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# **Understanding the Disappearance of Early-stage and Start-up R&D Performing Firms**

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With the collaboration of the  
National Angel Capital Organization



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## 1. Executive Summary

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The key objectives of this study include:

1. Determining the main reasons why R&D-performing companies disappear
2. Identifying key characteristics of disappeared R&D-performing companies
3. Identifying key measures to assist company growth and success
4. Exploring the future role of the federal government and other stakeholders (i.e., universities, etc.) in assisting companies to succeed

This has been a difficult study for us for four reasons. First, it was not easy to find the disappeared companies or to connect with the people whose lives had been significantly changed. Secondly, what we heard was complex and our understanding of it has evolved as we have tried to identify and understand the common threads. Thirdly, neither of us has ever been through the kinds of experiences we were hearing about. We were aware that understanding would evolve for us. Fourthly, we felt it was important to find companies located across the country and also across the industry sectors.

We heard the stories of 18 R&D intensive companies that disappeared. We interviewed 28 people. In every case we interviewed the founding CEO and, in most others, the founding investing financial person.

### Key Findings

- The companies disappeared in a range of 3 to 20 years after start up. Three went bankrupt; seven were liquidated, seven were sold and one merged with another firm. The 20-year old company was a successful one sold to a foreign buyer. With that company taken out of the calculation the average time to disappearance was 7.2 years within a range of 3 to 14 years. We were not able to determine the level of investments made in 3 of the 18 companies, but the total for the remaining 15 was \$478M or on average \$31.8M each. That would be \$4.4M per year for each on average.
- Negative consequences of disappearance were loss of investment, loss of firms to Canada, loss of corporate and personal income tax revenues and in many cases significant emotional costs.
- Positive consequences included financial rewards (five of the firms were sold profitably), learning experience for entrepreneurs, and in one case, the creation of a new industry in a particular region.
- A major contributor to failure and disappearance was related to customers and sales. Eight companies had no sales and seven of them had no customer. The remaining 10 companies that had sales averaged \$113M in their final year. However, if we subtract out the largest three, two of which were sold to foreign interests, the average for the remaining seven was \$6.4M each. In their peaks these 18 companies employed a total of about 2480 people. If again we subtract out the three largest, the remaining 15 companies averaged 40.5 employees in their peak year.
- Preoccupation with technology and dysfunctional governance were two other major reasons for disappearance.
- Serial entrepreneurs were the most successful and university entrepreneurs the least if being sold to a foreign buyer is considered successful. Industrial entrepreneurs were more successful than university entrepreneurs, but had failures as well.
- Investors were often inexperienced and did not add value to the firms in which they invested. Labour Sponsored Venture Funds were particularly inexperienced and were hampered by impractical investment rules.

- Canadian VCs generally come from financial, not entrepreneurial backgrounds. As a consequence, they are more inexperienced than their American counterparts, many of whom are serial entrepreneurs. Canadian service providers (lawyers, accountants and others) similarly lack enterprise experience.

### **Reasons for Disappearance**

- Many factors acted together to cause these 18 enterprises to disappear. Here is a partial listing:
  - No revenue from customers.
  - No input from customers on R&D performed or on the product or service being developed
  - Misreading of markets (e.g. overestimate size, delay market entry)
  - Poor business judgment.
  - Product not needed or it was not simple enough for the application.
  - Poor sales and marketing decisions (e.g. distribution channels vs. direct sales, delay going global or going global too quickly)
  - Timing wrong, the product or service was too early or too late.
  - Unaware of competitors and changing market conditions
  - R&D took much longer than expected.
  - The management was changed.
  - More money needed. Financing, especially toward the end, was consuming for senior management
  - Dysfunctional governance.
  - Junior service people in finance, law, etc. were put in responsibility and on boards of some of these young enterprises.
  - Attractive potential for acquisition.
  - Desire to sell.
  - Bad luck – tech bubble, 9/11, etc.
  - Greed.

### **Strong Elements Supportive of Success Were:**

- Highly competent supporting people were often involved in technical, financial and legal services.
- People were highly committed to succeed and sacrificed much.
- Financial backing that was remarkably high given the quality and risks of the business proposals.
- Foreign-born entrepreneurs, who were more pragmatic, frugal and prepared to do what it takes to succeed in commerce.. They were free of the Canadian culture of commerce.

### **Characteristics of Disappearing Firms**

- A partial list of characteristics of disappearing firms gleaned from the interviews:
  - No identified potential customers; only markets
  - No engagement with potential customers to determine their needs and to involve them earlier
  - No sales and no urgency to achieve sales
  - No or low sales and yet a significant number of employees (especially R&D employees)
  - CEO is the scientific or technical founder with no business experience
  - Lack of R&D focus
  - Large R&D team with a diffuse mandate
  - Venture Capital backed with short-term aggressive financial objectives

- Lack of shared goals and expectations between management and Boards
  - No independent directors on Board
  - No operational experience on Board
  - Too many financial people on Board
  - Firm has gone public before reaching profitability
  - Key employees lose confidence in the future and leave
- Many existing firms have some of these characteristics, but not all of them will disappear. It may be helpful, however, for CEOs and Boards to be aware that these traits are common in firms that have disappeared.
  - Customer oriented questions that senior management should ask often:
    - Do you have specific customers in mind?
    - Are you talking with them?
    - What are their needs that you can address?
    - Are any of them involved in the R&D stages as lead customers?
    - What actions are you taking with them to ensure sales results quickly?
    - Who else is addressing them?
    - What value are you offering that would make a customer choose you over your competitors?
    - Could an advisor or an investor or a mentor help the company?
  - The most common strategies firms used to address perceived weaknesses in the company were to seek foreign leadership or technical talent or try to find a development partner to share the large R&D costs.
  - The most common reactions to impending trouble were to change key personnel, especially the CEO, to try to raise more money, or to change the target market.

### **Summary Recommendations from Interviews**

- 1) Canadians need enhanced entrepreneurial and commerce learning through:
  - Promotion of realistic, complete role models for knowledge-based enterprises (by governments, business, communities, postsecondary education, K-12 education)
  - Enhanced enterprise-conscious contact with experienced entrepreneurs (by governments, regional economic development agencies, business enterprises, citizens)
  - Enhanced entrepreneurial learning in the educational and public policy environments (by postsecondary education institutions, governments)
  - Enterprise training and literacy (by postsecondary institutions, K-12 education, communities, business enterprises)
- 2) Canadians need enhanced awareness of appropriate enterprise sources of funding
  - Customers are the ultimate source of money and sooner is better (by business enterprises, investors, business schools, Canadian citizens)
  - Family, friends and frugality is key for many start-ups (by business start-ups, university tech transfer offices, Canadian citizens (families and friends))
  - Enterprise-experienced angels who invest themselves with their funds (by early-stage business enterprises, angel investors and groups, business schools)
  - Venture capital and institutional investors need to be more enterprise skilled and facilitating or firms should avoid them. These investors also need to develop a strong sense of justice and equity towards the early investors to be true ethical partners and facilitators. (by VCs, institutional investors, angel investors, business enterprises, business schools)

- 3) Canadian governments could make enterprise-facilitating modifications to their mechanisms for direct support and for tax credits
  - Improve tax system – introduce flow through shares (by federal and provincial governments)
  - Investment option for upper tier taxpayers [French wealth tax model] (by federal government, Canadian banks, angel networks)
  - Streamline SRED process to ensure it is an incentive not an uncertain windfall (by CRA)
  - Develop a “proof of concept” fund for firms (by federal and provincial governments)
  - Improve management of enterprise targetted “fund of funds” (by federal and provincial governments, angel networks)
  - Improve government officials’ understanding of their roles in the value exchange (by federal and provincial governments, postsecondary education, business)

### What’s Missing?

We have estimated that these 18 enterprises that disappeared had about \$580M invested by Canadians over an average of 8 years per company. They employed at their peak about 2500 Canadians, many highly educated and highly skilled. The entrepreneurs that founded them were courageous, technically competent people who believed in themselves and in their ideas to create value for world markets.

This is a small sample of what is still happening in Canada and what has been happening for more than 30 years. What is wrong? What is preventing us from identifying the problems and taking action to improve the success rate for enterprises like this and for entrepreneurs like these?

**If there is one message that this study gives it is that we are wasting the productive lives of many brilliant and courageous knowledge workers and losing large sums of money to do it. We need to move bravely to correct this. It will take courage and determination. We will have to make some radical changes..**

What are the directions and actions that need to be taken and who needs to do what?

*NO CUSTOMER  
NO SALES  
NO BUSINESS*

- (1.) We must establish clearly in our thinking, learning and culture **the essential role of the customer in commerce.**

The belief that Science and Technology coupled with sufficient Venture Capital is sufficient for success in knowledge-based commerce is leading us to repeated and assured failure. A new set of beliefs and knowing must be established for all of society.

*COMMERCE  
VALUE EXCHANGE  
HUMAN VALUES  
TRUST  
CONFIDENCE  
GOOD WILL*

- (2.) We must increase the understanding of **the human dimensions of the “value exchange”** which is called commerce. We need this understanding to permeate the culture of R&D-intensive Canadian enterprises, of the enterprises that largely create value internally for Canadian society, and among the people working in the public sector. Everyone being paid would benefit from understanding their customers and the value they are creating in the exchange.

The success and sustainability of commerce, the value exchange, is highly dependent on building human values such as trust, confidence and good will between the parties.

**This human development is the greatest challenge we will have to face in moving to customer-focused commerce.** The return will be very large, even for small changes.

- (3.) The disappearance of these enterprises, after large human and financial investments, was

not due only to lack of **commerce competence** in the technical founders. The lack of commerce competence was also equally present in the supportive financial, legal and governing partners.

### **What can be done by whom?**

Successful commerce needs:

- (1.) Human skills of understanding, acceptance and trust.
- (2.) Broad learning and versatile thinking.
- (3.) Ease and comfort working in a human value-exchange.
- (4.) Developed skills and wisdom in subjective, experience-based learning.
- (5.) Developed skills and knowledge in objective, evidence-based learning

The roots of these learnings and skills are developed, or not developed, mainly unconsciously, in life and in the education system. At the post-secondary level, particularly in the universities, the learning of (1) to (4) is crowded out by the specialization and research focus of (5). All are needed within a system of cross-disciplinary learning where the elements of the human and subjective, experiential learning are deliberately more in balance. This shift is essential if we are to move towards higher levels of commercial success.

The Americans are demonstrably the best in the world in Knowledge-Based Commerce (KBC), though far from perfect. What do they do? One very significant difference is the requirement for teaching and research faculty in their universities to find at least one quarter of their funding and support outside the university. This moves them into commerce and into the realities of live societal value-exchanges. Students emerge from these environments not only with respect for customers and commerce but with a different level of commitment to success in the value exchange.

The fact that commerce needs human respect, trust and integrity to work makes it a continuing human challenge. We learn early that we can be hurt in behaving this way and it doesn't end. The work in commerce to keep the human relationships healthy is ongoing and requires skills that can be developed and improved continuously.

This ongoing task is everyone's responsibility. Finger-pointing here only locks us into the ongoing failure of "I'm OK you're not OK". We all have a part in what is weak and failing. There is no room for arrogance and self-righteousness. Knowledge about the value exchange, acceptance of being in a value exchange, and skills to succeed in a value exchange are pervasive societal needs. The broad lack of value exchange knowledge, acceptance and skills in this country makes Canada, in the words of some of our interviewees, "the worst place for commerce". It's time for a change, and good change is possible.

## 2. Acknowledgements

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### 3. Introduction

With the recent disappearance of Nortel from the Canadian industrial landscape, people are increasingly wondering about Canada's dearth of large firms in knowledge-based sectors of the economy. Canada has a relatively good track record in supporting start-up firms in R&D-intensive sectors. R&D tax credits are generous by world standards. Federal programs such as IRAP<sup>1</sup> and TPC<sup>2</sup>, and provincial programs, have provided support in the form of grants, loans and collaborative agreements with research institutions. Despite this support, however, Canada's R&D-intensive sectors are not growing at a healthy rate.

Of approximately 9,000 R&D-intensive firms in Canada in 2001, almost half were small firms (average revenue of \$2.7M) that were not growing<sup>3</sup>. About 2,500 firms accounted for over 80% of the revenue but they did very little R&D (less than a half a percent of revenue) and were contracting as a group, not growing. Significant growth was confined to a small group of two hundred or so firms.<sup>4</sup> From 1994 to 2001, this small group of high-growth R&D Leaders increased in size by only about 14 firms per year, reaching 224 by 2001. While some new ones appear each year, others disappear. Indeed we have seen many of our larger successful companies disappear. This is a fragile base on which to build Canada's knowledge-based economy.

Our earlier studies of Canadian R&D-intensive companies<sup>5</sup> suggested that technology entrepreneurs have particular difficulties in business. They tend to focus on technology and lose sight of the customer. CEOs of highly successful firms told us in interviews that Canada is second to none in technology. Companies around the world value Canadian science and technology and compete to hire S&T graduates from Canadian universities. On the other hand, CEOs lamented the lack of commercial skills among Canadian graduates. They found themselves dependent upon U.S. and other foreign nationals for executive talent and particularly customer-facing experience and skills<sup>6</sup>.

A general lack of commerce skills among Canadian tech entrepreneurs has serious implications for technology-based companies. Starting and growing any business is a challenging undertaking. Successful firms create value, typically in the form of goods and services, and enter a mutually beneficial value exchange with customers. In commerce, the value exchange takes the form of monetary payment in return for a good or service. In addition, other intangibles are exchanged that build trust between the firm and its customers (Figure 1).

