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

ADVANCE

CYBERTITAN
EDUCATE · INSPIRE · EXCEL
Enseignement canadien en Cybersécurité
CANADIAN CYBERSECURITY EDUCATION INITIATIVE

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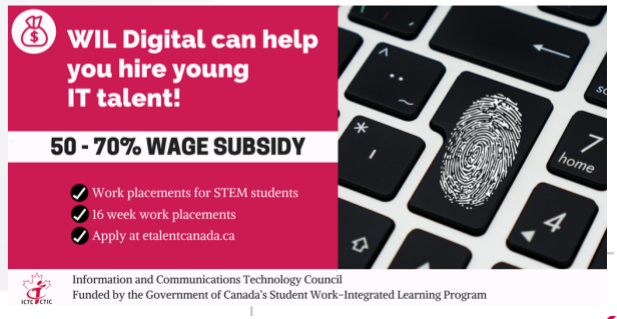
digital youth



https://www.ictc-ctic.ca

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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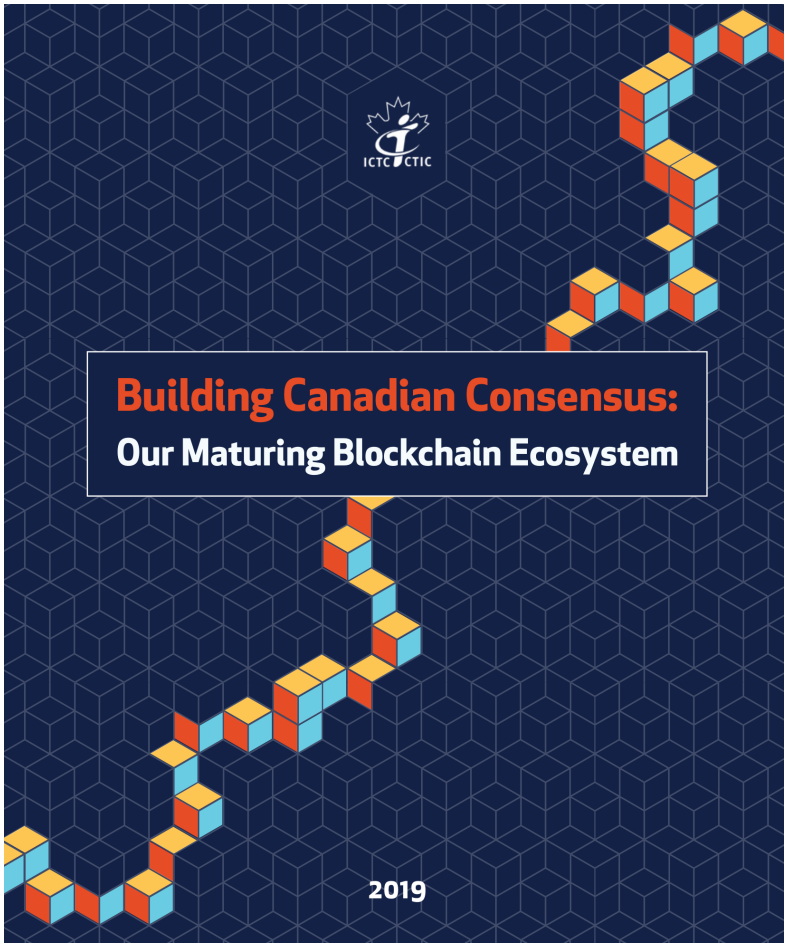
Report on the Blockchain industry in Canada



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. job boards), plus 24 interviews, and two group discussions.

