BLOCKCHAIN
AT MCGILL

CANADIAN BLOCKCHAIN ECOSYSTEM

Private Sector Consulting and Development

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Contents

Credits & Contact

Blockchain at McGill
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About Blockchain at McGill

Blockchain at McGill is a student run educational non-profit raising awareness and fostering engagement in the field of Blockchain and related technologies. BAM accelerates its members and executives to become leaders in the industry by providing them with relevant experience and industry connections.
Learn more at www.blockchainmcgill.com

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Blockchain in Canada

Goals & Current Situation

Blockchain technology has the potential to be the main driver for and the foundation of a global innovative, inclusive and respectful economy. Especially in regards to an individual's privacy rights, digital security, ownership of personal data and intellectual property. Blockchain is expected to be a platform for safely operating technologies such as Artificial Intelligence, robotics, autonomous machines, Internet of Things, big data analytics and peer-to-peer networks for communications and financial transactions.

> ***"Canada has one of the three biggest hubs for blockchain technology in the world."***
>
> *- Jason Cassidy*
> *CEO, Crypto Consultant*

Canada has emerged as a hub for cryptocurrencies foundational technology, blockchain. Canada has managed to achieve this by having many young innovators enter the industry three to four years ago. The federal and provincial governments have also been very pragmatic to working with the industry.

Canada is home to a number of blockchain pioneers. Among them is the digital currency Ethereum, which has two Canadians among its founding team, Toronto based Aion and Tendermint, whose co-founder and chief technology officer is based in Toronto. There is also a large Canadian presence of blockchain leaders such as Cosmos, who is building the foundation for a globalized interconnected token economy and ConsenSys, a world-leading developer of Ethereum-based applications.

Within Canada, thought leadership in blockchain is heavily centered in Toronto because of the Blockchain Research Institute (BRI). Alex Tapscott, the co-founder of BRI, says the rise of Canada as a blockchain hub can be attributed to many factors, including a healthy and vibrant start-up community, a transparent legal system, a robust financial services industry and even industry regulators who have been open to innovation. However, one key driver of growth is the blockchain entrepreneurs who have started companies and supported other blockchain ventures. An example would be Anthony Di Iorio, the Canadian co-founder of Ethereum who went on to launch and fund other companies in the industry.

There are an abundance of budding initiatives, development and education programs for Blockchain in Canada. Several large companies such as Deloitte and IBM have utilized blockchain heavily to help grow their own and other businesses in Canada. Considering this together with the grassroots initiatives such as BRI, CryptoCamps and the university education programs, Canada has a promising future in the blockchain world. Fueled by a hunger and passion to learn more about blockchain and organized efforts to help each other, the Canadian blockchain ecosystem is growing at an increasing rate. However, in comparison to countries such as the US, Canada still has a challenging path ahead to be at the forefront of the Blockchain revolution.

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General State of Blockchain

Blockchain & The Private Sector

Canadian Blockchain Sector

Generally, the Canadian Blockchain ecosystem can be understood as follows:

- Ontario (52%) and British Columbia (29%) are the main micro-clusters of activity, with Quebec (9%) and Alberta (8%) growing in prominence in the Canadian landscape;
- Over 450 companies mentioned blockchain in their business descriptions;
- According to Chamber of Digital Commerce survey results, the collective **federal and provincial policy** and regulatory positions relative to digital assets, and the businesses dealing with them, are **unclear** to many in Canada's blockchain ecosystem, especially the entrepreneurs;
- Lack of funding and need for more widespread education, across the public and all levels of government is essential to support future progress.

Canadian Private Sector viz. Blockchain

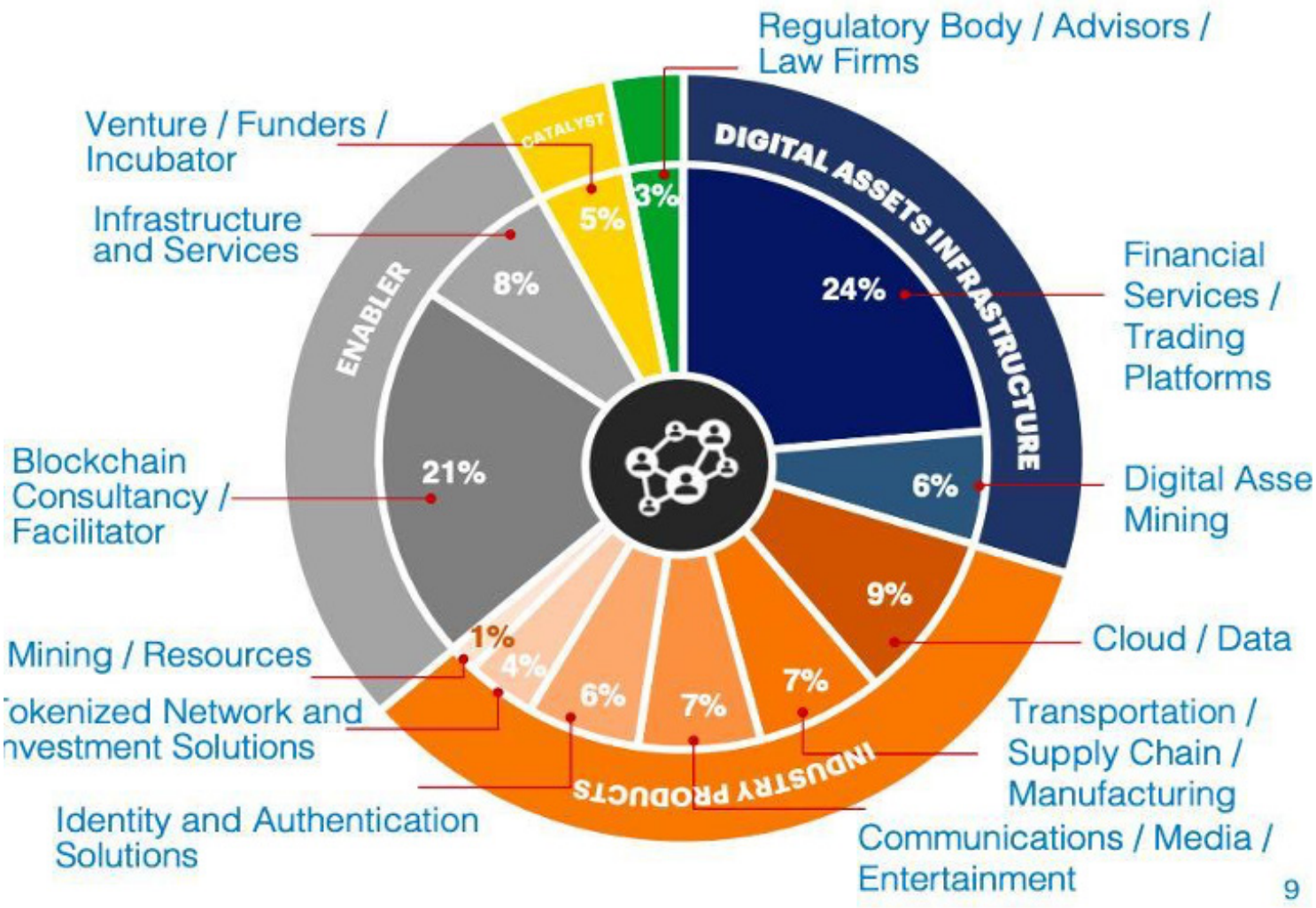
Similarly, the Private Sector Blockchain landscape in Canada can be summarized as follows:

