INVEST IN CANADA

INTERNET OF THINGS IN CANADA

Canada

The Internet of Things (IoT) revolution: how foreign investors in Canada are pioneering the disruptive technologies of tomorrow

When the term "Internet of Things" was first conceptualized in 1999, few predicted the exponential growth this sector would deliver within two decades. Today, foreign investors – including firms such as Samsung and Apple, as well as numerous Canadian start-ups – are at the forefront of Canada's IoT revolution.

# OVERVIEW OF THE CANADIAN IoT SECTOR

The term "Internet of Things" refers to the networks of devices, objects and machines that are connected by IP connectivity and can communicate without human intervention. According to GSMA, the association that represents the interests of mobile carriers worldwide, the total number of connected devices across all technologies is expected to reach 25.6 billion by 2020.[1]

Analyst firm IDC expects the Canadian IoT market to double in value between 2013 and 2018, to reach $6.5 billion– a compound annual growth rate (CAGR) of 18%.[2]

Canada offers foreign technology investors significant advantages in key areas of the IoT value chain. These include:

- Manufacturing, Research & Development (R&D) capabilities for IoT hardware including semiconductors, specialized Wi-Fi routers, microcontrollers, edge devices, etc.

- Opportunities for foreign software companies and systems integrators to develop and commercialize new IoT solutions and platforms in Canada.

- World-class infrastructure for big data analytics companies and cyber security firms to develop and test solutions for IoT data streams.

- Vendor opportunities in a wide range of IoT verticals such as health care, transportation, government services, tourism, extractive sectors (such as mining, oil and gas), retail and financial services, with a wide range of applications ranging from wearable smart watches, connected security cameras, home appliances and thermostats.

- Other applications include enterprise use cases where low-cost sensors can collect and relay information from connected objects in areas such as inventory management, fault detection, performance measurement and business process monitoring.

THE IoT ECOSYSTEM IN CANADA
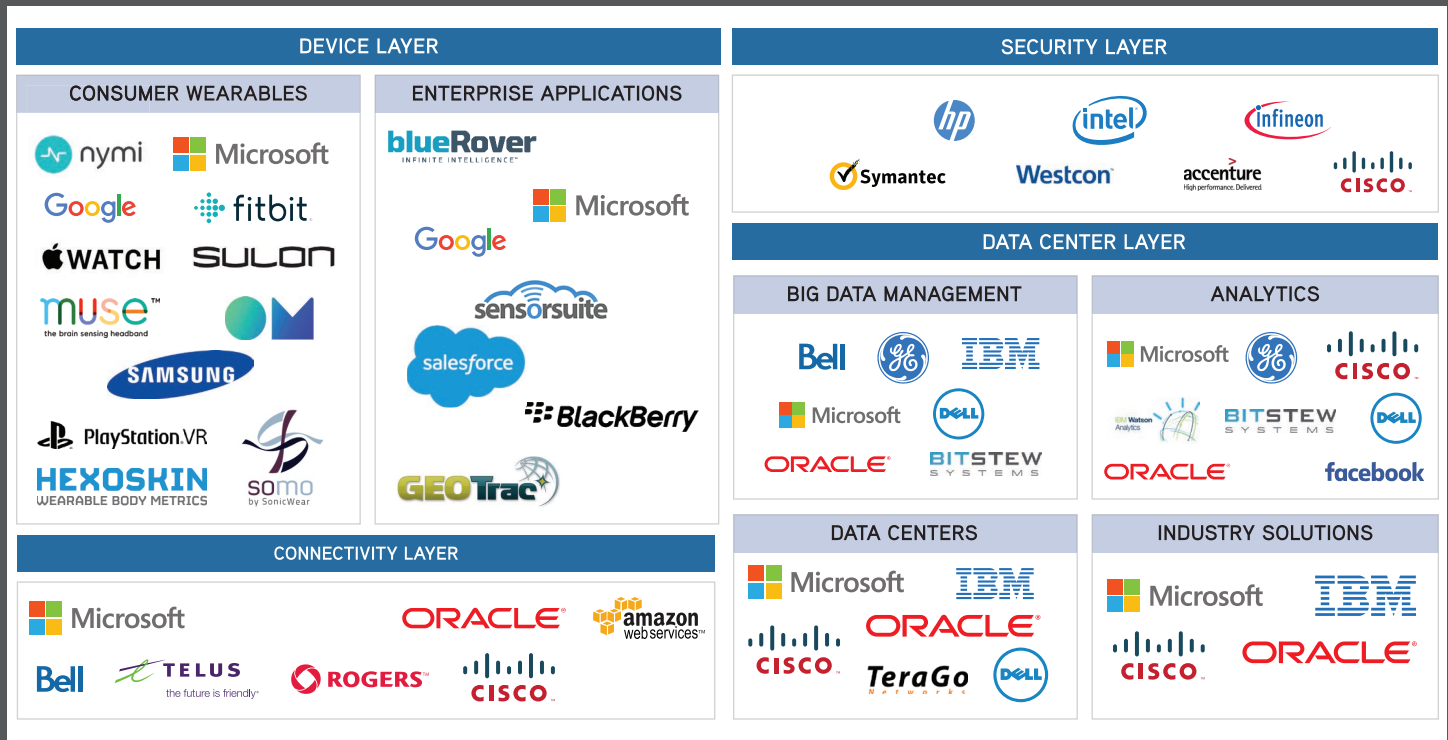
1   GSMA. *GSMA announces device and application connectivity efficiency guidelines to accelerate the Internet of Things.*
2   IDC. *Canadian Internet of Things Ecosystem and Trends.*