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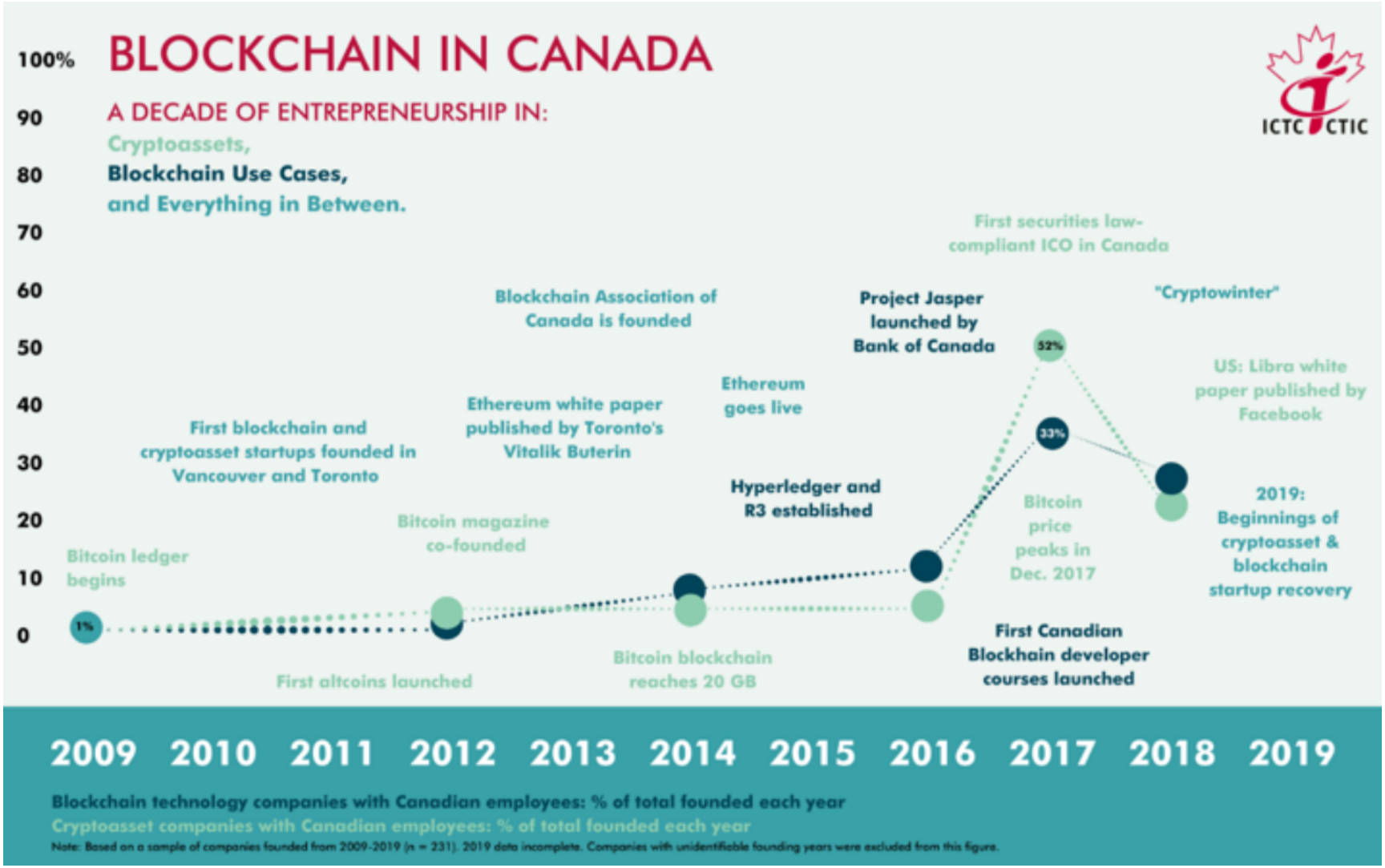
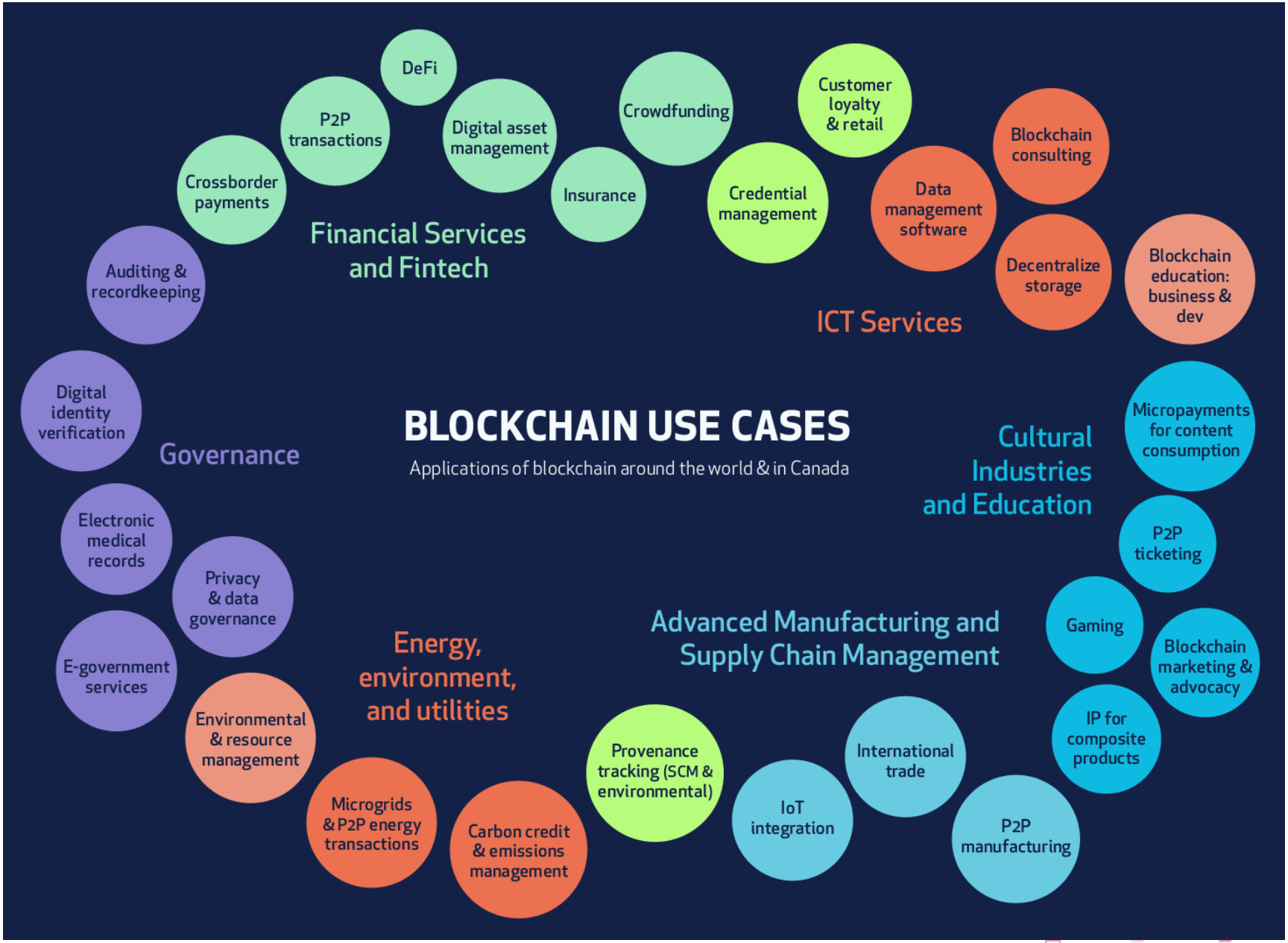
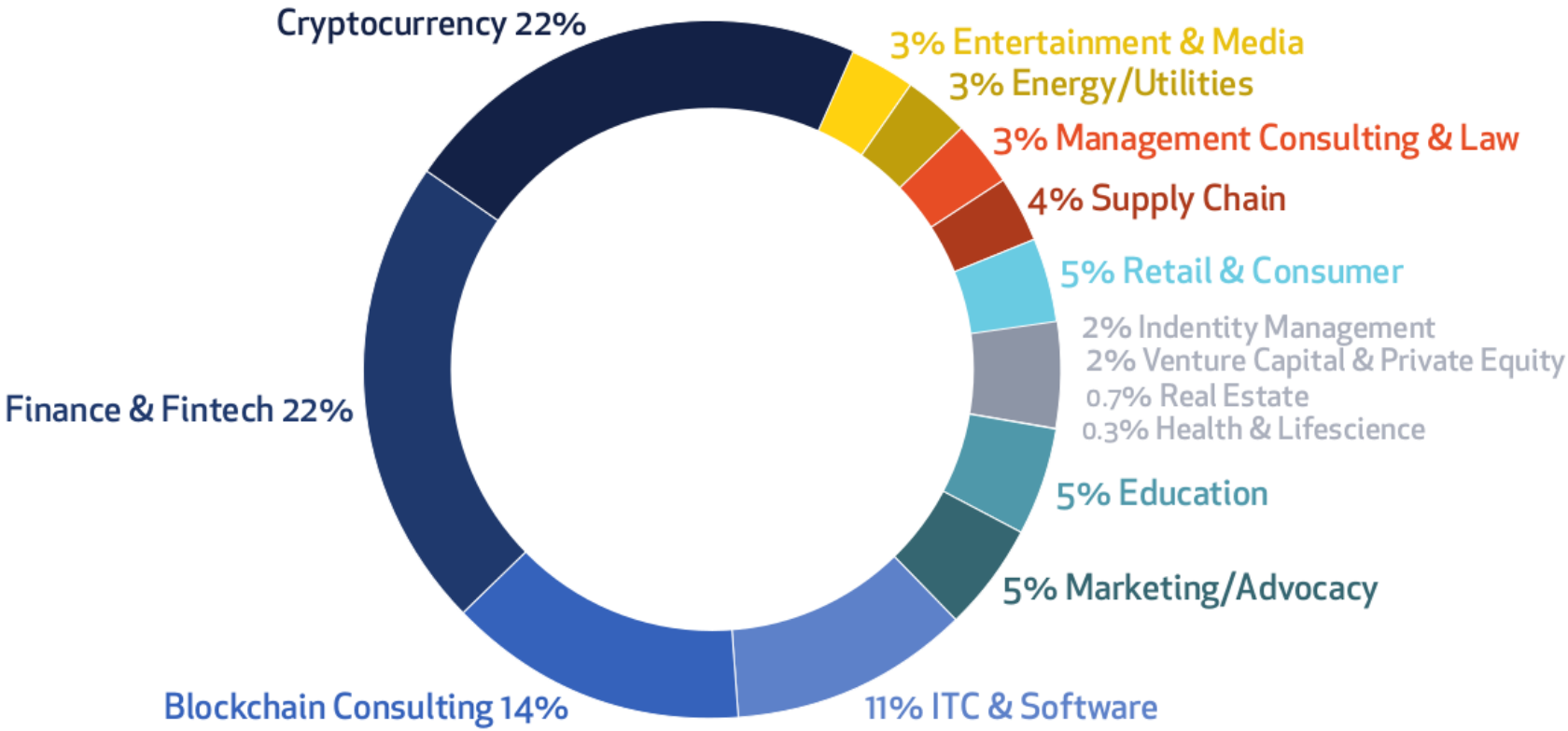
Blockchain in Canada



