The State of AI in Canada: Challenges, Opportunities, and Calls to Action

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Executive Summary

Canada stands at a pivotal moment in the global evolution of artificial intelligence (AI). Over the past decade, the country earned an early leadership position thanks to world-class researchers, pioneering public investments, and globally recognized institutes such as Mila, the Vector Institute, and Amii. These assets gave Canada a strong foundation in deep learning, talent development, and responsible AI. But the landscape has shifted rapidly. Nations such as the U.S., China, the UK, France, Singapore, and the UAE are now investing at unprecedented scale in sovereign compute, frontier model development, commercialization pathways, and talent retention. In comparison, Canada's progress has been meaningful but too slow, too fragmented, and too modest in scale to preserve its early advantage.

This white paper provides a candid, evidence-based assessment of Canada's AI ecosystem. It highlights strengths that remain globally significant, including research excellence, strong graduate programs, vibrant early-stage innovation, and international credibility in ethical AI. At the same time, it identifies critical weaknesses that now threaten national competitiveness. Canada struggles to retain AI talent, losing a significant portion of its top graduates and researchers to the U.S. Domestic capital remains insufficient to scale AI companies beyond the seed and Series A stages. Industrial adoption of AI lags behind peer nations, limiting productivity gains and domestic demand for innovation. Canada also faces severe constraints in compute and electricity infrastructure, with approximately 0.7% of global AI compute capacity as of late 2023, the lowest share among G7 countries.[2] These challenges are compounded by fragmented governance across federal and provincial systems.

Yet Canada also holds extraordinary opportunities. The country can become a global leader in applying AI to healthcare, energy systems, natural resources, climate resilience, supply chains, finance, and public administration—sectors that represent the backbone of the Canadian economy. It can build sovereign, sustainable compute infrastructure powered by its low-carbon grid. It can create a next-generation talent strategy focused on attraction, retention, and national mobility. Canada can accelerate commercialization by modernizing procurement, reforming tech transfer, and establishing large-scale AI growth funds. Finally, it can strengthen regional clusters while coordinating nationally across provinces and institutions.

To seize these opportunities, Canada must adopt a bolder and more integrated national approach. This includes developing sovereign compute capacity, modernizing procurement, accelerating

commercialization, strengthening interprovincial coordination, investing in electricity and data centre infrastructure, improving the retention of top students and faculty, and establishing a strong, active National AI Governance Council with a real mandate and accountability.

Canada has a narrow but meaningful window to define its AI future. With decisive and coordinated action, the country can build a globally distinctive model of AI innovation grounded in excellence, trust, sustainability, and societal benefit. Without that action, it risks becoming a research supplier to other nations rather than a full participant in the next wave of AI-driven economic transformation. The moment is urgent—and the opportunity is ours to seize.

1. Introduction

1.1 Purpose and Motivation for the White Paper

Canada has reached a decisive point in the global AI race. Over the past decade, the country has benefited from an early leadership position driven by world-renowned researchers, visionary public investments, and globally recognized research institutes. At the same time, the pace of AI progress worldwide has accelerated dramatically. Countries are moving swiftly to develop domestic talent, invest in large-scale compute infrastructure, build sovereign AI capabilities, attract global capital, and integrate AI across industry and government operations.

This white paper provides a comprehensive, evidence-based assessment of the state of AI in Canada. It offers a clear, honest view of our national strengths, identifies structural weaknesses that increasingly constrain our competitiveness, and proposes actionable recommendations for ensuring that Canada remains a leading global force in AI. The intent is not merely to diagnose but to provide a constructive, forward-looking roadmap for policymakers, industry leaders, universities, and investors.

Drawing on countless discussions and inputs from both senior academics across major Canadian universities and successful industry leaders, the paper aims to inform Canada's next-generation AI strategy and help guide coordinated efforts.[3] The stakes are high: AI will shape Canada's economic competitiveness, scientific leadership, workforce development, and societal well-being for decades to come. Recent analyses suggest that, under ambitious adoption scenarios, AI could add on the order of several hundred billion dollars to Canada's GDP by 2035, corresponding to 9.3% gains over baseline projections, though this lags behind the U.S.'s projected 14% gain.[4] In a similar vein, a 2024/2025 report commissioned by Google and conducted by Public First suggests that generative AI could boost Canada's economy by as much as CAD 230 billion and could save the average Canadian worker over 170 hours a year (i.e., 21 working days).[5]

1.2 Canada's Early Leadership in AI

Canada's AI story is unique. Long before the recent explosion of generative AI, Canadian researchers helped shape the foundations of modern machine learning (ML). The work of pioneers such as Yoshua Bengio, Geoffrey Hinton, and Richard Sutton, combined with the early support of CIFAR[6] and the federal government, positioned Canada as a global hub of deep learning research.

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[3] I am grateful to many colleagues and industry collaborators for their constructive feedback and suggestions, which have significantly improved this paper. I also thank Eddy Hage-Youssef for his outstanding research assistance.
[4] https://www.pwc.com/ca/en/value-in-motion.html
[5] https://www.publicfirst.co.uk/exploring-canadas-ai-opportunity-google-canada-economic-impact-report-2024.html
[6] https://cifar.ca/

Specifically, Canadian researchers have been pioneers in deep learning since 2012, with Geoffrey Hinton's AlexNet paper becoming one of the most cited works in history.[7] Canada punches well above its weight in AI research given its small population and constrained national AI compute resources, with Canada CIFAR AI researchers producing some of the highest impact AI research globally (ranking third for highly-cited publications).[8] In fact, in October 2025, Prof. Yoshua Bengio (often nicknamed "Godfather of AI") has become the first living scientist to reach one million citations on Google Scholar.[9]

This early leadership translated into the creation and growth of three globally recognized research centres: Mila (in Montreal with over 1,200 researchers and students),[10] the Vector Institute (in Toronto with over 700 affiliated researchers),[11] and Amii (in Edmonton with over 400 affiliated researchers).[12] These institutions served as magnets for talent, attracting top faculty and students from around the world. Canada's first-mover advantage also enabled the launch of the Pan-Canadian AI Strategy, one of the first national AI strategies in the world, with initial funding of CAD 125 million in 2017 and an additional CAD 443 million committed in Phase II (2022).[13]

The period 2015-2020 solidified Canada's identity as a research powerhouse. Canadian universities established leading master's and doctoral programs in AI and ML, academic papers from Canada received global recognition, and early-stage AI startups proliferated across major cities. On several metrics, Canada ranks among global leaders in AI research impact: for example, it ranked first in the G7 for AI-related papers per capita in 2024/2025.[14] Crucially, Canada developed a thoughtful voice on ethical and responsible AI, promoting principles of transparency, inclusivity, and safety, particularly through its support of the OECD AI Principles[15] and its leadership role in the Global Partnership on AI (GPAI).[16]

Yet as other nations began investing heavily, especially in large-scale compute, commercialization, security, and workforce development, Canada's early advantage narrowed. Between 2013 and 2024, private investment in AI amounted to USD 470.92 billion in the U.S. alone.[17] During the same timeframe, private AI investment in Canada reached only USD 15.31 billion,[18] namely, 3.25% of the U.S. investments. Accordingly, the upcoming decade demands a renewed sense of urgency and strategic coordination.

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[7] https://www.utoronto.ca/news/four-papers-authored-u-t-scholars-among-25-most-cited-21st-century-nature

[8] https://cifar.ca/ai/impact/

[9] https://www.nature.com/articles/d41586-025-03681-6

[10] https://mila.quebec/en/prospective-students-postdocs/research-masters-and-phd (disclaimer: I am an associate member of Mila since 2025)

[11] https://vectorinstitute.ai/research/

[12] https://www.ualberta.ca/en/science/research-and-teaching/research/uamii/index.html

[13] https://cifar.ca/cifarnews/2022/06/22/cifar-announces-plans-for-second-phase-of-the-pan-canadian-artificial-intelligence-strategy/

[14] https://oecd.ai/en/data?selectedArea=ai-research&selectedVisualization=18017, filtered for G7 countries in 2024

[15] https://www.oecd.org/en/topics/ai-principles.html

[16] https://www.canada.ca/en/innovation-science-economic-development/news/2020/12/canada-concludes-inaugural-plenary-of-the-global-partnership-on-artificial-intelligence-with-international-counterparts-in-montreal.html

[17] https://hai.stanford.edu/assets/files/hai_ai-index-report-2025_chapter4_final.pdf

[18] Ibid

1.3 The New Global Reality

Since 2020, the global AI landscape has been transformed by three unprecedented forces:

(1) the rise of foundation models and agentic AI systems,

(2) exponential growth in compute and data centre demands, and

(3) intensifying international competition for talent, capital, and intellectual property.

