus Development Corp.	✓	✓
Lynx Real-Time	✓	✓
Meridian Data, Inc.	✓	✓
Microrim, Inc.	✓	✓
Parametric Technology Corp.	✓	✓
Sandpoint Corp.	✓	✓
SofTech Inc.	✓	✓
Softek Design	✓	✓
Software 2000, Inc.	✓	✓
Sybase	✓	
Symantec	✓	✓
T/Maker	✓	✓
The Learning Company	✓	✓
Vantage Analysis	✓	✓
Verity Inc.	✓	✓

The Canadian & U.S. participating companies had the same size profile



Source: ZZ International

III-3 - Interview Guidelines and Questionnaires

Interview guideline
- open ended questions -

1. What are the top 5 questions key success factors/determinants of success in the software products industry?

2. Do Canadian SPI companies have any competitive disadvantages? What are they?

3. What are the 5 "show stoppers" - things that would most likely cause the failure of a SPI company?

4. What have been the constraints to growth (e.g., financing, people, etc.) and how did you/would you deal with them?

5. How important is a multi-product portfolio (either other software products, hardware or services)?

6. What techniques do you use to gather market intelligence? What are the roles and how important are: advertising, trade journals, direct mail, conventions and trade shows, product samples.

7. Advantages/disadvantages of being close to/far from critical mass of SP or related industry.

8. How do you fill senior vacancies in your company? What are the backgrounds and career progression of your senior management?

9. What role should government (at all levels) and industry play in helping to develop and sustain the SPI?

10. How do/can you gain competitive advantage in each of the following areas:

    distribution

    marketing

    sales

    finance

    human resources

THE COMPETITIVE DYNAMICS

OF THE

SOFTWARE PRODUCTS INDUSTRY

- CEO's QUESTIONNAIRE -

INDUSTRY, SCIENCE AND TECHNOLOGY CANADA,
GOVERNMENT OF CANADA

SOFTWARE BY DELTRINA

PRESIDENT / CHIEF EXECUTIVE OFFICER

1.1 Average years of experience in the Software Products Industry across your Senior Management Team:

0-5 _____ 6-10 _____ 11-15 _____ 15-20 _____ 20+ _____

1.2 Have any of your Senior Management been involved with SUCCESSFUL software product development initiatives?

yes _____ no _____

1.3 Would you describe your team's management style as:

participative	1	2	3	4	5	autocratic
delegating	1	2	3	4	5	authoritative
risk taking	1	2	3	4	5	risk averse

1.4 How many employees do you have in each area?

Finance _____ Human Resources _____ Marketing _____

Operations _____ R & D _____ Sales _____

Other _____

1.5 Do you have a management succession plan (for senior managers)? yes _____ no _____

1.6 Which of the following business plans do you have documented?

no plan _____ a 1 year plan & budget _____ a 2 year plan _____ a long range plan _____

How often do you update the plan? _____

1.7 Is your company involved in any form of strategic alliance with either software or hardware suppliers?

yes _____ no _____

1.8 If yes (select as many as apply):

	SOFTWARE	HARDWARE
Licensing agreement	_____	_____
Joint venture	_____	_____

1.9 What mechanisms do you use to sell outside of your country?

Export sales	yes ____	no ____
Licensing agreements	yes ____	no ____
Joint ventures	yes ____	no ____
Branch or subsidiary	yes ____	no ____
Distribution agreements	yes ____	no ____

1.10 To which countries/areas do you sell?

Canada ____ Pacific Rim ____ South & Latin America ____ EEC ____

1.11 What software products are you/do you develop and/or market?

System software	yes ____	no ____
User tools	yes ____	no ____
Applications	yes ____	no ____

1.12 What hardware platform was you key software product developed to be released on and does it currently operate on (check all that apply)?

	Mainframe	Mini	Micro
IBM	_____	_____	_____
Apple	_____	_____	_____
MAC	_____	_____	_____
VAX	_____	_____	_____
HP	_____	_____	_____
Other	_____	_____	_____

1.13 How many organization levels do you have in your company?

2 ____ 3 ____ 4 ____ 5 ____

THE COMPETITIVE DYNAMICS

OF THE

SOFTWARE PRODUCTS INDUSTRY

- CFO's QUESTIONNAIRE -

INDUSTRY, SCIENCE AND TECHNOLOGY CANADA
GOVERNMENT OF CANADA

SOFTWARE BY DELHINA

CHIEF FINANCIAL OFFICER

2.1 Do you update your budget annually? yes _____ no _____

2.2 Does your company monitor its performance against the budget on a regular basis (e.g., periodically estimate latest outlook for the year)? yes _____ no _____

2.3 What is the average unit price for your key software product? $_____

2.4 What is the average order size from a customer for your key software product? $_____

Results from the most recent (12 months) financial statements.
NOTE: PROVIDE CURRENTLY AVAILABLE INFORMATION FOR SOFTWARE PRODUCTS IF POSSIBLE _____ OR TOTAL COMPANY _____ (CHECK ONE)

2.5 Actual gross sales $_____

2.6 Budgeted sales $_____

2.7 Export sales $_____

2.8 Revenue from joint ventures/alliances $_____

2.9 Gross profit $_____

2.10 Profit before tax $_____

2.11 Total assets $_____

2.12 Total debt $_____

2.13 Equity $_____

2.14 Breakdown of expenses by major category:

Advertising $_____
Customer Service $_____
Finance $_____
Marketing $_____
Sales $_____
Personnel $_____
Training $_____
R&D $_____

2.15 What accounting treatment do you use for your R&D costs?
Expense_____ Capitalize_____

2.16 Software Product Sales: 1990 $_____ 1989 $_____ 1988 $_____
1987 $_____ 1986 $_____ 1985 $_____

Or % Growth: 1990____% 1989____% 1988____% 1987____% 1986 ____%

2.17 How many rounds of financing have you been through?

1st round_____ 2nd round_____ 3rd round_____ 4th round____ 5th round____

2.18 Which round of financing was most difficult to secure? _____round

2.19 For your 1st round of financing, indicate the sources as applicable.

mortgage _____% family _____% friends _____% employees _____%

venture capital _____% bank _____% government _____% other(specify) _____%

2.20 How much capital came from this 1st round? $_____

2.21 Could you have grown faster if you had obtained this financing sooner? yes _____ no _____

2.22 For your 2nd round of financing, indicate the sources as applicable.

mortgage _____% family _____% friends _____% employees _____%

venture capital _____% bank _____% government _____% other (specify) _____%

2.23 How much capital came from this 2nd round? $_____

2.24 Could you have grown faster if you had obtained this financing sooner? yes _____ no _____

2.25 For your 3rd round of financing, indicate the sources as applicable.

mortgage _____% family _____% friends _____% employees _____%

venture capital _____% bank _____% government _____% other(specify) _____%

2.26 How much capital came from this 3rd round? $_____

2.27 Could you have grown faster if you had obtained this financing sooner? yes _____ no _____

2.28 For your 4th round of financing, indicate the sources as applicable.

mortgage _____% family _____% friends _____% employees _____%

venture capital _____% bank _____% government _____% other(specify) _____%

2.29 How much capital came from this 4th round? $_____

2.30 Could you have grown faster if you had obtained this financing sooner? yes _____ no _____

2.31 Have you received any of the following forms of external financing:

Government grants _____ Government loans _____
Federal scientific research and experimental development tax credit _____
Software/Hardware affiliate loans _____

2.32 If you have received government funding, was it:

product based _____
in aid of an internal government (including DND/DOD) initiative _____

2.33 How much capital came from government monies? $_____

2.34 If you received venture capital, what type was it?

capital only _____ capital and Board of Directors representation _____
capital and management participation _____

2.35 Was the venture capital: U.S. based _____ Canadian based _____

2.36 Was the venture capital in the form of: convertible debenture _____ equity _____

2.37 If you have received financial support from hardware or software affiliates, was it:

product based _____ in aid of an internal affiliate initiative _____

2.38 Would you have succeeded without it? yes _____ no_____

2.39 How much capital came from affiliate funding? $_____

2.40 Is the company currently: public _____ private _____

2.41 How many employees have left (regardless of reasons) the company?

This year_____ Last year_____

2.42 How many employees joined the company? This year _____ Last year _____

2.43 Do you offer bonuses to your employees? yes_____ no_____

2.44 What is the maximum % of annual salary an employee can receive as a bonus? _____%

2.45 Total number of employees this year: Full time _____ Part time _____

2.46 Total number of employees last year: Full time _____ Part time _____

2.47 Total personnel costs per person per year (salaries, fringe benefits, performance bonuses)?

$_____

THE COMPETITIVE DYNAMICS

OF THE

SOFTWARE PRODUCTS INDUSTRY

MARKETING/SALES QUESTIONNAIRE

INDUSTRY, SCIENCE AND TECHNOLOGY CANADA,
GOVERNMENT OF CANADA

SOFTWARE BY DELRINA

VICE-PRESIDENT MARKETING / SALES

3.1 Is your company predominantly driven by a focus on:

product _____ technology_____ market_____

development_____ method of sale/distribution _____

3.2 How complicated is/are your software product(s) to:

learn the basic functionality	easy	1	2	3	4	5	difficult
become proficient?	easy	1	2	3	4	5	difficult

3.3 What share do you currently hold of your target market? _____%

3.4 What is your ranking in size (revenues) relative to competitors? No._____

3.5 How large did you think the market was for your principal (probably first) product when you developed it? $_____ million

3.6 How large do you estimate this market is in 1991? $_____ million

3.7 How many competitors are there in your market with over 5% market share?
_____ competitors

3.8 Historically, has your company been the:

Market leader 1 2 3 4 5 Market follower

3.9 How often do you survey your customers?

Never ____ Once a quarter ____ Once a year ____ Less than once a year ____

3.10 How many of the following customer intelligence programs do you hold in a year:

user groups _____ user conferences _____
customer visits _____ market research surveys _____ focus groups _____

3.11 How do you sell your product (choose as many as apply)?

Direct to customer _____ Direct to distributor _____
Direct to hardware vendor _____ Direct to other parties _____
Direct to retailers _____

3.12 Is your distribution network:

Your own _____ Partially owned _____ Arm's length _____

What is its scope?

