

# Blockchain Transformations



**BLOCKCHAIN  
RESEARCH  
INSTITUTE**

**Identifying Applications for the Blockchain Revolution to Transform  
Business, Competitiveness and the Public Sector**

**A Syndicated Investigation of the Blockchain Research Institute**

**Led by  
The Tapscott Group**

## Table of Contents

<b>The Blockchain Revolution</b> .....	<b>3</b>
<b>The Blockchain Transformation Program</b> .....	<b>4</b>
<b>Vertical Opportunities</b> .....	<b>4</b>
<i>Financial Services</i> .....	4
<i>Retail</i> .....	5
<i>Manufacturing</i> .....	5
<i>Media</i> .....	6
<i>Technology</i> .....	7
<i>Healthcare</i> .....	7
<i>Government and Democracy</i> .....	8
<b>Horizontal Opportunities</b> .....	<b>8</b>
<i>CLO – Logistics, Supply Chains &amp; Asset Management</i> .....	8
<i>CFO—Corporate Finances and Accounting</i> .....	9
<i>CMO—Sales and Marketing</i> .....	10
<i>CIO—Information Technology</i> .....	11
<i>CHRO—Human Resources and Procurement</i> .....	11
<i>Other</i> .....	12
<b>Regulation: What Regulators Should and Should Not Do</b> .....	<b>12</b>
<b>Societal Opportunities</b> .....	<b>13</b>
<b>Reality Check—Overcoming Challenges</b> .....	<b>13</b>
<b>Faculty (proposed partial faculty—to be completed and confirmed)</b> .....	<b>14</b>
<b>The Program Deliverables</b> .....	<b>14</b>
<b>Schedule</b> .....	<b>15</b>
<b>Pricing</b> .....	<b>15</b>
<b>Contact</b> .....	<b>15</b>
<b>Program Leadership</b> .....	<b>15</b>
<b>Joining the Program</b> .....	<b>17</b>
<b>Appendices</b> .....	<b>17</b>
<b>Appendix 1: Eight Transformations in Financial Services</b> .....	<b>17</b>
<b>Appendix 2: Potential Showstoppers</b> .....	<b>18</b>

## Identifying Applications for the Blockchain Revolution to Transform Businesses and Competitiveness

The technology that will enable, secure and formalize the digital relationships shaping the future of enterprise, government and the global economy has arrived — Blockchain. The first generation of the digital revolution brought us the Internet of Information. The second generation—powered by blockchain technology—is bringing us the Internet of Value: a new, distributed platform that can help us create the digital relationships that will reshape the world of business and transform the old order of human affairs for the better.

In the first best-selling book about the blockchain revolution, Don Tapscott and Alex Tapscott argued that blockchain technology will transform financial services, the deep architecture of the corporation, animate the Internet of Things, recast the role of government, revamp our content industries, and solve important problems like the security of organizations and the privacy of individuals. New blockchain-based business models will transform most industries, and disruptors like Uber may themselves become disrupted.

It's now time to take the next step and conduct deep research into killer applications — identifying the most important opportunities for blockchain in business and government and drawing the roadmap for how to get there.

The Blockchain Institute is pleased to announce a new, landmark initiative on the potential of blockchain across industries and also within the functions of organizations. Through a series of major research projects led by global experts, we will identify and explain key application opportunities, issues, strategies and approaches that enable companies and governments to capitalize on this emerging technology.

You are invited to join leading companies and governments around the world in this program to create a series of publications, tools, and videos to explore, explain and illustrate emerging solutions for the problems we are collectively facing.

### The Blockchain Revolution

The Internet is entering a Second Era. The first was the Internet of Information, and with blockchain we are entering the Internet of Value. But where are the most important opportunities and how do we anticipate and harness these seismic shifts?

For the last few decades we've had the Internet of information: a platform for everyone to publish and distribute information. Though it transformed how we communicate, its impact on business, commerce and prosperity ended up being quite limited. Why? Establishing identity and trust online still requires validation from a trusted third party like a bank, government, credit card company or big technology company. There are many drawbacks to relying heavily on intermediaries to secure our relationships. For one, they are centralized, making them vulnerable to attack or failure. They add cost and friction to our economy for consumers and businesses alike. They exclude 2 billion people from the global financial system. They capture vast amounts of data about citizens and organizations — which can undermine privacy, corrosive to a free society. Most troubling, power and prosperity are channelled to those who already have it. The upshot is that there is wealth creation but declining prosperity and the largesse of the digital age is being captured asymmetrically.

Today we're seeing the rise of the Internet of Value. At the core is the biggest innovation in computer science in a generation — the technology underlying the digital currency networks like Bitcoin and Ethereum — the *blockchain*. This technology platform is open and programmable, leading to an explosion of innovation, including support from the technology sector, the Linux Foundation, the banking sector, global governments, and business leaders everywhere. Blockchain holds the potential to unleash countless new applications and as yet unrealized capabilities that have the potential to transform everything in the next 25 years.

Broadly speaking, blockchain technology describes a distributed, highly secure platform, ledger or database where value — everything from money, stocks, bonds, intellectual property, and deeds, to music, art and even votes — can be stored and exchanged without powerful intermediaries. Trust and collective self-interest, hard-coded into this new native digital medium for value, ensures the safety, security and reliability of commerce online. Trust is programmed into the technology, and is achieved not by big institutions but by cryptography, collaboration and clever code. Moreover, it is incredibly malleable to suit the many challenges of different industries and institutions. Public blockchains, such as Bitcoin and Ethereum, could open the doors to the worlds unbanked, whereas private blockchains (like those being advanced by leaders on Wall Street) could remove hundreds of billions of dollars from financial infrastructure, making the industry faster, more efficient, more secure, and less risky.

