



10:30am – 12:00pm

Failure to thrive: Why Canada struggles to grow world leading tech companies

*Panel Organizer: Weronika Zych
Council of Canadian Academies*

Failure to Thrive: Why Canada Struggles to Grow World Leading Tech Companies

Moderator: Eric M. Meslin

Panel: PIERRE LORTIE, Lisa Crossley,
Judy Fairburn, Victoria Lennox, Iain Stewart

November 8, 2018
10:30AM – 12:00PM
International Ballroom, Delta Hotel

(Why) Does Canada Struggle To Grow World Leading Tech Companies?



Canada's inability to grow firms into large, globally successful industry leaders has been attributed to:

- technical and management skills gaps
- weak IP policies
- inadequate venture capital
- too much, or not enough, tax support
- small domestic market
- management training

Tough Questions

- Does it matter that Canada does not grow firms into large industry leaders?
- Do Canadians really want to scale companies?
- Are we content attracting foreign subsidiaries with world leading research capacity and infrastructure, and exporting ideas and innovations to be developed in other markets?



Canadian innovation policy has not delivered as expected. The heavy emphasis on R&D is clearly producing diminishing returns; Canada's international standing on innovation metrics is, if anything, deteriorating; and, most significantly, its productivity growth has been weak relative to other advanced nations for decades.

– P. Nicholson, Facing the Facts

Our Panel

- **Moderator**

Eric M. Meslin, FCAHS, President/CEO Council of Canadian Academies

- **Speakers**

Pierre Lortie, C.M., FCAE, Senior Business Advisor, Dentons Canada LLP

Lisa Crossley, Reliq Health Technologies, Inc.

Judy Fairburn, FCAE, Board Director, Veerum, Tundra Oil & Gas

Victoria Lennox, Co-Founder & CEO, Startup Canada

Iain Stewart, President, National Research Council Canada

Pierre Lortie

- *C.M., FCAE, Senior Business Advisor, Dentons Canada LLP*

THRIVING BEYOND CANADIAN BORDERS: A CANADIAN IMPERATIVE

PRESENTATION BY PIERRE LORTIE

AT THE CANADIAN SCIENCE POLICY CONFERENCE

CCA PANEL: *FAILURE TO THRIVE: WHY CANADA STRUGGLES TO GROW WORLD LEADING TECH COMPANIES*

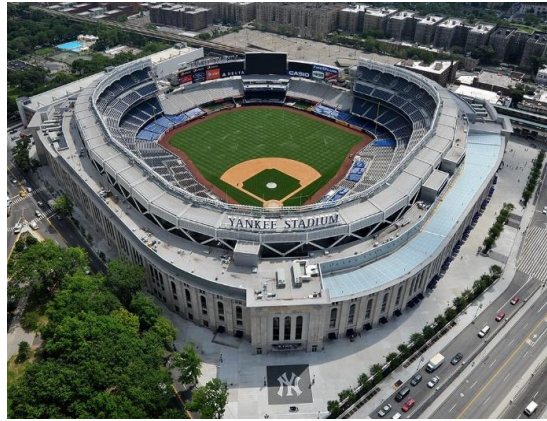
Ottawa, November 8, 2018

A FUNNY THING HAPPENED ON MY WAY TO THE OFFICE.....

- I drove pass the headquarters of multi-billion high-tech and engineering companies that are world leaders in their industry. In global markets, these Canadian companies take central stage:

CAE:	First in the design and production of civil flight simulators
Bombardier:	Second in business aircraft and in rail transportation
Héroux-Devtek:	Third in civil and military aircraft landing gear
CGI:	One of the five largest independent IT process services companies
SNC-Lavalin:	Constantly ranked among the best engineering firms in the world with operations in 160 countries
WSP Global:	One of the world's largest engineering firms with a presence in 40 countries

...FUNNY THINGS HAPPEN ON MY VISITS TO NEW YORK



Yankee Stadium



Mario Cuomo Bridge



Goethals Bridge



Arthur Ashe Stadium

Does anyone know how to get to Saint-Gédéon?

...AND OTHER FUNNY THINGS HAPPENED WHEN TRAVELING IN EUROPE

Milan's Fashion District

ALDO
SHOES & ACCESSORIES

CANADA GOOSE®

Sweden
(Stockholm)



Finland
(Rovaniemi)



Alimentation Couche-Tard operates an international network of about 15,000 convenience stores under the Circle K banner. With retail sales of more than C\$51 billion, it ranks among the 25 largest retailers in the world.

...AND GUESS WHAT I SAW IN JAPAN



...AND ITS FUNNY WHAT ONE LEARNS FROM THE BUSINESS PRESS

- **September 2016:** SNC-Lavalin, China National Nuclear corporation and Shanghai Electric formed a joint venture to develop, market and build the Advanced Fuel Candu Reactor. In **August 2018**, SNC-Lavalin was awarded an engineering contract for the implementation of the new technology in Qinshan (Zhejiang).
- **September 24, 2018:** Barrick Gold agrees to buy Randgold Resources in a \$18.3 billion share deal. The new Barrick, valued at \$24 billion including debt, would thus become the world's top gold miner by value and output, with a dominant position in Africa.
- **October 12, 2018:** Stingray acquires DJ-Matic. This added 10,000 sites to its network in Belgium, The Netherlands, Germany and Denmark. This European expansion followed shortly after the acquisition of SBA Music and SMA Entertainment of Australia.
- **October 2018:** Survey results reveal that between 2010 and 2018, 375 foreign companies were acquired by Québec-based companies.

A POPULAR REFRAIN: HOW ABOUT WE CREATE JOBS BY MOVING INTO THE 21ST CENTURY: WHY CAN'T CANADIAN COMPANIES INNOVATE?

SPAIN



GERMANY



JAPAN



CHINA



France



CANADA?!



IN REALITY...



Where does the bottleneck rest?

STRONG HEADWINDS RISING

Canada represents about 0.5% of world's population and 2.4% of world GDP. This means that Canadian companies that innovate and develop new products or services must penetrate foreign markets from the outset, which can be costly – they rarely have the luxury of local market testing and trials.