Local _____ Regional _____ National _____ International _____

3.13 Is your key software product targeted to the mass market _____?

A (narrowly) defined market_____:

Industry _____ Application _____ Hardware _____ Distribution _____
Operating system _____ Other _____

3.14 How many beta test sites did you use before launching your key software product?

0 _____ 1 _____ 2 _____ 3 _____

3.15 Have the beta test sites provided testimonials and/or helped in marketing the product?

yes _____ no _____

3.16 How many awards has your company received across all software products: Number _____

3.17 Have you been featured in key industry papers or journals? Yes ____ No ____

3.18 Do you conduct a FORMAL market survey as part of the market development process (choose as many as apply)? no _____

yes, before target market is identified _____ yes, before product concept design _____
yes, during conceptual definition stage _____ yes, during product testing _____
yes, after product release into market ____

3.19 Do your suppliers send you advance releases of system software or hardware?

system software yes _____ no _____
hardware yes _____ no _____

3.20 How many years has it been since your key product was first launched? _____ years

3.21 How many releases have you issued for your key software product since the initial product launch? _____ releases

3.22 On average, how many years of sales experience int he software product industry do your sales representatives have?

0-5 _____ 6-10 _____ 11-20 _____ 21+ _____

3.23 How many of your product sales staff are: full time _____ part time _____

3.24 What level of product sales is achieved by an average FULL TIME product sales representative in a year? $_____

3.25 Do you advertise in trade journals? yes _____ no _____

3.26 Do you pursue the trade press to evaluate, in writing, your new software products?
yes _____ no _____

3.27 Do you use/attend:
direct mail _____ conventions & trade shows _____ product samples _____

3.28 What type of training program do you offer your sales staff? (choose as many as apply)
on-the-job _____ formal in-house _____ formal outside _____

3.29 Does the company offer after sales service: free of charge _____
or charge for it separately _____

3.30 Do you offer customers a toll free hot line? yes _____ no _____

3.31 What percentage of your sales come from:

catalogues _____ own sales force _____
dealers/distributors _____ other _____


C&L

APPENDIX IV

SUMMARY OF FINDINGS

IV-1 - Top Line Results of the (Questionnaire) Survey of U.S. and Canadian Software Products Companies

IV-2 - Statistical Analysis of Questionnaire Results

IV-3 - Summary of Focus Group Discussions

IV-1 - Top Line Results of the Survey of U.S. and Canadian Software Products Companies

1.1 Average years of experience in the Software Products Industry across your Senior Management Team:

Canada - 10 years ***U.S. - 11 years***

1.2 Have any of your Senior Management been involved with SUCCESSFUL software product development initiatives?

Canada - 100% said yes ***U.S. - 95% said yes***

1.3 Would you describe your team's management style as:

Canada

participative	**1**	**2**	**3**	**4**	**5**	**autocratic**
	31%	**50%**	**13%**	**5%**		
delegating	**1**	**2**	**3**	**4**	**5**	**authoritative**
	13%	**31%**	**25%**	**31%**		
risk taking	**1**	**2**	**3**	**4**	**5**	**risk averse**
	13%	**25%**	**50%**	**12%**		

U.S.

participative	***1***	***2***	***3***	***4***	***5***	***autocratic***
	43%	***48%***	***9%***			
delegating	***1***	***2***	***3***	***4***	***5***	***authoritative***
	19%	***52%***	***24%***	***5%***		
risk taking	***1***	***2***	***3***	***4***	***5***	***risk averse***
	14%	***58%***	***14%***	***9%***	***5%***	

1.4 How many employees do you have in each area?

Canada

Finance	**3%**	**Human Resources**	**1%**	**Marketing**	**5%**
Operations	**28%**	**R & D**	**41%**	**Sales**	**11%**
Other	***11%***				

U.S.

Finance	***5%***	***Human Resources***	***3%***	***Marketing***	***10%***
Operations	***28%***	***R&D***	***22%***	***Sales***	***27%***
Other	***5%***				

1.6 Which of the following business plans do you have documented?

Canada	**a 1 year plan & budget**	**87%**	**a 2 year plan**	**42%**	**a long range plan**	**58%**
U.S.	***a 1 year plan & budget***	***81%***	***a 2 year plan***	***10%***	***a long range plan***	***48%***

How often do you update the plan?	**Canada**	***U.S.***
Monthly	**19%**	**-**
Quarterly	**6%**	***11%***
Semi-Annually	**31%**	**22%**
Annually	**44%**	**67%**

1.7 Is your company involved in any form of strategic alliance with either software or hardware suppliers?

Canada	**100% said yes**
U.S.	***74% said yes***

1.8 If yes (select as many as apply):

Canada	**SOFTWARE**	**HARDWARE**
Licensing agreement	**87%**	**27%**
Joint venture	***47%***	***33%***
U.S.		
Licensing agreement	***87%***	***27%***
Joint venture	***20%***	***27%***

1.9 What mechanisms do you use to sell outside of your country?

	Canada	***U.S.***
Export sales	**100%**	***55%***
Licensing agreements	**87%**	***55%***
Joint ventures	**33%**	***30%***
Branch or subsidiary	**67%**	***70%***
Distribution agreements	**93%**	***90%***

1.10 To which countries/areas do you sell?

	Canada	***U.S.***
Canada	**100%**	***80%***
Pacific Rim	**87%**	***80%***
South & Latin America	**67%**	***30%***
EEC	**87%**	***90%***

1.11 What software products are you/do you develop and/or market?

	Canada	***U.S.***
System software only	**-**	***5%***
User tools only	**6%**	***5%***
Applications only	**31%**	***45%***
Sys. Software & user tools	**31%**	***10%***
Sys. software & applications	**6%**	**-**
User tools & appl.	**20%**	***20%***
All three	**6%**	***15%***

1.12 What hardware platform was your key software product developed to be released on and does it currently operate on (check all that apply)?

	Canada	U.S.
Mainframe only		
Mini only	13%	26%
Micro only	20%	47%
Mainframe & mini		
Mainframe & micro	20%	
Mini & micro	27%	11%
All three	20%	16%

For each platform, specify the hardware:

		Canada	U.S.
Mainframe	IBM only	66%	33%
	IBM,VAX & HP		33%
	All hdwre.		34%
Mini	IBM & VAX	17%	
	VAX & HP	17%	
	IBM only	50%	12%
	VAX only	12%	22%
	IBM & VAX	13%	
	VAX & HP	13%	
	HP only		22%
	IBM/VAX & HP	12%	22%
	All hdwre.		22%
Micro	IBM only		7%
	IBM & VAX		
	IBM & Macintosh	67%	21%
	IBM, Apple & Macintosh	8%	
	Apple only	17%	14%
	Apple & Macintosh	8%	7%
	All hdwre.		7%
			44%

1.13 How many organization levels do you have in your company?

Canada	*U.S.*
56% have 3 levels	***5% have 2 levels***
38% have 4 levels	***20% have 3 levels***
6% have 5 levels	***50% have 4 levels***
	25% have 5 levels

2.1 Do you update your budget annually?

Canada	*U.S.*
100% said yes	***88% said yes***

2.2 Does your company monitor its performance against the budget on a regular basis (e.g., periodically estimate latest outlook for the year)?

Canada	*U.S.*
83% said yes	***94% said yes***

2.3 What is the average unit price for your key software product?

Canada	*U.S.*
$17,000	***$28,000***

2.4 What is the average order size from a customer for your key software product?

Canada	*U.S.*
$49,000	***$90,000***

2.5 Actual gross sales

Canada	*U.S.*
$18,345K	***$41,985K***

2.11 Total assets

Canada	*U.S.*
$14,652K	***$24,418K***

2.12 Total debt

Canada	*U.S.*
$4,028K	***$2,296K***

2.13 Equity

Canada	*U.S.*
$13,824K	***$9,925K***

2.17 How many rounds of financing have you been through?

Canada		*U.S.*	
1 only	**42%**	**1 only**	**18%**
2	**33%**	**2**	**35%**
3	**25%**	**3**	**18%**
		4	**12%**
		5	**17%**

2.19 For your 1st round of financing, indicate the sources as applicable.

	Canada	*U.S.*
	100%	

1st round of financing obtained 100% from:

Bank	**8%**	
Employees	**8%**	
Public	**17%**	**6%**
Government	**8%**	
Family	**17%**	**12%**
Venture Capital		**59%**
Affiliate		**6%**
A mix of Sources	**42%**	**17%**
		53%

2.20 How much capital came from this 1st round?

Canada	*U.S.*
$2,594K	***$4,121K***

2.21 Could you have grown faster if you had obtained this financing sooner?

Canada	*U.S.*
58% said no	***64% said no***

2.22 For your 2nd round of financing, indicate the sources as applicable.

	Canada	***U.S.***
2nd round of financing obtained 100% from:		
Bank	**14%**	**7%**
Public	**29%**	
Venture Capital	**14%**	**79%**
Affiliate	**14%**	
Friends		**7%**
A Mix	**71%**	**7%**

2.23 How much capital came from this 2nd round?

Canada	***U.S.***
$5,892K	***$4,914K***

2.24 Could you have grown faster if you had obtained this financing sooner?

Canada	***U.S.***
57% said yes	***73% said no***

2.25 For your 3rd round of financing, indicate the sources as applicable.

	Canada	***U.S.***
3rd round of financing obtained 100% from:		
Bank	**33%**	***12%***
Government	**33%**	
Venture Capital		**62%**
Public		***12%***

2.26 How much capital came from this 3rd round?

Canada	***U.S.***
$977K	***$7,375K***

2.27 Could you have grown faster if you had obtained this financing sooner?

Canada	***U.S.***
67% said no	***71% said no***

2.28 For your 4th round of financing, indicate the sources as applicable.

	Canada	***U.S.***
4th round of financing obtained 100% from:		
Bank		***20%***
Venture Capital		***40%***
Public		***20%***
Affiliate		***20%***

2.29 How much capital came from this 4th round?

Canada	***U.S.***
	$6,808K

2.30 Could you have grown faster if you had obtained this financing sooner?

Canada	***U.S.***
	50% said yes

2.31 Have you received any of the following forms of external financing:

	Canada	***U.S.***
Government grants	**55%**	
Government loans	**27%**	
Affiliate loans	**18%**	

