

Editor's Welcome

The AI Revolution: New Challenges and Opportunities

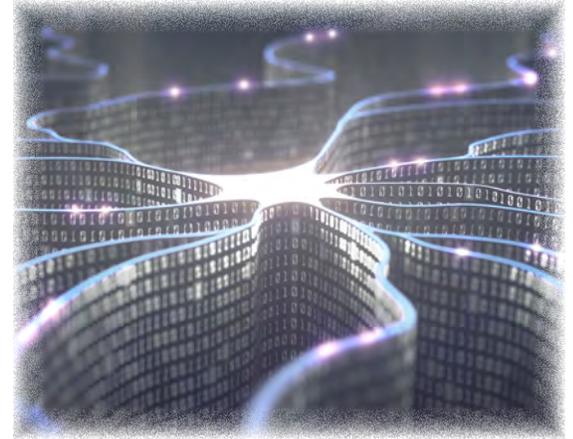
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The rapid speed of innovation and the development of disruptive technologies such as Artificial Intelligence (AI) over the past few decades has radically transformed the way businesses, individuals, and machines operate and interact. Thus, disruptive technologies have deeply permeated global markets and industry applications.

Due to its ability to substantially improve productivity and boost economic output, AI is considered to be the next big technological revolution with the potential to increase economic growth rates by a weighted average of 1.7% and profitability rates by 38% across a variety of industries by 2035¹.

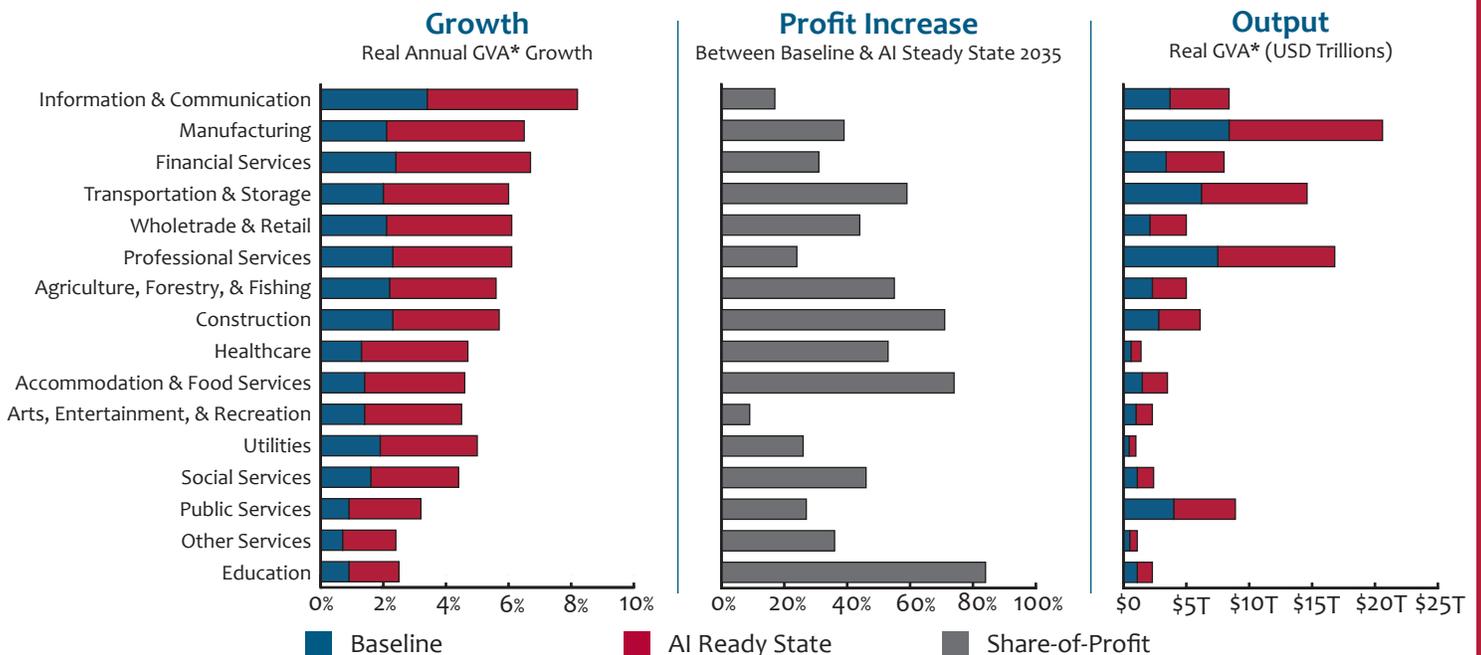
For labour intensive industries such as Information & Communications Technology (ICT), AI can improve labour and capital augmentation to delegate low value tasks, manage data, and maximize asset utilization rates, as well as predict and prevent failures. For capital intensive industries such as manufacturing, AI can provide intelligent automation (e.g. for supply chain management) as well as process monitoring to offer real-time supply chain visibility, and streamlining of the sales process by analysis of historical buying patterns. Furthermore, AI can optimize new product development based on design objectives and restrictions through comparison of cost, materials, and relative function data.

