



Maturing the Canadian Blockchain Industry

Blockchain Technology Symposium, Toronto 2020

By Marc Lijour

February 20, 2020



The Information and Communications Technology Council (ICTC) is a centre of expertise on the digital economy
with 25+ years of research on the ICT sector and the labour market

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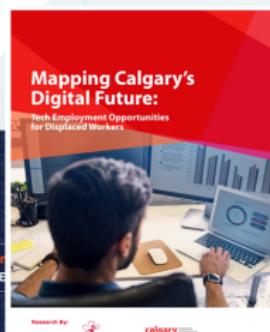
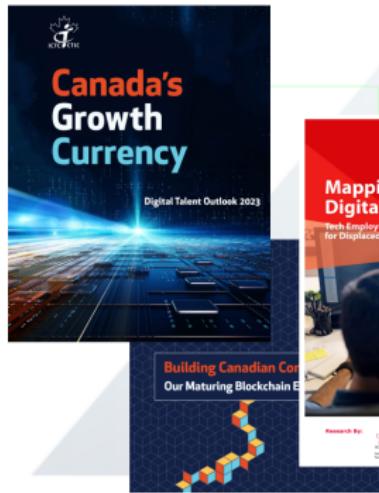


A centre of expertise for the Digital Economy

RESEARCH

PROGRAMS

Policy Development & Research



Capacity Building & Innovation Readiness



digital youth

WIL Digital can help you hire young IT talent!

50 - 70% WAGE SUBSIDY

- Work placements for STEM students
- 16 week work placements
- Apply at wilmcanada.ca

Information and Communications Technology Council
Funded by the Government of Canada's Student Work-Integrated Learning Program

1



Leading the Blockchain supercluster bid (2017)



- ICTC, ColliderX, Blockchain Research Institute, and the two Canadian Blockchain associations
- goals: education, startups, R&D, international visibility and promotion
- raised \$50 million dollars in pledges
- raised visibility and interest with the Federal government (ISED)

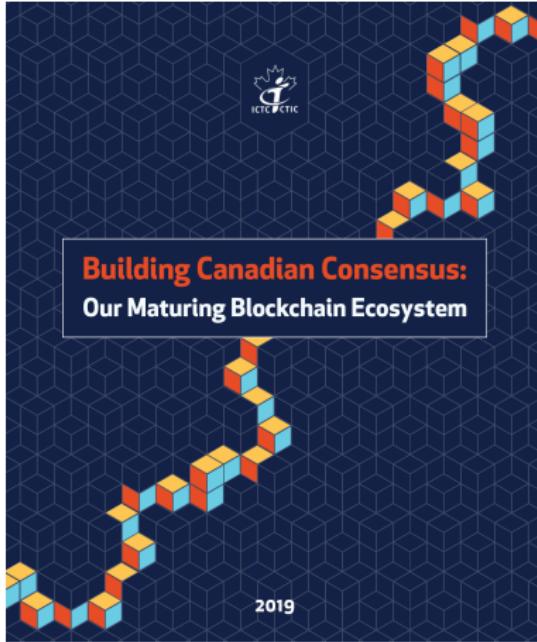


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Report on the Blockchain industry in Canada



A national study on the state of the Blockchain industry and its ecosystem in Canada (2019).

We looked at 288 firms and 1,600 workers and their role.

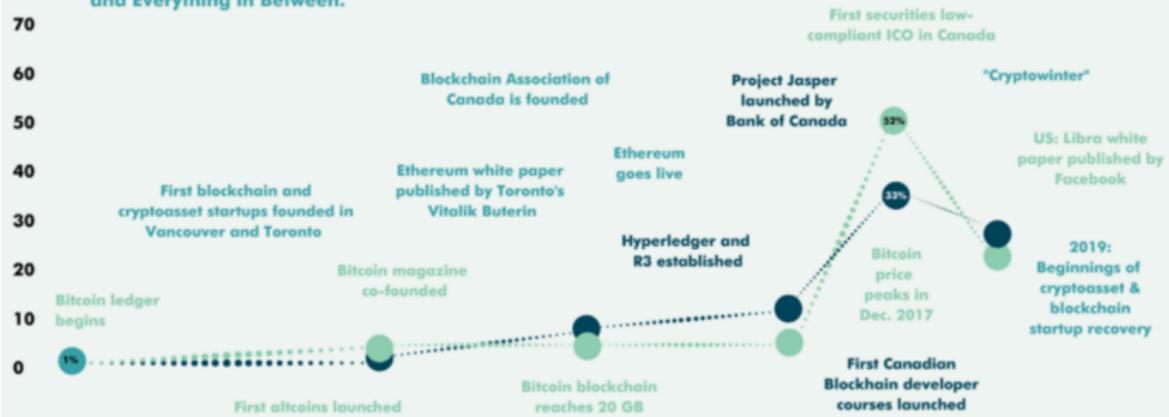
Source: Web (incl. partner LinkedIn), plus 24 interviews, and two group discussions.



Blockchain in Canada

BLOCKCHAIN IN CANADA

A DECADE OF ENTREPRENEURSHIP IN:
Cryptoassets,
Blockchain Use Cases,
and Everything in Between.