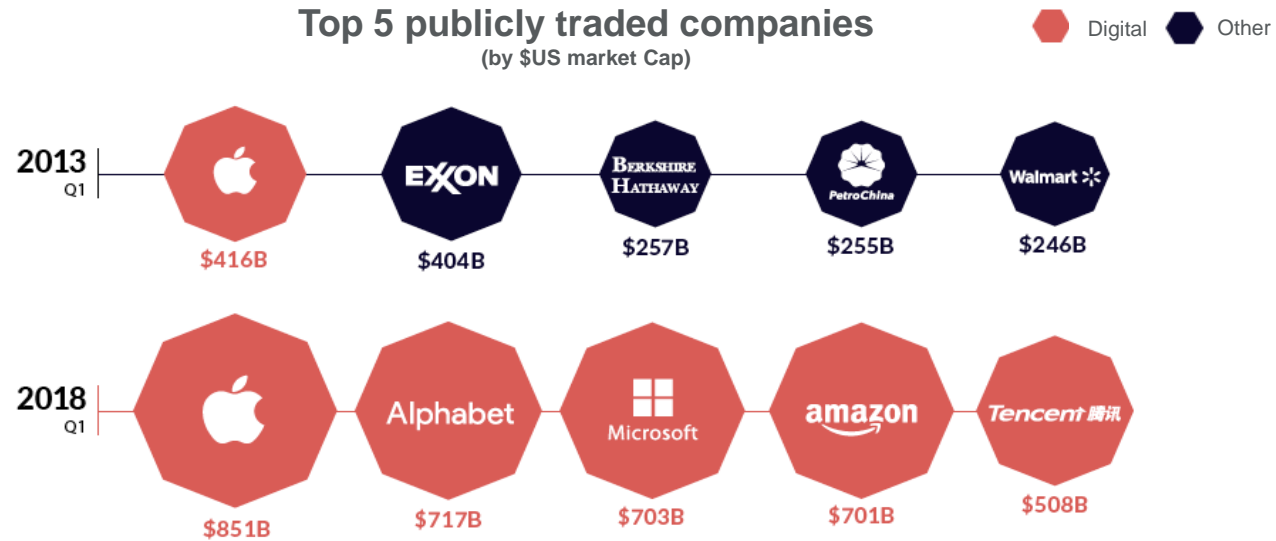
Access to market

- **The nature of U.S. market is changing:** Industry concentration has been rising in all sectors, resulting in increased regulatory and market barriers to entry and increase buyout activity of U.S. SMEs.
- **A slowdown in the growth of global value chain exports and imports:** Trade boomed in the 1990s and early 2000s "in part because intermediate goods began globetrotting"*. The global value chains are now "mature markets", making them increasingly challenging to penetrate.

* Olivier Blanchard, Adam S. Posen, *Reality Check For The Global Economy*, Peterson Institute of International Economics, March 2016.

STRONG HEADWINDS RISING

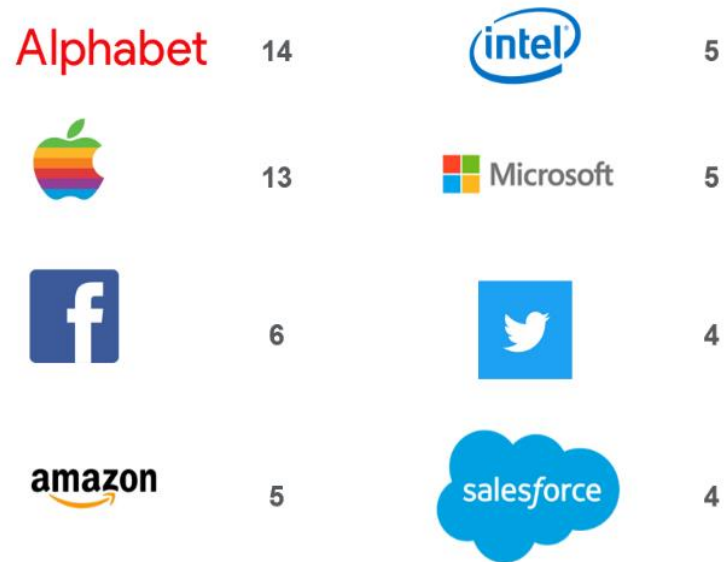
- The old industrial economy was driven by economies of scale; the new information economy is driven by the economics of networks.



- Metcalfe's Law: The value of a network grows at a pace equal to the square of the number of those connected to it: **double the network = four times the value.**
- Leveraging connectivity, network effects, artificial intelligence and the nonlinear scalability of digital platforms allows the tech Titans (BAT and FAANG) to create services that are almost impossible to compete with.

STRONG HEADWINDS RISING ...which encourages predatory behavior

The M&A of AI
(Number of AI tech company acquisitions since 2010)*



* Source: CB Insights, Fortune, July 2018

- In China, the three BAT companies account for close to half of all domestic VC investments.

"PRODUCTIVITY ISN'T EVERYTHING BUT, IN THE LONG RUN, IT IS ALMOST EVERYTHING"*

$$\left\{ \text{GDP/Population} = \text{GDP/worker} \times \text{workers/population} \right\}$$

- Canada has benefited greatly from the increase in the number of workers and labour force participation rates in recent decades.
- Going forward, these key demographic factors will be reversed.

Increasing productivity in the Canadian economy as a whole will soon become the central policy issue as strong productivity gains will be required to preserve, let alone improve, the standard of living of Canadians.

* Paul Krugman – *Second-Generation Productivity Analysis and Policy*, World Bank Conference, 2016.

A SLIPPERY SLOPE...

Global Competitiveness Index

Country	2017-2018 rank	2011-2012 rank	2009-2010 rank
Switzerland	1	1	1
United States	2	5	2
Singapore	3	2	3
Netherlands	4	7	10
Germany	5	6	7
Hong Kong SAR	6	11	11
Sweden	7	3	4
United Kingdom	8	10	13
Japan	9	9	8
Finland	10	4	6
Norway	11	16	14
Denmark	12	8	5
New Zealand	13	25	20
Canada	14	12	9
Taiwan, China	15	13	12

Source: *The Global Competitiveness Report*, World Economic Forum

"WITHOUT SCALING, WE LOSE OUR HOLD ON NEW TECHNOLOGIES. LOSING THE ABILITY TO SCALE WILL ULTIMATELY DAMAGE OUR CAPACITY TO INNOVATE." *ANDREW GROVE*

- Canadian policy-makers have a misguided belief in the job creation power of small enterprises when the focus and priority should be centered on scale-ups and the nurturing of "gazelles".*
- About a quarter of productivity growth is driven by innovation from new firms – principally by very fast growing "gazelles" because they generally use the most advanced technologies and displace less productive companies.
- The productivity level of companies is a function of their size. In Canada, companies with more than 500 employees and those with 100 to 500 employees have productivity levels that are 30% and 20% higher, respectively, than that of companies with fewer than 100 employees and the gap increases over time.