Industry applications

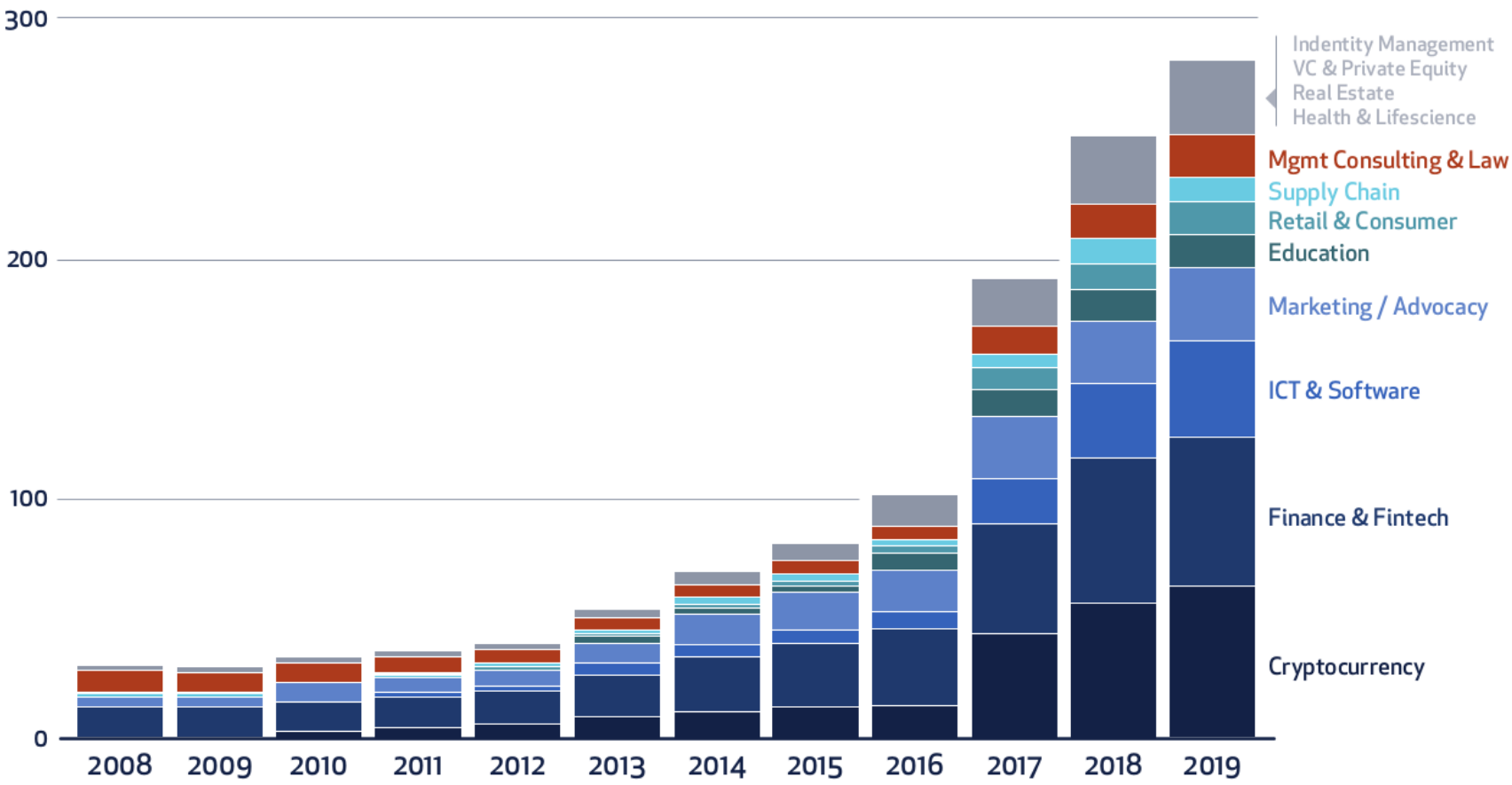


Canadian companies per sector



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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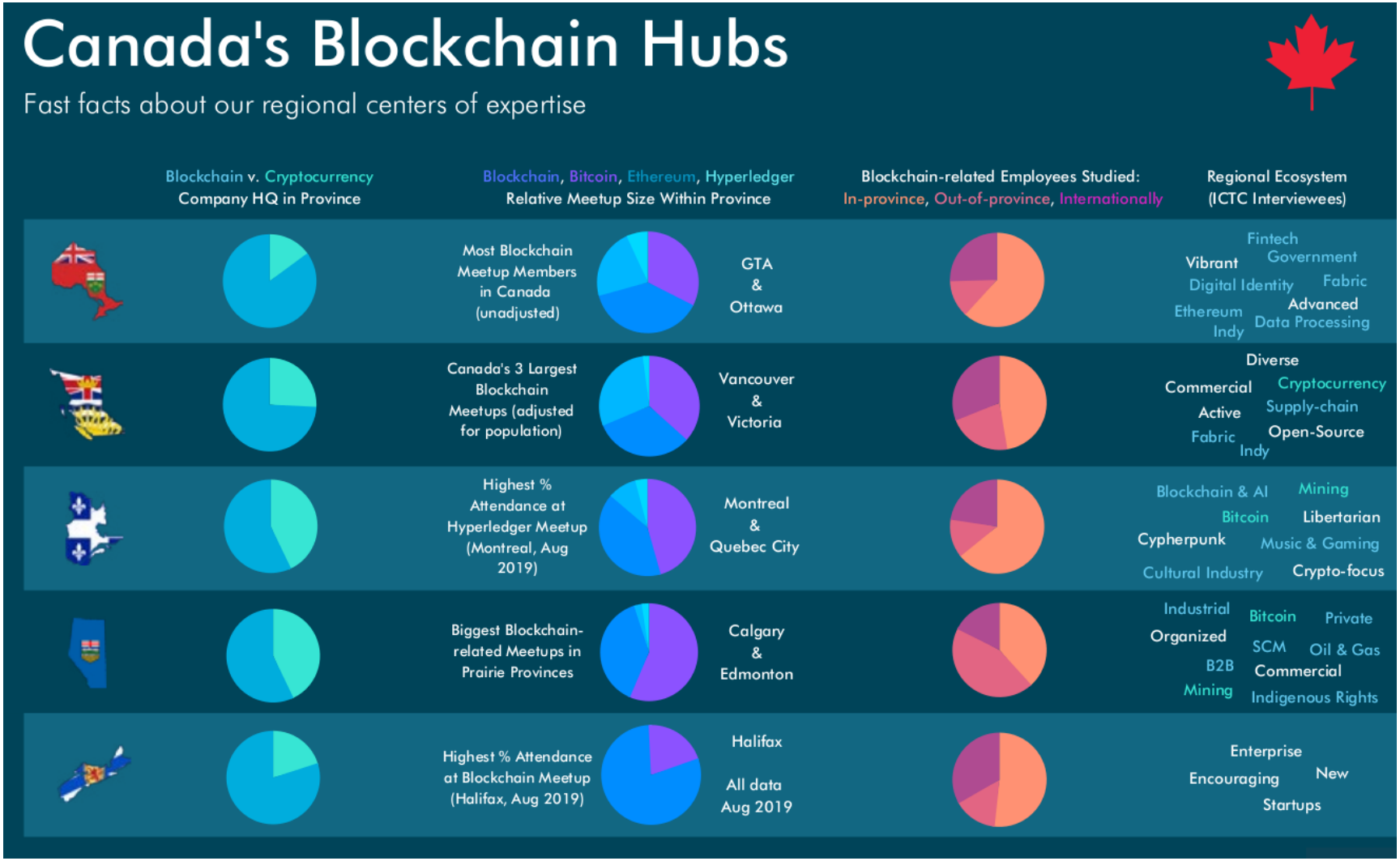
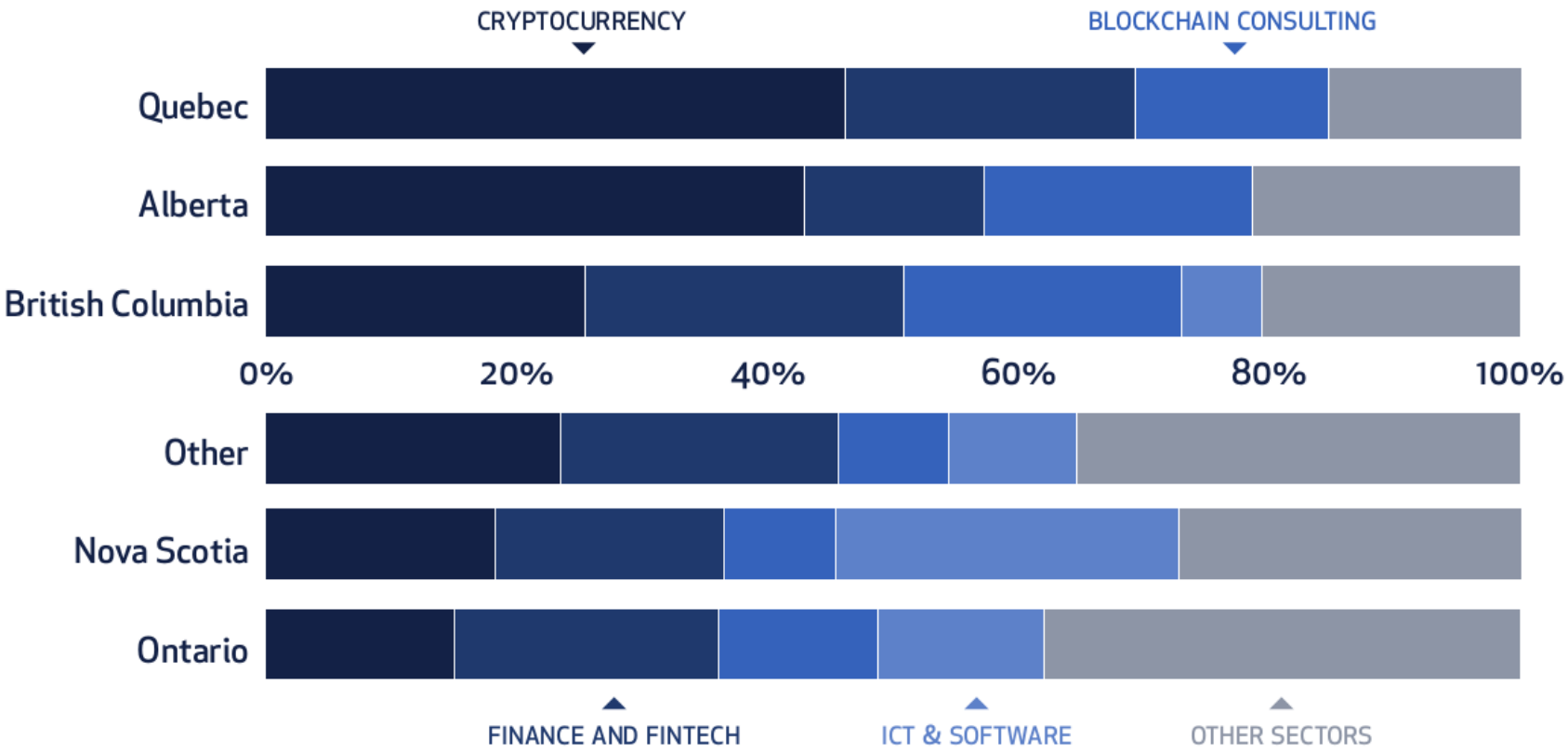
Regional expertise



