Blockchain Study Overview
Building Canadian Consensus: Our Maturing Blockchain Ecosystem

Study Scope

"Building Canadian Consensus" examines the Canadian blockchain ecosystem, documenting its current status and trends for its future.This study provides the following:

- Key concepts in blockchain technology
- Canadian blockchain ecosystem by industry
- Blockchain activity across Canada
- The blockchain labour market, skills and education
- Trends, issues and the future of blockchain in Canada

Blockchain Backgrounder

Blockchain is an early-stage emerging technology that is beginning to impact the Canadian economy and labour market.

After surviving what is referred to as "crypto-winter," the dramatic fall in the price of Bitcoin (a "kingpin" application of blockchain technology) from December 2017 to December 2018, Canada's blockchain ecosystem is showing signs of maturing beyond cryptocurrency applications.

Blockchain represents the "second era of the internet." The first era was the internet of information. Blockchain is the internet of value. Money, identity, cultural assets, such as or music or even votes, can be stored, managed and transacted securely by blockchain.

(For a technical primer on blockchain, please refer to Chapter 1 of the full report)

Current state of the technology

Blockchain technology is migrating from proof-of-concept to production-readiness in Canada.

- The financial services and fintech sectors are expected to lead blockchain development.
- As developers, educators, and employers become more familiar with blockchain and its uses, a vibrant blockchain ecosystem is anticipated in the coming years.

Despite these positive advances and a rich history of blockchain development, Canada's global blockchain footprint remains small. Industry consultants fear that Canada risks losing its early advantage due to a lack of investment and regulatory uncertainty.

Criticism of Blockchain

The most potent criticism of blockchain is that it can overcomplicate business processes.
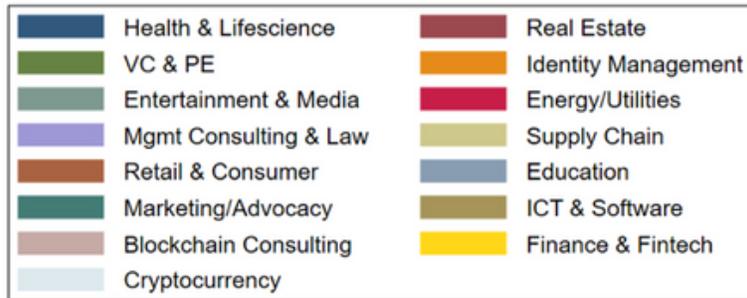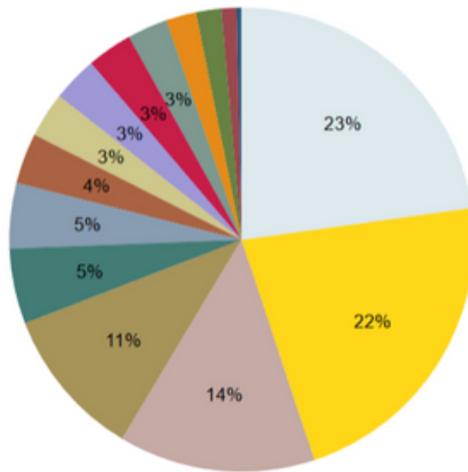
- A well-designed, real-time, editable, centrally managed database with multiple writers is often a simpler solution than blockchain. Coupled with the challenges of legacy system/blockchain integration, blockchain is not an efficient data management choice for many businesses.
- Bitcoin and other Proof-of-Work mechanisms also struggle with scalability due to intensive energy consumption. The current energy consumption of just Bitcoin is on par with the Czech Republic (Czechia).

Study findings

Canada's blockchain ecosystem is currently made up of over 280 companies, employing over 1600 workers.

- About 60% of Canadian blockchain firms offer services related to Cryptocurrencies, Finance & Fintech, or Blockchain Consulting. Emerging sectors in blockchain include culture and education.

Health & Lifescience		Real Estate	
VC & PE		Identity Management	
Entertainment & Media		Energy/Utilities	
Mgmt Consulting & Law		Supply Chain	
Retail & Consumer		Education	
Marketing/Advocacy		ICT & Software	
Blockchain Consulting		Finance & Fintech	
Cryptocurrency			

Source: ICTC
Unverified companies excluded.

