IVEY Business School | FinTech Club

SPRING 2018 EDITION

THE PERSPECTIVES

PRESENTED BY: **SCOTIABANK DIGITAL BANKING LAB**

EVERYTHING TECH

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The Perspectives

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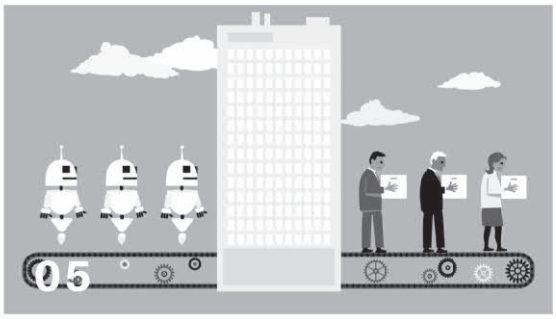
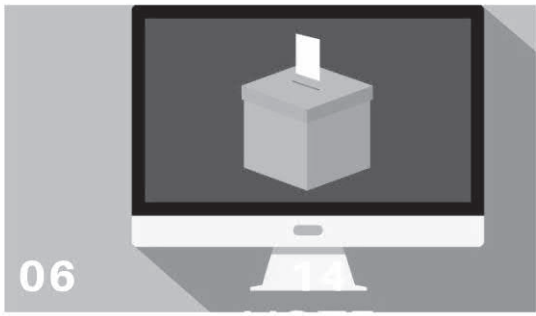
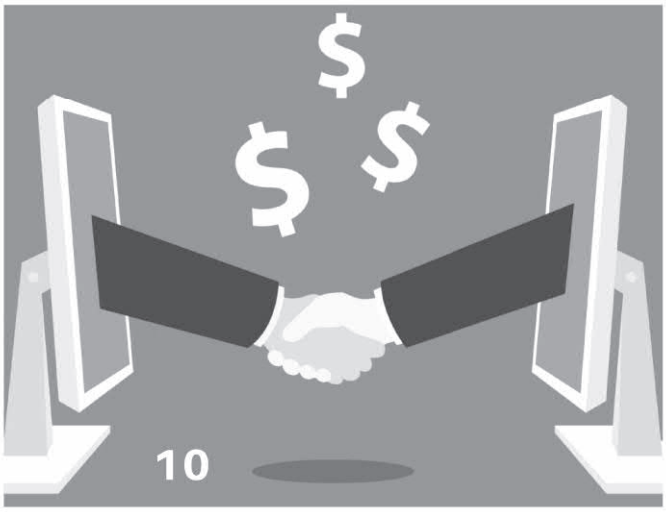
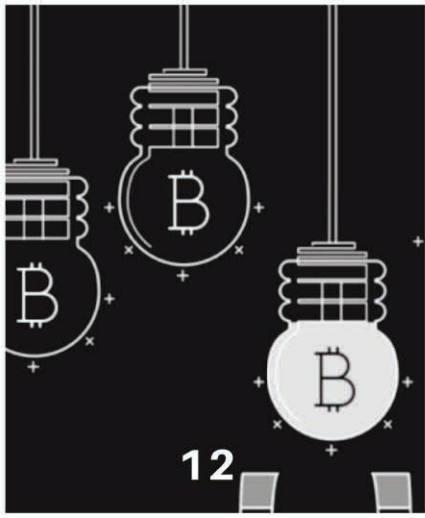
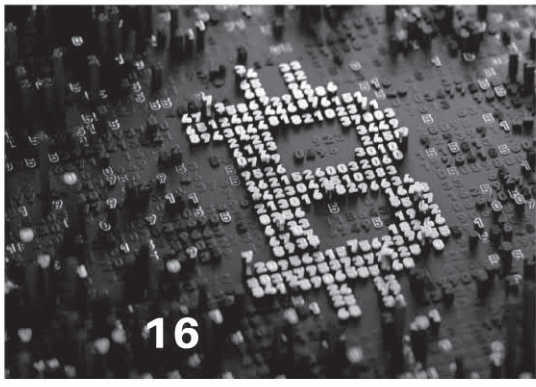
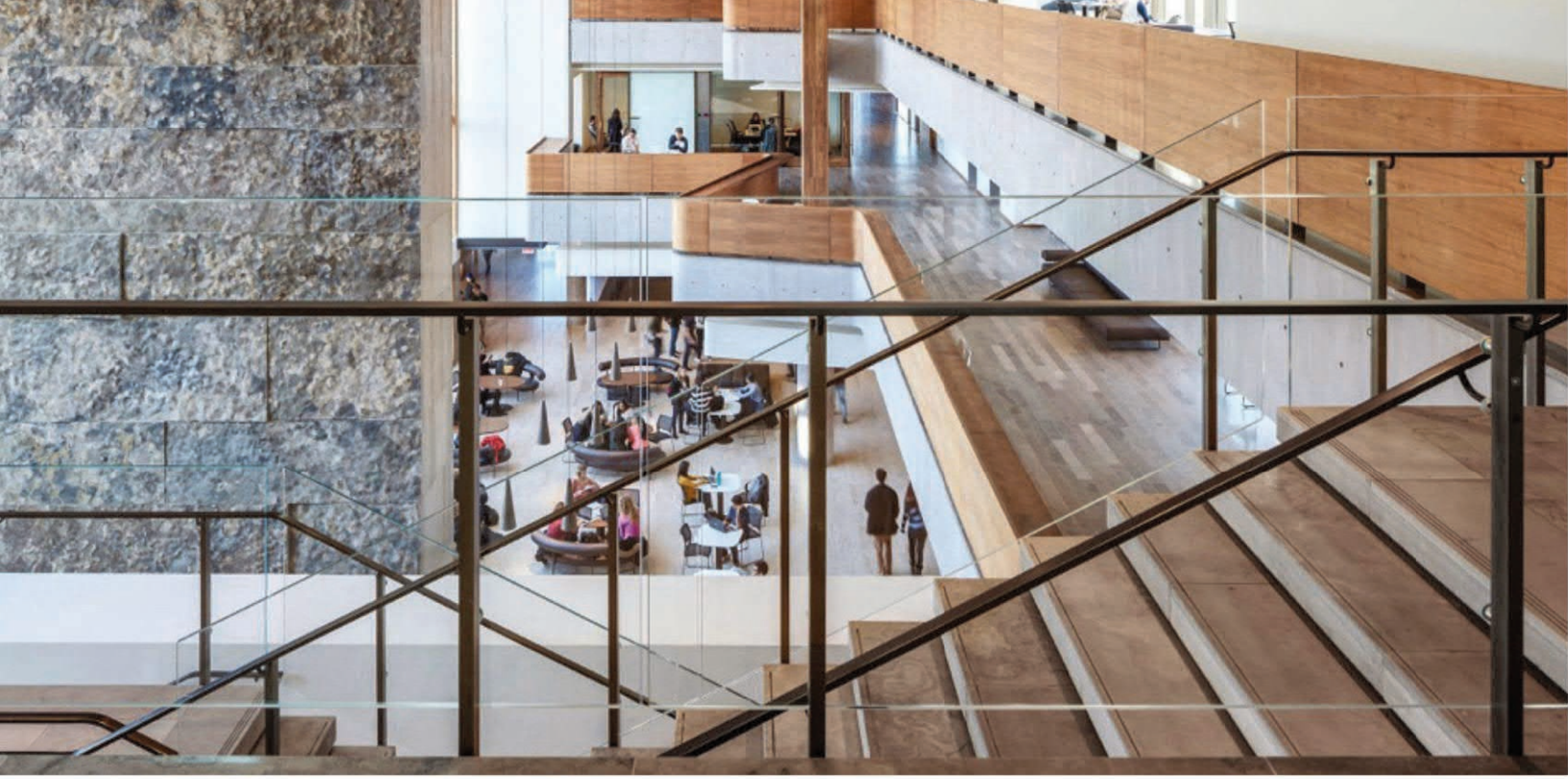