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

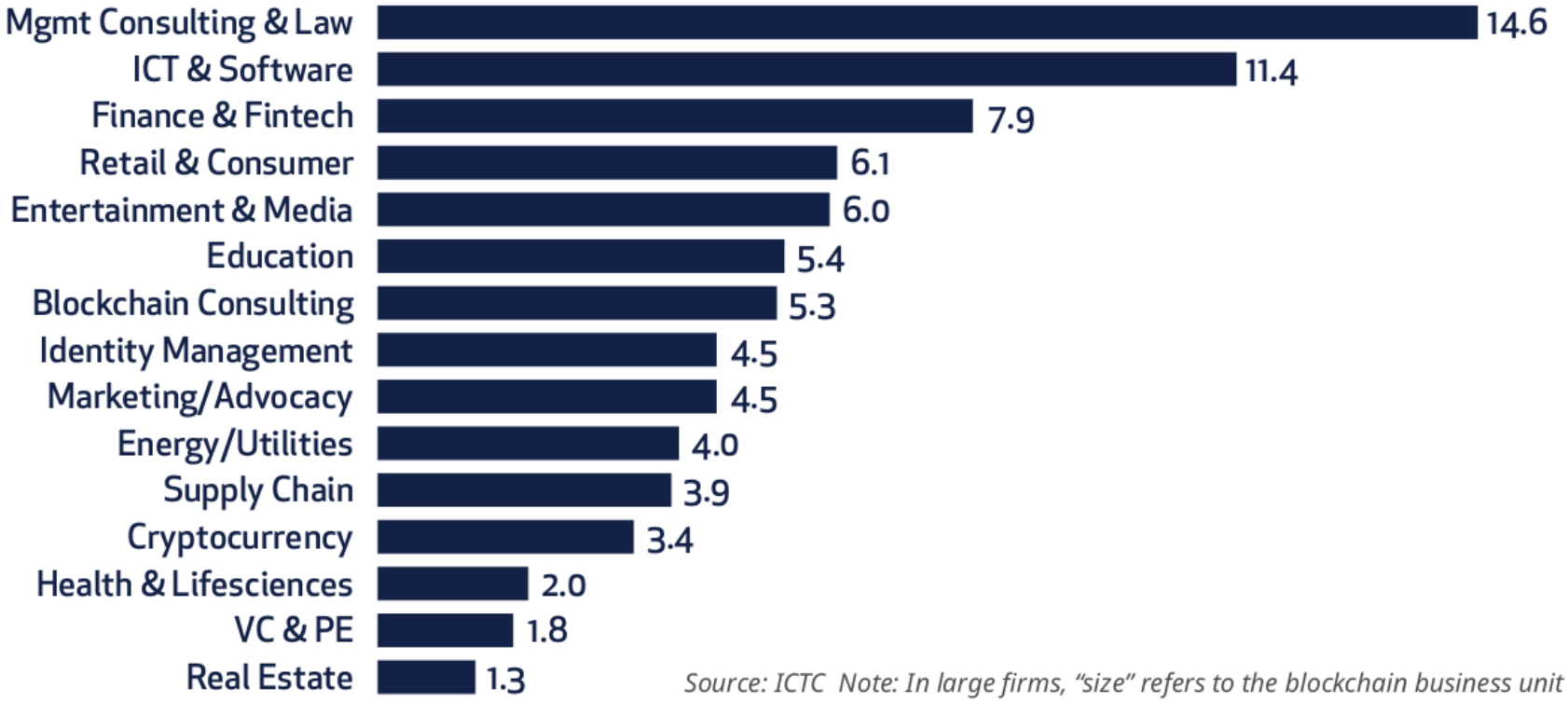

Figure: Average number of Blockchain workers per company or Blockchain business unit, by Industry (Canada, 2019)

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

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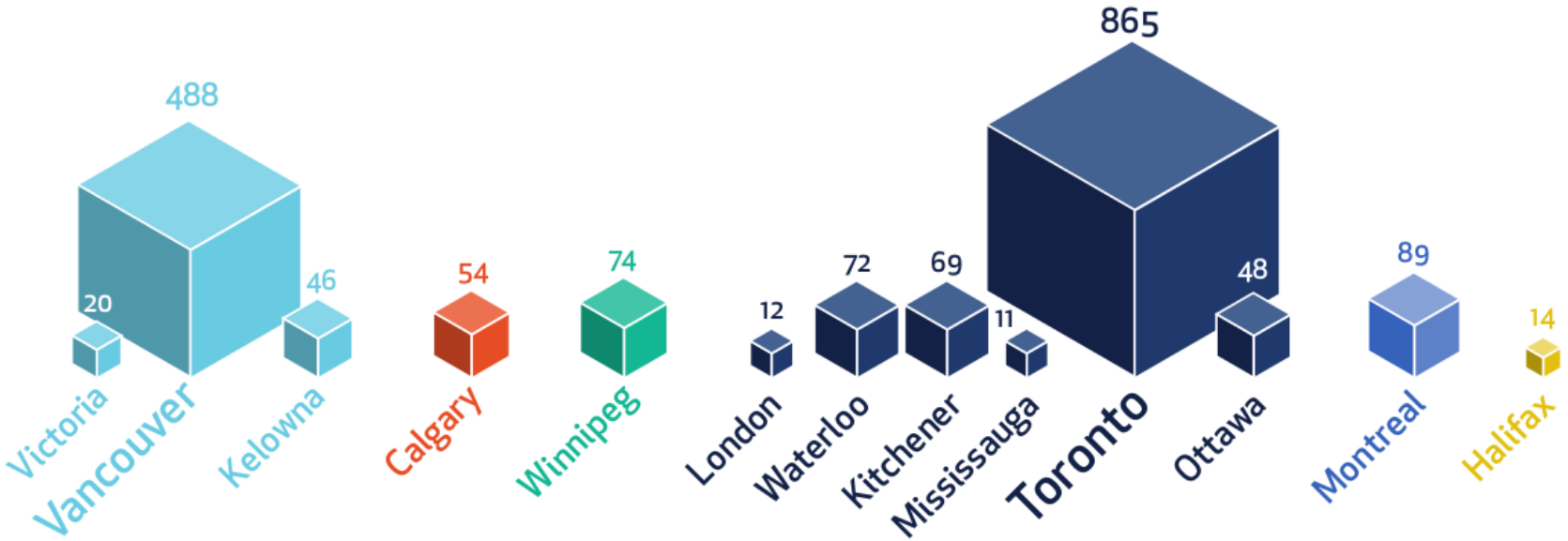
Follow the jobs



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)

Figure: The total number of jobs posted in each city from November 2017 to August 2019

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 Report [55]