Countries such as the U.S., UK, China, France, the UAE, and Singapore have each launched aggressive national strategies with multi-billion-dollar investments in sovereign compute clusters, model development, specialized AI regulatory frameworks, and large-scale industrial adoption. For instance, the U.S. CHIPS and Science Act has allocated over USD 52 billion to semiconductor and AI-relevant industries.[19] Similarly, the UK committed up to GBP 2 billion to its public AI compute and infrastructure,[20] and France has earmarked close to EUR 2.5 billion for its national AI strategy under the France 2030 investment plan.[21] Finally, the UAE has announced commitments totalling more than USD 148 billion to AI investments domestically and abroad, including USD 27.2 billion for the Stargate data centre project.[22]

In the private sector, major companies are devoting tens of billions per year to AI infrastructure, creating an environment where access to both compute and capital increasingly shapes research outcomes. During the 2023-2024 AI boom, NVIDIA experienced demand for its AI-focused GPUs that significantly outpaced available supply.[23] In 2024 alone, Alphabet, Amazon, Meta, Microsoft, and Oracle together spent more than USD 200 billion in total capital expenditures.[24]

In this new landscape, traditional sources of Canadian leadership, including academic excellence and ethical positioning, remain important but are no longer sufficient on their own. The centre of gravity has shifted toward scale, speed, and strategic alignment across government, academia, and industry. Nations that successfully integrate these elements will shape the next decade of AI innovation and economic competitiveness.

Canada must therefore confront a strategic question: How can a country of 40 million people (with only ~2.11% of global GDP,[25] and, as of late 2023, ~0.7% of global compute capacity,[26] and a high STEM talent emigration rate) develop and sustain world-class AI capabilities in an environment defined by exponential technological growth and intense global competition?

The answer requires coordinated action, renewed ambition, and a commitment to building enduring national assets, from talent pipelines and compute infrastructure to commercialization pathways and electricity grid resilience. Without intervention, Canada risks losing its current

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[19] https://hai.stanford.edu/policy/what-the-chips-and-science-act-means-for-artificial-intelligence
[20] https://www.gov.uk/government/publications/uk-compute-roadmap/uk-compute-roadmap
[21] https://www.culture.gouv.fr/presse/communiques-de-presse/france-2030-l-ia-comme-un-accelerateur-et-un-differenciateur-d-innovation
[22] https://finance.yahoo.com/news/uae-touts-148b-investment-ai-131334829.html
[23] https://www.cnbc.com/2023/11/21/nvidia-nvda-q3-earnings-report-2024.html
[24] https://www.spglobal.com/market-intelligence/en/news-insights/articles/2024/9/microsoft-blackrock-drive-ai-capex-surge-beyond-tech-sector-83384666
[25] https://tradingeconomics.com/canada/gdp
[26] https://dais.ca/wp-content/uploads/2024/03/Can-Canada-Compute.pdf

position among the leading countries in AI research and innovation, primarily due to talent flight and underinvestment in compute and commercialization.

This white paper aims to provide a clear framework for that collective effort. The remainder of the paper is organized as follows. Section 2 presents a detailed assessment of Canada's strengths in AI, including research excellence, talent pipelines, innovation ecosystems, and leadership in responsible AI. Section 3 provides a candid analysis of the structural weaknesses that limit Canada's competitiveness, from talent retention to compute capacity and commercialization challenges. Section 4 situates Canada within the global AI landscape by benchmarking its performance against leading nations. Section 5 outlines the most significant strategic opportunities for Canada over the next decade, while Section 6 translates these insights into concrete calls to action for governments, universities, industry, and investors. Finally, Section 7 concludes with a forward-looking vision for Canada's role in the global AI ecosystem.

2. Canada's Strengths in AI

2.1 Research Excellence and Academic Leadership

Canada's longstanding reputation for world-class AI research remains one of its strongest national assets. Canadian universities consistently rank among the global leaders in computer science, ML, and deep learning.[27] Cities such as Edmonton, Montreal, Toronto, Vancouver, and Waterloo continue to serve as global research hubs, attracting both faculty and graduate students from around the world.

The core drivers of this leadership include the internationally recognized work of researchers in deep learning, reinforcement learning, and optimization, and the presence of the three aforementioned major national AI institutes. Together, these institutes form one of the largest and most interdisciplinary AI research ecosystems globally.

Canada's scientific impact remains outsized relative to its population.

- In 2019, Canada ranked among the top four countries worldwide for AI publication impact (based on the h-index metric).[28]
- Canadian institutions have produced a large and growing volume of AI-related research papers, many of them published in top venues such as NeurIPS, ICML, ICLR, ACL, and CVPR.
- Canada has played an outsized role in the development of deep learning, with Canadian researchers and institutions consistently contributing to field-defining research since the 2010s.
- OECD data indicate that Canada is among the leading countries in AI research, accounting for 2-3% of global AI-related publications.[29]

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[27] https://www.utoronto.ca/news/u-t-ranks-third-globally-artificial-intelligence-new-shanghai-subject-ranking
[28] https://law.queensu.ca/sites/lawwww/files/files/Research/MachineMD/Pan-Canadian-AI-Strategy-Impact-Assessment-Report.pdf
[29] https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/02/ai-skills-and-capabilities-in-canada_09294563/87f76682-en.pdf

Canadian researchers have also played a pivotal role in the development of responsible AI, reinforcement learning, causal ML, and generative models—fields that now underpin major commercial applications.

2.2 Talent and Training Pipelines

Canada's universities educate a substantial share of the world's next-generation AI workforce. Programs in AI, ML, computer science, data science, and business analytics have rapidly expanded, and Canadian degrees remain highly sought after globally.

Several tens of thousands of students are currently enrolled in computing-related programs across Canadian universities, and demand significantly exceeds supply. In addition to engineering and computer science, most Canadian business schools offer undergraduate, graduate, and executive programs related to data science and AI with the goal of equipping the next generation of managers and executives with AI-related skills and literacy.

Co-op programs at institutions such as McGill University, Polytechnique Montréal, University of Toronto, UBC, and Waterloo, provide applied training at industry scale, which is a major comparative advantage.[30] Notably, the University of Waterloo operates one of the world's largest cooperative education programs, with an enrollment exceeding 26,000 active students.[31]

International students have also played an essential role in building the talent base. As of 2024:

- A significant portion of graduate students in AI-related programs are international.
- Canada attracts many international students to STEM graduate-level programs every year.
- Graduates equipped with AI and ML skills in Canada typically face strong job prospects right after graduation.

The ability to attract global talent has long been a competitive strength. However, as Section 3 will highlight, retaining that talent has become increasingly difficult.

Still, Canada's training ecosystem remains one of the most productive in the world. More precisely, data from 2019 showed that Canada accounted for approximately 5% of the world's top-tier AI researchers based on undergraduate degree origins,[32] despite its relatively small population. Additionally, as of 2022, Canada has outpaced all other G7 countries in the growth of its AI talent concentration.[33]

2.3 Innovation Ecosystem and Entrepreneurship

Canada has cultivated a vibrant early-stage AI startup ecosystem supported by leading incubators and accelerators such as the Creative Destruction Lab (CDL),[34] Centech,[35] DMZ,[36] Dobson

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[30] Co-op education programs vary by institution in structure and terminology. For instance, some universities use terms such as "internships" for similar programs.

[31] https://uwaterloo.ca/associate-provost-co-operative-and-experiential-education/co-operative-education

[32] https://web.archive.org/web/20220730073103/https://macropolo.org/digital-projects/the-global-ai-talent-tracker/

[33] https://oecd.ai/en/data?selectedArea=ai-jobs-and-skills&selectedVisualization=ai-talent-concentration-by-country, filtered for G7 countries in 2022

[34] https://creativedestructionlab.com/

[35] https://centech.co/en/

[36] https://dmz.torontomu.ca/

Centre,[37] Communitech,[38] Highline Beta,[39] NEXT AI,[40] MaRS,[41] and Volta[42] just to name a few.

Additionally, Montreal, Toronto, Vancouver, and Waterloo consistently appear in the top 40 global AI startup hubs.[43] Key indicators of ecosystem strength include:

- Since 2019, over 670 Canadian AI startups have secured investment deals worth at least USD 1 million.[44]
- Canada has produced several globally recognized AI companies, including Coveo,[45] Element AI (pre-acquisition),[46] Cohere,[47] Xanadu,[48] BenchSci,[49] and Sanctuary AI.[50]
- As of 2023, over USD 15 billion has been invested in Canadian AI companies, but this still remains small relative to U.S. (over USD 470 billion) or Chinese (over USD 119 billion) markets.[51]
- Several globally recognized AI consulting firms have been established in Canada (e.g., Ample Insight,[52] CGI,[53] Cohere, IVADO Labs,[54] Moov AI,[55] ShyftLabs[56]). A more comprehensive list of AI suppliers curated by Public Services and Procurement Canada (PSPC) together with the Treasury Board of Canada Secretariat (TBS) can be found here,[57]
- Within this ecosystem, a new category of SME-focused, execution-oriented AI providers has emerged, helping small domestic businesses automate repetitive tasks, streamline workflows, and support GEO and AEO functions[58] (e.g., Baseline,[59] Genia[60]).