A Message from the Editors

Digital disruption is re-shaping the world as we know it.

Goldman Sachs, one of the world's premier investment banks, is leveraging technology to build a consumer lending platform, and claims that expected revenue will soon match what is generated from its trading operations. BlackRock, the world's largest asset manager, has been quietly investing in and purchasing fintech startups to maintain a competitive edge. Even in governments, the effects of digital disruption are pervasive. Officials in Dubai, the leading international trading-hub in the Middle East, are aiming to transform the city into a blockchain-powered metropolis by 2020 with the help of IBM. Yet, the world's leading business schools still have not emphasized the importance of understanding how these technologies work. Beginning with *The Perspectives*, Ivey FinTech aims to bridge the gap between technology and business by encouraging our students to voice their opinions and challenge the status quo.

It's true - most business students are not engineers. We often separate business from technology, and for good reason. Business students have traditionally excelled in finance, consulting, and sales. We've left the programming and development of our ideas to the engineers. But this norm is quickly changing. Strong technical skills, inquisitiveness, and the ability to apply new concepts have already become an expectation for any entry level position. Today's students need to advance their education and career prospects by learning how to step outside their comfort zones.

Stay on top of trends, spend some time with engineers, and anticipate the effects technological disruption will have on the future. The first step is to become actively involved in the tech community at your school. For those at Western and Ivey, joining Ivey FinTech is a great place to start.

Justin Tang
Co-President, Ivey FinTech Club
Scotiabank Digital Banking Lab

Max Goyzman
Editor-in-Chief, The Perspectives
Ivey FinTech Club

Kevin Kim
Co-Head of Research
Ivey FinTech Club

Thoughts on Digital Disruption

INTERVIEW WITH EERO TRAAGEL, ASSOCIATE PARTNER, IBM GLOBAL BUSINESS SERVICES

Eero Traagel is a consultant and an associate partner at IBM Global Business services (GBS). He specializes in digital transformations and providing industry innovations around Cognitive Computing, Cloud, Blockchain and IoT to deliver end-to-end business solutions.

Ivey FinTech: Could you pinpoint any specific industry that you have worked in as a consultant that's been experiencing a rapid change in technology?

ET: I think there are a couple—CPG (consumer packaged goods) and the foods industry. Really interesting stuff in terms of trying to gain hyper-local insights and understanding when there's a specific demand in a specific area. For instance, based on weather information, or perhaps based on information such as knowing that there is a major event around, and leveraging those insights to make sure you have the right stock to avoid stock outs.

I work with a lot of distribution clients and what is happening in their industry is very interesting and disruptive. Oversimplifying it, but they, traditionally, move product from large manufacturers and distribute it into retail locations. With new technology introductions around logistics and different ways that we can ship, such as with drones and Amazon delivery, it's disrupting their core function. Helping our clients navigate those technology shifts, and find new business models is particularly important. From a business operations standpoint, they're under tremendous pressure as it is, on both supply and demand sides of the equation. As a result, they have to come up with new ways to make money, and preserve profits, such as becoming an information broker, instead of just a product mover. For them, these days, it's more about leveraging the information that they have on each side of the equation, acting as a broker and seller of this information, and facilitating that kind of digital marketplace.

Ivey FinTech: There are a lot of things happening in the AI field, and with it comes the debate on whether or not AI has the potential to be harmful. Do you think AI is dangerous? What is IBM doing to ensure that AI is not harmful to our society?

ET: At IBM, we've always been at the leading edge of technology. We started the conversation about Cognitive and AI way back when Watson was on Jeopardy on TV. Not many of our competitors today were talking about it at that time. We tend to trail blaze and break ground on new technologies, but with that, comes a responsibility—security, use case and applications, and purpose. IBM is (and has been since its inception) also very vocal about the relationship between humans and machines, and we truly see it as a symbiotic relationship, so one helping the other, not replacing the other. At IBM, we value solving true client problems and societal problems for the betterment of humankind.

Ivey FinTech: Do you think the technology underpinning cryptocurrencies (i.e. blockchain) is ready for prime time? Or will it take time to reach its maturity? From what you see working with clients, are most firms ready to adopt emerging technologies like blockchain?

ET: There are some barriers on other fronts, but in terms of the maturity of the technology, it's there. We're making news with our clients in many industries, and as you heard earlier today, applying blockchain to the Financial Services industry. One of the key challenges is getting companies in the same industry to cooperate and collaborate with one another, to create those communities essential to blockchain, to drive efficiencies. Often times there's traditional thoughts or barriers that prevent the application of the technology. This makes the change management critically important.

Unemployment in the AI Era

By Maxim Verzunov

While AI has, in many ways, shaped the modern world in a positive way, many people are questioning whether the future really is all sunshine and rainbows. In particular, a pressing question in nearly every industry is:

What will happen to my career?

The optimists say that AI will drive job creation. A Capgemini study of 1,000 companies concluded that in 80% of the organizations it was implemented in, AI created new jobs. Moreover, a 2017 Gardner report predicts that in the next three years, AI will create 500,000 more jobs than it will displace.

However, the pessimists argue that many jobs will disappear without a replacement. In 2017, Gallup.com determined that AI threatens millennial jobs the most, with 37% of millennials being at risk of holding redundant jobs. The relative job security for older generations comes from the fact that older generations typically occupy senior roles, which are not easily replaceable. Furthermore, McKinsey reported that half of today's work activities could be automated as early as 2035 in some scenarios.