The potential of AI to disrupt and transform almost every industry brings about great challenges, and yet even greater opportunities for innovation and economic growth for business and for Canada as a global AI hub.



Impact of Artificial Intelligence¹

Based on a comparison of baseline growth in 2035 with an AI steady state scenario where AI has been absorbed into the economy



¹Gross Value Added (GVA) is a measure of the value of goods and services produced; GVA represents a close approximation of GDP

Maximizing Labour and Capital Capacity with AI

AI technology and robotics are expected to revolutionize industry applications and create tremendous value by boosting capital and labour capacity, leading industry analysts to forecast the global AI and robotics market to grow to US\$153B by 2020².

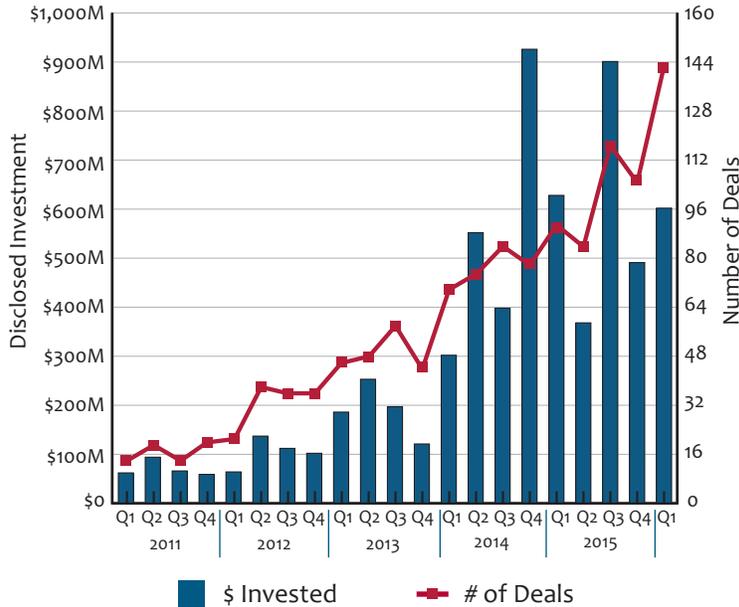
The table below summarizes some major opportunities for value creation and economic growth with AI and robotics in various industries:

