

RESEARCH MONEY

**The 12th Annual RESEARCH MONEY Conference
“Budget 2013: Checking the Pulse of Canada's Innovation Policies”**



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National Arts Centre, Ottawa**

**proceedings assembled and composed by
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Budget 2013: Checking the Pulse of Canada's Innovation Policies
The 12th Annual RESEARCH MONEY Conference
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At a Glance



Large versus small, direct versus indirect

Jeffrey Crelinsten, Publisher, RESEARCH MONEY, identified two themes that emerged from the previous year's conference, which would remain relevant in the 2013 deliberations. The first was the ongoing tension between the considerable support provided to start-up firms and the relative dearth of support for enterprises that have grown past a certain point. Although SMEs are widely celebrated as a source of employment, once they've passed the start-up stage there is precious little support for them. Without such support, Canadian SMEs rarely mature into large anchor firms, disappearing through failure or acquisition. Without domestic anchor firms, Canada's innovation ecosystem will remain fragile and vulnerable. Crelinsten noted a similar tension between policies endorsing direct or indirect support for R&D, strategies that could each claim to have particular advantages and disadvantages.

These same two themes — along with their respective tensions — figure largely in the 2013 federal budget, he noted. A tapering of support for the Scientific Research and Experimental Development (SR&ED) tax credit, coupled with a move to transform the National Research Council into a Research and Technology Organization, signals a fresh emphasis on direct support for R&D. Yet SR&ED continues to favor start-up firms over more established firms.

Building on the Jenkins report

The Hon. Gary Goodyear, Minister of State, Science & Technology and Federal Economic Development Agency for Southern Ontario, gave the opening keynote. He cited the Expert Panel Report on Federal Support for R&D (better known as the Jenkins Report, for panel chair Tom Jenkins) as a guiding document for many of the measures in the 2013 federal budget, specifically those which would help businesses improve their research capacity. Goodyear insisted that this move does not represent a favouring of applied research over pure research, but rather what he described as an acknowledgement that these activities contribute together to improving the economic and social prospects of the country. As for how those improvements are measured, he suggested that the current suite of metrics for R&D does not capture everything that is important, and he has challenged the Science and Technology Innovation Council to come up with better criteria.

Procurement and the private sector

Tom Jenkins, Executive Chairman of Open Text Corporation and chair of the panel whose report is popularly known by his name, promised a brutally honest assessment of the country's research system from a private sector perspective. He recounted that during his exploration of why some countries excel at innovation, he was told that these were also countries that have developed focused and coherent policies on defence procurement, using the considerable purchasing power of the military as a means of establishing solid markets for domestic manufacturers. He also argued that universities are hurting themselves by zealously going after every kind of government support to increase funding for basic research. He added that surveys of academic researchers reveal their work to be more satisfying when it finds some application that makes it more relevant to Canadian society. In light of the massive amount of money that the federal government will be putting into its refitting of all three branches of the armed forces — upward of \$500 billion over the next two decades — he suggested that a huge opportunity has opened up for funding basic and applied research and for firms seeking lead customers for their new products and services through military procurement.

Budget 2013 overview

David Watters, President, Global Advantage Consulting, offered an overview of the recent federal budget,

citing three trends that reveal much about where the current government's innovation policy is heading. The first was his observation that the actual amount of money dedicated to research and innovation is comparatively small; far more is being invested in infrastructure and military refurbishment, even though these areas tend not to be greeted with the same enthusiasm as money put into the granting councils. Secondly, direct support for university-based research is declining, even as new avenues are being created to invite the country's colleges to play a bigger role in research and skills development. Finally, he listed no fewer than 12 sector-based R&D strategies, targeting areas like aerospace or the automotive industry, which he interpreted as an indication that the federal government wants to target its support much more carefully.

The grass is not always greener

However challenging Canadians might think their current economic circumstances to be, the situation pales in comparison to some of the truly dire conditions on the other side of the Atlantic Ocean. Tim Bradshaw, Head of Research & Innovation at The Russell Group, UK, illustrated the effect these conditions are having on R&D in the EU. While governments there have significantly restricted many sorts of direct spending on innovation, he explained, they have also resorted to more concerted efforts to establish a new degree of collaboration between universities and industry. In the UK this process has been shepherding research into the marketplace over the course of decades, which can seem painfully slow to many politicians. Nevertheless, Bradshaw counseled patience, since this strategy turns out to be the best way of ensuring that the country can retain innovative enterprises and the talented people who drive them.

Panel #1: Implications for key industrial sectors

Moderator: Peter Frise, Scientific Director & CEO, Auto21

William Harney, Executive Director of Research & Development, Magna Exteriors & Interiors

Anthony Patterson, President and CEO, Virtual Marine Technology Inc.

Jim Stanish, CFO, Macadamian

People on the front lines of bringing innovative ideas to market have highly focused ideas about what government can do to help – and hinder – this work. Nevertheless, there is no single strategy to satisfy everyone at the same time. Panelists disagreed on the virtues of the SR&ED program, for example, some thinking them slow, cumbersome, or simply irrelevant to their needs, while others regard these tax credits as a lifesaver for up-and-coming firms. Nor is it necessary for Canada's research institutions to tout world-beating technical quality as their sole advantage to facilitate the success of the country's R&D goals; of greater value to the panel was the ability of these institutions to provide industry with talented people, and to be ready to act quickly on commercial opportunities as soon as they occur.

Panel #2: The financing landscape

Moderator: Jennifer Brooy, Vice President of Equity, Export Development Canada (EDC)

Lanis Anthony, Chief Entrepreneurial Officer, CCINC Group of Companies

Robert Finkel, President and Founder, Prism Capital

Charles Lax, Managing Partner, GrandBanks Capital, Boston

This panel offered an exceptionally candid portrait of Canada's place in the sometimes harsh world of venture capital investment. The two American participants were especially blunt in describing the limitations imposed by our smaller, scattered population, as well as logistical hurdles such as tax regulations or inadequate air transportation links. At the same time, both of these observers were enthusiastic about the prospects that do exist in this country, and the success they have enjoyed here. That success can be extended and enhanced, the panel observed, if Canadians would set aside many parochial and sometimes pretentious ideas about how private enterprise works, and the real benefits it brings.

Panel #3: Implications for innovation intermediaries

Moderator: Claudia Krywiak, VP Corporate Planning & Development, Ontario Centres of Excellence (OCE)

Pierre Galarneau, Vice-President & Chief Technology Officer, National Optics Institute (INO)

Ted Hewitt, Executive Vice President, SSHRC

Dan Patterson, President, Niagara College

Kevin Tuer, Managing Director, Canadian Digital Media Network

The latest federal budget reflected an ongoing emphasis on the notion that government's role is less about fostering innovation directly than in supporting the relationships between others who are better placed to act in commercial settings. These panelists represented organizations that are positioning themselves in just this way. The country's colleges, for example, are not only sought after by job-hungry students who are treating a university education as their second choice, but also by private firms that want direct solutions to technical problems they are facing. Whole sectors can flourish when the right forum is created for sharing talent and best practices, as the experience of the Canadian Digital Media Network illustrates. Moreover, this new innovation environment sets aside many longstanding perceptions of the boundaries imposed by various academic disciplines, as the success of the most sophisticated high tech products can depend on equally sophisticated social and cultural research into how people will use those products.

Closing panel: Priorities for Action

Moderator: Diana Royce, Managing Director & COO, AllerGen NCE Inc.

Jerome Le Corvec, President & CEO, Aonix Advanced Materials Corp

Grant McVicar, CEO, Innoventures Canada (I-CAN)

A wrap-up of the themes covered in the conference brought a wide array of comments and questions from the audience. Some were highly specific complaints, such as the observation that the definition of R&D to qualify for SR&ED tax credits is decades out of date, to the more sweeping observation that Canadians must understand the need to collaborate on a common commercialization agenda even if certain favourite undertakings are not included. There was some debate over whether government should lead the innovation charge or leave that to the private sector. In fact, the conference discussion wound up with the suggestion that there were simply too many government innovation initiatives around, and no more should be introduced until we can come up with a coherent form for our government's support of the country's research system.

Welcome and opening remarks



Jeffrey Crelinsten
Publisher, RESEARCH MONEY

Mark Henderson
Managing Editor, RESEARCH MONEY

Crelinsten established a perspective on the current conference by outlining some of the issues that were raised in last year's conference, which had considered a federal budget that followed the release of the Expert Panel Report on Federal Support for R&D (better known as the Jenkins Report, for panel chair Tom Jenkins). Among the issues raised by that report and the RESEARCH MONEY conference was that of culture, specifically how Canadian attitudes to risk and commerce affect our policies, education, and business environment.

"We were left with some critical questions," Crelinsten observed. "How can government help to shake our complacency, and inspire and nurture entrepreneurship, competition, and a desire to win in innovation? Is government support coddling non-performers, or is it allowing them to fail fast, leaving more resources to back winners? Are we backing winners or in fact backing losers?"

Another issue that was dealt with repeatedly at last year's conference was indirect and direct support for R&D, the former exemplified by the Scientific Research and Experimental Development (SR&ED) program and the latter exemplified by the National Research Council's Industrial Research Assistance Program (IRAP). "Together these two programs represent the yin and yang of government support for business innovation," said Crelinsten. "The discussion that took place last year acknowledged the value of the government's move to increase direct support, even at the expense of resources that had been dedicated to indirect support."

A related conference theme had been the balance between support for start-up enterprises and established firms on a growth track. The 2012 budget was largely aimed at helping start-ups, but conference participants endorsed the virtue of supporting established firms in order to build more large anchor companies based in Canada. As laudable as that goal might be, there was no agreement on just how the federal government could contribute to it.

Henderson sounded an optimistic note, indicating that the current federal budget did reflect a continuing shift in innovation policy toward commercialization and business-relevant research. "As a framing device, the budget offers ample opportunity to get a sense of where this government and Canada are going with research and innovation." He added that this latest budget indicates that the government has listened to the advice it has sought over the past few years, collecting recommendations that could be implemented. He cited two of the most obvious examples of such advice as the Jenkins report and the two-volume aerospace report, based on a review headed by former MP David Emerson. "New initiatives are springing from the insights that these expert panels have delivered in their respective areas."

In addition to renewing the budgets of granting agencies, and supporting the transformation of the National Research Council into a Research and Technology Organization (RTO), there was also an ongoing rebalancing of federal support for business R&D, which places greater emphasis on direct support through organizations such as IRAP, the Federal Economic Development Agency for Southern Ontario (FedDev), and Sustainable Development Technology Canada, a not-for-profit foundation dedicated to environmentally benign innovation. This rebalancing has come at the expense of indirect support mechanisms such as SR&ED, a change that Henderson acknowledged was already causing a backlash in several industry sectors.

Henderson noted that the budget promised a review of the indirect costs program for federally supported post-secondary research and the establishment of an aerospace research network, likely modeled after the successful Consortium for Research and Innovation in Aerospace in Quebec (CRIAQ).

He singled out an emphasis on skills training at Canada's colleges and polytechnical institutes as the most striking new feature of the budget. These measures enhance the College and Community Innovation Program and open NSERC's industrial undergraduate student research awards to colleges and polytechnics that offer degree-granting programs. "After advocating for a place at the innovation table, colleges are now being viewed

more as equal partners, with unique attributes that can only enhance Canada's efforts to boost productivity and create the kind of skilled personnel that Canada needs going forward.”

With respect to this year's RESEARCH MONEY conference, then, Henderson maintained that the participants should be dealing with the question of whether the budget is providing a better environment for private sector innovation to flourish, whether the new emphasis on innovation will contribute to greater productivity and global competitiveness, and whether Canada's research base is being eroded as knowledge industries are eclipsed by resource extraction.

Opening Keynote presentation



The Hon. Gary Goodyear
Minister of State, Science & Technology and
Federal Economic Development Agency for
Southern Ontario

Goodyear was introduced by Janet Walden, Acting President of NSERC, which was a Gold Partner of the conference. Walden referred to her organization's consultations with business organizations across the country, asking them about their innovation needs. "In 2009, we embarked on a process to help companies realize greater value from their investments in R&D. A key part of this includes helping students acquire the business focus skills that they're going to need to increase their impact and marketability. In three years, we have successfully increased by 60% the number of companies that are working with NSERC." The results have yielded more than 5,400 academic-industry partnerships and direct support for some 10,000 students working collaboratively with companies. She pointed to the leader guiding this strategy as Goodyear, who has held the Science and Technology portfolio since 2008. "Since his appointment he's become a tireless champion for growing Canada's science and technology agenda, a commitment we saw again reflected in budget 2013."

Goodyear began by recounting the high esteem he has heard for members of Canada's research and development community from stakeholders from around the world. For example, on occasions such as an EU meeting in Brussels, he has seen that many international participants want to know this community better, and work more closely with Canadian researchers and entrepreneurs.

"What I have seen in many of my travels is that the world wants to know, and is becoming more and more interested, in Canada's story."— Hon. Gary Goodyear, Minister of State, Science & Technology and Federal Economic Development Agency for Southern Ontario

Despite the many economic challenges that have confronted the current government, from domestic and well as international causes, Goodyear insisted that the commitment to matters of research and development has remained unwavering. "We have never missed the opportunity to fund science and technology," he said, referring to measures in the latest budget as the next step in this process. Citing statistics about job creation and economic expansion, he credited the ingenuity and determination of Canadians as the driving force. "These in fact are the unsung heroes of our economic recovery," he said. "And looking forward, Canada's ongoing success will depend on our willingness to nurture the highly skilled individuals and new ideas that will help our businesses innovate more, secure markets, and of course create more, better, and higher paying jobs."