2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019

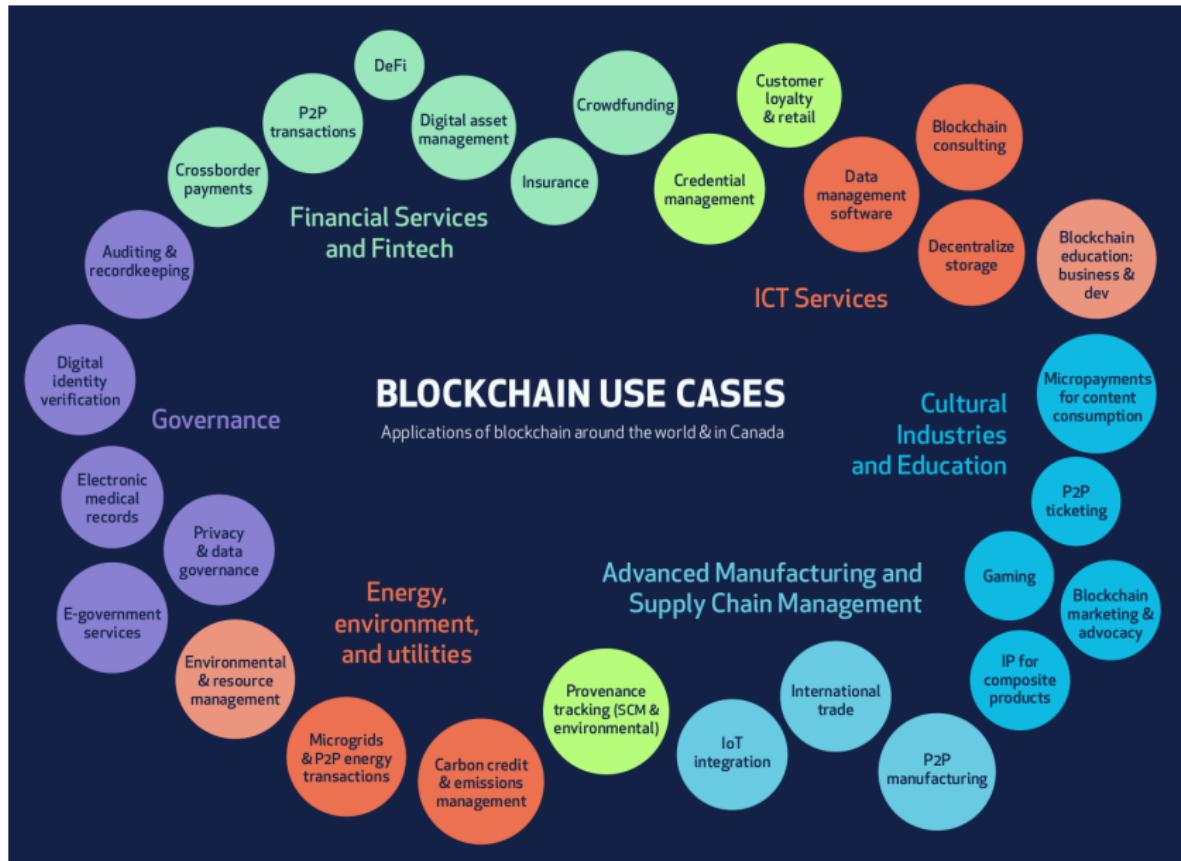
Blockchain technology companies with Canadian employees: % of total founded each year

Cryptoasset companies with Canadian employees: % of total founded each year

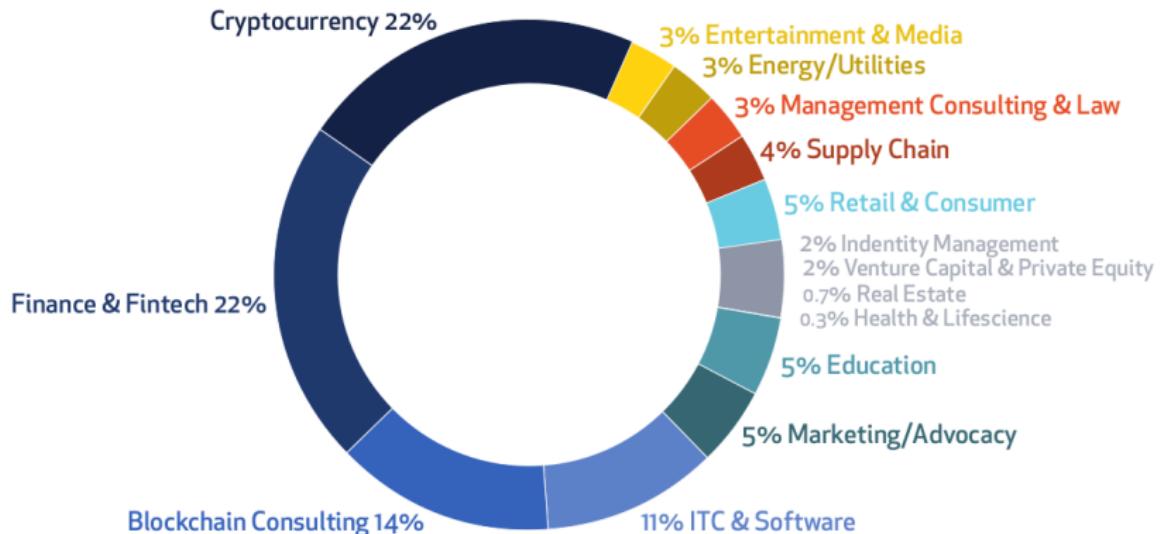
Note: Based on a sample of companies founded from 2009-2019 (n = 231). 2019 data incomplete. Companies with unidentifiable founding years were excluded from this figure.