Canada's AI ventures are particularly strong in applied verticals such as healthcare, drug discovery, retail, supply chain, robotics, natural language processing, and energy.

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[37] https://www.mcgill.ca/dobson/
[38] https://www.communitech.ca/
[39] https://www.highlinebeta.com/
[40] https://www.nextcanada.com/next-ai/
[41] https://www.marsdd.com/
[42] https://www.voltaeffect.com/
[43] https://startupgenome.com/report/gser2025/global-startup-ecosystem-ranking-2025-top-40
[44] https://www.canada.ca/en/innovation-science-economic-development/news/2024/12/canada-to-drive-billions-in-investments-to-build-domestic-ai-compute-capacity-at-home.html
[45] https://www.coveo.com/en
[46] https://www.servicenow.com/research/
[47] https://cohere.com/
[48] https://www.xanadu.ai/
[49] https://www.benchsci.com/
[50] https://www.sanctuary.ai/
[51] https://hai.stanford.edu/assets/files/hai_ai-index-report-2025_chapter4_final.pdf
[52] https://www.ampleinsight.com/
[53] https://www.cgi.com/en
[54] https://ivadolabs.com/en/ (disclaimer: I've served as a Scientific Advisor in AI and data science at IVADO Labs since 2020)
[55] https://moov.ai/en
[56] https://shyftlabs.io/
[57] https://www.canada.ca/en/government/system/digital-government/digital-government-innovations/responsible-use-ai/list-interested-artificial-intelligence-ai-suppliers.html
[58] GEO and AEO stand for generative engine optimization and answer engine optimization, respectively
[59] https://baseline.quebec/en/
[60] https://genia.co/en/ (disclaimer: I'm affiliated with Genia since its creation in 2023)

CDL alone has supported over 4,000 participating ventures and contributed CAD 51 billion in equity value creation.[61]

2.4 Public Funding and Research Infrastructure

Canada was among the first countries to launch a national AI strategy with the Pan-Canadian AI Strategy in 2017, supported by CAD 125 million in initial funding and expanded with CAD 443 million in Phase II (2022-2027).[62] These investments supported:

- The growth of Mila, Vector, and Amii as well as several other initiatives such as IVADO, which is an AI consortium focused on research, training, and knowledge mobilization.[63]
- AI research chairs across Canadian universities, including research chairs sponsored by both public funding (e.g., Canada CIFAR AI Chairs,[64] Scale AI Chairs[65]) and the private sector (e.g., the Hinton Chair in Artificial Intelligence sponsored by Google).[66]
- Graduate fellowships and training programs.
- National research networks and industrial partnerships.

Additionally, the federal and provincial governments have invested several billion dollars annually in broader R&D initiatives that directly or indirectly support AI (NSERC,[67] CIHR,[68] SSHRC,[69] NRC,[70] Scale AI,[71] Mitacs[72]). Compute infrastructure has also received targeted investments, including:

- Digital Research Alliance of Canada (DRAC),[73] which manages national compute resources used by thousands of AI researchers.
- Provincial investments in data centres and cloud expansion.
- Support for supercomputing clusters (e.g., Narval at Calcul Québec,[74] Cedar at WestGrid[75]).

While still modest relative to global peers, these investments have helped maintain Canada's research competitiveness.

2.5 Canada's Strength in Ethical and Responsible AI

Canada has earned international credibility in the domain of responsible, safe, and human-aligned

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[61] https://creativedestructionlab.com/about/
[62] https://cifar.ca/cifarnews/2022/06/22/cifar-announces-plans-for-second-phase-of-the-pan-canadian-artificial-intelligence-strategy/
[63] https://ivado.ca/en/
[64] https://cifar.ca/ai/canada-cifar-ai-chairs/
[65] https://www.scaleai.ca/education/research-chair-program/ (disclaimer: I've received one of these Scale AI Chairs in 2021)
[66] https://blog.google/technology/ai/hinton-chair-toronto/
[67] https://nserc-crsng.canada.ca/en
[68] https://cihr-irsc.gc.ca/e/193.html
[69] https://sshrc-crsh.canada.ca/en.aspx
[70] https://nrc.canada.ca/en
[71] https://www.scaleai.ca/
[72] https://www.mitacs.ca/
[73] https://www.alliancecan.ca/en
[74] https://portail.narval.calculquebec.ca/
[75] https://docs.alliancecan.ca/wiki/Cedar

AI. It is an early adopter and strong supporter of the OECD AI principles (now endorsed by more than 40 governments)[76] and was a founding member and early chair of the Global Partnership on AI (GPAI).[77] Additional indicators of leadership include:

- One of the highest concentrations of academic researchers in AI ethics and fairness.
- The globally recognized Montreal Declaration on Responsible AI.[78]
- Strong public demand for ethical AI governance, with three-quarters of Canadians supporting AI regulation and 89% wanting laws to prevent AI-generated misinformation.[79]

Canada is also home to internationally respected organizations working on AI governance and safety, including the Schwartz Reisman Institute,[80] the McGill Centre for Media, Technology and Democracy,[81] CIFAR's AI & Society program,[82] the newly launched nonprofit organization LawZero by Yoshua Bengio,[83] and several responsible AI labs across major universities.

This reputation for ethical leadership, grounded in academic rigor, transparency, and social responsibility, remains a distinctive comparative advantage in the global AI landscape.

3. Structural Weaknesses and Strategic Challenges

Despite Canada's strong foundations in AI research and training, several structural weaknesses now threaten the country's competitiveness on the global stage. These challenges span talent, infrastructure, commercialization, and national coordination. Without strong targeted interventions, Canada risks losing its early advantage and falling behind economies that are making substantial, coordinated investments in AI capacity.

3.1 The Talent Problem: Brain Drain and Retention

Canada's AI talent pipeline is world-class, but its capacity to retain that talent is increasingly strained. Top graduates and researchers face strong incentives to move to the U.S. and Europe—often within months (or days) of completing their degrees. Key indicators include:

- In 2015 and 2016, two-thirds of software engineering students in Canada left the country to work abroad, the majority of whom moved to the U.S.[84] In addition, a significant portion of Canadian AI PhD and top STEM graduates leave Canada within one year, primarily for roles in U.S. Big Tech firms offering higher compensation and access to compute.
- Compensation gaps are significant: Tech workers in the U.S. earn 46 percent more than tech workers in Canada.[85]

[76] https://www.oecd.org/en/topics/ai-principles.html
[77] https://www.canada.ca/en/innovation-science-economic-development/news/2020/12/canada-concludes-inaugural-plenary-of-the-global-partnership-on-artificial-intelligence-with-international-counterparts-in-montreal.html
[78] https://montrealdeclaration-responsibleai.com/
[79] https://kpmg.com/ca/en/home/media/press-releases/2025/06/study-shows-canada-among-least-ai-literate-nations.html
[80] https://srinstitute.utoronto.ca/
[81] https://www.mediatechdemocracy.com/
[82] https://cifar.ca/ai/ai-and-society/
[83] https://lawzero.org/en
[84] https://brocku.ca/social-sciences/political-science/wp-content/uploads/sites/153/Reversing-the-Brain-Drain.pdf
[85] https://dais.ca/news-releases/tech-workers-in-the-u-s-earn-46-per-cent-more-than-tech-workers-in-canada-tmu-study/

- Based on personal anecdotes, senior AI engineers at major U.S. tech companies routinely earn USD 300,000-800,000+, whereas equivalent roles in Canada often fall between CAD 150,000-300,000, even in competitive firms.

Universities face similar pressures: Canada has long struggled to retain its AI faculty and researchers, who are often attracted lucrative offers from U.S. universities and industry labs. Several Canadian AI faculty members have been aggressively recruited since 2020, with many receiving offers from U.S. institutions or industry labs with salaries Canada cannot match. Canadian researchers report difficulty accessing cutting-edge compute resources, which is one of the key factors driving relocations. However, with recent growing political funding uncertainty south of the border, Canada has a great opportunity to reverse the brain drain and attract top American scholars.[86] Several such Canadian initiatives are underway.

This talent drain threatens the long-term sustainability of Canada's AI ecosystem. Training world-class researchers is not sufficient if the ecosystem cannot retain them.

