

Open Innovation in Canada

Reinventing Collaboration

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We would also like to extend our gratitude to the individuals who generously contributed to this report's development, including those who completed our survey and interviews with us. We are particularly grateful to René Boudreau and David Eaves, who not only provided comments on this report but also presented at our public dialogue session in Vancouver.

EXECUTIVE SUMMARY

Innovation is at the heart of the Canadian identity. From insulin to sonar to the BlackBerry, Canadians are a people of new discovery and invention. Yet Canada today faces many challenges when it comes to innovation; we must act to remove barriers here at home and restore a declining international reputation. The new federal government has taken promising steps by creating a Ministry of Innovation, Science and Economic Development, with its mandate to “help Canadian businesses grow, innovate and export so that they can create good quality jobs and wealth for Canadians.” The time is ripe for specific actions by government that will facilitate the scientific and industrial innovation that is crucial to a growing economy.

The way to ensure sustainable innovation in this country must include a collaborative, open innovation strategy. Collaboration with external partners has become an essential element in the innovation process. Yet, according to OECD data, Canada finds itself falling behind almost all industrialized countries in this regard.

Open innovation is a collaborative strategy which allows the transfer of knowledge and expertise, both intra- and intersectorally, between different companies and organizations. This report outlines concrete actions that the federal, provincial and territorial governments should take to facilitate this transfer.

The following measures can be implemented immediately by the federal government:

- Elaborate a pan-Canadian open innovation strategy in partnership with provincial and territorial governments as part of the Innovation Agenda.
- Create an 'open innovation' training program for the Industrial Research Assistance Program's (IRAP) Industry Technical Advisors so that they may provide advice and support to businesses that wish to innovate using open innovation.

To build on these measures in the next few years, the federal, provincial and territorial governments should:

- Review the intellectual property regime to better integrate open innovation and strengthen Canadian patents.
- Create mechanisms for inter-provincial sharing of best practices in open innovation policy.
- Provide funding for open innovation conferences organised by the private sector.

Federal and provincial governments must act boldly to create the right environment for open innovation to occur. This requires eliminating misconceptions about open innovation through information; providing the right support system, in the form of advice and money, so that partnerships may be established; and ensuring that the intellectual property regime facilitates and protects collaboration.

Research shows that the culture of an enterprise is by far the most important determinant of entrepreneurial success. By employing an effective open innovation strategy, our government will equip themselves with the necessary tools to facilitate change in the culture of Canadian companies to bridge the innovation gap and be an inspiration once again to the other nations of the world.

INTRODUCTION

"It's impossible for any organisation to have all the best ideas."

General Electric, Open Innovation Manifesto

Immediately after coming to office, Canada's new government identified innovation as a priority by appointing a Minister of Innovation, Science and Economic Development. Although our country has been the birthplace of great invention, our ability to innovate is currently in decline; this minister's mission is thus to reinvigorate this process in our country.

Recent surveys have shown that collaboration with external partners has become an essential element in the innovation process¹. The majority of Canadian companies, however, especially smaller ones, have not adopted this approach. Indeed, among industrialized countries, Canada lags behind in terms of collaboration between companies². According to the Conference Board of Canada, we are being outperformed in innovation compared to many other countries, which is one reason why the organisation gave Canada a grade of "C" on its innovation report card³.

Canada needs a different, more open model of innovation. Such an approach would foster collaboration between partners, since the principle behind it recognizes that a single organisation cannot have all the resources and ideas necessary to innovate to its full potential.

Open innovation can bring together organisations of all sizes within vastly different sectors to collaborate in areas of shared interest, and benefit from their diverse experiences. The reason why a number of major multinational

companies are attempting this new strategy is because traditional research and development has not allowed them to stay competitive. Beyond the few multinationals currently practicing open innovation, it is also being looked upon enthusiastically within the private sector as a whole. Strengthening the case is a recent report on the importance of open innovation by the Young Entrepreneurs' Alliance, a forum attached to the G20. The report was submitted to G20 governments at a recent summit in Turkey⁴.