Industry applications



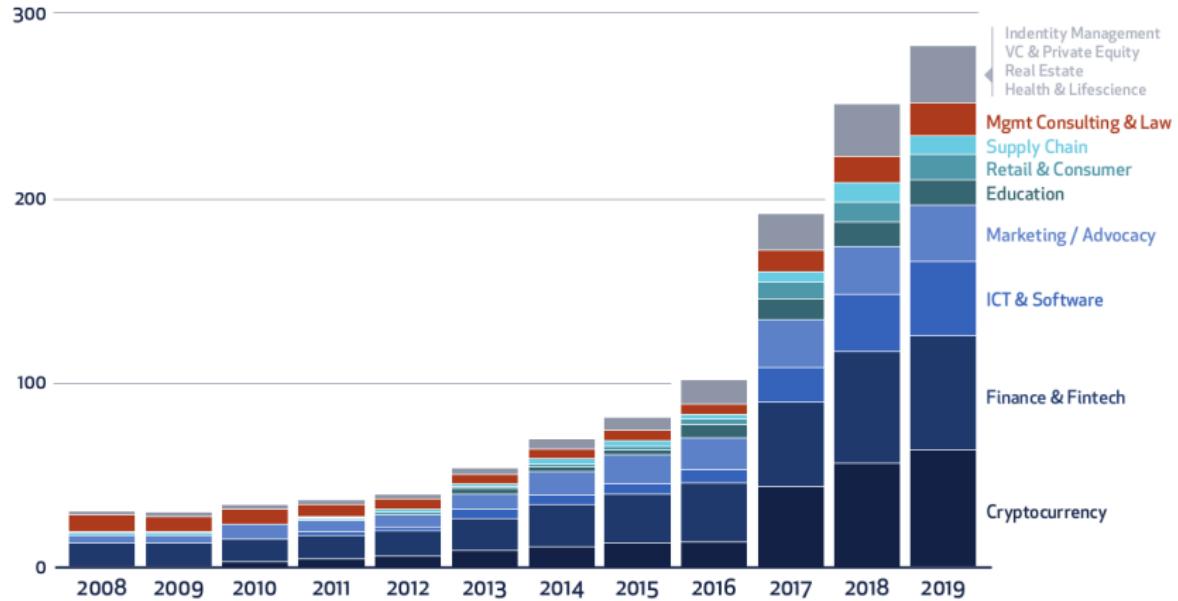
Canadian companies per sector



Source: ICTC Note: Unverified companies excluded



Canadian companies per sector



Source: ICTC Note: 2019 value based on first half of year



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Regional expertise

Canada's Blockchain Hubs

Fast facts about our regional centers of expertise



Blockchain v. Cryptocurrency
Company HQ in Province



Blockchain, Bitcoin, Ethereum, Hyperledger
Relative Meetup Size Within Province



GTA & Ottawa

Blockchain-related Employees Studied:
In-province, Out-of-province, Internationally



Regional Ecosystem
(ICTC Interviewees)

Fintech
Vibrant Government
Digital Identity Fabric
Ethereum Advanced Data Processing
Indy



Canada's 3 Largest
Meetups (adjusted
for population)



Vancouver & Victoria

Diverse
Commercial Active
Fabric
Indy
Cryptocurrency Supply-chain
Open-Source



Highest %
Attendance at
Hyperledger Meetup
(Montreal, Aug
2019)



Montreal & Quebec City

Blockchain & AI Mining
Bitcoin Libertarian
Cypherpunk Music & Gaming
Cultural Industry Crypto-focus



Biggest Blockchain-related Meetups in
Prairie Provinces



Calgary & Edmonton

Industrial Organized
B2B Mining
Bitcoin Private
SCM Oil & Gas
Commercial Indigenous Rights



Highest % Attendance
at Blockchain Meetup
(Halifax, Aug 2019)

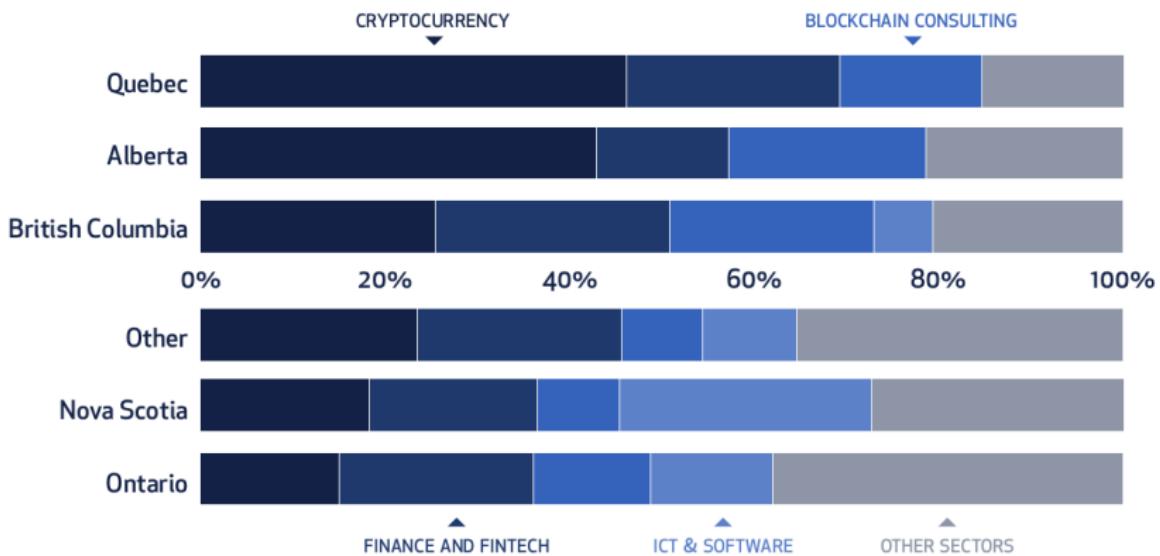


Halifax
All data Aug 2019

Enterprise Encouraging New
Startups



Regional expertise



Source: ICTC Note: Based on number of headquarters based in province, several provinces & territories excluded due to low sample size, sample size differs by province

