



# Enabling the Responsible Use of Artificial Intelligence in the Government of Canada

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# Canada and AI Innovation

## Canada funds \$125 million Pan-Canadian Artificial Intelligence Strategy

<https://www.newswire.ca/news-releases/canada-funds-125-million-pan-canadian-artificial-intelligence-strategy-616876434.html>

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14,230 views | Mar 13, 2018, 09:00am

## Here's Why Canada Can Win The AI Race

<https://www.forbes.com/sites/forbestechcouncil/2018/03/13/heres-why-canada-can-win-the-ai-race/#7faa8e1cc9b7>



**Salim Teja** Forbes Councils  
Forbes Technology Council CommunityVoice

TECHNOLOGY

## Four ways Canada can own the artificial intelligence century

Much of the foundational research into artificial intelligence originated in Canada, but we'll have to work to stay a leader in the field

by Danielle Goldfarb & Candice Faktor Feb 22, 2018

<https://www.macleans.ca/technology-3/four-ways-canada-can-own-the-artificial-intelligence-century/>

## Ontario budget makes \$15 million investment in top AI entrepreneurs

Français

<https://www.newswire.ca/news-releases/ontario-budget-makes-15-million-investment-in-top-ai-entrepreneurs-678236723.html>

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**NEXT Canada** →

Mar 28, 2018, 20:51 ET



# Using AI in the Government of Canada



## Public Health

Early warning analytic tool to detect potential public health threats worldwide



## Natural Resources

Early emergency warning and real-time extreme forest fire prediction and flood mapping



## Transport

Risk-based oversight of air cargo information

# An environment of low public trust for AI

Access to government support programs such as employment insurance



Which medical interventions are best for you and your family during an illness or after an accident



The implementation of government policies such as who can immigrate to Canada



Whether a person gets a job



*“AI & algorithms rather than people deciding on...”*

# *Fast Regulation vs. Slow Regulation*



# AI in GC: Collaborative and Multi-Departmental

AI is a transformative technology that requires a collaborative enterprise approach, leveraging the strengths of many key departments. As departments are starting to work with AI, the following departments are providing support to the enterprise

**Treasury Board Secretariat** — Provides central leadership to GC on digital government, TB policy suite and oversight, Project review, Lead on open government/data, Employer of the Public Service

**ISED** — Coordinates external AI stakeholders, including the AI Advisory Council, Pan-Canadian AI Strategy, Supercluster Initiative, and Government's of France and Canada Working Group

**Canada School of Public Service** — Offers training and enables experimentation

**Justice Canada** — Reviews and provides legal opinions related to the intersection of AI and the law

**Statistics Canada** — Performs enterprise data management, governance, and analysis

**Public Services and Procurement Canada** — Provides vehicles and support tools to enable the efficient, effective, and consistent procurement of AI across the government.

**Employment and Social Development Canada** — Leads social policy lead

**Canada Digital Services** — Supports business transformation through direct departmental support

**Shared Services Canada** — Provides large scale/centralized IT support

**NRC** — Supports departments and external stakeholders through education and funding opportunities

# Starting to Define AI

AI is a term given to a variety of computer applications that automate human cognitive abilities such as perception, reasoning, pattern recognition, and problem solving.

## ▶ Insights and Predictive Modelling

- ▶ Understanding patterns in data and using these patterns to predict future scenarios
- ▶ Can be used to discover insights in service clientele, understand what makes for successful employees, or better allocate financial resources

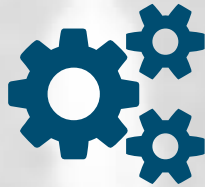
## ▶ Machine Interactions

- ▶ Providing an automated service experience in natural language
- ▶ Can include chatbots that respond to simple service queries, or information provided over voice-based virtual assistants such as Amazon Alexa or Google Home

## ▶ Cognitive Automation

- ▶ Automating the senses to derive insights from the world
- ▶ Can be used to recognize and understand handwriting in service applications or historical documents, to or recognize objects within images

# TBS AI Policy: Providing Central Leadership on AI



## Tools

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Provide departments with the services, solutions, tools and funding that they need to innovate



## Rules

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Build an approach that adapts quickly to new technology, is responsive of experiences, and provides transparency to the public



## People

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Guide the public service through this transformative time, providing the training and education needed to all levels of expertise



# Directive on Automated Decision-Making

*“The objective of this Directive is to ensure that Automated Decision Systems are deployed in a manner that reduces risks to Canadians and federal institutions, and leads to more efficient, accurate, consistent, and interpretable decisions made pursuant to Canadian law.”*

## Transparency

- Promoting better understanding of system functionality
- Providing as much information to the public as possible
- Encouraging accountability (measuring of compliance and performance reporting)

## Procedural Fairness

- Ensuring meaningful explanations
- Enabling examinations into the data used in making the determination
- Ensuring the ability to challenge the decision

# Scope and Application

## Scope

- Systems that provide external services as defined in the Policy on Service.
- Any system, tool, or statistical models used to recommend or make an administrative decision about a client.
- Any system in production, excluding systems operating in test environments.
- Does not apply to any national security system.

## Coming into Force

- Takes effect on April 1, 2019, with compliance required by no later than April 1, 2020.
- Will have an automated review process planned every 6 months after the date it comes into effect.