2.32 If you have received government funding, was it:

	Canada	***U.S.***
To support a product	**86%**	

2.34 If you received venture capital, what type was it?

	Canada	***U.S.***
Capital & Board of Directors representation	**100%**	***85%***
Capital only		***15%***

2.35 Was the venture capital:

Canada	***U.S.***
75% Canadian Based	***100% US based***

2.36 Was the venture capital in the form of:

	Canada	***U.S.***
Equity based	**100%**	***100%***

2.37 If you have received financial support from hardware or software affiliates, was it:

	Canada	***U.S.***
To support a product	**100%**	***100%***

2.40 Is the company currently:

	Canada	***U.S.***
Private	**70%**	***69%***
Public	**30%**	***31%***

2.43 Do you offer bonuses to your employees?

Canada	***U.S.***
92% said yes	***100% said yes***

2.44 What is the maximum % of annual salary an employee can receive as a bonus?

Canada	***U.S.***
21% average	***34% average***

2.47 Total personnel costs per person per year (salaries, fringe benefits, performance bonuses)?

Canada	***U.S.***
$48,000	***$80,000 average***

3.1 Is your company predominantly driven by a focus on:

	Canada	***U.S.***
Product	**21%**	***45%***
Technology	**14%**	***20%***
Market	**44%**	***20%***
Development	**7%**	
Method of sale/dist.		
Technology & market	**7%**	***5%***
Market, development and method of sale/dist.	**7%**	
Product and market		***5%***
Product and technology		***5%***

3.2 How complicated is/are your software product(s) to:

	Canada	U.S.
learn the basic functionality		
easy		
1	29%	25%
2	7%	14%
3	28%	33%
4	29%	14%
5	7%	14%
difficult		
become proficient		
easy		
1		9%
2	14%	29%
3	14%	14%
4	36%	19%
5	36%	29%
difficult		

3.3 What share do you currently hold of your target market?

Canada	U.S.
34%	25%

3.4 What is your ranking in size (revenues) relative to competitors?

	Canada	U.S.
Ranked themselves no. 1	36%	21%
Ranked themselves no. 2	29%	16%
Ranked themselves no. 3	14%	26%
Ranked themselves no. 4		5%
Ranked themselves no. 5		11%
Ranked themselves >5	21%	21%

3.5 How large did you think the market was for your principal (probably first) product when you developed it?

Canada	U.S.
$128 million	$78 million

3.6 How large do you estimate this market is in 1991?

Canada	U.S.
$142 million	$665 million

3.7 How many competitors are there in your market with over 5% market share?

	Canada	U.S.
said none	13%	14%
said 1	10%	5%
said 2	20%	14%
said 3	20%	19%
said 4	25%	29%
said 5	5%	19%
said >5	7%	—
100%	100%	100%

3.8 Historically, has your company been the:

	Canada	U.S.
Market Leader		
1	50%	57%
2	36%	19%
3	14%	19%
4		5%
5		
Market Follower		

3.9 How often do you survey your customers?

	Canada	U.S.
Never	7%	5%
Once a quarter	33%	25%
Once a year	40%	55%
Less than once a year	20%	15%

3.10 How many of the following customer intelligence programs do you hold in a year:

	Canada	U.S.
User groups	60%	75%
User conferences	73%	45%
Customer visits	93%	95%
Market research surveys	60%	50%
Focus groups	27%	55%

3.11 How do you sell your product (choose as many as apply)?

	Canada	U.S.
Direct to customer only	7%	24%
Direct to distributor only	7%	
Direct to customer & dist.	33%	10%
Direct to cust. & retailer	7%	5%
Direct to cust., hdwre. vendor & dist.	7%	5%
Direct to cust.,hdwre. vendor & other parties	3%	5%
Direct to cust.,dist. & other parties	12%	8%
Direct to cust., dist., hdwre. vendor & ret.	20%	43%

3.12 Is your distribution network:

	Canada	U.S.
Use their own	57%	57%
Use a partially owned one	7%	9%
Use an arm's length one	29%	29%
Use their own & arm's length one	7%	5%

What is its scope?

	Canada	U.S.
National	7%	30%
International	93%	70%

3.13 Is your key software product targeted to the mass market?

	Canada	U.S.
Mass market	20%	33%
Narrowly defined market	80%	67%

What type of narrowly defined market?

	Canada	U.S.
Industry		21%
Application	8%	21%
Hardware	8%	
Operating System	25%	
Industry & application	17%	22%
Hardware & application	17%	7%
Other	25%	29%

3.14 How many beta test sites did you use before launching your key software product?

	Canada	***U.S.***
Average	**7**	***33***

3.15 Have the beta test sites provided testimonials and/or helped in marketing the product?

Canada	***U.S.***
86% said yes **14% said no**	***75% said yes***

3.16 How many awards has your company received across all software products:

	Canada	***U.S.***
Average	**5**	***14***

3.17 Have you been featured in key industry papers or journals?

Canada	***U.S.***
93% said yes **7% said no**	***95% said yes***

3.18 Do you conduct a FORMAL market survey as part of the market development process?

Canada	***U.S.***
57% said no	***43% said no***

Of the remaining 43%:

	Canada	
Phase 1 Before target market identified	**30%**	**during phase 1**
Phase 2 Before product concept design	**15%**	**during phases 1,2**
Phase 3 During conceptual definition stage	**15%**	**during phases 1,2,3**
Phase 4 During product testing	**15%**	**during phases 1,2,3,4**
Phase 5 After product release into market	**15%**	**during phases 2,3,4**
	10%	**during phases 3,4,5**

Of the remaining 57%:

	U.S.	
Phase 1 Before target market identified	***5%***	***during phase 1***
Phase 2 Before product concept design	***5%***	***during phases 1,2***
Phase 3 During conceptual definition stage	***9%***	***during phase 2***
Phase 4 During product testing	***9%***	***during phase 3***
Phase 5 After product release into market	***19%***	***during phases 1,2,3***
		during phases 2,3,4
		during phases 3,4,5
	5%	***during phases 2,3,4,5***
	5%	***during all phases***

3.19 Do your suppliers send you advance releases of system software or hardware?

	Canada	***U.S.***
System software	**87% said yes**	***95% said yes***
Hardware	**60% said yes**	***85% said yes***

3.20 How many years has it been since your key product was first launched?

	Canada	***U.S.***
Average	**7**	***6***

3.21 How many releases have you issued for your key software product since the initial product launch?

	Canada	***U.S.***
Average	**8**	***6***

3.22 On average, how many years of sales experience in the software product industry do your sales representatives have?

	Canada	***U.S.***
Average	**5**	***5***

3.23 How many of your product sales staff are:

	Canada	***U.S.***
Full Time	**88%**	***90%***

3.24 What level of product sales is achieved by an average FULL TIME product sales representative in a year?

Canada	***U.S.***
$680,000	***$1,160,000***

3.25 Do you advertise in trade journals?

Canada	***U.S.***
73% said yes	***67% said yes***

3.26 Do you pursue the trade press to evaluate, in writing, your new software products?

Canada	***U.S.***
67% said yes	***95% said yes***

3.27 Do you use/attend:

	Canada	U.S.
Direct mail	**87% said yes**	***76% said yes***
Conventions & trade shows	**93% said yes**	***100% said yes***
Product samples	**60% said yes**	***48% said yes***

3.28 What type of training program do you offer your sales staff? (choose as many as apply)

	Canada	U.S.
On-the-job only	**20% said yes**	***19% said yes***
On-the-job and formal in-house	**33% said yes**	***57% said yes***
On-the-job and external	**20% said yes**	
On-the-job, formal in-house & external	**27% said yes**	***24% said yes***

3.29 Does the company offer after sales service:

	Canada	U.S.
Offer free of charge	**20%**	***24%***
Charge for it separately	**67%**	***62%***
Use both options	**13%**	***14%***

3.30 Do you offer customers a toll free hot line?

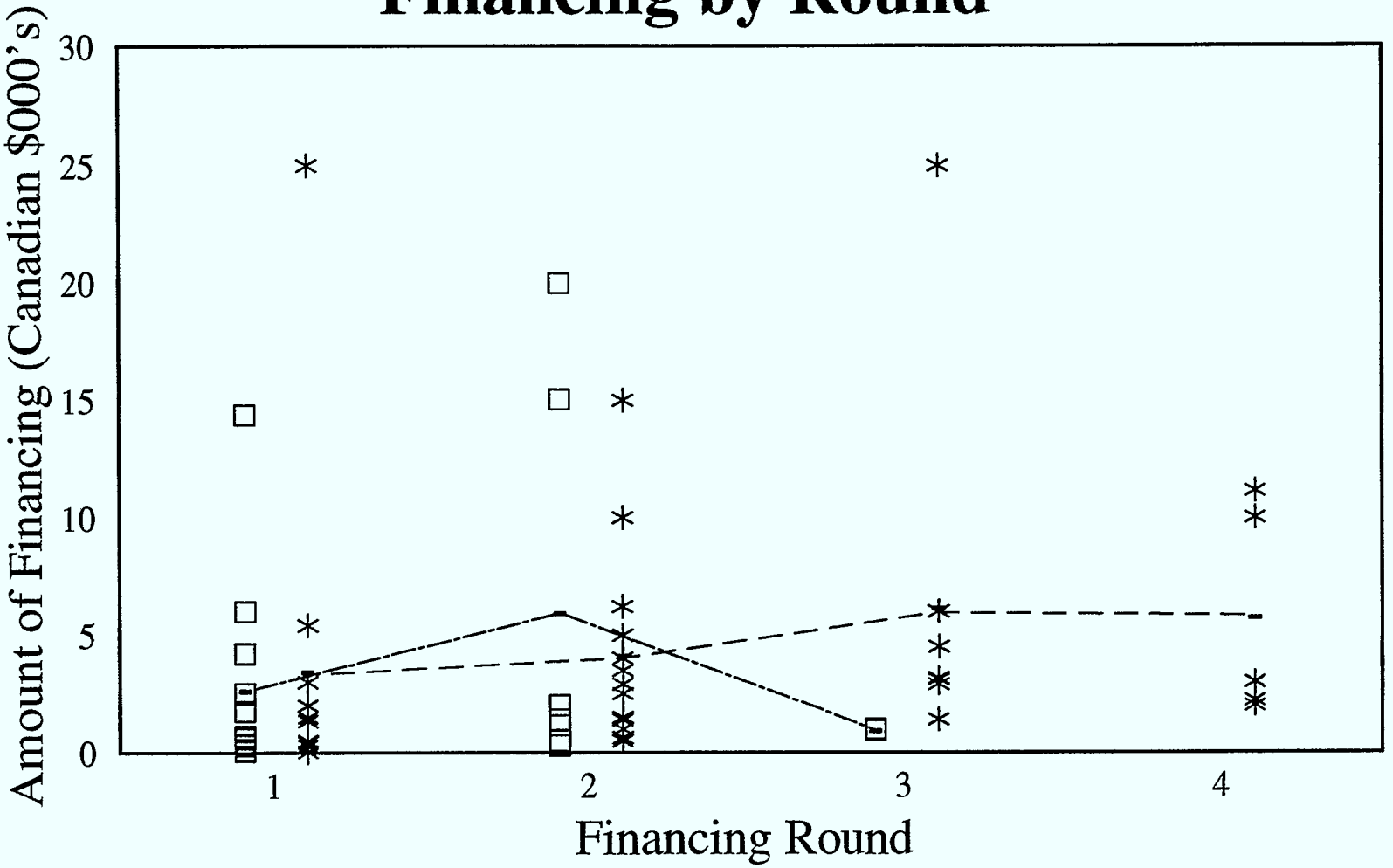
	Canada	U.S.
Said yes	**27%**	***71%***
Charge for it	**13%**	***35%***
Do not offer it	**60%**	***4%***