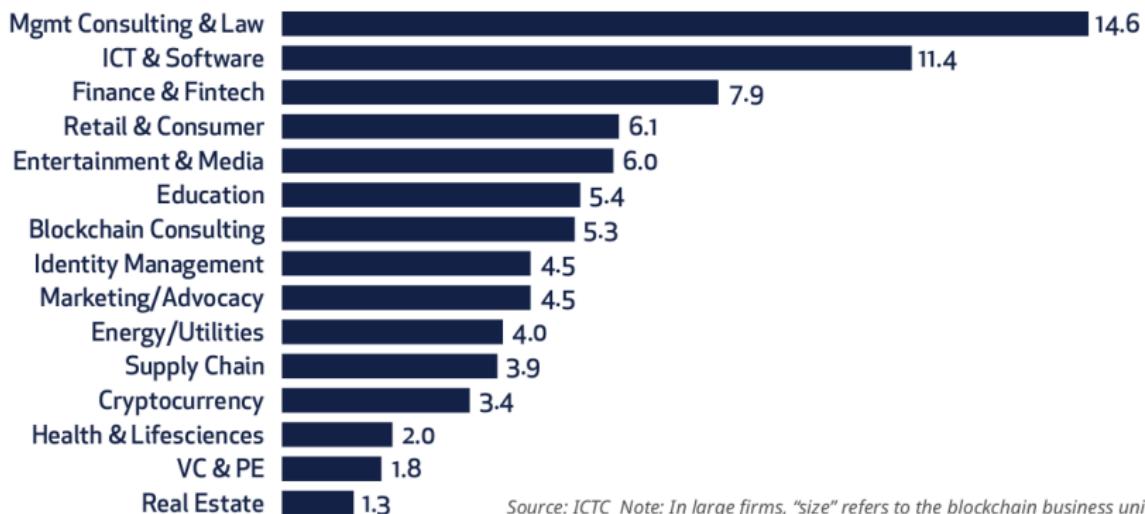


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Worker occupation per sector



Source: ICTC Note: In large firms, "size" refers to the blockchain business unit



Top developer jobs in Blokchain

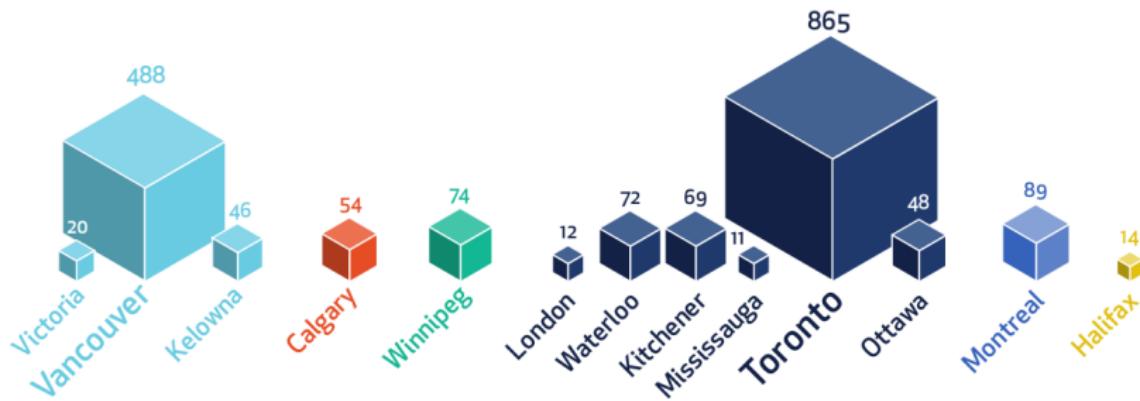
Figure 20: Frequency of Developer Jobs

		Frequency of Developer Jobs				
		1	9	18	27	36
Software Developer	Core Developer	Blockchain Development Lead	Full Stack Solidity Developer	Senior Blockchain Developer		
Full Stack Developer	Full Stack & Blockchain Developer	Blockchain Development Manager	iOS Developer	Senior Development & Integration Lead		
Blockchain Developer	Junior Blockchain Developer	Blockchain Software Developer & Researcher	Junior Developer With JavaScript & Web Services	Senior Development Manager		
Developer	Junior Blockchain Developer	Cloud Transformation	Lead Android Developer	Senior Front End Developer		
Front End Developer	Mobile Application Developer	Creative Developer	Lead Blockchain Developer	Senior Full Stack		
Lead Developer	AI Developer	CTO/Core Developer	Lead Developer Team	Senior Full Stack Developer		
Senior Software Developer	Application Blockchain Developer	Developer Success	Lead Front End Developer	Senior iOS Developer		
Web Developer	Application Development Associate Manager	Development Lead	Natural Language Processing Developer	Senior Software Developer & Product Lead		
Full Stack Blockchain Developer	Application Development Specialist	Development Manager	Product Development	Senior Software Development Manager		
Senior Developer	Applied Blockchain Research & Development Engineer	Director of Software	QA Automation Test Developer	Senior Solidity Developer		
Senior Mobile Developer	Back End Developer	Enterprise Solutions Developer	QA Automation / Web Developer	Senior Web Developer		
Application Developer	Back End Web Developer	Ethereum Blockchain Developer	Quantitative Developer	Senior Project Manager		
Blockchain Software Developer	Blockchain Application Developer	Full Stack Developer Intern	Senior .Net Developer	SRE Lead		
Blockchain Solution Developer	Blockchain Application Developer	Full Stack Software Developer	Senior Back End Developer	Web Project Management		