Throughout our research, open innovation experts and professionals have consistently identified government as a key player in the national adoption of this approach, given the strong innovation focus of existing national bodies such as the Industrial Research Assistance Program, the Networks of Centres of Excellence of Canada and the Canadian Intellectual Property Office.

In this report, we will explain why collaboration is essential to innovation, identify the major barriers that exist within Canada and make recommendations for government action to encourage open innovation.

OPEN INNOVATION:

DEFINITION AND EXAMPLES

The concept of open innovation was introduced in 2003 by American Henry Chesbrough to help companies manage their innovation process. Although several interpretations and definitions have appeared since, they are mostly rooted on the same basic principles. . Chesbrough's own definition (2003)⁵ is as follows:

"Open Innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology. Open Innovation combines internal and external ideas into architectures and systems whose requirements are defined by a business model."

Henry Chesbrough, Open Innovation:
The New Imperative (2003)

A company that adopts open innovation recognises that it is not possible for a single company to have all the best ideas, and therefore can free up resources formerly directed at attempting to innovate in isolation. Such a company will instead establish partnerships that will enable it to develop new ideas faster and at a lower cost. Additionally, with open innovation companies also make available their under-utilised ideas to others so that they can be developed. Rather than holding on to a patent that is not being used, companies seek to sell it or give it away. Some companies even make public valuable patents so that they may be exploited by others, and the entire sector can advance.

The concept of open innovation in its current form is quite recent, but in practice, successful corporations have long used numerous business practices that are actually early prototypes of open innovation, such as the forging of corporate alliances, making acquisitions or sharing intellectual property.

Industrial giants like General Mills, Samsung, LEGO and General Electric (GE) are examples of companies adopting this approach in various ways. This includes going public with the challenges they face in order to attract partners, setting up competitions so that small companies can submit new ideas for projects or products, or seeking outside partners to help develop under-utilised patents.

"We believe that by connecting the brightest minds and the deepest expertise with some of the world's most pressing problems and opportunities, what was once impossible can be made possible."⁶

Dyan Finkhousen, Director, Open Innovation and
Advanced Manufacturing, General Electric (2013)

GE has adopted a number of such approaches. In Canada, for instance, GE has launched an international competition to find projects that could reduce greenhouse gases during oil sands production. The company offered a million dollars in prizes and grants, as well as the possibility of becoming GE suppliers, to companies from around the world who proposed viable solutions. Among the winning projects is

a collaboration between GE Canada in Calgary and a small company in Chennai, India, that could lead to major changes in the consumption of fossil fuels⁷.

The idea of publicising needs has also been advanced by mining company Goldcorp, which went public with the company's geological data and offered a prize of \$575,000 to whoever could help the company increase its gold extraction potential. Two Australian companies responded to this appeal by jointly developing a three-dimensional map that enabled Goldcorp to find new gold deposits. Goldcorp estimates that the project has sped up exploration time by two to three years while also helping to locate deposits valued at \$6 billion⁸.

Since not all companies have as wide a reach as Goldcorp and GE, intermediaries are sometimes required for open innovation to occur. Whether publicly or privately funded, these intermediaries specialize in open innovation by helping companies find partners who can come up with solutions to their problems. Genome Canada plays this role via genomic centres throughout Canada. Among the many projects made possible by Genome Canada, Kelly Cove Salmon in Nova Scotia is currently collaborating with the University of Guelph to identify which salmon are most resistant to disease and parasites. Advanced genomic techniques will be used in salmon farming to improve their survival rate. A prior collaboration between researchers and

the company resulted in the identification of molecular markers linked to growth in salt water and the salmon's resistance to sea lice. This new collaboration should help to improve viability of the fish and reduce production costs in this vital industry⁹.