### Introducing a New Syndicated Research Program from the Blockchain Research Institute

— Led by Don Tapscott and Alex Tapscott

There are other important emerging technologies for the future of business and government including the mobile web, big data, robotics, the cloud and most of all artificial intelligence. Blockchain will act as a foundation and enabler for these technologies, allowing them to reach their true potential.

However, there are many challenges to moving forward. One of most pressing, is that the specific opportunities in key industries are unclear. In *Blockchain Revolution* we pointed to some light house cases where good progress was being made, and we also hypothesized about opportunities

for competitiveness and transformation. We were really just scratching the surface.

## The Blockchain Transformation Program

You are invited to join the definitive investigation into blockchain opportunities. We will investigate the most important applications vertically by industry and horizontally by function within different types of organizations. The research will also help to ground decision-making around blockchain integration and prototyping — offering guiding principles and tradeoffs to different approaches while remaining agnostic toward technology partners. Depending on the requirements of members, the program aims to focus on seven industries: Financial Services, Retail, Manufacturing, Telecommunications and Media, Technology, Healthcare and Government.

### Vertical Opportunities

#### Financial Services

Financial Industry leaders are coming to understand that blockchain holds the potential to profoundly transform the industry. Consider the implications for banks, insurers, accountancies, consultancies, and other

industry giants of a vast global and distributed ledger running on millions of devices and open to anyone, where not just information but anything of *value* – money, equities, bonds and other financial assets, titles, deeds, intellectual property, even votes – can be moved and stored securely and privately, and where trust is established not by powerful intermediaries but through mass collaboration and clever code. This new native digital medium for value would act as ledger of accounts, database, notary, sentry and clearing house, all by a consensus mechanism. This technology holds the potential to make financial markets radically more efficient, secure, inclusive and transparent.

The opportunities — and potential risks — are immense. Blockchain may enable incumbents to do more with less, expand their services, reduce risk and cut costs. But it also radically lowers barriers for new-entrants to create alternatives to the conventional financial industry, challenging incumbents in virtually every market where they operate.

All eight core functions ( See Appendix 1) of financial intermediaries are poised to be transformed, and it is incumbent on the industry's leaders and new-entrants alike to understand how to harness blockchain technology.

## Retail

During the first generation of the Internet, retailers collected consumer data to drive business. But when these firms get hacked, it's the consumers who bear much of the burden of stolen credit card and bank account information.

All of this is because we are asking hammer salesmen at Home Depot to store the same personal information as a bank in order to give a consumer some rewards points. Blockchains offer a powerful authentication tool to consumers, adding a new type of digital consent which could radically change the consumer-retailer relationship. But what does this new relationship between consumer and retailer look like? What are the implications for the infrastructure we're currently relying on for the consumer-retailer relationship?

Blockchains could make the retail experience more private and secure for the user while also offering a richer experience. Consider this: you are walking down the street, your mobile device advises you that the dress you have been looking at is available at the Gap. Walk into the store and the dress, in your size, is waiting for you. After trying it on, you scan it and the payment is complete. But you've got other things to do, so the dress finds its way to your house before you get home. In addition to increasing operational efficiencies and environmental monitoring, retailers will be able to personalize products and services to identify customers as they pass by based on their location, demographics, known interests, and purchasing history – provided that those customers opened their personal data to retailers on the blockchain. The world of big data in retail is giving way to the world of bigger, smaller, and more personalized data — with informed consent. How can companies that sell to consumers survive and thrive in this new world?

## Manufacturing

With blockchain, manufacturing-intensive industries can give rise to planetary ecosystems for sourcing, designing, and building physical goods, marking a new phase of peer production. Combined with other new technologies such as three-dimensional printing, manufacturing will move closer to the user, bringing new life to *mass customization*. Soon, data and rights holders can store information about any substance from human cells to powered aluminum on the blockchain, in turn opening up the limits of corporate manufacturing.

This technology is also a powerful monitor of the provenance of goods and their movement throughout a supply network. Indeed, manufacturers and other consumers of raw materials struggle with \$300 billion/year in global supply chain fraud and leakage. Tracking assets on a blockchain would reduce counterfeit goods and materials on the market, make fraud more difficult and streamline border crossings. Consider that over one billion dollars/day passes across the US-Canada border. As the World Economic Forum has estimated, even a 50% reduction in supply chain barriers at global borders could increase global GDP *six times* more than the elimination of all tariffs around the world – a huge opportunity for businesses and governments alike.

A look at the flow of goods in manufacturing leads to insight into how profound the implications are for the blockchain revolution. A contract is said to be a meeting of the minds. Blockchains are already being used to create smart contracts in manufacturing because they're becoming meeting places for digital relationships. These relationships are not just for supply chain management, but at the same time for trade financiers, certification organizations, and customs agents.

Blockchains are allowing for the coupling of the flow of goods and money. Some of the motivation for this coupling is deep tier financing. Here, the visibility and transparency in a supply chain extends through the manufacturing process from the financiers to the consumers. Visibility established through a blockchain is drawing financing to satisfy ethical consumption habits. Among other things this means financing activated in the fight against sweat shops, slavers, counterfeiters, or fraudsters. However when it comes to making this happen there are more questions than answers.