* Duanjie Chen, Jack Mintz, *Small Business Taxation: Revamping Incentives to Encourage Growth*, School of Public Policy, SPP Research Papers. Volume 4 • Issue 7 • March 2011.

PUBLIC CAPITAL MARKETS ARE AN ENGINE FOR ECONOMIC GROWTH

- Increases in productivity according to company size are linked to better capitalization. Indeed, productivity differences between exchange-listed companies of different sizes are much less pronounced.
- The way tech start-ups are financed has profound consequences for the dynamism and growth of an economy.
- The European Commission and the World Bank strongly recommend the development of Venture Public Markets to serve as a stepping stone to a main stock exchange.
- In the United States, the SEC has amended its "penny stock" rules to allow for the development of a "venture" exchange, the NASDAQ BX Market. It now accounts for close to 3% of the total volume in U.S. stocks.

EXTERNAL EQUITY SOURCES ARE NOT NEUTRAL

- Canada has a long experience in the management of a junior exchange market.
- The TSX (Venture) is well-established and can boast of a positive record:
 - It exhibits the world's highest number of graduations to the main exchange.
 - The TSX(V) nurtures small dynamics firms: revenues of future graduates grow about twice as fast each year as comparable firms (57% vs 32%) that list on the TSX through an IPO.
 - The probability of reaching the TSX is much higher for TSX(V) companies than for VC's capital-backed firms. The average rate of VC exits per IPO is below 3%, while the graduation rate of TSX(V) companies is 15.9%.*
 - VCs, including government-sponsored funds, prefer trade sales (78%) as exit path. Foreign trade sales by VCs are common and increasing in Canada. During the 2001-2012 period, 57% of trade sales by VCs resulted in migration.

How can Canada expect to improve its low ranking in innovation and productivity among its OECD peers if it keeps penalizing – through its tax regime – fast growing SMEs that go public, the very companies that have the greatest likelihood to grow into Canadian multinationals around which new technology companies can develop in symbiosis.

* Cécile Carpentier, Jean-Marc Suret, *Entrepreneurs and Junior Markets: An Assessment*, CIRANO, 2018

THRIVING BEYOND CANADIAN BOARDERS: A MORAL AND SOCIETAL IMPERATIVE

*Material progress and moral progress, which have always embodied an optimism about the human enterprise, go together. That's why growth is essential in any society.**

- The political and social histories of Western democracies teaches that periods of widely distributed economic growth and improved living standards render a society more open, tolerant, generous and democratic.

Today,

- Less than 50% of Canadians express trust in the core institutions of government, business and the media.
- There is a societal dysfunction and angry public discourse, exacerbated by the segregation promoted by online social media that creates echo chambers that exploit and amplify confirmation biases and polarization.
- Many Canadian parents no longer expect their children and grandchildren to live better than they did. **In Canada, this should not be.**

* Benjamin M. Friedman, *The Moral Consequences of Economic Growth* (Alfred A. Knopf, November 2010).

Thank you



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Lisa Crossley

Reliq Health Technologies, Inc.



Reliq Health
technologies

FAILURE TO THRIVE: Why Canada Struggles to Grow World Leading Tech Companies

November 8, 2018

© Reliq Health Technologies Inc. 2018

TSX-V: RHT OTCQB: RQHTF

BARRIERS TO SCALE UP

- Commonly cited barriers to scaling up from SME to major multinational
 - Shortage of managerial/executive talent in Canada
 - Challenges accessing sufficient capital to grow to large scale
 - Pressure from investors to deliver a short-term exit
 - Limited access to domestic market due to lack of alignment in procurement policies