The problem, as McKinsey explains, is that while robots would "increase productivity and improve our lives," they would also "substitute some work activities humans currently perform."

McKinsey goes on to suggest that up to a third of the workforce in the US will have to learn new skills or change jobs. Surely, with rapid development in AI and robotics, many new jobs will be created to offset those that are lost. However, the transitionary period that people will need to go through to re-educate themselves and later re-enter the workforce

may prove to be a significant burden on low-income families.

In fact, around 60% of the US population lacks a college degree. The majority of this 60% occupies low level positions prone to becoming obsolete with the development of AI. The question follows:

How will this vulnerable portion of the US population cope with having to pursue education to remain competitive in the workforce?

Oren Etzioni of wired.com offers one solution. As Etzioni points out, caregiving is a broad category of jobs that people categorically oppose machines doing, including companionship to the elderly, home health aides, baby sitters, special needs aides, and others.

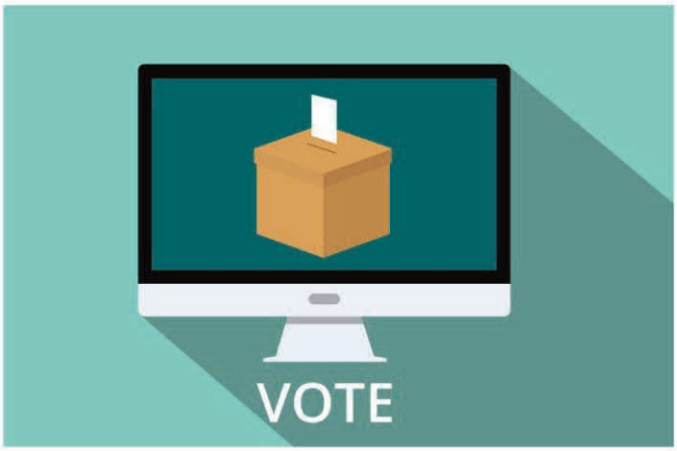
As Etzioni writes, "Instead of expecting truck drivers and warehouse workers to rapidly re-train so they can compete with tireless, increasingly capable machines, let's play to their human strengths and create opportunities for workers as companions and caregivers for our elders, our children, and our special-needs population. With this one action, society can both create jobs for the most vulnerable segments of our work force and improve the care and connection for all."

The key idea to realize here is that with machines taking mechanical jobs, it is becoming more and more important for humans to be exactly that – human. Emotion, empathy, and human connection could never be matched by an artificial intelligence, yet these are the cornerstones of a successful human society.

WHY CANADA SHOULD BECOME A BLOCKCHAIN DEMOCRACY BY 2019

BY HABIB A. JAFFER

Imagine being able to vote securely from your phone, tablet, or personal computer anywhere in the world. The Canadian government can and should make this a reality by replacing physical polling stations with an internet voting platform, built upon Blockchain technology, and utilizing SecureKey identification technology. With over 90% of Canadians already using the internet, 70% of Canadians accessing sensitive material including online banking, and millions of Canadians unable or unwilling to physically visit a polling station, there is a sizable portion of the population that would easily opt for the convenience and accessibility of this service.



Online voting would increase GDP and the government budget by hundreds of millions of dollars, and will also increase voter turnout, voting accuracy, polling efficiency, queuing, and counting by unprecedented degrees. It will also magnify the voices of marginalized populations, decreasing civil unrest, civic protest, and civic disengagement. Comparing the 2011 and 2015 election, there was an increased turnout of 71% in advance polling, totalling 21% of all voters, indicating an increased demand for polling convenience. The online version of this article justifies this infrastructural investment based on the federal election alone and would further benefit from additional analysis factoring in the benefits of accommodating both provincial and municipal elections as well.

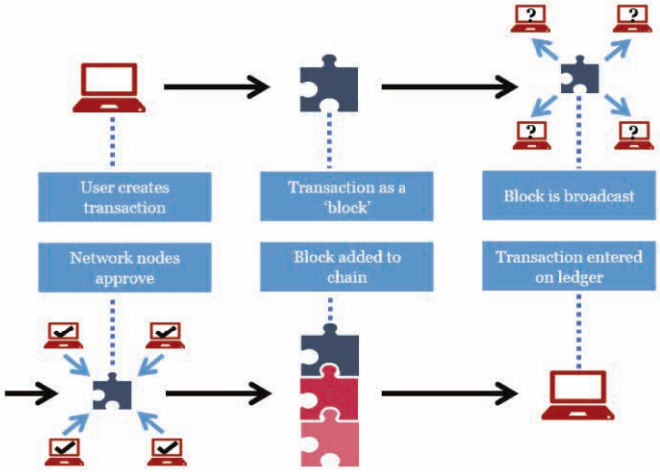
In the next election, Millennials are expected to make up the largest segment of voters but will likely continue to have the lowest turnout among any age group if voting conditions remain the same. They are also the most likely group to adopt and experiment with new technologies that utilize sensitive personal information. With close to half of eligible voters skipping out on the 2008/2011 elections, and costs surging to bring in additional voters for 2015, the Trudeau government has an opportunity to similarly increase future participation, and at a fraction of the cost, while revisiting part of its promise for electoral reform.

The total cost of the Canadian federal election went up 53% by $150M from 2011 to 2015, while the cost per voter went up 43% from $12 to $17. This was due to doubling the campaign length from the previous election, adding 30 new ridings, and 71 satellite offices, the cost drivers of which are increased labour demanded and voting facilities rented, both of which would be eliminated with a digital voting system. This does not include financial, economic, and environmental costs incurred through offering free transportation to voters by public transportation and private enterprises. Given that there are 66,000 polling stations in Canada, operating 10 hours a day for 4 days of advanced polling and 1 election day, total labour costs should approach $40M, using an estimated average poll-clerk wage of $17 per hour and 7 poll-clerks on-duty at any given moment. Additional cost savings from the total $443M 2015 election expenditure would come from not having to rent as many facilities, count votes, perform recounts, or mail as many documents.

Using data from the United States as a proxy for Canada, aside from travel costs to polling stations, the possibility and act of waiting in line undermines public confidence in the electoral process and would have discouraged 50,000 to 70,000 voters in the last federal election. Similarly, the economic cost to GDP as a result of workers standing in line would be approximately $50M, excluding time spent traveling from and to work, and logging in again.