INTERNET OF THINGS: KEY BUSINESS ATTRACTION FACTORS IN CANADA

THE CANADIAN IoT MARKET IS EXPECTED TO MORE THAN DOUBLE IN SIZE

$6.5B
(2018)
___
$2.9B
(2013)

Analyst firm IDC has predicted that the Canadian IoT market will grow at a CAGR of 18% between 2013-2018.[3]

NEW AND REVOLUTIONARY IoT PRODUCTS ARE APPEARING IN THE CANADIAN MARKETPLACE EVERY YEAR

114 MILLION
UNITS

IDC predicts that, in Canada, the number of devices connected to IoT solutions will grow from 28 million in 2013 to 114 million by 2018.[4]

32%

of Canadian enterprises have already deployed wired (i.e., connected via Ethernet) or wireless (i.e., cellular, Wi-Fi, Zigbee, NFC) sensors and systems for business purposes. Applications are deployed in a wide range of areas, including employee tracking, security systems, asset tracking, fleet tracking, remote monitoring, building management and augmented reality.[5]

GROWING WEARABLES AND VIRTUAL REALITY TECHNOLOGY CLUSTERS

Canadian cities such as Montréal, Toronto, Calgary and Vancouver are home to world-leading companies such as OmSignal, Hexoskin, Heddoco, Bionym, InteraXon, Felix & Paul Studios and Occupied VR—producing leading-edge products in biometrics, 3D motion capture and Virtual Reality solutions.

60%

In a national survey undertaken for Primus Canada by Leger Marketing in 2015, almost two-thirds of Canadians said that they want to be connected to the Internet 24/7. Canadians' connection to the Internet is evidenced by the fact that 76% now possess a smart phone. With such high technology usage and need to be constantly connected, it is not surprising that 45% of Canadians have heard of "The Internet of Things."[6]

100+

Over 100 Masters programs in Computer Science & Information Technology, ranging from Business Information Systems to Data Science and Big Data Analytics, are offered in Canada. According to QS Limited's *World University Rankings*,[7] four of the top 50 Computing Science universities are located in Canada—ensuring that foreign investors in the IoT space are able to source the best talent for their innovation strategies.

3 IDC. *Canadian Internet of Things Ecosystem and Trends.*
4 Ibid.
5 Ibid.
6 Primus Canada. *Consumers see IoT as a way to make life easier, safer, efficient and less expensive; one-in-four Canadians see themselves as early tech adopters.*
7 QS Ltd. *QS World University Rankings by Subject 2015 - Computer Science & Information Systems.*

CANADA IS A WORLD LEADER IN THE INDUSTRIAL INTERNET OF THINGS (IIoT)

A testament to Canadian innovation in the IIoT market are companies at the leading-edge of global IIoT deployments. Calgary-based Pure Technologies' Acoustic Fiber Optic Sensor system alerts operators of deteriorating pipelines, which can help avoid costly pipe bursts.