Source: ICTC



Follow the jobs



Source: ICTC, Emsi Note: Search keyword logic is (hyperledger OR ethereum OR corda OR solidity OR ASIC OR bitcoin OR hashrate OR DApp OR ICO OR litecoin OR ledger) AND (blockchain OR cryptocurrency OR distributed ledger)



Skills in high demand

Top Ten Skills Extracted from Technical Blockchain Job Postings

- 1 Blockchain
- 2 Cryptocurrency
- 3 Ethereum
- 4 JavaScript, React.js
- 5 Agile Software Development
- 6 Java
- 7 Python
- 8 Hyperledger
- 9 Node.js
- 10 Application Programming Interface

Canadian Interviews & Focus Groups (order not significant)

- Blockchain or Protocol-Level Experience
- Full-Stack Development
- Smart Contract Programming
- Experience with Enterprise-Scale Deployment & Legacy System Integration
- Back end software development
- Game Theory & Economics
- Database Management & Architecture
- JavaScript & Node.js
- User Experience Design
- C++ Development

CONSENSYS Blockchain Developer Job Kit

- Cryptography^{**}
- Blockchain Knowledge^{***}
- JavaScript
- Python
- Solidity
- Back end languages^{****}

LinkedIn 2018 U.S. Emerging Jobs Report⁵⁵

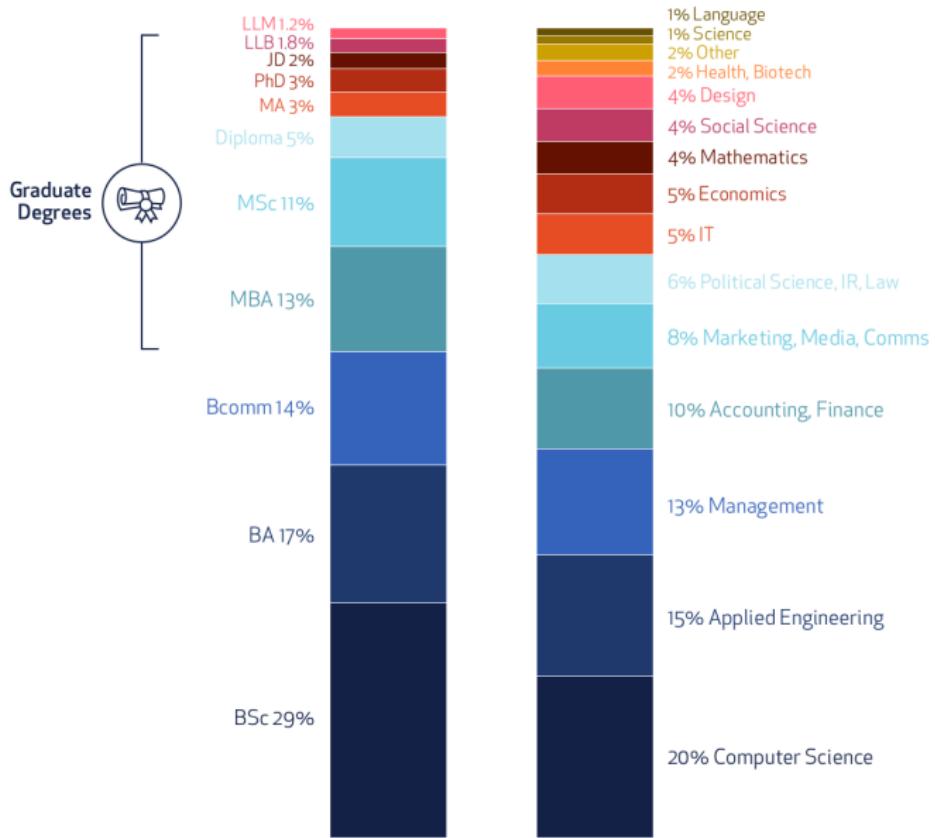
- Solidity^{*}
- Blockchain
- Ethereum
- Cryptocurrency
- Node.js

* See Appendix I for a discussion of methodology.

**Specific skills in Cryptography for ConsenSys include: Public Key Encryption; Private Key Encryption; Key Agreement/Exchange; Digital Signatures; Hash Functions; Ring Signatures; Zero Knowledge Proofs; Encrypted Storage; Elliptic Curve Encryption; and Trusted Execution Environments.

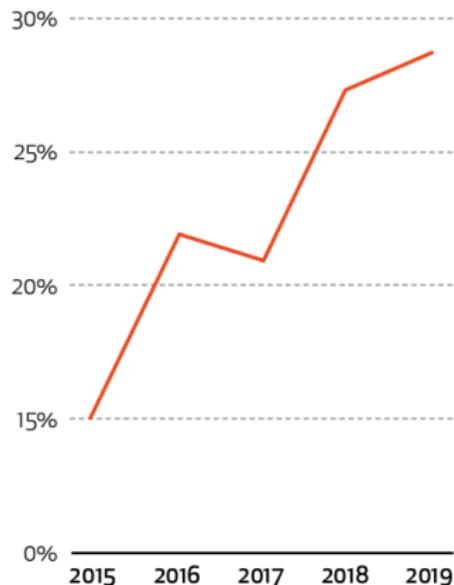


Education



Aiming for parity

Figure 22a: Percent of Female Blockchain Workers by Year (Canada)