Goodyear credited this progress to both short and long term stimulus investments, such as buildings or equipment to improve research capacity. "We understand that this is necessary. We understood it in 2006, and we've understood it all the way along and we still get it." In this context he reviewed specific aspects of the budget, such as research council funding to support collaborations between post-secondary institutions and industry. He went on to list other budget highlights, including support for cutting-edge work in genomics, efforts by the not-for-profit research body Mitacs to attract students from all over the world to Canadian universities, and support to maintain Ontario's Chalk River nuclear laboratories and research elsewhere to secure the country's supply of medical radioisotopes. All told, he concluded, since 2006 the federal government has invested more than \$9 billion into science and technology and other activities to promote the growth of innovative enterprises.

"Guided by the science and technology strategy, we are in fact redefining the way governments and business people band together, work together to move all of this knowledge out of the laboratory, onto our factory floors, providing more work for Canadians, and of course selling this stuff to the hospitals and living rooms of the world."

With respect to more objective indicators that such a strategy is having the desired effect, Goodyear noted

OECD rankings and scientific citation statistics that place Canada at or near the top of most international assessments of research output. He emphasized that such status enables us to attract and retain students as well as working scientists into the country's research community.

Above all, he argued, the critical contribution of science and technology to an increasing standard of living has inspired the government's promotion of business-led innovation. He cautioned against regarding this approach as favouring applied research over basic research. "Those in science will know that there is no distinct border between the two," he said. "They're in fact a transition, and one leads to the other, or it should."

According to Goodyear, the recommendations of the Jenkins report have driven the new emphasis on business R&D activities, as well as more sweeping changes such as the transformation of the National Research Council. He promised that the impact of this institution's transformation will become even more evident in the near future, as will other measures to help businesses gain access to the research capacity that they require.

"There are two reasons why we do research. One is of course to create knowledge and gain knowledge. But the second is to gain social and economic benefit from that knowledge." — Hon. Gary Goodyear, Minister of State, Science & Technology and Federal Economic Development Agency for Southern Ontario

He added that the innovation landscape has changed in the last several decades, from one dominated by large firms that generated most of the new ideas and new products to a much more diverse collection of smaller enterprises that carry on this work. Where before many innovators might have been capable of "going it alone", this new environment places an unprecedented emphasis on collaborations and partnerships.

"It is member-based organizations such as RESEARCH MONEY that are promoting information sharing and research connectedness, and by that I say they are helping advance our economics in this country."

Jeff Crelinsten asked a question based on Goodyear's comments on metrics at a recent meeting of the Alliance for Commercialization of Canadian Technologies. Goodyear replied that his primary concern is that "what we measure today is probably not as relevant to where we want to go as maybe it was 30 years ago. I think we can do a lot better. The easy thing to do is to say that we put this much money here and it created this many jobs. But that doesn't necessarily mean that we have improved competitiveness. And it certainly doesn't mean that it has improved productivity." He added that he has challenged the Science and Technology Innovation Council to come up with better measurements for these more elusive objectives, efforts that the OECD has credited Canada with leading.

Doug Barber later returned to the issue of metrics, singling out the notion that our significant research expenditures on health and medicine could well be assessed according to the number of productive years it adds to our lives. "It's very easy to think that if you're creating value for Canada you're either making a medical device or a molecule that does something," he said, insisting that productive longevity would make a far better measure. Goodyear agreed, and suggested that discoveries in fields such as genomics promise to make this kind of progress much clearer.

Peter Frise asked about intellectual property protection, a matter that Goodyear said was of universal concern, noting that "invention without protection is philanthropy". The real challenge will be determining what is protected, what is provided freely, and above all how to defend the distinction.

Ron Freedman asked about the role that research and innovation might be playing in discussions of free trade between Canada and the European Union. Goodyear replied that many of the points being raised echo those raised during NAFTA debates in the 1990s, many of which turned out to be very minor problems. With respect to science and technology, he suggested that the primary aim is a matter of collaboration, so that countries working together can accomplish more than they would have done independently. He offered the example of the International Space Station as a testament to this approach.

Freedman also asked about the prospect of changes to the government's science and technology policy, which prompted Goodyear to insist that changes need not be grounded in more money, but instead subtle cultural or behavioural shifts in support for these activities. "We are not the risk-taking nation that maybe we could be and should be," implying that some changes are bound to emerge from more sweeping consultations with his provincial counterparts.

A Private Sector View of Canada's Research System



Tom Jenkins
Executive Chairman, Open Text Corporation

Jenkins warned his audience that he was not going to hold back in both his critique of where research is heading in Canada. “I’m going to speak about many of the things that are unspoken in our country,” he said. “I’m going to be brutally honest amongst all of us here today about some aspects of the Canadian situation.” He based his opinion on extensive experience in reviewing how that situation has been evolving, including having a first-hand look at OECD measurements and best practices in other parts of the world that put Canada’s efforts in stark perspective. He therefore apologized in advance for taking this tack, but noted “a society should always have an honest discussion, because if it does, it’s a better society.”

He began by observing that the so-called “three pillars” of the research system — industry, government, and academia — are not so simple in Canada, which has an unusually complex assortment of shared responsibilities between its federal and the many provincial levels. The government “pillar” is actually a collection of many pillars, each with its own priorities and responsibilities. His first experience with this enormous complexity in Canada’s government “pillar” came in founding Open Text, the country’s largest software firm, which ultimately spawned Yahoo in the mid-1990s, and remains a powerful technological force that is still used by a third of all people on the Web. As for the academic “pillar”, he emphasized that the company was an exclusive creation of basic research. “Without the basic research, there would be no Open Text, there would be no billion-dollar multinational employing thousands and thousands of people.”

Jenkins recalled how enthusiastically he embraced the opportunity to discuss government support for R&D at international meetings, where he hoped to make direct comparisons that would improve the impact of systems such as the SR&ED tax credits. “We get to the chief economist at the OECD and we say ‘what other country is there that we can model from?’ They started laughing at us, and said ‘you’re Canada; you already do it the best in the world’. It was deflating a bit for us, because we wanted to find another exemplar. We as Canadians are brutally critical with each other, but the reality is that we do very well on an international level.”

He shared another primary insight that emerged from these sorts of discussions: discovering why the US and some other countries are so successful at innovation. He was told that it is because they have sorted out their approaches to defence procurement, which has gone on to become a cornerstone in their R&D strategies. While Canadians worry about assigning too large a role for military priorities in this sphere, confronting this challenge can reap huge advantages. “The reality is those nations, by whatever political or economic circumstances, have squared the circle of how you do that, how you get economic benefit and how you drive it.”

In the same way, he suggested that the poor international performance of Canada’s business sector might be overcome if the country stepped in to drive innovation by becoming a customer to this sector.

“We heard loud and clear in the innovation panel — people didn’t want handouts or subsidies, people wanted government to be their first customer. And when we went to look at some of the very successful economies, Norway and others, government was a very active participant in driving innovation.” —Tom Jenkins, Executive Chairman, Open Text Corporation

And for all the inherent research value provided by the country’s universities, Jenkins insisted they introduce a key problem. “Universities suck all the oxygen out of the room.” They are so effective at seeking out and winning every available form of government support, they distort the research system in ways that ultimately harm their own best interests within that system.

Similarly, competition matters, as Jenkins himself argued in *Policy Options* magazine in September 2011. He underscored competition as the leading factor inhibiting our productivity performance. “We will pay the piper on this and are paying the piper. This is a huge malaise for our country. We can argue about the measures of productivity, as has been done recently, but the bottom line is that it is an apples to apples measure, and you cannot ignore the decline over the last 30 years.”

He added that the implications of a lack of competitiveness could be dire for those whose livelihoods depend on research. In countries where research has not yielded commercial advantages, austerity measures have seen massive cuts to research budgets, a prospect that Canadian researchers could ultimately face if there is no clear return on this investment.

Jenkins observed that over the past three decades, Canada has moved from having 15 corporations considered to be global leaders to having 42 such enterprises. However, fewer than 10% of these corporations represent sectors with protection regimes designed to sustain them. He was referring to the six protected regimes defined by NAFTA negotiations in the 1980s: transportation, uranium, telecommunications, broadcast, financial services, and culture. “Those are six protected sectors from 30 years ago. Think about it: 30 years ago there were no cell phones, there was no Internet. Think of the profound changes that have occurred, because we have six pieces of legislation that absolutely inhibit innovation. If you’re a rational actor in the private sector, and you work within one of those six protected regimes, your aspirations are national; because the moment you go international, it’s a really rough world out there.”

“Competition matters. Competition is everything. But just like military procurement, sometimes in our society these are rather ugly things to talk about.” — Tom Jenkins, Executive Chairman, Open Text Corporation

He saw the results first hand within his own globally oriented firm, which had difficulty recruiting effective managerial talent from within Canada, since few managers had to contend with the rigours of anything but a protected domestic market.” Moreover, this kind of market provides players with additional pricing power that has enabled corporate profits to rise steadily, something that further reduces the incentive to alter the research regime in ways that would make the country more competitive. “We can only play this game for so long. It’s amazing that we’ve been able to get away with this for 30 years. Maybe we’ll get another five; we won’t get another 30.”

All this being said, however, he advocated a balanced model for innovation, one in which support for innovation from governments and universities would fairly complement pressure from forces such as competition and changing consumer tastes.

Turning from the private sector to government, he recalled a memorable insight obtained in a meeting with a procurement official at the US General Services Administration in Washington D.C., who told him that the laptop computer was created after a request from the Internal Revenue Service for portable hardware that its agents could take in the field to improve productivity. The RFP was for 5,000 machines, which would go to the company that produced the best model. “It’s an oh-so-simple story, folks, but oh-so-powerful,” he said. “What they’d do? They took a desktop, cut it up, and put it in a Samsonite briefcase, and you had the first laptop. Think of what that led to. Think of the innovations in semiconductors, the innovations in communications, the innovations in ergonomics. That led to so many things, and yet it started with procurement.”

The federal government is currently engaged in its own sweeping expenditure with the Canada First defence

strategy, a massive refit of all three branches of the country's armed forces. The amount in question is upward of half a trillion dollars, which promises to have an economic impact larger than that of the oil sands. He also noted that while these expenditures would enhance the activities of the Industrial Research Assistance Program, the Strategic Aerospace and Defence Initiative, and the Aerospace Technology Demonstration Program, the vast majority of this initiative's impact will take the form of industrial and regional benefits.

"That's why Israel, the United States, Norway etc. use procurement to drive research, and to drive innovation," he observed. "And we must learn how to do this better."

In this light, then, Jenkins recounted six key industrial capabilities identified by the six-member Defence Procurement Strategy (DPS) panel, which he chaired. These capabilities — arctic and maritime security, protecting the soldier, command and support, cyber-security, training systems, and in-service support — were proposed as the most effective areas for R&D activities supported by the DPS.

"We must connect research to solving problems, because at the end of the day that is the only place we're going to get recursive value." — Tom Jenkins, Executive Chairman, Open Text Corporation

As for prospective critics who might regard this expenditure as straying too far afield from basic scientific investigation, Jenkins recalled the findings from a survey of researchers whose work led them toward more socially and economically relevant results. They reported that they found this work to be more satisfying, which Jenkins takes to be a clear sign of where the research system should head. "We should embrace this, not fear this," he maintained. "Let us not give up core research, but let's make it relevant."

He outlined the research momentum that can emerge from this kind of collaboration, such as the Canadian Digital Media Network, one of the Centres of Excellence for Commercialization and Research (CECR). Initiated on a Stratford, Ontario satellite campus of the University of Waterloo, within three years it consisted of 6,000 participants from all walks of Canadian society. The result was a valuable clearing house for start-up firms that were aggregating around government, university, and industry, eventually yielding an influential demonstration at the 2010 G20 meeting in Toronto, where it captured the imagination of the international leaders in attendance.

"It's now been adopted by every country but one in all the multilateral meetings since. You know what this is referred to? The Canadian system. And it's all run by the Department of Foreign Affairs and International Trade (DFAIT) on servers out of Gatineau. That's what Canada can do when it puts itself on the international stage."

Nevertheless, the challenge remains of how to strike the right balance between social aspirations and economic reality. "Our competitiveness as a country and as a society will depend on our ability to make these strategic policy decisions," he concluded. "We will have to remain competitive. We cannot put our head in the sand. Our industries must compete against those international companies, we just have to think about how we motivate them."

Nobina Robinson asked Jenkins about his experience with the US Small Business Innovation Research program, and whether such a program could be implemented in Canada. He cautioned that the success of the American initiative was very much dependent on economies of scale, which might not necessarily translate into a Canadian setting.

When asked by David Watters about the reserve set aside by the Defence Procurement Strategy to prime the

pump of various R&D activities, Jenkins noted that the pool of available funds — upward of \$81 billion — is larger than the reserve maintained by the Bank of Canada. Jenkins therefore insisted that every Canadian company should find ways to take advantage of this opportunity. “We should be using this leverage, because guess what folks, you’ve already paid for it as a taxpayer.”

Economic Reset: A Strategic Outlook for Canada's Manufacturers & Exporters



Jayson Myers
President & CEO, Canadian Manufacturers &
Exporters

Myers began by noting the central importance of financial issues to any aspirations in science, technology, or any other field. “Vision without money is simply hallucination,” he suggested. That being said, while he did not deny that Canada has successfully invested a great deal of money into creating knowledge and expertise that drive the global economy, we need to do more.

“We do a really good job of creating the resources of the 21st century. Where we’re challenged, and where every business and policymakers really need to focus, is how to create value from those resources of the 21st century.” — Jayson Myers, President & CEO, Canadian Manufacturers & Exporters

He clarified this point by arguing that businesses do not assess their accomplishments based on how much they have spent on R&D, but rather on how much value they have been able to create for their customers. In this context, manufacturers and exporters find themselves faced with steep obstacles to the creation of such value, such as rapid technological change and stiff international competition. He referred to a classic microeconomic observation, namely that participants will enter a perfectly competitive marketplace until profits are reduced to zero.