- 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.*

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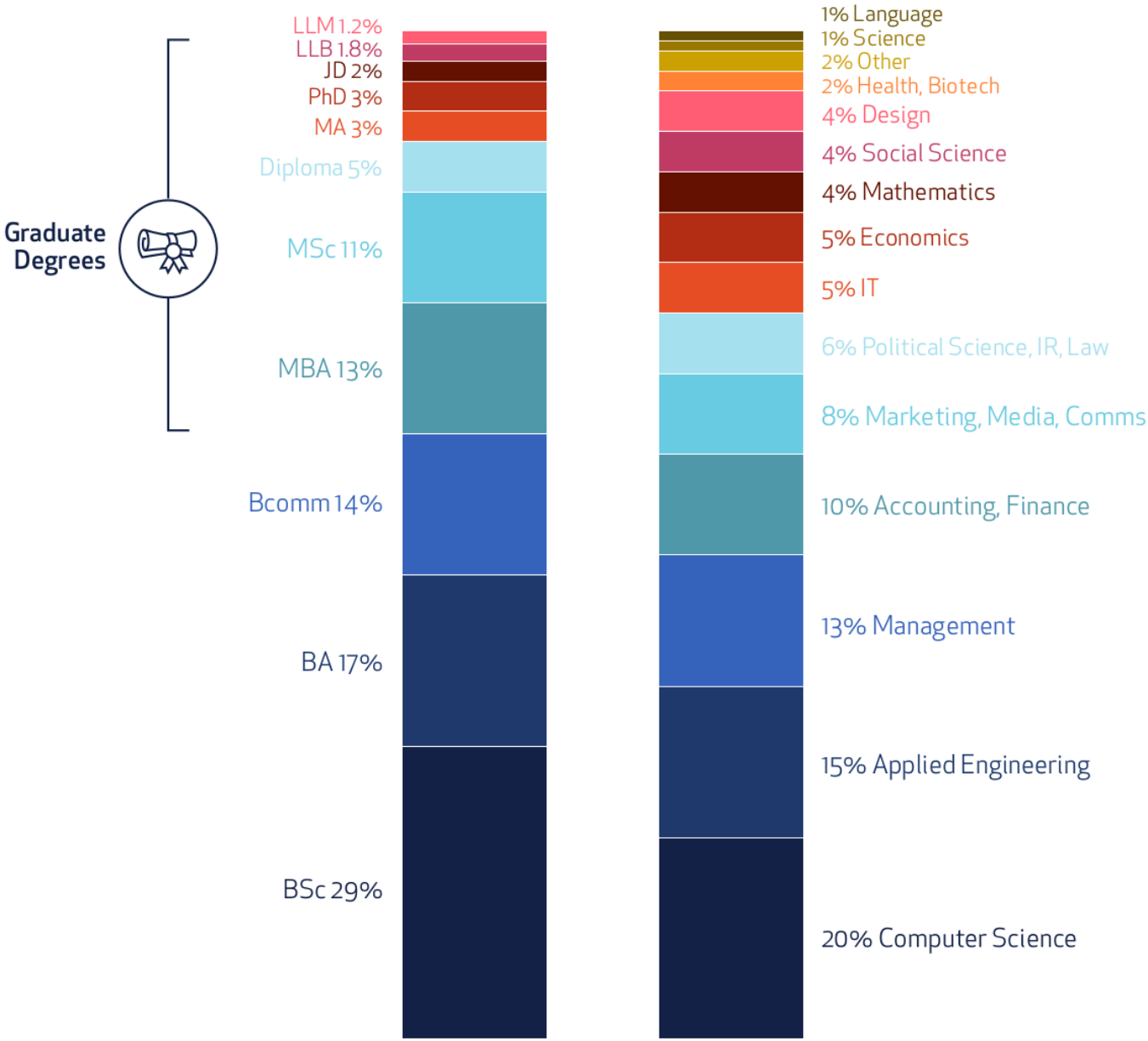
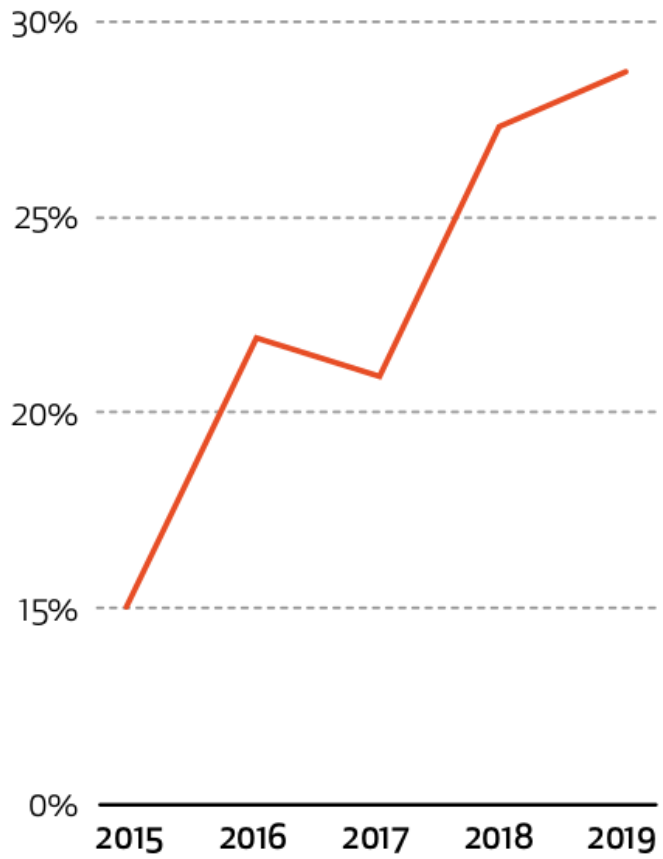
Education


Graduate Degrees
LLM 1.2%
LLB 1.8%
JD 2%
PhD 3%
MA 3%
Diploma 5%
MSc 11%
MBA 13%
Bcomm 14%
BA 17%
BSc 29%
1% Language
1% Science
2% Other
2% Health, Biotech
4% Design
4% Social Science
4% Mathematics
5% Economics
5% IT
6% Political Science, IR, Law
8% Marketing, Media, Comms
10% Accounting, Finance
13% Management
15% Applied Engineering
20% Computer Science