Source: ICTC



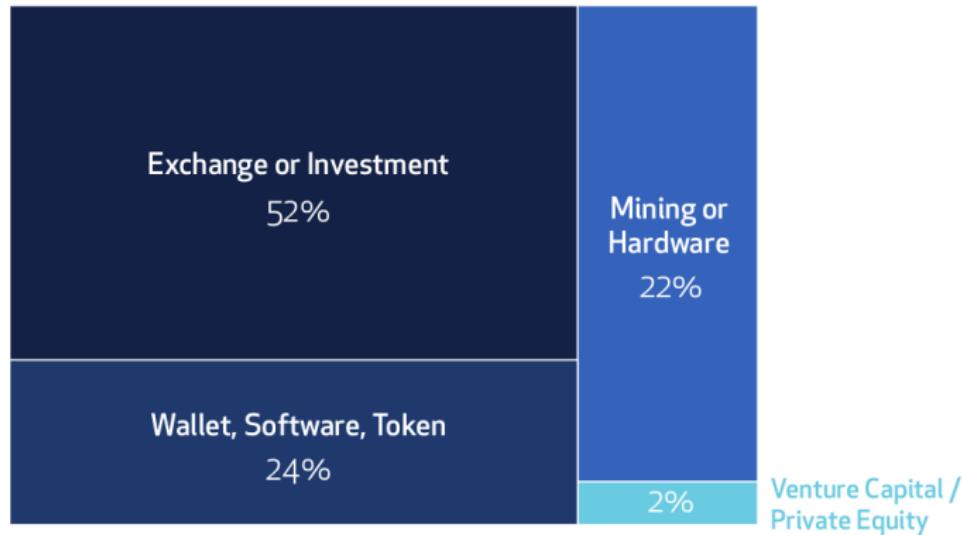
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Intellectual Property

Cumulative Canadian Patents by Company Size (percent of all companies)

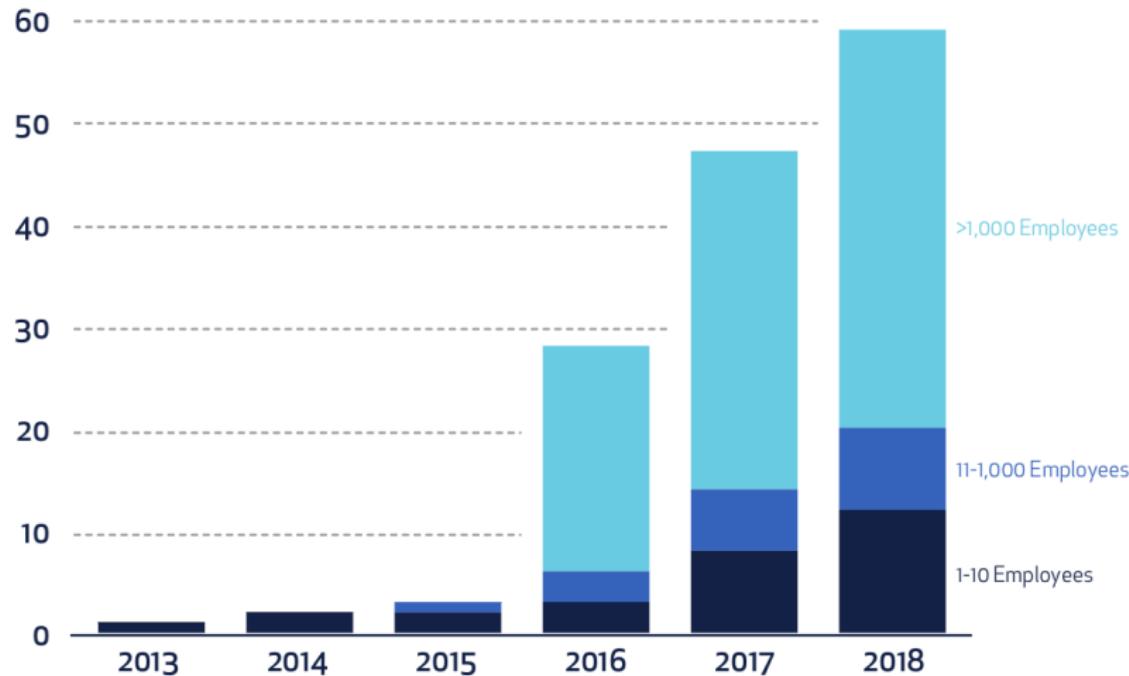


Source: ICTC



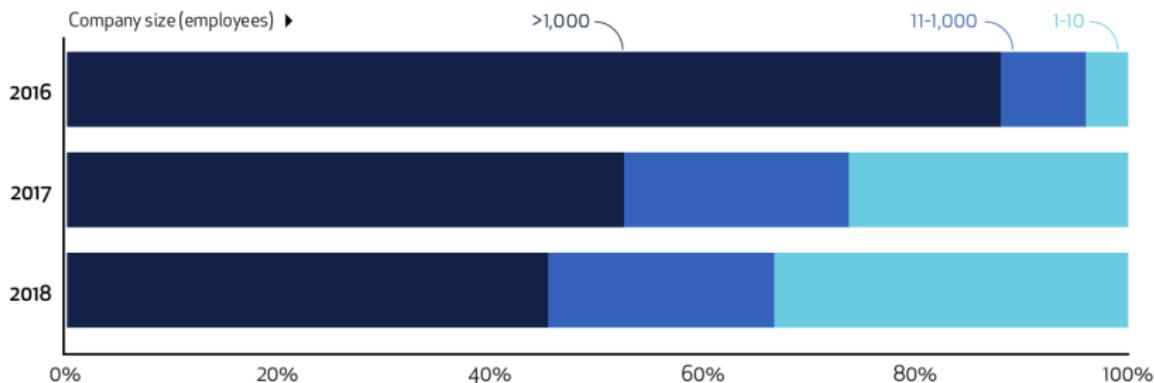
Creation of Intellectual Property

Cumulative Canadian Patents by Company Size (total)