## Media

Today, content creators do not receive their fair share of the value they create as the system for managing IP rights is fundamentally broken. Consider the newspaper industry that is in a chronic crisis. This is a huge social problem leading to the fragmentation of public discourse, and the challenges facing journalists to make a living for their work.

This goes for songwriters and recording artists who now receive only financial crumbs at the end of the process. For example, in the past a platinum song that sold a million singles would earn the songwriter about \$45,000. Today, if a song receives a million streams online, the songwriter makes \$35 – about enough to get a nice pizza. With new blockchain based digital rights management systems, content creators are empowered, controlling how their music is played, remixed, and licensed, and they get to choose how and when they're compensated. Blockchain removes the need for many intermediaries such as record labels, agents and other third parties, who for so long have controlled the industry for the sole reason that they been around for so long. What will this mean for existing intermediaries and incumbents?

The Bitcoin blockchain created the world's first inherently digital property where value can be protected. Before Bitcoin, the concepts of digital and scarcity was antithetical. Anything digital could be copied. Media industries are still coping with the Internet of Information and its treatment of all data as bits and bytes, sold wholesale by monthly packages consumed in gigabytes.

What the coordination and combination of technologies that make up a blockchain has created is some piece of digital code that is uncopyable, unique. All of the sudden, we live in a world where something digital, by being unique, can be traded as digital information of value. While many see this as relevant to finance, intellectual property as an institution also has an opportunity to grow as a result of the type of digital property blockchains have created.

## Technology

The technology industry is about to be disrupted in ways few could have anticipated. Consider the Internet of Things (IoT): by some estimates within a few years there will be hundreds of billions, perhaps trillions, of internet-connected devices doing everything from driving us around to monitoring our health to generating power, from heating our homes to organizing our affairs. These devices will need a native digital medium to communicate value and sensitive data securely, at zero-cost and at lightning speed. Indeed, the internet of everything will need a ledger of everything to ensure continuity and coherency.

There's also the legal character of these machines to consider. Picture, for example, using a trusted source of real-world data (an oracle of sorts) to supply information in a smart contract (eg. An IoT thermometer in a shipping container tied to a shipping insurance contract).

Any centralized client-server with accounts or log-ins for authentication of the IoT sensor would be at risk of all the same hacking vulnerabilities of the digital infrastructure we use today. Denial-of-service attacks and account information breaches would weaken the use of these tools. These vulnerabilities pose complex questions as we integrate machines into our responsibilities and obligations.

The push transaction of a machine authenticating itself through the possession and use of a private cryptographic key is a useful form of consent. It avoids the issues presented by a centralized account administrator. Identity and authentication established this way promises to satisfy the legal character machines need to participate in these contracts, integrating them into the Internet of Value.

Or how about the sharing economy? Companies like Uber and Airbnb and others have come out of nowhere to capture the imagination of people everywhere, but they are not real sharing models at all. In fact, they are successful simply because they don't share — they aggregate excess capacity through a centralized intermediary and re-sell it to a willing market. Oddly enough, it turns out that blockchain can replace a lot of those functions — and everything from identity and reputation to contracts and payments can be radially simplified. With a distributed application, you could have a true sharing economy model where those who create value are fairly compensated for the value they create.

Because a blockchain can process both static data (a database) and dynamic data (transactions), it represents an evolution in systems of record. Such a system of record can navigate and manage the many relationships and state changes of property being used in yet unimagined commercial ways.

## Healthcare

The healthcare system in many countries is under extreme strain, where every stakeholder, from healthcare providers to insurers, drug companies and most of all patients, all suffer as a result. Though there are many culprits, the root of the problem is our industrial-age thinking about delivering healthcare, where data is hoarded, patients are assumed to be ignorant, and where healthcare is only available when you're in the system. This leads to costly and ineffective care. Blockchain promises to change that. We can fix healthcare by basing it on a set of new principles — collaboration, openness, and integrity, and where the patient co-creates their own data with full transparency into it.

Patients and frontline health care providers are separated by a labyrinth of relationships between jurisdictions, professional services, specialists, and other providers. The digital processes used are really for



the logistics of handling paper documents. There are several paper trails per doctor-patient or patient-provider interaction, and lots of data entry duplication.

The process is the same as before anyone had ever heard about a computer, except the information moves into separate data silos much faster. In short, a lot of time and effort goes into managing data between organizations.

Another way to put this is that we used to expend energy maintaining databases. The invention of blockchains means we can move beyond the simple custodianship of a database and turn our energies to how we use and manipulate databases — less about maintaining a database, more about managing a system of record.

### Government and Democracy

Blockchain presents governments with four huge opportunities. The first is to harness this technology to rewire the economy for innovation. Blockchains will not simply disrupt every industry – they will dramatically lower barriers to business creation. This hints at the beginning of a new relationship between government and the private sector. From the beginning, blockchain developers have seen regulatory compliance regimes establishing the boundaries of certain relationships as a business opportunity. Blockchain-based markets can authorize transactions according to the regulatory regime of the marketplace. Food safety certification can be established using a blockchain as a digital system of record. In short, new and interesting opportunities exist for the private sector to formalize relationships prescribed by laws and regulations.