- Within Canada, private sector blockchain companies were based largely in Ontario (63%) and Quebec (21%);
- Types of Firms using Blockchain:
  - 39% Startups
  - 26% Accelerator
  - 22% SME enterprises
- Almost **half of the companies** had **fewer than 10 employees** and just over 20 percent of them had more than 50 employees;
- Majority of SME's experimented with blockchain over past 5 years. 25% of SME spent over $1M on blockchain projects and spending expected to increase;
- **44% of SMEs have completed a rollout**, 24% concentrated on education, 20% ran pilot projects, 8% did at least one proof of concept, and 4% have yet to move into the area;
- Access to talent, access to funding, regulatory uncertainty, and challenges to obtaining affordable audit or legal services were limiting Canada's growth in the space;
- **21%** of Canadian Blockchain Companies **Focus on Blockchain Consultancy/Facilitator**;
- Blockchain Companies Products and Services: Business Consulting Services (26%).

(Chamber of Digital Commerce Canada, 2019)

General State of Blockchain

Industry Breakdown



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Case Studies

We decided to research some of the major blockchain participants in the private sector to help assess the state of the Canadian blockchain ecosystem. Our choices were generally based on company size, reputation and accessibility to information online.

The following companies have been selected as case studies of large blockchain players in Canada. By assessing their developments and progress with Blockchain, we hope to gain a reliable and accurate insight into the health of the sector as a whole in Canada.

1) Deloitte Touche Tohmatsu Limited

Deloitte's global blockchain community of practice includes more than 800 professionals across 20 countries. They have developed over 30 blockchain-related prototypes, covering a multitude of use cases such as sharing genomics and clinical data, pharmaceutical supply chain, digital identity, cross-border payments, trade finance, and loyalty and rewards programs, as well as distinct efforts for the investment management and insurance sectors.

Deloitte's blockchain applications include food claim insurance transfers, corporate voting, interbank fund, real-time loyalty points distribution and redemption, health data management, prescription fraud management and business registry and licensing. However, we found Deloitte to focus heavily on the applications in three industries specifically; healthcare, insurance and cybersecurity.

2) SecureKey Technologies Inc.

SecureKey is a leading identity and authentication provider, based in Toronto, that simplifies consumer access to online services and applications. SecureKey enables next generation privacy-enhancing identity and authentication network for conveniently connecting people to essential online services using a digital credential they already possess and trust.

3) The International Business Machines Corporation (IBM)

IBM is heavily devoted to incorporating blockchain into its practices and aims to help other companies achieve something similar. Through the introduction of IBM Cloud and Blockchain, IBM hopes to encourage other companies to embark on blockchain projects while consulting them. IBM is using blockchain to revolutionize the trade and supply chain industry, increasing trust, efficiency and accountability in the process.

4) Ernst & Young Global Limited (EY Global)

EY Global has a blockchain department dedicated to improving businesses. EY Global claims blockchain will integrate information and processes within and across enterprise boundaries and has the potential to streamline and accelerate business processes, increase protection against cybersecurity and reduce or eliminate the roles of intermediaries.

5) The Burnie Group

The Burnie Group is committed to helping companies develop their own well-informed blockchain strategy. They provide blockchain services such as keeping your company informed of new major innovations or competitive avenues that could improve your company. However, they are also able to develop a comprehensive and actionable blockchain strategy plan, tailored to your company's needs.

6) Major League Growth Blockchain (MLG Blockchain)

MLG Blockchain was a global blockchain development and consulting firm that improved and accelerated the education and understanding of blockchain and the potential business opportunities for businesses. They focused on building next generation applications using blockchain and smart contract technology to help businesses create their own unique and differentiated blockchain strategy. They frequently used to collaborate with universities and young professionals, helping them break into the blockchain industry by hosting blockchain hackathons and collegiate case competitions that many companies use to recruit talent. After a promising start in the industry, the group has become inactive. This case study was chosen as an example of a private sector company that had not been successful, despite its numerous initial achievements

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Private Sector Blockchain Applications

Upon researching many of the blockchain developments and applications these companies are implementing, there are several common industries that are being targeted for improvement through the use of blockchain. These included insurance, cyber and financial security and blockchain education and consultation.

The following companies have been selected as case studies of large blockchain players in Canada. By assessing their developments and progress with Blockchain, we hope to gain a reliable and accurate insight into the health of the sector as a whole in Canada.

Deloitte and The Burnie Group

Given its ambitious potential to drive simplicity and efficiency through the establishment of new financial services infrastructure and processes, blockchain is rapidly gathering momentum within the insurance industry. Firms such as Deloitte and The Burnie Group have seized this opportunity.

Some of the challenges facing the insurance industry are:

- Inefficient exchange of information
- Limited underwriting accuracy
- Fraud prone
- Fragmented data sources
- Use of middleman
- Manual claims review and processing
- Complex liability assessments for
- Syndicates/reinsuance

Both firms have worked towards improving the underwriting process for insurance companies by facilitating an efficient exchange of information, improving risk profiling and enabling automation through smart policy. The introduction of Blockchain to the insurance industry has led to the following improvements.

Impacts of blockchain in the insurance industry:

1. Improved claim registration and assessments

- Claim registration has vastly improved. Blockchain provides verified submission of claim data and documentation while enabling claims to be both securely and automatically submitted without the need for human intervention.
- It automates the claim process to engage repair and assistance providers to reduce response time and ensure use of preferred suppliers.
- Claim assessments have also been revolutionized. Blockchain provides access to validated external data through trusted sources and further enables the automatic determination of loss liability.
- Automated assessment of loss coverage for syndicates or reinsurance. In the case of complex risks, programmable escalation to human decision making is possible.
- Blockchain provides automatic payment to insurees through smart contracts and immutable and transparent proof of claim settlements.

2. Improved customer engagement

- Traditionally in the insurance industry, people fear sharing private data and resent the repetitive data-entry processes. Blockchain can help facilitate a shared interface between trusted third-party data providers such as real state registry, notary services and public records.
- Digital identity records stored on a blockchain will enable new types of discrete interactions with customers while protecting privacy and satisfying regulators.
- Blockchain-based digital identity utilities will accelerate and simplify customer onboarding. This will reduce institutional exposure to fraud and customers' risk of identity theft while allowing customers a greater sense of control over personal data.
- There will be smoother onboarding through the capture of verified and immutable information based on digital cryptography. This allows insurance companies to provide fast, seamless and transparent experiences when binding policies to insurees.

3. Cost effective product offerings

- Blockchain technology allows for improved cost-efficient product offerings in markets such as peer-to-peer (P2P), micro-insurance and parametric insurance.
- P2P insurance fundamentally changes the traditional insurance business model. In the new model, pools of individuals cross-insure each other while insurers aim to provide customer need-based product recommendations and premium risk-assessment services instead of focusing on asset management.
- In the P2P model, investors bid on the demanded insurance through crowdfunding or P2P interactions. Smart contracts will be utilized to guarantee payments from investors to the claim recipients and vice-versa.
- Transactions are more efficient because of automation and the removal of third-party intermediaries. Additional savings are possible as there is no longer a need to invest the capital required to insure as this role is adopted by investors.
- Improved accuracy of insurance pricing and quoting through transparent quantifications of risk and the removal of third-party intermediaries. Deloitte is able to provide digital smart contracts to capture obligations and terms binding the insurer and insuree.