“That’s the danger,” he explained. “That is what every business has to avoid. And that is the beginning of good business strategy, which needs to drive product innovation and improvement. No company today can afford to be like anybody else. If that’s the case, and you’re producing a product or a service that can be replicated very quickly, then you’d better do something else.”

For Myers, innovation makes it possible for a company to differentiate itself and provide its customers with practical solutions to their problems, which can be valued almost to the point of being unique and irreplaceable. To pin down the particulars of such success, the Canadian Manufacturers and Exporters surveyed 1,642 of its members that were growing exceptionally well. Success was not limited to any particular sector, nor even to companies that had ongoing R&D programs. More than two-thirds of firms engaged in technology transfer in order to improve their goods or services. The general emphasis was on the adoption of new technology to improve products, processes, and services. The survey also found that fewer than 5% of respondents cited access to government or post-secondary institutions as an important part of their business plan.

The focus that Myers urged, therefore, should fall on these firms that have demonstrated the ability to turn innovation into added value. He added that larger companies should come in for much of that attention, since their role in this network turns out to be crucial.

“It’s the larger companies that create spin-offs. It’s the larger companies that are the anchor for so much value creation among the smaller companies, simply because it’s the larger companies that are the customers.” — Jayson Myers, President & CEO, Canadian Manufacturers & Exporters

Myers then considered the latest federal budget, which he praised for its emphasis on manufacturing, which was set at the forefront of international competition rather than merely being relegated to a branch of more

traditional industries. He was particularly enthusiastic about direct investment programs for areas such as automotive, aerospace, or forestry, as well as activities associated with FedDev Ontario. Similarly, he anticipated that new support for IRAP and the transformation of the National Research Council will ultimately benefit many of the country's most promising small and medium-sized enterprises.

At the same time, he rejected any further pressure to "push" new technology into the marketplace. This kind of approach overlooks the vital role of customers, who often remain an afterthought until it becomes clear that their absence can be fatal to new products or ventures.

"We do a lot of investment in research and development," he says. "Then we count on start-ups to get that research out into the marketplace. And then we wonder why there's a disconnect between the quality of the research we do and the take-up." — Jayson Myers, President & CEO, Canadian Manufacturers & Exporters

On a related note, he questions the logic behind asking government to invest in activities that the private sector necessarily avoids. "This, in my mind, is a formula for funding failures," he said. "Why would we spend our taxpayers' money funding what business wouldn't fund because they don't see any return on that investment?" Instead, more money should go to those companies that have demonstrated their own support for new products and processes.

Myers listed five priorities for strategic government policy:

- maximize business opportunities, at both the domestic and international level;
- help to minimize technology risks, through support programs such as IRAP;
- minimize commercial risks, by promoting better collaboration within the research community and among businesses;
- minimize financial risks, ensuring there will be sources of funding for essential investments; and
- minimize operational risk, by maintaining a high quality regulatory system.

"Let's make sure we have an administrative process and a bureaucratic process that actually backs up what we're trying to achieve in strategy," he said, noting that these processes often fail to inspire confidence in the business community. "We have to make sure that we have clear objectives in programs. We have to make sure that those objectives are lined up with business objectives, and we do need to reevaluate what we're doing in direct funding programs as well as tax support."

He returned to the fundamental role of customers, especially for those high growth firms that are seeking to meet the needs of customers through the use of new technology and new processes.

Bert Van Den Berg of NSERC asked about the metric basis for identifying high growth companies. Myers responded that such companies identified themselves, and the most outstanding entrepreneurs will come to the fore. Offering up the example of IRAP's Industrial Technology Advisors, he suggested that these kinds of skilled, well informed intermediaries could make useful contributions to matching the most appropriate firms with the most appropriate support mechanisms.

Ron Freedman asked if government is biased against large companies, and Myers agreed that seems to be case. "We've lost sight of the need to support product development mandates, which is where the competition is in

large companies, is a different game than providing support to high-growth small businesses. We need to do more in terms of that strategic support.” Rather than simply providing these larger enterprises with the same types of incentives to do R&D, they need broader assurances that Canada is the right place for them to do product development and ultimately production.

“We can have the best programs, we can have the best objectives, and we can have some money behind it, and sometimes it’s really difficult to give that money away, because there aren’t that many companies stepping up to use this. And if they’re not ready to use this, I don’t know why we should be forcing it on them.” — Jayson Myers, President & CEO, Canadian Manufacturers & Exporters

Jeff Crelinsten asked about what could be done to support the middle tier of companies that grow large enough to find themselves cut off from many sources of support before they have a chance to establish themselves in the market. Myers cited these cases as perfect opportunities for government to step in as a prospective customer. He also noted that firms in this position often need specific expertise to see them through this stage of their growth, an area that could be targeted for funding to mentors or skills development.

Analysis of Budget 2013 from an innovation policy perspective



David Watters
President, Global Advantage Consulting

Watters began with three points to take away from a consideration of the federal budget: the amount of money set aside for research and innovation is very small, a trend away from university-based research is continuing, and there is a new emphasis on sector strategies. With regard to the last item, he identified no fewer than 12 initiatives in the budget related to technology development in the Canadian economy.

Watters divided the budget into three distinct components. One consists of an assessment of the country's overall economic performance, which is more than satisfactory when compared to other countries in the G8 and OECD. Nevertheless, projected revenue increases that had been forecast well before the budget turned out to be much lower in the final document, largely because of declining oil and gas revenues. Similarly, job creation was lower than expected, which Watters outlined in order to portray the tenuous economic circumstances that could affect support for many of the announced federal initiatives.

Secondly, with respect to the government's stated bid to balance the budget by 2015, he noted that the anticipated surplus is given as 0.8 billion. "This is smoke, this is nothing," said Watters, voicing some skepticism. "That is a very small amount of money when you're beginning to look over a three-year period. It's a very tight figure to focus on."

Finally, the budget contained measures to support jobs and growth, such as job grants supported jointly by the federal and provincial governments, in collaboration with employers. Although infrastructure programs were not touted as a highlight, Watters observed that these investments totalled no less than \$70 billion over the next decade. This amount is much more than the \$454 million for research and innovation, even if much of the funding is being sourced internally, i.e. represents no new money, but is instead diverted from previous commitments.

Watters built a hierarchy that culminates in the country's quality of life, which is in turn dependent on standard of living, which itself depends on competitiveness, which stems from productivity. According to him, productivity is sustained by inputs from labour, innovation, and capital; and innovation can be further subdivided to include inputs from R&D based on goods and services, process, organizational or marketing innovations.

Watters noted that of these various inputs to innovation, the vast majority of activity is dedicated to R&D toward goods. "We are not so good a designing programs to be able to get the other four components of innovation. Arguably, this may be one of the challenges we face in terms of improving Canadian productivity."

Watters broke down the \$454 million that the 2013 budget contained for research and innovation over the next two years. He noted that while \$37 million for the granting councils might seem like a lot in absolute terms, relative to their combined budget that amount barely enables them to keep pace with inflation. Similarly, much of the \$141 million for Atomic Energy of Canada Ltd. is narrowly targeted to the challenge of medical isotope production. He praised the \$165 million for Genome Canada as an outstanding investment, along with the \$325 million for Sustainable Development Technologies Canada. He was also enthusiastic about the \$60 million being provided for business accelerators, as well as another \$100 million dedicated to the companies that emerge from those accelerators, though he cautioned that the particular design of this initiative was still unknown. On the other hand, the \$225 million being provided to the Canada Foundation for Innovation is actually not new money, but actually the interest on money already provided to the organization.

He cited two statements made by Prime Minister Stephen Harper in 2012, both of which endorsed the value of investments in science and technology but criticized the country's lacklustre return on such investments. Watters takes such criticism to be the publicly voiced rationale for a strategy to improve that return.

Looking again in absolute terms, the budget's \$454 million investment in R&D might seem impressive, until it is compared with the \$59 billion that Canada will spend on R&D over the next two years. Placing these amounts in an even larger international context, Canada is clearly in the middle of the global pack in terms of our investment relative to GDP. Looking at the amount in altogether different terms, Watters observes that Walmart is spending \$450 million on its stores in Canada to brace itself for the competitive pressure of rival Target's arrival in this country.

In the wake of last year's budget, a number of policy initiatives have also emerged, including:

- the Emerson report on aerospace
- a report on international education
- the Defence Procurement Strategy
- the \$400 million Venture Capital Action Plan
- the Hands-Off Healthcare approach assigning responsibility for these services to the provinces
- strong trade initiatives into regions such as India and the EU
- the Foreign Direct Investment Review highlighted by the ownership of Canada's potash industry
- immigration guidelines to welcome entrepreneurs
- renewal of the Automobile Innovation Fund
- intervention on mortgage rates

Looking more closely at how funds will flow through organizations in various sectors, Watters stressed the significant amounts of money that have been dedicated to aerospace and defence measures such as the Strategic Aerospace and Defence Initiative (\$1 billion over five years), the Aerospace Technology Demonstration Program (\$110 million over four years), the new National Aerospace Research and Technology Network, and the very ambitious Defence Procurement Strategy (\$49 billion in regional benefits by 2027). More modest amounts are being dedicated to the transformation of the National Research Council, Agriculture and Agri-Food Canada, Natural Resources Canada, Environment Canada, the Canadian Space Agency, and Fisheries and Oceans. He reiterated his earlier observation that the increase to the granting councils would have no real impact, although he acknowledged the new emphasis on activities involving colleges.

Watters singled out a telling phrase from page 266 of the budget: "The Government will introduce legislation as needed to consolidate operations and eliminate redundant organizations."

"If that doesn't send a shiver down the spine of every public servant, I don't know what will," he said. "When you put a statement like that in the budget, you obviously have a plan to look at some restructuring and some reorganization."

He also described a sizeable "war chest" being assembled in the form of \$920 million over five years to the Federal Economic Development Agency for Southern Ontario, with the potential for many new prospects in terms of research and technology development.

Watters examined access to risk capital, noting that of \$1.5 billion in Canadian venture capital invested in 444 companies in 2011, almost half went into information technology, almost a quarter went into life sciences, and another 16 per cent went toward clean technology. Meanwhile another 134 firms shared \$82.4 million worth of angel investment. Given that these funds benefitted fewer than 600 firms, he compared that number with the 20,000 Canadian firms that conduct R&D, and the 40,000 Canadian firms that have moved into export markets.

"Are those firms accessing the kind of capital that they need?" he asked, challenging the assumption that a

larger pool of risk capital will have a sweeping economic impact. “You may find that you’re only helping, per year, 40 or 50 additional companies.”

In order to take stock of Canada’s Business Expenditures on Research and Development (BERD), which is only about half the rate of the United States, he put the size and structure of Canada’s private sector into a more accurate perspective. He began by noting that of some 1.1 million businesses in the country, just over 2,500 are large (with an average size of 1,550 employees). The remainder, still around 1.1 million, count as SMEs, with an average size of just six employees. Concentrating specifically on businesses performing R&D, he counted slightly more than 19,000 of them, all but some 500 of them being SMEs. “Again, these are firms with six people,” he said. “So you’ve got six people trying to run the business, worry about cash flow, hire employees, trying to do research and development. Maybe some of the challenges they’re facing, if they’re in an area that has a public benefit, needs some additional assistance.”

Watters returned to the question of whether industry sector strategies are being developed, given how often the same areas — such as forestry, aerospace, automotive, and advanced manufacturing — show up in various budgets. Meanwhile, although a great deal of attention went to the amalgamation of the Canadian International Development Agency into Foreign Affairs and International Trade, a new trade agenda has been emerging, with China supplanting the UK as our second largest export partner. As for who is exporting, of more than 36,000 businesses that do so, all but some 1,200 are SMEs; again, he observed, the challenges associated with a six-person firm trying to engage in export would seem to call out for some assistance.

By way of conclusion, Watters identified a shift away from funding to university research towards industrial sector strategies, which will be led by Technology Development and Demonstration. He also highlighted 12 specific budget measures that were designed specifically to help many different types of firms through the notorious “valley of death” between technology development and market launch. Nevertheless, he left the audience with the lingering question of whether \$454 million would be enough to address this challenge over the next two years.

Doug Barber asked if the very provocative facts Watters had just presented would in fact be discounted or even dismissed by many Canadians, who would insist that major change is not imminent and the current changes will give way to the economy’s former status quo. Watters suggested that with a deep enough understanding of how Canada’s private sector operates, it should be possible for everyone to see what is happening, and whether the budget’s allocations will be sufficient for the demands of domestic and international marketplaces.

Terry Anne Boyles, of the Association of Canadian Community Colleges, pursued the point about the trend away from university research. She noted that while the proportion of granting council funds garnered by community colleges is still only around 2.5% of the total, the real growth in such funding is coming through other streams such as IRAP. Watters concurred that new funding avenues, such as the job grants program, are ushering in new ways of thinking about R&D activities. “I’ve even suggested that we create a carve-out from that \$300 million for skills training for innovation and commercialization training,” he said, noting that this sort of novel approach would open up new prospects for combining federal and provincial efforts to promote research and innovation.

Panel #1

Implications for key industrial sectors



Moderator: Peter Frise

Scientific Director & CEO, Auto21

Anthony Patterson

President and CEO, Virtual Marine Technology Inc.

Jim Stanish

CFO, Macadamian

William Harney

Executive Director of Research & Development, Magna Exteriors & Interiors

“Nobody does research just for the sake of doing research,” Peter Frise began. “Research is always done to solve a problem, and it is important to connect our research capabilities with solving problems.”

He added that those problems, such as maintaining Canada’s standard of living in the face of international economic competition, have come up repeatedly during the conference. He then asked each of the panelists to offer their own perspective on the “Canadian problem” with respect to innovation.

Patterson emphasized that research is not the same thing as innovation, although research does make up part of innovation. “Until your research is converted into something that someone can buy and use, that you can support, they have not achieved any innovation,” he argued. His own company’s experience has been that it is an expensive proposition, and one that moves more slowly than you ever expect.