Comparing the 2011 and 2015 election, there was an increased turnout of 71% in advance polling, totalling 21% of all voters, indicating an increased demand for polling convenience. Research has correlated the cost of traveling to reach a traditional voting site with nonvoting, in some cases making it harder for certain marginalized communities or ethnic groups to vote.

In the 2015 Canadian Federal Election Report, frequent complaints included polling stations running low on ballots, many ballots being pre-marked or smudged, and another 3085 reports about poor accessibility. To accommodate students, First Nations, and young people, Elections Canada piloted 71 satellite offices in the 2015 election which received 70,000 votes, running costs to operate for 10 hours per day for 4 days consecutively. Another 22,000 Canadians voted in hospitals, including 764 in acute care facilities. Between the last two elections, an average of 35% of expatriates, 57% of Canadian forces, and 52% of voters aged 18 to 24, did not vote.



Aside from security concerns, the key issues that have stalled the implementation of a remote online voting system to date have surrounded the inability to verify a voter and their condition upon voting. In terms of confirming that a voter is not being coerced or influenced, a dual-witness and two-factor authentication system may work. At the time of every vote, a voter will have to ask two other eligible voters to confirm two pieces of the voter's identification (eg. a driver's license and credit card) and then provide them with a randomly generated code from their own accounts. To then protect voters from fraudulent votes, a follow-up communication will be received via email or other means through which the voter can confirm that they voted at the documented time or location.

Beyond having two witnesses validate them, their identification will have also been verified using Toronto based SecureKey Technologies upon voting. SecureKey is backed by $27M in investments from Canada's leading banks and has announced a partnership with IBM to deliver blockchain-based digital identity verification for bank accounts, driver's licenses, transactions, and utilities. It is currently being tested here in Canada, using Hyperledger Fabric, the most advanced permissioned-blockchain technology available. In order to gain acceptance from the public, a pilot initiative can be undertaken during advanced polling in the next federal election, with tweaks being made to accommodate provincial and federal elections thereafter.

This could all be financed with cost savings from the existing federal election budget. The Canadian government has also had experience developing mobile applications, costing them as little as $11,000 for a shared taxi application to $750,000 for a mobile application for geoscience data management. Given the existing identification infrastructure being developed and piloted by SecureKey Technologies in Canada, this application would see most funding going toward development, server capacity, stress testing, public education, additional security measures, and maintenance.

The possibility of implementing this effectively is high, as Canadian made Ethereum technology is being used by BitCongress to develop an altcoin called Votecoin in the United States, using the application Axiomity to handle the voting process. Not only are these voting results being publicly audited, but the government has commissioned the accounting firm PwC to inspect the code and simulate external cyberattacks to strengthen the infrastructure further.

Ultimately, with the economic, social, and technological considerations explored, this initiative appears to make rational sense. All that stands between our nation and being a step closer to true democracy involves our government's decision to further empower our local talent.

TIME TO LOOK UNDER THE HOOD: BLOCKCHAIN, CAPITAL MARKETS, AND THE END OF HIGH-FREQUENCY TRADING

BY DAVID MIRYNECH

Despite the onset of a digital revolution, evolution in some areas at the intersection of finance and technology have lagged behind. In efforts to speed up the movement of capital, new technologies have been added onto an existing banking infrastructure, yet this underlying system remains outdated. Present day banks are beginning to offer a growing set of digital products and service offerings from robo-advisors and insurance, to mobile banking and video consultation. However, the reality is many financial institutions are still governed by paper processes and run computer mainframes that should have been left in the previous century. In the financial system, this is most apparent because there has been no clean transition between new technologies as they have been developed. In the push to quickly adopt the next big thing we have been left with an inefficient system comprised of multiple 'legacy technologies,' many never quite realizing their full potential.

High-Frequency Trading

Nowhere else is this phenomenon more evident than high-frequency trading. High frequency trading is a form of algorithmic trading, characterized by high speeds, high-turnover rates, and high order-to-trade ratios. Traders leverage the timing of financial data and electronic trading tools to capitalize on time sensitivity and accumulate small gains in the short run, and large gains in the long run. Through this process HFT traders buy and sell on the world's stock exchanges in nanoseconds and the trades are routed immediately.

HFT traders capitalize on the most efficient data transferring technology available so they can act on this information, particularly changes in stock prices and currencies, before the news reaches non-HFT investors. This has led to an arms race to acquire the fastest technology available.

Using glass optical fibres, data can travel at two thirds of the speed of light. Nevertheless, this has actually proved to be not quite fast enough for HFT. Data has been engineered to travel in the air through microwave and millimeter-wave links. The result has been an even more efficient network of lasers, based on military technology for in-flight signaling between airplanes, installed to link the New York and New Jersey as well as the London and Frankfurt financial exchanges.

Post-Trade Settlement

In the race to be the quickest on the front end of the trade; however, many have forgotten the archaic processes that govern the back end: clearing and settlement. Although a trader may route an order to an exchange in microseconds, this trade may take three full days to settle. Blythe Masters, former CFO of JP Morgan Chase, puts it bluntly when she states:

Bear in mind that financial services have not evolved in decades. The front end has evolved but not the back end. It's been an arms race in investment oriented toward speeding up transaction execution, so that competitive advantage is now measured in fractions of nanoseconds.

The irony is that the post-trade infrastructure hasn't really evolved at all. It still takes days and in some cases weeks of delay to do the post-trade processing that goes into actually settling financial transactions and keeping record of them.

This reality places a large strain on the financial system. Recent analysis on modernizing the US Equities post-trade infrastructure reports that, "on average over $5 billion is still held in margin to manage counterparty default risk in the system." This does not include safeguarding against peak settlement days that requires additional liquidity adding further costs and risk to U.S. markets.

Blockchain and Capital Markets

Blockchain is an emerging network technology that functions as a globally distributed ledger of value enabling exchanges between peers without the need for a trusted intermediary.

Due to the blockchain's low latency in the clearing and settlement of transactions, one could naturally be led to believe the platform has the potential to speed up capital markets further. A report from CoinDesk quotes Jens Weidmann, Chief of the German Central Bank Bundesbank, "One certainty that can't be denied is that new technologies like blockchain have the potential to make financial markets and services even faster and even more efficient."

Tradeoff Between Speed and Market Integrity?

Yet, speeding up financial markets has not always been in the best interests of a fair and equitable marketplace. In fact, with HFT, fibre optic technology and its networks were specifically designed to create an edge for HFT at the expense of everyday non-HFT investors. Not only do these technologies give many HFT traders a significant advantage, but the traders themselves actually target trades as often as possible with ordinary investors, who have slower connections. They are also able to do so because of the complexity of HFT leading to an inability on behalf of non-HFT traders to understand how their order prices suddenly change. The outcome is that HFT technology ends up being the means to facilitate and bring about nefarious market behavior.