4. New offerings utilizing the Internet of Things (IOT)

- The IOT utilizes sensors and network connectivity to collect and communicate data. Electronic devices, cars and home appliances are all insurable products that could be registered by smart contracts on a blockchain network.
- They can be insured against theft, loss or for their quality of performance within predetermined parameters. IOT sensors can determine the condition of an insured object and using smart contracts, can facilitate the payment of any claims to the policyholder or certified repair shop with minimal cost, friction and lagtime.
- In the blockchain powered ledger, there will be significantly more data available and accessible to insurers, allowing them to gain a better understanding of customers to develop better policies suited to individual needs.

5. Reinsurance reconciliation

- Blockchain helps reinsurers achieve contract transparency and insights about risk exposure. The immutable and transparent nature of a blockchain makes reinsurer attempts to offload policy portions to subsidiaries visible to insurers.
- Improved risk assessment. Blockchain enables trusted and verifiable information while providing transparency on existing or past insurance policies and claims associated with insurees and property.
- It further ensures appropriate and responsible re-balancing of capital exposures against specific risks. Auditing costs are substantially reduced too because of increased transparency.

6. Fraud Detection

- Blockchain can reduce fraud by confirming client identity and ownership of insured assets, as well as the authenticity of the assets themselves.
- This is achieved through connection to external registries or building new blockchain based registries that may be shared among insurance ecosystem participants.
- With a decentralized digital registry, insurers can verify and identify duplicate transactions and prove the details of policy issuance or product purchase.
- Blockchain provides a complete and immutable history of a client's activity

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Cyber Security & Financial Crime

Deloitte

With the rapid adoption of and dependence on new technologies across the finance industry, cyber security and financial crime have become two subjects of priority for banks and businesses alike. Cyber-attacks have become increasingly targeted and complex due to highly sophisticated pieces of malware being leveraged and the increasing threat of professional cyber organizations. Financial entities are having to tailor their risk-based approaches to consider the money laundering and terrorist financing implications brought about by new technologies.

In light of these realities, compliance professionals in the financial crimes space must now start operating under an innovation imperative. Currently, investigators of suspicious activity spend most of their time hunting for information and collecting documents. By automating these tasks through robotic process automation, investigators could focus more of their time on risk management. Similarly, by applying advanced analytics to transaction monitoring, organizations could automatically resolve false positives without human intervention, freeing up analysts to concentrate on higher-level risks and tasks. Even then, helping institutions gather crucial data and information is not hugely effective in itself. Most organizations struggle to turn that data into insight that can drive business decisions.

"We're entering an age of hyper-personalization where technology can be used to understand the behaviours and motivations of individual consumers. Imagine using this kind of model to detect criminal activity or enhance know-your-customer protocols. We could literally change the face of AML compliance. With this technology at their disposal, compliance professionals will be able to enhance their efficiency while improving their collective capacity to fight and expel financial crime."

- Paul Zikoplous, IBM Canada.

(Deloitbte)[5]

Deloitte is working on promising innovations in blockchain to help tackle cyber risk challenges such as false digital identities and maintaining data integrity. Blockchain could potentially aid cyber defense as the platform can secure and prevent fraudulent activities through consensus mechanisms. Furthermore, it could detect data tampering based on its underlying characteristics of immutability, transparency, auditability, data encryption and operational resilience.

(Deloitte, 2017)[6]

SecureKey

The SecureKey Concierge Service is an authentication network and innovative credential broker service for conveniently connecting Canadians to essential online government services using a banking credential they already possess and trust. It is configured to be "triple-blind", meaning that no party receives sensitive or personal information from other parties. Four of Canada's largest banks are the initial Trusted Sign-In Partners, with more financial institutions expected to follow.

SecureKey has teamed up with these institutions to provide a service that ensures a simple, convenient and secure way to access your online government services. Assuming your bank has partnered up with SecureKey, you can now login to government services online using the "Trusted Sign-In Partner" option. This option ensures no personal information is exchanged during this process, your privacy is protected and the bank will not know which government service you are accessing.

Verified.Me

Designed by SecureKey Technologies, Verified.Me is a digital identity service and attribute sharing network built on blockchain technology. It is available via a web portal and mobile application. It promises consumers a way to control their personal information: who it gets shared with, what they use it for, and what they can do with it. It simplifies and ensures the safety of sharing personal information online with participating service providers. Verified.Me helps authenticate peoples' identities online with the services they need in a privacy-enhanced and secure way. It provides access to financial services in a way that makes it easy to prove you are who you say you are while enables businesses to achieve more streamlined, effective and cost-efficient client services and onboarding.

This approach to digital identity combines the best capabilities of numerous parties including financial services, telecommunications and insurance providers to develop a holistic approach to digital identity that will hopefully protect the interests of consumers and businesses as they navigate and participate in the digital economy.

Many banks including CIBC, Desjardins, RBC, Scotiabank, TD, BMO and National Bank of Canada will support the blockchain-powered application. This service is the most significant use of blockchain in Canada yet. The service aims to help improve Know Your Customer processes, meet anti-money laundering compliance standards but mostly to enhance customer convenience.

The application will initially make use of on-device biometric confirmation features such as face unlock or fingerprint scans on smartphones. In the future, there are plans for an independent facial recognition system which eventually could be applied to verify identity for certain government services.
For high-value transactions, two different forms of identity might be checked against one another to enhance security.

(SecureKey, 2019)[7]
(IBM, 2017)[8]
(Jackson, IT World Canada, 2019)[9]

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Blockchain Consulting & Education

IBM

BlockChain Expertise

IBM has more than 1600 business and technical experts working on more than 500 IBM Blockchain projects thus far. It has helped companies put blockchain at the center of their digital transformation; helping them explore, envision, establish and evolve their solution. IBM also has a Blockchain Partner Program which allows companies to discover new business opportunities with other innovators in the IBM Blockchain Ecosystem. Lastly, IBM offers a Blockchain 101 tutorial; a quick start guide for developers. Developers can spin up a network based on the latest open source Hyperledger Fabric framework or build it manually.

The Burnie Group

Blockchain Consulting and Implementation

The Burnie Group provides a range of services that help companies use blockchain technology to open new business opportunities, reduce transaction costs and boost trust and security. These services span from a basic 'market-watch' service to keep you informed of major innovation and competitive moves that can impact your organization, to comprehensive research and strategy development that results in a customizable and actionable blockchain strategy plan. The Burnie Group also released an insight report on Blockchain, aiming to educate individuals and companies about the technology and its potential applications. Some of their blockchain consulting and implementation capabilities are as follows.

Advisory Services, Market and Offering Expertise: Advise companies embarking on blockchain implementation or proof of concept on available options, vendor selection and capabilities. They can also track records, perform due diligence and validation of offerings.