Another example of Canadian expertise is Vancouver-based Awesense, which uses secure wireless current sensors and analytics to provide real-time intelligence on high risk segments of a utility's distribution grid.

Moncton-based RtTech Software provides real-time visibility on energy consumption of plant floor assets, allowing manufacturers to automatically map and manage energy consumption, thereby allowing companies to reduce energy costs.[8]

CANADA HAS THE LOWEST SOFTWARE DEVELOPMENT COST STRUCTURE AMONG G7 COUNTRIES

According to KPMG's *Competitive Alternatives 2016* report, Canada offers the lowest overall cost structure in the G7 to investors looking to establish software development operations.[10] Total labour costs in Canada are 30.0% lower than in the United States. This is an important consideration for IoT companies looking to establish operations in North America, as software development is the single-largest operating expense in this area.

THE GOVERNMENT OF CANADA HAS AN INNOVATION-FOCUSSED APPROACH TO SUPPORTING THE IoT VALUE CHAIN

The Canadian government has been a proactive partner in the IoT value chain through programs such as the Industrial Research Assistance Program (IRAP), which provides technical advisory services and financial support to small and medium-sized enterprises engaged in technology innovation in Canada. As early as 2010, private sector contributors to government policy had specifically identified the IoT sector as a priority research area in terms of Canada's overall Science and Technology strategy.[9]

CANADIAN DATA CENTRE CLUSTERS HAVE SIGNIFICANT COST AND LOCATION ADVANTAGES OVER OTHER NORTH AMERICAN LOCATIONS

Canada is a major hub for data centre operations of global players ranging from IBM to Amazon Web Services. Canadian cities such as Winnipeg, Edmonton, Calgary, St. John's, Vancouver, Toronto, Montréal, Ottawa, Regina and Moncton all have the lowest electricity costs in North America for large power consumers, according to a 2015 Survey by Hydro-Québec.[11] All major Canadian cities also have continent-wide and southbound carrier-diverse redundant fiber optic networks. Canada's naturally cold environment also offers data centre operators the flexibility to minimize power and cooling costs.

8   McRock Capital. *The Industrial Internet of Things.*
9   GS1 Canada. *Advancing the "Internet of Things". Digital Economy Strategy Submission to Industry Canada.*
10 KPMG. *Competitive Alternatives 2016.*
11 Hydro-Québec. *Comparison of Electricity Prices in Major North American Cities 2015,* p. 15.

INTERNET OF THINGS ACTIVITY IN CANADA

British Columbia

Vancouver is one of the most connected cities in the world, and this city's tech hub is also home to major software developers like **Microsoft**, innovative social media companies such as **Hootsuite** and notable IoT start-ups like **Mojio**, which has created an app and a device that allow motorists to monitor their driving costs, improve gas mileage and automate trip expensing

Alberta

Calgary and **Edmonton** are the closest major cities to Canada's oil fields, and are home to innovators like the start-up **Ambyint**, which develops IIoT solutions for oil production operations.

Ontario

Toronto is widely regarded as Canada's primary tech hub, in addition to the city's role as Canada's financial capital. Its rich technology ecosystem includes numerous companies engaged in sectors ranging from financial technologies to cloud computing, gaming and IoT.[12]

Waterloo, Canada's leading IoT cluster, is home to companies like **Miovision**, which is developing innovations in traffic light systems; **Terepac**, a maker of sailboat sensors; and **Intelligent Mechatronics Systems**, engaged in sensor-based road charging solutions.[13]

Companies in the Kitchener-Waterloo area include **blueRover**—known for smart restaurants and connected hockey arenas; **Aterica**, which manufactures an internet-connected EpiPen, and **QNX**, which was purchased by BlackBerry in 2010 and has developed an IoT platform targeting connected cars and medical devices.[14]

Quebec

Montréal is home to a number of start-ups such as **Hexoskin**, the manufacturer of biometric clothing; **Mnubo**, which helps companies with advanced real-time analytics and strategic insights in the IoT sector; and **Hykso**, which manufactures biometric clothing specifically tailored to boxing.[15]