- Toronto and Vancouver drive Canada's blockchain economy, with 60% of blockchain companies and 65% of blockchain workers.

Investment Interest in Blockchain

ICTC interviewees found that Canadian investors and businesses are taking a conservative approach to blockchain.

"For every $1 of business you can do in Canada, you can do $100 in the US or $100,000 in China," one respondent said about blockchain investment.

Canadian Regulatory Considerations

Canada is currently discussing token economy regulations. The Canadian Securities Administrators (CSA) has made blockchain a strategic business goal for 2019-2022.
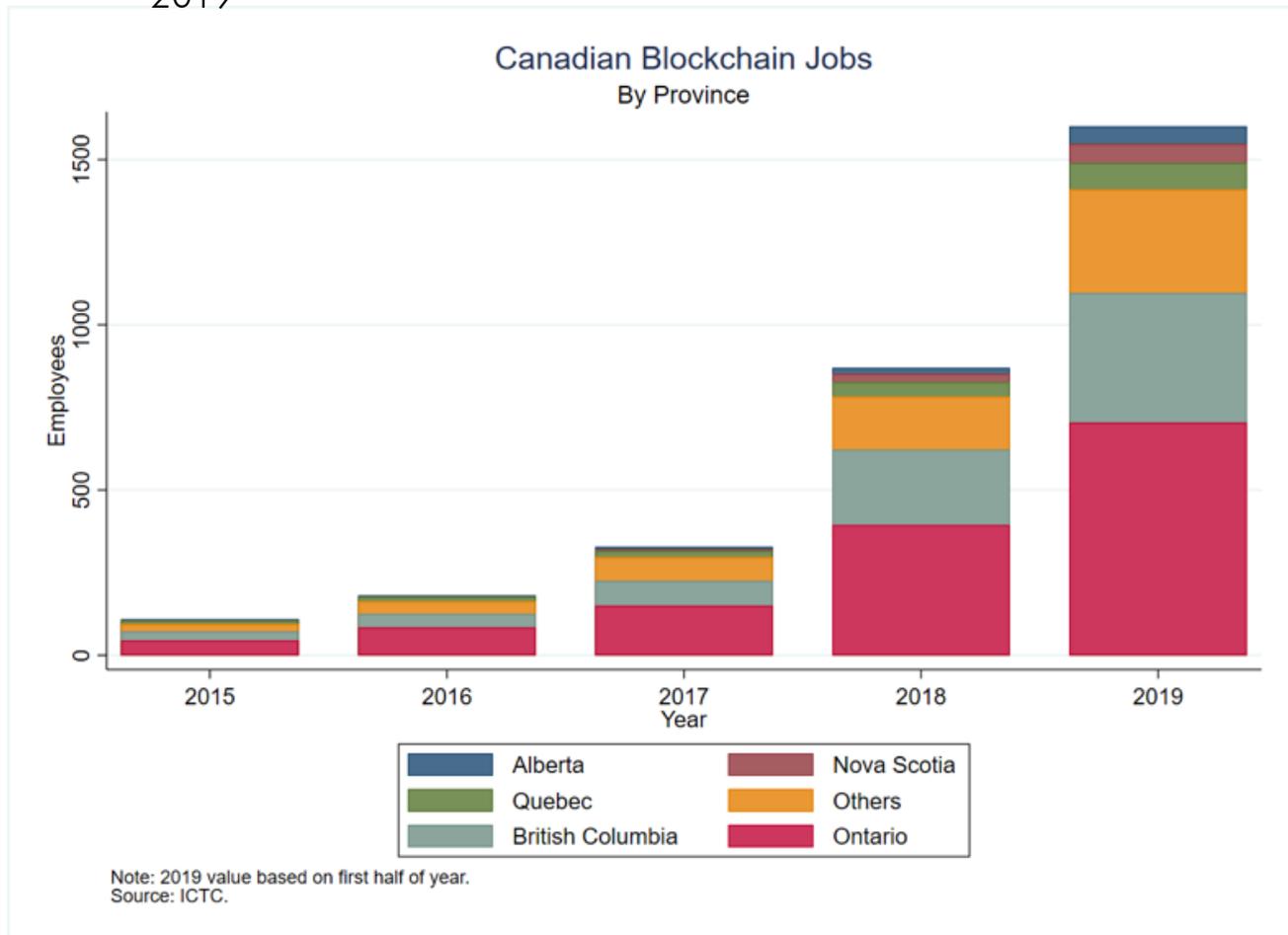
Industry consultants, however, note that current regulatory uncertainty has disincentivized several blockchain companies from remaining in Canada, including Ethereum.
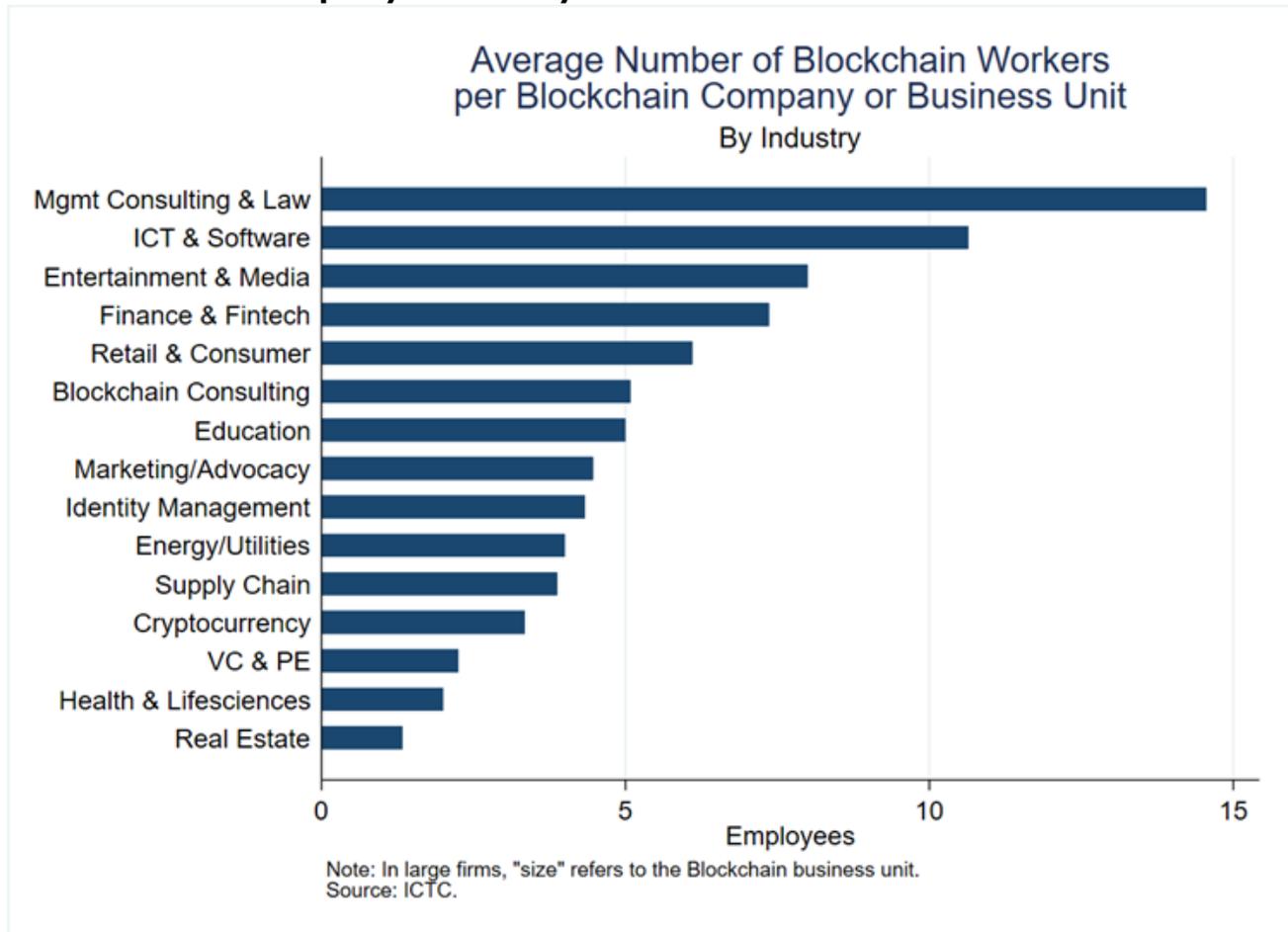
Blockchain Development Across Canada