Industry	Use Case (AI Technique)	Technology	Estimated Technology Market Value ²
Agriculture & Food Processing	<ul style="list-style-type: none"> Agricultural land use optimization (Meta-heuristics) Real-time optimization of equipment cleaning and food sorting (Operations Management & Signal Processing) Disease recognition from a list of symptoms (Pattern Recognition) Classification of samples and forecasting (Machine Learning) 	Agricultural Robots	\$16.3B by 2020
Industrial/ Manufacturing (including Automotive and Aerospace)	<ul style="list-style-type: none"> Detection and Navigation (Computer Vision) Video/image processing (Signal Processing) Economic production cycle design & sales/operations planning (Operations Management) Air traffic management, ground traffic optimization, & vehicle routing optimization (Meta-heuristics) Customer segmentation (Machine Learning) Classification of samples (Machine Learning) 	Autonomous Cars	\$87B by 2030
		Industrial Robots	\$24B by 2025
		Logistics, Packaging & Materials	\$31B by 2020
		Drones (UAV/UGV/UUV)	\$14B by 2025
		Military	\$7.5 by 2018
Financial	<ul style="list-style-type: none"> Fraud detection (Machine Learning) Optical Character Recognition in ATM check deposits (Computer Vision) Cybersecurity (Quantum Computing) Algorithmic trading strategy performance improvement & Stock pick recommendations based on Twitter feeds (Cognitive Computing) Forecasting (Machine Learning) 	Robo Advisor	\$255B-2.2T AuM (assets under management) by 2020
Biotechnology, Pharmaceuticals & Healthcare	<ul style="list-style-type: none"> Patient Treatments & Clinical Trials (Cognitive Computing) Disease recognition from a list of symptoms & white blood cell recognition (Pattern Recognition) Personal assistant and machine translation (Natural Language Processing) Spoken word recognition (Pattern Recognition) Psycholinguistics (Signal Processing) Data management & mining medical records (Cognitive Computing) 	Surgical	\$18B by 2022
		Exoskeletons	\$2.1B by 2021
		Rehabilitation	\$1.1B by 2021
		Personal & Care-bots	\$17.4B by 2020
		Domestic Robots	\$12.2B by 2018
Digital Gaming	<ul style="list-style-type: none"> Video/image processing (Signal Processing) Analysis of customer behaviour to target content at point-of-sale (Cognitive Computing) Marketing campaigns (Operations Management) Social media sentiment analysis (Natural Language Processing) Customer segmentation (Machine Learning) 	Entertainment & Leisure	\$7.6B by 2018

AI Financial Landscape

As one of the top technologies currently disrupting industry, Artificial Intelligence (AI) is leading to profound opportunities that are translating into growing stock momentum with large companies and annual investment gains for early stage startups, within Canada and on a global scale.

Global Quarterly AI Financing



AI stocks are gaining strength with the Global X Robotics and Artificial Intelligence ETF (BOTZ) up 30% this year and the Global Robotics and Automation Index (ROBO) up 25%, outpacing the S&P 500 (up 11%), and the Dow Jones industrial average (up 9%)³. AI has also been gaining traction in the stock market, attracting interest from 22 of the leading 60 TSX companies, and drawing investment from 13 companies⁴.

Global equity deals to startups in AI increased almost six-fold from 2011 (~70) to 2015 (nearly 400). These deals went predominantly (65% or more) to early-stage AI-focused companies raising seed/angel or Series A rounds⁵. In 2016, 650 AI startups around the world raised US\$5B.