RECENT IoT INVESTMENTS IN CANADA

- In 2015, **Alberta Enterprise Corporation** invested $10 million as a limited partner in the **McRock iNFund**, a Canadian venture capital fund that is primarily focussed on investing in the IIoT market.[16]

- In 2016, **Eigen Innovations**, a Fredericton-based IoT startup which provides vision systems, sensors and software that detect, learn and correct defects in areas like raw material waste and inefficient energy use, closed a $1.4 million in equity financing.[17]

- In 2015, Montréal-based **Mnubo**, the data analytics company whose platforms are specifically designed for IoT, said that it had raised $6 million in a Series A investment led by **White Star Capital** with participation from **McRock Capital**.[18]

- In 2016, Vancouver-based **Semios**, a provider of real-time agricultural information and precision pest management tools, announced it has closed an $8 million financing. The Semios IoT solution provides real-time insights into risks associated with weather, pests, disease, frost and irrigation.[19]

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12 City of Toronto. *Canada's High Tech Hub.*
13 CBC, *Why Waterloo, Ont., is set to dominate the Internet of Things market.*
14 Ibid.
15 Built In Montreal. *Start-up Lists.*
16 McRock Capital. *Alberta Enterprise and Kensington Invest in McRock.*

17 BetaKit. *Eigen Innovations raises $1.4 million in funding as CTO takes over CEO role.*
18 Mnubo. *Press Release: mnubo raises $6M led by White Star Capital & McRock Capital.*
19 Semios. *Press Release: Semios raises $8M in private equity financing.*

WHY CANADA FOR R&D AND INNOVATION?

KPMG shows that Canada has emerged once again as the most cost-competitive country in the G7 in which to do business, with a **14.6%** cost advantage over the US.

In knowledge-based areas such as R&D Services (which includes Product Testing services), development and testing firms typically enjoy **27.8%** lower costs relative to their US-based counterparts. For software development, Canada's total cost advantage is the lowest in the G7, **22.1** percent lower than in the US.

These cost advantages are significant for foreign investors in the IoT sector, where product development and testing, and software development are some of the largest expenses during the development phase of a project.

CANADA-WIDE PROGRAMS

As a world leader in cutting-edge R&D, Canada supports the innovation and entrepreneurship of investors with significant federal and provincial incentive support for R&D activities in Canada.

Listed here are just some of the programs available to investors and technology innovators in Canada:

INDUSTRIAL RESEARCH ASSISTANCE PROGRAM (IRAP)
IRAP provides small and medium-sized investors engaged in technology innovation in Canada with technical advisory services and financial support.

SCIENTIFIC RESEARCH AND EXPERIMENTAL DEVELOPMENT PROGRAM (SR&ED)
SR&ED provides investors with refundable tax credits for their R&D activities. This program allows investors to claim expenditures that: wages and salaries of employees engaged in R&D work, overhead expenditures, material expenditures and contract expenditures for R&D activities performed on behalf of investors in Canada.

ATLANTIC CANADA
Atlantic Innovation Fund
Atlantic Canada Opportunities Agency

Provides Research & Development funding to investors in Atlantic Canada.
http://www.acoa-apeca.gc.ca

R&D Proof of Concept Fund
Newfoundland and Labrador

Helps reduce the technical and financial risk of pre-commercial R&D projects.
http://www.rdc.org

ONTARIO
Advanced Manufacturing Fund
Federal Economic Development Agency for Southern Ontario

The Fund supports the development of new technologies and large-scale activities aimed at improving processes and increasing productivity.
http://www.feddevontario.gc.ca

QUEBEC
Tax credit for e-business development
Investissement Québec

Tax credit provides financial assistance to specialized corporations in the information technology sector.

http://www.investquebec.com

WESTERN CANADA
Western Innovation Initiative
Western Economic Diversification Canada

This program supports the commercialization and growth of innovative technology in Western Canada.
http://www.wd-deo.gc.ca

Health Product Development Program
Alberta

This program supports Alberta-based inventors and small to medium-sized enterprises in developing new health technology products.

http://www.albertatechfutures.ca

For a comprehensive list of programs, please visit:
www.investincanada.com

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