3.2 Startup Scale-Up Challenges

Canada produces a large number of early-stage AI startups but struggles to scale them into global competitors. The startup funnel is strong at the seed stage but weak at Series B and beyond. Key structural issues include:

- Most of the late-stage funding for Canadian AI companies comes from foreign investors, particularly U.S. venture capital (in fact, a similar pattern is increasingly emerging at earlier funding stages).
- Only a small number of Canadian companies have secured venture rounds above USD 200 million in recent years—most prominently Cohere[87] and Waabi[88] (which are often considered as the two most successful Canadian AI companies of our time)—while U.S. and European ecosystems see many more AI megadeals of that size.
- A large portion of Canada-founded AI startups relocate significant operations to the U.S. by the time they reach Series B.

Commercialization challenges play a central role:

- Canadian enterprises adopt new AI solutions slowly (see Section 3.3).
- Procurement cycles for major Canadian enterprises and governments often take a long time to complete, compared with lower cycles in the U.S.
- Canada has relatively few "anchor customers," namely, large domestic firms willing to systematically procure and scale Canadian AI technologies.
- Several successful startups (e.g., Element AI,[89] Maluuba[90]) were acquired early by foreign firms, reinforcing a pattern: Canada excels at creating AI IP but struggles to keep it.

[86] https://www.reuters.com/world/americas/canadian-universities-aim-attract-top-global-scholars-with-funding-boost-2025-12-09/
[87] https://cohere.com/blog/august-2025-funding-round
[88] https://waabi.ai/insights/waabi-series-b-announcement
[89] https://newsroom.servicenow.com/press-releases/details/2020/ServiceNow-to-Acquire-AI-Pioneer-Element-AI-11-30-2020-12-00-AM/default.aspx
[90] https://blogs.microsoft.com/blog/2017/01/13/microsoft-acquires-deep-learning-startup-maluuba-ai-pioneer-yoshua-bengio-advisory-role/

3.3 Industrial Adoption Gap

Canada's AI adoption rates lag behind those of peer countries. While large enterprises in finance, retail, transportation, and telecom are beginning to deploy advanced AI systems, adoption among small and medium-sized enterprise (SMEs), which represent around 99.8% of Canadian businesses,[91] remains low. Key data illustrate this challenge:

- AI and digital adoption rates in Canadian businesses (12.2%)[92] are among the lowest in the OECD countries.[93]
- Around two-thirds of Canadian businesses report that they have no current plans to adopt AI over the next 12 months.[94] In fact, many Canadian firms lack internal staff with data engineering or ML expertise, preventing them from integrating data-driven decision-making into their operations.
- In a ranking of 47 countries, Canada ranked the fourth lowest in AI training and literacy.[95]

This slow adoption reduces productivity growth and limits domestic demand for Canadian AI technologies. Among SMEs, we are beginning to see a widening divide between early adopters and laggards, giving rise to a two-speed economy in which some organizations are already experimenting with sophisticated tools and systems while others remain stuck at the awareness or theoretical stage.

3.4 Infrastructure Gaps in Compute and Energy

3.4.1 Compute Shortages

Access to compute, especially GPUs and high-performance clusters, has become one of the most important bottlenecks for AI research and commercialization. Canada faces serious capacity gaps:

- As of late 2023, Canada accounts for less than 0.7% of global AI compute capacity, far below the U.S. (53%) and China (6%).[96]
- Demand for compute exceeds supply for many researchers, with waiting queues often lasting weeks to months.
- Canadian companies often rely on U.S. hyperscalers,[97] raising concerns about data sovereignty, privacy standards, cost, and long-term competitiveness.
- To train state-of-the-art models, Canadian labs often require external partnerships (e.g., AWS, Google Cloud, JAX Research), highlighting the limited availability of domestic large-scale compute.

Without major investment, Canada risks losing the ability to conduct advanced AI research, particularly in foundation models and agentic systems.

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[91] https://www.bdc.ca/en/articles-tools/business-strategy-planning/manage-business/10-things-didnt-know-canadian-sme
[92] https://www150.statcan.gc.ca/n1/pub/11-621-m/11-621-m2025008-eng.htm
[93] https://www.rbc.com/en/thought-leadership/the-growth-project/bridging-the-imagination-gap-how-canadian-companies-can-become-global-leaders-in-ai-adoption/
[94] https://publications.gc.ca/collections/collection_2025/statcan/11-621-m/11-621-m2025011-eng.pdf
[95] https://kpmg.com/ca/en/home/insights/2025/06/canada-lagging-global-peers-in-ai-trust-and-literacy.html
[96] https://dais.ca/wp-content/uploads/2024/03/Can-Canada-Compute.pdf
[97] Ibid

3.4.2 Electricity Grid Constraints

AI and data centre development require reliable and abundant electricity. Canada's grid, while relatively clean, faces three major challenges:

1. **Insufficient excess capacity**
- New AI data centres can require more than 100 MW each, equivalent to powering a mid-sized city.[98]
- Provincial utilities project that electricity demand will grow by up to 100% by 2050,[99] driven in part by AI and electrification.

2. **Slow permitting and interconnection processes**
   Timelines for grid connection often exceed several years to complete.

3. **Geographic mismatch between demand and supply**
- Provinces with large AI clusters (BC, Ontario, Quebec) face grid strain.
- Provinces with abundant renewable energy (Manitoba, Newfoundland & Labrador) lack major AI infrastructure.

These constraints limit Canada's ability to build sovereign compute capacity, which will be a clear prerequisite for AI competitiveness over the next decade.

3.5 Fragmented National Coordination

Canada's AI governance is dispersed across federal agencies, provincial governments, research institutes, and industry associations. While diversity can be a strength, it often results in duplication of efforts and suboptimal resource allocation. Key challenges include the following:

- Multiple provincial AI strategies (Alberta, BC, Ontario, Quebec) with limited alignment.
- Overlapping national programs and inconsistent metrics for measuring impact.
- Fragmented digital and data governance across ministries.
- Limited coordination between immigration, research funding, industry adoption, and economic development.

For example, while the federal government funds AI research, provinces control electricity policy, which dictates the feasibility of building data centres. These policy domains rarely converge. A unified national strategy that includes shared KPIs and cross-provincial coordination seems essential.

3.6 Slow Commercialization of AI Research

Canada's commercialization ecosystem continues to underperform despite strong academic output. While Canadian universities produce globally influential AI research, the mechanisms for translating research into market-ready products lag behind global peers. Here are some indicators of underperformance:

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[98] https://www.congress.gov/crs-product/R48646
[99] https://news.hydroquebec.com/content/hydroquebec/en/news/press-releases/montreal/growth-in-electricity-demand-remains-strong.html

- Canada ranks 17th globally in overall innovation performance, underscoring persistent challenges in turning research strength into commercial outcomes and growth.[100]
- In 2012, tech transfer offices at U.S. universities backed patent filings nearly double the rate of their Canadian counterparts, and by the following ten years, this gap had widened to a threefold difference.[101] Tech transfers offices in Canada often have limited staffing and long approval cycles, with researchers reporting significant delays to spin out startups. In comparison, close to 80 European deep tech university spinouts reached USD 1 billion valuations or USD 100 million in revenue in 2025.[102]

Regulatory fragmentation also plays a role:

- Health AI and medical device approvals are often much slower than U.S. FDA accelerated pathways.
- Data governance varies across provinces, complicating national deployments of AI solutions in healthcare, insurance, and education.[103]

Without improved commercialization frameworks, Canada will face the risk to continue losing AI IP to global competitors.

4. Canada's Position in the Global AI Landscape

Canada's early leadership in AI remains a core asset, but global competition has intensified dramatically. In the past five years, major economies have launched ambitious national AI strategies with substantial investments in compute, talent, and industry adoption. While Canada still enjoys a strong reputation in research and responsible AI, its relative position has weakened as other countries invest aggressively to build end-to-end AI ecosystems and incentivize mass adoption.

This section situates Canada within the global AI landscape by benchmarking against peer nations and extracting lessons which are essential for Canada's long-term competitiveness.

4.1 Global Benchmarking Against Peer Nations

The U.S.: Scale, Capital, and Commercialization Power

The U.S. currently dominates global AI development due to unparalleled investments in compute, capital, and advanced model training. Key indicators include the following:

- In 2025, the U.S. accounts for 74% of global AI compute capacity.[104]
- In 2024 alone, U.S. private investment in AI exceeded USD 100 billion, compared with less than USD 3 billion in Canada.[105]

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[100] https://www.wipo.int/gii-ranking/en/canada/
[101] https://itif.org/publications/2024/04/29/assessing-canadian-innovation-productivity-and-competitiveness/
[102] https://techcrunch.com/2025/12/30/76-european-deep-tech-university-spinouts-reached-unicorn-or-centaur-status/
[103] https://scc-ccn.ca/system/files/2024-05/scc_data_gov_roadmap_en.pdf
[104] https://www.federalreserve.gov/econres/notes/feds-notes/the-state-of-ai-competition-in-advanced-economies-20251006.html
[105] https://hai.stanford.edu/assets/files/hai_ai-index-report-2025_chapter4_final.pdf

- The U.S. leads in frontier model development with companies like OpenAI, Google DeepMind, Anthropic, Meta, Perplexity, and Amazon, each training models requiring thousands of GPUs and budget ranges in the tens or hundreds of millions. At this rate, the training cost of new frontier models will cost more than USD 1 billion by 2027.[106]
- U.S. companies attract the majority of global venture capital invested in AI.