With respect to software production, Stanish suggested that the Canadian problem was a lack of coordination between business, government, and academia. Although his company has benefited from the SR&ED program, there is still a need to improve how firms make their way across the valley of death, so that priority is given to making one’s way to market, rather than perfecting one’s product beforehand. Moreover, he would like to see partnerships between private and public sector organizations that would overcome the tendency for firms to hoard capital during times of uncertainty, a move that inhibits growth and the ability to respond to changes in the market.

Harney offered the very specific point that public support for consumer research was absent, even though the majority of innovative measures originate from customers or employees responding to customer feedback. “If we can’t develop meaningful data in terms of what the market actually wants, whether it be in China, India, or the USA, we’re really at a disadvantage,” he said.

Frise reminded the audience that much of the world regards Canada as a caricature of tourist images rather than a technological player, which raises the point about whether Canadians know how to do business in a way that will overcome such stereotypes.

Stanish insisted that the skills do exist, but there is an ongoing need to engage the right people. Patterson built on this assertion, citing the stiff competition in his field of marine technology; his firm has coped with such competition by embedding itself in manufacturing clusters where it can thrive within an appropriate niche. Harney said that at Magna’s scale of output, success is characterized in terms of state-of-the-art manufacturing facilities, ongoing innovation, and identifying changes in markets as efficiently as possible. He credited that last requirement with creating a dependence on a highly skilled workforce, one that is able to operate culturally and linguistically in all parts of the world where Magna operates.

Patterson offered a specific example of innovation, which was initiated by the oil industry’s interest in learning how to launch a lifeboat from a sinking offshore platform. The situation was too complex to employ real equipment, so the industry was willing to invest in computer modelling services from Virtual Marine. The company worked closely with Memorial University, which used this private sector support to obtain more funding from the Atlantic Canada Opportunities Agency. As the work proceeded beyond a prototype to a prospective training tool, the system was transferred to the university’s Marine Institute so that students could further hone it. . In 2010, after five years of work, Virtual Marine welcomed national and international regulatory approval that allowed the company to tout the world’s first commercial lifeboat simulator.

“Since 2007, we have provided over \$1 million in grants to Memorial University,” said Patterson. “We have invested over \$1 million in ourselves, and the university has been able to assemble an addition \$8 million of research funding. This leveraging off of oil and gas injections, then leveraging into public sources and venture

sources has been the way we've moved ahead.”

Stanish acknowledged the virtue of these public support mechanisms, but insisted that they move too slowly to be of any practical assistance. Nor is it even assured that their efforts to obtain SR&ED credits will qualify for support. He credited design as a key aspect of differentiating software in ways that will enable it to compete internationally, yet public support programs like SR&ED do not necessarily recognize this kind of activity. “One of the things we'd like to see is expanding the definition of what's considered to be a qualifying expenditure,” he said.

Harney observed that Magna's size excludes it from many mechanisms of support that are targeted primarily at small and medium-size enterprises. “For us to spend money on R&D, especially when it comes to adding heads who can be involved in the research to create products, is a challenge for us,” he said. Programs that can make it possible bring in this outside talent, then, can have a significant impact.

By way of summarizing what the panel members were seeking from organizations dedicated to innovation, Frise listed *speed* of response to capture opportunities when they occur, *flexibility* to tailor activities to the need of your enterprise, *predictability* or *reliability* of support for R&D, and above all, *access to people* on a fast, flexible and reliable basis.

He then asked the panel how their firms select particular products for development. Harney reiterated the importance of customers to such choices, but he also pointed to the substantial links Magna has built with research-intensive organizations, which helps to identify the future promise in areas such as materials science. “We get huge benefit when we do interact deeply with organizations like the NRC,” he said, referring to examples such as the Magna-NRC Composites Centre of Excellence, which was established in 2009 at one of the company's R&D facilities north of Toronto.

Stanish said Macadamian is proud of having a 90% repeat customer rate, which solidifies a perception that these customers are more like partners in the company's ongoing activities. Returning to the virtues of outstanding software design, he cautioned that this quality will only offer a temporary advantage, until major players around the world hone their own design skills, at which point a new approach will be demanded.

Similarly, Patterson said his firm operates closely with the oil and gas industry, not simply to find out what it might be able to sell to its customers, but to learn more about any changes in the regulatory and technical environment facing those customers. By bringing an in-depth understanding of that environment to oil and gas producers, Virtual Marine can develop projects that will build on industry needs as well as finding support from government or academia.

Frise re-stated these observations somewhat more bluntly, recalling the euphemism “lack of receptor capacity” for a dearth of customer interest. “If somebody doesn't want to buy your stuff, you don't have a business,” he concluded. “You have a way of turning money into knowledge, which is just not the same thing.”

He then asked the panel to consider the praise lauded on the quality of Canada science and technology research capacity, and what this means to their businesses in an international context. Patterson said his fiercest competitors come from Norway and the Netherlands, both of which have developed their own extraordinary research capacity to support such competition. In contrast, Brazilian firms have approached Virtual Marine for help, which he takes as an indication of that country's still-developing R&D capabilities.

Stanish did not deny Canada's reputation in science and technology, but he said it has done Macadamian little good because they have seldom found an appropriate mechanism or opportunity for interacting with the

country's various research institutions. "What needs to happen is more of a strategic perspective," he said. "There has to be a commitment on the part of the institution, as well as the company, that they're going to be a partner with respect to a certain technology. Then, when the opportunity presents itself, you can access that."

Harney also acknowledged the high calibre of the country's assets for basic research, but suggested that the field in which Magna operates is one of basic *commercialization*. The competition features companies who have plenty of skilled talent and the full-scale industrial infrastructure they need to succeed, challenges that will not be addressed by better science.

Speaking as someone embedded in an academic setting, Frise elaborated on Harney's point, noting that universities are not industrial entities and are in no way set up to become so. "We create knowledge and we educate people," said Frise. "We're really good at that, and if it can help a company advance their business, then it's a really good thing."

Referring to the conference theme, Frise asked the panelists how they responded to the federal government's latest budget. Harney was generally pleased with some of the budget initiatives, but noted that measures like the Automobile Innovation Fund — designed to provide low-interest loans to support R&D — would not have a major impact while the cost of borrowing commercially remains low.

Stanish was pleased to see SR&ED continue, but added that he remains wary of the tightening definition for this form of support. "It will have an impact in terms of us determining where we will have the ability to do the work," he said. "In fact, what we'd like to see is perhaps a revision of the definition in order to include elements of design in order to create that element of connection with the customer."

Patterson regarded the attention to small and medium-sized businesses as a positive move, although changes to SR&ED credits were of limited interest to them because of the way in which they licence technology in the academic sector. He was more concerned with a prospective phasing-out of early-stage venture financing, which is of direct interest to his company.

Frise noted that even our most ambitious efforts might pale on the international stage, so that a reality-check is necessary before we celebrate our accomplishments. He then asked the panelists if they think Canadians and their government have a sufficient sense of urgency when it comes to facing global competition, and what they would suggest to convey that sense of urgency.

Patterson replied that he saw no sense of urgency, and given how reliant the country has become on resource commodity prices, such a sense is well warranted. He would tell people in government that the country's real priority should be innovation, not simply academic R&D. "Let's keep the momentum forward to couple the universities with the companies," he said. "You forge that relationship, make it solid; you flow the money from the companies into the universities, that will strengthen the relationships." Likewise, he added, many government departments could significantly streamline the processes that make it possible to open up foreign markets.

Stanish agreed at the lack of any sense of urgency, as evidenced by drops in the lines of support for innovation. "There has to be a groundswell from all the stakeholders — the universities and business — to lobby our politicians," he said, adding that government should be made aware of the need for greater public-private partnership in matters of research and innovation. "We need to be able to engage academic institutions to support businesses, to support technologies that are already there, in order to build on that." Moreover, he advocated educational measures that would improve science literacy, in order to address the significant need for skilled people.

Harney noted that the people he works with do in fact have a profound sense of urgency, but he agreed with the other panelists that such a sense is generally lacking in Canada. He also recommended a shift away from commodities toward models such as those adopted by South Korea. "They've focused on picking winners and empowering companies through enormous support to be experts at product based on design," he said.

Further to Harney's point, the first question from the audience addressed the question of measures that would enable government to focus on growing companies, specifically the medium sized companies that can move into export markets. Patterson suggested that long terms loans would be advantageous, but conceded that the best remedy is private capital. "Governments don't have enough money to grow all those little companies into big companies," he said. Stanish reiterated his point about emphasizing education as a way of ensuring that the right people would be available to build these firms. Harney added that it would be worth distinguishing small and medium size companies in any policy deliberation, rather than lumping them together as SMEs.

When asked about how to nurture innovation within a firm, Harney referred to a Dragon's Den approach that Magna uses to challenge new ideas and see how they hold up to critical scrutiny. A follow-up question asked about key innovation processes, which Stanish described as a response to expressed customer needs. And a related query asked the panelists how much time they spend on innovation issues, which Patterson indicated in his case comes to about half of his working day.

Another audience question asked for a perspective on how public policy can address matters that the market does not. Stanish insisted that government's priority should rest with facilitating partnerships, in his case with academic institutions. More specifically, if the funding model could be tied to the market potential of the work being done, that would be even more advantageous. And such a tie to market prospects would also avoid the pitfall stated earlier by Jayson Myers, which is that governments should not be investing in areas the private sector consciously avoids.

Harney offered some encouraging words for people working in government, suggesting that they should actually celebrate their most outstanding achievements. "There's some bureaucrats that are excellent to work with, and some that aren't so much so," he said. He also recommended a better coordination between government and business budget cycles, to avoid the ongoing "jet lag" that dogs interactions between these two spheres.

Further to Harney's point, Patterson summed up the priority as one of time, with governments unsuccessfully attempting to operate at the same rate at businesses.. "Businesses are focused on very short time steps. We have to be very agile, we have to respond. Universities are less so, and a government program can be five to 10 years long. If everyone can stay within their time steps, and the government focuses on enabling certain strategies to be implemented and making sure the funding mechanisms and policy vehicles are in place, that would help the most."

An audience question asked for specific advice to government employees on how to make their coordination more effective. According to Stanish, the approach should be no different than his firm does in visiting customers to find out how they are doing and what they need.

When asked about the role of intermediary organizations, such as granting councils or accelerators, Stanish noted that his firm does not work with them but would welcome the opportunity to do so. Patterson referred to the difficulty of finding appropriate partners within universities, where the right individuals would have neither the incentive nor the reward for engaging in this kind of work. He suggested that part of the granting council budget be set aside for these kinds of industry collaborations, in order to provide this kind of enticement to academics. Frise qualified this suggestion, noting that the responsibility for such a change did not really lie with

the granting council, but within individual university administrations more concerned with academic stature than economic contributions.

A final question from Yvon Brousseau CEO of C3E, asked the panelists how the innovation strategies of their firms might change throughout the 21st century. Stanish pointed out that being geographically close to customers has emerged as a priority, even if many parts of the operation are conducted more remotely. Harney echoed that point, indicating that much of Magna's operations would necessarily have to migrate to wherever cars are being built, which increasingly is in the developing world. Patterson took it even further, arguing that an international blending of corporate capabilities will become much more typical. This change will have implications for local employment, but it will be the only way to ensure the health of these enterprises. "That's not a failure of the Canadian innovation system, that a Canadian entrepreneur brought a company up that merged with some foreign company," said Patterson. "That's not a mistake, that's not a bad thing. In fact, we have to do that if we're going to attract the capital flow to keep growing the company."

*"I would encourage people in government to talk to companies in the various sectors that they have to support, understand what their issues are, and then you'll be amazed once you hear the pains of the various companies how you're able to respond. As we have customers, I'm hoping the philosophy of government is that we the business community are also customers. So the best way to get to know us is to come out and see us." —
Jim Stanish, CFO, Macadamian*

By way of conclusion, Frise offered an observation that complements Jayson Myers' comments: "Attracting and retaining product development mandates is critical. Canada is going to have a big struggle ahead if all we try to do is be a manufacturing nation. We have to be a product development nation, because that's where the intellectual work is done that can absorb the graduates of our very fine education system."

Crelinsten added that Brousseau's earlier question about evolving innovation strategies raised issues such as business model innovation. He offered the example of a company building a key piece of equipment used by optometrists, which they initially thought of retailing direct for \$50,000. "What optometrist could lay down \$50,000?" he said. "They changed the business model and gave it to the optometrist for free, who would charge the customer a nominal fee that the company shared. It worked, and they made a lot of money. So that's business model innovation."

Reinventing Canada



Darrell Bricker
CEO, Ipsos Public Affairs Worldwide

Bricker began by confessing to be intimidated by the audience, all of whom he regarded as being more educated and experienced in the matters he would be discussing. He added that his interpretation of those matters might be at odds with some members of the audience, a result that has become his stock and trade, as evidenced by his new book, *The Big Shift*. He recalled the inspiration after witnessing the 2011 federal election, which defied the expectations and predictions of many well established observers.

“When John Ibbitson and I wrote *The Big Shift*, it was to start a conversation, not end it,” he said. “It was to politely grab the people who comment on Canada by the lapels and give them a little bit of a shake.” The concern, he maintained, is that many of these presumably informed commentators are missing major changes affecting the Canadian economy and society.

By way of demonstrating just how many of us may be missing those changes, he offered “So you think you know Canada?”, a series of assertions about various parts of the country. He asked the audience to compare their own perceptions of which parts of the country support measures such as the decriminalization of marijuana with the results of detailed polling data (most thought it would be British Columbia, but it is in fact the Maritimes). After a number of these examples, it was clear to everyone that the caricatures we often employ to describe the country are not just superficial, but often just plain wrong.