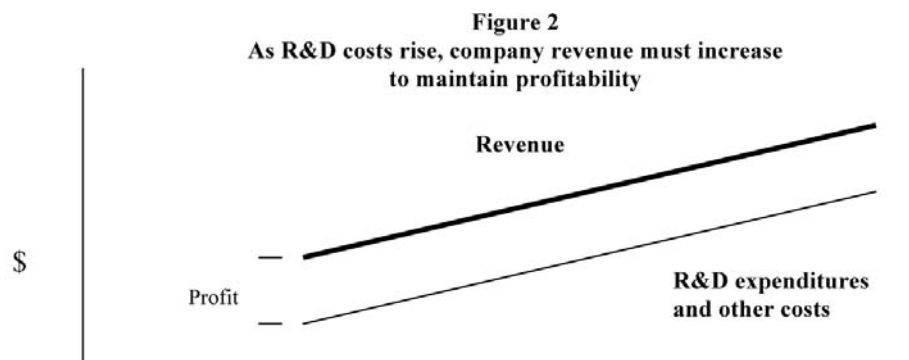
**Figure 1**  
**Value Exchange Between a Firm and its Customers**



The more it costs to create a good or service, the more revenue a company needs to generate from its customers in order to cover costs and get a return on its investment (Figure 2). The significant investment in people required to develop and support a product demands that technology entrepreneurs are astute about the value they are creating and the price they charge for it. For whom are they creating that value? Who else is creating similar value for these potential customers? Why would these customers choose to deal with the firm instead of its competitors?

In our earlier studies of Canadian R&D-intensive companies we learned that many start-up and early stage companies disappear year by year to be replaced by new ones. We have estimated the churn to be significantly greater than the typical rate of bankruptcies that occurs in the

many hundreds of thousands of small to medium sized enterprises in Canada. We decided there was much to be learned if we could confidentially interview the founding CEO and the founding financial backer of a sample of these companies. We offered confidentiality because it would open us to the true accounts of what transpired. Our goal was to gain a better understanding and to explore more fully the issues behind why early-stage and start-up R&D performing companies disappear. We also wanted to try to identify more effective ways to help these early-stage companies succeed that might be relevant for government policy.



The key objectives of this study include:

- (1.) Determining the main reasons why R&D-performing companies disappear
- (2.) Identifying key characteristics of disappeared R&D-performing companies
- (3.) Identifying key measures to assist company growth and success
- (4.) Exploring the future role of the federal government and other stakeholders (i.e., universities, etc.) in assisting companies to succeed

Interviews began in mid-2007 and a total of 28 interviews were completed<sup>7</sup> (17 ex-CEOs and 11 investors) representing 18 companies. We tried to interview both an ex-CEO and a principal investor for each company to more fully explore why the company disappeared and to gain a more complete understanding of the issues from these perspectives.<sup>8</sup> As much as possible, we sought a good spread of companies across the sector focus for this study and regions. Table 1 presents some demographics of our final sample.

**Table 1**  
**Demographics of Sample Interviewed**

ICT dominant; some pharma/biotech and one medical device; one parts manufacturer for the oil and gas sector.

Sector distribution in order of quantity from largest number to least: ICT (over 50%), Pharma/biotech, Medical Devices, Oil & Gas<sup>9</sup>

Regional distribution in order of quantity from largest number to least: Ontario, Alberta, British Columbia, and equal numbers from Quebec and Atlantic Canada. Quebec was under-represented in our sample.

The companies included in this study had ceased operations in the past 2-10 years and were mostly small companies under 100 employees.

The following report summarizes the information from these interviews. This report is strictly qualitative in nature and provides only indicative information because of the small number of interviews, and because they were not drawn randomly.

For purposes of confidentiality, some information has been aggregated and specific details may be omitted. Unless specified in the text, references to “government” could include federal or provincial granting or loan programs, and reference to venture capital could include venture capital firms, labour-sponsored venture funds, the venture arm of Business Development Bank Canada or Export Development Canada, or corporate venture capital.

We want to thank the people who took the time to talk with us about their experiences. We are grateful for the often-painful honesty these people shared with us. We expected to face differing accounts from the two perspectives we engaged (CEO and investor) but what we heard was generally very similar even if nuanced differently.

## 4. Key Findings

### 4.1. How Firms Disappear

Companies disappeared in a variety of ways. In our sample of 18 firms, there were three bankruptcies, seven firms were simply closed down and liquidated, seven were sold, and one merged with another firm (Table 2).

**Table 2**  
**How Firms Disappeared**

Mode of disappearance	Bankrupt	Liquidated	Merged	Sold
Number of companies	3	7	1	7

The companies disappeared in a range of 3 to 20 years after start up. The 20-year old company was a successful one sold to a foreign buyer. With that company taken out of the calculation the average time to disappearance was 7.2 years with a range from 3 to 14 years (Table 3).

#### *Bankruptcy*

**Table 3**  
**Firm Life-times**  
**(excluding 20-year old firm)**

Average lifetime	7.2 years
Range of life-times	3-14 years

Three of the companies we looked at went bankrupt. In all cases the trigger was when one of the investors called a loan, even though the specific situations were all different. Table 4 summarizes how each case occurred.

**Table 4**  
**Bankruptcy scenarios**

Investment Situation	Trigger	Aftermath
One of the venture capital firms that had invested in the firm had negotiated a line of credit with a bank	Money ran out and bank put the company into receivership.	The bank sold the IP to a competitor, which later went public and was a success.
Company raised money from governments and venture capital firms.	Company burned through cash without getting any customers; and when bridge financing from a corporate investor fell through, one of the government funders called in a loan.	Entrepreneur resurrected the company in a different form with a different product; convinced the government to forgive the loan. New company eventually disappeared via merger..
Consortium of VC firms invested several rounds in the company. When the company mis-judged the market and had to change course, the investors agreed to another financing round, but one of them insisted on structuring its contribution as a loan.	Time ran out and the investor called in the loan and put the company into receivership, despite the fact that all the other investment partners wanted to finance another round.	Assets sold to competitor; not yet successful.

### *Liquidation*

A more common way of disappearing was for the Board of Directors to close the company, having run out of money and being unable to attract a buyer or follow-on investor. Seven of the companies we studied disappeared in this manner. Table 5 gives a breakdown of the kinds of companies that disappeared in this way.

**Table 5**  
**Liquidated Firms by Type**

Type of firm	University Spin-off	Corporate Spin-off	Entrepreneur-led Start-up
Number of companies	3	3	1

In a majority of the cases, the Board was able to sell the assets or IP, usually at a fire sale price and often to a competitor. In a few instances, the IP reverted or was sold back to the founder.

As discussed in more detail in section 4.3, firms that went bankrupt or shut down after a number of years typically found themselves in this position because they were too slow getting paying customers. Some firms were preoccupied with R&D and burned through their cash; others spent most of their time trying to set up distribution networks before they had a product or customers; and there were those that were preoccupied with raising money and neglected customer relationships and organizational issues. Some entrepreneurs misjudged the market and simply ran out of options.

### *Merger*

One firm ran into trouble when its business failed to develop products that could compete against larger players. Wanting to keep the excellent technical team together, and unable to attract venture capital because the firm had no customers, the CEO found an equity partner in a complementary business who agreed to try to find VC investors. The two firms could not find any and eventually merged their two companies. They re-focused the business and are operating today under a new name.

### *Sale*

Seven of the firms were sold, five profitably for the founders and investors, the others not. Some investors especially venture capitalists, invested in young firms with the intent of selling them. Naïve CEOs were not always aware of this when they obtained VC financing. Acrimony and disappointment often followed. In a couple of the firms we studied, investors did not understand the nature of the business they were investing in and under-invested. When the money ran out, they sold, usually at a loss. In one instance, a hostile takeover offer triggered the sale of a profitable company. The sale was very profitable but the country lost a public company.

## 4.2. Consequences of Firm Disappearance

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We have estimated that these 18 disappeared enterprises had about \$580M invested by Canadians over an average of eight years per company. They employed at their peak about 2500 Canadians, many highly educated and very skilled. The entrepreneurs that founded them were courageous, technically competent people who believed in themselves and in their ideas to create value for world markets.

This is just a small sample of what is still happening in Canada and what has been happening for more than 30 years. The consequences are enormous. Table 6 lists a number of consequences, both negative and positive, which are elaborated with examples below.

<b>Table 6</b>	
<b>Consequences of Firm Disappearance</b>	
<b>Negative</b>	<b>Positive</b>
- Loss of investment	- Financial reward
- Loss of firms to Canada	- Learning experience for entrepreneurs
- Loss of tax revenue	- Creation of an industry
- Emotional cost	

### **Negative Consequences**

#### *Loss of investments*

Significant money was invested into these companies and much of it was lost. We were not able to determine the level of investments made in 3 of the 18 companies, but the total for the remaining 15 was \$478 M or on average \$31.8M each. That would be \$4.4M per year for each on average.

Several of these companies attracted investment from labour-sponsored venture funds (LSVFs). As will be discussed in the next section, some of the investment rules imposed on the LSVFs encouraged inexperienced investment managers to make very risky investments simply to satisfy certain quota requirements. Other rules hampered the ability of the LSVF to adequately support investee firms with subsequent financing rounds. The losses that resulted have contributed to the poor returns suffered by retail investors who were attracted into these funds by the tax credits they offered.

#### *Loss of firms to Canada*

Seven firms had to sell in order to survive or go to the next level. While there are exceptions, most Canadian firms sell to foreign buyers. In our small sample, ownership of five of the firms left the country. There are two principle reasons. First, the number of potential buyers in Canada is a small fraction of what exists in the U.S. and elsewhere. Second, the level of maturity of firms, the risk tolerance (in making a decision to acquire a firm) and the quality of management tend to be higher in the U.S. than in Canada. Of the seven acquirers of firms in our sample, the five foreign ones are ongoing successful companies. The two Canadian acquirers are both troubled companies.

#### *Loss of tax revenue*

Canada's inability to grow successful firms and retain growing firms in the country translates into less corporate tax revenue for the federal government. In addition, firms like the ones we studied employ highly skilled people who have above average salaries that generate significant

personal income tax to governments. A high rate of firm disappearance means these jobs are lost along with the accompanying income tax revenue.

### *Emotional Cost*

Many of our interviews had strong emotional elements. People related painful experiences that carry ongoing emotional scars for some. Virtually every CEO we interviewed put their heart and soul into the venture they ran, making many personal sacrifices along the way. They made this commitment with their eyes open, fully expecting to be successful. In most cases, the result failed to meet expectations. It would be disingenuous to believe that the subsequent result did not take a toll.

## **Positive Consequences**

On the other side of the coin, there are clearly some positive outcomes to firm disappearance. These must be weighed against the damaging effects and the cost/benefit ratio needs to be looked at carefully. Then strategies need to be devised to maximize the positive and minimize the negative.

### *Financial reward*

Of the seven firms that disappeared by being acquired, five of them brought significant financial rewards to the investors and founders.

### *Learning experience for entrepreneurs*

All of the entrepreneurs we interviewed have gone on to other pursuits. Some moved into investing, others into mentoring and advisory roles for other entrepreneurs and investors, and some have gone on to work in or run other firms. In all cases, they have been able to take away lessons learned from their experiences that they believe are helping them perform better in their current role.

While this learning by experience is invaluable, it was clear from our interviews that not everyone was fully aware of the mistakes that were made. There was a tendency for investors and CEOs to place blame on the other, rather than seeing the larger picture involving all players and their lack of commerce experience and competence. Some people appreciated the larger picture as our conversation progressed. Others had already recognized the key issues on their own before they spoke with us. It is our hope that some of the false assumptions and beliefs that make it so difficult for entrepreneurs in Canada might be altered by this study.

In some cases, firm disappearance is a healthy outcome that builds a team's experience and enhances their chances of success in subsequent ventures. Some entrepreneurs and investors are willing to take certain risks in order to try to find a way to grow a firm successfully. These experienced risk takers understand that some ventures will fail, and they are ready to make the attempt. However, they put in adequate resources to give their venture a chance and "fail fast" if their initial assumptions prove to be faulty. We encountered one example of this kind of team, but they lost a significant amount when they misjudged their target market. This example is discussed in the next section.

### *Creation of an industry*

Canada's strong resource sector has not spawned large numbers of value-added technology-based firms that provide products and services to resource firms in Canada and around the world. One company we looked at created a technology business that did not exist there

before. The firm grew out of a discontinued division of a firm. Former division employees created a start-up that ran for a number of years before requiring external financing. The CEO eventually brought in some investors who wanted to “package this baby for sale”, but the CEO and the development team “wanted to do it ourselves.” The CEO found an international partner, who eventually bought the company. According to the CEO, “everybody except management kept their jobs. We created an industry that wasn’t there before.” Nonetheless, the challenge remains that Canada is not building a sector with profitable, growing firms in this area.

### 4.3. Why Firms Disappear

While there was a wide range of specific factors that triggered company disappearances, we found three systemic causes: lack of commerce competence, preoccupation with technology, and dysfunctional governance (Table 7). These three factors often complemented one another in leading to the demise of some of the firms.

<b>Table 7</b>	
<b>Three Systemic Causes for Firm Disappearance</b>	
(1)	Lack of commerce competence
(2)	Preoccupation with technology
(3)	Dysfunctional governance

lack of commerce competence appears to be the primary reason for company disappearance. Most of the firms were started by intelligent, capable individuals brimming with enthusiasm and energy. They were highly competent in their field of expertise. They were willing to work hard and take risks. They pushed themselves and did their very best. Yet almost every one was unprepared for commerce in one way or another. In many cases, they were unaware that they weren’t ready. Some realized mistakes that they had made; some still do not.

A major contributor to failure and disappearance was related to customers and sales (Table 8). Eight companies had no sales. Seven of these had no customer. The remaining 10 companies that had sales averaged \$113M in their peak year. However, if we subtract out the largest three, two of which were sold to foreign interests, the average for the remaining seven was \$6.4M each.