Anyone can build value in this global economy, and governments should consider what role they can and should play to achieve this goal. The second opportunity is to reconfigure government for greater transparency and accountability to citizens. Government should do far more at less cost, with more input from citizens. The third is to design the preconditions for everyone to succeed. Rather than re-distributing wealth, we could pre-distribute wealth, democratizing the means by which citizens generate wealth in the first place. Finally, what are the implications of blockchain for the democratic process, and how can we help overcome the crisis of legitimacy of democratic institutions. This also forces an existential question for governments. Because the technology's capacity is to secure relationships in the digital world, there are implications for a concept inherent to relationships in the physical world: the idea of jurisdiction itself is under stress. How can governments adapt their treatment of jurisdiction and remain relevant?

### Horizontal Opportunities

#### CLO – Logistics, Supply Chains & Asset Management

One of the greatest opportunities for deploying the capacity of blockchain technology is in tracking assets—or, put in other words—by integrating blockchain across supply chains and logistical

networks. 60% of global trade is made up of intermediate goods and services, making supply chains a strategic asset for multi-national corporations. Optimization of supply chains for greater responsiveness and transparency is a constant focus of major companies looking to more



efficiently respond to fluctuating consumer demand. On top of these economic factors, regulatory bodies in the US and the EU are also accelerating the need for greater transparency and adaptability in supply chains to meet new standards of safety, anti-corruption, and environmental targets for our increasingly global networks. Combined, these forces are ripening the moment for many of our legacy organizations to integrate decentralized technologies like blockchain.

To date, there has been no systematic study of Blockchain as it relates to the world of supply chain, operations, shipping, logistics, global trade finance, and how it will affect some of the largest companies operating sprawling and complex supply chain and logistics networks.

Blockchain is a technology that will drive radical new opportunities around the issues related to counterfeit drugs and luxury goods, provenance tracking of raw minerals and materials, supply chain transparency and responsiveness, compliance, food safety, attestation of authenticity, trade finance, back-to-birth traceability, land title documentation, fractional asset ownership, and autonomous supply chains integrated with the emerging world of the Industrial Internet of Things (IIoT).

Imagine, for instance that you could trace the exact prescription drug you pick up at the pharmacy, or the food you consume, all the way back to its origin. Or that as a company you could have real-time data about your product and its readiness or certification. The ability to use an open database (while still protecting confidential information from all parties) would allow greater flow and accuracy of goods across borders, and change the relationship between producers, consumers, and regulators for the better. But how do we go about linking real-world products and assets to the blockchain? What levels of scalability and confidentiality are necessary? How can access by regulators to source-testing and real-time

production data remove barriers to importation? Where will IoT and IIoT devices play the biggest role?

To bring our supply chains into a new era we will need the research to help educate and engage our top global firms and institutions.

Our research will uncover the relevant responses to questions such as: 1) what are different models for putting an asset and attributes on a blockchain, 2) how do we balance transparency and security with confidentiality, 3) how do we achieve network scale and efficiency, and 4) how do we approach autonomous supply chain functions with Industrial IoT.

### CFO—Corporate Finances and Accounting

Accounting—the measurement, processing, and communication of financial information—is up for profound changes. It performs a critical function in today's economy. However, the implementation of accounting methods must catch up with the modern era and the blockchain revolution. First, the current regime relies upon managers to swear that their books are in order. This places often undue challenges on responsible executives. Additionally, dozens of high-profile cases—Enron, AIG, Lehman Brothers, WorldCom, Tyco, and Toshiba—show that management doesn't always act with integrity. Greed too often gets the best of people. Cronyism, corruption, and false reporting precipitate bankruptcies, job losses, and market crashes, but also high costs of capital and tighter reins on equity.<sup>1</sup> Second, human error is a leading cause of accounting mistakes, according to AccountingWEB. Third, new rules such as Sarbanes-Oxley have done little to curb accounting fraud. Fourth, traditional accounting methods cannot reconcile new business models. Take microtransactions. Most audit software allows for two decimal places (i.e., one penny), useless for microtransactions of any kind.

Blockchain opens up vast new possibilities that need exploration. Modern financial reporting is

based on a simple concept called double entry bookkeeping—for every transaction, both a debit and credit are recorded and in the end they must balance (hence the term, “balance sheet”). Blockchain offers the promise of a new paradigm in accounting: where a third entry recorded to a distributed ledger becomes instantly accessible to those who need to see it—the company’s shareholders, auditors, or regulators. Imagine that when a massive company like Apple sells products, buys raw materials, pays its employees, or accounts for assets and liabilities on its balance sheet, the ledger recorded the transaction and published a time-stamped receipt to a blockchain. The financial reports for a company would become a living ledger—auditable, searchable, and verifiable. Generating any up-to-the-minute financial statement should be as simple as a spreadsheet function, where the click of a button gives you an immutable, complete, and searchable financial statement, free of error.

The idea is tantalizing, but how does it get implemented and what questions should managers be asking? Companies have a right to trade secrets but also a duty to disclose important information. So, to whom should these records be exposed? How does triple entry accounting reconcile with non-cash items that rely on management discretion?

### CMO—Sales and Marketing

Just as the blockchain provides a way to obtain information about potential contractors and partners, it will be able to tell managers about people or businesses they propose to do business with. Individuals will control access to their own data in virtual block boxes. Since companies will no longer be able to profile customers by tracking and capturing their behavior online, the blockchain will allow them to engage with individuals on a peer-to-peer basis. This may seem like a lot of effort but it could actually be a huge opportunity. Some consumers may offer businesses access to their data in exchange for freebies; others will charge fees to license their data. Either way, companies

will be able to reach their target audience with greater precision.