“Immigration policy in Canada used to be about compassion. It’s now about economic necessity. And in the last 20 years it’s gone through that transition.” — Darrell Bricker, CEO, Ipsos Public Affairs Worldwide

“All of this means that making assumptions leads to stereotypes, which can also lead to bad decisions,” he said, moving to demographic information that can be no less surprising in its implications. For example, Bricker revealed that 80% of Canadians use the Internet every day for something other than work, compared with a global average of around 30%. “Canada is one of the most wired countries in the world,” he said. “They say about Europe that it has too much history and Canada has too much geography. The way that we deal with it is through technology. If you don’t have a strong on-line strategy, in just about every capacity of Canadian life today whether you’re a retailer or a government, you’re missing your entire market.” Even doctors, he noted, will admit that many of their patients arrive better educated by the Web about particular ailments than they are.

He outlined other trends in areas such as employment, trade, and government spending. He also reminded the audience that a population the size of Toronto is now emigrating to Canada every decade, and settling disproportionately in southern Ontario and the West. “That has huge implications for every aspect of our lives,” he argued. “But you wouldn’t know it, for example, looking around this room.”

He portrayed the country’s approach to newcomers as one of our greatest strengths. “One of the biggest innovations we’ve made over the last 50 years is a combination of a liberal immigration policy and multiculturalism,” he said. “We figured out a way to get people to the country and welcome them here when they come. Some of our biggest competitors in the world have not figured either one of these things out.” This approach, which was once characterized by Canada as a haven for refugees and reunifying families, has become an instrument of economic policy, although the country is currently accepting more immigrants in all categories than it has ever done.

He defined Canada’s changing relationship with the rest of the world as the essence of the big shift from which his book takes its title. “It’s the confluence of global trends, the movement of money and people,” he said. “The effects here aren’t just for Canada, but the entire world.” Our ability to draw large numbers of immigrants puts us ahead of many countries, and enables us to keep up with trends such as the rising levels of skilled labour to

be found in Asia, as opposed to Europe.

Bricker also dealt with changes in the Canadian political landscape, the consumer economy, and the educational system. He noted a growing economic optimism that flies in the face of assertions that Canada is simply a smaller version of the United States; it is clear that we have some lessons to teach the Americans about how to manage the economy, for instance. Conversely, challenges being faced by the United States are not necessarily the same as those we must face.

He took questions afterward, fielding opinions about the prospect that Justin Trudeau could revive the Liberal party sufficiently to unseat the Conservatives. Similarly, he noted that as controversial a figure as Toronto Mayor Rob Ford represented a key trend that was driving the rise of right wing politics, specifically “the suburbs beating up downtown”.

“There are only certain parts of the world that are actually producing the people who are going to be the workers of the future and only certain parts of the world that have economic power right now and actually have some incentive. This has caused massive changes in a lot of countries, but especially in Canada, as we move from being an Atlantic country to being a Pacific country.” — Darrell Bricker, CEO, Ipsos Public Affairs Worldwide

He was also asked about the implications of demographic change and immigration. “One of the biggest challenges that we have economically is to keep this progress going, and bringing in enough people to keep it going,” he said, adding that the apparent success story of China threatens to be undone by the rapid aging and declining birth rate of its own population.

He acknowledged that unexpected technological changes could transform the way we view particular skills and economic constraints, but he insisted that planning should be based on what we definitely know now. “The demand for knowledge and information will continue to rise,” he said. “The pressure on people in the workforce to be knowledgeable will be even greater. We’re going to continue to be in this competition, and increasingly a more difficult competition, for access to skilled workers from around the world, unless we start doing a better job of making our own.”

From garage to global how to build strong innovative SMEs in Canada



Jerome Le Corvec
President & CEO, Aonix Advanced Materials
Corp

Le Corvec premised his remarks with reference to a set of key points that he has gleaned from years of experience working on projects all over the world. He established some of the basic questions that surround the concept of innovation, including the nature of its inputs and outputs, the extent to which we have a culture that enables us to innovate, the distinction between innovative goals versus actions, and the best innovative practices that have been implemented around the world.

His preferred analogy for analysing this intricate subject was that of a cube, which has six sides, only three of which are visible at any one time. Depending on your level of expertise in a given subject, he said, you will be aware of just one or several of these faces. “Let’s always look at the hidden faces,” he insisted, then took the audience on a face-by-face tour of the cube.

The first face he examined was that of innovation itself. He broke this down into four further categories: science, technology, design, and problem solving. “Over the past 20 years, the key was more in technology; we were focused more on hardware, on technology,” he said. “Now we are in the area of user experience, design, and perception.” This shift is important, because it opens up the basis of design, in principle, to a much greater proportion of the seven billion of us who inhabit the world. For more and more of us, he argued, innovation has become a “real event” we experience, rather than an abstract technological claim.

Another face of the cube consists of innovators, whose characteristics were again subdivided in four: knowledge, know-how, soft skills, and creativity. Living as we do in a widely touted information society, he noted, knowledge is widely available and has a decreasing inherent value. Know-how, on the other hand, has become an increasingly prized asset. “Know-how is much more complicated to get and transfer than knowledge,” he said, adding that the purely technical aspects of innovation are increasingly being shaped by what has traditionally been viewed as secondary aspects such as soft skills and creativity dedicated to particular goals.

Le Corvec coloured this analysis with brief portraits of two innovators. The first, Percy Spencer, was a Raytheon engineer who observed that a radar magnetron melted a candy bar in his pocket. This led him to experiment with this equipment with water, then foods such as eggs. The ultimate result of his pioneering research was a practical design for a now-ubiquitous household appliance: the microwave oven.

Another innovator, Stephanie Kwolek, had wanted to be a doctor, but worked as a chemist at Dupont in order to raise the necessary funds for her education. She was struck by a failed polymer reaction, in which she found thin filaments. The result turned out to be the first batch of kevlar, a material that has found a wide number of commercial and consumer applications.

In both cases, Le Corvec explains, these innovators had no special knowledge at work for them, but they did have a great deal of know-how, along with soft skills and creativity. “They had the mind-set to think outside of the box; they had the willingness and interest to understand.” In this way, what might have been regarded as trivial failures were actually milestones. “In my company,” he explained, “it’s even more important to understand why something doesn’t work rather than why it works.”

He cited no less an observer than Albert Einstein paying homage to these qualities: “Theory is when you know everything but nothing works. Practice is when everything works but nobody knows why. We have put together theory and practice: nothing is working ... and nobody knows why!”

Le Corvec offered business innovators as another face of the cube. In this case, the four subdivisions consist of four types of businesses: start-ups, small, medium, and large, each distinguished by the number of employees and the nature of the firm’s cash flow. In Canada, he noted, 95% of companies have an average of six

employees, placing them in the category of start-up or small; alternatively, these categories might be compared with stages of human growth, from infancy to maturity, so that the nature of funding they require might be compared to the different types of food we require as we grow. In this light, it is important to see the funding provided for innovation as being essential to commercial growth, so that firms can move toward maturity; if this link is not there, the funding will not succeed in helping the firm, even if the innovation itself appears to be technically successful.

Similarly, the sources of funding also bear on the most appropriate sustenance for different types of firms. Where SR&ED tax credits might be of significant help to a more established firm, it will not be helpful to a smaller one that has a more immediate need for cash flow, as opposed to a way of managing expenses over a longer term. Such distinctions also put pressure on policymakers, who will find themselves confronting a variety of different calls for support, depending on the size and age of the firm making the application.

“It’s all about the right kind of money, in the right amount, at the right moment, with the right conditions and a continuous flow,” he said. He emphasized the overriding importance of continuity, which will prevent the company’s progress from halting or back-sliding. Similarly, continuity is reflected in how quickly a firm is willing and able to respond to particular requests from customers, which will be an indication of how well they can cope with the demands of customers. Referring to his own experience in the materials industry, he noted that as a customer he prefers dealing with supplier firms in the United States or Asia that have stock on hand and can create test moulds in a matter of a day or so. Canadian firms often take upward of two weeks to fill such orders, because they must first obtain stock. This kind of “just in time” strategy may keep a company’s bookkeepers happy by reducing overhead, Le Corvec concluded, but it is no way to keep customers happy.

He also examined the question of risk-taking, arguing that this behaviour relies on the extent to which a firm can afford to fail. He offered the celebrated example of Apple, which was on the brink of bankruptcy but bet everything on the iPod, which transformed the company’s fortunes. More recently, he added, the example of RIM may turn out to be a similarly valuable lesson in awareness of embracing the prospect of failure in order to make significant gains.

Returning to the case of Apple, he quoted Steve Jobs, who pointed out that IBM was spending far more on R&D, but it was nevertheless Apple that produced the Mac, thanks to having the right people for this goal. “It’s not all about the money, it’s about the way you spend it,” he asserted, pointing out that if we have the resources to work faster, we can also reach our goals at a far lower cost.

He then turned quickly to the subject of infrastructure, namely the physical circumstances where innovation is occurring, be it a garage, educational institution, or corporate laboratory. While much of our attention is focused on universities, he suggests that a more fundamental level of creativity can be nurtured at the secondary school level.

He also addressed the nature of what he dubbed the innovation ecosystem, which is most often regarded in terms of an extended supply chain. However, he added other facets to the concept of an ecosystem, including the nature of a global economy, the creation of silos where people and ideas can be restricted, and the ecosystem’s ultimate role as an enabler of innovation. “Is your ecosystem a supplier of innovation,” he asked, “or are you pushing innovation into your ecosystem?”

Cultural aspects of innovation — perceptions of risk, trade, security, and creativity — are no less significant than the ecosystem. The role of wealth creation is another reflection of how innovation can vary from one setting to another; this process can take forms such as targeted trade with growing markets, or seeking the best value for innovation rather than simply trying to achieve the lowest cost.

As for why these matters are crucial to Canada's future, Le Corvec cited the demographic changes that will be shaping the country's population — and economy — over the next four decades. He cast this as nothing less than a competition between countries that will succeed in raising their standard of living while others will see their standard of living slowly decline. For Canada to succeed in this way, then, he identified five needs that will have to be met. First, we must increase the average size of our enterprises, so that we have more medium-size ones capable of competing internationally. "If we expect that 95% of companies with six employees to be the world leaders, we're lying to ourselves," he said. "It's just not possible."

Secondly, he called for a better understanding of the roadblocks to innovation and higher productivity. This kind of work could begin with a review of successful ventures supported by IRAP. "There is a gold mine there," he said. "There are a lot of answers there. And then we can connect it to the macro level."

Thirdly, he insisted on properly financing innovation, so as to get away from a one-size-fits-all programs for all industrial categories. "It's not about putting in more money," he said. "It's about putting the right money in the right way, under the right conditions."

Fourth, he argued that we must help the education system strike a better balance between knowledge, know-how, soft skills, and creativity. "Innovation is a lot more chaotic than it is linear, and we need to have the right mind-set," he said.

And finally, we need to help Canadian culture embrace the values associated with innovation, such as pride in accomplishment, competitiveness, speed, and efficiency. "If we want to compete, we need to feel confident that we can win," he said, proposing that we do a better job of showcasing our successes. "We need to have entrepreneurs and successful people going to universities and talking about their experiences, about their successes and especially about their failures, because we learn a lot more from our failures."

Panel #2

The financing landscape



Robert Finkel

President and Founder, Prism Capital

Moderator: Jennifer Brooy

Vice President of Equity, Export Development Canada

Lanis Anthony

Chief Entrepreneurial Officer, CCINC Group of Companies

Charles Lax

Managing Partner, GrandBanks Capital, Boston

Anthony introduced herself as an investor who works with companies that she deems to have high potential but remain underserved, so that her investment activities include support tools and international advancements. Lax made a similar point when explaining why his Boston-based firm makes about 20% of its investments in Canada. “We really do enjoy the elements of entrepreneurial culture up here that we can get our arms around,” he said. “But also because this is where money isn’t.” While many of his colleagues at other firms shy away from this country, his own experience has been quite positive. “We’re batting 1,000. Every single company we’ve invested in in Canada, we’ve had success with.”

That being said, he was critical of the way a great deal of financing takes place in Canada. “Continuing to fund and sponsor bad VCs with bad behaviour will get bad outcomes. One of the things that the Canadian venture capital industry is really good at is funding bad companies. When companies get funded, and they continue to get funded with bad ideas or an inability to grow big and scalable businesses, that capital is being sucked away from other opportunities, great entrepreneurial opportunities that otherwise would be getting funded.”

Finkel confirmed what Lax had indicated, describing how difficult it was for him to entice prospective investors to check out offerings in Canada. When asked by the moderator whether Canada was accessible to American investors, he referred to an outstanding roster of flights that could get him to Toronto sooner than he could reach many important American destinations. “The ease is not the issue,” he said. “There’s a perception issue. It’s not misunderstood, it’s just not thought about.” As for whether the government could do anything to change that perception (or lack of perception, more specifically), Finkel marvelled at the stark contrast between highly integrated investment communities such as Silicon Valley and the utter lack of investor interest in the equally dynamic region of Waterloo

Lax agreed that Toronto was highly accessible, especially given the competitive spur that has been provided by the success of Porter Airlines. That has not been the case in Montreal, he noted, leaving Quebec nowhere near as accessible; he also dismissed Halifax and Ottawa as parochial and not worth the effort. He suggested that the government could try to overcome these air transportation shortcomings, especially since his company has a rule that they will not go anywhere that requires a connecting flight, because their time is too important. “We want to be able to do cities in one day. I can do LA in one day, I can do San Francisco in one day; I can’t do Quebec in one day.”

Lax also celebrated the repeal of Section 116 of the federal tax regulations, which had pursued the investments made by non-residents as “taxable Canadian property.” The repeal came after 10 years of lobbying the government to reconsider this impediment to foreign capital. “The tax authorities here were under the mistaken opinion that it was their money once we made the success and they should be able to tax it,” he said, noting that upward of 10 per cent of the financing wound up in the hands of lawyers responsible for shielding each venture from Canadian law. “We had to spend \$400,000 per investment to get around the Section 116 nonsense, to structure the investment so we could get our money in and get our money out. Think of how many more engineers we could hire with that.” He added that the Canadian government should widely publicize this change to the tax regime, which is still perceived by many prospective American investors as a primary reason to stay out of the country.

