

**Government of Canada's Advisory Council on Artificial Intelligence** 

**Commercialization Working Group Final Report February 2020** 



# Background

Launched in August 2019 as part of the Government of Canada's Advisory Council on Artificial Intelligence and building on the work started by the Digital Industries Economic Strategies Table, the Commercialization Working Group's mandate is to examine ways to translate Canadian-owned artificial intelligence (AI) into economic growth that includes higher business productivity, benefits for consumers, and job creation.

The Working Group recognizes that Canada has an imperative to commercialize its AI, with a brief window to capitalize on existing Canadian advantages in R&D and talent. Without increased commercialization, Canada risks falling behind its global competitors, who are actively striving to achieve first-mover advantage in AI. Through commercialization and digital adoption, Canada can fulfill the economic promise of AI in the form of higher productivity and market growth, new products and services for consumers, firm scale-up, and job creation, especially in sectors in which Canada has a strong competitive advantage. Doing so requires that Canada act quickly to put in place the right factors for AI sector growth and competitiveness.

## Advancing commercialization in Canada: Need for urgent action

Recognizing that AI is set to affect many economic sectors as well as transform the global economy and society, there is a unique window of opportunity to strengthen the commercialization capacity and competitiveness of the Canadian AI sector. Canada has many of the foundational pillars necessary to be a leader in AI commercialization. However, in order to build on this opportunity and foster the growth of the Canadian AI sector, immediate, concerted action is required. If strategic investments or initiatives are not made urgently, Canada risks losing its advantage in this fast-moving space where international competitors are gaining ground.

As such, the Working Group proposes the key actions items to turn Canadian research and IP into valuable and responsible AI products and services, increase business adoption of AI, and encourage the rapid growth and scale up of Canadian AI firms.

The Working Group envisions a set of interlocking strategies that accelerate investment in AI technology investment by Canadian companies of any size, and the application of AI to increase the competitiveness and productivity of Canadian firms by rapid adoption of technologies.

This report summarizes findings and recommendations into five priority areas:



## **Recommendations in depth**

The following outlines the Commercialization Working Group's full suite of recommendations. The recommendations cover the various phases of the commercialization process, from research to marketing. Across all recommendations, urgency in action is of paramount importance as Canada seeks to extend its academic advantage in AI and become a commercial leader.

#### 1) **People-** access to skilled talent

Canada is home to a strong talent base in AI, including a large number of graduate students and leading experts at the world's foremost research institutions. Yet against global competition, more is needed to address the limited supply of experts in Canada and to ensure that industry has access to workers who are skilled in working alongside AI-driven processes.

The Working Group makes the following recommendations"

# 1. Bolster work-integrated learning and skills development programs, and create specialized AI streams within them to encourage companies to explore applied - AI projects

Convene stakeholders to define targeted measures for strengthening a multi-faceted Al workforce equipped to drive the development, deployment and adoption of industry-ready machine learning and Al capabilities. Leverage existing investments in Canada's Al ecosystem to increase academia-industry partnerships across sectors to encourage data-rich companies to make their first steps towards Al innovation and adoption by hiring highly skilled students.

#### 2. Expand the Pan-Canadian AI Strategy

Additional funding for the attraction and retention of global AI talent in Canada through the Pan-Canadian AI Strategy linked with Canada's AI institutes and universities. Expanding the Pan-Canadian AI Strategy for a longer funding cycle could help anchor talent in Canada. The expansion should also consider broadening the mandate of the Strategy to encompass knowledge transfer and mobilization. It could provide financial support for these activities, including support for technologies with sector-agnostic commercialization potential. This initiative can be leveraged in the

short term to attract and connect talent to commercial activities and in the longer term to promote cross-cutting innovation.

#### 2) **Policy-** *environment* for innovation

Establishing marketplace frameworks that support innovation and protect Canadians is critical to the effective commercialization of responsible AI. Canada must adopt an agile approach towards regulation to continue to adapt to the fast-paced environment of AI development. Democratizing access to the data needed to develop AI systems, while protecting Canadians' privacy, would foster innovation and help firms to develop products/services that are comprehensive and responsive enough to market.

The Working Group makes the following recommendations:

#### 1. Leverage Canada's network of AI Institutes for IP awareness strategy

Work with Canada's network of Al Institutes Mila, Amii, Vector, to:

- a. Generate awareness on IP protection and its importance in driving innovation;
- Examine the impact of surging rates of patent-filing for AI innovations by multinationals, state-owned enterprises, and post-secondary institutions in other countries on the Canadian AI ecosystem;
- c. Encourage translating IP into the development and deployment of real-world applications through key industry connections (health,mobility, energy, etc.).

Additional consideration should be given to the substantial cost of IP protection and the limited resources post-secondary institutions and SMEs have to manage it. Canada should draw upon this work as it continues to develop its AI-related IP policies, including the possibility of additional guidance for granting IP protection to AI-enabled technologies, similar to that issued by other countries.