<b>Table 8</b>		
<b>Customers and Sales Record for Firms Interviewed</b>		
	<b>Companies with no sales</b>	<b>Companies with sales</b>
<b>Total number of companies</b>	8	10
<b>Companies with no customers</b>	7	
<b>Average sales in peak year</b>		\$113M
<b>Average sales subtracting 3 largest firms</b>		\$6.4M

Preoccupation with technology was an exacerbating factor for many of these entrepreneurs. Whether they were in academia or industry when they first got the entrepreneurial itch, their strength derived from their technical prowess and ingenuity. Their leadership qualities were typically honed in an R&D environment. Certainly their training was in a technical field. A majority of these entrepreneurs were enthralled with the technical side of the businesses that they started. Their technical confidence – and predilection – led them naturally to neglect essential aspects of the business. In particular, they ignored or put off having conversations with potential customers.

Dysfunctional governance led to the downfall of several firms we examined. In many of the cases we looked at, the investors were equally unprepared for commerce, having little experience in running a business and being preoccupied with finance. This lack of preparedness among investors, especially VCs, was a new and important finding of this study. It exacerbated the difficulties encountered due to entrepreneurs' lack of commerce skills and led, in a number of cases, to discord at the Board level. Some investors we spoke with continued to fund subsequent rounds and lost their entire investment when the firm failed. They often closed the doors without ever having gained a customer.

Our earlier studies indicated that many entrepreneurs running R&D performing firms in Canada lack commerce skills and complained in interviews about the difficulties they face in recruiting senior people in Canada with sales, marketing and management skills. This theme came out strongly in the present set of interviews as well, but the scope and scale of the problem facing Canadians expanded significantly to investors, regulators and service providers. We will now examine in more detail the three major causes of firm disappearance (Table 7), focusing first on entrepreneurs and then investors, although the impact of the other players is equally important for Canada.

## Lack of preparation for commerce

### *Entrepreneurs*

In our small sample, we talked with four different kinds of entrepreneur: serial entrepreneurs, industrial entrepreneurs who left large companies to start a firm, technical entrepreneurs, and university entrepreneurs – academics who spun out a company from a university. Table 9 summarizes the different kinds of entrepreneur that we encountered during this study.

<b>Entrepreneur Type</b>	<b>Number of Companies</b>
Serial Entrepreneur	3
Industrial Entrepreneur	7
Technical Entrepreneur	2
University Entrepreneur	6
<b>Total</b>	<b>18</b>

Many entrepreneurs we talked with, especially university entrepreneurs, knew they were unprepared. Some thought they could make the transition, and failed. Others tried to bring in others to provide the business acumen, and things didn't work out. Most of the university start-ups we studied did not succeed and were shut down. One was bought by another firm that wanted the research team and the IP for its own business. One was resurrected as a different company by a former employee and eventually merged with another firm when it could not succeed on its own.

*"Working in a university environment was not easy, The people had their own pace and way of doing things. They had a totally different work ethic and were not productive."  
CEO, university start-up*

A typical conundrum for university spin-offs is whether or not to sever ties with the university and go forth into the private sector. Most of the spin-offs we looked at kept some ties. Two of them operated out of university incubators for a number of years. One eventually left and the other firm was liquidated before it could move out. Other firms started with the founding academic as CEO, but the professor stayed on the university payroll and performed regular teaching and research duties. One firm actually operated out of the university, but found it was not a conducive environment for doing business. The professor was not an experienced manager and underestimated the time it takes to develop a commercial product. The CEO had to move the professor to an advisory role and brought in an experienced R&D manager from

industry. In fact, as discussed in more detail in Section 4.5, many firms changed their first CEO due to lack of business acumen, although in most cases the change did not help.

*“We thought we’d be innovative and underestimated the big guys’ ability to innovate. We assumed the adoption rate would grow because of our disruptive technology. But the big guys (our potential customers) didn’t need the shiniest toy. We misjudged the culture of the customer.”  
CEO, university spin-off*

A typical mistake university entrepreneurs encountered was misreading the market, usually estimating it as larger than it really was or believing the market needed something that it didn’t need. One firm was created by a group of technical wizards at a university who were “sitting around a coffee table” and came up with an exciting technical challenge. They thought they could revolutionize a particular market and decided to form a company. The founders put up the initial money and were able to attract significant funding from VCs and governments north and south of the border. Though the team achieved various technical breakthroughs, including some ‘world firsts’, they never got any customers. Incredibly, they continued to attract funding from investors and government. However, it eventually became clear that although the project was a technical success, the market for what they were building did not exist. The company ultimately went bankrupt.

Another university spin-off went through years of learning about a particular market, and burned a lot of investors’ cash before having to give up. Difficulties arose early on when it became clear that the initial target sector was too small to support the firm’s business. The team set out to identify a range of vertical markets where the core technology could provide a solution for companies. “We were a solution in search of a problem.” The team eventually identified a potential solution that could save millions of dollars in a particular sector and were able to raise a new round of financing. Unfortunately, the sector they picked was not ready for their solution. It was difficult finding the right people to talk to, and when they found them, they weren’t interested in changing their procedures. “It felt like you were talking to a government department when you talked to these guys.” Cultural factors in the sector made it difficult for the potential customers to adopt their solution. The team finally developed an approach that might work, but then encountered difficulty with their pricing model. “We asked senior managers in about 50 firms, how do you want us to charge?” They devised a pricing model that narrowed down the target market and the customer profile for their solution. They managed to get some beta customers to undertake pilot projects; but while senior management was interested, they encountered resistance at the operational level. The team altered their customer profile and managed to generate some revenue from pilot projects. Finally they were able to interest some potential customers, but the selling cycle proved to be very long. Eventually the investors ran out of patience and shut down the firm.

*“We were trying to sell an industry to adopt technology, but they never do it!”  
CEO, University spin-off*

The people who started these firms were confident that their technology was excellent, and simply thought that people would want it. This lack of commerce competence plagued most of the firms we looked at in one way or another. The lessons learned from these experiences were valuable for the people who went through them. For example, one take away from the last firm was the need to understand how firms in a target market conduct business. “You have to look at the buying patterns in a market, and you can’t change it.” However, it was an expensive lesson in both emotional terms and financial ones. The entrepreneurs and investors lost a significant amount.

Lack of preparation for success in commerce was not confined to academics. Industrial entrepreneurs – experienced business managers and corporate researchers – tried their hand at starting firms, but failed. Like their academic counterparts, a number of the industrial entrepreneurs we talked with did not succeed because they misjudged the market. They thought their product would be useful, but discovered that their target customers didn’t want to spend the additional money to get the added functionality they were offering. Or, the founders misjudged the culture of the organizations they wanted to sell to. They discovered too late that their target customers didn’t want to change the way they were used to operating in order to use the new product.

An important difference between the university entrepreneurs and the industrial entrepreneur in one firm we looked at (Exhibits 1 & 2) was that the industrial entrepreneur knew more about business in general and could adapt to changing circumstances. According to the investor who backed the industrial entrepreneur and the team, "These people are the kind of people we were designed to get involved with. The CEO is the prototypical entrepreneur we would back, and still do – a hustler with integrity and a 'can do' attitude." The investor admitted, however, "We were lucky with the outcome. Typically, we're not so lucky." In fact, the acquiring company did not do as well. Its stock and revenue collapsed and it had to cut back. It turned out that the management team at the acquired firm had guessed wrong about the new market segment after all. "Our original vision was wrong."

### **Exhibit 1: Industrial Entrepreneur Misjudges Market Needs**

The head of the consumer products division in a large firm had an idea for a new product area and started a company. The founders were technically strong but lacked business development and marketing experience. Nonetheless, a VC was sufficiently impressed to provide seed funding. They developed their idea, got some letters of intent from potential customers, wrote a business plan, and raised an A round of VC financing. After a year of design and prototyping work they realized that the market for their product wasn't there. The team identified an emerging market segment and developed a new business plan to develop the technology standard. The investors liked the team and were confident in their technical prowess. They funded a B round to try to capture the new developing market. The company eventually signed a development pact with another firm, but it wasn't long before the development partner offered to buy them out. After "a walk in the woods" the CEO decided that selling was the best option. The investors did very well. All the staff stayed with the acquiring firm. The CEO left after a year to start another company, which is still operating, with funding from the same investors.

### **Exhibit 2. Industrial Spin-off Misjudges Market Size**

Some industrial entrepreneurs had been working as a team inside a large multinational and couldn't find customers with the approach they had been using. They found an angel investor who was familiar with their sector to finance a start-up with a co-investor. With an IP licencing agreement from the multinational, they attracted first and second rounds of venture financing. The VCs were impressed with the technical know-how of the founder team and the strength of the technology, which "leap-frogged" the competition. A large multinational dominated the market, but the firm decided to become the leader in the rest of the market, which had about a hundred smaller firms and was projected by analysts at more than \$1 billion. Within a year they realized that the market was one tenth the size. "At \$5-10 million revenue we were in Zombie territory. The money was bleeding away." The Board refused an acquisition offer, holding out for a higher price. They included the would-be acquirer in a third financing round, but the market never materialized. The Board brought in a new CEO, who managed to raise a fourth round of VC financing, severely diluting the early investors. "They were wiped out 10 to 1." The new Board stopped product development and focused on serving existing customers until the fourth round investors recouped their investment plus interest. Then they shut down the company. Everyone on the engineering team is working

Some of the corporate start-ups failed because the founders were used to a large company environment and were unprepared for the vicissitudes and fast pace of a start-up (Exhibit 3). They tended to spend too much time on product development, ramping up their R&D staff and burning through the initial investment too quickly. These entrepreneurs often ran into trouble with impatient Boards who wanted to see sales and customers before they would provide follow-on financing.

### **Exhibit 3. Industrial Entrepreneur From Large Corporation**

When a large corporate division was shut down, division engineers invested their severance packages and spun out a firm. Some mortgaged their houses. The person who put in the most became CEO. "I would never do this again," recalled the CEO. "We were born and raised in a big company. We had no experience with a start up." The team brought in investors who were not on the same page as the CEO and management. The firm tried to make a go of it but eventually brought in a partner that ended up acquiring the company. For the CEO, it was a tremendous learning experience. "There were some rough times, but I wouldn't trade it for the world. It was fantastic. I made enough financially to start the next business, and the next one..."

As mentioned in the previous section, some experienced entrepreneurs are conscious risk takers. They will start firms around a new technology that they hope will replace older technology or processes and become the new standard. These entrepreneurs are comfortable trying new things. Due to previous successes, they can attract investors who trust them. We encountered one example in this study (Exhibit 4). Unlike some of the other private sector founders who came out of large companies and were unable to operate in a start-up environment, these entrepreneurs were experienced with start-ups. They were comfortable "failing fast" and moving on to the next opportunity, having accumulated more experience.

### **Exhibit 4: Taking Risks with Eyes Open**

Some experienced engineers, who had worked together in a start-up that had recently been acquired, started a new company. They had no product or customers, only a promising concept for the core technology. Their strategy was to provide better functionality in a fast-growing standards-based market; but it would be essential to move quickly and become the de facto standard before any of the competitors. VCs provided initial funding to put together an engineering team and build the design. The investors knew the former start-up and were betting on people they knew and liked. However, the team took too long to develop a product and missed the market. They revised their strategy, developed a business-to-business product, got some traction, but although the new product would enhance performance, the price of their customers' product would be higher. Their customers felt consumers would not want to pay the extra premium. "It was a 'nice to have' feature, but not essential to sell their product." The experienced investors and entrepreneurs soon realized that other competitors were coming in, regulatory changes were afoot that might affect their customers, so they decided to sell the company. Unfortunately, their development team was the most attractive asset to potential buyers, but most of them left before a sale could be consummated. The Board had to close down the company.

Even these experienced people made similar mistakes about their target market and customers that less experienced entrepreneurs and investors in our sample had made. The difference was that they knew the risks they were taking; and they were nimble in their responses to changing circumstances. When they realized it was taking too long to generate significant sales, they decided to sell while they still had something of value to potential buyers. They failed on the human dimension, however, not keeping the team together and suffering a mass defection before they could sell the company.

Was the background of the entrepreneur a factor in determining the outcome of a company? Table 10 summarizes the outcomes for the different types. Because this sample is small it is hard to conclude that there is an advantage to any kind of entrepreneur but it does seem that serial entrepreneurs are the most successful and university entrepreneurs the least if being sold to a foreign buyer is considered successful.

**Table 10**  
**Outcomes by Type of Entrepreneur**

	Companies	Bankrupt	Liquidated	Merged	Sold			
					Cdn.		Foreign	
					#	rating	#	rating
Serial Entrepreneur	3	1					2	√
Industrial Entrepreneur	7		4		1	X	2	√
Technical Entrepreneur	2			1			1	√
University Entrepreneur	6	2	3		1	X		
<b>Total</b>	<b>18</b>	<b>3</b>	<b>7</b>	<b>1</b>	<b>2</b>		<b>5</b>	

## Investors

The 11 investors that we interviewed were all working in the venture capital industry when they were involved with the firms we studied. One was a corporate VC and the others were fund managers or partners in a venture capital firm.<sup>10</sup> Some had just moved into VC from corporate finance or banking, others were already veteran VCs during the period we discussed. Several of them have since moved on to related pursuits. The lack of angels in our interview sample and the preponderance of VCs somewhat skews the picture we obtained.<sup>11</sup> However, most of the investors we spoke with were able to give us a fairly complete picture of the company in question, including the various types of investors that were involved.