Relative to this scale, Canada remains a high-quality but small contributor. Canada's strength in fundamental research is recognized, but its capacity to deploy, scale, and commercialize advanced AI remains limited.

The European Union: Regulatory Leadership and Responsible AI

The EU offers a contrasting model, emphasizing regulation, consumer protection, and responsible innovation. Key indicators include the following:

- The EU's AI Act (2024) represents the world's first comprehensive legal framework for AI, shaping global governance norms.[107]
- Europe invests over EUR 1 billion annually in AI-related R&D through Horizon Europe and national programs.[108]
- Countries like France, Germany, and the Netherlands operate large public compute facilities such as GENCI (France),[109] Gauss Centre (Germany),[110] and SURF (Netherlands).[111]

Canada's ethical AI leadership aligns more closely with the European model, but Europe's scale and coordinated regulatory infrastructure now surpass Canada's influence on global norms.

The UK: AI Safety and Model Evaluation Leadership

The UK has positioned itself as a leader in AI safety, evaluation, and model governance. Key indicators include the following:

- The UK established the world's first national AI Safety Institute in 2023, now collaborating with the U.S., Canada, and Japan.[112]
- The government committed up to GBP 2 billion to AI compute and infrastructure.[113]
- London remains a major financial hub for AI-driven fintech and enterprise solutions.

Canada participates in international AI safety dialogues but lacks a dedicated national institution with equivalent scale or mandate.

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[106] https://arxiv.org/pdf/2405.21015
[107] https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai
[108] https://digital-strategy.ec.europa.eu/en/policies/european-ai-research
[109] https://genci.fr/en
[110] https://www.gauss-centre.eu/
[111] https://www.surf.nl/en
[112] https://www.gov.uk/government/news/prime-minister-launches-new-ai-safety-institute
[113] https://www.gov.uk/government/publications/uk-compute-roadmap/uk-compute-roadmap

China: Infrastructure Scale and Rapid Industrial Adoption

China views AI as a strategic national priority and has invested heavily in compute and industrial deployment. Key indicators include the following:

- In 2025, China accounted for 14% of global AI compute[114] and is rapidly expanding its domestic semiconductor capabilities.
- Chinese AI investment surpassed USD 9 billion in 2024,[115] with substantial government-led funding for model training and deployment (and sometimes also by indirectly funding energy bills for compute).[116]
- Industrial adoption is accelerating across many sectors of the economy, including manufacturing, logistics, healthcare, and public administration.
- Several Chinese models (e.g., DeepSeek R1) have achieved global benchmark-competitive performance, rivaling with frontier U.S. models.[117]

While Canada retains advantages in academic freedom, ethics, and international partnerships, it cannot match China's investment scale or industrial mobilization.

Israel: Agility, Defense Tech, and Fast Commercialization

Israel offers a model of entrepreneurial agility and effective integration of AI with defense, cybersecurity, and robotics. Key indicators include the following:

- As of 2021, Israel invests 5.78% of GDP in R&D, the highest proportion in the world.[118]
- Tel Aviv ranks among the top five global hubs for AI and deep-tech startups,[119] despite the country's small population.
- Israel excels in rapid commercialization: Israel is fifth in the world for deep-tech startup funding, both in investments and per-capita funding.[120]

Canada shares similarities with Israel in scientific quality but lacks the speed, defense integration, and venture capital density that fuel Israel's AI innovation engine.

How Canada Stacks Up Overall

Across the major pillars of AI competitiveness, Canada's global position can be summarized in the following table:

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[114] https://www.federalreserve.gov/econres/notes/feds-notes/the-state-of-ai-competition-in-advanced-economies-20251006.html

[115] https://hai.stanford.edu/ai-index/2025-ai-index-report/economy

[116] https://www.cnbc.com/2025/11/07/chinas-strategy-in-ai-race-with-us-big-chip-clusters-cheap-energy.html

[117] https://www.vellum.ai/llm-leaderboard

[118] https://www.theglobaleconomy.com/rankings/research_and_development/OECD/

[119] https://embassies.gov.il/nepal/en/news/tel-aviv-ranks-4-global-startup-ecosystem-2025-global-startup-ecosystem-report-startup-genome

[120] https://innovationisrael.org.il/en/press_release/innovation-report-2025/

Dimension	Canada's Position
Research Excellence	Top five globally in 2023 (number of highly cited publications).[121]
Talent Training	As of 2022, first in the G7 in the growth of AI talent concentration.[122]
Talent Retention	Canada faces a STEM brain drain problem, particularly to the U.S.
Compute Capacity	Bottom of G7 countries.[123]
Startup Creation	Among the world leaders.
Scale-Up Success	Canadian startups face multiple scaling difficulties.[124]
Industrial Adoption	Bottom of the OECD pack.[125]
Ethical & Responsible AI	Among the world leaders.[126]

This confirms the same pattern: Canada excels at creating talent and research but struggles to retain, scale, and deploy AI at speed.

4.2 Lessons from Global Leaders

A review of global strategies reveals several potential lessons for Canada. These lessons are not abstract; they reflect concrete policy models that have already produced measurable impact.

Lesson 1: Scale requires strategic public investment (U.S., China, France, UAE)

Leading nations literally treat AI infrastructure as a national priority:

- The U.S. and China have, together, invested over USD 120 billion into AI compute, data centres, and semiconductor manufacturing.[127,128]
- France's GENCI supercomputing network and AI clusters reflect long-term, centralized, multi-billion-euro commitments.[129]
- The UAE data centre industry is set to more than triple by 2030.[130]

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[121] https://hai.stanford.edu/assets/files/hai_ai_index_report_2025.pdf

[122] https://oecd.ai/en/data?selectedArea=ai-jobs-and-skills&selectedVisualization=ai-talent-concentration-by-country, filtered for G7 countries in 2022

[123] https://dais.ca/wp-content/uploads/2024/03/Can-Canada-Compute.pdf

[124] https://dais.ca/reports/getting-to-scale/

[125] https://www.rbc.com/en/thought-leadership/the-growth-project/bridging-the-imagination-gap-how-canadian-companies-can-become-global-leaders-in-ai-adoption/

[126] https://www.canada.ca/en/innovation-science-economic-development/news/2020/12/canada-concludes-inaugural-plenary-of-the-global-partnership-on-artificial-intelligence-with-international-counterparts-in-montreal.html

[127] https://hai.stanford.edu/policy/what-the-chips-and-science-act-means-for-artificial-intelligence

[128] https://www.goldmansachs.com/insights/articles/chinas-ai-providers-expected-to-invest-70-billion-dollars-in-data-centers-amid-overseas-expansion

[129] https://www.genci.fr/en/news/genci-and-cnrs-choose-eviden-make-jean-zay-supercomputer-one-most-powerful-france

[130] https://www.khaleejtimes.com/business/tech/uae-data-centre-market-set-to-triple-by-2030-on-back-of-ai-cloud-boom

Canada lacks a similar long-horizon infrastructure strategy, particularly in compute and grid planning.

Lesson 2: Retention requires targeted talent incentives (U.S., UK, Singapore)

Top AI nations deploy aggressive retention policies:

- The U.S. offers exceptional compensation and access to frontier compute.
- The UK introduced fast-track visas and talent schemes for AI, quantum, among other fields.[131]
- Singapore uses multi-year, high-visibility national scholarships and fellowships to retain and attract top STEM talent.[132]

Canada has strong immigration pathways but comparatively weak retention mechanisms.

Lesson 3: Commercialization thrives when large domestic enterprises act as "anchor customers" (U.S., Israel)

Countries with fast commercialization dynamics share common features:

- Large domestic enterprises adopt AI early and frequently help fuel innovation.
- Defense, finance, and telecom sectors in the U.S. and Israel routinely serve as first customers for new AI solutions.
- Government procurement is structured to accelerate (and not delay) pilots and deployment.

In Canada, public and private procurement cycles are comparatively slow, hindering growth for domestic AI startups.

Lesson 4: National coordination is essential (EU, UK, France)

Effective AI ecosystems have centralized bodies with real mandates:

- The EU's AI Office coordinates strategy across 27 member states.[133]
- The UK's AI Safety Institute influences global standards and is a pioneer in this domain.[134]
- France's INRIA serves as a national hub for AI research and deployment.[135]

Canada lacks a comparable coordinating institution with national authority across compute, talent, standards, and commercialization. Nevertheless, several recent initiatives and discussions signal a growing recognition of this gap and a desire to address it.