For her part, Anthony maintained that Canadians have much to learn from people elsewhere. “I don’t think as Canadians we’re listening to what others are in earnest giving advice about,” she said, suggesting that this stems from a simple lack of interest, which in turn originates with our lack of appreciation for entrepreneurial culture. This means we are seen — and see ourselves — as nice people living in a place packed with natural resources, but not commercially appealing. “We are not good sharers,” she complained, which accounts for why ambitious Canadian entrepreneurs are drawn to the sharing milieu of Silicon Valley. “Why? Because they can sit down with someone from Google or Facebook, or someone who wants to be Google or Facebook, and find money,

management, and mentorship that's a heck of a lot easier than we put them through the rigours here. We make it very difficult for ourselves to achieve what we want to achieve. We sneer when others have succeeded."

Anthony added that Canadian public education omits discussions of business and entrepreneurship as positive forces in our society, which leaves young people vulnerable to much of the pessimism that surrounds economic matters, rather than being inspired to take control of their careers.

When asked about the relative dearth of serial entrepreneurs in Canada, Lax explained that these individuals had more sophisticated goals than simple commercial success, namely building larger lines of business. In that light, he said, Canada presents a less attractive environment because the population base is smaller and more scattered than it is in the United States, making it more difficult to scale up a company in this country. "For us in the United States, pardon me, Canada is a 51st state," he said, describing the country only in terms of its most economically promising centres. "It's small, it's tiny, it's a fraction of the size of most of our states in the US. And if you're really going to build a scalable company, you've got to be looking at a world-wide company." If that company is going to be close to its customers, he concluded, it must come to grips with the fact that most of those customers will not be in Canada.

Finkel built on this observation, suggesting that what Canada required was less the culture of collaboration — which is widely celebrated — than an organized pattern of mentorship in the often rough-and-tumble ways of doing business globally.

On a different matter, the role and perceived responsibility of government as the prospective first customer for many goods and services, Anthony conceded that this function could be fairly compared with that of a nurturing parent. On that basis, she criticized the Canadian government for failing to engage directly with most businesses, and for choosing instead to sit on the sidelines changing the rules for those businesses in a downright passive-aggressive way that any good parent would want to avoid. She remained optimistic that many people in government are starting to grasp this idea and address it, offering the example of the Canadian Innovation Commercialization Program launched by Public Works and Government Services Canada. "Our nation needs to understand fully, from a government perspective and an investor perspective, that there's a time, a place, and a need for every piece in that concept-to-commercialization navigation path," she said, insisting that such an understanding will help firms through the notorious valley of death.

Lax maintained that government serving as first customer represents the very best way of directing financial support to early stage firms. Entrepreneurs and universities in the United States excel at shepherding themselves from government-funded R&D projects into commercial products or services based on the results of those projects. That being said, he was highly critical of the crowd-funding initiatives emerging from one of the American government's most recent forays into this sphere, namely the Jumpstart Our Business Startups (JOBS) Act. "There's going to be a rampant number of charlatans out there taking money from people who can ill afford to lose that capital," he said. He cautioned that apparent government endorsement of this behaviour could leave many burned investors highly cynical about the process; in contrast to the large amounts of money that led the justice system to move against a major swindler such as Bernie Madoff, the amounts being lost through crowd-funding will be much lower and much less likely to prompt this kind of intervention.

On the question of whether venture capitalists should look more to high growth markets in the developing world, Finkel insisted that the virtues of being close to an established customer base should trump the lure of exotic destinations. Lax agreed in principle, but did not rule out looking further afield. "There's a time and a place for an export market," he said. "The question is which export markets are approachable and which ones can we get to." Anthony agreed, arguing that the challenge was not one of finding the best place to invest, but rather of finding the best investment, wherever it might be. "We keep talking about what it's going to take to be

successful,” she says. “Know the customer and be ready to serve, wherever they are, whatever they’re doing.”

When asked how the government should spend the announced \$400 million injection of venture capital funding in Canada, Finkel responded that any input would be a good input for an industry that has been starved of capital. However, he qualified that optimism with a call for a more holistic strategy, which would offset the uninspiring investment approach that led to starvation in the first place. Lax expressed his concern that this new money would end up in the hands of people who do not know how to scale up an enterprise. As for a preferable alternative, he pointed to Israel’s Yozma Group, which serves that country as an evergreen fund for start-ups that returned as much as six times the original investment. What could make this happen in Canada is an aggressive search for new talent, and having that talent pass along its skills to people in this country. “Historically, the venture capital industry up here in Canada got what it deserved,” he said. “They’re lousy investors, they’re lousy support stewards, and they’re generating poor returns.” Anthony referred to this country’s VCs as spoiled children who have wound up throwing good money after bad, which is disappointing in light of the genuinely promising investments that could be made. “I have not yet seen a VC in this nation that announced the kind of returns that it set out, which says a lot,” she concluded.

Ron Freedman challenged a general assumption that often surrounds the growth of companies, which is the idea that enterprises grow organically from start-up to some level of maturity. Given how aggressively the VC industry works to flip companies in order to maximize return on investment, he asked the panel if it would be worth modelling the growth of companies as an ongoing process of acquisition.

Lax responded that this vision of growth reflected much of what he had seen, whereby companies acquire the funding that they need through a merger of one sort or another. Particularly in places like Europe, it makes much more sense to acquire an existing firm and its customer base so that you will be enjoying returns in a matter of months, when you would otherwise still be setting up a new enterprise with your own people. This is a typical strategy, he noted, and it has worked well in Canada, where they have acquired businesses that provide an established American customer base. Finkel related a similar success story, with the caveat that in buying an existing firm, you had to be ready to deal with all aspects of that firm’s culture.

An audience question wondered why Canadian SMEs might be of interest to American investors, when most of these enterprises consist of just a handful of people. Finkel insisted that the talent to be found in Canada is considerable, very real, and all too often undervalued relative to any comparable American asset. Above all, such circumstances make it much easier to add value to an enterprise. “It’s not really SME so much as just a growth stage,” he observed. Lax built on this idea, suggesting that such investments are intended to be scalable. “It’s not about the Canadian market,” he said, portraying that market as too small to be of interest in itself. “It’s about the opportunities around the engineering idea or the product idea. It’s about scaling that on a worldwide basis. This whole room has got to stop thinking parochially. The fact is that you’ve got natural resources here in abundance — both physical natural resources and people, from our perspective engineering talent. Because very few of my brethren are up here, I can get that talent at a discount and make the investment at a discount, then bring our expertise to help them scale on a worldwide basis and grow.”

NDP MP Laurin Liu asked about the budget cutback in the SR&ED program and the prospective appeal of a better targeted tax credit for commercialization. Anthony responded that such programs generally eat into the vital time that start-up companies need to establish themselves; a better approach is the concierge service first proposed in the Jenkins report, which would help these firms quickly identify what will be of the most help to them. “Government needs to stop looking at band-aiding the economy and the people driving the economy,” she said. “They need to work with those people, roll up their sleeves and ask them, in earnest, what is it that we can do to help?”

Finkel disagreed, describing it as a good program that does take some time to execute, but is far less challenging than working with large VCs. "I really would encourage people to understand what a gift SR&ED was," he said. "It was cash, and cash as thoughtfully put in a government program as I've ever heard of or seen."

Panel #3

Implications for innovation intermediaries



Pierre Galarneau

Vice-President & Chief Technology Officer, National Optics Institute

Moderator: Claudia Krywiak

VP Corporate Planning & Development, Ontario Centres of Excellence

Kevin Tuer

Managing Director, Canadian Digital Media Network

Dan Patterson

President, Niagara College

Ted Hewitt

Executive Vice President, SSHRC

Krywiak introduced the panel members as “innovation intermediaries”, a term she defined as an individual or organization that acts as a facilitator or catalyst for any aspect of the innovation process between two or more parties. “Innovation intermediaries can be anything from granting councils to incubators, accelerators, academic institutions, research centres, science and technology parks, and a host of other types of innovation agents,” she elaborated. She therefore initiated the comments from the panel by asking how their particular organization will be affected by the direction of the 2013 federal budget.

Hewitt began by describing how the wide array of research and training initiatives that SSHRC supports make it well aligned with the budget’s goals. “We will continue to do that,” he said. “It’s part of our mandate. It’s what our community needs. I believe it’s what Canada needs, in many respects.” He outlined an equally broad community of people who have been supported by the Council and maintain links with the council, all of whom are linked with some aspect of innovation. He took this opportunity to note the growing number of those links that are embedded in industry and business, such as the AUTO21 group. “These folks are our partners. They invest in our programs significantly.” Above all, he emphasized the support for ideas and human factors that increasingly determines the success of many innovations. “Technology is king. It’s phenomenally important in innovation, but without the human thought and behaviour, the understanding that goes with that, product success is not assured by any means.”

Galarneau explained that the National Optics Institute in Quebec City does not directly provide financial support for innovation, but rather technical skills and background knowledge. “We have been located in the valley of death since our beginning,” he said, referring to the Institute’s crucial role in translating knowledge into commercial products. The need to overcome this innovation gap is recognized internationally as the key to making innovation work, but rather than visualizing it as a relatively short step that requires a relatively short bridge, he suggested that the reality is that it really is a much more demanding process that must be supported as such. “It’s not a jump but really a long process, and hard work,” he said.

Patterson highlighted the budget’s emphasis on the role of colleges in economic development, as indicated by the emphasis on skills training and the growing access colleges are receiving from funding sources such as the granting councils and FedDev. He also cast colleges as a small player in this realm, representing no more than 2.8% of the \$2.9 billion spent on research in higher education in the Canada. He added that this figure could rise to 5% in the next few years, given the natural fit colleges have with the SMEs that are being targeted by the government. “When you talk to small and medium size enterprises, they have a great deal of comfort of interface with colleges,” he said. “Our role has evolved to a very exciting point.”

“We have to encourage application of research results and create the vehicles that will place those results in front of the broadest possible audience, who will be in a position to move forward.” — Ted Hewitt, Executive Vice President, SSHRC

Tuer indicated that the Canadian Digital Media Network is dedicated to growth within the sector it has identified. “We’re measured by job creation, company creation, wealth creation,” he said. “We connect primarily with industry, but also intermediary organizations, to help them better serve their customers.” Above all, he noted, CDMN works with the full spectrum of small, medium, and large firms, extracting best practices from across the board. Nor is it a matter of growing these firms to a certain point and then abandoning them; for example, he cited the unique challenges of enabling medium-sized enterprises to continue growing even after many of their earlier lines of support have disappeared. “It’s easy to serve in many ways the early stage companies; they’re all suffering and they all face basically the same challenges,” he said. “With medium size

organizations, you need to speak with them one-on-one and you need to understand their challenges and design a program specifically for them. That's why we don't see a lot of medium-size business programming out there."

With respect to serving the needs of firms, Patterson outlined how Niagara College approaches problems posed by industry and what the college could do for them. This could mean helping the local wine industry compare its output with international competitors, or find ways of enabling a small manufacturing plant to improve its productivity.

Hewitt added that SSHRC has been pleased with the way in which their programs have been opened up to allow for greater private sector participation. "This has taken off in ways that we hadn't anticipated," he acknowledged, referring to large partnership grants that could amount to as much as \$2.75 million over four to seven years. "We have about a third of these that work with industry partners. Of the matching money that these programs draw, which is also a surprise to us, we extended about \$70 million in the first round of funding; the matching funds that were provided to us totalled about \$70 million. About 20% of that came from industry, and there's a long list of companies." The skills that drive such programs, he explained, bring ideas into the marketplace, a matter of nurturing business acumen and building working relationships that is quite different from mastering work in a laboratory.

When asked about how this kind of collaboration affects his organization's work, Galarneau recalled the earlier distinction made by Jerome Le Corvec between knowledge and know-how. Knowledge can be a purely academic affair, but the National Optics Institute becomes involved when that knowledge needs to be transformed in more practical ways. Tuer observed that these kinds of collaborations build a vital bridge between the academic environment that educates and trains students and the business environment where they could wind up working. From the smallest start-up to the largest multinational, he said, the hunt for talent is universal. "We create that innovation ecosystem where the talent can connect with the receptor community in a meaningful way."

Krywiak recalled Tom Jenkins' remarks that without basic research, Open Text would not have existed. In light of the federal budget's clear shift away from pure research, she then asked the panel to comment on what balance should be struck between this kind of activity and more applied efforts that lead to knowledge transfer and knowledge mobilization in the marketplace. Galarneau insisted that both were equally important, and must be funded to a comparable extent or neither pure nor applied undertakings would succeed. Patterson agreed, and he maintained that there should be no misperception that applied work taking place at colleges somehow replaces pure research taking place there or anywhere else; in reality, both types of research sustain one another.

SSHRC funds both types, which Hewitt said are distinguished only as good projects, rather than particularly pure or applied. One feature that they should have in common, he noted, is accessibility to the public; by way of example, he raised the results of a study at the US patent office which illustrated that some 70% of products submitted were based on publicly accessible fundamental work done at universities. It remains unknown just how many of the people engaged in that fundamental research ever imagined their work culminating in this kind of intellectual property, but the simple truth is that without the earlier work, you do not get the later invention. "We have to think of this in a holistic way," he said. "We have to fund and support creativity."