**Table 11**  
**Investment History for Disappeared Firms in Study**

Entrepreneur Type	Type of investment at start-up								
	Founder	Consulting revenue	Angels	Government	Bank loan	Institutional investor	Venture capital	Parent firm VC	University incubator
Serial	x								
		x							
							x		
Industrial	x								
	x								
	x								
			x						
							x		
							x		
								x	
Technical			x	x					
						x			
University	x								
		x							
			x						
			x	x	x				x
				x					x
<b>Total</b>	<b>5</b>	<b>2</b>	<b>4</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>1</b>

Entrepreneur Type	Type of follow-on investment								
	IPO	Customer revenue	Angels	Government	Bank loan	Institutional investor	Venture capital	Corporate	University incubator
Serial	x								
		x							
							x		
				x				x	
Industrial		x				x			
							A, B		
							A, B	B	
							A, B		
							A, B		
							A, B, C		
Technical	x	x							
			A					B	
University				x			x		
							x	x	
							A, B, C		
				B			A, B, C		
							x		
<b>Total</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>3</b>		<b>1</b>	<b>12</b>	<b>6</b>	

A = 1<sup>st</sup> round financing; B = 2<sup>nd</sup> round financing; C = 3<sup>rd</sup> round financing

The investment history of each of the 18 firms was varied. Start-up financing came from a wide variety of sources, including founders, angels, government, university (incubator), banks, institutional investors, venture capital and revenue from consulting. Financing from founders, especially among industrial entrepreneurs, was the most important source of start-up financing. Angel and venture financing were equally important at the start-up phase for our small sample of firms, although angels are typically more important than VCs for start-ups. After start-up, however, 12 of the 18 companies had venture financing and 6 had financing from other companies. Table 11 summarizes the types of investor that played a role in financing the companies we investigated.

Lack of experience among investors appears to have been a significant factor in the disappearance of a number of firms in this study. Some firms found investors who were unfamiliar with technology firms in general (especially where resource-based industries are the norm) or with the particular sector. Many of the CEOs found that the investors they dealt with had little or no operational experience and did not view their role as mentoring firm management or helping them build the company. CEOs frequently made the more general observation that Canadian VC firms typically hire financial specialists such as investment bankers or financial managers with MBAs who have never run a company and lack an understanding of start-ups. Interviewees familiar with VCs north and south of the border emphasized that U.S. VC firms have significant numbers of serial entrepreneurs on staff with operational experience and deep connections to the industry sectors in which they invest. They typically add value to firms with advice and contacts relevant to their business. In some of the Canadian firms we studied, lack of experience on both sides – the entrepreneur and the investor – led to some disastrous results.

One university spin-off started as a public company because the VC that provided the start-up financing was used to that financing model. “I was nervous about the method of financing, but went ahead,” recalled the CEO. “It turned out to be a big mistake.” To make matters worse, the investors underestimated the amount of capital required to make a success. The initial investment was not enough to finance the development and the CEO had to hire junior people and spend a lot of time and energy training them. The technology was good enough to attract some corporate investors, but product development took a long time. The VC firm did not want to put in more money and the CEO could not raise any follow-on venture capital, because an IPO exit was not available. “VCs aren’t interested in public companies.” Furthermore, the CEO and senior management were burdened with reporting requirements that gobbled up precious time and energy. Eventually the money ran out. The CEO tried to raise more, but 9/11 occurred and “everything shut down.” The CEO had to wind down the company.

As mentioned earlier, a number of firms had dealings with Labour-Sponsored Venture Funds (LSVFs). Government created the LSVFs to encourage citizens to invest in early stage firms. The risk was mitigated for the retail investor by providing a substantial tax credit. Fund managers earned generous fees. The LSVFs operated under strict “pacing rules” which forced them to invest a significant portion of their funds within less than a year after receiving them from investors. If they didn’t invest the money in time, the government penalized them. These constraints, together with lack of operational experience with technology firms among fund managers, created severe problems for some of the firms we examined.

In one university spin-off (Exhibit 5) inexperience on the part of the academic founders, the CEO they recruited and the LSVF investor brought on by the CEO, led to the company’s demise. In retrospect, the investor admitted that the initial investment was too low for this sector. More importantly, the team never worked, and it should have started off with more

experienced people from the particular sector. The LSVF was too naïve, or pressured to find deals, to refuse to invest or insist on changes before investing. The investors lost their investment and the CEO has moved on to other pursuits. The academics are still at the university.

#### **Exhibit 5. LSVF-funded university start-up**

A university spin-off ran for a number of years on government grants before it went for venture financing. It had developed a prototype and was working with a beta customer to develop the product. The university founders recruited an industry executive to be CEO and to raise money. The new CEO made a deal with a fund manager who had recently moved from a senior corporate finance position to run an LSVF. "We had to make investments," recalled the fund manager, "but there were not a lot of good ones coming out of the university. There were a lot of professors doing stuff." What made this particular professor stand out was that the firm was working on a prototype with a beta customer. "Without that company being involved, we wouldn't have touched it." Tensions between the CEO and the Board emerged as their funds began to run out. The firm was having trouble meeting specifications required by the beta customer. The CEO focused on trying to build a distribution network in Asia as well as identifying possible acquirers of the firm or investors. Finally, the money ran out without a final product.

*"We thought they'd become a partner, but they had no experience with operating companies. They were a bank."  
CEO re LSVF*

*"Management led us to believe we had 24 months, but we only had 13 months. That's not enough runway. When we went to sell the company, there wasn't as much IP as we had envisioned. There wasn't enough customer engagement."  
LSVF manager re firm*

*"The VC did not add value. It was a financial play, not a venture play. I expected them to send their top lawyer to help with negotiations with the U.S. firm, but they didn't."  
CEO re LSVF*

In another case, an entrepreneur ran into trouble with an LSVF after years of working without any venture capital, because the LSVF was focused on an IPO exit. After struggling for a long time, the firm signed a development deal with a U.S. firm that became its biggest customer. Sales increased dramatically, creating a cash flow problem, so the CEO began looking for venture capital. The CEO struck a deal with a Canadian LSVF, but the relationship was not a good one. The LSVF manager, on the other hand, thought that the technology was "clever" but "at a very preliminary stage." The LSVF found a competitor that was already selling similar equipment. Nonetheless, the VC firm was "under a lot of pressure to do deals" and went ahead. The LSVF felt the firm was too reliant on its major client and wanted to hire more marketing people to find other customers. The CEO disagreed. Things began to go sour quickly when the firm's champion at the major client left and the new management decided to get out of the business. Facing an abrupt loss of sales, the CEO negotiated to buy the discontinued business from the client, but the LSVF vetoed the deal. The CEO recommended downsizing until sales increased, but the LSVF wanted to grow the company and go public. The CEO offered to move the client's manufacturing to Canada and the client would do the sales. The deal was still in play when the LSVF fired the CEO, so nothing proceeded. The company's burn rate eventually put it into bankruptcy and the IP was sold to a competitor, which went public several years later.

In retrospect, the VC admitted being inexperienced, but still blamed the failure on the CEO. However, it is clear that the LSVF's IPO strategy was not right for this firm. The CEO knew all the major client's customers and was trying to work out an arrangement to take over the business. At the time of receivership, the firm received a large order from another customer. A joint venture was in the works. The LSVF had control functions that limited its ability to properly manage its investment. Not able to invest more than 50% in any one firm, for example, it had no room for follow-up financing rounds when needed. The CEO expected the LSVF to be a partner, to help when things went wrong. On the other hand, the CEO made mistakes, too. The over-reliance on the one major client put the company in a precarious position. Lack of experience with VCs also put the CEO at a disadvantage in the initial negotiations for financing.

Similar errors in judgment occurred in most of the firms we examined, both by entrepreneurs and investors. Many of the investors admitted their lack of experience and pointed out that the

*“The level of sophistication of VC investors was not high. Showing up with not enough money. Lack of ability to mentor, coach. We would have done things differently now.”*

*Investor*

*“The LSVC model was very naïve – investing based on the calendar. There’s a lot of focus on searching for new investments.”*

*Investor*

Canadian VC sector is in the process of maturing. “It was only the third or fourth deal I’d done,” admitted one investor. “Now we do more due diligence, looking at the IP portfolio, customer traction, balance sheet and burn rate. There was huge pressure to make deals. We made some bad decisions.”

The size and nature of the VC community in Canada was a topic of concern for a significant number of CEOs we interviewed. One particular complaint was the fact that VC firms spread their relatively small funds too widely. They did not hold enough back for subsequent investment rounds in firms that merit continuing support. One interviewee noted that in a well-known Canadian firm, compensation is tied to the number of new investments. This policy encourages fund managers to look for a large number of deals and spread themselves too thin. “We need existing investors to have enough follow on money, and not continually run after new ones.”

Several investors and entrepreneurs noted that the labour-sponsored venture fund model exacerbated this problem in Canada. LSVFs they were involved with (as investee firm or investor) could only invest up to 50%, so they ran out of room too quickly and could not do follow-on investments. In several cases, the LSVF partner had to prevent other VC partners from investing more and the firm had to be shut down or sold.

Most CEOs we talked with felt that Canadian VC firms behave more like banks than venture capitalists. They noted that Canadian VCs assess venture risk in a similar way that they approach investment banking:

- Diversify their portfolio
- Make small investments in many different firms
- Expect good returns on 1-3% of their investments, moderate returns on some and no returns or losses on others
- Rely on “home runs” to bring in an overall ROI

A majority of both CEOs and investors felt that Canada’s VC community is inexperienced and too risk averse to properly assist companies in which they invest. CEOs, particularly, noted that the primary role for a VC firm should be to support its investee firms, for example by finding the appropriate CEO for the company’s stage of growth, connecting them with customers and partners, mentoring and coaching. While some investors did find CEOs for firms examined in this study, none of our case studies involved any mentoring or coaching of management. Several people we interviewed remarked that this behaviour is almost absent in Canada due to the lack of operational experience.

### *Preoccupation with technology*

In an earlier study we showed that a majority of Canada’s R&D-performing firms are small and were not growing over the seven-year period leading up to the dot.com bust in 2000-2001.<sup>12</sup> Subsequent interviews with CEOs of a sample of firms in what we called the “greenhouse” revealed a preoccupation with technology among senior management.<sup>13</sup> Technically proficient people, who believed their technology would be so useful that customers would emerge easily, were running companies with little or no attention to engaging potential customers to learn about their needs. These were all firms that were still in business; but almost half of them had no sales and only a few were profitable. We predicted to ourselves that most of them would disappear within the next few years. In fact, out of 30 firms, one went bankrupt, three were acquired, three stopped operating and tried to sell their assets (two were successful and one is unclear), and one relocated offshore (Table 12). So only eight firms actually did disappear, which is a smaller number than we predicted.<sup>14</sup> However, our studies indicate that firms can

last for many years without engaging in commerce. A closer look at one of the surviving firms that we believed would disappear shows that it has been spending about \$2.5 million a year for about a decade for a total of \$40 million, and it still has no customers. So there is still no commerce happening

<b>Disappeared</b>		<b>Still in Business</b>
Bankrupt	1	22
Acquired	3	
Liquidated	3	
Relocated offshore	1	

In the present study, we encountered firms that had been similarly preoccupied with technology and that disappeared as a result. In some cases, the management thought they had a winner but they turned out to be wrong. In others, the initial idea was potentially sound but the execution was faulty and the firm ran out of money.

University spin-offs were particularly prone to the technology trap (Exhibit 6). With government policy makers pushing commercialization of university research and university technology transfer offices looking for new opportunities to generate licensing revenue, there is tremendous pressure on institutions to push technology out the door by creating spin-off companies. The rewards outside of academia are great for academics that take the plunge in terms of grants, awards, recognition and kudos from government players who want to demonstrate success. However, the academic receives no recognition inside academia or the academic granting community for commercial activities, and is often penalized. External accolades often come too soon while academic censure lingers on.

#### **Exhibit 6. University Spin-off Caught in the Technology Trap**

An academic spun out a company to exploit a new technology developed at the university. Government and the university supported the firm for several years before the firm sought venture capital. Some VC investors liked the team and thought the technology had commercial potential. They set out to get a market-ready product and to establish a strong sales and marketing capability. The team discovered that their technology was too good and would dramatically decrease the number of products customers would need to buy. "The speed of our technology was killing us. We realized there was no way we would hit our [sales] projections." Finding a new strategy became an urgent necessity.

The team developed a new business plan that would require more R&D. The investors agreed to another financing round, but the R&D took a long time. "It wasn't 'cut and paste' engineering. There were lots of iterations and trials." After a few years, cash started running out, so the CEO approached investors for another financing round. They agreed but one investor re-structured its contribution as a loan with a set maturity date. The CEO accepted. "I thought I could make it." By the time the R&D was completed, the cash was gone and the investor consortium fell apart. The loan was called, the staff was let go, the Board resigned, and the assets were sold to a competitor. While the founders learned a great deal, the emotional and financial costs were enormous.

Preoccupation with technology was not confined to university spin-offs. Even experienced entrepreneurs can fall into the technology trap (see Exhibit 7). Sometimes technological changes external to the firm render earlier decisions obsolete. In one case we looked at, the firm could not recover from such a development. Two seasoned tech managers with extensive experience in larger firms invested their own money, helped by family and friends and local

angels, to develop a product. Two rounds of venture financing enabled them to get several promising pilot projects. They selected a particular technical solution over one that would have been more costly for customers on an ongoing basis. While their alternative was a smart choice at the time, the cost for the other technology dropped suddenly and dramatically. While they had customers and revenue, it was not enough to adapt their solution to the other technology. They approached the Board for more financing. The Board decided to change CEOs and put in one of their own people. The new CEO focused on cost cutting instead of growth and the company ran out of steam. The Board decided to sell the company to another firm for stock at a significant loss. The acquirer hired some of the existing staff, but the jury is still out on whether or not the acquirer will succeed. Significantly, the former CEO recalled that too much time had been spent on talking with potential channel partners and too little time on finding early adopter customers. Their focus on a particular technology and application had blinded them to other possibilities, and the technology they picked took longer to develop than they had anticipated.