3.31 What percentage of your sales come from:

	Canada	U.S.
Catalogues		***13%***
Own sales force	**63%**	***65%***
Dealers/distributors	**37%**	***41%***

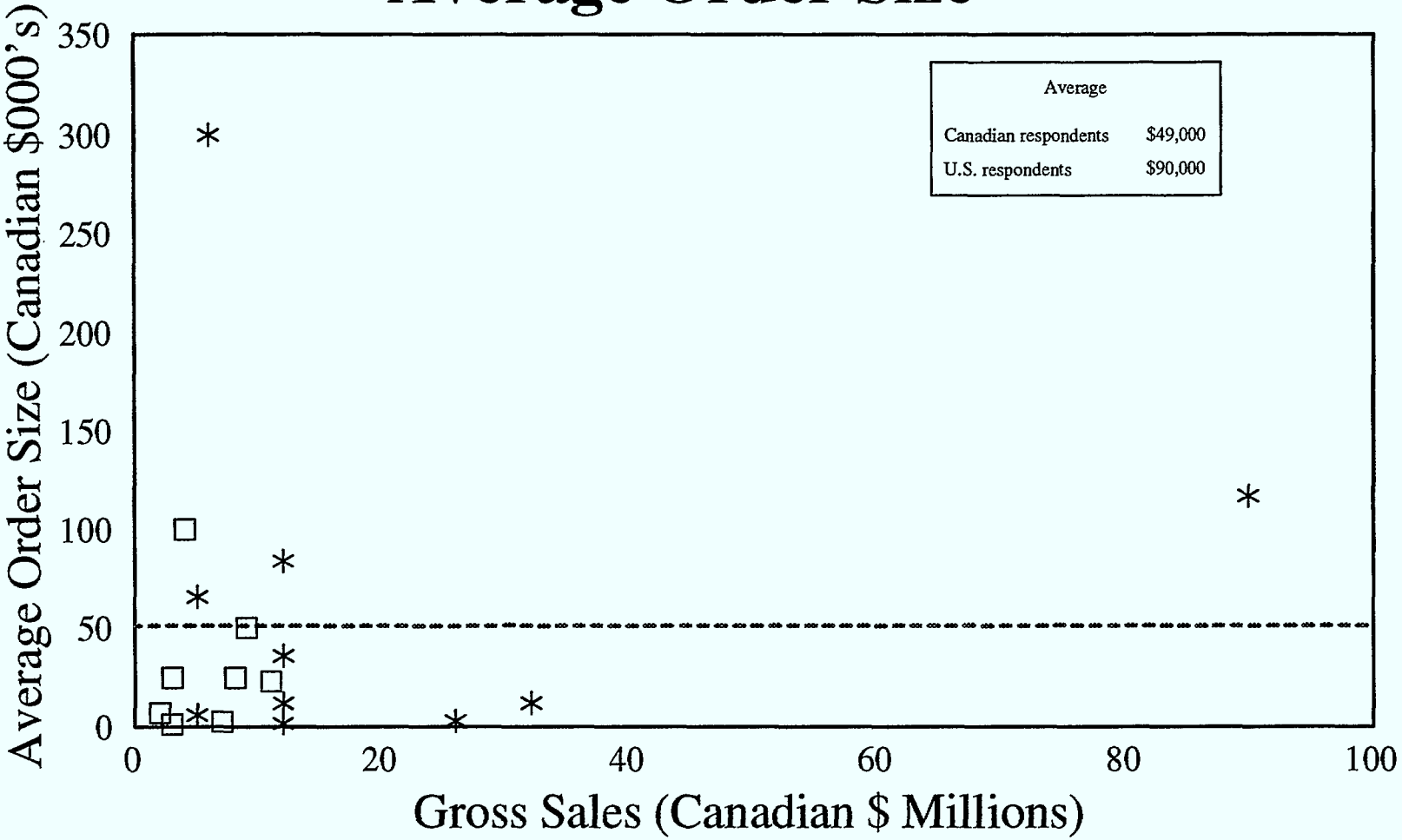
IV-2 - Statistical Analysis of Questionnaire Results

Financing by Round



Source: 1991 Coopers & Lybrand Survey

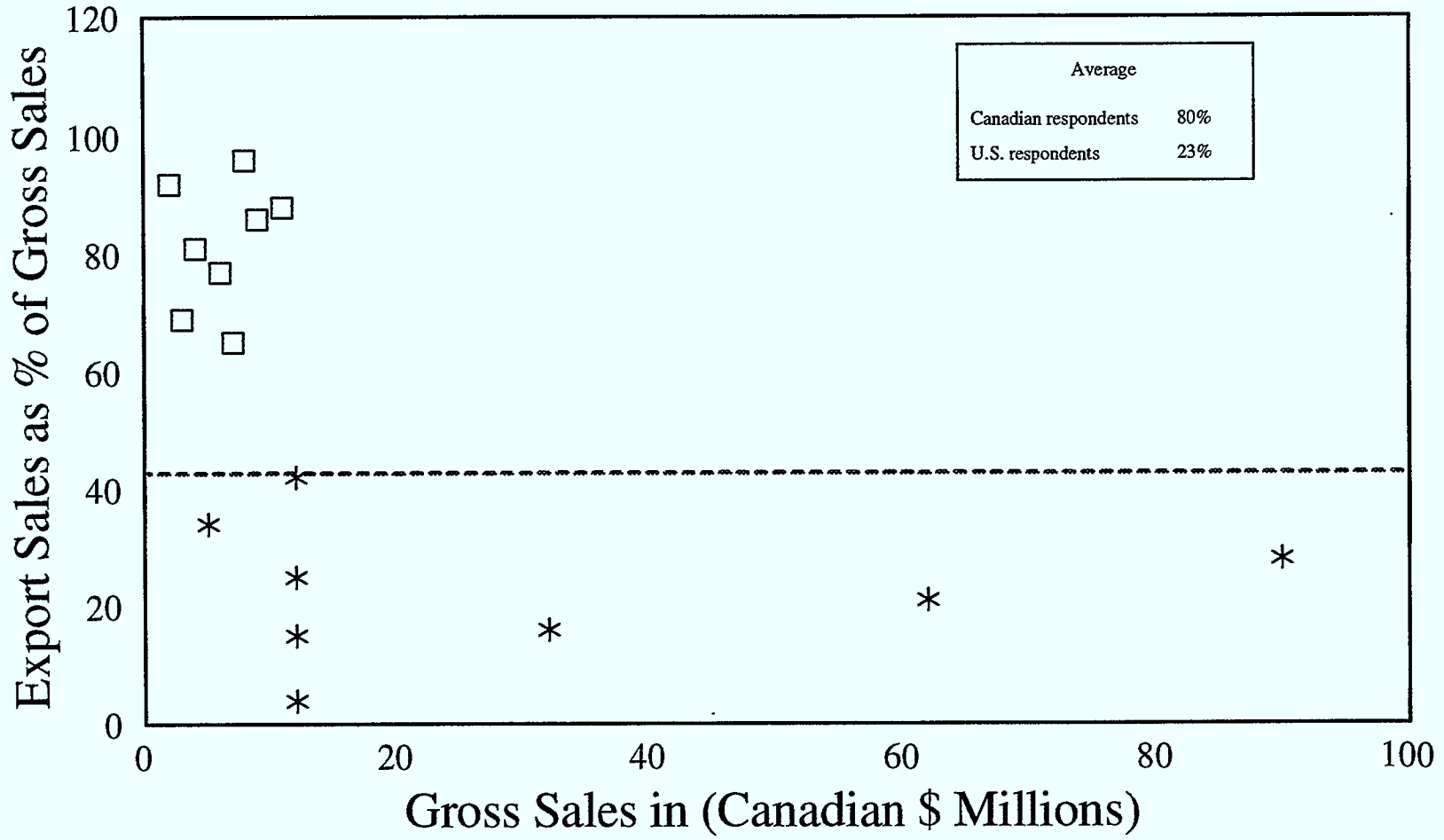
Average Order Size



Source: 1991 Coopers & Lybrand Survey

Note: All companies with revenues over $80M are plotted at $90M.
Cognos's figures are not shown.