Blockchain is also a financial technology that suffers from a high degree of complexity. However, the fundamental characteristics of the distributed ledger actually offer the change to restore market integrity.

According to a report called "Blockchain in Capital Markets: The Prize and the Journey," written by Oliver Wyman, a global management consulting firm, trade platforms that run on the blockchain could prevent the sort of market manipulation associated with HFT. Ben Shepherd, co-author of the report and a partner at Oliver Wyman explains:

In blockchain architecture, counterparties agree to transfer in ownership of an asset in [near] real time and therefore stop the ability to amass a multitude of trades and net out at the end of the day. Therefore, HFT cannot turn over assets as quickly as they do today and generate critical market demand, because they must settle each trade immediately.

The result would be a very substantial slowdown in traders rate of activity, limiting their predatory behaviour.

Furthermore, Masters, who is very familiar with capital markets having pioneered the derivatives market and the credit-default swap in particular, believes blockchain could also minimize search costs for traders. The distributed ledger would enable reduced inefficiencies and costs by allowing multiple parties to rely on the same information rather than duplicating, replicating it, and having to reconcile it. In an environment such as this, shared information on a distributed network would help to eliminate inherent informational advantages that characterize HFT. In current models of HFT, trading exchanges act as central nodes in centralized networks giving those who possess superior technology and closer proximity inherent information advantages. However, on a distributed network, or a decentralized exchange, there is no central database and geographic proximity is less pronounced.

Implementation

What must be noted here is how reluctant many HFT traders would likely be to see this technology implemented in markets and thus see much of their advantage slip away. Nonetheless, the application of blockchain in markets has moved past a theoretical stage and already begun being tested and applied. NASDAQ CEO Bob Griefeld has already begun integrating blockchain's distributed ledger technology into NASDAQ's private markets platform called NASDAQ Linq. While adoption may be slow, the implications of blockchain on the integrity of financial markets, and specifically HFT, are something that now cannot be ignored.

THE FUTURE OF PEER-TO-PEER LENDING IN CANADA

BY CONNOR HUTCHISON

Traditionally, individuals that wanted a loan would apply through a large financial institution. The bank would run extensive credit checks to determine if the individual would qualify for a loan, and if so, what interest rate would apply to the loan. Individuals whose loan applications would be rejected or those that would want to avoid high-interest rates may opt for an alternative way of borrowing funds, such as peer-to-peer lending.

With peer-to-peer lending, borrowers take loans from individual investors who are willing to lend their money for an agreed upon interest rate. Loans are generally financed through multiple individual investors, and investors generally invest in multiple loans in order to diversify their risk. This allows individuals who would otherwise be rejected for a loan at a bank to receive a loan for a competitive interest rate, funded by many individual investors.

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For Example, John is an entrepreneur who wishes to purchase a car for $20,000. John has a poor credit score of 600, due to the debt he has incurred funding his startup. John applies for a loan through his bank and is approved for a $20,000 loan with a 16% APR. John cannot afford an interest rate that high, so he seeks an alternative source of funds. John applies for a loan on Upstart, a peer-to-peer lending startup that

uses supplementary data to your credit score, such as education and employment history, to more accurately assess a borrower's risk. John is approved for a $20,000 loan with a 10% APR, and his loan now enters the marketplace.

Within minutes John sees he has an investor — Sam. Sam has additional cash and is looking to realize a greater return than he can with a traditional savings account. Sam has invested $5,000 towards John's loan. With UpStart's auto loan feature, investors can preselect their risk tolerance and UpStart will automatically invest their capital into appropriate loans. Due to this feature, John's entire $20,000 loan is fully funded within hours.

Peer-to-peer lending has gained significant traction in the United States and the U.K. Lending Club, the largest peer-to-peer lender in the U.S, has issued over $30 billion in loans as of December 2017. The U.K has over 100 marketplace lending platforms currently in operation. The reason for this discrepancy is mainly due to consumer awareness and regulation standards.

Canada has only five major banks, which control roughly 80% of the market in Canada. The U.S has a market that is more fragmented than Canada, offering fewer barriers to entry for FinTech startups. Consumer confidence of financial institutions in Canada is higher than that in the United States. This positive attitude towards Canadian banks is partly due to the fact that Canadian banks were less affected by the 2008 financial crisis. The lack of

consumer confidence in U.S banks provided a tremendous opportunity for FinTech startups to capitalize on. Consumers were more willing to look outside of traditional lending institutions due to their distrust of the large banks.

Borrowell CEO, Andrew Graham, likens the current consumer attitude on peer-to-peer lending to online dating 10 years ago. There's a certain stigma associated with alternative lending similar to the stigma that used to exist with online dating.

Borowell is one of Canada's most prominent marketplace lenders and takes a similar approach to that of Lending Cub in the U.S. The major difference is that Borowell only accepts investments from institutions and accredited investors.

Under Canadian regulations, matching borrowers and lenders on a marketplace constitutes a promissory note, which is dealt as a security. Any company that wishes to offer securities must prepare a comprehensive and expensive document known as a prospectus, and provide it to regulators and investors. American companies such as Lending Club and Prosper have gone through this process and are now allowing non-accredited investors to fund loans with a minimum investment of $25.

Currently, one Canadian peer-to-peer lender is accepting investments from non-accredited investors. Lending Loop opened in 2016 as a peer-to-business lending platform, allowing retail investors to invest in SME (small to medium-sized enterprises) loans. Lending Loop has had tremendous initial success, originating over $14 million loans backed by over 15,000 investors. However, they have also experienced a few hiccups, being the first peer-to-business lender in Canada. Lending Loop closed their doors briefly while in talks with regulators to ensure their platform was operating within regulations. Lending Loop's SME loans are backed by asset-based collateral, which gives investors additional protection. This additional protection allowed them to accept investments from non-accredited investors without having to file a prospectus.