LACK OF A CULTURE OF COLLABORATION IN CANADA

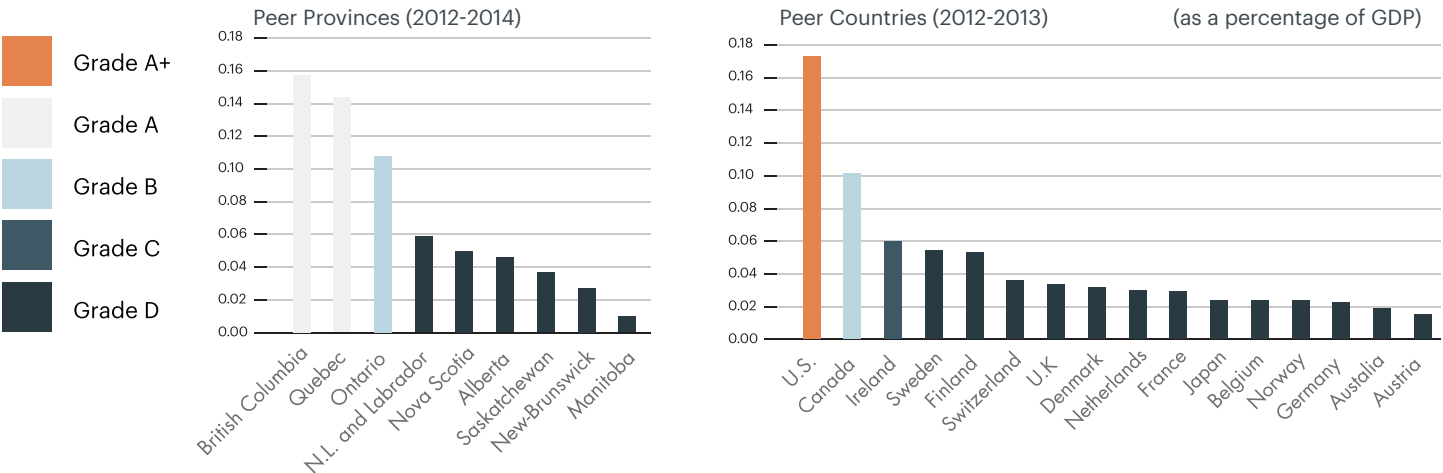
Over the past several months, our task force has conducted research on open innovation in Canada, resulting in the culmination of more than thirty interviews, and survey responses from dozens of experts in the field of innovation from across Canada in the private, governmental and academic settings.

With regard to Canada’s weak position in world rankings on innovation, many maintain that this can be explained by a lack of venture capital combined with an under-aggressive Canadian business culture. The picture, however, is much more nuanced, as the problems explaining this situation are not derived solely from a lack of financial resources. While it is true that Canada has less venture capital than some countries, in proportion to the size of our economy, Canadian businesses can often count on some level of access to this support. On the other hand, less than 20% of this capital goes to companies in the ini-

tial phases of their development, i.e. companies more likely to be collaborative within their ecosystem¹⁰. Openness to collaboration at the outset is essential to economic and social growth.

A strong correlation has been established between the collaborative attitude adopted by a company and its ability to innovate to increase revenue¹¹. Without being able to count on easy access to venture capital, the creation of startups and small-to-medium businesses is more difficult in Canada, and those that do exist are much less likely to develop the tools required for a collaboration favouring innovation. This choice by venture capital investors demonstrates that hubs of competitiveness rely more on research and development within a given company than favouring innovation in ecosystems where a myriad of companies collaborate with each other.