Aiming for parity

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



Source: ICTC

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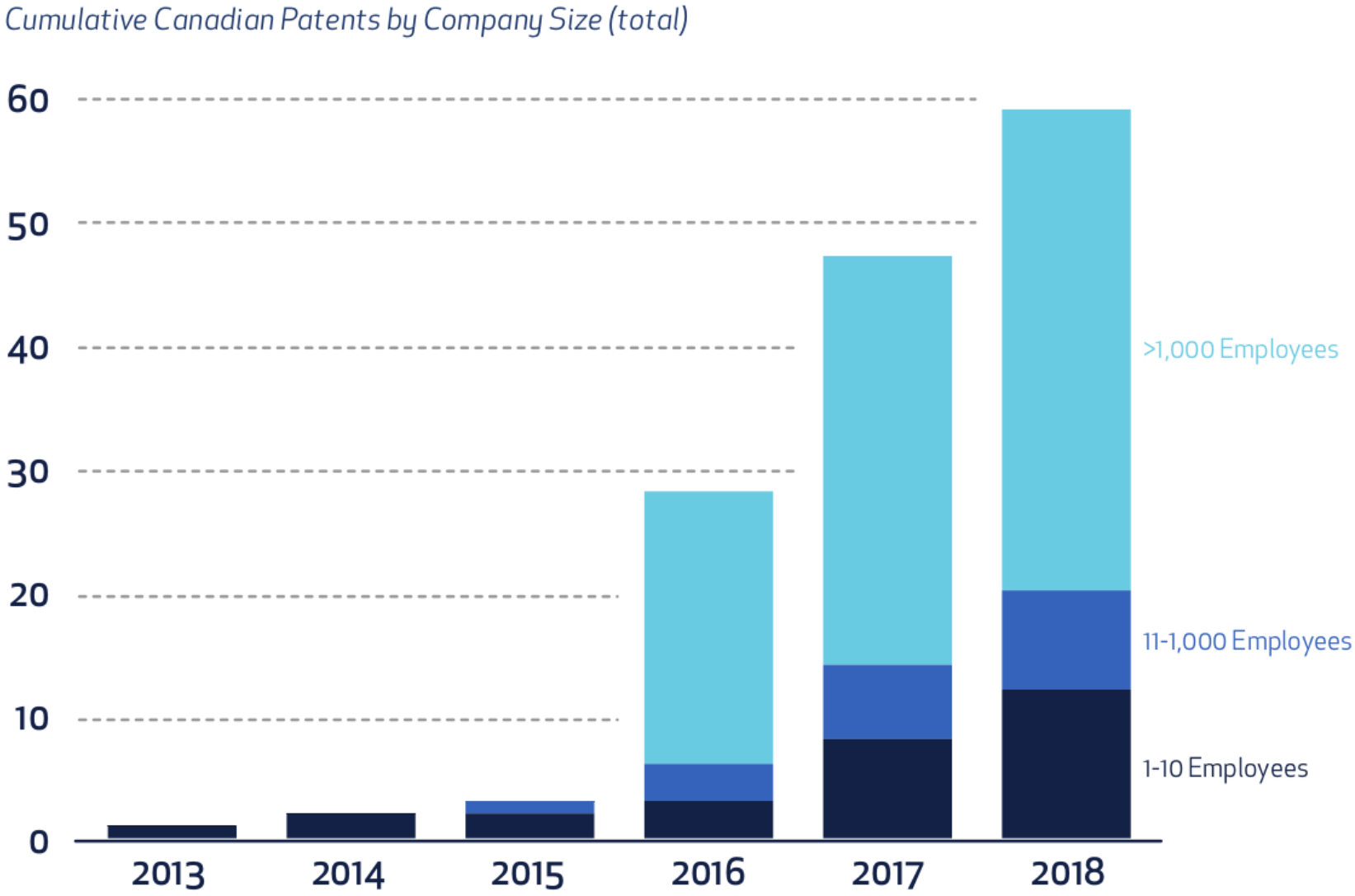
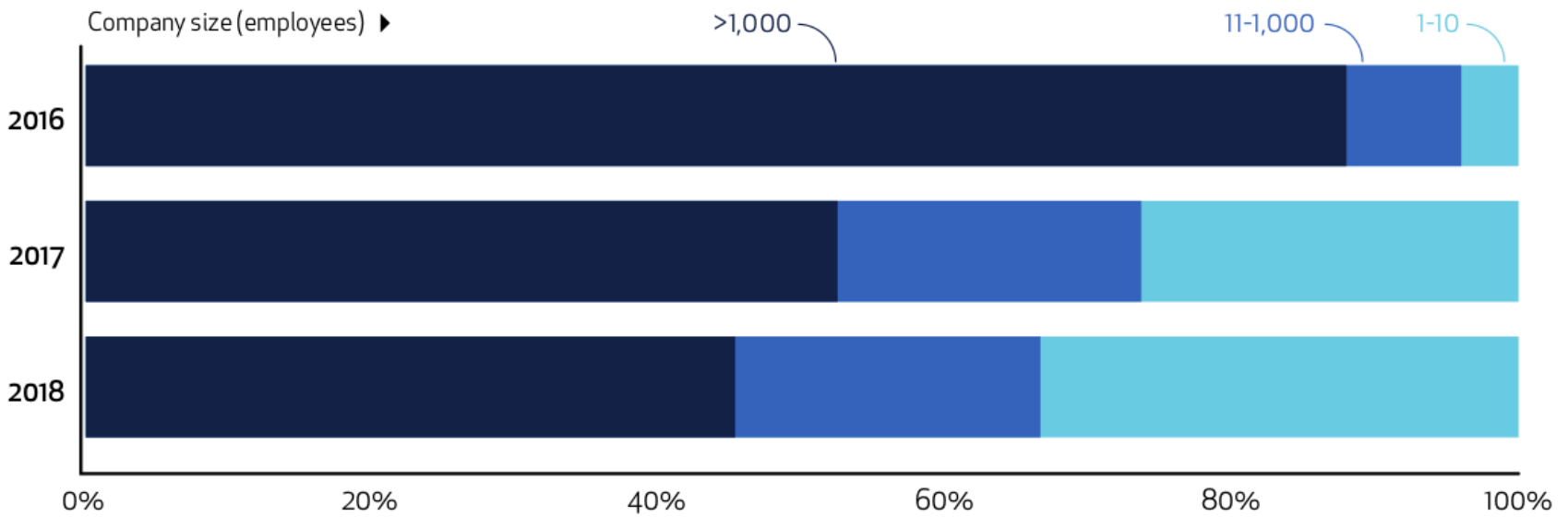
Creation of Intellectual Property



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

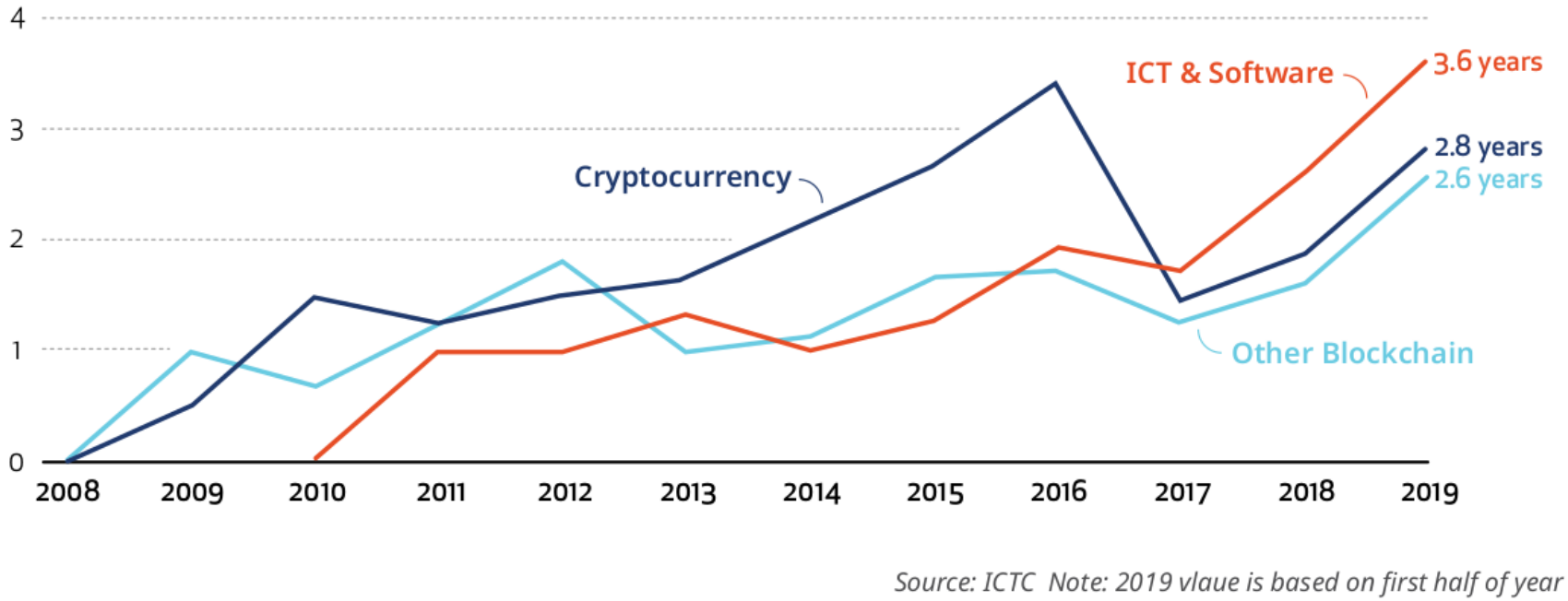
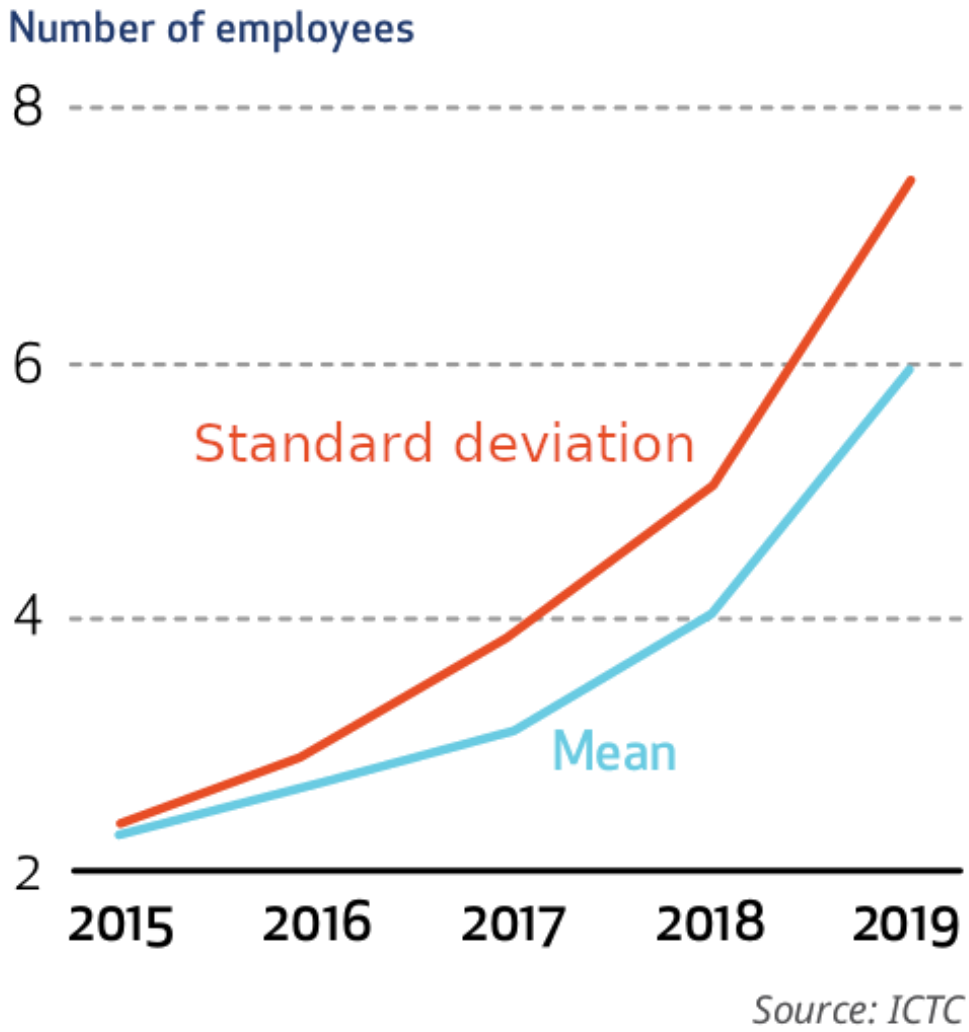