Lesson 5: Regulatory clarity enables faster deployment (U.S., UK)

Countries leading in AI deployment often share:

- Clear guidelines for safe and ethical use of AI.
- Accelerated regulatory pathways (especially in healthcare, fintech, and transportation).

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[131] https://www.gov.uk/global-talent-digital-technology
[132] https://www.a-star.edu.sg/News/astarNews/news/features/how-stem-scholarships-seed-talent-for-singapore
[133] https://artificialintelligenceact.eu/the-ai-office-summary/
[134] https://www.gov.uk/government/publications/ai-safety-institute-overview/introducing-the-ai-safety-institute
[135] https://ai-watch.ec.europa.eu/countries/france/france-ai-strategy-report_en

- Regular updates (with transparent communication channels) to reflect evolving technology.

Canada's regulatory environment is well-intentioned but typically slower and more fragmented, especially for high-stakes applications like medical AI. While balancing the trade-off between innovating in AI with the need to carefully manage execution risks is inherently delicate, excessively restrictive regulatory approaches may slow innovation and limit the ability to capture important economic and societal opportunities. Another pressing concern is the need to strengthen the AI regulatory environment around several high-stakes societal issues, including the creation and distribution of deepfakes (a federal bill aiming to address this was proposed in December 2025).[136]

5. Strategic Opportunities for Canadian Leadership (2026-2035)

Despite significant challenges, Canada holds unique opportunities to reclaim and reinforce global leadership in AI. Over the next decade, strategic investments in infrastructure, talent, and commercialization can create a competitive position that is not based on scale alone, but on specialization, trust, interdisciplinary excellence, and smart national coordination.

Canada cannot—and need not—compete with the U.S. or China on raw compute or capital expenditure. Instead, its advantage lies in building a high-trust, high-talent, socially aligned AI ecosystem anchored in scientific excellence, responsible innovation, and strong public institutions.

This section outlines the five most consequential opportunities for the country from 2026 to 2035.

5.1 AI in Strategic Canadian Sectors

Canada's economic structure creates several sectoral opportunities where AI can deliver transformational value, and where Canada can strive to lead globally. These include healthcare, energy, natural resources, supply chain, finance, and public administration.

Healthcare and Life Sciences

Canada invested close to CAD 400 billion in healthcare in 2025 (more than 12% of GDP),[137] making it one of the country's largest potential AI markets. Opportunities include the following:

- AI-enabled diagnostics (medical imaging, pathology, triage, discharge, treatments),
- Personalized medicine and genomics,
- Preventative healthcare and automated tests and vaccinations recommendations,
- Predictive hospital operations, resource allocation, scheduling, and automation of administrative tasks (documentation, billing, insurance claims, etc.),
- Drug discovery (already accelerated by companies like BenchSci and Recursion Canada[138]).

AI could reduce emergency department wait times, improve surgical scheduling, increase diagnostic throughput and consistency, expand access to care, increase system efficiency, and reduce costs—areas where Canada faces several challenges. At the same time, AI can deliver its full value only if the data infrastructure (privacy, interoperability, data quality) is ready and

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[136] https://www.ctvnews.ca/politics/article/federal-government-tables-bill-on-femicide-deepfakes/

[137] https://www.cihi.ca/en/more-than-money-canadas-billion-dollar-health-budget

[138] https://www.recursion.com/ (Recursion is an American company, though it also has Canadian operations)

modernized and the regulatory environment is well designed. In summary, strategic investment in AI for healthcare has the potential to deliver transformative long-term benefits for Canadian society. Given the scale of healthcare spending and the mounting pressures on the system, it is both an economic and societal imperative for Canada to position itself as a global leader in AI-enabled healthcare innovation.

Energy, Natural Resources, and Sustainability

Canada's resource sectors (directly and indirectly) generate over 19% of the national GDP.[139] AI applications have the potential to substantially strengthen productivity, environmental performance, and operational safety. Examples of use cases and applications include the following:

- Predictive maintenance for pipelines, energy grids, and heavy equipment,
- Emissions monitoring and reduction,
- AI-driven geological exploration,
- Optimization of renewable energy storage and dispatch.

Given global climate constraints, AI for clean energy and resource decarbonization is an area where Canada can aim to become a global leader.

Retail, Supply Chain, and Transportation

Canada's transportation and retail systems are increasingly digital and data-driven but still under-optimized with several promising opportunities:

- AI for demand forecasting (which is a mature and well-understood use case but not deployed at a large enough scale across all the sectors of the economy),
- Dynamic pricing (optimizing pricing decisions, which can be data-driven, adaptive, dynamic, and personalized, while satisfying fairness and ethical considerations),
- Route optimization and supply chain resilience,
- Warehouse automation,
- Agentic systems for customer service, marketing campaigns, back-office routine operations (e.g., accounting reconciliations, document processing), and HR-related decisions.

With retail and supply chain representing over CAD 800 billion in annual economic activity, even modest AI adoption gains would produce major productivity improvements.[140]

Financial Services

Canada's banks and insurers are among the world's most stable and profitable, with the top three banks controlling over 60% of assets in Canada.[141] They have the scale to anchor domestic AI development with a myriad of potential impactful use cases:

- AI for fraud detection, risk modelling, credit scoring,
- Automated compliance tools,

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[139] https://natural-resources.canada.ca/science-data/data-analysis/10-key-facts-canada-s-natural-resources-2023

[140] https://www150.statcan.gc.ca/n1/daily-quotidien/250221/dq250221a-eng.htm

[141] https://dbrs.morningstar.com/research/421868/dbrs-morningstars-takeaways-from-credit-outlook-canada-2024-solid-fundamentals-position-large-canadian-banks-for-growth-opportunities

- Enhancing financial literacy and democratizing access to various investment vehicles and well-informed opportunities,
- Large-scale adoption of foundational models for customer service and other financial applications.

Public Administration

Government services handle billions of citizen interactions annually. AI can dramatically enhance:

- Service delivery (immigration, taxation, benefits processing),
- Fraud detection and program integrity,
- Decision-support tools for public servants,
- Automated document processing,
- Multilingual service accessibility.

Public-sector AI adoption can create anchor markets for Canadian vendors while improving service quality and efficiency.

5.2 Building a Sovereign AI Infrastructure

A strong national compute and data strategy is essential to sustaining leadership. Canada's current compute capacity is insufficient for modern model training, but it offers an opportunity to build the next generation of infrastructure in a coordinated, scalable manner.

Opportunity 1: National GPU clusters

Canada can develop large multi-node GPU superclusters (10,000-50,000+ GPUs) dedicated to research, companies, and government missions. Such clusters would:

- Reduce reliance on foreign hyperscalers (especially for sensitive applications),
- Support training and fine-tuning of foundation models,
- Enable national-scale experimentation in healthcare, climate, and public services,
- Provide compute access for researchers and startups that cannot access U.S. resources.

A recent encouraging step in that direction was announced on December 15, 2025 with Queen's University and Bell collaborating on building a state-of-the-art computing facility to enhance Canada's AI capacity, drive domestic AI adoption, and strengthen digital sovereignty.[142]

Opportunity 2: Public-private partnerships for compute

Models from France (GENCI), the UK (Isambard-AI),[143] and Singapore provide interesting templates. Canada should continue forming co-funded partnerships between:

- DRAC,
- National AI institutes (Mila, Vector, Amii),
- Provincial governments,
- Large enterprises,
- Cloud providers,

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[142] https://www.queensu.ca/gazette/stories/laying-groundwork-canada-s-ai-and-data-sovereignty
[143] https://www.gov.uk/government/publications/ai-research-resource

- Startups and SMEs through subsidized access.

Opportunity 3: Green, renewable, distributed data centres

Canada has a competitive advantage in renewable energy with 83% of electricity that already comes from zero-emission sources.[144] With proper planning, Canada can build:

- Low-carbon efficient AI data centres,
- Distributed compute systems near hydro and wind resources,
- High-density colocation environments optimized for GPUs.

This will position Canada to become a global hub for sustainable AI compute.

5.3 A Next-Generation Talent Strategy

As discussed, Canada trains world-class AI talent but struggles to retain it. A new talent strategy must focus on attraction, retention, and mobility between academia, industry, and government.

Opportunity 1: Elite national fellowships and retention grants

Canada can build a flagship talent program similar to NSF Graduate Research Fellowships[145] or the Rhodes[146]/NSERC models:

- 500-1,000 high-value fellowships annually in AI, computer science, robotics, and data science,
- Retention bonuses for top students and faculty,
- Long-term funding security for early-career researchers.