Board Director as a Service: The Burnie Group provides seasoned professionals with strong board of director experience and technical depth to represent their customer's interests in the companies they invest in as formal directors or in order to perform ad-hoc intervention.

Seminars: The Burnie Group can supply expert speakers, on both the technology and the business impact of blockchain in a specific industry for customizable corporate education events or seminars. Exploratory Workshop: The Burnie Group can facilitate and provide consulting expertise or in-house workshops leading to a formal actionable report. They can range from strategic ideation to operations and implementation planning.

Feasibility Studies: The Burnie Group blockchain feasibility study covers the technical, business and financial viability of a blockchain solution. They can align technology and product or vendor capabilities to business objectives and detail implementation challenges and make risk mitigation recommendations.

Build and Configuration: The Burnie Group can bring industry leading blockchain expertise quickly, and cost effectively, to deliver a proof of concept according to a company's needs and specifications.

Blockchain Architecture: The Burnie Group can provide blockchain architects, with deep industry experience in scaling real world implementations.

(The Burnie Group, 2017)[11]
(The Burnie Group)[12]

MLG

Global Certification Program

On September 5th 2018, MLG Blockchain announced a Blockchain Certification Program accessible to anyone in the world. The course offers individuals or businesses a comprehensive introduction to cryptocurrency, investing, regulation and real-world applications of blockchain technology.

(businesswire, 2018)[13]

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Blockchain For Business

On 30th May 2018, MLG Blockchain and WhatMatrix released a Blockchain for Business comparison guide which allows for blockchain platform comparison. The new category analyzes and ranks major available blockchain platforms, enabling visitors to identify the most appropriate solution for their use case. The category provides an enterprise-focused technical review of the most prominent protocols and their implementations in the blockchain space. The analysis covers technical details including security models and consensus, business applications, support, implementation challenges and total cost of ownership.

The comparison platform's unique depth of information is the first of its kind in the industry with regards to its unbiased review process. It helps business leaders to get familiarised with the disruptive technology without being sold on a particular solution. Users will be able to learn the major technical performance metrics to evaluate this new technology, with the option to customize product recommendations for specific business use cases. New consultants and vendors similar to WhatMatrix are keen to include their emerging technologies in the comparisons; it generates marketing value by being involved and the technical evaluation generates unique product awareness for companies. Product capabilities are also further highlighted through an enhanced analysis listing that provides better insight and visibility to their solutions.

Case-Specific Blockchain Applications

Deloitte has utilized blockchain to improve the efficiency and trust of processes embedded in the healthcare system in Canada. Deloitte's Blockchain features the following characteristics which enable this improvement to occur.

- Distributed verification: consensus amongst distributed parties within a network removes the need for an intermediary to validate transactions.
- Digital signatures: allows users to remain anonymous while still having unique accounts.
- Immutability: recorded transactions cannot easily be changed, allowing for a secure system.
- Time-stamped transactions: allows for easy tracking by recording date and time.
- Consortium networks: private networks can be established, limiting access to the network.
- Smart contracts: transactions can be automatically executed once defined conditions are met.

The utilization of blockchain in the healthcare industry by Deloitte has yielded several significant outcomes:

- Health records will not need to be stored by health organizations anymore, rather they can be controlled by individuals and distributed at need to trusted parties.
- The free flow of reconciled and secured information between multiple trusted health care stakeholders will eliminate the need for information silos.
- Information will no longer have to be manually transferred; it can be automatically distributed to relevant parties after requirements are fulfilled.

Ultimately, this results in improved quality of care provided to patients, reduced costs to store and reconcile patient information, improved visibility and trust between physicians and patients, and reduction in fraudulent transactions. However, there are existing barriers to Deloitte's blockchain goals for healthcare in Canada. In order for most of these benefits to be realized, major cultural and business barriers need to first be overcome:

- Regulation: Blockchain offers a fundamentally alternative way for industries to function. Although regulators are closely scrutinizing its effects, there are still many regulatory uncertainties which prevent its broad-scale adoption.
- Awareness: Lack of public understanding about blockchain and its applications outside of common uses.
- Culture of resistance: Essential to using blockchain in healthcare is the removal of a central authority; a radical transformation. This will most likely face resistance, so education of blockchain needs to be integrated into society without disrupting and inconveniencing daily operations and business

(Deloitte)[19]

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Cannabis Quality Control and Safety

Deloitte and TruTrac Technologies Inc. have formed a strategic alliance to introduce blockchain product-traceability solutions to the growing cannabis industry. Deloitte aims to help corporations build trusted and transparent brands, ensure both recreational and medicinal distributors and retailers receive accurate, reliable shipments and improve consumer confidence with regards to product verifiability and credibility of sources.

Deloitte aims to tackle one of the main challenges facing the industry, strain security. Its goal is to ensure the products in store match their promised origin. This goal of improved transparency stems from ensuring that product information is accurate and reliable for both consumers and retailers.

Using the "StrainSecure" system, TruTrace collects plant-testing data and performs genomic verification in plant batches. This information is then registered in a blockchain-enabled database for protection of intellectual property and the validation of strains. All information collected from the plants, such as their molecular and chemical makeup, is tracked at every stage along the supply chain from seed to sale. This platform also improves the efficiency of the administrative process of genetic and mandatory quality-control testing for legal cannabis, reducing administrative costs and time.

This is the first integrated blockchain platform to register and track intellectual property in the cannabis industry. The platform allows cannabis growers to identify and secure rights to their intellectual property. TruTrace's technology is proprietary, immutable and cryptographically secure, thereby establishing an accurate and permanent account for cannabis strains from ownership to market.

IBM

IBM Cloud

The IBM Cloud is a robust suite of advanced data and AI tools, and deep industry expertise to help companies on their journey to the cloud. It offers a full-stack cloud platform with over 170 products and services ranging data, containers, artificial intelligence, internet of things and blockchain. Many companies have collaborated with IBM to improve their business in all aspects from customer experience to vertical integration. IBM Blockchain works in tandem with IBM Cloud to provide its clients with the best possible blockchain consulting and advice to hopefully utilize blockchain to provide more efficient, convenient and trustworthy services and applications to customers.

IBM Blockchain

> "Leverage the world's most advance blockchain expertise, technology and ecosystem to rewire your industry."

IBM Blockchain is more than just a technology. It's a movement to help redefine companies' most important business relationships through trust, transparency and newfound collaboration. Many technical innovators have turned to the IBM Blockchain Platform; the leading Hyperledger Fabric platform, to build, operate, govern and grow blockchain solutions across any computing environment through Red Hat's Open Shift software. With the blockchain platform, there is total deployment flexibility for companies' and their blockchain network participants. This means companies can keep their current computing environment. IBM offers flexible deployment options across multi-cloud, hybrid cloud and on-prem environments. Furthermore, IBM commissioned a Forrester Total Economic Impact (TEI) report to help companies identify the costs, benefits, flexibilities and risk factors of working with IBM Blockchain.

IBM Blockchain Platform

The IBM Blockchain platform allows companies to deploy the leading Hyperledger Fabric platform in the environment that's right for the specific company. It allows for ease-to-use ownership of everything the company creates and allows them to explore the latest, leading Hyperledger Fabric platform. Some of the main features are as follows.