Tuer expressed an understanding of the demand for each type of research as being on an as-needed basis, with basic work being essential to advancing some enterprises, while others count mainly on applied research to survive. He then posed a question to Hewitt about the kind of metrics that SSHRC employs to gauge its own efforts to make this distinction between basic and applied work, and whether those metrics include an assessment of commercialization efforts. Hewitt confirmed that the SSHRC approach does include such

metrics, but he cautioned that many of the projects it supports have extremely long life spans that may make it difficult to connect the initial work with its later impact. "An idea or a study that influences policy may not see the light of day for 20 or even 30 years," he said, citing the example of recent old age security reforms that have their roots in research from the 1970s and 1980s. Nevertheless, he argued: the fact that industrial partners join SSHRC in such undertakings means that there must be some value for them. "They would not be wasting their time with us otherwise." Moreover, SSHRC is building on such interest by establishing a group responsible for reporting the ultimate value of collaborative work. By way of example, he recalled a \$25,000 project that improved the design of a nozzle used in oil sands recovery equipment, which the partner firm reported has reduced its annual operating costs by about \$40-\$50 million.

Returning to Tuer's comment that the emphasis on support for start-ups may do little more than abandon them on the treacherous brink of a competitive marketplace, Krywiak asked if this was in fact true and whether there might be a way to help them at this point with follow-on financing or some other initiatives. Hewitt conceded that this situation is real, with some firms lacking the resources to do anything but sell to an interested party. That being said, he also noted that supporting firms at this stage in their development is much more challenging than helping start-ups. "It could be anything from advocacy with government to connecting them with venture networks," he said. "Things like that can result in great returns and gives them the perspective that they can grow their company here in Canada."

Speaking more specifically, Patterson described a network of 24 colleges that work with the Ontario Centres of Excellence to share the necessary expertise to companies that might be facing this kind of growth challenge. Galarneau echoed this kind of enthusiasm, indicating that his own organization was doing just that by providing the technology and know-how for its client firms to focus on the needs of their customers. "If they can put all their attention to customers, then they will raise the market and bring good solutions," he said.

Krywiak raised the notion that the growth of a digital economy, one premised on massive amounts of information and the skills necessary to employ that information, will alter our expectations for education and entrepreneurial success. Hewitt pointed out that this tremendous growth in data was being driven by the growth of social or business networks, as opposed to the collection of readings from scientific facilities. "We have an interest in that, because we work in the realm of society, social data, human thought, and behaviour," he said, adding that this interest extends to the nature of the networks that will be used to process this growing wave of information. Potential gold mines, such as databases containing the details of how the country's hospital emergency rooms are being used, often remain inaccessible for reasons that can range from the technical incompatibility of storage systems to an inability to identify the right people who could coordinate a collaboration. The greater challenge, he concluded, will be organizing ourselves and our institutions in such a way as to take advantage of such data, a challenge that we may not yet be ready to confront.

Patterson agreed, suggesting that Canada was not necessarily embracing the promise associated with Massive Open On-line Courses that are starting to become widely available elsewhere. Tuer added that this lag reflects how long it has taken many of us to realize that we have been living in a digital economy for the past decade. "All we need to do is look around the world and realize that from an adoption perspective we're way behind," he said. "Europe and even Africa are doing things that we're still looking at from a research perspective, which is unacceptable. It's not apathy; I think there's a lot of passion. There's just a lack of urgency, and a bit of complacency, in terms of the fact that we have a pretty good lifestyle here. This is not an option anymore. If we don't step up, and we don't do these sorts of things and we stop talking about it and start doing it, we're going to get left behind."

Galarneau insisted that however much we may think we are living in a digital economy now, there is even more to come. Just as land lines initially connected our homes and workplaces, mobile phones have become a new

means of connecting people directly, and soon the appliances in those homes and workplaces will be similarly linked to networks. “We will go from buildings to people to devices being connected,” he said. “There will be a lot of data available and going on-line everywhere.”

As a final question to the panel, Krywiak asked how we measure success and what that measurement means with respect to sustainability of these efforts to promote innovation. Tuer confessed that while it is possible to come up with concrete measures of success, the definition of sustainability is more difficult. “A big part of the demographic that needs our help the most are the ones that can’t afford it,” he said, noting that much of what the Canadian Digital Media Network does is aimed at finding ways of helping these small enterprises survive and thrive. “We do operate on the Robin Hood principle. We get those who can afford to pay to pay a little bit more so we can offer things to those who can’t. But those who pay a little bit extra get value out of that as well.”

Patterson concurred that outcome measures were relatively easy to assemble, but sustainability is harder to characterize. “While our funding is dependent on post-secondary programming, the whole research function is one that we have to be entrepreneurial about,” he said. And however difficult it may be to make those activities sustainable, he regarded the ongoing interest from clients of all sizes and disciplines as testimony to the fact that the need to nurture innovation will only continue to grow. Similarly, Hewitt said SSHRC could measure its own success by how many of these working partnerships it has been able to establish, and with increasing amounts of data available to examine the impact that these partnerships have had, the direction of these efforts will be shaped to yield the best results. Meanwhile, Galarneau cautioned that his own organization had found real limits to the amount of external support that could be obtained for this kind of work, referring specifically to the fact that no more than 50% of the funding can come from clients, which could ultimately compromise the sustainability of such efforts.

The first question from the audience asked Hewitt if SSHRC had made any attempt to monetize the data it was assembling. Hewitt said that prospect had been considered but not yet acted upon, because the potential value of this data has not yet been well defined. For example, could studies of traffic flow around a major city be used to enact policies that improve drive times, and would that change offer a quantifiable economic advantage? Similarly, geographic information systems that can assemble details about the lifestyle of neighbourhoods could have real value for companies interested in marketing to the local population; what price can be put on this data, however, is still in question.

Doug Barber asked if there had been any changes to the silos that in Canada have isolated privately funded work and publicly funded work, preventing them from interacting and benefitting one another. Tuer replied that his network was consciously trying to break down such silos by making it clear to participating organizations that there was much for them to gain by overcoming these barriers. “It’s a one-on-one endeavour,” he said. “Just by creating the network and connecting people doesn’t make the silos come down. It’s about creating relationships and nurturing relationships, and we’ve been able to do that with our partners to do some tangible things. But the silos are still thick, and sadly, they’re still popping up.”

Sarah Chappell, of Global Advantage Consulting, recalled David Watters’ comment that some measures, such as job growth numbers, can exaggerate the actual impact on the economy. In that context, she wanted to know how this information should be attributed in order to be most accurate. Tuer admitted that it is a struggle to clarify attribution in the databases that mount in the wake of collaborative projects. “One of the things that we’ve tried to do is reach out to those that we believe have had impact and ask them to quantify for us what they feel the impact has been,” he said. “If they raised \$5 million in financing, and one of our organizations was a part of that, what would have been the effect if you hadn’t had that input?” The difference, he noted, would reveal the network’s actual impact. And even if the evidence for this impact ends up being anecdotal, he would

sooner hear it from a network client than have the network itself express it. "I'd sooner have them sit up here and talk about what CDMN has done for them than for me to tell you all the great things that we do," he concluded. Jeff Crelinsten later noted that the National Research Council's Industrial Research Assistance Program has now imposed an obligation on its clients to provide just such feedback about the value that was created by its activities through the program. By way of making the problem even more complex, Galarneau referred to the possibility that a project could save jobs, as opposed to create them.

A final question considered the fact that this discussion amongst innovation intermediaries amounted to preaching to the converted, with the next step being a matter of getting the country to appreciate the need to get basic research into the market and how to get the market into basic research. Referring to the stated concerns of academics, who fear that a growing emphasis on applied research will compromise the resources available for pure research, the panel was asked how people attending this conference can address that fear in order to tout Canada's need for competitive commerce, products, and services.

Hewitt replied that even people in the humanities, including art, music, and history, are used to seeing their work commercialized in one respect or another, to the extent that our televisions are packed with programming that draws on these subjects. Likewise, people in the pure sciences will know that their work can also wind up in successful commercial products of one sort or another. "It will drive the system because there are those of us who will find ways to get at things, to commercialize them, if they know where it is, if they know how to get at it, and if it's available."

Innovation and research policy — university and business perspectives from the UK on what's needed in an age of austerity



Tim Bradshaw
Head of Research & Innovation, The Russell Group,
UK

As the reference to austerity in his title would indicate, Bradshaw indicated that the UK was suffering from the worst economic setback in living memory, which is being compounded by massive public debt and a major trading market that is suffering even worse indignities. Perhaps not surprisingly, government has responded by cutting back on its expenditures, including those at the department responsible for business innovation and skills, which has seen its budget cut by 25%. “And this is the department that supports growth,” he said, noting that the cuts have reduced programs such as regional development. Nor is government adopting a laissez-faire attitude toward its remaining expenditures, but instead is looking more closely than ever at those things it is continuing to fund.

Bradshaw zeroed in on research as one way to analyse what is happening. He credited the UK research tax credit with enabling business investment in research. Similarly, initiatives to support design have addressed this key aspect of innovation and commercialization. “Our big issue is the government wants to spread the money too thinly, and that is a danger,” he said, suggesting that it would be better to concentrate on those things that the country does well and matter most. In that respect, he referred to Ted Hewitt’s comments about the growing role of human qualities in making technology successful. “Behaviour, change, and social sciences are becoming increasingly important in what industry’s been asking for, and what they’re engaged with universities for,” he said. “It’s about user experience around technology and new services and products — it’s not just technology that makes the difference.”

He noted that universities naturally lobby for a well supported post-secondary education sector, which can be regarded as a resource that industry demands from any place it wishes to do business. “We are not standing there in the UK as an isolated island,” he said. “We’re competing against the best in the world, and if our system isn’t up to scratch, then the best academics, the best companies will go elsewhere. We have to see investment in the higher education system as an investment, not a cost, and that is a really hard message to get across to government. They see money going out, and what return are they getting?”

By way of response, impact studies try to quantify that return. But Bradshaw also counselled patience, a need evidenced by studies showing that it can take upward of 17 years to see a basic research idea through to commercial success, and much longer in areas such as defence, electronics, and aerospace. The corollary observation is that you can readily cut basic research without seeing much immediate effect on commercial development; only over the longer term will the more devastating impact become obvious, as you run out of ideas for the next generation.

Universities also want autonomy, Bradshaw observed. This makes sense, he adds, since they will be well placed to determine where their resources are best invested.

Infrastructure and research facilities is another area where ongoing investment is essential, he explained. A 2011 innovation survey in the UK showed that about 30% of business spending was on the acquisition of capital. Nevertheless, the country scores very poorly with respect to tax recognition of such investments. When Oxford University studied 33 different tax regimes around the world, comparing features such as corporate taxation and capital gains taxes, the UK scored 31st with respect to the quality of the capital allowance system. Canada, by comparison, scored 19th.

That being said, some individual programs are outstanding. One of these programs targeted the funds sitting idle in corporate coffers, enticing companies to invest it in infrastructure funding at universities. Because universities are required to match government input two-to-one with business input, they usually turn to more than one business partner, which makes each of them feel as if they are getting more bang for their buck. The partnerships run a gamut, with Jaguar-Land Rover supporting a centre of automotive excellence, Rolls Royce investing in a metallurgy group, and Unilever participating in materials chemistry.

Bradshaw outlined a steady decline in the investment government is making in the country's universities. In 2009, capital grants from government made up 49% of the money that went into university infrastructure, with just 12% being funded by the universities themselves. By 2014-15, it will be only 12% of this funding that comes from government, and universities will be putting in 74% of their own money. "What we'd really like is a return to formula-based funding," he said. "That's our autonomy issue. Give the money to universities and let them decide how best to use it to invest in their future." Nor is this a trivial matter, as much of what the universities need to spend money on is rather straightforward campus maintenance and renewal work, while government representatives would rather announce that their support has been put into something new and exciting.

Harkening back to Tom Jenkins' remarks about the virtues of government procurement with respect to innovation, Bradshaw cited his own experience with the Confederation of British Industry, where the highest priority of most members would be obtaining a contract for goods and services. With that in mind, the UK government has ramped up the proportion of its procurement that will be done in concert with the department dedicated to business innovation. Moreover, the country also has a Technology Strategy Board, which Bradshaw compared with the intended form of the National Research Council's transformation. "Businesses like it very much," he said, referring to its tag line of "concept to commercialization". It focuses on technology readiness levels, getting prospective products closer to market; its budget has increased to almost £400 million annually; and it obtains detailed metrics on its R&D investments, so that it can demonstrate how it generated some £9 for every £1 invested in small companies.

As successful as it has been, he would like to see more. "My worry is that if they don't link up with universities, we'll end up just subsidizing what is more derivative or incremental innovation," he said. "What I'd like them to do is be able to tap into that knowledge and research base and bring through some of the basic research that might take 17 years to get to the market, but if we put it through this system we might get it to market in 15 years or 13 years and get that advantage."

Another major issue in the UK is proof of concept funding. In 2010, some 3,000 firms were spun out of research at UK universities. In this context, he identified a "third stream" of support, a program funded with about £160 million a year, which promotes business-university collaborations. "It helps to embed that culture of engaging with industry," he observed, crediting this approach with a doubling of the total investments made in universities since 2001, an amount that is now around £3.3 billion, from businesses, government research organizations, and charities.

"You've got to make some hard decisions around funding what you're good at, rather than trying to do everything." — Tim Bradshaw, Head of Research & Innovation, The Russell Group, UK

In conclusion, Bradshaw argued that businesses need the skills in research and innovation that are to be found on the country's university campuses. Among other challenges, this is where the companies are looking to resolve a shortage of engineers, as well as building up the ability of those companies to take in more graduates, through apprenticeship programs and efforts to make curricula more business-relevant. In graduate schools, even up to the post-doctoral level, business relevance is now being nurtured. Businesses are also seeking more prospective managerial talent, with UK universities regularly comparing their progress with the high professional standards set by the German Mittelstand system.

"The biggest challenge of course for universities is that there's not enough money in the system," he said, pointing out that the UK invests some US\$16,000 per student, while Canada invests US\$21,000.