In fact, on December 9, 2025, the Government of Canada announced a CAD 1.7 billion Canada Global Impact+ Research Talent Initiative to attract more than 1,000 world-leading and emerging researchers to Canadian institutions.[147] The program funds elite research chairs, early-career talent, infrastructure, and training awards, with a focus on strategic areas such as AI, health, clean tech, and advanced manufacturing. Its goal is to strengthen Canada's global competitiveness in science, innovation, and economic growth. This is a great first step in that direction.

Opportunity 2: National cross-university graduate programs

Canada can establish shared programs across major universities (and multi-disciplinary, such as engineering and business, engineering and law) to reduce duplication and create critical mass:

- Joint PhD programs in AI and health, AI and climate, AI and supply chain, and law and AI,
- Shared courses, compute access, and supervision teams,

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[144] https://iea.blob.core.windows.net/assets/7ec2467c-78b4-4c0c-a966-a42b8861ec5a/Canada2022.pdf

[145] https://www.nsf.gov/funding/opportunities/grfp-nsf-graduate-research-fellowship-program

[146] https://www.rhodeshouse.ox.ac.uk/scholarships/the-rhodes-scholarship/

[147] https://www.canada.ca/en/innovation-science-economic-development/news/2025/12/government-of-canada-launches-new-initiative-to-recruit-world-leading-researchers.html; https://www.canada.ca/en/impact-plus-chairs/program-details/competition/2026/apply.html

- University programs in close collaboration with industry partners (large firms and startups), such as the partnership between Google and the University of Waterloo on the future of learning and work launched in October 2025.[148]

Opportunity 3: Upskilling the workforce

A competitive economy requires more than research talent. It has now become clear that the workforce is poised to go through a substantial transformation, and it is crucial to anticipate this transformation and be ready for it by upskilling and reskilling the future generation of workers. Canada should target:

- Upskilling at least 1 million workers in AI literacy, analytics, automation, and cybersecurity,
- Industry-led micro-credential programs with strong hands-on skills (e.g., prompt engineering),
- Expansion of college and polytechnic AI offerings,
- Educate and sensibilize SMEs to digital technology, data-driven processes, pipeline automation, and agentic solutions (e.g., by offering subsidies, tax rebates, and free trainings).

Critically, learning AI differs from learning traditional skills: the only way to truly develop mastery is through continuous experimentation with real workflows and rapid feedback loops. Put simply, workers need opportunities to "get their hands dirty."

Opportunity 4: Immigration pathways for AI experts

Canada has already a strong immigration system, but could strengthen:

- Fast-track permanent residency for top AI engineers, scientists, and entrepreneurs,
- Visa pathways for frontier-model researchers,
- Retention incentives for international graduates.

5.4 Commercialization as a National Priority

As mentioned, Canada excels at creating AI IP but underperforms at scaling it. A renewed focus on commercialization can change this trajectory.

Opportunity 1: Strengthening anchor customers

Large enterprises, such as banks, telecoms, retailers, and government institutions can serve among the first major customers for Canadian AI companies. This creates:

- Early growth and revenue that lead to proof of concepts,
- Real-world validation with quick feedback and constant improvements,
- Pathways to scale globally.

Opportunity 2: A "Canadian AI commercialization accelerator"

Canada can establish a national commercialization vehicle focused specifically on AI, combining:

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[148] https://blog.google/technology/ai/google-university-of-waterloo-education-work/

- Funding and office space,
- Compute credits,
- Pilot deployment support,
- Procurement pathways,
- Access to industry partners and anchor customers,
- Help with legal matters.

This would complement existing incubators (e.g., CDL, Centech) with a national, sector-agnostic mandate.

Opportunity 3: Modernizing tech transfer

Canada can accelerate and improve university research commercialization by:

- Standardizing IP frameworks across institutions,
- Reducing negotiation timelines and administrative processes,
- Hiring specialized commercialization staff,
- Encouraging professor-led spinouts,
- Creating shared IP pools for interdisciplinary projects.

Opportunity 4: Domestic capital pools

It may be in Canada's best interest to create new financial mechanisms:

- A CAD 1-2 billion AI Growth Fund,
- Attractive tax incentives for AI venture investment,
- Co-investment models (government + pension funds).

5.5 Regional and Sectoral Cluster Development and Reinforcement

Canada's AI ecosystem is spread across provinces with strong local strengths. Instead of building isolated ecosystems, Canada can aim to strengthen national connectivity while empowering regional specialization.

Opportunity 1: Sector-specific national clusters

Canada could support clusters aligned with regional strengths:

- Montreal → Foundation models, deep learning, responsible AI,
- Toronto-Waterloo → Fintech, healthcare, enterprise AI,
- Edmonton → Reinforcement learning, robotics, autonomous systems,
- Vancouver → Computer vision, gaming, generative media,
- Calgary → Energy and industrial AI,
- Atlantic Canada → Ocean technologies and AI for climate resilience.

Opportunity 2: National AI testbeds

Testbeds can help accelerate adoption by offering shared physical and digital platforms for experimentation. Canada can develop testbeds in several domains, including the following:

- Healthcare operations,

- Smart grids,
- Autonomous vehicles,
- Robotics and warehouses,
- Energy systems.

Opportunity 3: Inter-provincial infrastructure planning

National competitiveness may require improving the following:

- Shared data standards,
- Unified compute access,
- Interconnected energy planning,
- Integrated regulatory frameworks.

Canada can strengthen its competitive advantage by coordinating these systems nationally, which is something that very few countries do effectively.

6. Calls to Action

Canada has the talent, research excellence, and institutional capacity to be a global leader in AI. But this will happen only if governments, universities, industry, and investors take coordinated action. The next decade will define whether Canada becomes a thriving AI nation or loses its early advantage to countries investing more aggressively and strategically.

This section presents clear, actionable, and measurable calls to action tailored to the five stakeholder groups that must jointly shape Canada's AI future:

(1) Federal Government, (2) Provincial Governments, (3) Universities, (4) Industry and Large Enterprises, and (5) Startups and Investors.

These recommendations emphasize national coordination, long-term planning, sovereign capability, and rapid commercialization, which are all areas where Canada has significant room for improvement.[149]

6.1 Federal Government

Call to Action 1: Launch a national AI compute strategy

Canada must invest in sovereign compute capacity comparable to leading nations.

- As mentioned above, build national GPU superclusters, each with 10,000-50,000+ GPUs, accessible to researchers, enterprises, and startups.
- Establish a national compute governance body to coordinate DRAC, AI institutes, cloud partners, and provincial stakeholders.
- Prioritize privacy-preserving, research-accessible, and low-carbon infrastructure.

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[149] The recommendations presented in this section are intended to be comprehensive and reflect my own perspective. An equally important step is the strategic prioritization of these recommendations (including their timelines), which depends on a range of factors and considerations and is beyond the scope of this article.

Call to Action 2: Create a CAD 1-2 billion national AI commercialization fund

To address scale-up challenges, the federal government should create a fund modeled after the U.S. CHIPS incentives, France's AI cluster strategy, and Singapore's Temasek-backed deep-tech fund.[150] The fund should support the following activities:

- Growth-stage financing,
- Foundational model training costs,
- Pilot-scale deployments in healthcare, energy, and public administration,
- Co-investments with pension funds.

Call to Action 3: Modernize national procurement

The government should become among the first customers for Canadian AI solutions.

- Accelerate pilot programs (3-6 months, not 12-24),
- Streamline procurement rules for early-stage AI deployments,
- Establish a Federal AI Sandbox for safe experimentation,
- Increase government AI adoption in immigration processing, CRA, healthcare, and transportation.

Call to Action 4: Strengthen immigration and retention pathways

Once again, Canada must not only attract but retain AI talent. For example:

- Fast-track permanent residency for top AI engineers, researchers, and entrepreneurs,
- Introduce a "National AI Talent Visa" with two-week processing,
- Offer matching grants for companies hiring Canadian-trained AI graduates,
- Fund 500-1,000 elite graduate fellowships annually in AI-intensive fields.

Call to Action 5: Establish a national AI governance council

Similar to the UK's AI Safety Institute or EU AI Office, such a body should coordinate:

- Computation policy,
- National safety guidelines,
- Standards and testing,
- Provincial alignment,
- International collaboration.

Canada has already started acting on that direction. In 2019, it created the Advisory Council on AI, which is a federal expert body (from academia, industry, and civil society) that provides independent advice to the Government on key AI developments, opportunities, risks, and policy directions to support responsible AI adoption and strengthen Canada's global competitiveness in the field.[151] The council has the mission to provide guidance on issues such as governance, talent, economic opportunity, and broader societal impacts of emerging AI technologies.