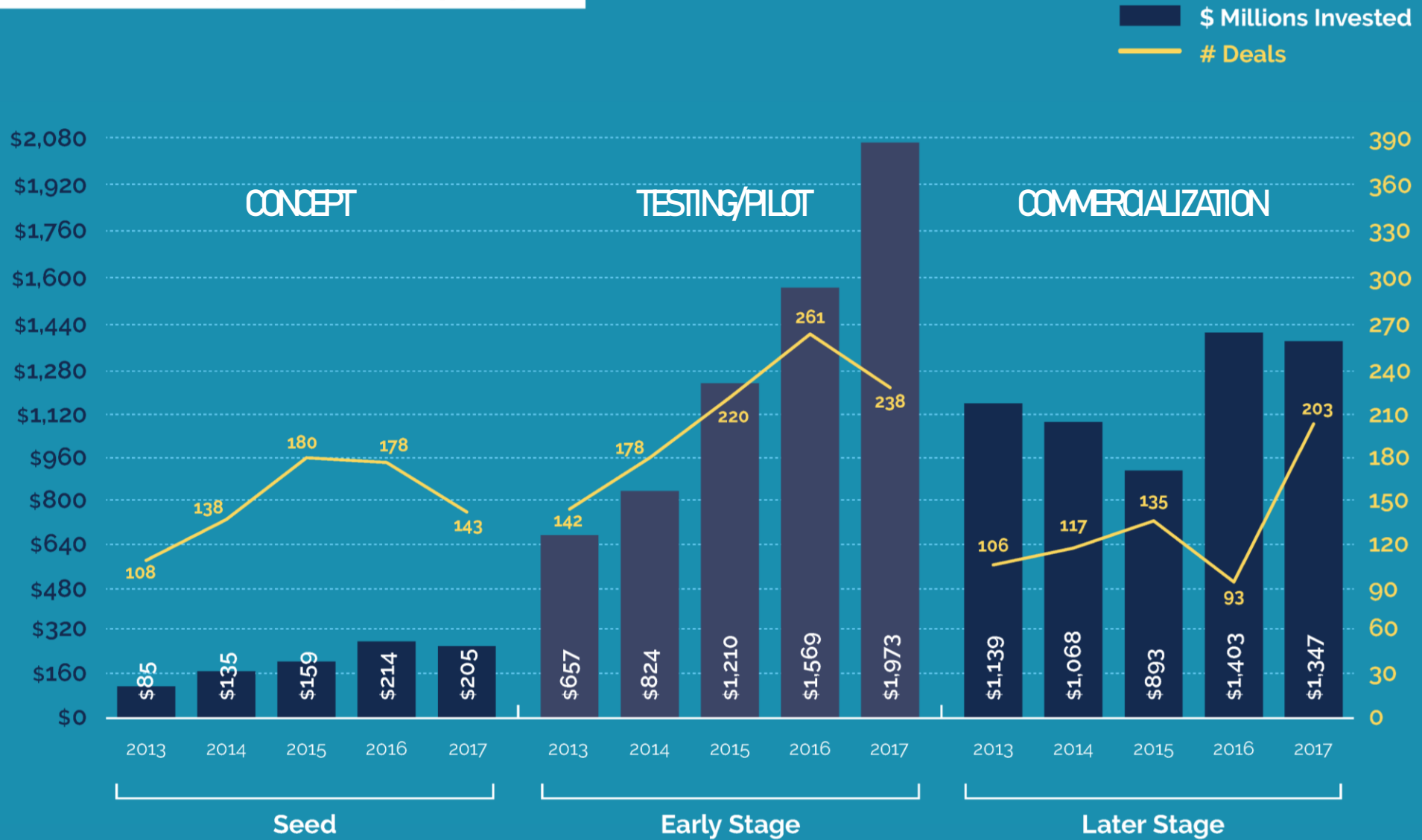
LACK OF MANAGEMENT TALENT

- “Strong entrepreneurial and management skills and access to talent are necessary for SME growth and scale up.”
 - OECD Discussion Paper: *Enabling SMEs to Scale Up*, SME Ministerial Conference, Mexico City, February 2018.
- “A lack of management talent was identified as the top constraint to growth by Canadian technology stakeholders.”
 - Herman, D. and S. Marion. 2016. *Scaling success: tackling the management gap in Canada’s technology sector*. Lazaridis Institute for the Management of Technology Enterprises.

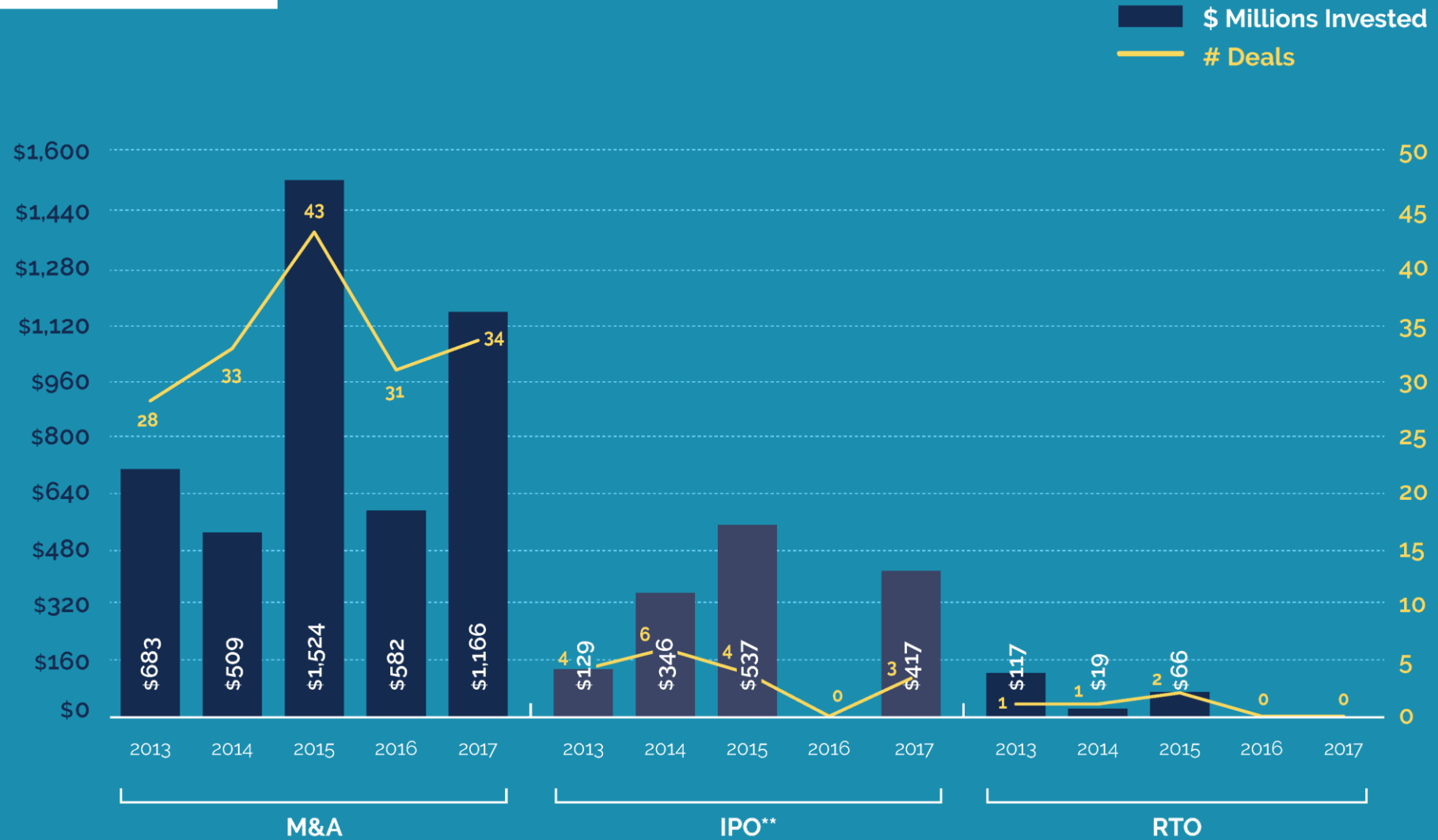
ACCESS TO CAPITAL

- Limited access to capital, especially for later stage companies
 - Majority of venture capital dollars are spent on companies at the seed or early stage (proof of concept or beta/pilot phase)
- Need to provide investors with a clear path to exit
 - Success defined as M&A vs growing into a self-sustaining large enterprise
 - Investors exit horizon typically 3-5 years, which doesn't provide companies with enough time to build a successful global business

VC STAGE BREAKDOWN // 2013-2017



VC EXITS* // 2013-2017



* INCLUDES TRANSACTIONS WITH UNDISCLOSED VALUES;
 ** IPO VALUATION

POLICIES AROUND PROCUREMENT

- Limited access to public procurement opportunities for small and medium enterprises (SMEs)
- Standard procurement processes favor large, mature businesses
 - Complex, focused on risk avoidance, lowest cost instead best value
- “Government could introduce legislation that requires all public procurement of goods to include a criteria for ‘domestic end products’, whereby local expertise and regional economic activity are acknowledged as assets in the selection process.”
 - Canadian Federal Procurement as a Policy Lever to Support Innovation and SME Growth. Liao, Orser and Riding, Telfer School of Management. Ottawa, 2017.