#### 2. Facilitate agile regulation

Formally recognize industry standards, codes of practice, and certification mechanisms as legal compliance tools. Recognizing ethical AI standards in law as a means of demonstrating due diligence with statutory requirements would provide an incentive for organizations to adopt them. This would reduce regulatory uncertainty for firms seeking to deploy AI technologies.

#### 3. Increase access to data

Democratize access to reliable annotated data in a secure manner that respects Canadians' privacy rights. This could be achieved through different means such as the establishment of legal frameworks that support the formation of data trusts or through the funding of large national secure data platforms. High quality training data is foundational to the development of AI and machine learning-based products and services, and accessing sufficient quantities can be difficult for smaller innovative firms.

#### *3)* **Program-** *adoption by industry*

The growth of a strong Canadian AI ecosystem depends on AI adoption by industry, yet Canada has a low rate of adoption compared to its international counterparts. As Canada has developed its AI research capacity, other jurisdictions have looked to grow commercial AI ecosystems and innovation. Canada needs to have in place the right initiatives and incentives to increase business adoption of AI to help grow the domestic market for Canadian AI innovations.

The Working Group makes the following recommendations:

# 1. Establish an industry-academia network to build projects for commercial application

Bring together researchers and businesses to develop and deploy industry applications of AI. Offer incentives to businesses that match with AI researchers to solve specific industry problems. This would help firms across all sectors of the economy adopt Canadian artificial intelligence research and data expertise to address a specific business challenge.

#### 2. Leverage existing government programs

Leverage existing federal programs such as the Strategic Innovation Fund through AI-specific targeted funding envelopes. Building on the Government of Canada's mandate to use digital tools like AI for better government – increase coordination efforts across all departments and agencies to promote awareness of Innovative Solutions Canada as a valuable procurement tool and encourage program challenges related to AI. Government acting as an early adopter of AI technologies would help Canadian firms establish a first reference customer.

#### 4) **Podium- e**ncouraging growth through communication

To support the growth and scale-up of Canadian AI firms, success stories and benefits of AI applications could be better communicated to prospective buyers. Canadian businesses, particularly senior-level executives, may not be aware of the benefits of applying digital tools like AI into their operations. To address this knowledge gap, a strategy could be developed to broadcast ways in which AI applications have been deployed successfully across industry.

The Working Group makes the following recommendation:

#### 1. Launch a Made-in-Canada Al campaign

Create an ongoing platform to demonstrate successes, share data, demystify research, and make AI more accessible to industry (a bridge between researchers and the market). Since few companies know where they can meaningfully apply AI, there needs to be an open sharing of use cases in order to build a market for AI. Building on Canada's Digital Charter, and linking with our Advisory Council counterparts in the Public Awareness Working Group, this campaign would also promote the responsible use of AI and data governance.

#### 5) **Platform-** infrastructure for development

To commercialize AI solutions, researchers and entrepreneurs need access to advanced computing resources such as high-powered computers, graphics processing units, and tensor processing units, to enable AI techniques that involve very large data sets. Firms, especially small and medium-sized enterprises, face challenges in accessing these resources due to cost or limited supply.

The Working Group makes the following recommendation:

#### 1. National strategy on computing power

A national strategy on expanding access to computing power is necessary to support the needs of industry as well as academia going forward. While the Government is investing in high performance computing for academics through its Digital Research Infrastructure Strategy, the need for affordable computing power is also essential for start-ups and SMEs. Without sufficient and affordable computing resources SMEs can struggle to develop and scale their AI products and services.

#### 2. Incentivize infrastructure investment

Implement a scheme incentivizing infrastructure investment to help fuel a competitive cloud provider ecosystem. These investments could help fulfill the needs of SMEs by providing an alternative to dominant market cloud providers.

## **Moving forward**

To fully capitalize on our advantages in AI and remain globally competitive, Canada must advance AI commercialization and support all areas of the innovation ecosystem, including academia, industry, and civil society. Only by increasing AI adoption by industry, improving access to skills and expertise, developing an environment conducive to innovation, and providing infrastructure for development will Canada's AI ecosystem will evolve and flourish.

We hope that the recommendations put forth in this report encourage all Canadian stakeholders to act in support of AI advancement.

This report serves as a call to action addressed to all Canadians. A synchronized approach with industry, academia, civil society and all levels of government is needed to ensure Canada remains a leader in artificial intelligence, in a highly competitive global economy.

## Membership

### **Co-Chairs**



Foteini Agrafioti, Royal Bank of Canada and Borealis Al Facilitated the sub-group on Creating Value from Research and IP



John Shannon, National Research Council of Canada Facilitated sub-groups on Increasing Al Adoption and Firm Growth and Scale-up

## Members



**Carolina Bessega**, Stradigi Al



**Eric Bukovinsky**, Yaletown Venture Partners



Marc-Antoine Dilhac, Université de Montréal



Ted Graham, General Motors



Wellington Holbrook, ATB Financial



Stéphane Létourneau, MILA



Kristina McElheran, University of Toronto



Jodie Wallis, Accenture



Dornoosh Zonoobi, MEDO.ai