What’s more, sellers won’t have to worry about who the customers are and whether they are able to pay. With the new platform, sellers don’t have to incur the costs of establishing trust, thus facilitating transactions that were either risky or might not have been possible otherwise. Furthermore, blockchains eliminate the cost of warehousing data and protecting other people’s data from security breaches. It should also be easier to target customers who make their interests known.

However, there has been virtually no exploration of the impact of blockchain on sales and marketing. In *Blockchain Revolution* we discuss how enterprises create platforms when they open up their products and technology infrastructures to outside individuals or communities that can cocreate value or new businesses. One type is *prosumers*, customers who produce.<sup>2</sup> In a dynamic world of customer innovation, a new generation of producer-consumers considers the “right to hack” its birthright. Blockchain technology supercharges prosumption. Nike running shoes could generate and store data on a distributed ledger that, in turn, Nike and the shoe wearer could monetize as agreed in their smart contract. Nike could offer a tiny piece of its shares with every pair it sells, if the customer agrees to activate the smarts in the shoes, or even synch her shoes to other wearables, such as a heart monitor or glucose level calculator or other valuable data for Nike.

Some platforms differ from prosumer communities where a company decides to cocreate products with its customers. With open platforms, a company offers partners a broader venue for staging new businesses or simply adding value to the platform. However this is just scratching the surface. How does blockchain change the four p’s of marketing (product, place, price and promotion)? How do blockchain tools like prediction markets change market research? What

are the implications for the brand? In a world where individuals have greater privacy and control over their data, how do brands build trust with customers to gain critical insights? And how do they build prosumer relationships practically, as a function of the business and a component of their overall strategy?

### CIO—Information Technology

Blockchain creates significant opportunities and challenges for the CIO and the IT function. Every firm will need a target architecture and a migration strategy such that new investments contribute to a desired future rather than perpetuating the past. Such programs need to engage the Chief Information Security Officer as blockchain may be the solution to many security challenges.

As with other big innovations like the PC, the web, mobility and the social web, blockchain experimentation is often starting outside the IT function. Thoughtful CIOs should view this positively because every business will become a blockchain business and every business leader needs to explore opportunities for transformation.

The trouble is that IT challenges are enterprise challenges. Companies need to have an integrated, enterprise architecture to have a single version of the truth and to harness the power of blockchains. They need to have security standards and systems to protect them from bad actors. They need back up capabilities to ensure business continuity. They need an enterprise strategy for the next generation of blockchain collaboration tools and systems to cut across business silos. They need to have elite IT talent to deal with the many complexities of becoming a blockchain business. The program will investigate solutions to this dilemma. We believe a new model of the IT function is emerging, and one that makes the CIO more important than ever.

One solution is what we call the Blockchain Services Supermarket: The CIO anticipates business needs and provisions a rich supply of services, from standards for blockchain application

development and architecture compliant applications to elite talent with expertise in blockchain architecture and development—all in the “shelves” of a supermarket. The business customer goes to the supermarket—a self-service portal or catalogue—and pulls up the available services. They choose the services, and the level of service required and combines them to meet their technology needs.

How can a CIO get started? Personal use of this technology is a precondition to comprehension and CIOs should download a digital wallet and buy something with digital currencies. Beyond that how can CIOs take steps to ensure they and their organizations are informed about the blockchain revolution and the best practices in hiring or transitioning key blockchain IT talent to get going. What does a next generation blockchain architecture project look like? Pilots and proofs of concept are a must. But what kinds of pilots make sense in every industry to gain experience and achieve initial successes? Who should companies partner with—established technology vendors or startups? How can companies overcome suspicion of competitors to collaborate towards a common end?

### CHRO—Human Resources and Procurement

Blockchain will enable organizations requiring specialized talent and capabilities to obtain better information about potential contractors and partners than traditional recruitment and procurement methods. With a prospective employee’s consent, an employer will have access to a rich store of information that’s known to be correct because it has been uploaded, stored, and managed on a highly secure, distributable database. For example, job prospects wouldn’t be able to lie about their training or degrees because an authority, such as the university they graduated from, has entered the data on the blockchain. Tampering with data after the fact wouldn’t be possible: it would involve taking over the entire blockchain, a nearly impossible task. Individuals would control their own personal data

(including birth date, citizenship, financial and educational records) in a virtual black box. They alone would be able to decide what to do with the information.

Human resources and procurement staff will need to learn how to query the blockchain with specific yes/no questions: For example, do you have this kind of license? Can you code in this specific language? The responses from all the black boxes will provide a list of people who meet these qualifications. Employers can ask whatever they want, and job seekers can program their black boxes with answers or refuse to answer. (In cases of possible employment discrimination, the blockchain will offer proof.)

### **Regulation: What Regulators Should and Should Not Do**

Many regulatory bodies are now exploring the emergence of blockchain to enhance the financial welfare of their population and to prevent abuse and bring transparency into the financial system and economy as a whole. This project proposes to investigate blockchain technology as the solution to the challenges regulators face, and suggest some best practices and new directions regulators should consider.