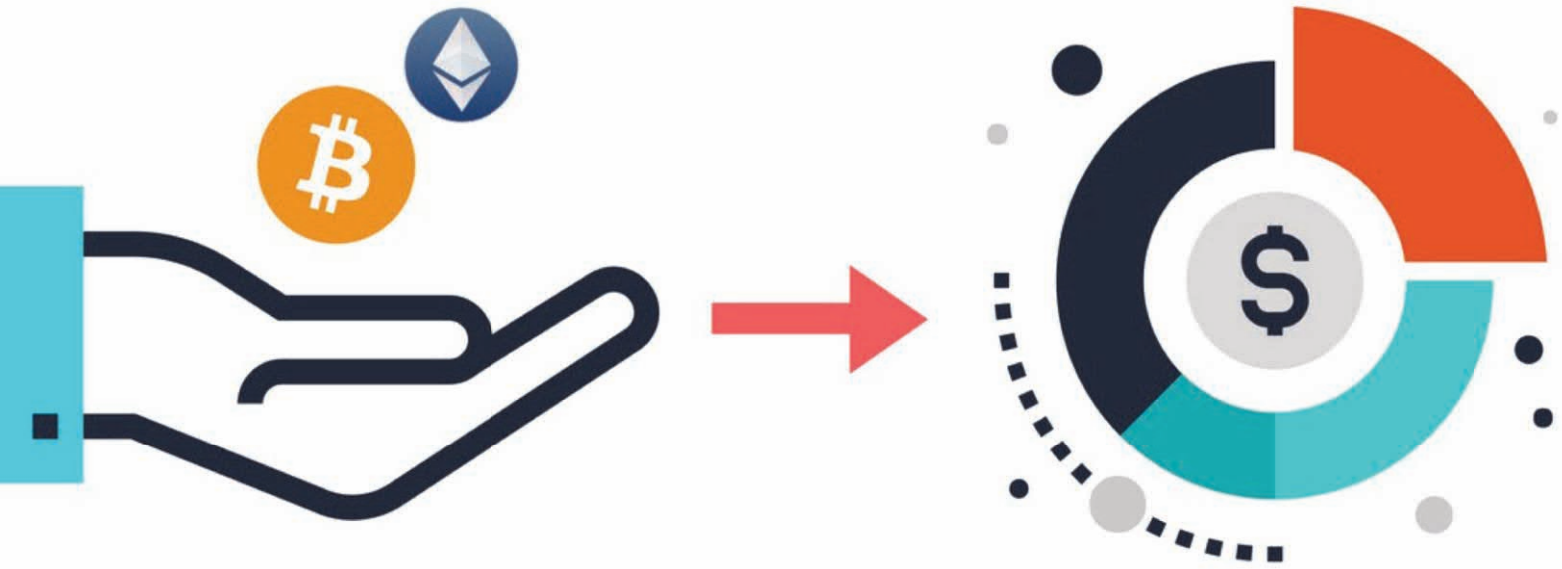
What's next for peer-to-peer lending?

The future of peer-to-peer lending in Canada is uncertain but optimistic. If Canada mirrors the progress of the United States and the U.K, then we can expect many more marketplace lenders in the coming years.

It is also likely a Canadian marketplace lender or American peer-to-peer lender to file a prospectus in Canada to open up the market for personal loans to retail investors. As companies like Borrowell and Lending Loop grow, they are acquiring the necessary capital to fund a prospectus and become the first player in the peer-to-peer lending market in Canada. Companies like Lending Club and Prosper already have gone through the process in the United States and may be looking to expand their market share to Canada as well.

Over the next few years, it is also likely we will see many partnerships between marketplace lenders and large financial institutions. This has been the case in the United States with partnerships between JP Morgan Chase and OnDeck Capital, and in Canada with Borrowell partnering with CIBC.

The future is bright for peer-to-peer lending in Canada. However, the industry is still extremely young and there is a long way to go if peer-to-peer lending expects to have a significant impact on the financial industry. As FinTech continues to rapidly expand, consumers are becoming acquainted and accepting of technologies and industries that did not exist even five years ago. Consumers find it second nature to send payments over the internet, or to pay for a taxi with their phone, and within a few years may find it second nature to receive a loan funded by individual investors.



Blockchain Disruption's Next Stop: ICOs and the VC Industry

BY IOANA DIACONESCU

In 2014, an open source digital trading engine called Buttercoin was launched. The goal was to provide a reliable, fast, and easily accessible bitcoin marketplace to facilitate larger-scale transactions in the US business sector. Hardly a year later, Buttercoin shut its doors, despite having secured $2.1 million in funding from highly reputable Venture Capital (VC) investors including Google Ventures, Centralway Ventures, and Y Combinator.

The reason? A lack of interest from VCs meant that the marketplace was just unable to generate enough capital to continue funding itself.

Buttercoin is far from being the only startup that has experienced grievances with the traditional venture capital funding model. Startup roadshows can take several months and VCs generally fund less than 3% of the companies they review. So naturally, the stifling of innovation in the blockchain space would be a valid concern if firms had no options other than VCs. Fortunately, there is a reason why headlines like those of Buttercoin are becoming less prevalent. Decentralized alternative technologies call for decentralized alternative funding mechanisms and lately, these have taken the form of initial coin offerings (ICOs).

An ICO is a means of raising funds where a percentage of a venture's cryptocurrency is sold to early backers of the project in exchange for legal tender or other cryptocurrencies.

This trend is remarkable when considering the risks companies are choosing to subject themselves to by conducting ICOs. A company could face severe legal penalties if their coin is deemed an 'investment contract' subject to US Securities laws, without being compliant with the registration and disclosure requirements of this classification. Hackers also present a security risk, as many thefts of crypto-assets have occurred where proper security protocols had not been in place. Now the question remains, what is it about ICOs that makes them worth the risk to the extent that they have now become the norm for raising blockchain startup capital?

1) Access To Funds

The most obvious answer to this question is the sheer volume of capital that blockchain startups have been able to raise through this method. ICOs regularly raise upwards of $10 million with little more than a white paper. They are also responsible for 8 out of 10 of the crowdfunding projects that have generated the most funds to date. These funds are acquired by the company as soon as the transaction is completed, allowing some ICOs to raise millions of dollars in just several hours. The coins or tokens are usually paid for with Ethereum tokens on exchanges worldwide, making them open to virtually anyone with internet access.

This also makes them particularly attractive as they are highly liquid and easily tradeable, expanding a company's investor base from just

wealthy limited partners contributing to VC funds, to virtually any retail investor with an interest.

Now, investors can contribute to the capital of a blockchain startup for reasons other than simply having faith in the feasibility of their business model, as was the case with VCs. Investors may instead choose to take advantage of the success of the cryptocurrency market as a whole, or even to diversify their investment portfolios since price movements of blockchain tokens have little correlation with price movements of other asset classes. ICOs also present a unique opportunity to invest in private companies by directly offsetting one of the biggest downsides; the difficulty of selling the investment.