CASE STUDY: HEALTHCARE

- Canada spends over **11%** of our GDP on healthcare, over **\$240 Billion** annually
 - Single largest budget item for every province in Canada
- We lack the strategic procurement policies found in other jurisdictions that encourage adoption of homegrown healthcare technologies and would help Canadian SMEs grow
- Value-based procurement policies help level the playing field for SMEs, promote innovation and reduce total costs – could save Canadians billions of dollars and improve access to and quality of care

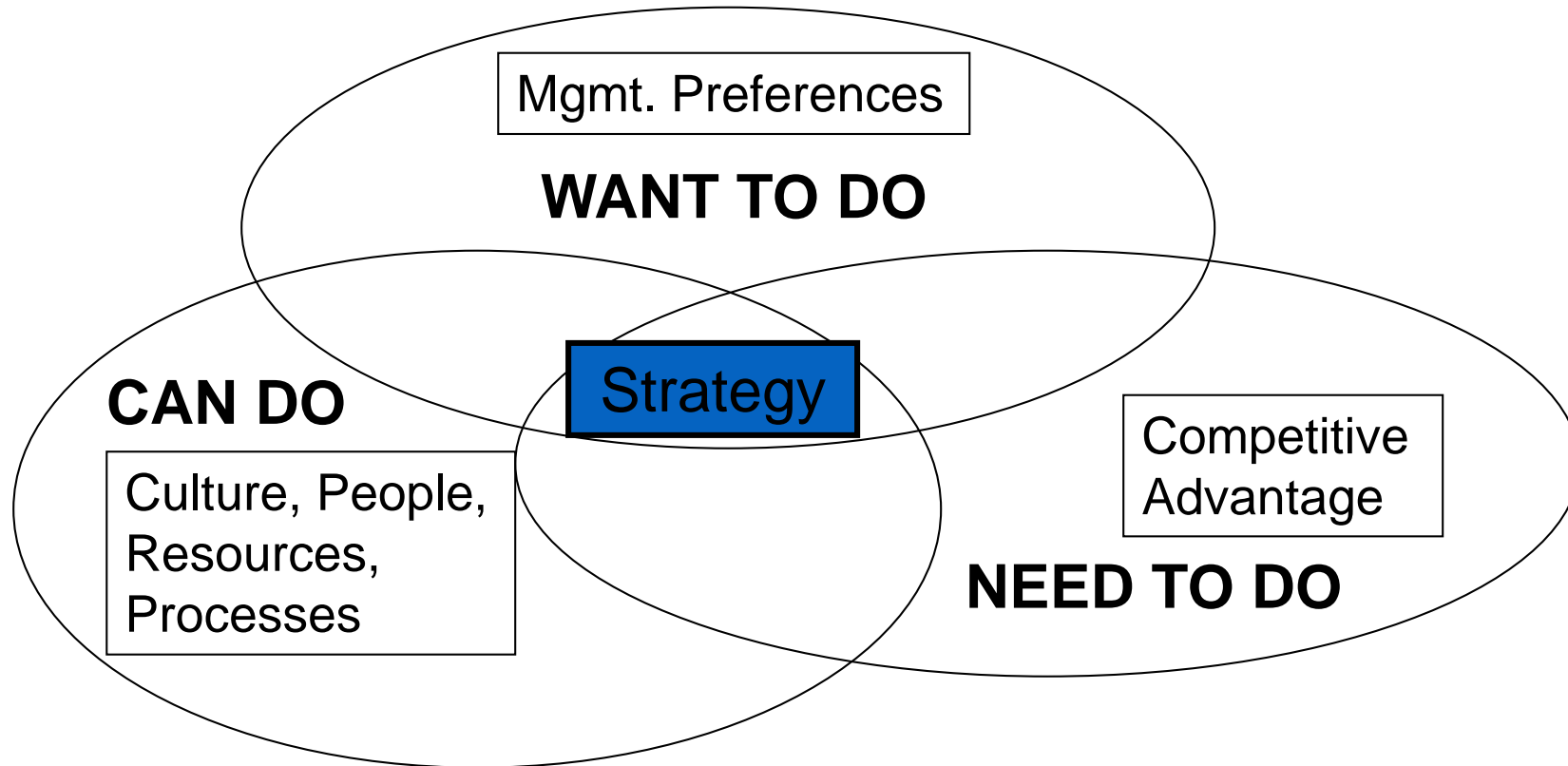


Judy Fairburn

- *FCAE, Board Director and Chair, Public Policy Forum, Sustainable Development Technology Canada, Tundra Oil & Gas Inc., Veerum Inc., and Calgary Economic Development*

A Winning Strategy

It all Fits!