Currently, in collaboration with our partner on these matters – the Chamber of Digital Commerce – there are a number of approaches that we have identified as problematic. Some state regulatory bodies have adopted regulations where they are unnecessary or undesirable. As an example, some applications of the blockchain do not represent a utility for money transmission; however, these entrepreneurs are held to onerous compliances that are completely gratuitous, oppressive and do not serve the public interest. Others have adopted contradictory and duplicative regulations by

### **Other**

Depending on client membership and interests we may explore the impact on the corporate legal department (smart contracts), and R&D (how blockchain changes the innovation process), and our practices of Raising Capital. (Rewards points, payment processing, and raising capital, from the paradigm shift of cryptographic keys as the tool for interfacing on a blockchain. When paper money was created, it was referred to as ‘currency’ because it was ‘current’, as in useful in real time as opposed to a pound of gold or silver. With the full power of private cryptographic keys being used by individuals, a new tool has entered the world of currencies.)

multiple agencies that drive up compliance costs for startups to unsustainable levels and strangles innovation

There are countless issues, some far-reaching. For example, should the emergence of the blockchain sector require the harmonization of regulatory practices? If so, for what issues should a harmonized regulatory body or SRO pre-empt state and local (providences and territories) jurisdictions for domains such as AML and anti-terrorism?

There has been no systematic study of the do and do nots of regulation of blockchain technology. There is too much at stake to address this on an ad hoc basis, and thus there remains a high risk that a socially and economically valuable industry will be strangled in the cradle. Regulators should encourage the blockchain industry for many reasons. However it’s unclear to most what a sensible approach looks like.

## Societal Opportunities

Depending on client interest and project resources we may investigate some broader societal opportunities. Consider the case of Climate and Planet Stewardship.

With the emergence in 2015 of the Sustainable Development Goals (SDGs) and the Paris Agreement as the new global framework for addressing climate change, this enormous momentum is being manifested with an unprecedented diversity of initiatives and innovative models integrating environment, society and economy. Although developed country governments led the way during the 1990s and 2000s, that leadership has turned to stagnation, and in some cases—notably the US—possibly going into reverse, action is being focused at the sub-national level by a multitude of non-state actors such as cities and companies. Several of these non-state actors are starting to use digital technologies such as IoT devices and big data analytics to enable better measurement and verification of sustainability performance. However, the existing market infrastructure for sustainability issues, such as carbon markets, faces a plethora of challenges such as fragmentation, non-fungibility of market instruments, difficulty scaling—among many other challenges—that is limiting non-state actors to be able to monetize their sustainability performance.

Blockchain technology has the potential to overcome many of these challenges, as well as enable non-state actors to create new strategies and business models from their data and stakeholder networks.

However, within the climate and sustainability communities, blockchain technology is almost entirely unknown and is perceived as radical and a disruptive force that would need to be linked with additional innovations such as collaborative governance models (e.g. “standards 2.0”). To determine the path forward for blockchain with the climate and sustainability space, research is needed to answer the questions: 1) how does blockchain need to be connected with other digital innovations to address the needs of the various types of actions/initiatives on climate and sustainability?; 2) recognizing the inherent fundamental nature of climate and sustainability to incorporate multi-stakeholder governance, how can a blockchain solution be governed under such multi-stakeholder demands?; 3) as natural capital and other environmental and sustainability assets/commodities are created, how can blockchain be designed to ensure environmental integrity (e.g. all the actions/assets on the blockchain add-up to the global carbon budget)?

## Reality Check—Overcoming Challenges

There are many challenges and obstacles to the Internet’s Second Era. For a sobering appreciation of the problems consider [Coindesk’s Q3 2016 State of the Blockchain Report](#). While interest and activity is up, investments are down. There is much confusion by enterprises about where the big opportunities are. There is a roadblock on the way to the new enterprise and the new model of government.

Organizations need a sober appreciation of the opportunities and challenges, and also practical steps they can take to move forward. These fall in two categories: 1. Systemic problems to the blockchain revolution. (See



Appendix 1). 2. Specific challenges for companies and governments in exploiting this opportunity. The program will investigate both and outline practical ideas and actions on how to move forward and in doing so remove the roadblock to significant progress.

## Faculty (proposed partial faculty—to be completed and confirmed)

The program and its projects will be led by many of the world’s leading thinkers in the Internet’s Second Era.

### 1. Financial Services

- Project Director: Alex Tapscott, CEO of Northwest Passage Ventures and Co-Author of *Blockchain Revolution*.
- Faculty: Jesse McWaters, World Economic Forum; Oliver Bussman, formerly of UBS

### 2. Private Sector

- Faculty: Bettina Warburg, Co-founder and Managing Partner, Animal Ventures, Executive Producer “Tech on Politics”, TED Speaker; Tom Serres, Co-founder and Managing Partner, Animal Ventures, Host “Tech on Politics”; Nolan Bauerle, author and researcher for Coindesk; Primavera De Philippi, National Center for Scientific Research, Paris; Michael Casey, Co-author of *The Age of Crypto Currency* and former columnist for the *Wall Street Journal*; Jason Brett, Chamber of Digital Commerce, Former FDIC Regulator; Christine Ing, Partner, Technology Specialist at Blake, Cassels & Graydon; Tomicah Tillemann, New America Foundation; Christa Steele, Muskoka Group, Former CEO Mechanics Bank; Katie Haun, US Federal Prosecutor in Digital Currencies.

### 3. Government

- Project Director: Brian Forde, MIT Digital Currency Initiative.
- Project Manager: Joan McCalla, former executive with Cisco and Blockchain Research Institute collaborator specializing in the impact of blockchain on government and democracy.