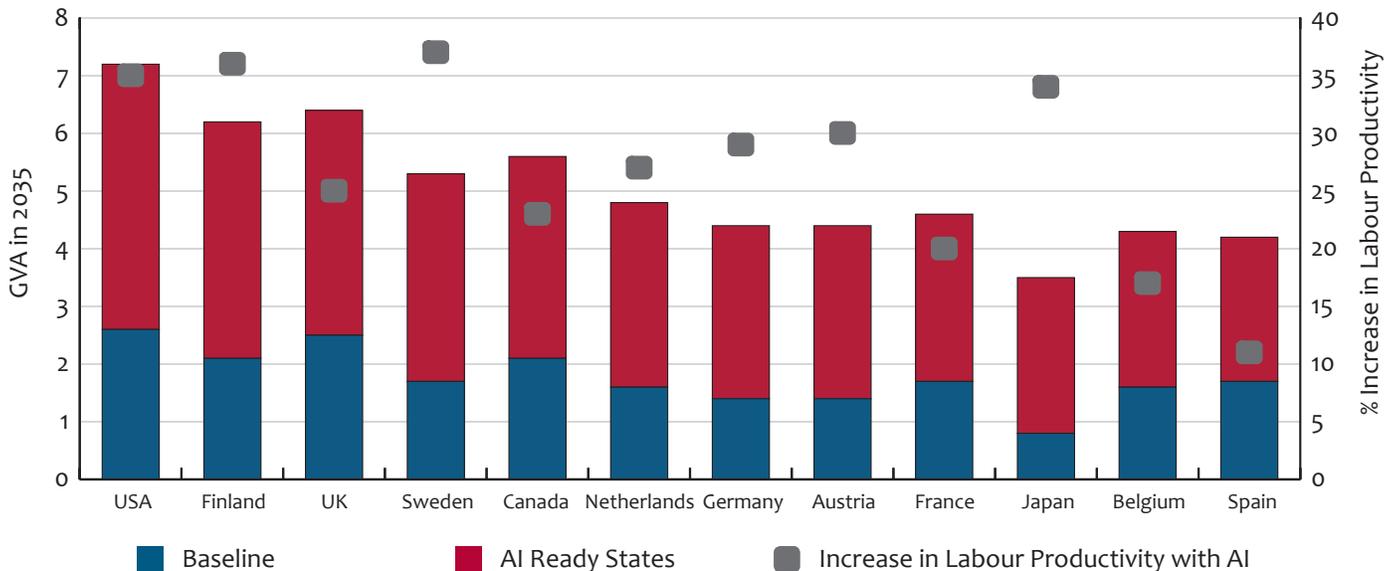
AI investment in Canada is growing with an annual total of 16 deals made⁶ and Canada accounting for 2.7% of the global deal share in 2016⁴. Investment surged to a record breaking \$162M across 12 deals in the first half of 2017 alone, amidst slowing investment in the tech sector. Overall, the most active investors in Canada in 2017 Q2 include BDC, 500 Startups, Real Ventures, our sister company NorthSpring Capital Partners, MaRS, Cycle Capital, Golden Triangle Angel Network, and Relay Ventures⁶.

AI Market Forecast

Global AI software revenue is estimated to grow from \$1.38B in 2016 to \$59.75B by 2025, at a compound annual growth rate (CAGR) of 52%⁷, with global economic impact predicted to be as high as US\$3T over the next decade⁴.

Industry forecasts estimate that by 2035, AI will increase Canadian annual gross value added (GVA) growth rate from 2.1% to 3.5%, and boost labour productivity by 23%⁸.

Estimated AI Impact on Growth & Productivity in 2035



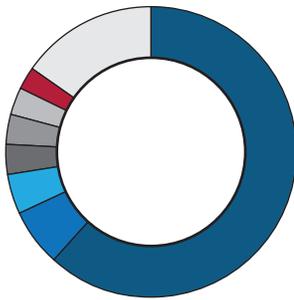
Canada: A Global AI Hub

Over the past year and a half, nearly \$500M has been committed by the federal and provincial governments, academic networks and partnerships, and private corporations to develop Canada's artificial intelligence ecosystem⁴.

The Federal Government committed \$125M to launch a Pan-Canadian Artificial Intelligence Strategy aimed at promoting international investment and collaboration between Canada's main AI hubs in Montréal, Toronto-Waterloo, and Edmonton.