Export Sales as % of Gross Sales

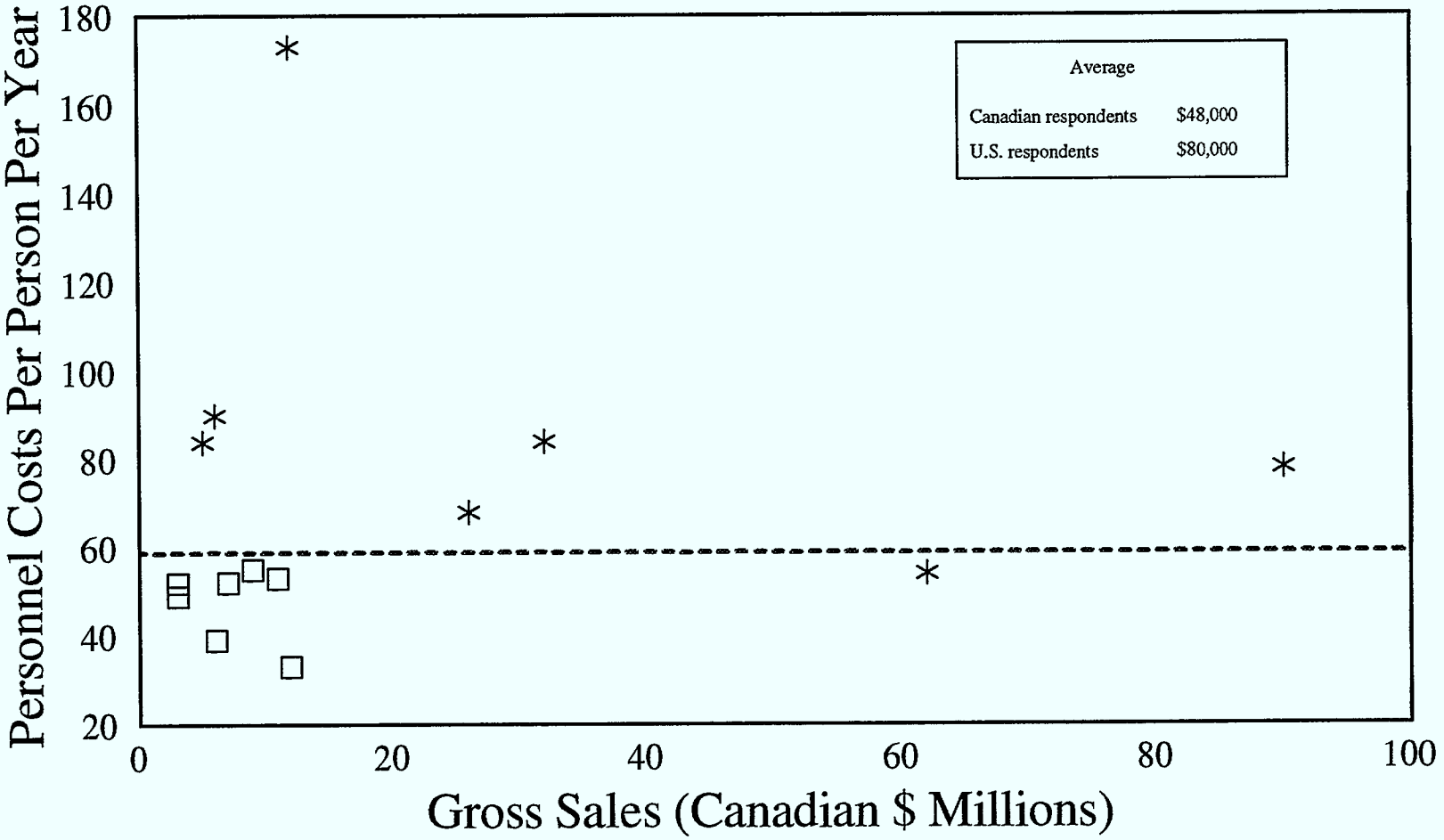


Source: 1991 Coopers & Lybrand Survey

G-26

Note: All companies with revenues over $80M are plotted at $90M.
Cognos's figures are not shown.

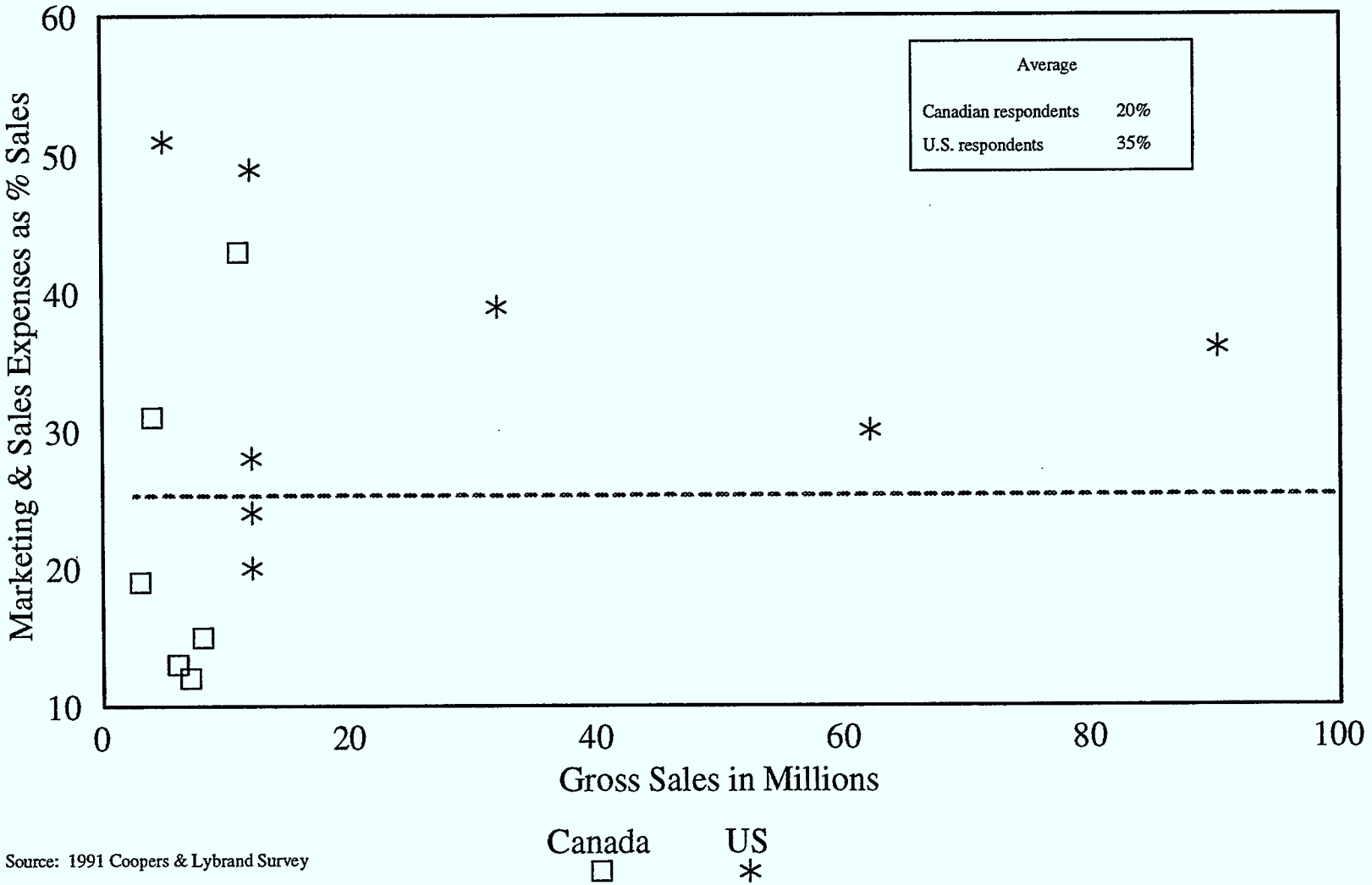
Personnel Costs Per Person Per Year



Source: 1991 Coopers & Lybrand Survey

Note: All companies with revenues over $80M are plotted at $90M.
Cognos's figures are not shown.