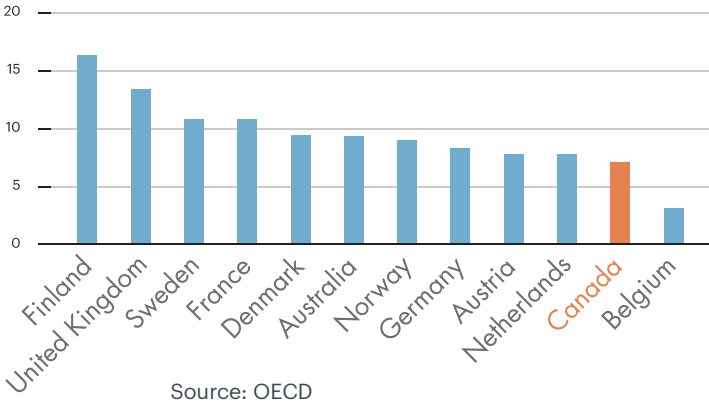
VENTURE CAPITAL INVESTMENT



Source: The Conference Board of Canada

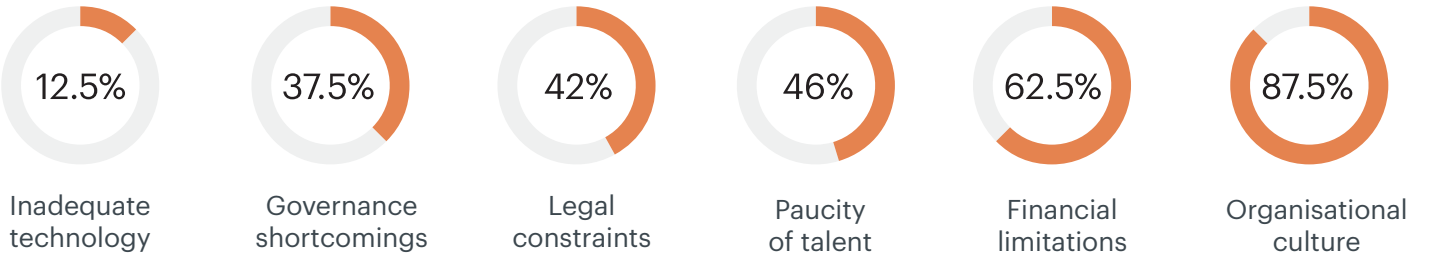
Besides disinclination to invest in smaller companies, a Canadian business culture widely perceived to lack aggression is often seen as a hindrance to investment and innovation. Yet Canada is no less entrepreneurial than other countries. In fact, the Conference Board of Canada notes that only the United States and Australia have a better entrepreneurial attitude than Canada. Paradoxically, this entrepreneurial attitude is less present because we have a lower ratio of company startups than other industrialized countries. Consequently, the hindrances to innovation stem less from a lack of venture capital resources, given the size of our economy, than from the way in which these resources are distributed.

NEW FIRMS AS A PERCENTAGE OF ACTIVE FIRMS, 2012



Source: OECD

BARRIERS TO COLLABORATION



While remaining respectful of the choices made by private investors, the government could favour players that wish to change the organisational culture of Canadian companies to one more receptive of open innovation. A closed-minded business culture was identified by our survey respondents as the greatest barrier to collaboration during the innovation process¹² and experts similarly believe that it represents a serious obstacle to innovation in Canada¹³.

CHALLENGES TO OPEN INNOVATION: POLICY, PATENTS, AND PARTNERSHIPS

Why are Canadian companies lagging behind when it comes to collaboration, even though it is an increasingly vital factor in innovation? The answer may be threefold:

1. POLICY AND PROGRAMS

The practice of open innovation challenges the linear model of innovation, from which the current policies are largely inspired. Open innovation is more complex, fluid and iterative. federal, provincial and territorial policies play a significant role in making sure open innovation happens. Legislation, regulations, litigation rules and tax incentives all affect the ability of businesses to innovate effectively.

Government has, to an extent, recognised the value of open innovation. The federal Build in Canada Innovation Program invites innovators to propose products, services and processes that can be tested by government departments, which then provide feedback, helping Canadian companies bring better products to market. The federal government also funds the Networks of Centres of Excellence, one of which is Wavefront, an organisation that helps wireless companies

connect with partners of different sizes. Large companies are made aware of the innovations that will keep them competitive, while startups find the partners that can help them bring their innovations to market.

At the provincial level, some provinces are also seeking to foster open innovation. For example, Ontario is currently developing a new program that seeks to link together producers and users of innovation, to bridge the existing gap between small and medium enterprises (SMEs) and large firms. Yet the efforts within individual jurisdictions remain largely limited and disconnected from one another. Where some provinces are moving forward, others seem unaware of the programs being developed by their neighbours.