#### **Exhibit 7: Entrepreneur-led Start-up Foiled by Technology**

A successful entrepreneur decided to develop a technology for a particular market. Unfortunately, it took twice as long to develop the technology than anticipated. "The design took about three solid years of blood, sweat and tears to develop." Furthermore, the firm misjudged customer willingness to accept a new technology. "We thought we had a hot technology that would integrate easily into their system. But selling into the sector was difficult. We were struggling terribly." Eventually the firm succeeded for awhile, but ultimately went bankrupt when it lost a major customer.

These examples illustrate the dangers of being focused on technology and neglecting to focus on customers and their specific needs. This technology preoccupation is particularly problematic in Canada where, as discussed earlier, VC firms tend spread their investments widely hoping to find one winner that can fund weaker investments. Canadian VCs often are seduced by the technology entrepreneur's search for the next "big thing", because they are also looking for an investment "home run". These examples also demonstrate the importance of strong relationships between management and Boards. The Board changed the CEO when things were going wrong. When Board personnel changed, established relationships disappeared and things fell apart.

#### *Dysfunctional Governance*

In some of the firms we looked at, lack of experience in commerce on the part of entrepreneurs, managers and investors led to dysfunctional governance that hampered firms and limited their potential. In our interviews, we came across clashes between management and Boards of Directors, disagreements within the Board, and misalignment of goals (Table 13). Some entrepreneurs took on inexperienced investors who insisted on having a seat on the Board of Directors despite having no operational experience in running a company and lacking any experience or contacts with potential partners or customers. As noted earlier, a significant number of entrepreneurs – and investors – whom we interviewed underlined the lack of operational experience in Canada's venture capital community.

Some of our interviews highlighted a particular challenge related to the type and number of directors on the Board. Most of the cases we looked at involved several investors that co-financed the firm. In many instances, each co-investor insisted on a Board seat rather than letting the lead investor represent the syndicate. This practice prevented the election of independent directors that could add value to the business. The Board essentially became a watchdog to protect the investment rather than a Board that was working to build and grow the business. Several of the people we interviewed told us that the main objective of their

“finance-heavy” Board was to sell the company for a profit. In some cases, the naïve entrepreneurs realized this fact months or years after the investors came in.

<b>Table 13</b> <b>Types of Dysfunction in Firm Governance</b>
Clashes between management and Boards
Clashes within Boards
Misalignment of goals between entrepreneurs and investors
Boards dominated by financiers

The situations faced by some of the people we interviewed illustrate a few of the pitfalls that can occur.

*“There were a bunch of science people with ‘beany hats’ who were smart and enthusiastic; and a second group of financial ‘wheeler dealers’ who wanted a front guy to engineer an IPO deal.”*  
CEO

Some academics started a company with angel investors and after a number of years attracted several rounds of venture financing. The number of shareholders grew quite large, mostly family and friends and some VCs. The Board of Directors consisted of the scientists and some of the investors. As successive rounds of financing brought in new Board members, the quality of the Board deteriorated. “We started as a naïve Board, then a good one, and then it went bad.”

*“The company had a fragmented shareholder base and a wobbly Board. Some people were lured in without being aware of the risks. They all thought they would make a lot of money on an IPO.”*  
CEO

The Board recruited a U.S.-based business development executive to come to Canada. The newly-arrived CEO was shocked to find a dysfunctional Board. The scientists “wanted to make money with no liability or risk.” The CEO quickly assessed that the firm had excellent science and people that understood the technical issues, and set about focusing the team. “I toned down the ideas and focused on building value and establishing a framework to develop products.” The new positioning of the firm attracted a round of financing from a consortium of VC firms and private investors, some from the original group and some new. The CEO’s attempts to improve the Board of Directors did not succeed as well.

The development team was struggling with the science, but the CEO’s repositioning of the company attracted a potential buyer of the firm. The Board refused, preferring to go the IPO route. “I was weak,” recalled the CEO. “I agreed to the IPO. I should have threatened to quit.” As resources began running out, the firm cut down its R&D and for practical purposes evolved into a service company for one of its corporate investors. “There was no value creation. We had to cut down, cut down, cut down. Eventually, we ran out of breath.” The company was sold for a small fraction of the amount invested over the years and the acquirer kept most of the employees on.

*“The North American market was drying up but some of the investors were focused locally and didn’t see it. They didn’t have the experience of looking at 400 deals a year across all of North America.”*  
Investor

Board problems can plague industrial start-ups as well as university spin-offs. After a Canadian firm closed one of its business units, one of its employees used a generous severance package to start a firm. Assuming the role of President, the founder built a prototype system using a combination of personal funds and government grants, and subsequently attracted an initial round of venture financing from a consortium of VC firms. The VCs recruited a CEO who had product management experience in the relevant sector but had never been a CEO. The founder moved to the CTO position. The Board had representatives from each of the participating VCs plus the CEO.

The firm focused on R&D, obtaining a couple of beta customers, but sales were not ramping up quickly enough for some of the investors. The Board disagreed on how to proceed. The lead investor wanted a business model that would facilitate selling the company. Others wanted the firm to grow and succeed according to the initial business plan. Despite the differences, all the original investors agreed to a second round of financing. However, the lead investor insisted that the CEO resign and move into an advisory role. The founder moved back into the President role in addition to being CTO.

*“It’s a dirty little secret. If the deal is having trouble getting funded it must be the CEO’s fault. Of course, more revenue could have changed things.”*  
Investor

The Board hired an experienced U.S. sales executive to lead the effort. “He looked good on paper, but was a disaster.” Some of the investors had confidence in the firm and wanted to invest a third round to grow the business. The lead investor had a veto, rejected a subsequent funding round, and tried to sell the company without success. The now dysfunctional Board decided to cut the employees down to a few technical people. The President managed to place most of the employees into other local companies. Eventually the Board sold the IP back to the founder, sold the net operating loss to a firm in another sector, and closed the company. The founder eventually started another firm with financing from some of the original VCs that had been supporters, grew the new firm and sold it.

According to one investor we interviewed, discord among syndicate members is too common in Canada. “The number of times it happens is frightening.”

*Summary of Factors Leading to Disappearance*

Many factors acted together to cause these 18 enterprises to disappear. Some were a direct consequence of the lack of commerce competence. Preoccupation with technology also played a role, as did luck and timing in some cases. Dysfunctional governance and non-alignment of business goals were driving factors in some instances. Table 14 gives a partial listing.

<b>Table 14</b> <b>Partial List of Factors Leading to Disappearance</b>
No revenue from customers.
No input from customers on R&D performed or on the product or service being developed.
Misreading of markets (e.g. overestimate size, delay market entry)
Poor business judgment.
Product not needed or it was not simple enough for the application.
Poor sales and marketing decisions (e.g. distribution channels vs. direct sales, delay going global or going global too quickly)
Timing wrong, the product was too early or too late.
Unaware of competitors and changing market conditions
R&D took much longer than expected.
The management was changed.
More money needed. Financing especially toward the end was consuming for senior management
Dysfunctional governance.
Junior service people in finance, law, etc. were put in responsibility and on boards of some of these young enterprises.
Attractive potential for acquisition.
Desire to sell.
Bad luck – tech bubble, 9/11, etc.
Greed.

In our earlier studies we identified a number of factors that played an important role in the success of the R&D Leader firms we looked at (see Table 15).

<b>Table 15</b> <b>Strong Elements Supportive of Success in R&amp;D Leader Firms (previous study)</b>
Highly competent supporting people were often involved in technical, financial and legal services.
People were highly committed to succeed and sacrificed much.
Financial backing that was remarkably high given the quality and risks of the business proposals.
Foreign-born entrepreneurs, who were more pragmatic, frugal and prepared to do what it takes to succeed in commerce.. They were free of the Canadian culture of commerce.

#### 4.4. Key Characteristics of Disappearing Companies

There is no neat classification that can capture the diversity and complexity of the experiences of these firms. However, there were warning signs that related to the main three causes of disappearance identified in the previous section (Table 7) . Money is often fingered as a chief cause, so it is important to highlight the fact that these companies all had significant financial banking that would probably have been sufficient if these three causes had not dominated.

As noted in the previous section, a major contributor to failure and disappearance was lack of customers and low sales (Table 8). Despite low sales, the firms we looked at had significant numbers of employees. At their peaks these 18 companies employed a total of about 2480 people. If we subtract out the three largest, the remaining 15 companies averaged 40.5 employees in their peak year Table 16). So firms with no customers or little or no revenue that keep going for years with significant staff are likely candidates to disappear.

<b>Peak number of employees for 18 companies</b>	2480
<b>Average number of employees in peak year for all 18 firms</b>	137.8
<b>Average number of employees subtracting 3 largest firms</b>	40.5

Another major contributor to disappearance was related to technology. Firms that relied on technical specialists to run the company faced greater challenges than those that were run by people with some industry experience. Large R&D programs that developed multiple products for different potential markets burned cash quickly on unfocused research unrelated to identified customer problems. Focus is a key characteristic of a healthy firm. Without a customer in mind, and engaged, R&D employees tended to develop advanced functionality without any feedback from potential users about whether they needed (or wanted) it. Targeting a market is not sufficient. As Peter Drucker once famously remarked: "I've never seen a market place a purchase order." So firms run by technical CEOs with large, unfocused R&D programs are also possible candidates to disappear.

Finally, governance is a key indicator of whether or not a firm will disappear. If the goal of the Board is to sell, it will happen – perhaps not profitably, but the firm will disappear. If the Board is inexperienced and packed with MBAs who never ran a business, its chances of disappearing are high. If the Board composition is determined by desire for control, successful enterprise is unlikely.

Table 17 contains a partial list of characteristics of disappearing firms gleaned from the interviews.

No identified potential customers; only markets
No engagement with potential customers to determine their needs and to involve them earlier
No sales and no urgency to achieve sales
No or low sales and yet a significant number of employees (especially R&D employees)
CEO is scientific or technical founder with no business experience
Lack of R&D focus
Large R&D team with a diffuse mandate
Venture Capital backed with short-term aggressive financial objectives
Lack of shared goals and expectations between management and Boards
No independent directors on Board
No operational experience on Board
Too many financial people on Board
Firm has gone public before reaching profitability
Key employees lose confidence in the future and leave

Many existing firms have some of these characteristics, but not all of them will disappear. It may be helpful, however, for CEOs running these firms and their Boards of Directors to be conscious of the fact that these traits are common in firms that have disappeared, often at great emotional and financial cost. They can raise their awareness simply by asking pertinent questions such as those displayed in Table 18.

<b>Table 18</b> <b>Customer-oriented Questions that Senior Management Should Ask Often</b>	
1)	Do you have customers in mind?
2)	Are you talking with them?
3)	What are their needs that you can address?
4)	Are any of them involved in the R&D stages as lead customers?
5)	What actions are you taking with them to ensure sales results quickly?
6)	Who else is addressing them?
7)	What value are you offering that would make a customer choose you over your competitor?
8)	Could an advisor or an investor or a mentor help the company?

Statistics Canada could add a few of these kinds of questions onto their annual company survey. Over time, analysts would be able to refine the characteristics of firms that disappear by correlating answers to these questions with longitudinal data on firm survival.

#### 4.5. Main Measures Used to Attempt to Prevent Company Disappearance

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All the principals involved in the firms we looked at wanted to succeed. Very few of them had a clear plan of how to do it. The typical approach was to start with a technology, identify a potential market, develop the technology, try to get some beta customers and hope to make sales. There were two, often diametrically opposed, views of what constituted success. Most entrepreneurs wanted to grow a successful company. Some investors – especially VCs – started with the aim of selling the firm. So “disappearance” was part of their plan.

Most firms were strictly reactive in their attempts to move the business forward, although some examples of proactive thinking did come up. The two most common strategies firms used to address perceived weaknesses were to seek foreign talent or try to find a development partner. The most common reactions to impending trouble were to change personnel or to try to raise more funds. In cases where people realized that they had picked the wrong market, a typical strategy was also to shift gears and try something else (Table 19).

<b>Table 19</b> <b>Most Common Strategies to Prevent Firm Disappearance</b>	
<b>Proactive</b>	<b>Reactive</b>
Seek foreign expertise	Change personnel, especially the CEO
Find a development partner	Raise more funds
Find a distribution partner	Shift gears – different market, revised technology development

##### *Getting foreign expertise*

Several of the firms we looked at in this study tried to recruit executive and other talent from outside the country, but it didn’t always work out. As described earlier, one of the university

spin-offs recruited a U.S. CEO who decided to stay in the U.S. and hire a Canadian COO to run the firm. The Board eventually fired the CEO.

A corporate spin-off, discussed earlier, that changed CEO twice recruited a sales executive from the U.S. to try to increase sales. They did not know him personally, relying on credentials, and he didn't work out.

Another firm, an entrepreneurial start-up, went to Europe to find a development team, but the group they selected couldn't meet the challenge. They brought the work back to Canada, but the team the CEO put together couldn't tackle the problem either. In the end, it took too long to get a product and a competitor in the U.S. got the jump on them. They had to abandon their initial idea and try something else, but that didn't work out either.

### *Finding a Partner*

Some firms tried to partner with larger firms to complement the core team with expertise and contacts they didn't have. Four firms found development partners, but in two cases the partner eventually acquired the firm. The third merged with its partner to form a different company. The fourth, described earlier, did well after it opened a U.S. sales office and found a development partner that ended up being a major customer. Unfortunately, changes in personnel and circumstances with the partner ultimately ended the company when the Board could not agree on a strategy moving forward.

One firm that grew out of a research institute developed a very successful product and became profitable. The company licensed the product to foreign firms to increase sales worldwide, keeping the Canadian market for itself. Eventually, further revenue growth became impossible and a foreign multinational bought the company for its research team.