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[150] https://www.temasek.com.sg/en/news-and-resources/news-room/news/2023/NTU-NUS-Temasek-invest-75m-deep-tech-ventures
[151] https://ised-isde.canada.ca/site/advisory-council-artificial-intelligence/en

In September 2025, the government also launched an AI Strategy Task Force composed of a group of experts to conduct an intensive consultation process and deliver recommendations for a renewed national AI strategy.[152] The task force is focused on identifying Canada's strategic advantages, addressing risks, and setting priorities for long-term investment and policy action. Together, these initiatives aim to shape a cohesive national approach to AI to guide policy, public engagement, and strategic priorities for AI innovation and safe adoption across the economy and society, while ensuring safety and trust.

6.2 Provincial Governments

Call to Action 1: Expand electricity grid capacity for AI

AI data centres require reliable power. Provinces should:

- Invest in modernized transmission infrastructure,
- Establish fast-track permitting processes,
- Support clean, renewable-powered AI campuses,
- Coordinate interprovincial grid planning (currently fragmented).

Electricity constraints are among Canada's largest long-term AI bottlenecks.

Call to Action 2: Support regional AI clusters

As mentioned before, provinces should continue investing in cluster strengths:

- Quebec → Foundation models, deep learning, responsible AI,
- Ontario → Fintech, healthcare, enterprise AI,
- Alberta → Reinforcement learning, robotics, autonomous systems,
- B.C. → Computer vision, gaming, generative media,
- Prairie & Atlantic → Climate, agriculture, and ocean AI.

Provinces can co-fund AI testbeds in hospitals, energy grids, supply chains, and smart cities.

Call to Action 3: Align provincial AI strategies with national priorities

This includes the following:

- Unified standards for health data interoperability (support shared data repositories, promote privacy-preserving technologies, incentives to contribute anonymized datasets to public testbeds),
- Shared compute access frameworks,
- Coordinated training and upskilling programs,
- Consistent regulatory frameworks for AI testing and deployment.

6.3 Universities

Call to Action 1: Build inter-university and inter-disciplinary graduate programs

Universities and different faculties should collaborate to create national programs in:

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[152] https://ised-isde.canada.ca/site/advisory-council-artificial-intelligence/en/ai-strategy-taskforce

- AI and health,
- AI and climate,
- AI and supply chain,
- AI governance and policy,
- Law and AI,
- Robotics and autonomous systems.

These programs should share faculty, compute, and coursework, while collaborating closely with industry partners. At the same time, achieving this integration is challenging: universities tend to evolve slowly, making it time-consuming to launch new programs or update curricula, and instructors often have limited incentives to modernize course content. By contrast, the pace of change in AI is far faster.

Call to Action 2: Transform tech transfer models

To accelerate commercialization:

- Standardize IP policies across Canadian universities,
- Shorten negotiation times (weeks, and not months),
- Encourage professor-led and lab-level commercialization,
- Create joint university-funded pre-seed AI vehicles.

Call to Action 3: Professionalize AI education

Universities should:

- Integrate AI literacy into all undergraduate programs (and even at the high-school level), moving beyond basic exposure to chatbots like ChatGPT or Gemini,
- Build applied AI labs involving industry,
- Expand co-op partnerships in AI-intensive sectors,
- Train 10,000+ new applied AI graduates per year by 2030,
- Encourage university professors to adopt AI tools so as to enhance the learning experience and to teach students at all levels how to use AI effectively and responsibly.

Call to Action 4: Improve faculty retention

Universities must aim to compete globally:

- Offer retention bonuses for top AI researchers and match international compensation packages,
- Improve access to compute resources,
- Create hybrid research appointments with leading AI institutes,
- Expand strategic hiring in high-demand subfields (LLMs, agentic AI, robotics).

6.4 Industry and Large Enterprises

Call to Action 1: Act as anchor customers for Canadian AI

Large enterprises, especially in banking, telecom, retail, energy, and government should:

- Prioritize procuring Canadian AI startup solutions,

- Sponsor AI pilots across business units,
- Share anonymized datasets for safe testing and cross training,
- Co-invest in national compute clusters.

Active procurement is the fastest way to scale domestic AI companies. Canadian companies may be incentivized to do so by receiving government funding, attractive rates, equity shares, and preferred investment opportunities, including joint IP ownership.

Call to Action 2: Adopt responsible AI frameworks

Industry should implement:

- Model risk governance,
- Bias and discrimination-free auditing protocols,
- Transparent reporting,
- Third-party model evaluation.

This will strengthen trust and accelerate adoption.

Call to Action 3: Invest in upskilling workers

The target is to train as many Canadian workers as possible in AI literacy by 2030. This includes:

- On-the-job training,
- Partnerships with universities and colleges,
- Micro-credentialing programs,
- Manager- and executive-level training.

Call to Action 4: Contribute to national AI infrastructure

Enterprises can co-invest in:

- GPU superclusters,
- Federated data systems,
- Sector-specific testbeds,
- Applied research labs.

6.5 Startups and Investors

Call to Action 1: Build Canadian-owned AI IP

Startups should:

- Prioritize defensible AI IP,
- Maintain Canadian HQs where possible (assuming that attractive incentives exist),
- Leverage national compute incentives,
- Collaborate with universities for talent pipelines.

Call to Action 2: Strengthen late-stage domestic capital

Investors should:

- Establish larger Series B-D funds to preserve Canadian AI innovations,

- Partner with pension funds,
- Increase investments to match global norms (Canada currently attracts only a small fraction of global AI venture capital funds).

Call to Action 3: Participate in national testbeds

Startups should engage in:

- Health AI pilot domestic programs,
- Energy and smart grid optimization projects,
- Supply chain forecasting testbeds,
- AI for government services.

Such participation will accelerate validation and revenue generation.

Call to Action 4: Adopt global standards early

To compete globally, Canadian AI companies should align with:

- ISO/IEC AI standards,[153]
- UK and EU safety testing frameworks,
- NIST AI risk management guidelines,[154]
- International benchmarking of models.

Canada's long-term competitiveness in AI requires more than investments in research, compute, and talent. It requires coordinated, transparent, and measurable governance. Fragmentation across ministries, agencies, provinces, and institutions has slowed progress and diluted the impact of public investments. To compete globally, Canada needs a clear governance structure with defined responsibilities, enforceable standards, and transparent metrics to assess progress.

In addition, to ensure accountability, Canada also needs a transparent and measurable framework for tracking AI progress. This framework should be multi-dimensional with concrete, easy-to-measure metrics (talent, research impact, compute and infrastructure, commercialization, industry adoption, responsible and safe AI), should be updated annually, and fully transparent (results published publicly and benchmarked internationally).

7. Conclusion: A Vision for the Next Decade

Canada stands at a defining moment in the evolution of AI. Over the past decade, the country has earned global recognition for its research excellence, its early leadership in deep learning, and its principled approach to responsible and human-centric AI. These foundations remain among the strongest in the world. Yet the global AI landscape has changed fundamentally: innovation is accelerating, compute and data have become strategic assets, and talent flows increasingly shape national competitiveness. In this new reality, Canada must act decisively to secure its leadership for the next generation.

The message of this white paper is clear: Canada can remain a global leader in AI, but only if it embraces bold, coordinated, and transformative action. Incremental progress will not be sufficient.

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[153] https://www.iso.org/obp/ui/en/#iso:std:iso-iec:42001:ed-1:v1:en
[154] https://www.nist.gov/itl/ai-risk-management-framework

Countries that once followed Canada's lead have now invested aggressively in AI infrastructure, scale-up capital, workforce development, and regulatory clarity. To compete, Canada must match this ambition—not in scale, but in focus, strategy, and national alignment.

Canada's strengths are real and consequential: world-class researchers, robust training pipelines, interdisciplinary excellence, globally recognized research institutes, and a strong culture of responsible innovation. These assets uniquely position Canada to lead in domains where trust, talent, and societal alignment matter as much as scale and compute. But these strengths are fragile. Talent outmigration, limited domestic capital, slow adoption, and constrained compute capacity threaten to erode Canada's advantages unless addressed with urgency.

The next decade presents a generational opportunity. If Canada can build sovereign AI infrastructure, attract and retain top talent, accelerate commercialization, and coordinate national strategy across provinces, academia, and industry, it can define a uniquely Canadian model of AI leadership—one that prioritizes excellence, sustainability, and societal impact.

If realized, this vision will not only support global competitiveness—it will improve the everyday lives of Canadians, including more accessible and faster healthcare, cleaner energy systems, more efficient supply chains, dynamic public services, stronger cybersecurity, and more inclusive economic growth.

Canada has the opportunity to shape not just the future of AI, but the future of how AI coexists with society. The choice is whether to lead with purpose or follow reluctantly. The path forward demands bold policy, cross-sector collaboration, sustained investment, and a commitment to excellence.

The next decade will determine whether Canada continues as a global AI nation.

The time to act is now.