Victoria Lennox

- *Co-Founder & CEO, Startup Canada*



Building a THRIVING
entrepreneurship ecosystem:
Culture, Connectivity and Community

VICTORIA LENNOX

CO-FOUNDER & CEO,
STARTUP CANADA

@VLennox
@Startup_Canada

Iain Stewart

- *President, National Research Council Canada*

Growing companies to scale:

Iain Stewart
National Research Council of Canada

Inputs – growing to scale

- Access to talent  • Funding for higher education, ease of immigration, work integrated learning
- Innovative ideas  • Funding for research, networks, facilities, support for company research activity
- Conducive environment  • Ease of starting a business, regulatory environment, incubators / accelerators, social acceptance of the new product or technology
- Capital  • Project funding, access to risk capital and equity, debt and growth capital
- Customers / access to markets  • Conducive environment for customer investment in new technology and business models, internal trade, free trade agreements, government as customer, cluster support



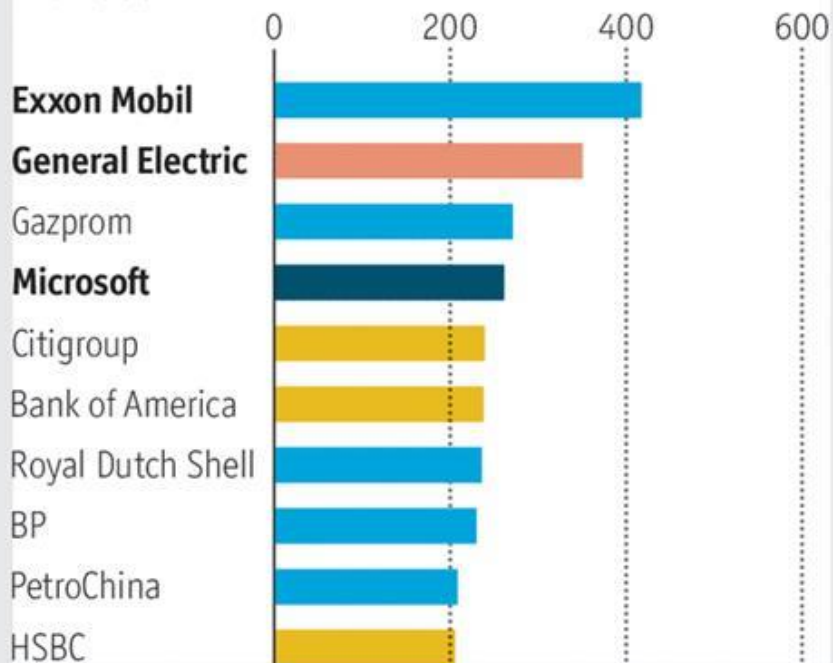
Disruption creates opportunity (digital)

A virtually new world

World, largest listed companies by market capitalisation, \$bn

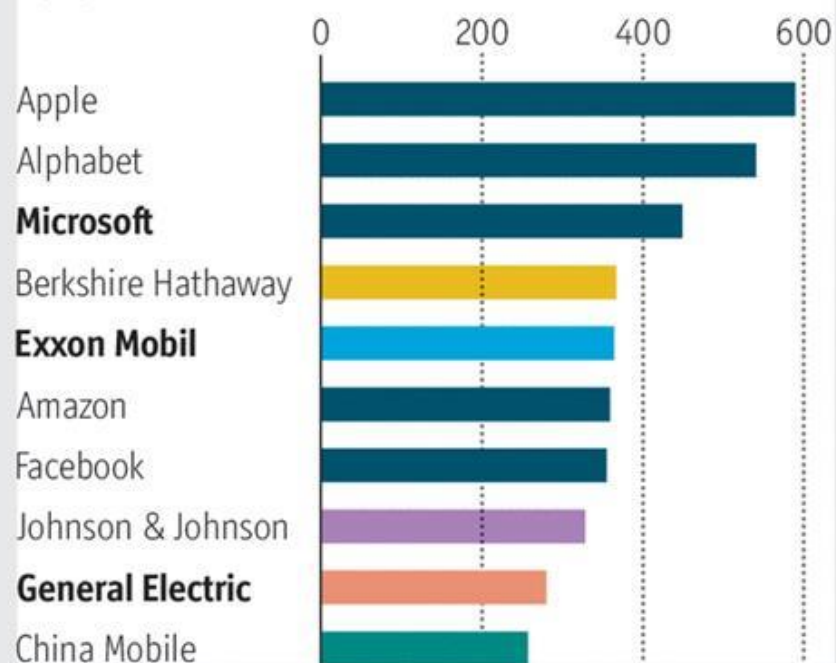
Sector: Energy Financials Health care Industrials IT Telecoms

End 2006



Source: Bloomberg

2016*

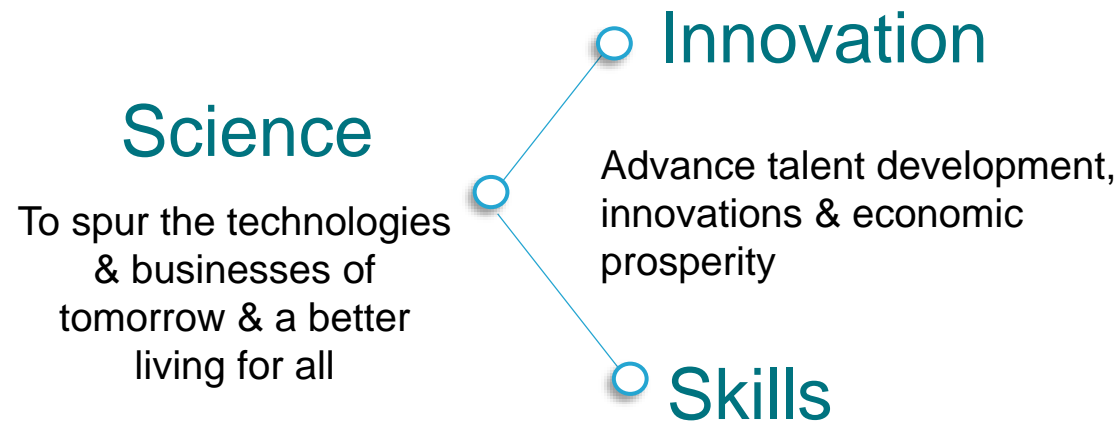








*At August 24th 2016



Innovation and Skills Plan – targeting AI

An integrated approach



-  Policy - Economic Strategy Tables
-  Scale - Innovation Superclusters
-  Science – Increased funding
-  Innovation – More coordinated support
-  Eco-systems – Regional approach
-  International - Collaboration

Supporting areas of strength

- **Artificial Intelligence**
- Quantum Computing
- Biomedical Research
- Agriculture and Agri-food
- Clean Technologies
- Clean Energy

Coordinating innovation support - “Flagships”

1. National Research Council’s Industrial Research Assistance Program (NRC-IRAP)
2. Strategic Innovation Fund
3. Regional Development Agencies
4. Canadian Trade Commissioner Service