The platform allows companies to build solutions such as smart contracts. Companies can leverage IBM's advanced Visual Studio Code extension for smooth integration between smart contract development and network management. It also allows for seamless transition from development to test to production in a single environment. Furthermore, companies can write smart contracts in JavaScript, Java and Go languages.

It enables companies to freely operate and govern their own projects and work. They can manage all network components in a single place no matter where they are developed. There is also no vendor lock-in; companies maintain complete control of identities, ledger and smart contracts. They are only required to deploy the blockchain components their company needs.

The platform encourages and supports the growth of companies. There is no upfront investment, companies pay as they grow for what they use. They can easily upgrade should they want to. They can also connect to a single peer to multiple industry networks with ease. Moreover, they are able to connect to nodes running in any environment, whether it would be in-premises, public or hybrid clouds.

IBM allows companies to see their blockchain platform operate and work. They offer a guided tour of the leading open source blockchain for business platforms, led by technical experts. It is a complete overview of everything needed to get started for businesses. IBM's blockchain platform is currently being utilized to help businesses accelerate growth and has already been used for many great endeavours.

(IBM)[10], (IBM)[19]

IBM Blockchain for Supply Chain

One of the biggest disruptions IBM is causing is in the supply chain network. IBM Blockchain creates solutions that impact all elements of the supply chain, with a specific focus on logistics. Traceability and transparency are important foundations of logistics. IBM Blockchain can optimize business transactions and trading relationships with secure, global business networks.

With TradeLens – the new, open and neutral blockchain-powered platform built to support global trade – major shipping and logistics participants are benefiting from a shared, reliable ledger that's frequently updated and validated instantaneously with each network participant. This results in greater collaboration, streamlined inventory management and improved asset utilization.

One of the most significant achievements of IBM Blockchain is the greater supply chain efficiency, which is now updated over a million times a day. TradeLens, a global supply chain platform designed to promote a more efficient, predictable and secure exchange of information, delivers the details of every transaction right to your fingertips. This ensures freight shipments keep moving smoothly and predictably. TradeLens is now available to all members of the shipping and logistics ecosystem.

IBM Food Trust

"Modular solution built on blockchain, benefiting all network participants with a safer, smarter and more sustainable food ecosystem".

IBM Food trust is a blockchain system that consists of digitizing information about our food supply chain in a way that is searchable and indelible. It is a collaborative system of growers, processors, wholesalers, distributors, manufacturers, retailers and others which aim to enhance visibility and accountability across the food supply chain. The system is built on IBM Blockchain and connects the various players through a permissioned, immutable and shared records of food provenance, transaction data and processing details. It is the only network of its kind to connect participants in the food supply chain through a permanent and shared record of food system data. This results in a customizable variety of solutions that can improve the food supply system.

It allows the food industry to optimize efficiency of its supply chain; using its capabilities to enable longer product shelf lives and better access to shared information. Furthermore, it allows producers and distributors to have instant access to records, allowing the trace of food products back to its origin which could greatly improve food safety. The entire history and current location of any food item along with its necessary information; such as certifications, test and temperature data; can be found in seconds. Other benefits include reduced food waste, greater visibility and transparency to supply chain and digital record verification.
Features of IBM Food Trust:

Trace: Securely trace the location and status of food products beyond the one-up, one-down process including a farm-to-store view, multi-ingredient view, and essential details at every step.

Certifications: With digitizing standards compliance, users can access information, provide provenance and manage certifications, and share single-sourced inspection and quality certifications and registrations.

Data entry and access: Share data from your food system only with need-to-know partners in a secure and confidential environment that leverages global standards. This service is provisioned by invitation only.

(IBM, 2019)[22]
(IBM, 2019)[23]

Batavia

Batavia was a global trade finance platform based on blockchain and built on the IBM Blockchain Platform. IBM developed the new platform in consultation with transportation industry experts and the banks' customers. The consortium aimed to support the creation of multi-party, cross-border trading network by establishing Batavia as an open ecosystem that can be accessed by organizations around the world. It aimed to bring transparency, simplicity and efficiency to every financial transaction.

(Keller, IBM, 2018)[24]

Digital Trade Chain

we.trade' is a platform that acts as a digital trade chain supported by IBM Cloud. The platform is built on the IBM Blockchain Platform using Hyperledger Fabric, offering banks' customers access to a simple user-interface, leveraging innovative Smart Contract and opening up potential new trading opportunities. 'we.trade' aims to expand and improve trade finance through a multibank collaboration with blockchain technology.

It aims to solve some of the challenges within financial services, namely help small and medium enterprises participate in transaction banking because some do not have access to any formal credit from their banks. It has built a blockchain community that will exist and create trust and transparency among SMEs' and banks. If an SME is selling goods to another SME internationally, then through a menu that is provided by IBM to the representative bank, the SME can place the order that they have, which then flows through the system to the other desired bank and then to other SME.

Ultimately, it offers many banks and businesses more efficient and cost effective ways to trade internationally with an improved overall customer experience. Some of the functions of the platform are as follows:

- Create trade orders online easily.
- Management of the entire trade process from order to payment.
- Select banking products, settlement conditions and payment terms.
- Guaranteed payments when all contractual agreements have been met.
- Fully automated platform and quicker order-to-payment process.

(we.trade, 2018)[25] (IBM, 2018)[26]

According to latest reports, we.trade and Batavia have merged platforms after several banks left Batavia to join we.trade. The two platforms shared many similarities and functions.

"The platforms have a lot of commonalities, which were increasingly uncovered as we developed them," he says. "The two projects had different starting points, but if you look at them from a more holistic point of view, we eventually want to achieve the same. And, of course, there is the fact that we have developed the platform on the same technology and have the same provider."

Plastic Bank

Plastic Bank is an organization founded in Vancouver in 2013 that aims to reduce the amount of plastic waste in the environment while also helping to alleviate poverty in developing nations. Plastic Bank has leveraged Blockchain and IBM Cloud technologies to create an application that monetizes ocean plastic. Plastic bank wants to create an ecosystem that reveals value in waste plastic and helps reduce poverty levels.

Although there is rising awareness of plastic pollution in oceans, it has done little to overcome the root of the problem. An estimated eight million metric tons of plastics go into the oceans every year. Plastic Bank envisions setting up recycling systems in economically disadvantaged parts of the world that would enable local citizens to monetize plastic pollution. Thus, they developed a security-rich, scalable reward system – a blockchain banking platform – that runs on the IBM Cloud. This not only dignifies recycling for collectors trying to make a living but only reduces the volume of plastic bound for oceans and waterways.

"Our progression and transition into the cloud becomes even more relevant as we grow. When we continue to implement by country around the world, that's where the IBM Cloud comes in."

- David Katz, CEO and Founder, The

EY Global

EY OpsChain Public Finance Manager (PFM)

In April 2017, EY launched its blockchain solution Ops Chain. It is a customized version of the Ethereum blockchain. It now has both private consortium versions of the solution as well as a public edition which uses Zero-Knowledge Proofs for privacy and works on the public Ethereum network. PFM is built on the Ops Chain.

The EY OpsChain PFM is a blockchain enabled solution designed to aid governments in improving their processes for financial management of public funds. Launched on October 16 2019, it helps governments improve transparency, provide accountable goals for citizens and track budgets, expenditures and results. Blockchain technology is used to match government spending programs with tangible outcomes even as funds are passed through multiple public and government service agencies.