In interviews, innovation policy-makers have admitted that Canadian governments and their programs are still grappling with how innovation works in a service-based economy, as many approaches are still operating within an economy focused on manufacturing.

According to the respondents to our survey and interviews, the scepticism of officials towards open innovation is another main barrier to developing supportive policies. Politicians and civil servants are unlikely to look favourably on what might be perceived as untried or unproven policies or products. Even the Build in Canada Innovation Program has met such resistance. These apprehensions must be addressed if open innovation is to be adopted more broadly.

2. PATENTS AND INTELLECTUAL PROPERTY

Collaboration requires companies to be confident that the inventions they bring to the table are protected. Large Canadian companies have identified improved intellectual property (IP) rights as a high priority for further collaboration¹⁴. Patents therefore need to be well defined with clear boundaries so that owners can be confident their claims to them will be upheld by the courts, if challenged. If patents are ill-defined and difficult to uphold, owners will be unwilling to share. Yet, according to some IP experts, Canada's current system is not offering patent holders the confidence they need in order to accomplish this.

The protection of IP is an instinctive component of traditional business practices. Interviewees and respondents to our survey identified the fear of losing control of IP as a major barrier to open innovation. Prima Québec, an organisation that facilitates collaborative innovation in advanced materials, must often expend considerable energy reassuring companies that open innovation does not create any greater challenge for IP than any other form of collaboration. All forms of partnerships require parties to work out intellectual property agreements; these arrangements are no more complicated for open innovation.

Ideas with profit potential can also be developed and protected within companies reluctant to relinquish or share current or as yet unknown future benefits. Academic researchers may be similarly preoccupied with concerns surround-

ing ownership of IP, especially when maintaining control over data that may have a bearing on career advancement and funding.

3. PARTNERSHIPS

Business culture can be a main barrier to open innovation and, ultimately, innovation. Nine-sigma, a company that facilitates open innovation by connecting companies facing challenges with external partners that can provide solutions, highlights convincing companies to try this new approach as the biggest challenge. It requires a shift in mindset.

Even when companies are willing to try open innovation, issues of organisation and accountability must often be addressed: who will be responsible for the project? From which budget will it be funded? How will the company's needs be identified? This is particularly true of smaller companies, which often lack the business experience or extensive professional networks to develop collaborative ventures. Some provincial innovation policy-makers have noted that this problem is exacerbated by the fact that interactions between large and small companies are often limited.

RECOMMENDATIONS

OPEN INNOVATION SUPPORTED BY GOVERNMENT

The federal government has taken promising steps towards innovation through the creation of the Ministry of Innovation, Science and Economic Development. In his mandate letter to the new Minister, the Prime Minister highlights the importance of the government's partnering closely with business and other sectors, and for these communities to diversify beyond their borders, especially those who "have relied heavily on one sector in the past for economic opportunities". The letter proposes the creation of an Innovation Agenda, as well as expanding support for the Industrial Research Assistance Program. Open innovation fits well as a key response to these concerns.

To address this need, both the federal, provincial and territorial governments should consider taking the following measures:

Work with municipal governments and associations to support the creation of innovation districts across the country. These geographic areas, where companies and institutions gather and connect with startups, business incubators and accelerators¹⁵, are more suitable to support open innovation, and are able to connect all the innovation ecosystem players.

Evaluate how the Networks of Centres of Excellence are currently fostering open innovation to see how their role can be expanded or improved. Entrepreneurs believe that one of the most important roles government can play is to help them find innovation partners through organisations such as these, particularly when they come from completely different fields.

Provincial and territorial governments should:

Keep each other abreast of policy programs they develop to foster open innovation, so that they may coordinate their efforts and learn from one another's experience. New programs and best practices should be shared through a range of institutionalised mechanisms, such as regular meetings among innovation policy-makers and the use of information bulletins.

Evaluate how they could integrate and expand the Build in Canada Innovation Program in their ministries and agencies. Heads of ministries and agencies should clearly communicate the value of this program to their employees so that they are willing to adopt and test the new products.