One university spin-off engaged an international distribution company to sell its product worldwide before the product was ready. The company spent a great deal of money and personnel time supporting the international sales reps but the firm ended up having to change its product.

### *Personnel changes*

Of the six university spin-offs, three of them tried CEO changes in order to improve the chances of success. In one case, the founding CEO had to move into an advisory role when VC investors first came on board. The investors brought in a U.S. CEO who decided not to move to Canada and hired a Canadian COO to run the company. The investors set out at the start to try to capture 10% of a particular market and sell the firm.<sup>15</sup> They hired U.S. marketing and sales people to implement the plan. When the product they developed turned out to be a "nice to have" for potential customers and revenues did not materialize, they fired the CEO and brought in a consulting firm to run the company. After trying unsuccessfully to sell, they closed it down.

In another case, discussed earlier, the founding CEO was eventually moved by the investors into an advisory role and soon left. A search firm found a U.S. CEO who was able to focus the R&D team, but was unable to fix problems at the Board level. In the third example, one of two founders had started as CEO, but when the firm ran into trouble with product development, the Board forced the CEO to relinquish the role to the other co-founder, who remained CEO to the end.

One of the corporate spin-offs also tried changing the CEO. The firm had gone after a market that turned out to be too small. A customer offered to buy the firm, but the Board wanted a higher price and brought the customer in as an investor. When sales did not grow, the Board moved its CEO to the CTO position and recruited a new CEO to raise more funds. Ironically, the new CEO succeeded in raising another round of financing but it diluted the original investors dramatically. The new CEO stopped all product development, milked the company for several years until the last round investors were able to recoup their investment plus interest, and then closed down the firm.

Another corporate spin-off started off with one of the founders as CEO. When venture financing came in, the CEO moved to CTO and the investors recruited a first-time CEO with product management experience. When sales didn't ramp up quickly enough, the Board moved the new CEO into an advisory role and brought back the founder as CEO and CTO. The Board disagreed on strategy and eventually sold the IP back to the founder CEO.

When one firm decided to abandon a market that they had missed, they replaced their VP engineering to try to tackle another market, but health problems slowed the effort. After several downsizings the team succeeded in getting a product, but customers were too slow to adopt it and the firm had to close down when key people left.

#### *Additional financing*

As discussed in Section 4.3, many of the firms misjudged their target market and some tried to shift course. The change of tack typically meant that product development would have to continue or accelerate, and in many cases, more financing became the immediate need. Investors were willing to raise additional financing, putting in more themselves and bringing in partners. However, in several cases, one investor insisted on certain conditions that ended up killing the company. In two cases, an investor converted its contribution to a loan and later called the loan. In several other cases, one investor insisted on a veto and when differences of opinion emerged later, exercised the veto to block the majority and the company was sold or closed down.

One firm that had to change course dramatically, counted on SRED credits for cash flow, but the process took so long that when an investor called in a loan, the company was forced into bankruptcy. The SRED credit was used to pay one of the investors after the company was shut down.

Another firm that started as a public company could not get venture financing when it was running out of cash, so it turned to government. Matching requirements, however, made it difficult and the firm ultimately had to be shut down.

It was remarkable to learn of investors' willingness to keep putting money into these ventures, despite the stumbles and wrong guesses. Seven of the firms encountered major obstacles, such as a missed market or a product that customers didn't want or were slow to adopt. In five of these cases, the investors agreed to a further round of financing to try to move forward. However, there was a limit to investors' patience and if another obstacle appeared or it took too long to generate enough revenue, the Board would refuse to fund another round. As mentioned earlier, serious disagreements emerged among Board members in a number of the firms. Typically the dispute occurred around whether or not to sell the company or continue financing it in the hope that it would succeed in generating significant revenue.

Most of the above attempts to fix problems that occurred could have been avoided at the initial stages of the companies' lives. In a sense, they were reactions similar to moving the

deck chairs on the Titanic. The ship was sinking, and no amount of personnel change, tweaking the technology or additional funding was going to help.

## 5. What's Needed?

### 5.1. Enhanced entrepreneurial and commerce learning

It is evident from the interviews we conducted that the main measure needed to assist company growth and success in Canada is enhanced entrepreneurship and commerce competence. A number of suggestions emerged from our interviews with entrepreneurs and investors (Table 20).

<b>Focus Areas</b>	<b>Specific issues/activities</b>
Promote realistic, complete role models	Failure as a learning experience
	Take risks and learn from the experience
	Recognition of Canadian entrepreneurs
Enhanced enterprise-conscious contact with experienced entrepreneurs	Government SBDAs provide client firms with links to experienced entrepreneurs
	Develop "expat" community of Canadian entrepreneurs abroad to advise, mentor CEOs in Canada
Enhanced entrepreneurial learning in the educational and public policy environments	Universities provide opportunities to train entrepreneurs how to mentor other entrepreneurs
	Postsecondary institutions and communities offer entrepreneurship learning opportunities to students, entrepreneurs and aspiring entrepreneurs
	Government granting councils fund research on entrepreneurship
	Universities develop industry engagement strategies
Enterprise training and literacy	Governments fund universities' industry engagement activities
	Postsecondary institutions provide more training on managing an enterprise, including entrepreneurship, management, marketing, sales, distribution, customer relations and enterprise-related professional services
	Better education in starting a business
	Commerce literacy in K-12 education

#### *Promoting realistic, complete role models*

In a society that is commerce averse, it is important to identify appropriate role models that can dispel negative attitudes and provide a realistic picture of the risks and opportunities available through entrepreneurship. Investor attitudes toward the entrepreneurs they invest in provide a clue to the right approach.

A majority of the people we interviewed – including entrepreneurs and investors – felt that the best learning for entrepreneurs, and investors, is to do it. Investors looking for investment opportunities prefer to see a CEO who has “been there done that”. This is true for venture capital investors, who want to invest in people who can ultimately go public, hence providing an exit.<sup>16</sup> It is also true for investors and other stakeholders who want to see more small firms grow to medium size, and more medium-size firms grow larger.

The key is understanding risk and how to learn from failure if it occurs. Learning from failure includes accepting that failure occurs and being both astute in recognizing the signs of failure

and agile in taking corrective actions quickly. Investors we interviewed prefer to invest in firms run by entrepreneurs who have “been there, done that”, even if they made mistakes – as long as they learned from them. A majority of interviewees pointed out that failure can be an important learning experience for an entrepreneur. A significant number of the CEOs and investors we talked with highlighted a difference in attitude toward failure between Canada and the U.S. They told us that Canadian CEOs they know who failed the first time often found themselves shut out by Canadian investors when they wanted to do something else, whereas in the U.S. investors are more inclined to look at the CEO’s first failure as an important learning that increased the CEO’s value. Canadians tend to be risk averse, fear failure and cannot tolerate failure when it occurs.

So, to some extent, entrepreneurs need to go out there, take risks and learn from the experience. However, it does not mean that one should take stupid risks. As Alan Barrell, Entrepreneur in Residence, Cambridge University, stated at a recent conference<sup>17</sup>: “‘Who dares, wins’ is the motto of the UK Special Air Service. But daring can be planned. Daring doesn’t mean jumping off the cliff without a parachute.”

All of the entrepreneurs we talked with found their experiences to be emotionally and physically grueling, but every one of them felt that the learning experience was invaluable. All of them are involved in some kind of entrepreneurial or investment activity today. Some are running new companies, some were hired to run existing firms, some went over to angel or VC investing, some are doing business consulting.

More recognition of experienced Canadian entrepreneurs, including for their failures as well as successes, would go a long way to generating a more entrepreneurial culture in Canada and stimulating more Canadians to become entrepreneurs. Studies of “survival entrepreneurs” – people with few other economic options – show that they are motivated primarily by role models.<sup>18</sup> Canadians need to harvest this rich resource of experienced entrepreneurs and engage them to help others and show them the way.

#### *Enhanced enterprise-conscious contact with experienced entrepreneurs*

Any program or activity that puts start-up or growing firms into contact with experienced entrepreneurs will be one of the most useful ways to help these firms and their leaders. When queried about the place of the federal government in assisting companies, several people we talked with mentioned that the government could provide assistance to entrepreneurs, not only with funding, but also by connecting CEOs with experienced entrepreneurs who can advise them on business matters. For example, many firms received IRAP support, and several recalled that the particular ITA assigned to their firm provided valuable advice and expertise on governance issues. Some recalled ITAs introducing them to others who could help them. Many federal and provincial government science-based departments and agencies interact with industry and have extensive contacts with Canadian R&D-performing companies. In principle, they could provide similar assistance to firms by developing relationships with experienced entrepreneurs through industry associations, angel networks, incubators and other organizations. Once plugged into such a network, they could refer their client firms to entrepreneurs for advice or assistance.

The Department of Foreign Affairs and International Trade helped create the “Digital Moose Lounge” in Silicon Valley and the San Francisco area, where Canadian expatriate entrepreneurs can meet. A program that connects these and other<sup>19</sup> “expat” Canadian entrepreneurs with entrepreneurs and businesses in Canada would be a major help. Many Canadian entrepreneurs have left Canada over the years to run successful enterprises in the U.S. and elsewhere. The vast majority will not move back to Canada, but have family and other ties that bring them here regularly. Many of them would be pleased to act as advisors or mentors to Canadian

entrepreneurs running companies in Canada; and some would serve as Directors on the Boards of Canadian firms. DFAIT posts abroad could identify candidate expats through their extensive local networks. In Canada, economic development agencies and industry support programs at all levels of government as well as investment groups could help identify potential Canadian companies that could benefit from the expat service.

### *Enhanced entrepreneurial learning in the educational and public policy environments*

All of our interviews lasted over an hour and some went significantly longer. Many of the people we talked with gained a new perspective on their experiences through relating their story and discussing its larger implications. If one were to ask them to try to teach what they know to others, it would be difficult for most of them. In order to benefit from the experience of entrepreneurs in our society, we not only need to engage them but develop a means to “train the trainer”.

Cambridge University in the U.K. has evolved a community over 4-5 decades that cultivates entrepreneurial learning. Over 200 entrepreneurs are available to the community as advisors, mentors, investors, directors to local firms and start-ups, and as teachers at the Centre for Entrepreneurial Learning at the University. A mixture of formal training, informal practice, qualification by doing, and learning from each other engages the community of entrepreneurs. The Centre has formal “Train the Entrepreneurs to Teach” programs – especially prepared and delivered, refreshed and updated regularly – and an “Entrepreneurs in Residence” program and a Summer School for entrepreneurs based locally, nationally and internationally. Experienced “mentors” take “new mentors” with them when they work with young company entrepreneurs, and the new mentors “shadow” the experienced ones when working on the Summer School. Entrepreneurs learn by doing and developing.<sup>20</sup>

A few Canadian universities are developing entrepreneurship programs where experienced entrepreneurs teach, mentor or coach students, entrepreneurs and other interested individuals. In Ontario, Ryerson University’s School of Business Management offers a Specialization in Entrepreneurship and Innovation that includes an Entrepreneurship Major with courses taught by experienced entrepreneurs; McMaster University offers a Master’s program in Engineering Entrepreneurship & Innovation for entrepreneurs; and MaRS in Toronto runs a popular course, “Entrepreneurship 101”, open to anyone. University of Moncton in New Brunswick launched an entrepreneurship course several years ago. In Nova Scotia, the Centre for Entrepreneurship Education and Development is a not-for-profit organization that partners with local universities, business and government.

Interviewees emphasized the need for more entrepreneurial education in Canada, including more postsecondary institutions and communities offering these different kinds of entrepreneurship learning opportunities, not only to students but also to entrepreneurs and would-be-entrepreneurs in the community. More learning about entrepreneurship and how it can be nurtured, developed and supported would strengthen the case for educational institutions to take up the challenge. The federal and provincial governments could encourage and support such learning.

Universities could develop industry engagement strategies that combine the traditional technology transfer, contract research and incubator functions and focus on engaging companies and entrepreneurs to find out what their needs are. Government granting programs could be tailored to support “industry engagement” activities at postsecondary institutions.

### *Enterprise Training and Literacy*

The overarching message that has emerged from this study is the need for increased

knowledge and skills in commerce. Indeed, several interviewees emphasized the need for more training on managing an enterprise, including entrepreneurship, management, marketing, sales, distribution, customer relations and enterprise-related professional services (legal, accounting, etc.). Enterprise training also needs to include learning about investors, owners, governance, financing and the money pitfalls. Training, coaching and mentorship in these areas could be provided or facilitated by the private sector, universities and colleges and government. Many interviewees also called for better education in starting a business, which is the responsibility of provincial departments of education, as well as the informal education sector<sup>21</sup> and postsecondary education institutions.

In general, it appears that the greatest challenge facing entrepreneurs and investors is inexperience with enterprise and the need for mentorship, training and support on the business side of these ventures. Governments of all levels have been stressing the importance of science and technology literacy in developing future generations of skilled personnel for the knowledge economy. A similar effort on enterprise literacy, and highlighting the link between S&T and commerce in the knowledge economy, seems to be a much desired and needed addition to government priorities, according to entrepreneurs and investors we interviewed.

## 5.2. Appropriate Enterprise Sources of Funding

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Canadians need enhanced awareness of appropriate enterprise sources of funding. Many of the enterprises we studied started off on the right foot, but things went wrong as management brought in inappropriate investors who did not have the same goals as the founders; or management became preoccupied with financing and lost sight of the customer.

Customers are the ultimate source of money. Successful firms find customers early, the sooner the better. Seven of the firms we looked at never had a customer before they disappeared. One firm that had an early beta customer neglected them and focused on other things. Many of the firms that sought and obtained VC funding early, used the money to fund R&D without engaging customers.

### *Three F's for successful start-ups*

Family, friends and frugality are key for many start-ups. Some of the firms we looked at started off with their own money as well as some provided by family and friends. Frugality kept them in the game for a number of years. They went wrong later on, through lack of attention to customers, preoccupation with technology, bringing in the wrong type of investor, or a combination of such factors.