Marketing & Sales Expenses as % Sales

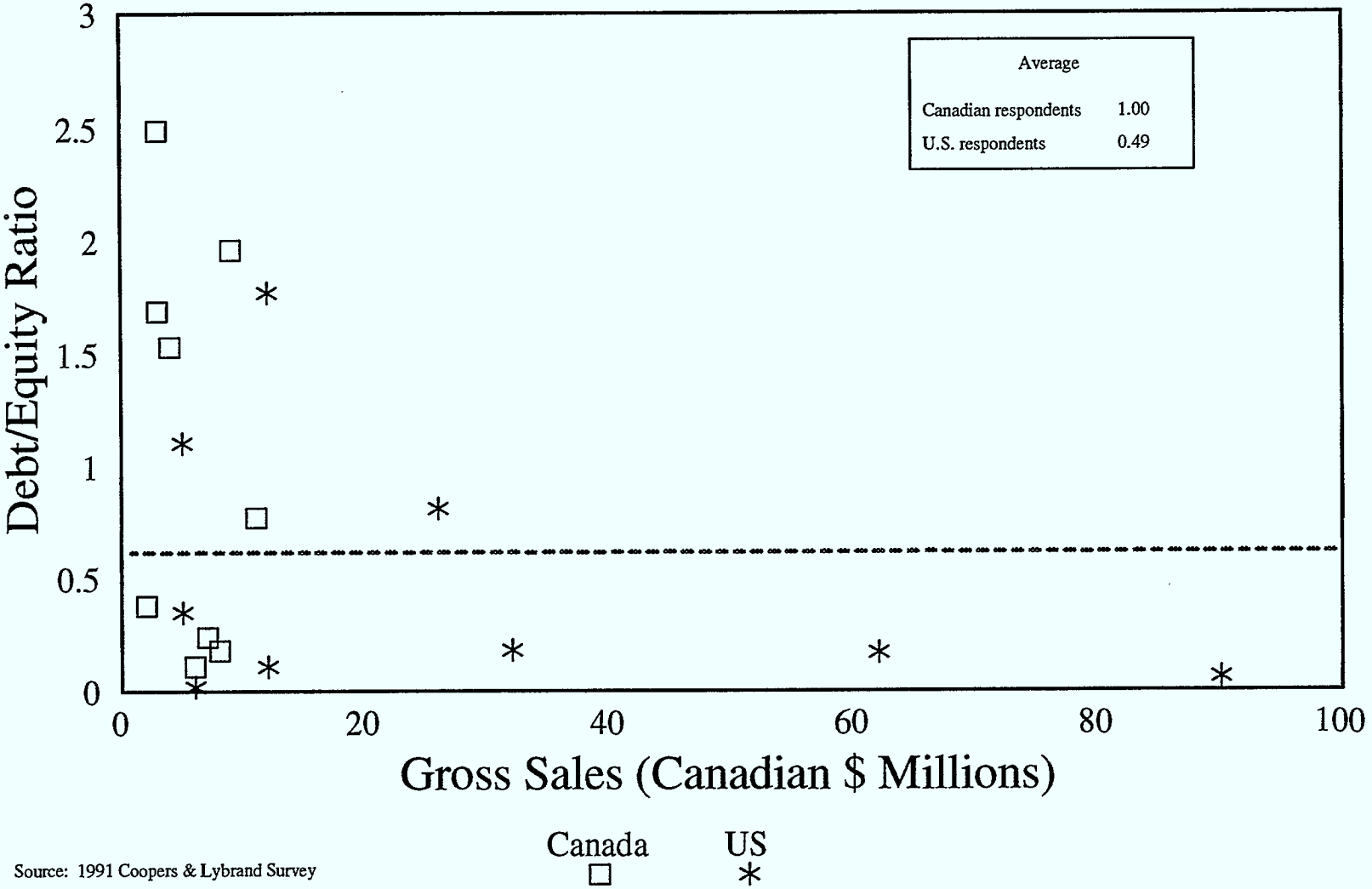


Source: 1991 Coopers & Lybrand Survey

G-24

Note: All companies with revenues over $80M are plotted at $90M.
Cognos's figures are not shown.

Debt Equity Ratio

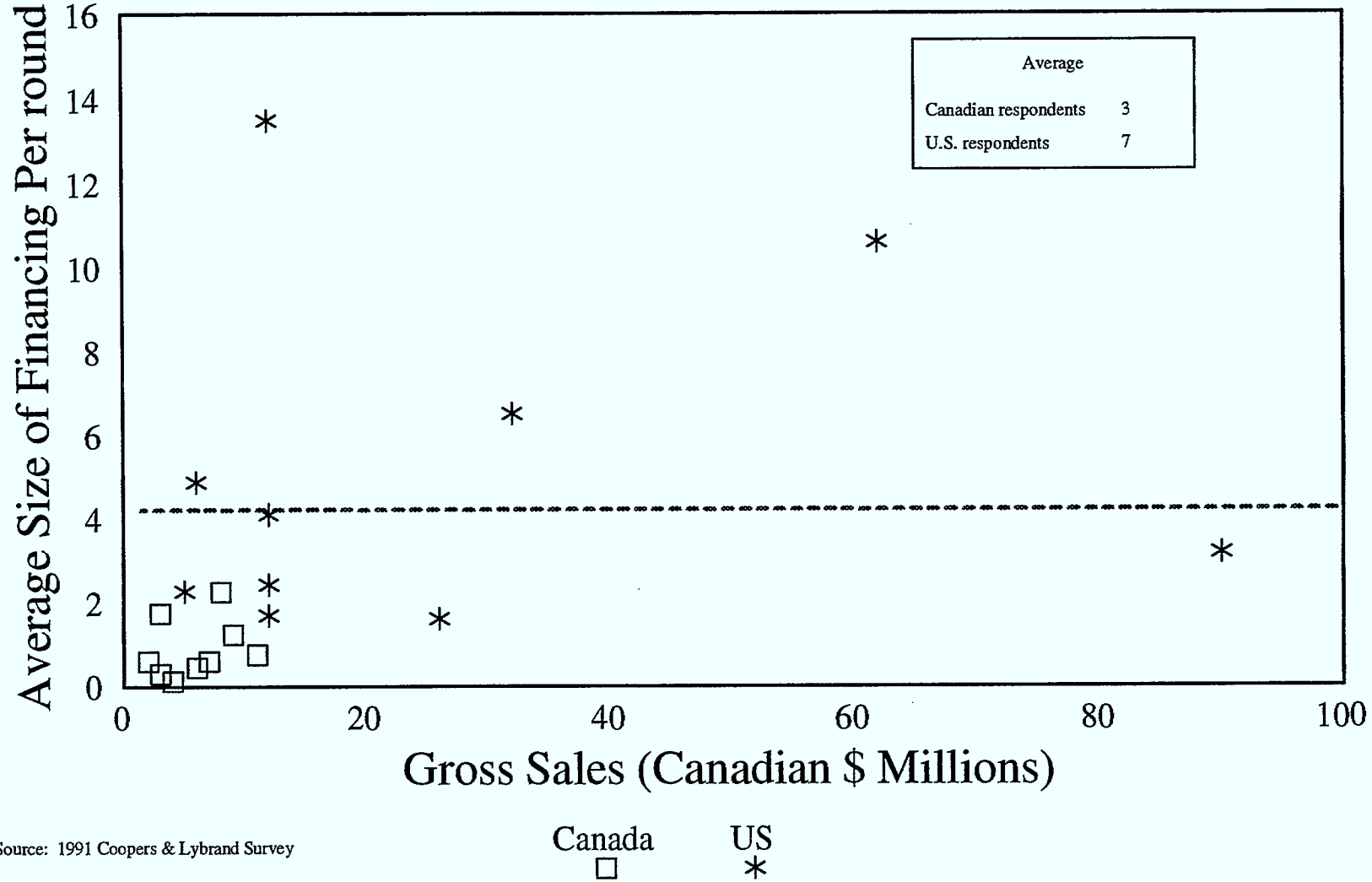


Source: 1991 Coopers & Lybrand Survey

G-23

Note: All companies with revenues over $80M are plotted at $90M.
Cognos's figures are not shown.

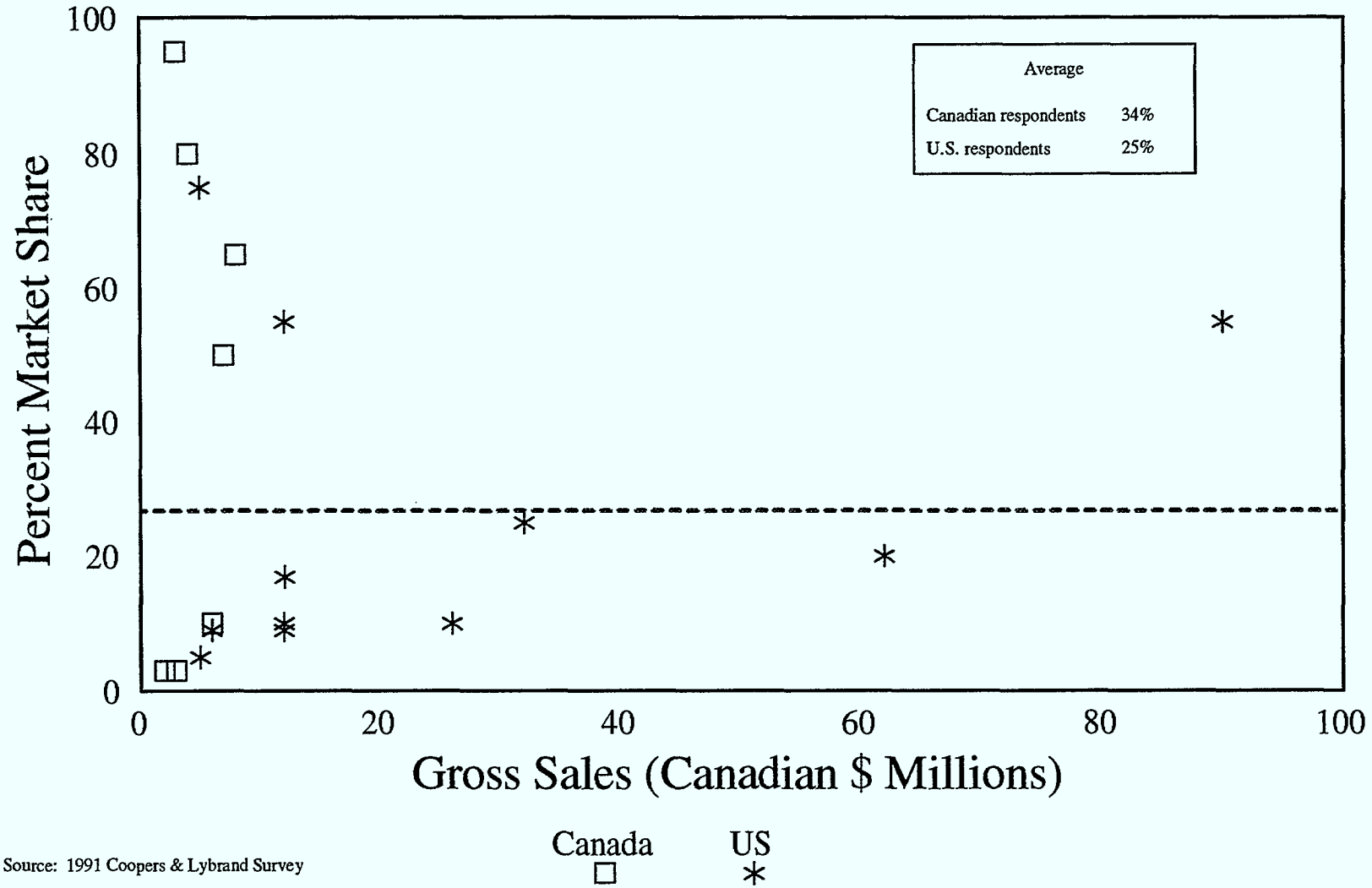
Average Size of Financing Per Round



Source: 1991 Coopers & Lybrand Survey

Note: All companies with revenues over $80M are plotted at $90M.
Cognos's figures are not shown.