2) Incentivize Community-building

This is where factors unique to blockchain startups really start to make a difference. Investors participating in an ICO get to benefit from more than just the increase in the value of the token over time. Most tokens give holders the privilege of unlocking some kind of value in the company. This could include early access to a company's platform or application, free or discounted services, or complementary products- all with the goal of facilitating early adoption and establishment of a user base. These benefits are especially critical for blockchain startups whose platform or application's success depends on the network effect, where having a large number of participants improves the value of a product or service, similar to social media. The tokens can even be later utilized to incentivize deeper involvement of users, as the instant messaging app "Kik" took advantage of by rewarding active users with its Kin token in proportion to their usage volume.

These tokens can also raise capital indirectly by incentivizing developers to create complementary products and contribute to open-source code, resulting in potential alternative revenue streams and greater value of the core product. Rewarding these third-party developers with a token allows them to capture the value they create for a project, and incentivizes them to contribute in the future. This is a solution of the 'tragedy of the commons' problem often occurring in open-source communities whereby many people own a resource and could benefit from its improvement, but the reward for any individual's contribution is low. ICOs also provide the opportunity to raise resources other than capital, that may be just as valuable. For example, quantitative hedge fund Numerai launched their Numeraire token, not to fundraise, but to automatically reward its network of data scientists that contribute to its algorithms based on their effectiveness.

So what does this mean for VCs today?

Alternative fundraising mechanisms like ICOs do not necessarily cut VCs out of the picture, since ICOs are open to VC involvement too. In fact, the most successful ICOs were more likely to have benefitted from some level of VC involvement. The key difference between direct VC funding and VC involvement in ICOs lies in the balance of power. ICOs put a substantial amount of power back into the hands of startups since they have the freedom to outline the terms of a deal in the smart contract code, which not only allows for complete accountability and transparency, but also limits the value-add of VCs. Participating in ICOs has additional implications for a VC's business model since portfolio managers will be forced to adopt a more active trading strategy given the liquidity of token assets, and legal and compliance teams will have to be increasingly vigilant. It is also important to note that the limited partner model and funding policies of VCs may prevent them from even considering investments with this level of legal and regulatory ambiguity. For this reason, many VC firms today prefer to invest indirectly into ICOs through cryptocurrency hedge funds and Bitcoin futures contracts.

The most interesting alternative however, involves VCs taking advantage of ICOs to fundraise for themselves. With the launch of the First Digital Liquid Venture Fund, Blockchain Capital raised $10 million in six hours with a token that was compliant with securities regulations. It is without a doubt that ICOs will be a recurring theme in the SWOT analyses of many VC firms, ultimately proving to be just as difficult to ignore as they are to capitalize on.

Healthcare and You, Is this it?

BY: FRANK WANG

With blockchain's tantalizing benefits becoming clear to the healthcare industry, the movement beyond data silos and low-value physician timing has begun.

Imagine you're sick. Your physician's about to prescribe you antibiotics, but before they finish writing the prescription, they ask if there's any medication they should know about. You strain your mind but just can't remember the name of that long, scientific drug your specialist put you on a year ago. So instead, your prescription is delayed and blood work is ordered to determine if there are any adverse drug interactions.

Imagine you recently changed physicians. They ask if you have any family or medical history they should know about. You do, but the notes are locked away with your previous physician — impeding your new physician's ability to gain a holistic picture of your health. These aren't cases isolated to the imagination, these are daily realities.

In 2001, the federal government created Canadian Health Infoway Inc (Infoway) to begin the transition from paper to digital. Over $2 billion was poured in from the government to be invested in Electronic Health Record (EHR) systems with the hopes of creating a more accessible, interconnected digital system with hopes of ultimately benefiting the patient.

However, when one delves into EHR, comparing its intentions with its impacts, some eyebrows begin to be raised.

Reduction of Physician-Patient Time

The way the patient describes their symptoms; voice inflections, hand gestures, eye contact serve as crucial information in condition assessment. The amount of time an individual spends with the physician is already short, but it's made shorter when physicians need to spend increasing amounts of time inputting details of their interaction. Time efficiency has been long touted as a benefit of EHR systems, but recent findings say for every hour a physician spends on clinical time, nearly double that time is spent on EHR and desk work. A survey of 600 doctors conducted in 2016 by Deloitte reveals that that 70% of physicians think that EHRs reduce their productivity — an opinion that's stayed consistent since 2014.

Data Silos

Perhaps the hottest word in the healthcare industry: silo. When the Canadian government invested in Infoway to develop EHR systems, Infoway developed a guideline for developers in order to receive funding. The result was an explosion of EHR systems – systems that aren't able to share information. Canadian physicians can specialize in about 84 fields in Canada. Each of these specialties has different workflows and information to record. Specialized systems exist for these doctors to best capture their workflows – resulting in each system holding a piece of pie about the patient – passed only by request via paper, phone calls, fax, and mail. This scattered data throughout specialized systems keeps patient information locked, unable to be used to create better health outcomes.

Blockchain Technology

The idea behind blockchain is simple — multiple sources add information called blocks in a chain-like fashion, complete with timestamps. Once the information is inputted, it's permanent, creating a ledger of information that's accessible by nodes in a network. Bitcoin uses this technology to track the flow of money. When applied to medicine, it creates a system where different devices can add blocks of information to create a lifelong picture of a patient. This kind of system uses a distributed ledger, synchronizing data from specialist systems, different EHRs, and decreases low-value imputation time to maximize the amount of time physicians can spend with patients.

In the age of analytics, this completeness of patient data allows pharmaceutical companies to locate the individuals needed for faster and cheaper clinical trials. On a societal level, analytics will allow for deep dives into population disease trends; allowing the health care system to finally move away from being reactive - to becoming truly preventive.

33%

MILLENNIALS WILL OWN CRYPTOCURRENC -IES BY 2018

AN OP-ED ON THE BITCOIN CRAZE AND CRYPTOCURRENCIES TRADING

BY JUSTIN TANG

According to cryptocurrency exchange, London Block Exchange, 1/3 of millennials will have an investment in cryptocurrencies by the end of 2018. So, what is it with this bitcoin craze? Backers have called it the future of money; critics have given it the doomsday prophecy. I am not going to attempt to take a position on this op-ed. Rather, I am hoping to bring some perspectives to this phenomenon.

What type of asset is bitcoin from an investment standpoint? In many ways, bitcoin is very much like every other asset class. Most bitcoin traders/investors are day-trading. There isn't much intrinsic value to a bitcoin. Most of it is speculative, so people are only trading on "momentum". This is in many ways similar to other markets—with the psychology of the bulls and bears; the fear and greed; the animal spirits.

But then what kind of asset class is it similar to? Is it a currency? Absolutely not. How could bitcoin be actually usable? Currencies need to be stable. The Dollar, Yen, or Euro, won't go up and down in value in the double-digits overnight. Cryptocurrencies are not usable. Even as firms like Amazon accept bitcoin, they are still going to convert it into dollar right away after the sale.