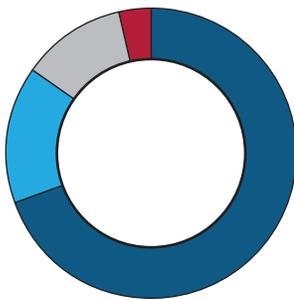
AI Deal Shares in 2016

- USA
- UK
- Israel
- India
- France
- Germany
- Canada
- Other

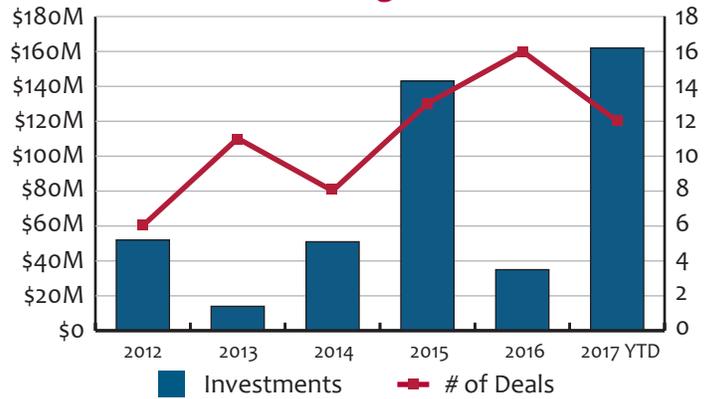


AI Companies

- USA
- Europe
- Asia
- Canada



AI Financing in Canada



Ontario is investing \$650M over 5 years in the Business Growth Initiative including \$50M for Artificial Intelligence to support the Toronto-based Vector Institute (in addition to federal and provincial support, more than 30 private companies have also committed a combined total of \$80M for the Vector Institute), \$130M for 5G (fifth generation wireless technology), \$20M for Quantum Computing, \$75M for the Advanced Research Computing and Big Data Strategy, and \$80M to create the Autonomous Vehicles (AV) Innovation Network⁹. In 2016, Toronto became the home base of NextAI, a global innovation hub for artificial intelligence, launched with initial funding of \$5M through a partnership between some of Canada's largest corporations (including RBC, Magna, BDC Capital and Scotiabank). Toronto will also become the home of Canada's second Google Brain lab as well as Uber's new autonomous car lab in Toronto⁵.

Québec committed to invest over \$800M over 6 years to stimulate research and innovation including a \$100M investment to build an AI supercluster¹⁰. In January 2017, Microsoft committed \$7M investment in AI research in Montreal for the acquisition of Maluuba, a natural language processing start-up⁴. Google has also invested a total of \$4.5M in AI research in Montreal's Institute for Learning Algorithms and is opening a lab in Montreal dedicated to deep learning¹¹.

BC is devoting an additional \$87M over the next 3 years to the implementation and enhancement of BC's tech strategy¹². Meanwhile, the Alberta Enterprise Corporation will continue to receive funding to spur the growth of tech companies¹³. Furthermore, funding was doubled for technology development programs through Alberta Innovates, a provincial innovation catalyst¹⁴.

¹Accenture: AI Industry Growth – How AI Boost Industry Profits & Innovation, 2017
²Bank of America Merrill Lynch: Robotics and AI, 2015
³CNBC: Crushing the Old Economy, 2017
⁴Royal Bank: Canada's AI Challenge, 2017
⁵CBI Insights: Artificial Intelligence Explodes, 2016
⁶PWC: MoneyTree Canada Report (Q2), 2017
⁷Tractica: Artificial Intelligence Software Revenue, 2017

⁸Accenture: Artificial Intelligence is the Future of Growth, 2017
⁹Ontario Budget 2017
¹⁰Quebec Economic Plan 2017-2018
¹¹Tech Crunch: Google Opens New AI Lab and Invests \$3-4M in Montreal-based AI Research, 2017
¹²BC Budget 2017-2018
¹³Alberta Budget Highlights 2017-2018
¹⁴Government of Alberta: Jobs Plan Supporting Businesses, 2017

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About Us:
 NorthBridge Consultants has been assisting companies access government funding for over 20 years. As one of the largest independent government funding consulting firms in Canada, our objective is to maximize our clients' funding potential.