Percent Market Share

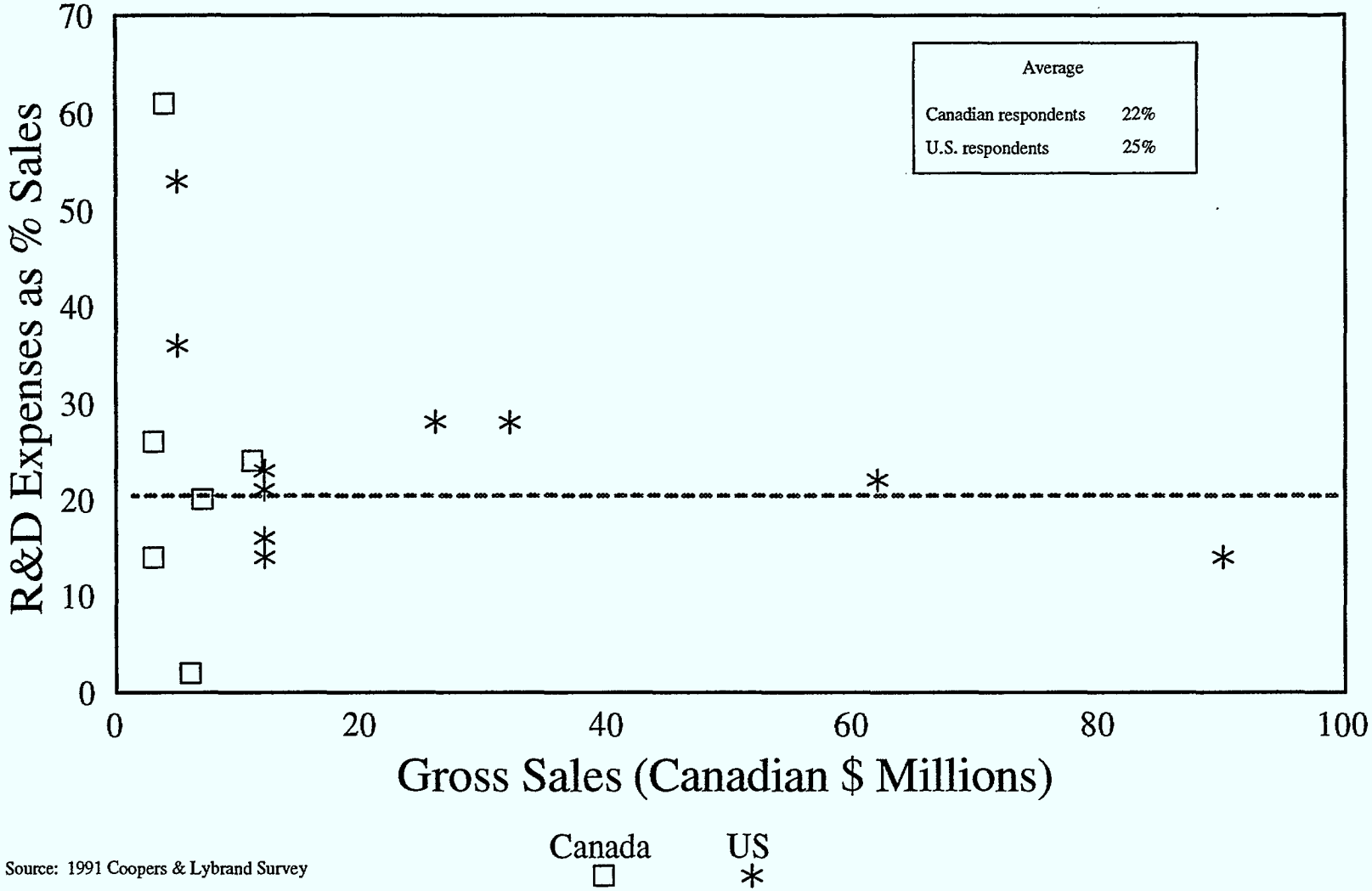


Source: 1991 Coopers & Lybrand Survey

G-29

Note: All companies with revenues over $80M are plotted at $90M.
Cognos's figures are not shown.

R&D Expenses as % Sales

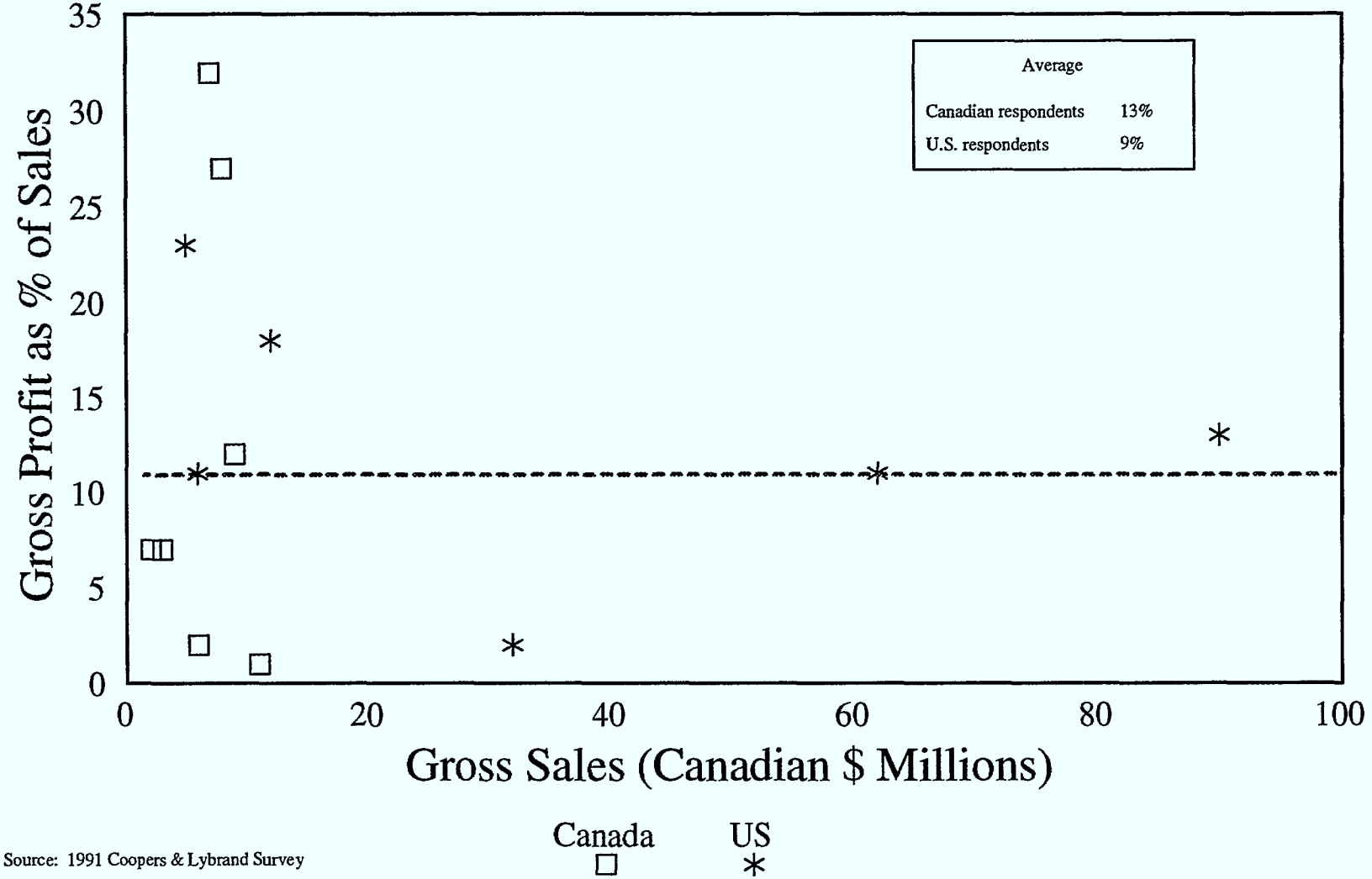


Source: 1991 Coopers & Lybrand Survey

G-25

Note: All companies with revenues over $80M are plotted at $90M.
Cognos's figures are not shown.