Ontario and British Columbia currently absorb 70% of blockchain workers, but other provinces are scaling their blockchain ecosystem and their ability to attract and develop skilled talent.

- Alberta tripled its number of blockchain workers from 2018 to Q2 2019
- Nova Scotia grew from no activity in 2016 to about 50 workers in Q2 2019

Canadian Blockchain Jobs
By Province

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

Blockchain Employment by Sector

Average Number of Blockchain Workers per Blockchain Company or Business Unit
By Industry

Industry	Employees
Mgmt Consulting & Law	~14.5
ICT & Software	~10.7
Entertainment & Media	~8
Finance & Fintech	~7.3
Retail & Consumer	~6.2
Blockchain Consulting	~5.1
Education	~5
Marketing/Advocacy	~4.4
Identity Management	~4.3
Energy/Utilities	~4
Supply Chain	~3.8
Cryptocurrency	~3.3
VC & PE	~2.3
Health & Lifesciences	~2.1
Real Estate	~1.5

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

Blockchain Education

Blockchain professionals report that their employees are either self taught or have learned blockchain on the job.

Blockchain knowledge is dynamic and changes quickly, which makes curriculum development at post-secondary institutions challenging. A small cohort of institutions, however, are responding to demand for blockchain talent.

- In Canada, York University, George Brown College, and UBC, and organizations such as CryptoChicks and Creative Destruction Labs have begun to offer formal programs for blockchain development.
- Micro-credentialing in blockchain varies across Canada. TransformationWorx, founded in 2017 and based in Ontario, for example, offers two-day bootcamp-style courses in blockchain and solution design for professionals.

Industry members consulted by ICTC also noted that education in Computer Sciences, Engineering, and Mathematics were useful for blockchain development.

Most In-Demand Talent

Technically skilled blockchain professionals and blockchain solutions architects are the top in-demand blockchain roles.

- Many interviewees described difficulties finding back-end or full-stack developers with core blockchain protocol knowledge.

Since 2015, founders declined as proportion of blockchain workers, falling from 23% to 14%, suggesting a maturing industry, where entrepreneurs are being supplemented by professionals.

What skills does a blockchain developer need?

Canadian Interviews & Focus Groups (order not significant)	Top Ten Skills extracted from technical blockchain job postings	ConsenSys Blockchain Developer Job Kit	LinkedIn 2018 U.S. Emerging Jobs Report
Full-Stack Development	Blockchain	Cryptography	Solidity
Experience with Enterprise-Scale Deployment & Legacy System Integration	Cryptocurrency	Blockchain Knowledge	Blockchain
Backend software development	Ethereum	JavaScript	Ethereum
Blockchain or Protocol-Level Experience	JavaScript, React.js	Python	Cryptocurrency
Game Theory & Economics	Agile Software Development	Solidity	Node.js
Database Management & Architecture	Java	Backend languages	
JavaScript & Node.js	Python		
User Experience Design	Hyperledger		
C++ Development	Node.Js		
Smart Contract Programming	Application Programming Interface		

Salary in Blockchain

- Salary estimates for blockchain developers in the US range from US$125,000 to $175,000.
- In Canada, the Blockchain Research Institute's survey reported an average salary of $98,423.

The Future of Blockchain in Canada

International forecasts of global blockchain market size vary widely, from USD $57.6 billion by 2025, to over $176 billion in business value by the same year.

The growth and maturity of the blockchain industry in Canada is set to scale, as the blockchain industry matures and diversifies from cryptocurrency to applications in supply-chain, real estate, and healthcare.

This expansion will disrupt old processes and continue to capture the imaginations of governments, entrepreneurs, and the public.