OPEN INNOVATION PROGRAM

Government initiatives that seek to encourage open innovation should be part of existing innovation agencies and programs, such as the National Research Council of Canada (NRC) or provincial innovation ministries or agencies (e.g. Innovation Saskatchewan, the Ministry of Research and Innovation of Ontario, Alberta Innovates, etc.). The NRC's highly regarded Industrial Research Assistance Program (IRAP) would be one of the best-suited programs to further integrate open innovation, which would also be a step in fulfilling the federal Minister of Innovation's mandate¹⁶. While in some cases open innovation initiatives may require new staff to oversee the measures, in others, existing innovation experts within government can simply add open innovation to their toolkits.

I- EDUCATION

An information campaign on the benefits of open innovation could be led by IRAP in collaboration with provincial and territorial innovation agencies, as well as industry associations. This can include a specific toolkit, offering best practices for forming partnerships, as well as a database of successful examples, providing step-by-step details on how the partnerships came to fruition, replicable road maps and potential contacts for open innovation endeavours.

II- ACCELERATORS

Forging the parameters of a partnership between two separate entities working together on a project can take time and money; therefore, IRAP could provide Industry Technical Advisors (ITAs) to assist. Much as they already do, ITAs could provide assistance on the legal framework, strategic intelligence, potential linkages with other partners, and relevant funding programs, all related to open innovation¹⁷. With advice from CIPO, IRAP could also develop and provide a model contract of how various types of collaborations and partnerships could be structured. Funding for open innovation projects could also be provided through IRAP's financial assistance arm, using existing eligibility criteria already in place for businesses and other projects¹⁸.

III- ENCOURAGE PARTNERSHIPS

Both federal, provincial and territorial agencies can help create a collaborative environment by funding open innovation conferences. Organised by an actor within a sector, these conferences would bring together different stakeholders as well as experts from other fields to brainstorm on ideas and issues. All ideas that emerge could be used by participants to develop a new product, service or process.

Reviewing the Intellectual Property Regime

“A true innovation has market value.
A patented invention may or may not.”

Jeremy de Beer, Professor of Law, University of Ottawa

Open innovation raises a range of questions around IP. Some firms and individuals engaging in open innovation are uninterested in patents, whether it is because they want the process and results to be open, or because their sector evolves at too fast a pace for patenting to be worthwhile. In the technology sector in particular, getting a product to market can be more critical to success than getting it patented.

A system that fosters open innovation still needs to highlight the importance of contracts, to ensure that collaborators define how they will share what they produce, both in terms of who owns it and how they share the profits it generates. To the extent that parties wish to protect their IP, a contract should define allocation of risk, property, losses, etc. Government does not and should not define how IP is shared between partners, yet companies that engage in open innovation have identified this as the most challenging aspect in establishing terms of the partnership.

To better foster collaboration, we recommend that CIPO:

Review, in consultation with federal government and industry associations, the types of innovation that are patent-worthy to make technology transfers easier and faster. In doing so, CIPO should also assess the impacts the current regime is having on innovation, both positive and negative, to know what needs to be changed to improve the quality of Canadian patents.

Consider adopting mechanisms that allow third parties to challenge patents when they are granted, such as the inter-party review or the post-grant review that are part of the recently adopted America Invents Act¹⁹. By avoiding the courts, this would reduce the barriers and costs of challenging weak patents. In the U.S., this has reduced the number of patent litigation²⁰.

CONCLUSION

With a policy of open innovation, Canadian governments will equip themselves with a tool to facilitate change in the country's business culture to bridge our innovation gap - a gap that has social and economic consequences for all Canadians. Furthermore, open innovation is not just a way to innovate more, it is also an approach that fosters the development of unconventional creativity with the potential to revolutionize our economy and our environment. The result will be a catalyst to enhance the country's innovative character. This report therefore calls for increased collaboration at all levels and stages of the innovation process to help companies reach their potential, increase the country's competitiveness internationally and ensure a prosperous and fulfilling future for all Canadians.