Conventionally, government bodies allocate funds for specific purposes and contract third party agencies to carry out the work. However, the accounting becomes complex when federal, state and public institutions are working on the same project in different capacities. EY OpsChain PFM blockchain provides clear, accurate and timely data for financial reporting and accountability. The system improves administrative efficiency by tracking funds in real time and creating a single source of integrated financial and non-financial performance information to facilitate decision making.

EY OpsChain PFM has been piloted worldwide, most notably in the city of Toronto. The city has tested its application in trying to improve how reconciliations and interdivisional fund transfers are managed. This could increase transparency between divisions and facilitate more efficient and effective financial and asset performance reporting.

(EY Global, 2018)[29]
(Ledger Insights, 2019)[30]
(Short, 2019)[31]

"With a commitment to championing the economic, social and environmental vitality of the city of Toronto, our officials strive to implement technologies that best help us meet our residents' evolving needs. Testing new technologies is part of our ongoing approach to financial management transformation taking place at the city."

- Heather Taylor, City of Toronto Chief Financial Officer

MLG BlockChain

Since 2016, MLG consulted on over $160M in token sales, helping blockchain enterprises grow from their infancy stage into the global space. From token development and marketing to building blockchain application, MLG used to rapidly mobilize their client's blockchain innovations from start to finish. MLG had a wide range of experience in multiple Blockchain fabrics such as the bitcoin blockchain, Ethereum, Hyperledger, Ripple, Factom and Eris which make them adequately suitable to support a blockchain organisation's development. MLG also launched a new company called Crypto Media Global in 2018, offering complementary services to their global blockchain consulting firm.

AirDropX: Token Development and Marketing

At the beginning of 2018, MLG Blockchain co-launched a new community development solution called AirDropX, which enabled token projects to create globally distributed and actively engaged communities of enthusiasts. The success of AirDropX was proven to be a successful method of developing a vibrant community, surpassing the wildest expectations of the company.

At its core, AirDropX was a social platform designed to facilitate educational air drops. In the cryptocurrency community, an airdrop is a distribution of a cryptocurrency token or coin, usually for free, to numerous digital wallet addresses. Airdrops are commonly used as a way of gaining attention and new followers, resulting in wider user-bases and a larger disbursement of coins.

AirDropX was developed for two kinds of users. Firstly, blockchain companies looking to build and engage with their communities (Both pre-and post-ICO). Secondly, crypto enthusiasts looking to easily participate in the hottest projects and earn free tokens.
Unfortunately, AirDropX seems to be defunct now as a result of MLG no longer being active.

(Schorg, 2018)[33]

Other BlockChain Applications

BitJob

Bitjob is a peer to peer global job marketplace powered by Ethereum blockchain technology that is designed for students to earn money and gain work experience doing work related to their career path or current expertise. Students can see jobs related to their future career by creating an account. The platform allows them to do work for professional employers in between classes and studying, via smart contracts. Students are paid via Paypal or STU tokens, a new cryptocurrency that can be used to get exclusive deals and pay where STU coins are accepted.

When a student completes a project on BitJob, the company they worked for will rate the students work, which becomes part of their resume, showing they did relevant industry or professional work associated to their degree of study. BitJob is currently being tested to launch at universities across North America including McGill, Concordia, MIT, Berkeley and Michigan.

(bitJob, 2018)[34]

BLOCKCHAIN AT MCGILL

Blockchain Initiatives by the Community

Blockchain Vancouver

This is a community effort to organize blockchain events and bring like-minded people together to learn and educate one another on blockchain.

Toronto Blockchain Research Institute (BRI)

BRI is an independent, global think-tank that brings together the world's top global researchers to undertake ground-breaking research on blockchain technology. It wants to help realize the new promise of the digital economy. Funded by a membership consisting of international corporations and government agencies, its syndicated research program aims to fill a large gap in the global understanding of blockchain technology and its strategic implications for business, government, and society.

Its global blockchain experts are dedicated to informing leaders of the market opportunities and challenges of this nascent technology. Research areas include financial services, manufacturing, retail, energy and resources, media, telecommunications, health care, and government; the management of organizations, the transformation of the corporation, and the regulation of innovation; and blockchain's potential role in the Internet of Things, robotics and autonomous machines, artificial intelligence, and other emerging technologies.

Furthermore, The Blockchain Research Institute partnered with INSEAD, one of the world's top business schools, to launch a set of courses under the specialization of "Blockchain Revolution for the Enterprise."

(Blockchain Research Institute)[3]

CryptoChicks

CryptoChicks is an international, self-financed, non-profit organization that is empowering women who want to learn about blockchain technology. It has participated in hackathon events and chapters around the world and helped educate women through mentorship programs such as CryptoChicks Hatchery. CrytoChicks were nominated for the Blockchain Company of the Year Award at the Canadian FinTech and AI Awards in 2018 and 2019.

(CryptoChicks)[36]

Blockgeeks

Blockgeeks is an online hub where entrepreneurs, investors, and leaders can learn about the rapidly evolving world of blockchain technologies. Through innovative online guides and courses, Blockgeeks claims to remove the high barriers to entry in the Blockchain world, allowing anyone with a passion for Blockchain to work in the industry, should they desire that.

"Blockgeeks, with its innovative approach to education, is uniquely qualified to train on blockchain concepts, architecture and application."
- Steve Wozniak

(Wozniak)[37]

Blockchain Initiatives by Universities

As of now, only a handful of the 28 top-ranked Canadian Universities offer relevant Blockchain certifications. Of those who do, they have extensive networks of partners to guide curriculum, facilitate programming and offer students practical experience through projects and work opportunities. For example, the University of Waterloo is the only Canadian member of Ripple's University Blockchain Research Initiative, which includes Berkeley Haas School of Business, Cornell, Massachusetts Institute of Technology, Princeton, and Stanford. A great step forward would be to encourage more Canadian universities to join this Blockchain Research Initiative, which would foster the development of young talent looking to work in the industry in the near future.

Academia reports are showing that interest is high and growing in blockchain courses, certifications, talks, research, and events. While there should be an increase in the number of schools adopting blockchain education programs and initiatives, the progress of schools that have introduced these are promising.

McGill University

Blockchain at Mcgill (BAM) educates students by giving them the opportunity to provide value to the industry. BAM is a student run educational non-profit raising awareness and fostering engagement in the field of Blockchain and related technologies. BAM accelerates its members and executives to become leaders in the industry by providing them with relevant experience and industry connections. BAM also piloted MLG's Blockchain Certification Program. BAM's current publications include a report on supply chain systems & anonymity, cross border payments & voting and state of the canadian blockchain ecosystem.

University of British Columbia

The University of British Columbia (UBC) in Vancouver and Kelowna has a range of blockchain programs, from one-day executive workshops to upper-graduate summer courses covering blockchain architecture, use cases, and socioeconomic impact of the technology. Just recently launched in January 2020, Blockchain@UBC is Canada's first, Blockchain and Decentralized Trust Technologies, training pathway for graduate students. The training path is multidisciplinary and is supported by industry partners from a wide range of sectors. The initiative will provide a capacity for Master's and PhD students who are interested in this area and desire to contribute in scaling Canada's Blockchain industry while also engaging in some of the world's most complex socio-technical issues.