Source: ICTC Note: 2018 value is likely underestimated due to slow patent processing

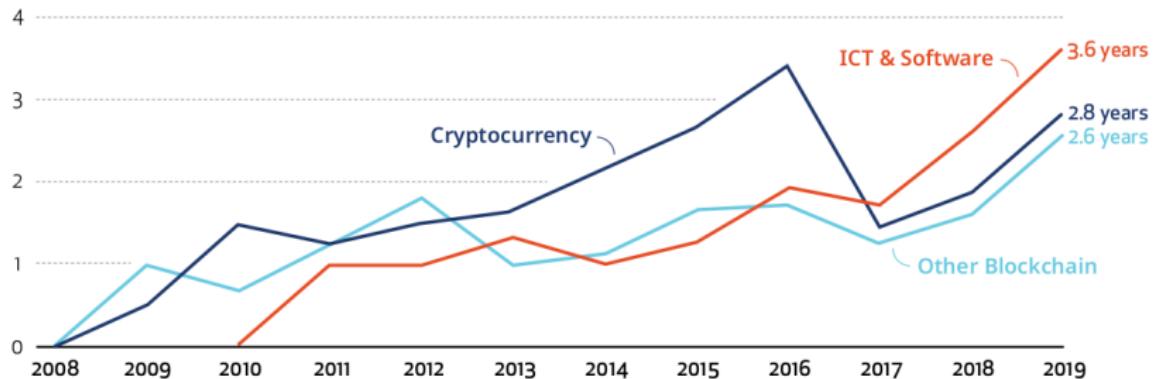
Smaller firms are gaining ground on creating Intellectual Property



Source: Canadian Intellectual Property Office



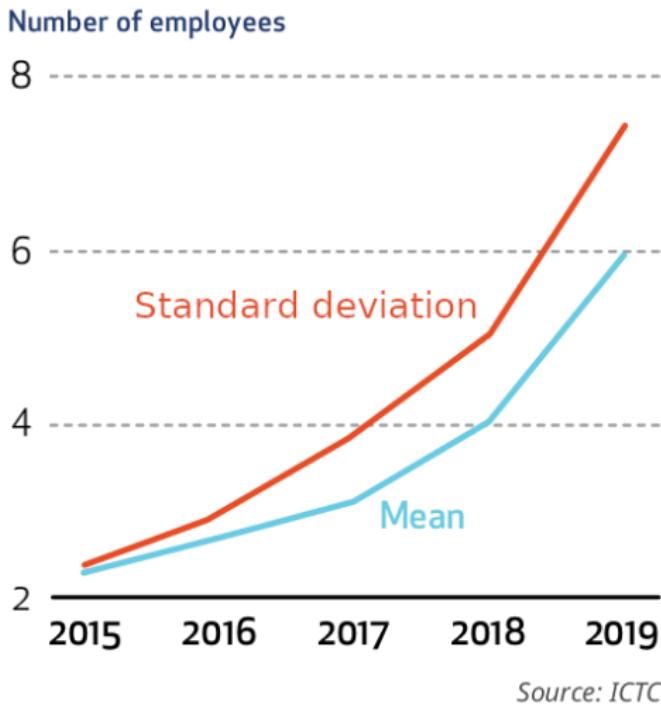
Startups are maturing



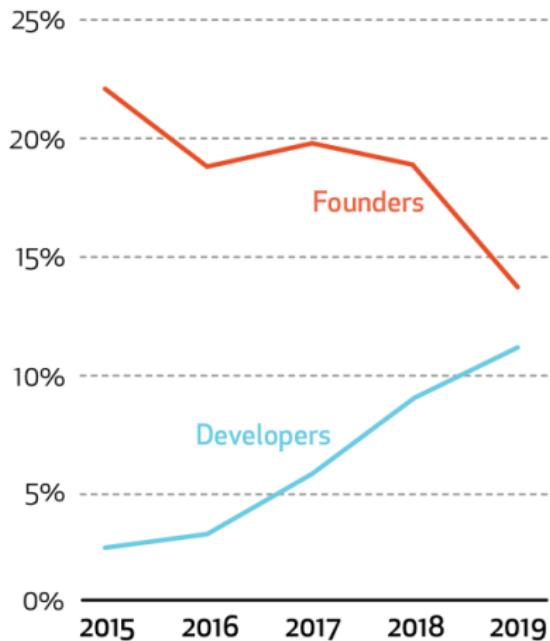
Source: ICTC Note: 2019 value is based on first half of year