The back story – investing in AI ideas and talent

NSERC support for AI

- From 2006-2016, NSERC invested over \$392M to support basic research, training and partnership and applied research
- In 2017-18 alone, \$75M in AI R&D
- Investments in Talent:
 - Since 2007-08, investments in scholarships & fellowships = \$43.3M
 - 2017-18 Direct investments in students & fellows training = \$4.9M
 - Substantial indirect support (stipends) through research grants



The backstory – investing in scale and networks

Scale

- \$93.6M CFREF: IVADO (2016)
- Canada Research Chairs: 10
- CERC: Andrea Lodi

Networks

- CIFAR's first AI network 1983
- Pan Canadian AI Strategy (\$125M)



Richard Sutton



Geoffrey Hinton



Yoshua Bengio

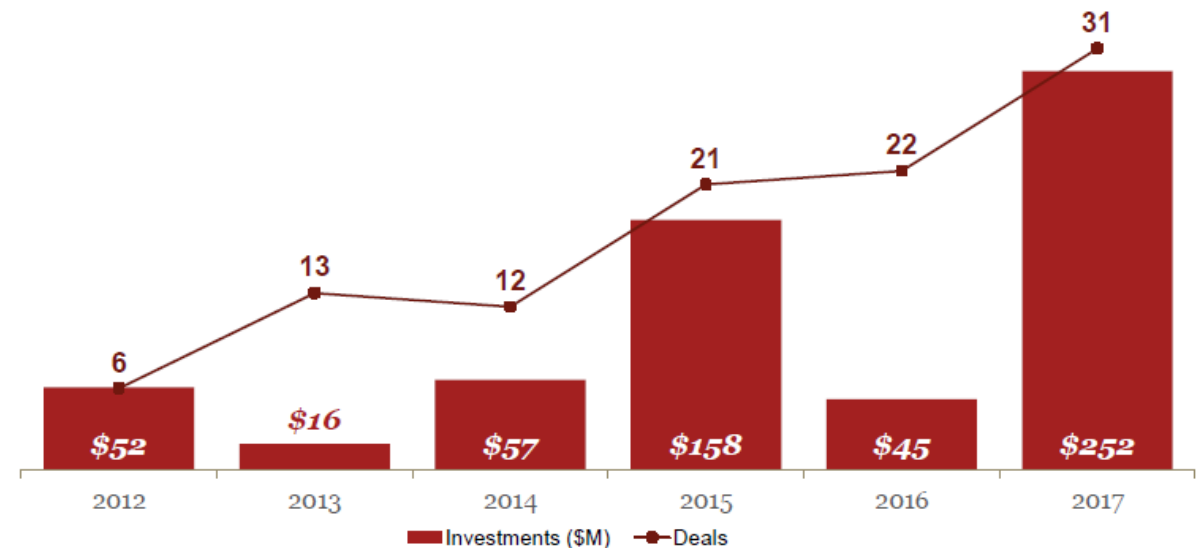


The back story – investing in companies

Project funding (IRAP 2013-18)

FY	# Firms	# Projects	Total Funding
13-14	173	209	\$20,545,764
14-15	233	328	\$23,329,759
15-16	229	314	\$29,662,788
16-17	312	401	\$44,271,868
17-18	267	387	\$25,603,687

Company funding (2012 to 2017)

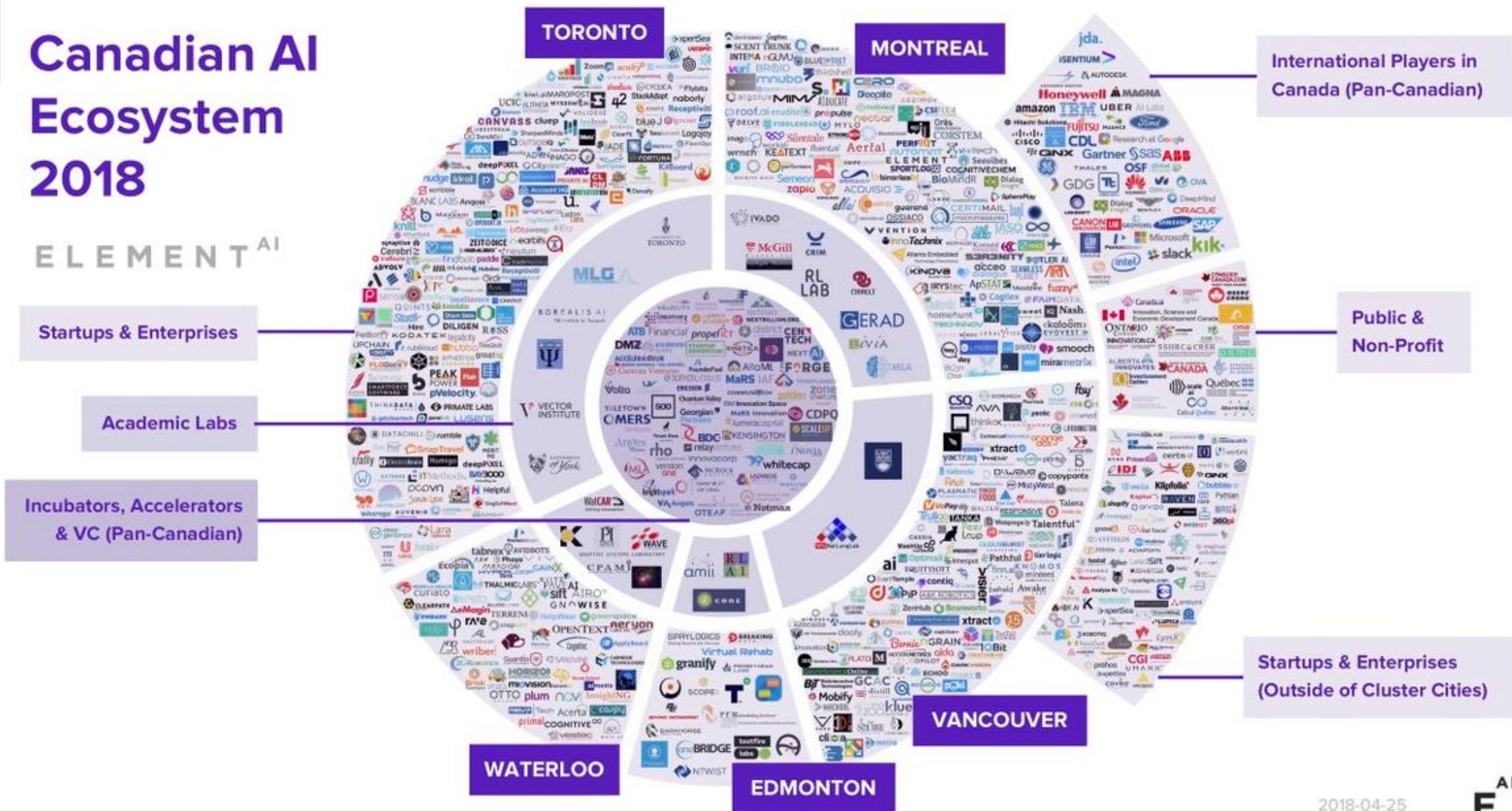


PwC (CB Insights MoneyTree Canada Report Q4 2017)

Current status – the Canada AI Ecosystem

Canadian AI Ecosystem 2018

ELEMENT AI



Challenge #1 – Canadian customers?