# Algorithmic Impact Assessment

## Scaling Requirements

- Peer Review
- Notices
- Explanation Requirements
- Testing
- Monitoring
- Training
- Contingency Planning
- Human-in-the-loop
- Approval for system to operate

Requirements

Impact





# Algorithmic Impact Assessment

- Raw Risk Score : Assessing Impact
- Mitigation Score: Assessing Mitigation Measures
- Establishing Requirements
- Making the Results Public

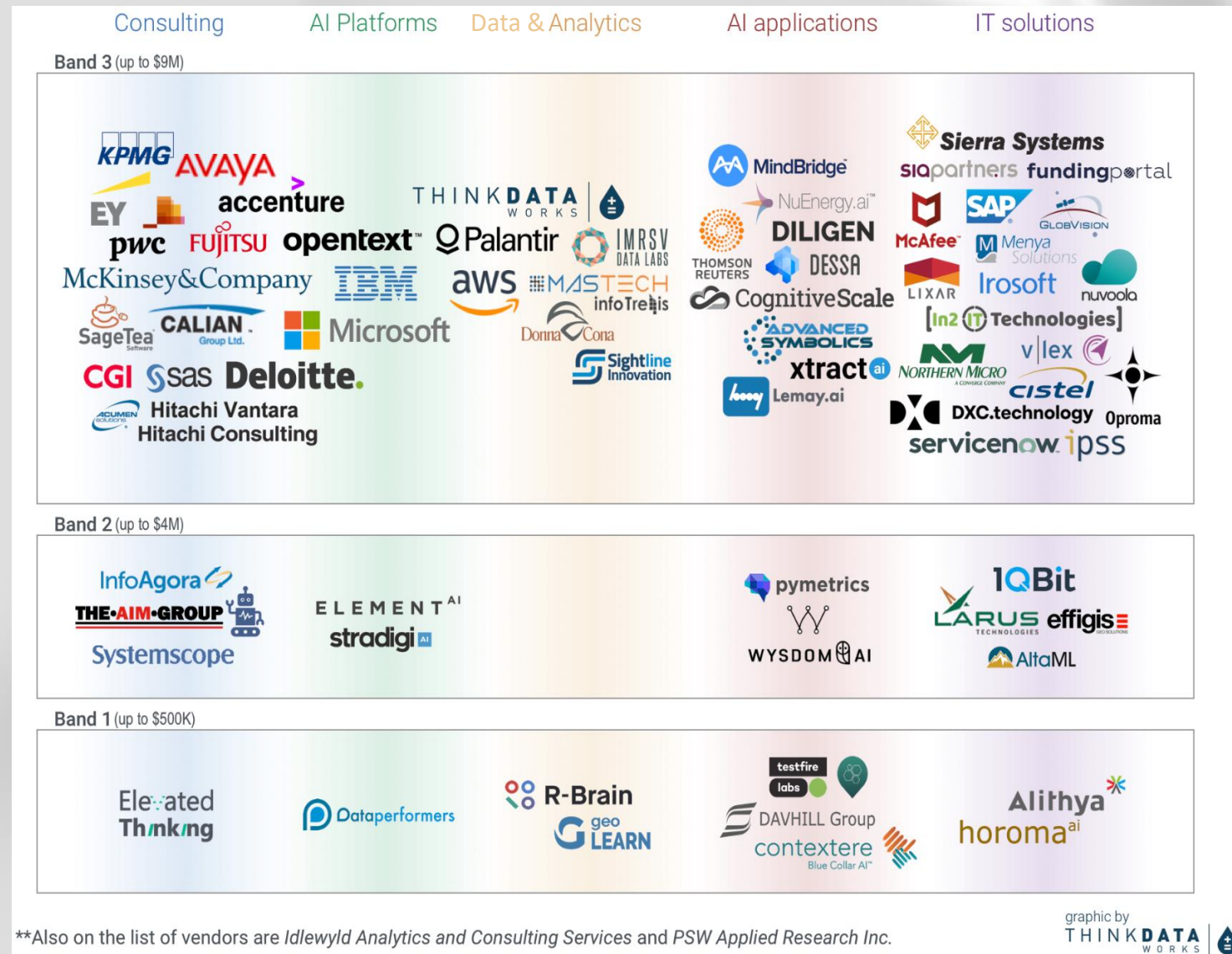


# Algorithmic Impact Assessment

Live Demo (Beta)

<https://canada-ca.github.io/aia-eia-js/>

# GC AI Procurement Strategy





# THANK YOU



# Annex : Examples of AI applications in the GC

Department	Use Case
NRCAN	<ul style="list-style-type: none"> <li>• Forest fire protection and flooding map</li> <li>• Optimizing industrial process and performance</li> <li>• Extraction of features from high-definition images</li> </ul>
TC	<ul style="list-style-type: none"> <li>• Risk-based oversight of air cargo</li> </ul>
PHAC	<ul style="list-style-type: none"> <li>• Early warning of worldwide public health threats (in collaboration with NRC)</li> </ul>
HC	<ul style="list-style-type: none"> <li>• Automation of repetitive rules-based tasks</li> <li>• Assessment of risk communication activities</li> </ul>
ISED	<ul style="list-style-type: none"> <li>• Identifying debtors who may warrant investigation</li> </ul>
CSA	<ul style="list-style-type: none"> <li>• Next generation holographic console</li> </ul>
CRC	<ul style="list-style-type: none"> <li>• Management of spectrum</li> <li>• Engineered surfaced design</li> </ul>
DND	<ul style="list-style-type: none"> <li>• Underwater, ground, and airborne autonomous systems</li> <li>• Ground, airborne, and space sensor processing</li> <li>• Decision support systems, knowledge-based reasoning</li> </ul>
ECC	<ul style="list-style-type: none"> <li>• Meteorological and environment modelling processes</li> <li>• The creation of land cover information from satellite data</li> <li>• Improved and automatic classification of sea ice</li> <li>• The characterization, mapping, and monitoring of ecosystems and habitats important to wildlife</li> </ul>
NRC	<ul style="list-style-type: none"> <li>• Tracking greenhouse gases in the port of Montreal</li> <li>• Teaching machines disappearing indigenous languages</li> <li>• Helping to manage power consumption in buildings</li> </ul>