Startups are maturing



Startups are maturing



Source: ICTC



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Convergence

of disruptive technologies and practices leads to exponential growth

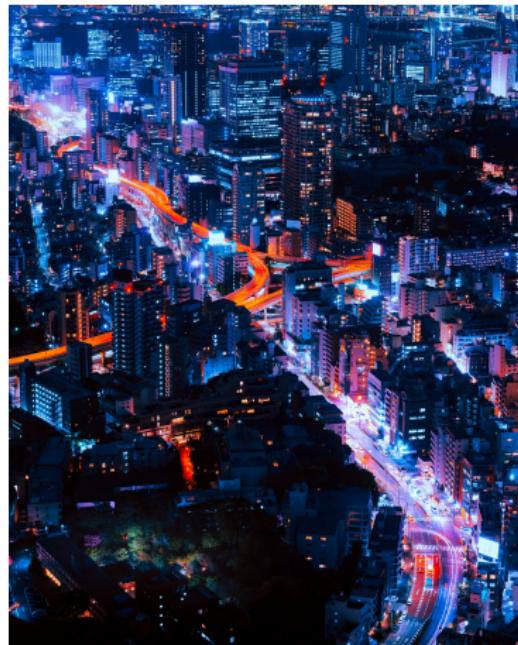


Photo by Paweł Nolbert on Unsplash

- Blockchain
- AI
- 5G
- IoT
- Open collaboration



Focus on business value

NEW YORK TIMES BESTSELLER



**OKRs – The Simple Idea
That Drives 10x Growth**

John Doerr

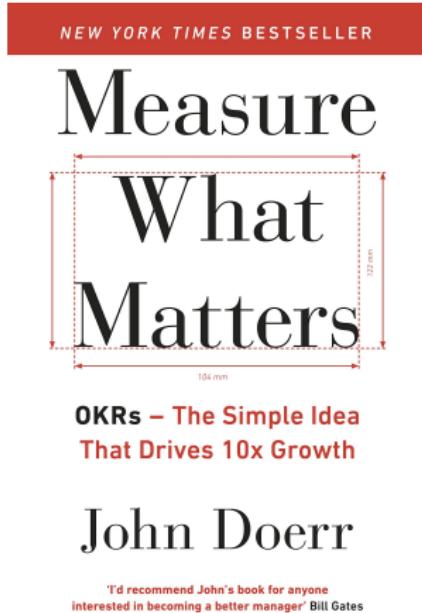
'I'd recommend John's book for anyone
interested in becoming a better manager' Bill Gates

Ted Talk intro at
<https://www.youtube.com/watch?v=L4N1q4RNi9I>

Fiercely pursuing objectives that matter, breaking down silos, taking calculated risks are necessary conditions for an effective transformation.



Focus on business value



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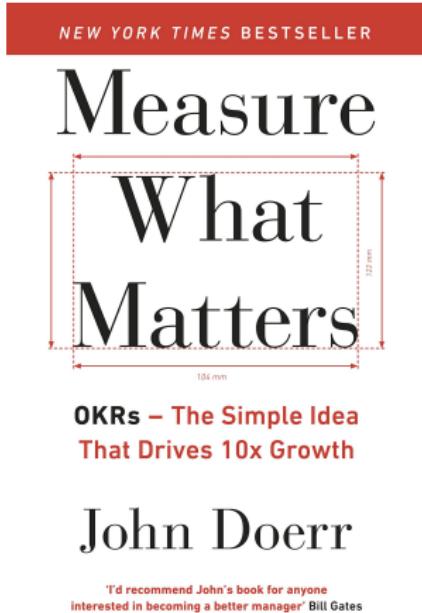
Internal convergence ("Collective Genius", Hill et al., 2014):

- domain expertise

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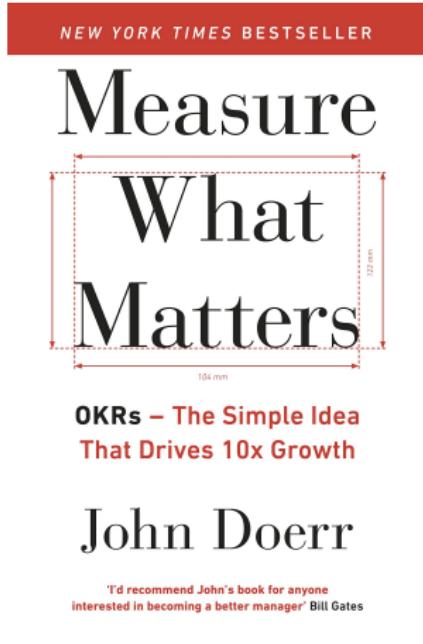
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Internal convergence ("Collective Genius", Hill et al., 2014):

- domain expertise
- freedom to innovate
- freedom to fail (fast)

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Internal convergence ("Collective Genius", Hill et al., 2014):

- domain expertise
- freedom to innovate
- freedom to fail (fast)
- big bets



WIL Digital

Accelerating innovation in key sector to boost the digital economy in Canada

- Canalyst
- Clearbanc
- The Cooperators
- Fi.span
- Fundica
- Gradient Ascent
- Grow Technologies
- Guusto
- Kooltra
- Mindbridge AI
- Oodler
- Overbond
- Quandl
- Sensibill

ICTC's WIL Digital program focuses on key sectors highlighted by our research:

- FinTech (see on the left)
- IoT
- Intelligent Retail
- AI
- Cybersecurity

Interested in joining the FinTech Collaborative, please contact us at fintech@ictc-ctic.ca

[https://www.ictc-ctic.ca/
upskilling-canadian-post-secondary-students-strengthening-fintech-industry/](https://www.ictc-ctic.ca/upskilling-canadian-post-secondary-students-strengthening-fintech-industry/)





Micro-credentials



Career mapping to
in-demand jobs



Education and skills
pathways

The future of Work:

- Dynamic labour market intensity map
- Wayfinding
- Guided learning path
- Self-Sovereign Identity and micro-credential signaling employability

See the [iAdvance announcement](#)



Call to Action

from the Think Tank and Innovation Catalyst

Let's partner to accelerate innovation in Canada!

We need a comprehensive approach to grow the digital economy

- talent development
- regulations
- new infrastructure (e.g. identity, currency, finance)
- new ventures
- adoption of technology and new business models



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- Hamoni, R., McLaughlin, R., & Rice, F. (2019). *Building canadian consensus: Our maturing blockchain ecosystem.* Information and Communications Technology Council (ICTC). Ottawa, Canada. Retrieved from <https://www.ictc-ctic.ca/wp-content/uploads/2019/12/canada-blockchain-ecosystem-2019.pdf>
- Hill, L. A., Brandeau, G., Truelove, E., & Lineback, K. (2014). Collective genius. *Harvard Business Review.* Retrieved from <https://hbr.org/2014/06/collective-genius>