(UBC, 2020)[38]

York University

In Toronto, various universities have ramped up their blockchain adoption. The Blockchain Hub, an innovation hub for blockchain education, research and commercialization, based in York University, offers a range of degrees in the blockchain field. Students can choose from blockchain business tracks to technical and developer tracks and emerge with full certification once completing the course. York's blockchain lab is focused on the real-life managerial and entrepreneurial applications of blockchain technology.

(The Blockchain Hub)[39]

University of Toronto

The University of Toronto (UofT) has the Creative Destruction Lab at the Rotman School of Management. It is a program for seed-stage, science-based start-ups that have the potential to scale into massive companies. The lab has a unique process for incubating and investing in new ideas. Its Blockchain Incubator Stream is a 10-month highly selective program in which blockchain founders are mentored by veteran entrepreneurs, investors, and visionaries in AI and blockchain. Participants are eligible for up to US$100,000 in funding, local office space, and additional technical training.

The UofT also offers several blockchain-related courses and course content in the School of Continuing Studies, the Rotman School of Management, the Field Institute for Research in Mathematical Sciences, and the Faculty of Law. Furthermore, UofT has several student groups such as the Blockchain Laboratory of Toronto, which provides an educational environment for people interested in blockchain.

(Creative Destruction Lab)[40]

University of Waterloo

The university of Waterloo has a blockchain research division where a diverse group of researchers are working on a range of blockchain academic and industry-driven research projects as a means to further the technical development and innovation of the endless applications of blockchain. Areas of research include a real-time embedded software group, a Communications Security Lab, a Side-Channel Security of Embedded Systems Lab, and Waterloo's Cybersecurity and Privacy Institute. Waterloo's Institute for Quantum Computing has contributed to research on quantum's impact on blockchain encryption schemes.

(University Of Waterloo)[41]

Other Canadian Universities

George Brown College was the first to offer a blockchain development program with a comprehensive certificate. Toronto's Ryerson University launched Ted Rogers Emerging Technology, a group that aims to inspire and educate Ryerson business students on developments in new and emerging technologies such as blockchain that will define the course of commerce in the future.

(George Brown College)42(Facebook)[43]

Potial improvements to increase Blockchain adoption in Canada

Introduce Blockchain education in learning institutions such as universities:

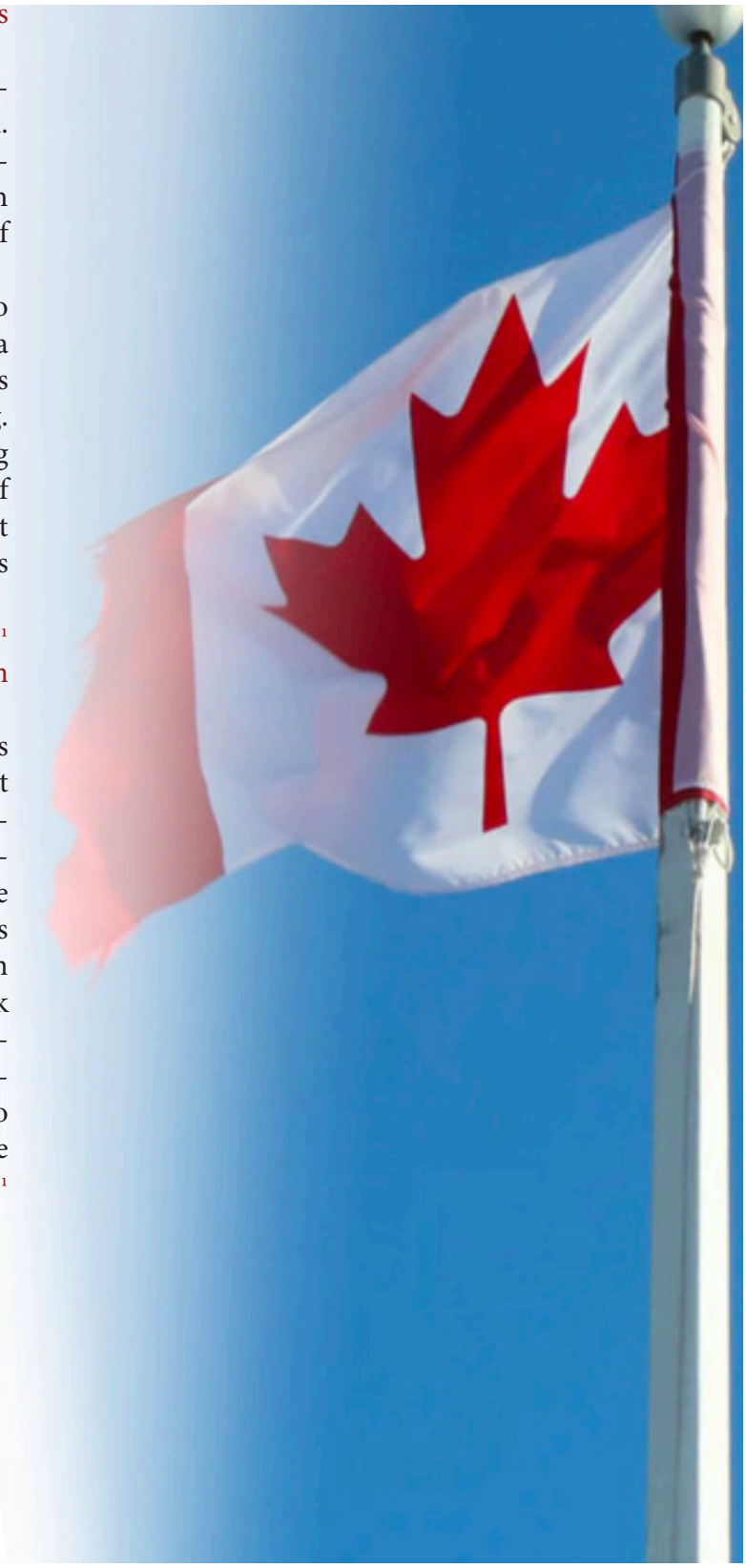
According to Alex Tapscott, Canada could improve in academic research and training for blockchain. Despite the abundant research going on among companies, universities need to step up their efforts in research as well as offer programs to train the next generation of blockchain developers and entrepreneurs.

Jason Cassidy said that in order for Canada to strengthen its position as blockchain leader, Canada needs to do more to educate Canadians. He believes government support is essential to the industry thriving. "We need universities to start offering courses to young minds because the biggest issue in blockchain is lack of talent. We also need to be getting more pilot projects set up and we need to be breaking bread with companies looking to push this narrative forward."