Figure: Average age of Blockchain firms funded after 2008 (Canada)

Startups are maturing



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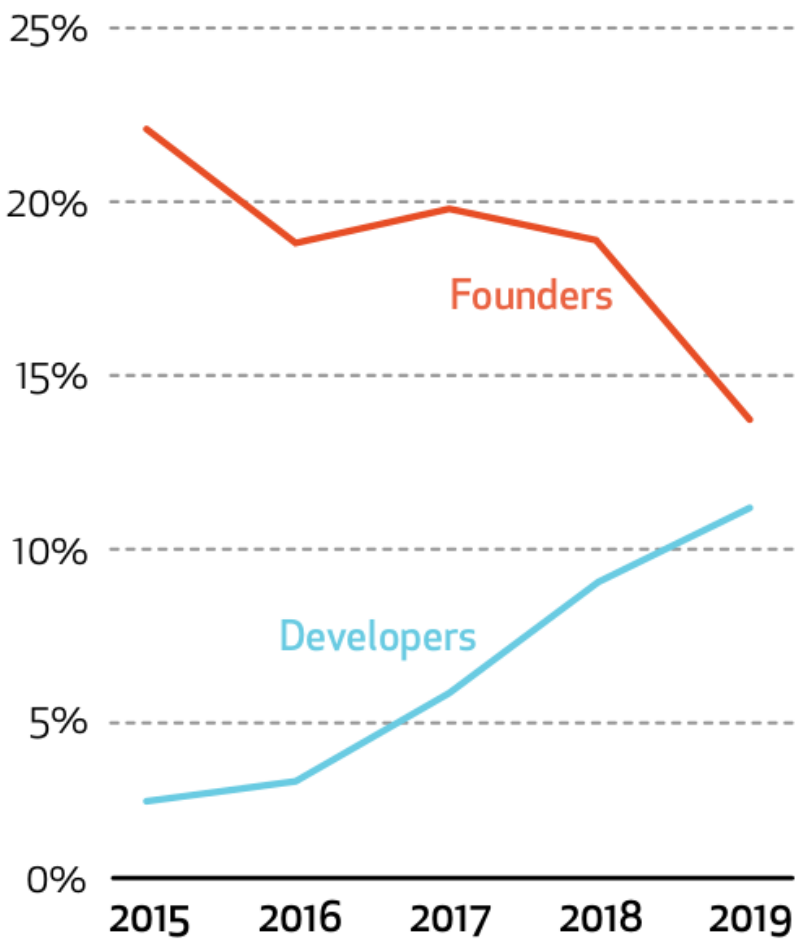

Source: ICTC

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Convergence

of disruptive technologies and practices leads to exponential growth

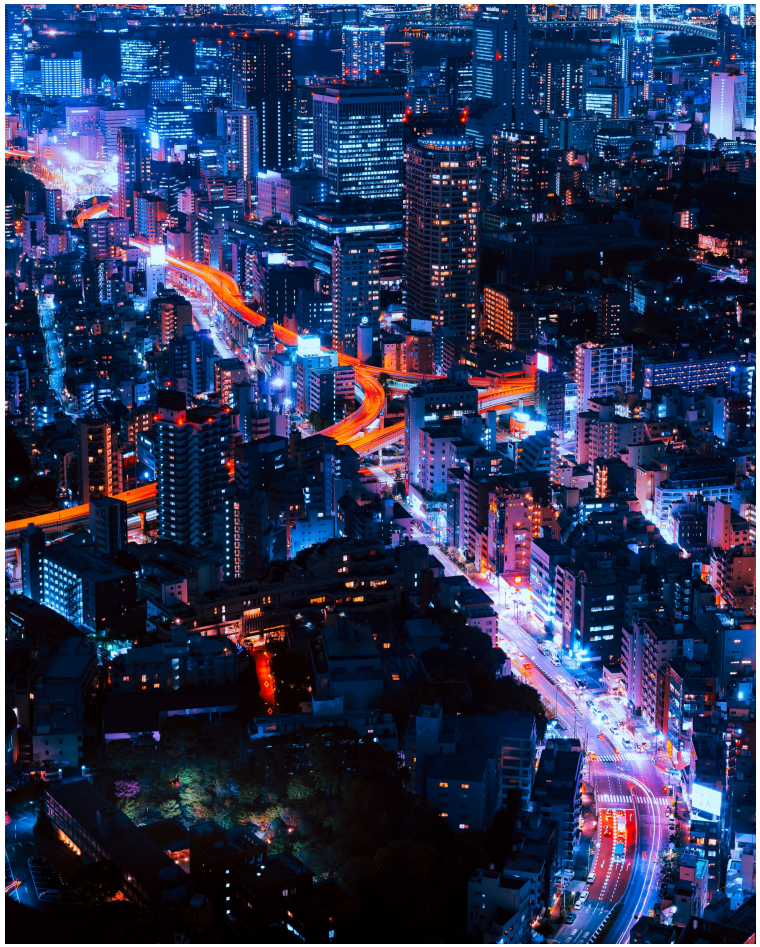
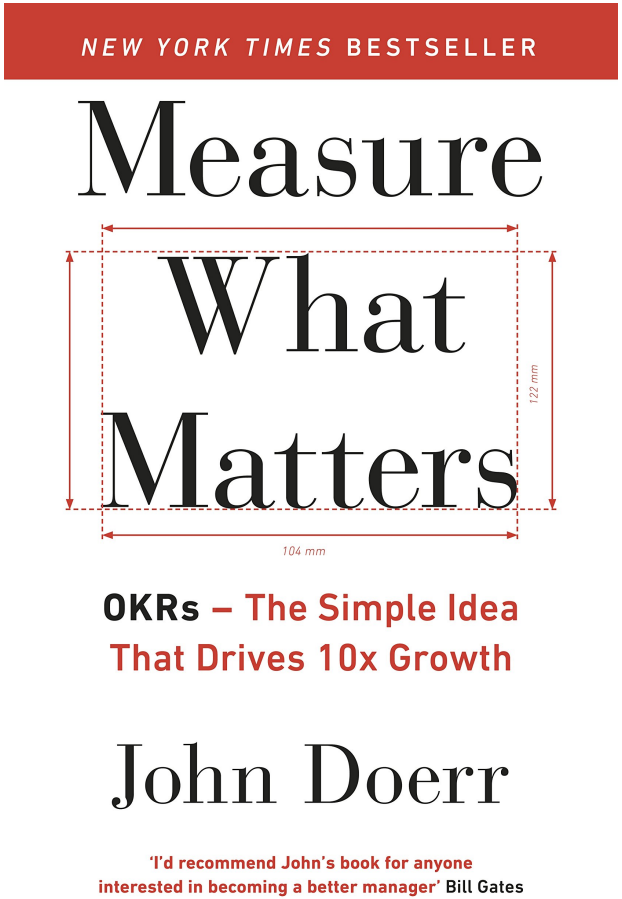