AUTHORS

SIMON GAMACHE

Simon Gamache is an arts administrator with a depth of experience in educational management, media production, performing arts, and music performance. He currently serves as Manager, Classical Music & Banff International String Quartet Competition at The Banff Centre, Alberta.

SARA-CHRISTINE GEMSON

Sara-Christine Gemson is a TV, radio, and web journalist for Radio-Canada in Toronto. She holds an M.Phil. in Comparative Government at Oxford University, writing her thesis on the role of media in humanitarian intervention. While in England, she interned at BBC Afrique, the World Service for francophone Africa, and on the public policy desk at the Financial Times.

YOUMANI JÉRÔME LANKOANDÉ

Economist and entrepreneur, Youmani Jerome Lankoandé is president of Innovation Quebec, a Montreal-based firm specialized in consulting services and commercialisation of technological innovations. Mr. Lankoandé serves as president of the Junior Chamber of Commerce and Industry of Saint-Laurent - Mont-Royal in Montreal.

JONATHAN PLAMONDON

Certified Industrial relations Counsellor and mediator at the Canada Industrial Relations Board, Mr. Plamondon has a European Masters in labour science (Louvain Catholic University and the Warwick Business School; 2014), during which he received the Quebec-French community of Belgium scholarship, and a Bachelor's degree in Industrial relations (Laval University; 2012). In addition, he obtained a minor degree in Ethics and Law (University of Montreal; 2008) and a certificate in Law (Laval University; 2009).

JANE THORNTON

Jane Thornton is a resident physician who specializes in preventative health and sports medicine. Specifically focusing on physical activity as both prevention and treatment of chronic disease, Jane is involved in the development of educational resources and medical curricula in Switzerland, Luxembourg, the United Kingdom and here in Canada, lecturing on the topic internationally. Her international collaborations and hands-on work experiences in various countries have given her insight into improving healthcare for Canadians.

ANDRÉ JUNEAU, TASK FORCE ADVISOR

André Juneau is a former federal deputy minister who now advises and lectures on intergovernmental relations in Canada and abroad.

NOTES

¹ OCDE, Open Innovation in a Global Perspective, what do existing data tell us? (2008)

² *Ibid.*

³ Conference Board du Canada, *How Canada Performs: Innovation* (2015)

⁴ Le rapport est disponible à <https://www.accenture.com/us-en/insight-b20-digital-collaboration.aspx>

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⁷ GE Reports Europe, *Start-Ups Help Kick-Start Spanish Innovation* [En ligne]. <http://gereports.eu/post/102458852024/start-ups-help-kick-start-spanish-innovation> (Page consultée le 26 décembre, 2015)

⁸ GE Reports Canada, *Anything I Can Do, We Can Do Better: GHG Ecomagination Innovation* [En ligne]. <https://gereports.ca/ghg-ecomagination-innovation-challenge-winners/> (Page consultée le 26 décembre, 2015)

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¹⁰ <http://genomeatlantic.ca/project/salmon-and-chips/>

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¹² Accenture, *Harnessing the power of entrepreneurs to Open Innovation* (2015)

¹³ Résultat d'un questionnaire fait auprès de 24 innovateurs canadiens. Le questionnaire fut administré par Internet et ne contient aucune marge d'erreur.

¹⁴ Côté, M., Miller, R., *Innovation Reinvented* (2012).

¹⁵ Accenture, *Harnessing the Power of Entrepreneurs to Open Innovation*, 2015, p. 9

¹⁶ <http://www.brookings.edu/about/programs/metro/innovation-districts>, page consultée le 11 janvier 2016

¹⁷ <http://pm.gc.ca/fra/lettre-de-mandat-du-ministre-de-linnovation-des-sciences-et-du-developpement-economique>

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¹⁹ http://www.nrc-cnrc.gc.ca/fra/pari/services/aide_financiere.html

²⁰ <http://www.aipla.org/advocacy/congress/aia/Pages/summary.aspx>

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