### *Enterprise-experienced angels*

Angel investors who have enterprise experience can be extremely helpful to early-stage firms. Not only do they bring money to the table, but these types of angel investors also will most often provide advice, contacts and mentoring for founders and senior management. Some angels will take on the role of non-executive chairman for start-ups that require an experienced hand to help get the company going. Some of the firms we interviewed benefited at the early stage from angel investors, but other circumstances eventually derailed the firm. Sometimes the entry of later-stage investors forced out early angel investors, and things went wrong afterwards.

### *Venture Capital and Institutional Investors*

Not all firms require venture capital and it is sometimes not in the best interest of the company to take on a VC investor. If a company can grow organically on customer revenue, it may take

longer, but the rewards can be significant. Several firms found out too late that the VC investor was more interested in selling the company than seeing it grow and succeed. We encountered a preoccupation with raising VC money among many of our CEO interviewees. Several of them, in retrospect, felt that they had made a mistake getting involved with VCs too early in their firm's development.

In at least one instance, later-stage investors severely diluted the early investors and demonstrated a callous disregard for them and the founders. This kind of behaviour can taint business relationships and cast a pall on the VC community. Firms need to be vigilant and do their due diligence about the investors, just as the investors do their due diligence on firm management.

### **5.3. Government Support – Direct support and tax credits**

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While many of the people we interviewed talked a lot about financing, it was clear that financing is not the biggest problem facing Canadian entrepreneurs. We were struck by the fact that firms could go on for years without customers or sales, living on financing from government, angels, VCs and other sources. We found this to be true in our previous studies as well. CEOs of smaller firms that weren't growing ("greenhouse") admitted that they had been too preoccupied with looking for financing and neglected talking with potential customers. Many went public much too early, before they had significant sales, and became mired in reporting requirements for public companies. Successful CEOs emphasized the importance of customers and sales as priority sources of financing for their firms.

Nonetheless, in all our studies, CEOs have emphasized the benefits of tax credits, government support programs and investors who can help grow the business. In the present study, it was clear from our interviews that federal and provincial funding for these firms was important. The general impression from interviews was that IRAP was important to some CEOs for early funding and also for advice. The majority of people who mentioned IRAP were extremely positive. Some people had less than stellar experiences, either because the particular person they dealt with was not helpful, or because the amount of funding available was relatively small. Other government support programs were important, too. Some firms received large grants from the federal or provincial government, as well as loans. Unfortunately, the taxpayer lost significant amounts of money in a few cases.

Many interviewees mentioned the Scientific Research and Experimental Development (SRED) tax credit program. Most firms used SREDS, which were often critical for early company survival. At least one firm, however, reported that delays stemming from the bureaucracy of the SRED application and approval process were a factor in the firm's demise. The importance of SREDS to firms highlights the need for them to be visible and accessible. One interviewee noted that only 30% of CEOs take advantage of them, either because they are unaware of them or due to the time required to apply and the unpredictability of success.

The importance of government granting programs and tax credits for firms underlies the need for government officials to understand their role in the value exchange. Canadian government employees responsible for building Canada's innovative capacity and supporting the performance of Canadian technology firms are in direct competition with their counterparts in other countries. If they fail to compete successfully, none of them will suffer loss of pay or loss of a job. The same is not true for employees in these government agencies' client companies. If they fail, or if government support requires inordinate time and energy to access, or is too slow in coming, everyone in the company loses.

Despite the existence of some direct support government programs for companies, Canada

lags behind other countries in this area. Most government funding is directed toward universities and other public sector institutions. Companies are often expected to match government dollars to fund projects that aim at commercialization of public sector research.<sup>22</sup> These kinds of programs emphasize technology and research, and are not very helpful to companies that want to increase sales and customers.

Support models for public sector organizations involved in innovation are not appropriate for the private sector. Timescales are different and consequences of failure are severe for firms while often irrelevant in the public sector. We need a different support model for companies, where timing is more critical and competition is ever present. An entrepreneurship workshop for civil servants managing and delivering industry support and economic development programs at all three levels of government would go a long way to addressing some of the cultural gaps that exist today in Canada.

#### *A funding gap – ‘proof of concept’*

One particular area where our interviews identified a funding gap – proof of concept – illustrates the unbalanced nature of Canada’s funding landscape. One investor noted that there is a lot of pressure on academics to commercialize results of federally-funded research, but claimed there is no federal or provincial government money for proof of concept for companies, including university spin-offs. Some federal programs do in fact exist, but they are limited to university researchers.<sup>23</sup> This investor pointed out that venture capitalists in Canada used to provide such funding to early-stage firms, but that investing in university spin-off firms that were too early stage has burned the venture capital community. As a consequence, now VCs are no longer investing in early-stage firms. This interviewee is in the biopharma sector and recommended government grants to companies of \$100K-500K over 2-3 years for proof of concept in drug development or diagnostic development.

*“We need some kind of fund with experienced people managing the fund and advising researchers on experiments needed before looking for venture funding.”  
Investor*

Several other people highlighted the need for supporting proof of concept either within universities or in companies. The Atlantic Innovation Fund (AIF) is an interesting model, since companies and universities are eligible to apply for funding. AIF is one of the few programs in Canada whose funds are available to firms. Most other government programs aimed at facilitating university-industry collaboration flow money exclusively to the university partner. Perhaps for this reason, none of our interviewees mentioned these programs. Interviewees most often mentioned the U.S. Small Business Industrial Research (SBIR) program as a useful model for industrial support programs. In the university context, existing structures such as the Networks of Centres of Excellence or Centres for Commercialization and Research, NSERC’s Ideas to Innovation program and CIHR’s Proof of Concept grants offer ways to fund proof of concept work at universities in collaboration with industry. However, these programs were not referred to at all by interviewees, likely because they only fund academics, not companies. Entrepreneurs and investors in Canada are at a disadvantage because Canadian governments have an aversion to funding companies directly. Other countries do not exhibit similar prejudices.

#### *‘Funds of funds’*

The strong criticism of Canada’s venture capital community that emerged in our interviews underlines the importance of developing sound policies in this area. BC, Alberta and Ontario have created “fund of fund” programs in an attempt to provide venture capital for firms in certain sectors. However, interviewees cautioned that experienced investors should manage such funds, preferably serial entrepreneurs with operational experience running companies as well as investing experience. Some noted that angel investors in Canada are better suited to this role than bankers and financial-oriented VCs.

A recent development in France around the French wealth tax that is stimulating cross-border early-stage investing in Europe provides an interesting model for Canada. The Sarkozy government has allowed individuals who are assessed a wealth tax to invest the tax in early-stage companies. The banks operate the funds and provide their clients with the service. The money is actually invested by angel networks whose members qualify the companies and co-invest. They also typically advise, mentor and coach their investee firms. The French government opened the funds to investment in firms all over Europe, hence stimulating cross-border investments. While Canada does not have a wealth tax, some of the principles involved in the French initiative could be applied to the Canadian situation.

The Appendix summarizes some of the specific ideas that came out of our interviews and earlier work that we have done. Others will undoubtedly think of more that we can do. There are, however, some basic principles and attitudes that need to underlie our thinking about specific actions that we must take going forward.

## 5.4. Our Greatest Challenge

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If there is one message that this study gives it is that we are wasting the productive lives of many brilliant and courageous knowledge workers and losing large sums of money in the process. We need to move bravely to correct this situation. It will take courage and determination. We will have to make some radical changes.

What are the directions and actions that need to be taken and who needs to do what?

(1.) We must establish clearly in our thinking, learning and culture the essential role of the customer in commerce. This is especially true in knowledge-based commerce where the role of customers is different from their role in commodity-based commerce. In commodity-based commerce, customers look for the lowest price. In knowledge-based commerce a conversation about perceived value between supplier and customer needs to take place. Knowledge-based firms must engage customers to understand their needs and how to offer real value.

*NO CUSTOMER  
NO SALES  
NO BUSINESS*

The belief that Science and Technology coupled with sufficient Venture Capital is sufficient for success in knowledge-based commerce is leading us to repeated and assured failure. A new set of beliefs and knowing must be established for all of society starting with entrepreneurs, service providers such as financiers, accountants and lawyers, leaders such as politicians, bureaucrats, professors, instructors and teachers, and finally in the thousands of SME's and in society itself.

(2.) We must increase the understanding of the human dimensions of the value exchange that is called commerce. Commerce is an exchange of value between a supplier and a customer, both of whom are humans influenced in their decisions and choices by other humans. We need this understanding to permeate the culture of the 20,000 R&D-intensive Canadian enterprises struggling to create value for the world in the knowledge-based society.<sup>24</sup> This understanding is also essential for the 1.3 million enterprises employing 13.6 million people who largely create value internally for Canadian society. Equally important is the need for increased understanding of the human dimensions of the "value exchange" among the 3.4 million people working in the public sector, and especially an understanding that they are in a value exchange as salaried employees. Everyone being paid would benefit from understanding their customers and the value they are creating in the exchange. In the end, our global commercial competitiveness is determined by the integrated productivity or value creation of every worker in our society. This has an enormous potential for increasing Canadian prosperity.

*COMMERCE  
VALUE EXCHANGE  
HUMAN VALUES  
TRUST  
CONFIDENCE  
GOOD WILL*

The success and sustainability of commerce, the value exchange, is highly dependent on building human values such as trust, confidence and good will between the parties. These human values are essential ingredients in the value exchange. We do not trade well with crooked customers or suppliers. The building blocks of these values are such things as respect, ethical behavior, reliability, honesty, civility and the learning and practice of humility. We must establish means to deliberately cultivate the learning and the practice of these human values. We must also learn how to recover trust, confidence and good will when we have damaged them.

This human development is the greatest challenge we will have to face in moving to customer-focused commerce. The return will be very large, even for small changes.

- (3.) The disappearance of these enterprises, after large human and financial investments, was not due only to lack of commerce competence in the technical founders. The lack of commerce competence was also equally present in the supportive financial, legal and governing partners. Most of these enterprises had scientific scientists, engineering engineers, financial financiers, legal lawyers and procedural governors. Not one of them had enterprise scientists, enterprise engineers, enterprise financiers, enterprise lawyers or enterprise governors with sufficient concentration to make good enterprise decisions soon enough to succeed or to re-direct the enterprise with less investment and less pain.

### **What can be done by whom?**

To reiterate, successful commerce needs:

- (1.) Human skills of understanding, acceptance and trust.
- (2.) Broad learning and versatile thinking.
- (3.) Ease and comfort working in a human value-exchange.
- (4.) Developed skills and wisdom in subjective, experience-based learning.
- (5.) Developed skills and knowledge in objective, evidence-based learning

The roots of these learnings and skills are developed or not developed, mainly unconsciously, in life and in the education system. Some would suggest that this does occur to some level and with some deliberation in preschool, kindergarten, primary, and secondary education. At the post-secondary level, particularly in the universities, the learning of (1) to (4) is crowded out by the specialization and research focus of (5). All are needed within a system of cross-disciplinary learning where the elements of the human and subjective, experiential learning are deliberately more in balance. This shift is essential if we are to move towards higher levels of commercial success.

The Americans are demonstrably the best in the world in Knowledge-Based Commerce (KBC), though far from perfect. What do they do? One very significant difference is the requirement for teaching and research faculty in their universities to find at least one quarter of their funding and support outside the university. This moves them into commerce and into the realities of live societal value-exchanges. Students emerge from these environments not only with respect for customers and commerce but with a different level of commitment to success in the value exchange.

The fact that commerce needs human respect, trust and integrity to work makes it a continuing human challenge. We learn early that we can be hurt in behaving this way and it doesn't end. The work in commerce to keep the human relationships healthy is ongoing and requires skills that can be developed and improved continuously.

This ongoing task is everyone's responsibility. Finger-pointing here only locks us into the ongoing failure of "I'm OK you're not OK". We all have a part in what is weak and failing.

There is no room for arrogance and self-righteousness. Knowledge about the value exchange, acceptance of being in a value exchange, and skills to succeed in a value exchange are pervasive societal needs. The broad lack of value exchange knowledge, acceptance and skills in this country makes Canada, in the words of some of our interviewees, “the worst place for commerce”. It’s time for a change, and good change is possible.

## Notes

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<sup>1</sup> Industrial Research Assistance Program

<sup>2</sup> Technology Partnerships Canada, now the more narrowly focused Strategic Aerospace and Defence Initiative (SADI)

<sup>3</sup> From 1994 to 2001 the total revenue of this group of 4100 companies grew only 0.5% per year and totaled \$11B by 2001, an average of \$2.7M per firm.

<sup>4</sup> H. D. Barber and J. Crelinsten, “The Economic Contribution of Canada’s R&D Intensive Enterprises 1994-2001,” (Toronto: Research Infosource Inc., March 2004). Growth was measured in company revenue, R&D expenditure, total number of employees and total number of R&D employees.

<sup>5</sup> H. Douglas Barber and Jeffrey Crelinsten, *Can the private sector get Canada into the top five innovative economies of the world by 2010?: Views from leaders of Canada’s innovation-intensive firms* (Ottawa: ITAC/Research Infosource Inc., September 2003); “Growing R&D-intensive firms in Canada: Views of CEOs in the “Greenhouse”, (Toronto: The Impact Group, March 2005).

<sup>6</sup> For example, sales and marketing.

<sup>7</sup> We attempted to book two interviews per firm, one with a former CEO and a principal investor. We succeeded for 11 disappeared firms. Toward the end of the interview period we only had 11 disappeared firms (22 interviews). We decided to include disappeared firms for which we could only interview a former CEO, as it proved very difficult to find investors that would agree to an interview. We interviewed 6 former CEOs and one former senior executive, increasing the total number of disappeared firms to 18.