Bradshaw agreed with the conference speakers who referred to the innovation ecosystem. “It is an ecosystem,” he said. “It is very complex. It needs nurturing and stroking gently, not pulling up at the roots every few years.” He also reiterated the theme of international competitiveness as a means of determining what areas you will support. Similarly, he called for a critical mass of support, emphasizing the quality of funding to key areas rather than spreading funding as widely as possible. Finally, he revisited his call for patience, and the need to educate people in government about how long it takes to translate basic research into commercial products. “We’re very similar countries in that approach, we have ministers who want to have immediate returns, but it takes time.”

Crelinsten asked Bradshaw if his transition from industry to university was because of a changing perspective in the academic sector on how to interact with businesses. “When they hired me, they talked about how to build up their innovation activities,” Bradshaw recalled. “It wasn’t about how to get more money into the system, but how to build a collaboration with industry.” And he saw the motivation for this new attitude coming from academics themselves, who want to see their work commercialized.

Doug Barber asked how a priority of autonomy for universities can be reconciled with the need to frame a unified national policy. Bradshaw insisted that universities and industry understand their respective customer base better than the government could ever do. “The government has to trust that, and should then monitor what happens and try to shape that future direction,” he replied. “You’ll see if they do because the growth figures will go up. You see if they do because we’ll get more research money being brought into the UK from other countries. You see if they do because our rankings will go up on various scales.”

Moreover, some directed programs can take universities or industry into areas that government would like to make a strength, such as a particular branch of technology. “If you direct a few things, you can move the whole ship in the right direction,” he said. “The challenge is when the government tries to direct the entire ship. It’s going to get it wrong. It’s never been good at picking winners. No government has been.”

Closing panel Priorities for Action



Grant McVicar

CEO, Innoventures Canada

Moderator: Diana Royce

Managing Director & COO, AllerGen NCE Inc.

Jerome Le Corvec

President & CEO, Aonix Advanced Materials Corp

Royce asked the audience to cast this assessment in terms of four questions: what should we keep doing that is helping us, and is working; what should we stop doing that we are currently doing and is not helping us; what do we need to start doing that we are not currently doing, in order to achieve our goals; and what is the single most transformative thing that needs to be done in your sector, or across sectors, in order to move the markers and have Canada move up in the rankings.

She then began by asking Le Corvec and McVicar if they heard anything at the conference that surprised them. McVicar said that he had come to the conference expecting to hear more negative responses to the changes in the SR&ED program, which did not happen. He was also struck by the suggestion of using Canadian military procurement as an economic stimulus strategy, especially in light of the observation that the government has actually set aside more money than contractors will be able to claim. Finally, he marvelled at how often “collaboration” and “silos” were each brought up in discussions, something that revealed to him tensions that fuel the Canadian challenge for innovation.

Le Corvec remarked on how eagerly Canadians plan to implement strategies that work abroad, such as the emphasis on military procurement. We have been slow to learn from these examples, he insisted, because we have been unwilling to play by the rules of international competition.

Crelinsten said he was struck by the slide in Tom Jenkins’ presentation that purported to show the traditional three pillars of Canada’s research system, which supplemented the Canadian flag with the nest of provincial flags, demonstrating just how complex most government initiatives become. An audience member also referred to Jenkins’ identification of Key Industrial Capabilities, which moved from the idea of innovation for innovation’s sake to a discussion of what the outcome of innovation should be, which can rally all participants around those concrete outcomes.

Other members of the audience commented on how large they found the health care procurement could be, how large they found the medium-sized portion of the business community in relation to the public resources that are being dedicated to this segment, the striking disparity of information that is available amongst various Canadian business sectors, and the heartening comments about the value of design.

Peter Frise recalled the blunt talk from the American investors, which served as a reminder that urging governments to invest in ventures that the business community has already rejected is a recipe for failure. He suggested that such observations serve as a pointed reminder that Canadians need to have a grown-up conversation amongst themselves about how big or how small we are in the global context, and what real impact we have made or can expect to make. “We need to be more aware of what’s going on abroad, or we’re not going to make any progress,” he said. “We’ll just run through a whole bunch of money for no purpose.”

For her part, Royce admitted she was struck by the American investor’s observation that without direct flights to Quebec, he would do no business in that province. “There are some things outside of our policy conversation that are completely out of our control, and we probably aren’t even aware of them,” she said. Crelinsten added to that list the harsh realities of Canada’s impending demographic trends and our need to sustain innovation with immigration, as observed by Le Corvec in his presentation — another topic that is unlikely to come up at formal discussions about innovation policy. Further to the immigrant issue, an audience member mentioned a program that would fast-track immigrant entrepreneurs who have secured funding from investors, which might cause some friction amongst Canadians and might not even promote innovation in Canada. Le Corvec endorsed this kind of program as a recognition of how to motivate people to overcome the many minor but annoying logistical obstacles that can get in the way of talented people moving to this country.

Another audience member remarked on Tim Bradshaw’s observation that despite monumental economic

challenges, the rate of R&D in the UK had not gone down. In contrast, the uptake in the SR&ED program has declined, although we do not know if that is because there is less R&D taking place or companies are finding it too difficult to qualify for the credits. Another comment touched on Bradshaw's observation that funding should not be spread too thinly, but that universities should be granted autonomy in the spending of that funding.

Bert Van Den Berg of NSERC pointed out that much of our innovation strategy is premised on our current lines of trade, which is with countries and cultures that have a great deal in common with Canada. In the coming decades, however, the world will welcome upward of 1.7 billion new consumers, most of them in places that have very little in common with Canada. "I'm not sure I'm hearing in the discourse that we're really understanding all of the challenges that it takes to change our innovation model to be one from selling to people like us nearby to selling to people that are across the world that are from a different cultural context and a different developmental state," he said.

McVicar responded that this comment reminds us of the enduring advice to know one's customer. "There is the issue of selling into a culture that we don't necessarily understand," he said. "But the rules in some ways are still the same. If we don't meet their needs, if we don't understand their needs, we're not going to sell to them. And the worst thing we usually do is project our needs on them." By way of example, he referred to an American ultrasound machine maker that had failed to make inroads in China because its product price was too high; the Chinese then developed their own machine for a much lower price, one that was initially of inferior quality but has been steadily improved until it is now competitive.

Doug Barber extended this point, noting that our educational system omits any formal teaching of human behaviour. He regarded that as a flaw that inhibits our ability to engage in commercial activities. "Commerce is a value exchange," he said. "It's a value exchange that goes on between people. There are human values that have to get exchanged, before you can get to exchanging a product that uses technology." He added that this process amounts to building up a level of trust sufficient for individuals to commit their time, money, or other resources.

Le Corvec agreed with Barber's argument, which overrides the possibility that good ideas are all we need to succeed in business. We cannot ignore our own history, or that of other nations, Le Corvec insisted, assigning much of China's current success to a tradition of commerce and trade that goes back for thousands of years; he portrayed Canada, in contrast, as a place people settled as a safe haven, not as a hub of enterprise. "At the scientific and technological level, we're doing a really good job," he said. "But we are not good sellers. We don't know how to do commerce with others."

McVicar outlined a fundamental aspect of any commercial strategy as that of solving a customer's problem, but that strategy fails if a business does not take responsibility for providing that solution, and instead directs a potential client to someplace else, such as a university research lab. Le Corvec added that such a response reinforces the silos in which people contain their efforts.

Tim Bradshaw extended this line of thought to the significant activity of procurement, where it is entirely acceptable to select the cheapest option even if it is not the most appropriate for the task at hand. What he is looking for is a way to change this attitude so that procurement instead makes innovation its leading priority.

Peter Frise returned to a similar observation, namely that we should not stop setting outstanding standards for our work in science and technology, but we must make that work relevant, and make it relevant in a timely fashion. "All the quality in the world isn't going to do us any good if we can't get it in time to be relevant," he concluded.

With regard to the power of basic research, Le Corvec observed that this work used to be done in research centres of one sort or another; today, small and medium size firms conduct a great deal of such research.

A representative of the National Research Council's Industrial Research Assistance Program noted that this decades-old government initiative came up in practically every talk given at the conference. He suggested this was because the program has been successful in adapting to the changing needs of its clientele, often venturing into areas that were entirely new but highly relevant. "It demonstrates that there isn't one way to do this," he said. "There's a number of different ways you can work with companies, there's a number of ways you can encourage innovation, there's a number of different needs out there."

By way of example, Barber noted that there is a post-graduate innovation and entrepreneurship program at McMaster University, which can only be entered by students who are in the process of attempting to start an enterprise. Kevin Tuer added that essentially all of the incubators and accelerators that are part of the Canadian Digital Media Network have mentoring programs, with paid in-house mentors. As laudable as this may be, he suggested that informal mentoring may be even better. "It's the peer-to-peer mentorship, an early stage company that's struggled with an issue that can mentor one of their colleagues in another company, which we don't see happen but it's probably some of the best information that they can get," he said. "That peer learning shouldn't be underestimated, but it does get seeded by formal mentoring programs."

Royce asked McVicar to initiate the commentary on things that Canada is not doing that we should start doing. He replied that our venture capital culture needs help, specifically in the form of more experienced people from elsewhere who can show us what to do. At the same time, we need to grasp the idea that innovation must lead to commercialization, otherwise it has no purpose. "If you don't commercialize your new widget, new concept, new process, new way of doing things, it's simply a bright idea," he said. In other words, commercialization is not merely nice to have, but an essential part of all research, including the most basic research.

Le Corvec responded that Canada must tackle the task of implementation, of acting on these same bright ideas that have already been put forward. "Implementing is tough, and first we need to have the talent," he said. "I'm not sure if we have the talent we need to implement it. There is a lot of capacity building to do." For example, business schools should be showcasing successful and unsuccessful entrepreneurs, both of whom can offer valuable insights on how implementation works. He also endorsed the value of alliances, which means not just collaboration but bringing together organizations in ways that enable the whole to be much more than a sum of the parts.

Tuer asked if it qualifies as success or failure when a Canadian firm grows large enough to be acquired or otherwise move outside the country. "I would say anything is a success," Le Corvec replied. "Just the increase of experience is a success." He added that this interpretation goes well beyond the limited scope of our metric methods. Even outright failures can nurture talent and lay the groundwork for future successes, something he has encountered in his own experience.

Taking a new direction, Claudia Krywiak argued that something to start doing is aligning federal and provincial programs, so that government activities can be regarded in a holistic way. This will make life easier for everyone who interacts with any level of government, noting that the proposed concierge approach is just the first step in this direction. Karine Morin, of Genome Canada, echoed that view, detailing how her networks activities to assess the ethical, environmental, economic, legal, and social aspects of genomics calls for dealing with a dizzying array of provincial and federal support. A representative of the Atlantic Canada Opportunities Agency later returned to this point, suggesting that the critical mass of the population represented by his organization might be comparatively small, and the political boundaries sometimes challenging, but measures that unite participants can nevertheless yield outstanding results.

Royce then asked Le Corvec and McVicar to initiate the discussion of things that Canada should stop doing, as well as what might be our most transformational new undertaking. McVicar began by insisting that we must come to terms with the fact that we cannot do everything, that our favourite projects will not find the support they need, and move on.

“Much as we say we don’t like to pick winners and losers, occasionally we have to graciously lose and figure out how to work with the winners,” he said. “It would mean leaving my pet project alone and working on someone else’s pet project, because that’s what they need. If we all learn to do that, that would make a huge difference in moving forward the commercialization agenda.”

— *Grant McVicar, CEO, Innoventures Canada*

In a similar vein, Le Corvec argued that we must not see innovation programs as a one-size-fits-all affair, but tailored to specific conditions. By way of response, Knowledge Transfer specialist Kay James suggested that the qualifying terms of SR&ED credits should be revisited. “Most countries are using the current OECD definition of R&D, which is worded as ‘using existing knowledge to produce advanced new products’,” she said. “That’s something that would not qualify under SR&ED. The definition we use is the 50-year-old definition from the original version of the OECD.”

Ron Freedman endorsed James’ remark, adding his own radical proposal in the form of a moratorium on new innovation programs. He recounted a proliferation of innovations programs in various parts of the country, most of which addressed gaps and shortcoming in other innovation programs. “That’s the definition of declining marginal returns,” he said.

Le Corvec agreed with Freedman’s proposal, as well as tackling the terms of SR&ED. He offered his own radical proposal in the form of shutting down SR&ED and placing this money in the hands of investors who must put it into technology firms. He explained that this would replace indirect government support with hands-on direction from business people, who will take on more risk.

McVicar concluded with an observation about the challenges surrounding metrics, which are often overshadowed by anecdotal evidence of return on investment reported by experienced and credible investors. Presenting this kind of evidence in a formal way can be done, and it can play a useful role in decision-making, so long as the way in which it is gathered is clear. “It’s an interesting metric, just in terms of impact,” he said. “Do we believe our clients all the time? Nope. We actually have a tendency to discount it. But even after doing that, and cutting those figures severely, they’re to consistently able to report a very interesting figure back to governments. So let’s get our metrics right. Let’s use all this incredible data that is out there to understand what our clients need, then use that information again to report the metrics back to our clients.”

Ron Freedman then wrapped up the conference by harkening back to Tim Bradshaw’s comments about the perilous times in which we live. “It’s a period in which we’re really questioning the tenets of our society, and the very tenets of our economy,” he said. Taking a broader historical perspective, he reviewed the evolution of the Canadian innovation system over the past four decades. The 1960s were characterized by the introduction of the SR&ED program, followed by the creation of granting councils in the 1970s; by the 1980s, centres of excellence were being formed, followed by entirely new structures in the 1990s, including the Canada

Foundation for Innovation, the Canada Research Chairs Program, Sustainable Development Technology Canada, and Genome Canada.

Unfortunately, no further innovative paradigms have emerged since the turn of the century. “Here we are in 2013 and we still haven’t found a new paradigm,” he complained. “What we’ve really been doing for the last 15 years or so is more of the same. We need a new paradigm for research and innovation, because we’ve maxed out the one we have now.”