Is it a future currency? In which case you are arguing it is more similar to tech stocks / equities—that you are investing in the potential of a technology product that will become mainstream in the future. What are you buying into then? Future growth? Adoption rate? You might be able to argue that.

If you trust that cryptocurrencies will become mainstream in the future, you probably should invest based on some sort of valuation. Like value investing, you want to invest in the cryptocurrencies that are undervalued. What kind of valuation model would you apply? Perhaps instead of using a EV/EBITDA multiple, measure Market-Cap/Adoption-Rate? Market-Cap/Active-Users? These are all possibilities.

So there are a lot of potential—like high growth tech stocks? Hold on to that thought. The biggest issue right now is that cryptocurrencies is also the perfect asset to see a speculative bubble in. Jamie Dimon, JP Morgan's CEO, openly called bitcoin a fraud and a bubble that will eventually burst.

The same reason that people are rallying behind bitcoin—the fact that it is anonymous and unregulated—is the same reason there is a big issue. Many tactics that are illegal in other markets, such as pump and dump, are seen every day in cryptocurrencies trading. With many retail investors chasing after speculative prices, traders can do these things without the legal repercussions. These prices seen today really aren't sustained by anything. There is also the risk of government intervention. Governments don't want anonymity. They want oversight in the financial markets, and central banks as their levers to set monetary policies.

Cryptocurrencies right now are primarily speculative vehicles. If you do want to take a gamble, just beware of the risks you are taking.

THE INCREDIBLE POTENTIAL OF MOBILE WALLETS AND THREATS TOWARDS ITS ADOPTION

BY EMILY ZHOU

Mobile wallets take the form of an application on a mobile phone containing the user's bank account details and/or card information. This enables the user to issue transactions just by using his/her mobile phone, often as easily as with a tap or by entering a security pin.

The mobile wallet market's expected CAGR of 40% until 2022 points to another trend in mobile commerce: Conversational Commerce, the combination of chat threads and an online community with mobile commerce. We all text more than ever, so why not expand texting's potential to sending payments, buying products, ordering on-demand services, paying bills, and more.

After the concept of conversational commerce was created by WeChat, many big names are following closely behind: SnapChat has introduced SnapCash, Line developed LinePay, Apple Pay is partnering with Telegram while also developing Apple's own messaging platform called Business Chat, and Facebook Messenger is also including in-app purchases.

Mobile wallets provide a comprehensive package for payments, including easy online payment, physical in-store payment, and peer-to-peer money transfers. And yet, the growth of mobile wallets has been slow. A survey looking at reasons for why some consumers haven't picked up mobile wallets shows that 47% are concerned about security and privacy, and 45% say that mobile wallets don't provide enough additional benefits to bank cards.

Currently, the largest barrier to widespread adoption is security concerns, which may be overcome as people become more educated on mobile wallets. Otherwise, key factors determining a wallet's success include its marketing strategy and socio-cultural integration ability. The future remains bright, and it is an exciting time to witness how the development of other technologies will affect mobile wallets and further change the payments industry in the next few years.

OPEN BANKING APIS CREATING REAL "OPTIONS" IN MAKING INVESTMENT DECISIONS

BY CHRIS OSWALD

With a very uncertain and rapidly evolving future there is a need to create "options" that can accommodate a variety of industry scenarios. Banking customers are demanding a seamless client interaction with easy and simple transaction processing across any device, through any channel at any time of day.

Welcome to the World of Open Banking

Open banking is enabled through Application Programming Interfaces (APIs). Also known as Banking as a Platform (BaaP), open banking allows for more choice about where to store money and acts as a one-stop shop for all financial needs. BaaP requires that banks open their proprietary client profile and account data to third parties if clients request that them - all enabled through APIs.

How Open Banking is Benefiting The Consumer

✓ Transparency and money management made easier
✓ Alerts for overdraft
✓ Integrated tools apply for mortgages, tied to real estate agents and lawyers
✓ Maps of all accessible ATMs within region tied into your GPS
✓ Account information aggregated across several FI's
✓ Real-time updates about investment portfolios

Open banking could become the autonomous vehicle of the banking industry. Customers can rely upon trusted secure technology to assist their financial services. We now have the availability of software and new FinTech market entrants to manage a client's money consistent with the client's direction and instructions. Daily transaction execution and banking can occur using voice commands and predetermined rules. To make this work, however, banks need to invest in technology that creates options on routes that are headed to a BaaP destination.

The bank of the future will be a marketplace, connecting customers to third parties. The role of the bank will inevitably shift and as a result, the bank of the future could be an Apple, Amazon or Facebook. 'Open' banking will allow for new market entrants into the previously dominated financial sector. Large-cap banks will need to shift focus and reimage their company to stay afloat.

Validated third-party companies will now be able to access the financial data of their clients and allow for seamless lending, online purchasing, and loyalty programs.

The emergence of new technologies will see an increase in competition among retail banks, decreased margins, and more "shopping around". As a result, banks will no longer have exclusive rights over client data. Creating real "options" in a customer-centered digital reality to an "open technology platform" changes the focus of competitive value proposition from the use of captive data to open data competing on services and functionality.

2018 TECH CONSULTING COMPETITION: IVEY FINTECH X WESTERN FOUNDERS NETWORK

Tech Sponsor: IBM Global Business Services: SAP Practice

Case Sponsor: CIBC Capital Markets

2018 Champions

1st Place
University of Waterloo: Yatin Kapur, Chaitanya Bhutani, Adam Yoshida

Universities represented include: Western University / Ivey Business School, University of Waterloo, University of Toronto, Wilfred Laurier University, McMaster University, Ryerson University, Queen's University, York University, McGill University, University of Ontario Institute of Technology

2018 TECHNOLOGY CONSULTING COMPETITION

On March 11, 2018, over 500 students and 105 teams from 10 universities in Canada participated in the 4th annual **IBM** Technology Consulting Competition, featuring case sponsor, **CIBC**. The Tech Consulting Competition is Western's largest case competition that brings together business and engineering students. It is a student-run, annual case conference hosted by **Ivey FinTech** and **Western Founders Network** at the Ivey Business School. The competition is among the largest case competitions in Canada, and the only one with a focus on technology.

The students were given the opportunity to analyze a real life business scenario, and apply technology solutions to solve some of the toughest problems corporate executives are facing. Students competed in teams of four, and were given four hours to derive a solution and present in front of seasoned industry professionals.

The winning team not only received cash prizes, but were granted 1st round interviews with IBM and CIBC. Congratulations to all competitors - we hope to see you back next year.

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