<sup>8</sup> Both the sensitivity of the topic of this research and the difficulty of actually locating both a match set of an ex-CEO and investor from a company no longer in business contributed to the extended elapsed time for this project. In many cases we could get the name of the former CEO from an investor, but could not locate the person. In several cases, the former CEO did not want to be interviewed. In many cases, investors declined interviews as well or simply did not return calls.

<sup>9</sup> In some cases we found it difficult to place companies neatly into one of these sector categories.

<sup>10</sup> We attempted to recruit angel investors through the National Angel Capital Organization. We talked to a number of angel investors who were willing to be interviewed, but the matching CEO was either not available or unwilling to talk with us.

<sup>11</sup> We are aware that during the period we were considering, angel investment in Canada was about double the venture capital investment.

<sup>12</sup> Barber and Crelinsten, “The Economic Contribution of Canada’s R&D-intensive Enterprises 1994-2001), note 4.

<sup>13</sup> Barber and Crelinsten, “Growing R&D-intensive firms in Canada: Views of CEOs in the “Greenhouse”, note 3

<sup>14</sup> We checked their status in July 2008, 3-4 years after we interviewed them.

<sup>15</sup> William H. Davidow once remarked that if a firm has 15% of a market, it should decide whether it’s on the way in or on the way out. In other words, firms targeting a small percentage of a market are not sustainable. See W. H. Davidow, *Marketing High Technology* (New York: The Free Press, 1986). Many VCs have this strategy of building a small market share and then trying to sell the company to a bigger player.

<sup>16</sup> Researchers at Harvard Business School recently studied venture-backed firms in the U.S. and found that entrepreneurs who successfully grow a company and go public have a 30% likelihood of doing it again with another company; whereas first-time entrepreneurs only have an 18% chance of doing it. Entrepreneurs who did not succeed in going public have a 20% chance of succeeding with their next company. The researchers only partly attribute the differences to skill. Another factor they consider is the perception of success that influences suppliers and customers who are more likely to commit resources to working with an entrepreneur who has done it before. P. A. Gomers, A. Kovner, J. Lerner and D. S. Scharfstein, “Performance Persistence in Entrepreneurship: Working Paper 09 028” (Harvard Business School, 2008. <http://www.hbs.edu/research/pdf/09-028.pdf>)

<sup>17</sup> “Going Global: Expanding the Footprint of Canadian Technology Firms”, the 8<sup>th</sup> annual RESEARCH MONEY conference, 12 March 2009, National Arts Centre, Ottawa, Ontario

<sup>18</sup> Comments by Paul Kedrosky, Senior Fellow, Kauffman Foundation, at the 8<sup>th</sup> annual RESEARCH MONEY conference, see Proceedings, p. 19 <http://www.researchmoneyinc.com/conferences/200903/pdf/ConferenceProceedings.pdf> The Kauffman Foundation helps overcome negative attitudes that hinder the success of entrepreneurs by showcasing the success of others just like them. Significantly, the Foundation finds that the best role models are neither too modest nor too ambitious and outline the lessons of any failures along with their successes.

<sup>19</sup> CanDiego is a similar group operating in San Diego, California.

<sup>20</sup> [www.cfel.jbs.cam.ac.uk](http://www.cfel.jbs.cam.ac.uk) Alan Barrell, Entrepreneur in Residence, explains: “You can’t teach good mentoring by lecturing. You can ‘show the way’ by working in twos.”

<sup>21</sup> Shad Valley is a good example for youth.

<sup>22</sup> Large firms can more easily accommodate this requirement; but for most SMEs it is impractical.

<sup>23</sup> The Canadian Institutes of Health Research (CIHR) have had a Proof of Concept granting program in place for several years. The current round has a total budget of \$4.75M for grants of up to \$150K for one year (unrenewable). University researchers are eligible for these grants. NSERC’s “Ideas to Innovation” program provides grants of up to \$125K for one year for equivalent research in natural sciences and engineering. Both CIHR and NSERC also provide funds for projects carried out in partnership with industry. Neither granting council provides Proof of Concept funding to companies, only to university researchers.

<sup>24</sup> The latest figures available from Statistics Canada show 19,087 R&D-performing firms in Canada in 2005. See Statistics Canada, Industrial Research and Development, 2004 to 2008, September 2008 edition

## APPENDIX: Summary Recommendations from Interviewees

### 1) Enhanced Entrepreneurial and commerce learning

Focus Areas	Specific issues/activities	Responsible parties
Promote realistic, complete role models	Risk/failure as a learning experience	Postsecondary institutions <ul style="list-style-type: none"> <li>• K-12 education</li> </ul>
	Take risks and learn from the experience	<ul style="list-style-type: none"> <li>• Entrepreneurs/VCs</li> <li>• Business enterprises</li> </ul>
	Recognition of Canadian entrepreneurs	<ul style="list-style-type: none"> <li>• All levels of government</li> <li>• Postsecondary institutions</li> <li>• K-12 education</li> <li>• Communities</li> </ul>
Enhanced enterprise-conscious contact with experienced entrepreneurs	Government SBDAs provide client firms with links to experienced entrepreneurs	<ul style="list-style-type: none"> <li>• Federal government SBDAs</li> <li>• Provincial government SBDAs</li> <li>• Regional economic development agencies</li> <li>• Business enterprises</li> </ul>
	Develop "expat" community of Canadian entrepreneurs abroad to advise, mentor CEOs in Canada	<ul style="list-style-type: none"> <li>• DFAIT</li> <li>• Federal government SBDAs</li> <li>• Provincial government SBDAs</li> <li>• Regional econ devel agencies</li> <li>• Business enterprises</li> <li>• Investment community</li> </ul>
Enhanced entrepreneurial learning in educational and public policy environments	Universities provide opportunities to train entrepreneurs how to mentor other entrepreneurs	<ul style="list-style-type: none"> <li>• Postsecondary institutions</li> </ul>
	Postsecondary institutions and communities offer entrepreneurship learning opportunities to students, entrepreneurs and aspiring entrepreneurs	<ul style="list-style-type: none"> <li>• Postsecondary institutions</li> <li>• Communities</li> </ul>
	Governments fund entrepreneurial learning	<ul style="list-style-type: none"> <li>• Federal government</li> <li>• Provincial government</li> </ul>
	Universities develop industry engagement strategies	<ul style="list-style-type: none"> <li>• Postsecondary institutions</li> <li>• Business enterprises</li> </ul>
	Governments fund universities' industry ' engagement activities	<ul style="list-style-type: none"> <li>• Federal and provincial government funding agencies</li> </ul>
Enterprise training and literacy	Postsecondary institutions provide more training on managing an enterprise, including entrepreneurship, management, marketing, sales, distribution, customer relations and enterprise-related professional services	<ul style="list-style-type: none"> <li>• Postsecondary institutions</li> </ul>
	Better education in starting a business	<ul style="list-style-type: none"> <li>• Postsecondary institutions</li> <li>• K-12 education</li> <li>• Community organizations</li> <li>• Business enterprises</li> </ul>
	Commerce literacy in K-12 education	<ul style="list-style-type: none"> <li>• K-12 education</li> <li>• Postsec education faculties</li> <li>• Business enterprises</li> </ul>

<b>2) Enterprise sources of funding</b>		
<b>Focus Areas</b>	<b>Specific issues/activities</b>	<b>Responsible parties</b>
Customers	Ultimate source of money for firms and the sooner, the better	<ul style="list-style-type: none"> <li>• Business enterprises</li> <li>• Investors</li> <li>• Business schools</li> <li>• Canadian citizens</li> </ul>
Family and friends	Important source of money for many start-ups	<ul style="list-style-type: none"> <li>• Business start-ups</li> <li>• University tech transfer offices</li> <li>• Canadian citizens (families and friends)</li> </ul>
	Frugality is key for many start-ups	<ul style="list-style-type: none"> <li>• Business start-ups</li> </ul>
Enterprise-experienced angels	Can help start-ups and early stage firms with advice, contacts, mentoring in addition to money	<ul style="list-style-type: none"> <li>• Early stage business enterprises</li> <li>• Angel investors and groups</li> <li>• Business schools</li> </ul>
Venture capital and institutional investors	Need to be more enterprise-skilled and facilitating	<ul style="list-style-type: none"> <li>• VCs and institutional investors</li> <li>• Business enterprises</li> <li>• Business schools</li> </ul>
	Need to develop a strong sense of ethics, justice and equity towards early investors and all stakeholders	<ul style="list-style-type: none"> <li>• VCs and institutional investors</li> <li>• Angel investors</li> <li>• Business enterprises</li> <li>• Business schools</li> </ul>

### **3) Government support – Direct support and tax credits**

<b>Focus Areas</b>	<b>Specific issues/activities</b>	<b>Responsible parties</b>
Tax system	Improve system to encourage investment in start up and early stage tech firms by allowing flow-through shares for tech investors	<ul style="list-style-type: none"> <li>• Federal and provincial government</li> </ul>
	Adapt French wealth tax investment option for upper tax brackets in Canada	<ul style="list-style-type: none"> <li>• Federal government</li> <li>• Canadian banks</li> <li>• Canadian angel organizations</li> </ul>
	Streamline SRED process to reduce wait times for eligible claims	<ul style="list-style-type: none"> <li>• CRA</li> </ul>
Direct support programs	Develop a "proof of concept" funds for firms Improve management of "Fund of funds" programs by recruiting experienced investors with past operational experience as entrepreneurs	<ul style="list-style-type: none"> <li>• Fed/prov granting agencies</li> <li>• Federal and provincial government</li> <li>• Angel investor networks</li> </ul>
Improve government officials' understanding of their role in the value exchange	Entrepreneurship workshop for civil servants managing and delivering industry support and economic development programs	<ul style="list-style-type: none"> <li>• Fed/prov government agencies</li> <li>• Postsecondary institutions</li> <li>• Business enterprises</li> <li>• Investment community</li> </ul>

## **H. Douglas BARBER, O.C., Ph.D., D.Sc., FCAE, P.Eng.**

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H. Douglas Barber, born on a Saskatchewan farm, attended the University of Saskatchewan obtaining his B.Sc. with Great Distinction, winning the Governor General's Gold Medal, and earning M.Sc. in Electrical Engineering. As an Athlone Fellow and NATO Scholar he received his Ph.D. from Imperial College, University of London in 1965.

Dr. Barber began employment in 1965 in a new microelectronics initiative at Canadian Westinghouse, Hamilton, Ontario, Canada. In 1973 he was one of the founders of Linear Technology Inc., now known as Gennum Corporation, which designs, manufactures and markets microcircuits. Gennum has grown profitably at 20% per year and now employs about 650 people. He was President and CEO when he retired in 2000. He retired as a Director in 2007.

A part-time Engineering Physics Professor at McMaster University from 1968 to 1994, Dr. Barber was appointed Distinguished Professor-in-Residence in 2001. He is a past Chair and continuing member of the university's Board of Governors. The recipient of numerous awards and distinctions for his engineering and entrepreneurship achievements, Dr. Barber's most recent honours include appointment as Officer of the Order of Canada and an Honorary Doctorate of Science from the University of Saskatchewan.

Dr. Barber has been involved in numerous advisory committees and corporate directorships. He was a director of DALSA Inc. from 2005 to 2008, NetAccess Systems Inc. from 1994 to 2009. He is presently a director of Micralyne, AllerGEN NCE, and the Institute of Quantum Computing, posts he has held since 1997, 2003 and 2006 respectively. In 2009, Dr. Barber has joined the boards of the Centre for Probe Development and Commercialization, the Centre for Surgical Innovation and Invention and the IRAP Advisory Board.

The author of 29 refereed papers and holder of several patents, Dr. Barber speaks frequently on business, technology, learning, innovation and economic development. He and his wife, June, have raised a family of four whose families now include ten grandchildren. He is a man of faith with over 37 years of active involvement in their church.

## **Jeffrey CRELINSTEN, Ph.D.**

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Jeffrey Crelinsten is President and co-founder of The Impact Group, a Toronto consulting firm specializing in science and technology policy, communications and education since 1987.

In 2000, Dr. Crelinsten co-founded Research Money Inc., which publishes RE\$EARCH MONEY, Canada's leading newsletter on science, technology, innovation and investment. Co-publisher of RE\$EARCH MONEY, he organizes the annual RE\$EARCH MONEY national and regional conferences that deal with important policy issues relevant to Canada's innovation and investment communities. In 2001, he co-founded Research Infosource Inc., publishers of *Canada's Top 100 Corporate Spenders* and *Canada's Top 50 Research Universities Lists*, providing business intelligence related to Canadian research and innovation. In 2009, the company launched the *Innovation Atlas of Canada*, a web-based subscription service that provides users with a comprehensive visual picture of research and innovation information in all sectors, and displays it on maps of varying levels of detail.

After obtaining his B.Sc. in physics at McGill University and his M.Sc. in astronomy at the University of Toronto, Dr. Crelinsten was Assistant Professor of Science and Human Affairs at Concordia University from 1971-1977. He left teaching to obtain his Ph.D. in history of science and science policy at the Université de Montréal.

An accomplished science writer, having written 16 television documentaries, 5 film documentaries, 14 radio documentaries, 6 teaching and learning guides for K-12 educators and students, and two books, Dr. Crelinsten is a frequent speaker on communications, innovation, policy, science for young people, and Einstein.

Dr. Crelinsten has served on a number of boards and committees. He was a director of the Canadian Science Writers Association from 1987 to 1991, serving as President for two years. A strong science literacy advocate, he was a director and Communications Committee Chair of Youth Science Foundation Canada from 1995 to 2001 and is a founding director of the Science and Technology Awareness Network. He is Vice Chair of McMaster University's Committee on the Commercialization of University Research and a member of the Information Technology Association of Canada's Talent Committee. He lives in Toronto with his wife Paula.



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