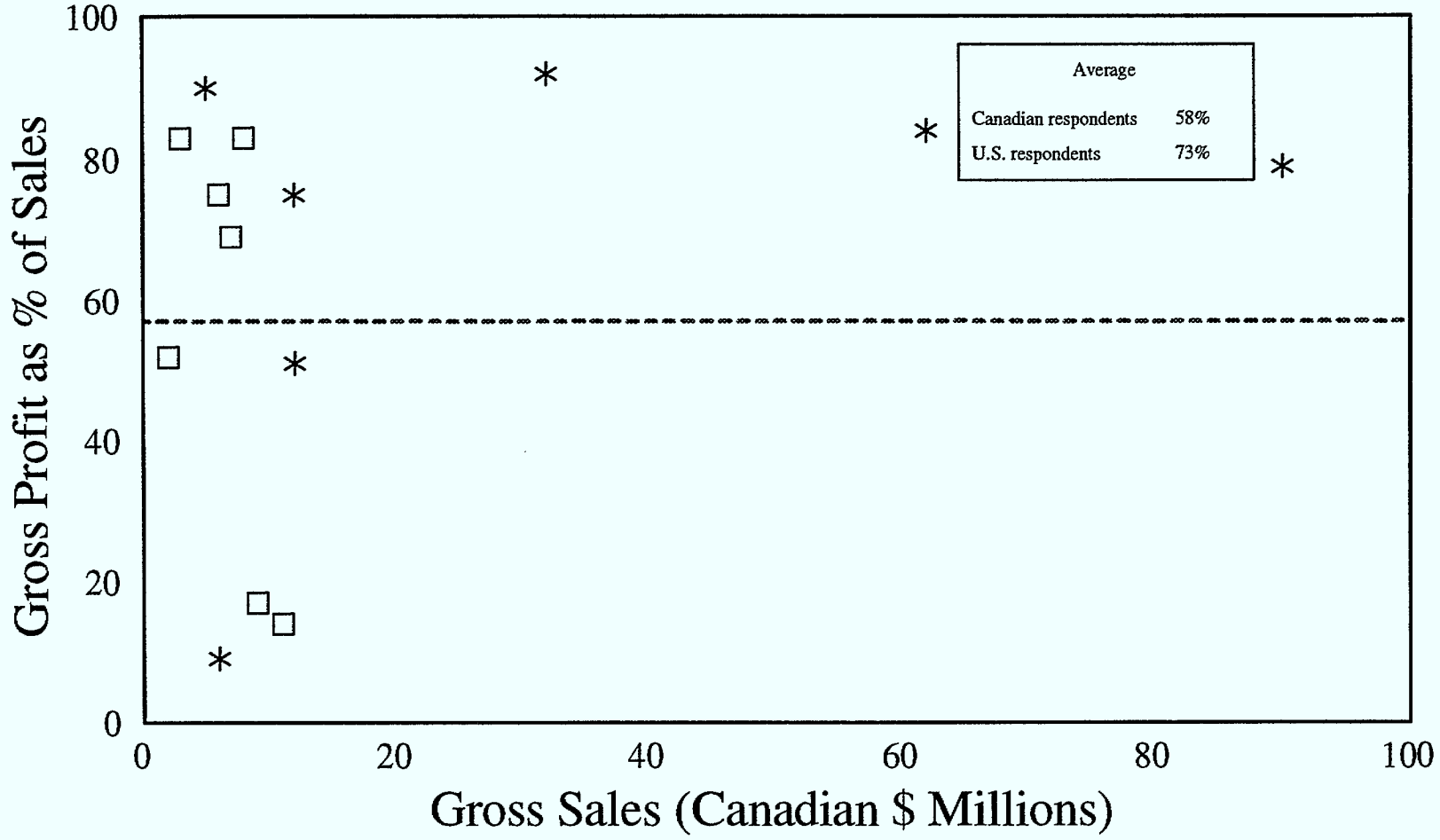
Profit Before Tax as % of Sales



Source: 1991 Coopers & Lybrand Survey

Note: All companies with revenues over $80M are plotted at $90M.
Cognos's figures are not shown.

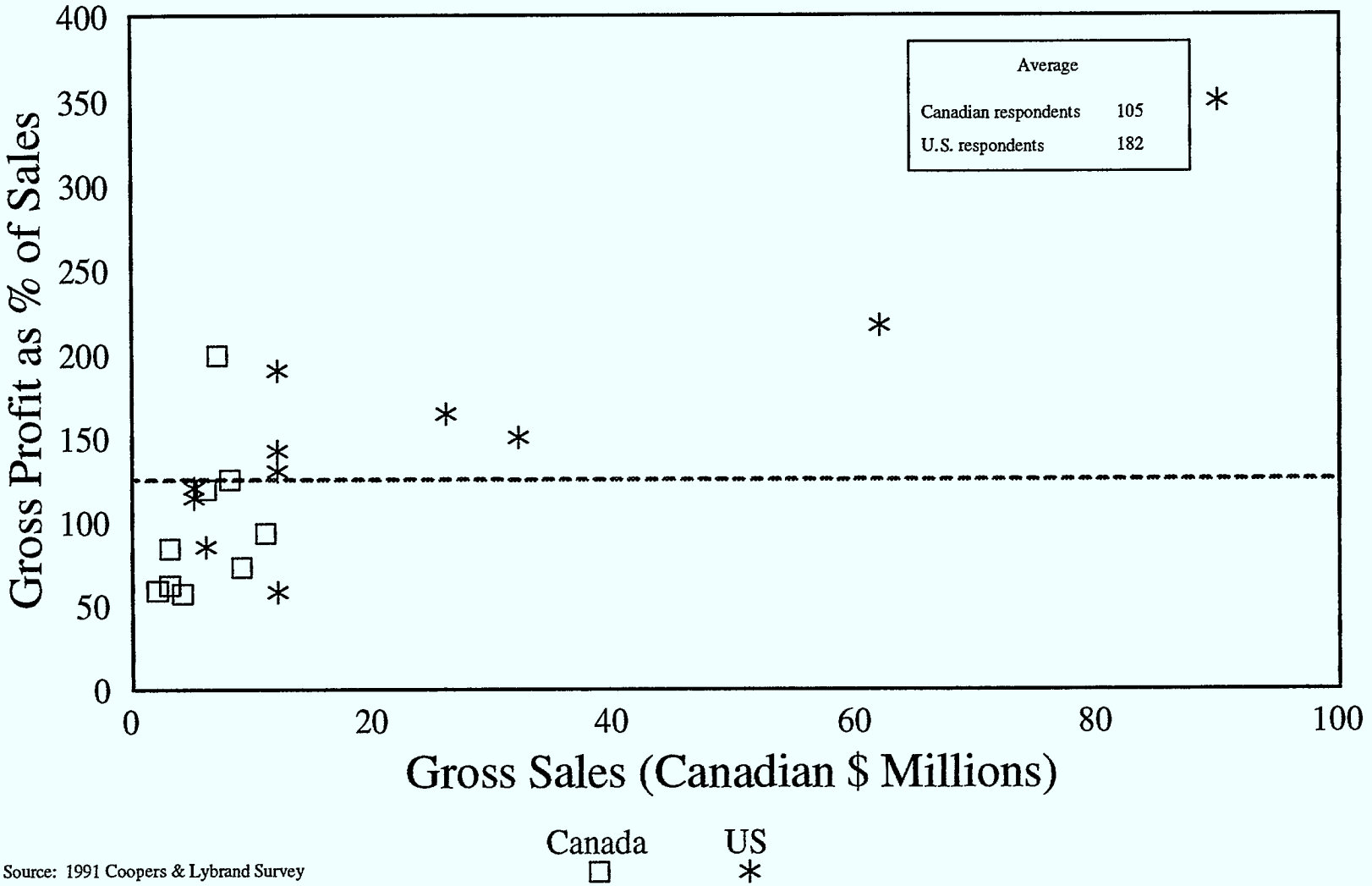
Gross Profit as % of Sales



Source: 1991 Coopers & Lybrand Survey

Note: All companies with revenues over $80M are plotted at $90M.
Cognos's figures are not shown.

Sales Per Employee



Source: 1991 Coopers & Lybrand Survey

G-20

Note: All companies with revenues over $80M are plotted at $90M.
Cognos's figures are not shown.

IV-3 - Summary of Focus Group Discussions

SUMMARY OF DISCUSSIONS - FINANCING FOCUS GROUP

The following is a summary of the discussions held during the financing focus group.

KEY SUCCESS FACTORS FOR FINANCING OF CANADA'S SOFTWARE PRODUCTS INDUSTRY

- Adequate start-up capital covering not only product research and development costs, but also the product launch and financing of receivables during the early phases of product release.
- Access to expertise in financial management including knowledge of sources of funds, funds management and ongoing financing support.
- High awareness and thorough understanding of the software products industry by venture capital firms and a willingness to invest.
- A demonstrable, successful track record of venture capital investment in the software products industry.
- A clear indication of stability in government programs to support, or at minimum, not be counter-productive to the profitable growth of industry.

ADVANTAGES OF FINANCING SOFTWARE PRODUCTS COMPANIES IN CANADA

- Government R&D tax credits are seen to be helpful and perhaps the best in the world. General consensus that Canada's R&D tax credit program provides better funding than the U.S.'s.
- Lower operating costs (i.e., salaries) reduces financing requirements for most start-up companies.
- The U.S. - Canada Free Trade Agreement, common time zones and seamless infrastructure provide Canada with the opportunity to access U.S. venture capital and public equity markets.

DISADVANTAGES OF FINANCING SOFTWARE PRODUCTS COMPANIES IN CANADA

- Many government policies inhibit investment in Canadian software products companies, such as capital gains taxes, personal tax rates, director's liabilities, and incompatibility of federal and provincial policies such as business location incentives, etc.

- North American venture capital do not proactively seek out Canadian investment opportunities. There are several reasons cited for this, including:

  - being outside of the traditional software clusters of California and Route 128
  - no Canadian clusters of hardware/software companies permitting "one-stop shopping" for venture capitalists
  - "off-shore" designation of stock listed on the American exchanges
  - some funds pools will only invest in the U.S.
  - Canada's current image of growing political instability

- Canada's venture capital industry does not understand the software product industry.

- Financing institutions are unwilling to provide adequate underwriting of U.S. accounts receivable making financing, even after product launch, difficult.

SUMMARY OF DISCUSSIONS - MARKETING FOCUS GROUP

The following is a summary of discussions and notes taken during the marketing focus group.

KEY SUCCESS FACTORS FOR EFFECTIVE MARKETING IN THE CANADIAN SOFTWARE PRODUCTS INDUSTRY

- There must be close relationships established with distributers/customers in order to ensure rapid product rollout to the market and to be able to quickly respond to changes required by the marketplace.
- Strategic alliances with other firms can provide significant competitive advantage. These alliances can be with either hardware, companion software or distribution companies who can add marketing clout and name recognition to Canadian products.
- Ability to recruit and retain marketing and sales professionals who are experienced in the software products industry.
- Clear positioning in specific market niche(s).
- Control of channels of distribution.
- Access to marketing, ad agency and other promotional professional firms who are skilled and experienced in the software products industry.

CANADIAN ADVANTAGES IN MARKETING SOFTWARE PRODUCTS

- Our common language, time zones and selling approaches provides Canadians with easy access to U.S. markets.
- Our awareness of multi-cultural and multi-lingual issues gives us an advantage over U.S. firms who tend not to have the international focus and perspectives held by Canadian software products companies.
- Canadian software products have a reputation for high quality and functionality.

CANADIAN DISADVANTAGES IN MARKETING SOFTWARE PRODUCTS

- Canada's lack of marketing and sales staff and professional support firms experienced in software products, is a disadvantage. Not only are we not developing our own people at an adequate rate, but current immigration regulations make it extremely difficult to recruit staff from the U.S.

- There are few established and experienced professional support firms in the areas of marketing, selling or advertising for software products companies, resident in Canada.

- The dominance of the U.S. market and a large volume of exports of Canadian software products companies force Canadian software products companies to manage the geographic separation of the product development function from the market. Common solutions are to open international sales offices close to the customer and distribution channels or to spend large percentages of senior management time in the U.S. Both of these solutions reduce the effectiveness of Canadian operations.

DATE DUE