## The Program Deliverables

Program findings are restricted to members, although top line results may be communicated openly. We will conduct a number of projects as outlined above and create a deliverable or deliverables for each which could include a report, deck, data set, website, tools, MOOC, or other device for sharing results. We will also hold a final summit, with attendance restricted to program members and faculty, where program results will be shared and discussed.

1. Reports and Tools that share program conclusions and enable member organizations to interact with this content
2. Monthly webinars
3. A custom executive briefing from Don Tapscott and/or Alex Tapscott at the member’s location, at a mutually agreed upon time and date
4. At least one all member summit

5. A private website for presentation of deliverables and communication among members

## Schedule

The program will begin April 30, 2017 and will be completed a year later. The final Program Summit will be held in the Spring of 2018.

## Pricing

One-time membership fees for the program are USD \$200,000. Lower fees are available for governments and not-for-profit organizations.

## Contact

For more information, or to subscribe to updates on this landmark program, please contact:

Jenna Pilgrim, Project Manager

**The Blockchain Institute**

[Jenna@tapscott.com](mailto:Jenna@tapscott.com) +1 416-863-8810

## Program Leadership

### Don Tapscott, Executive Director



Don Tapscott, CEO of The Tapscott Group, is one of the world's leading authorities on the impact of technology on business and society. He has authored 16 books including *Wikinomics: How Mass Collaboration Changes Everything*, which has been translated into over 25 languages. Don has been advancing ground-breaking concepts for over 3 decades. His 1992 bestseller *Paradigm Shift* helped coin the seminal management concept, and in 1995 his book *The Digital Economy* changed business thinking about the transformational nature of the Internet. Two years later he helped popularize the terms "Net Generation" and "the Digital Divide" in *Growing Up Digital*. Don's latest book is co-authored with his son, startup CEO and bitcoin governance expert Alex Tapscott. *Blockchain Revolution: How the Technology Behind Bitcoin is Changing Money, Business, and the World* has been a bestseller in Canada since its release in May 2016, and has been featured in nearly every major publication in North America. *Blockchain Revolution* is also in the process of being translated into 12



languages. In 2015, Don became a member of the Order of Canada, and was ranked 4<sup>th</sup> most influential management thinker in the world by Thinkers50. He is an adjunct professor at the Rotman School of Management, and an Associate at the Berkman Klein Center for Internet and Society at Harvard University, Don is Chancellor of Trent University in Ontario. He lives in Toronto.

### **Alex Tapscott, Executive Director**



Alex Tapscott is a globally recognized thought-leader, speaker and writer focused on the impact of emerging technologies on business, society and government. Alex is the co-author (with Don Tapscott) of the critically acclaimed #1 Globe and Mail Non-fiction best-seller, *Blockchain Revolution: How the Technology Behind Bitcoin is Changing Money Business and the World*. His writing has been featured in TIME, Fortune, Forbes, the Harvard Business Review, the Toronto Star, the Globe and Mail and dozens of other publications. In 2014, Alex published the seminal white paper “A Bitcoin Governance Network.” Prior to writing *Blockchain Revolution*, Alex worked for 7 years in Canadian and U.S. Capital Markets – raising hundreds of millions of dollars in critical growth capital. Alex is also the founder and CEO of Northwest

Passage Ventures, a social innovator. Alex currently sits on Advisory Board to Elections Canada, the independent, non-partisan agency responsible for conducting federal elections and referendums, and is a founding Member of the World Economic Forum’s Global Futures Council on Blockchain. Alex is a graduate of Amherst College (cum laude) and is a CFA Charterholder. He lives in Toronto.

## Joining the Program

**\*See Accompanying Membership Agreement for registration.**

## Appendices

### ***Appendix 1: Eight Transformations in Financial Services***

*Abridged from Blockchain Revolution: How the Technology Behind Bitcoin is changing Money, business and the World.*

#### **Authentication of Identity and Reputation**

Today, we rely on rating agencies, analytics firms and banks to establish trust, verify identity in transactions and decide who merits access to the system. In contrast, reputation accrues on the blockchain itself. Blockchain technology lowers or eliminates the need for trust altogether.

#### **Moving and Storing Value**

Blockchain start-ups such as Circle, Abra and Paycase want to make retail banking a global free commodity, like Google, and can do so because their back end, supported by blockchain, is secure and inexpensive to run. “When was the last time you sent a ‘cross-border e-mail’?” asked Jeremy Allaire, CEO of Circle, rhetorically. He bets hundreds of millions of millennials globally will find this prospect appealing.

#### **Lending**

Retail, commercial and mercantile banks, along with credit scoring and rating firms, facilitate the issuance of credit card debt, mortgages, corporate and municipal bonds, T-bills and asset-backed securities. On the blockchain, anyone could check creditworthiness before issuing, trading and settling traditional debt instruments directly, reducing friction and increasing transparency. The unbanked and entrepreneurs everywhere could access loans from peers.

#### **Exchanging Value**

Market-making will change profoundly as financial assets move from a paper-based format to a native digital format based on blockchain. Settlement times on transactions can be reduced from days or weeks to minutes or seconds. This is a huge opportunity for incumbents to reduce cost, but it also poses risks.

#### **Venture capital, IPOs and Project Finance**

The halcyon days of entrepreneurship may be upon us. Ethereum, a blockchain platform supported by Microsoft, Manulife, Deloitte and others, got its start as a “blockchain IPO” – issuing native tokens for bitcoins.