Mindbridge

Disrupting financial
audit industry
AI Accounting

Miovision

Intelligent solutions for
traffic data collection
Smart Cities

Coveo

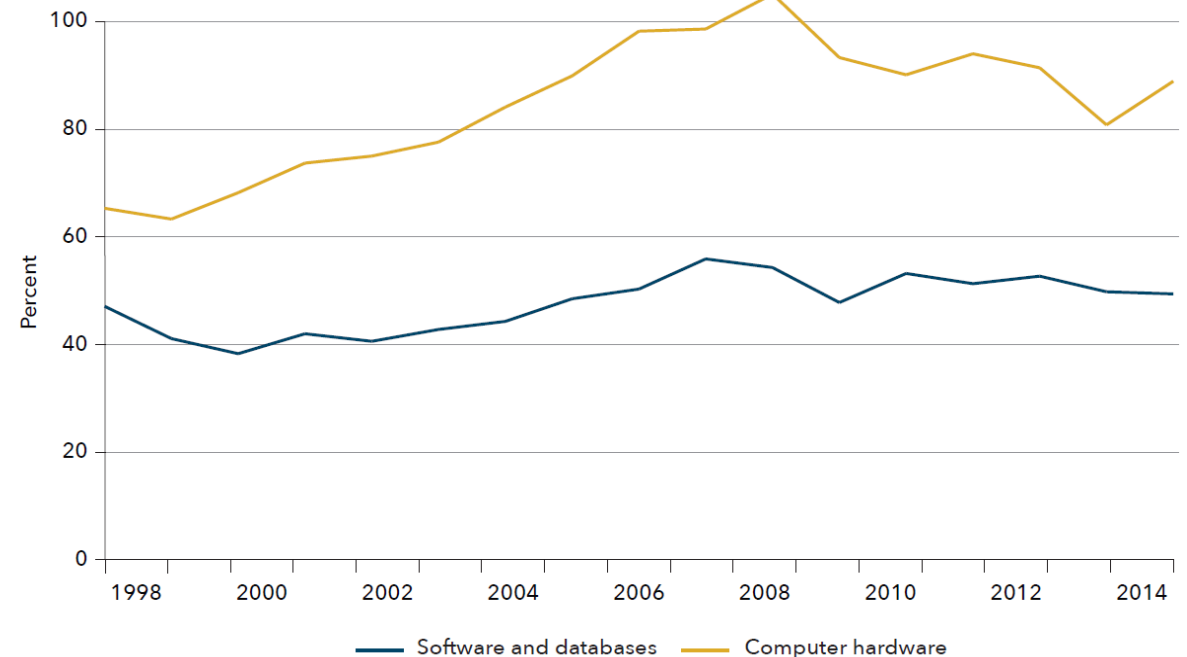
Intelligent and
predictive
Search solutions

Blue J Legal

Predict legal outcomes &
tax foresight
Legal

Investment information and communication technologies per job, Canada as a percentage of United States¹, 1998-2014

Figure 11. Investment in information and communications technologies per job, Canada as a percentage of United States,¹ 1998-2014



Strategy – connecting disruptors and clients

Scale.AI supercluster

- Regional concentration: Quebec and Ontario
- Technology focus: Artificial Intelligence and supply chain
- Skills Development and Talent : Increase current workforce's capabilities in AI and intelligent supply chain, increase academic programs for high-demand skill sets, drive diversity in technology fields
- Expected economic impact over 10 years:
 - Projecting \$16.5 billion GDP impact
 - Anticipate more than 16,000 jobs

More than 110 participants, including:

- Agropur
- Aldo
- Air Canada
- CGI
- CN
- Coveo
- Kinova
- Loblaw
- Optel
- Thomson Reuters
- NEXT Canada
- Creative Destruction Lab
- IVADO
- University of Waterloo



Challenge #2 – competition for talent?



**Globally
22,000 active
AI PhDs**

- US 9,010
- UK 1,861
- **Canada
1,154**

(China under-
represented)



Strategy – dialogue around need for talent

- Dialogue with education providers: encourage investment in STEM and related programming.
- Technology focus: in addition to sustaining research talent (universities), a shift in need toward application skills (colleges, polytechnics).
- Workforce skills development: work integrated learning, co-ops, internships to bridge new talent into labour force.



Challenge #3 – regulatory and social unreadiness?



Strategies - Government projects to model standards?

Getting ready

- Select some “lighthouse” projects to work through the issues?
- Develop rule environment
 - Canada-France commitment to inclusive AI
 - Policy framework for responsible use of AI (TBS) to guide projects
- Curated standing offer list (PSPC)
- Funding tools for Government to engage private sector
 - Build in Canada Innovation Program (PSPC)
 - Innovation Solutions Canada (ISED)
- Government use cases
 - Risk-based
 - Inspections / audits
 - surveillance for air cargo
 - Prediction
 - Weather
 - disease pathways
 - wildfires and floods
 - Translation / language
 - Design tools and process optimization
 - etc



Summary – growing AI firms to scale

- Disruptive technologies create new opportunities, and Canada has a very healthy AI ecosystem
 - Wide array of Canadian firms now launched, and seeking to scale up
- But some key vulnerabilities:
 - Social acceptance - government is engaging, but public issues and perceptions not yet clear.
 - Talent supply - SME growth and MNE investment may be challenging adequacy of higher education's supply of talent
 - “5-95” – start-ups need customers, and will face the long-standing under-investment of Canadian firms in innovation inputs.





Thank you

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