- Jason Cassidy (The Globe and Mail, 2018)[1]

Encourage a more liberal regulatory environment in Canada:

William Mougayar, author of The Business Blockchain and managing partner and chief investment officer at JM3 Capital, says there's room for improvement in the country's regulatory environment. Particularly, Canada's position on initial coin offerings – the use of cryptocurrencies to raise money for business – has negatively affected the digital currencies and blockchain market. This might cause companies to leave and seek alternative jurisdictions that are welcoming to the digital token phenomena. Ensuring a more liberal regulatory environment would reduce the industry's barriers to entry and allow firms to be more creative and expressive in their blockchain applications. (The Globe and Mail, 2018)[1]



BLOCKCHAIN AT MCGILL

Citation

1. Johne, Marjo. The Globe and Mail. (Nov 2018). Canada emerges as a hub for blockchain technology. https://www.theglobeandmail.com/business/article-canada-emerges-as-a-hub-for-blockchain-technology/
2. Chamber Of Digital Commerce Canada. (Oct 2019). Canadian Blockchain Census 2019. https://digitalchamber.org/wp-content/uploads/2019/10/Oct15-Chamber-BlockchainCensus-2019.pdf
3. The Burnie Group. Blockchain In Insurance. https://burniegroup.com/blockchain-in-insurance/
4. Deloitte. Blockchain in Insurance. https://www2.deloitte.com/ca/en/pages/financial-services/articles/blockchain-in-insurance.html
5. Deloitte. Combating financial crime in a digital age: The double-edged sword of technology. https://www2.deloitte.com/ca/en/pages/risk/articles/combatting-financial-crime-in-a-digital-age.html
6. Deloitte. (2017). Blockchain and Cyber Security. https://www2.deloitte.com/ca/en/pages/financial-services/articles/blockchain-and-cybersecurity.html
7. SecureKey. (May 2019). SecureKey and Initial Network Participants Accomplish Key Milestone in Bringing Digital Identity Network to Market. https://securekey.com/press-releases/verified-me-launch-release/
8. IBM. (Mar 2017). IBM and SecureKey Technologies to Deliver Blockchain-Based Digital Identity Network for Consumers. https://www-03.ibm.com/press/us/en/pressrelease/51841.wss
9. Jackson, Brian. IT World Canada. (May 2019). Canada's 'big 5' banks launch blockchain-based digital identity service with SecureKey. https://www.itworldcanada.com/article/canadas-big-5-banks-launch-blockchain-based-digital-identity-service-with-securekey/417406
10. IBM. Blockchain. https://www.ibm.com/blockchain
11. The Burnie Group. (Nov 2017). The Blockchain Disruption. https://burniegroup.com/wp-content/uploads/2017/12/Blockchain-Disruption-Dec-5.pdf
12. The Burnie Group. Blockchain Consulting and Implementation. https://burniegroup.com/technology-operations/blockchain/
13. businesswire. (Sept 2018). MLG Blockchain Launches Global Certification Program.https://www.businesswire.com/news/home/20180905005862/en/
14. ASPIONEER. (2018). Disruptors riding the blockchain wave, pg 56-59. https://aspioneer.com/flipbook-disruptors-riding-the-blockchain-wave-2018/
15. PRNewswire. (May 2018). WhatMatrix Launches Industry's First 'Blockchain for Business' Comparison. https://www.prnewswire.com/news-releases/whatmatrix-launches-industrys-first-blockchain-for-business-comparison-684039941.html
16. TheSiliconReview. (2018). MLG Blockchain Consulting Speeds Up the Understanding of the Blockchain and Its Potential Opportunities for Businesses. https://thesiliconreview.com/magazines/mlg-blockchain-consulting-speeds-up-the-understanding-of-the-blockchain-and-its-potential-opportunities-for-businesses/
17. Deloitte. Dissecting blockchain: A look at applications within health care. https://www2.deloitte.com/ca/en/pages/life-sciences-and-healthcare/articles/l.html
18. Deloitte. (Sept 2019). Deloitte and TruTrace Technologies Inc. form strategic alliance to improve cannabis quality control and safety for retailers and consumers. https://www2.deloitte.com/ca/en/pages/press-releases/articles/deloitte-and-trutrace-technologies-inc-form-strategic-alliance-cannabis-quality-control.html
19. IBM. IBM Blockchain 101: Quick-start guide for developers. https://developer.ibm.com/technologies/blockchain/tutorials/cl-ibm-blockchain-101-quick-start-guide-for-developers-bluemix-trs/
20. BM. IBM Supply Chain. https://www.ibm.com/supply-chain
21. TradeLens. DIGITIZING THE GLOBAL SUPPLY CHAIN. https://www.tradelens.com/about
22. IBM. (2019). IBM Food Trust. A new era for the world's food supply. https://www.ibm.com/blockchain/solutions/food-trust

23. IBM. (2019). IBM Food Trust. A modular solution built on blockchain, benefiting all network participants with a safer, smarter and more sustainable food ecosystem. https://www.ibm.com/ca-en/products/food-trust
24. Keller, Fabio. IBM. (April 2018). Blockchain-based Batavia platform set to rewire global trade finance. https://www.ibm.com/blogs/blockchain/2018/04/blockchain-based-batavia-platform-set-to-rewire-global-trade-finance/
25. we.trade. (2018). The Platform. https://we-trade.com/the-platform
26. IBM. (2018). we.trade. Helping companies trade seamlessly with IBM Blockchain. https://www.ibm.com/case-studies/wetrade-blockchain-fintech-trade-finance
27. Wass, Sanne. (2018). we.trade and Batavia merge blockchain platforms for trade finance. https://www.gtreview.com/news/fintech/we-trade-and-batavia-merge-blockchain-platforms-for-trade-finance/
28. IBM. Revolutionizing recycling by creating an ecosystem for plastic. https://www.ibm.com/blockchain/use-cases/success-stories/#section-5
29. EY Global. (May 2018). How blockchain can improve the management of public finances. https://www.youtube.com/watch?v=3JfQlemhZ7M
30. Ledger Insights. (2019) EY launches blockchain solution for government spending. https://www.ledgerinsights.com/ey-launches-government-blockchain-solution/
31. Short, Eva. (Oct 2019). EY launches blockchain solution for financial management of public funds. https://www.siliconrepublic.com/enterprise/ey-blockchain-public-finance-management
32. EY Global. (Oct 2019). EY launches public finance management blockchain solution to improve efficiency and transparency in governments. https://www.ey.com/en_gl/news/2019/10/ey-launches-public-finance-management-blockchain-solution-to-improve-efficiency-and-transparency-in-governments
33. Schorg, Cameron. Medium. (June 2018). AirdropX says 'Hello'. https://medium.com/airdropx/airdropx-says-hello-22be1568ebda
34. bitJob. (2018). Students' Jobs Marketplace. https://bitjob.io/#home-s10
35. Blockchain Research Institute. https://www.blockchainresearchinstitute.org/
36. CryptoChicks. https://cryptochicks.ca/
37. Wozniak, Steve. https://blockgeeks.com/
38. The University of British Columbia. (Jan 2020). Graduate Blockchain Training Pathway. https://slais.ubc.ca/programs/specializations/blockchain-ubc-pathway/
39. The Blockchain Hub. Blockchain Academy. York University. https://theblockchainhub.com/academy
40. Creative Destruction Lab. CDL Toronto. https://www.creativedestructionlab.com/locations/toronto/
41. University of Waterloo. Blockchain Research. https://uwaterloo.ca/blockchain-research/
42. George Brown College. Blockchain Development Program (T175). https://www.georgebrown.ca/programs/blockchain-development-program-t175
43. Facebook. Ted Rogers Emerging Technology. https://www.facebook.com/tedrogerET/

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