Photo: credit goes to Pawel Nolbert (Unsplash)

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

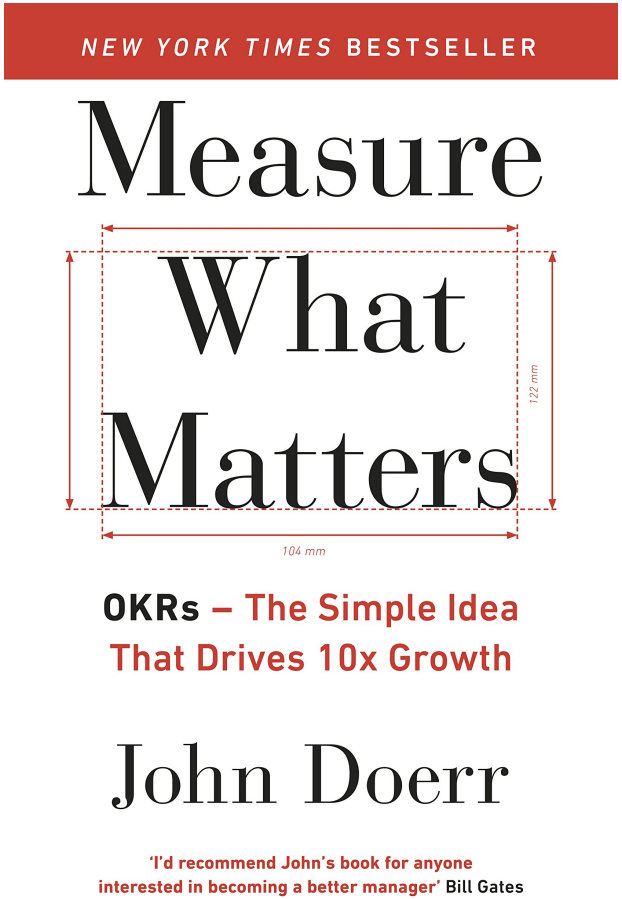
Focus on business value



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

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

Focus on business value



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

- domain expertise

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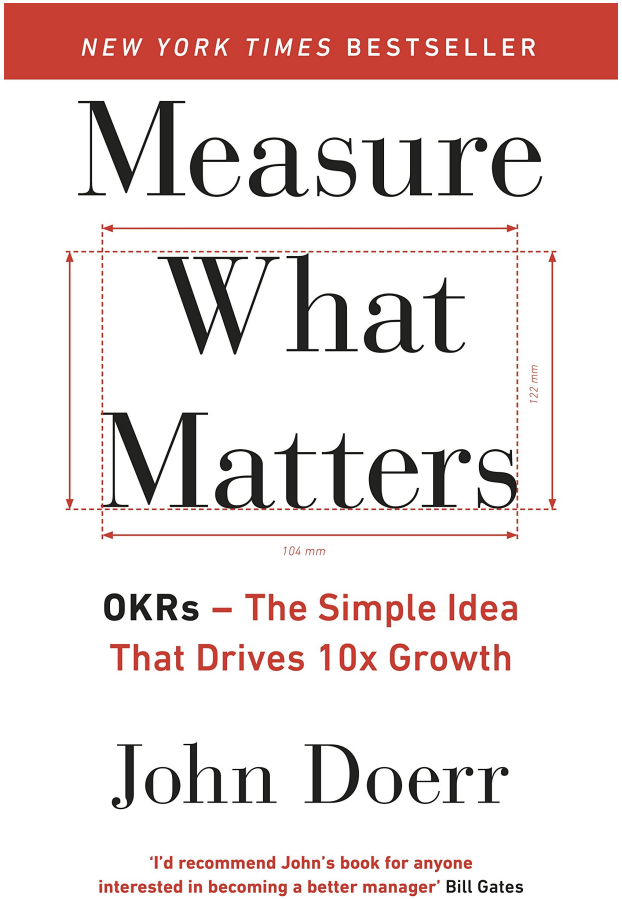

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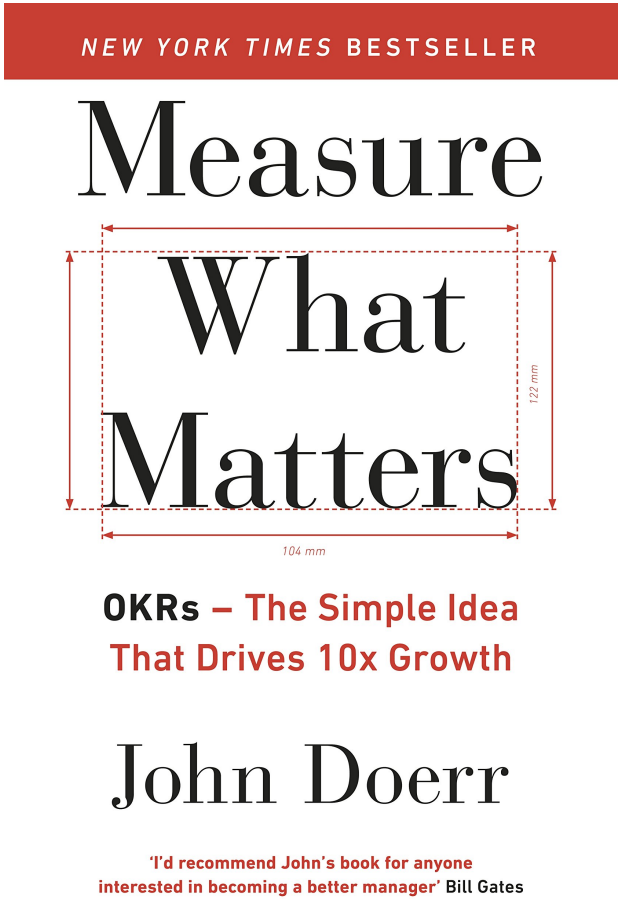

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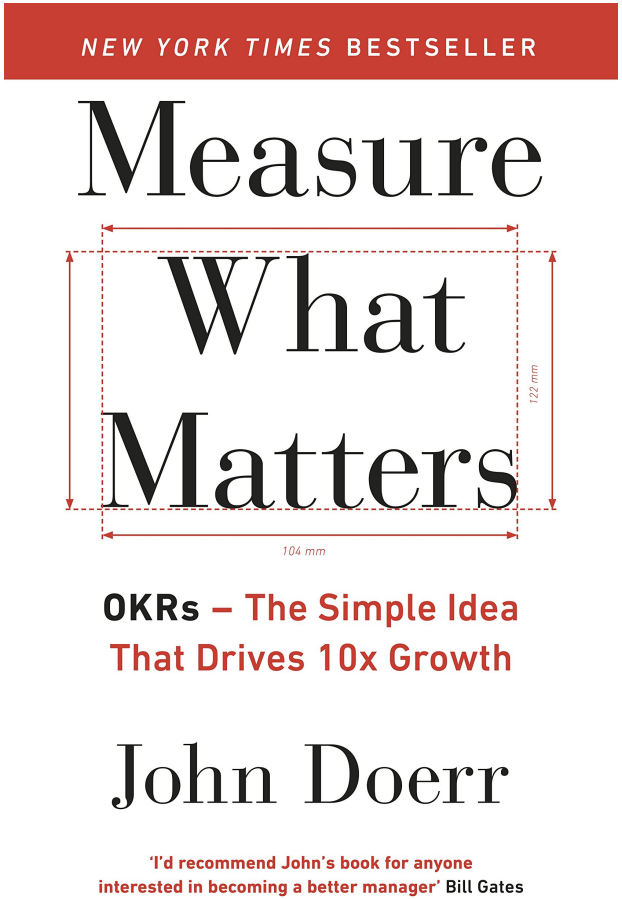

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Fiercely pursuing objectives that matter, breaking down silos, taking calculated risks are necessary conditions for an effective transformation.

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/

iAdvance

See the iAdvance annoucement

The future of Work:

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

Call to Action

from the Think Tank and Innovation Catalyst

Let's partner to accelerate innovation in Canada!

Towards 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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References I

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