No need for bankers, lawyers, auditors and stock exchanges. Today, it's worth \$1-billion (U.S.). Blockchain also automates the matchmaking, enabling more efficient, transparent, secure models for peer-to-peer financing, recording dividends and paying coupons.

### **Insurance and risk management**

The Insurance industry sells an intangible asset – the promise to pay. It's a promise to pay in the event of some problem or another. To deliver this promise to pay, a vast network of claims managers, clerks, underwriters, actuaries, adjusters, brokers, agents, lawyers, and accountants conduct an orchestra of professional relationships. In short, these relationships establish the trust needed to deliver on the promise to pay. Blockchains are about trust and entrepreneurs are already presenting new and interesting digital relationships, platforms and markets that are helping to deliver this promise to pay.

Using reputation systems based on a person's economic and social capital, insurers will be able to make better-informed decisions, which explains why Manulife just announced a flagship agreement with blockchain developer Consensus Systems. The over-the-counter derivatives market, with a notional value of \$600-trillion, is paper-based and opaque and relies too heavily on centralized clearinghouses. Moving all derivatives to blockchain would reduce counterparty and systemic risk in the financial system.

### **Accounting**

Traditional accounting practices are not keeping pace with the velocity and complexity of modern finance. The blockchain's distributed ledger will make auditing transparent through time-stamped third entries on a blockchain, enabling regulators to more easily scrutinize financial actions within a corporation in real time. Deloitte, PWC and others are investigating these "triple-entry" accounting schemes for their audit practices.

This is not the death knell for financial services or a new platform for reinvention. For sure, blockchain will create winners and losers. Banks can thrive if they can steer clear of the innovator's dilemma and disrupt from within. Organizations like R3 are prototyping applications. What's also needed is an in depth investigation of strategic opportunities.

## ***Appendix 2: Potential Showstoppers***

*Abridged from Blockchain Revolution: How the Technology Behind Bitcoin is changing Money, business and the World.*

**1. "The technology is not ready for prime time."** For example, it is said that if everyone rushed to get bitcoin, the blockchain would become unstable: its infrastructure lacks the transactional capacity to on-board millions of people. Many interfaces are user-*unfriendly*, requiring a high tolerance for alphanumeric code, and users lack legal recourse because the law has yet to rule on the irrevocability of transactions and smart contracts.

**2. "The energy consumed is unsustainable."** The proof-of-work method used to secure the bitcoin network involves hashing, the process of running pending transactions through a secure hash algorithm (SHA-256) to

create a hash (a digital digest) that solves a puzzle. But hashing burns a lot of electricity, and the trend is toward more hashing.

**3. “Governments will stifle it.”** Where governments have beheaded centrally controlled networks like Napster, pure peer-to-peer networks like Tor have persisted. Will the bitcoin blockchain network hold its own against mighty central authorities? There must be a stable approach to regulation, legislation, and negotiation of treaties to minimize uncertainty, so that investors will continue to support development.

**4. “Powerful incumbents will usurp it.”** Corporations captured and are using the Internet in their private empires to extract most of its value. Will incumbents defend their territory, lobbying so that onerous regulations apply to small start-ups and suing any start-up that survives the regulatory inquisition?

**5. “Incentives are inadequate for distributed mass collaboration.”** Bitcoin miners have an incentive to secure the bitcoin network because, if it failed, all the unconverted bitcoin earned by mining would be at risk. So any design change must set appropriate incentives to maintain miner decentralization. But is that possible? The number of new bitcoins that miners can earn halves every four years. What will happen when the reward drops to zero?

**6. “Blockchain is a job killer.”** A global platform that drops the cost of participating and establishing trust could attract more participants—not only enabling entrepreneurs to raise capital, rent assets, and create jobs in poor communities but also improving the delivery of aid and reducing corruption, a precondition for jobs.

**7. “Governing the protocols is like herding cats.”** Unlike the Internet, the blockchain community lacks formal oversight bodies to anticipate needs and guide their resolution. Community members prefer it that way but cannot agree on a way forward. If we don’t address governance, then the movement could collapse on itself as it disintegrates into warring factions.

**8. “Distributed autonomous agents will form Skynet.”** According to researchers in artificial intelligence, we are years, not decades, away from autonomous offensive weapons and militarized drones. How should society govern them? We recommend that app developers identify any significant public impact—good, bad, or neutral—and alter source code and designs accordingly.

**9. “Big Brother is (still) watching you.”** While blockchains ensure a degree of anonymity, they provide a degree of openness. Corporations and countries known for spying will likely redouble their efforts because value is involved. Imagine a big bull’s-eye on top of the Internet. The good news is that shenanigans are transparent on the blockchain.

**10. “Criminals will use it.”** There is nothing unique to blockchain technology that makes it more effective for criminals than other technologies. Authorities in general believe that digital currencies could help law enforcement to fight cybercrime by providing a record of suspicious activities.

In balance, the arc of technological history has been a positive one. Consider the many advances in medicine, from R&D to treatment and prevention: technology has made for greater human equity, productive capability, and social progress. Leaders of this new distributed paradigm must stake their claim and initiate a wave of economic and institutional innovation so that everyone has an opportunity. This time, let’s fulfill the promise.

<sup>1</sup> Ibid.

<sup>2</sup> “Prosumers” is a term invented by Alvin Toffler in Future Shock (1980). In The Digital Economy (1994) Don Tapscott developed the concept and notion of “prosumption.”