ALBERTA ADVISORY
ASSURED EXECUTION

Research Paper

A CEO's Crash Course On Blockchain

www.alberta-advisory.com

Are You prepared for the world's Universal currency and peer-to-peer Commerce With No Mediators?

The side gutsy question sums up what many Chief Executive Officers (CEO) and Chief Information Officers (CIO) are bombarded with by Product Managers, Industry Pundits, Technology Enthusiasts, Strategists and Futurists when trying to understand the phenomena often referred to as "BitCoin", "Blockchain" or "Distributed Ledgers".

CEOs and CIOs are hailed to envisage a new world where transactions (e.g. commercial, government, civil, digital currency similar to BitCoin) can be executed among various parties on a peer-to-peer – *often anonymous* - basis in a secured, tamper-proof manner without the need for a centralized authority (e.g. central exchange, central registrar). The technology platform / concepts used to realize this new world is called Blockchain, while a famous application of that technology in the field of digital currencies is called BitCoin.

This research paper aims to equip CEOs with a brief, well-rounded understanding of Blockchain and a decision making tool to help guide the company's future Blockchain technology investments.

To achieve that, we attempt to impersonate a CEO's mindset in terms of- level of technical expertise and business priorities. Specifically, we surmise that a CEO is focused on 3 priorities; *Profit*, *Growth* and *Sustainability*. A CEO strives to deliver a healthy return on capital for shareholders, by expanding the company's products, customer base and markets, while carefully observing and managing the risks associated with markets, the environment, competitors, suppliers, customers and internal operations.

Catalyzed by the aforementioned mindset, we address four (4) key questions-

1. What is Blockchain all about (components and benefits)?
2. Where does the Blockchain market stand today?
3. How would Blockchain impact by business?
4. Shall I plunge in?

Question 1 – What Blockchain Is All About?

A ledger that is maintained by many parties In A Unique Way That ensures Accurancy, Secrecey and Non-Repudiation

Distributed Ledgers (DLs) or Blockchain refers to a technology concept that allows information to be securely stored and updated in multiple places (possibly geographically and organizationally dispersed) by multiple parties connected over a network. Hence, an organization procurement contract, sales invoice or payment instructions need not only be stored and managed in a centralized "Enterprise Resource Planning – ERP" or a "Core Banking System", but can be easily initiated and stored by any participant on the network. These participants could be suppliers, manufacturers, clearing agents, insurers, banks, customers or logistics companies. All participants have up-to-date records of the transaction executed and can consequently vet the transaction's source and accuracy without relying on a single, centralized source of information. Be aware, that Blockchain generally complements – *not supplants* - existing corporate systems.

This is the point where you need to muffle your curiosity a bit and defer your questions of "*So What?*, "*What's in it for me?*", etc. We already pledged to address these questions later on.

Simply put, Blockchain – *as a technology concept with many software implementations* – typically has 3 components-

Participants holding the distributed ledgers. Each ledger held by a participant is an exact copy of the other ledgers and is tamper-proof. If tampered, the other participants will restore the tampered ledger to its original status.

Encryption & Consensus Mechanisms ensure that data is promptly (through time stamps) and securely (through encryption) transmitted to all participants who then collectively validate (*by voting and achieving consensus*) the data for accuracy and completeness. The mechanism also recovers any participant who was subject to failure or vandalism.

Network a communication infrastructure to exchange the information. The network could be a private network set-up by

the company, or simply the Internet.

Figures 1,2 and 3 below provide examples of how Blockchain is used in everyday commerce transactions.

Figure 1: The 3 Components Of A Blockchain In A Sample Commerce Transaction

A customer buys a car and undergoes the processes of auto loans, auto insurance, title registration and delivery. Using Blockchain, all participants instantly receive the same "Car Purchase Contract" information and automatically activate their related procedures based on the terms agreed in the contract and subsequent events (i.e. Smart Contract)

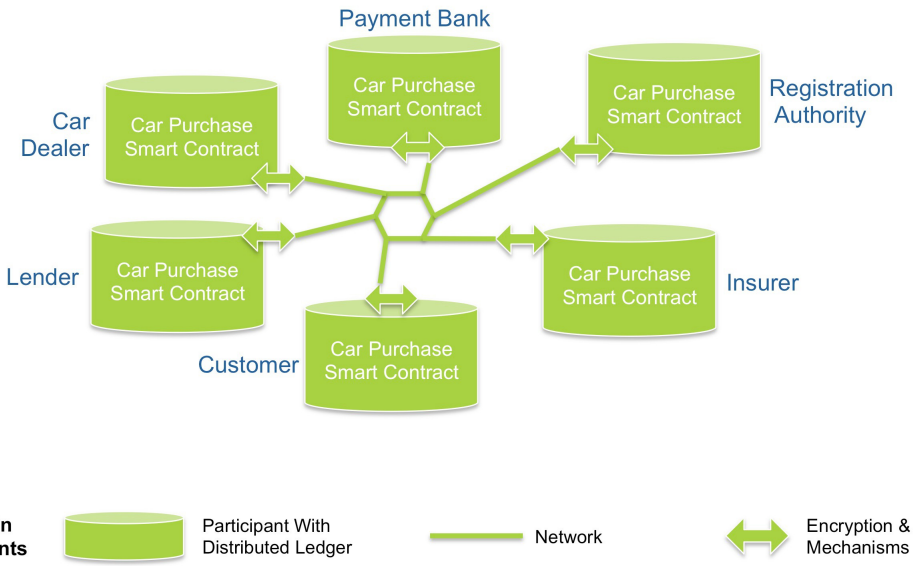


Figure 2: Blockchain As A Digital Currency (BitCoin) Issued & Traded Over The Internet

A private or public authority issues digital currency in the form of encrypted, digital tokens (e.g. BitCoin) maintained by a distributed ledger of Blockchain technology. Various parties (e.g. consumers, merchants) subscribe either directly or indirectly to this distributed ledger to buy, sell and transact the digital currency. Each transaction is vetted, communicated and stored by all nodes within the Digital Currency's Distributed Ledger to ensure no duplicate purchases and proper ownership records.

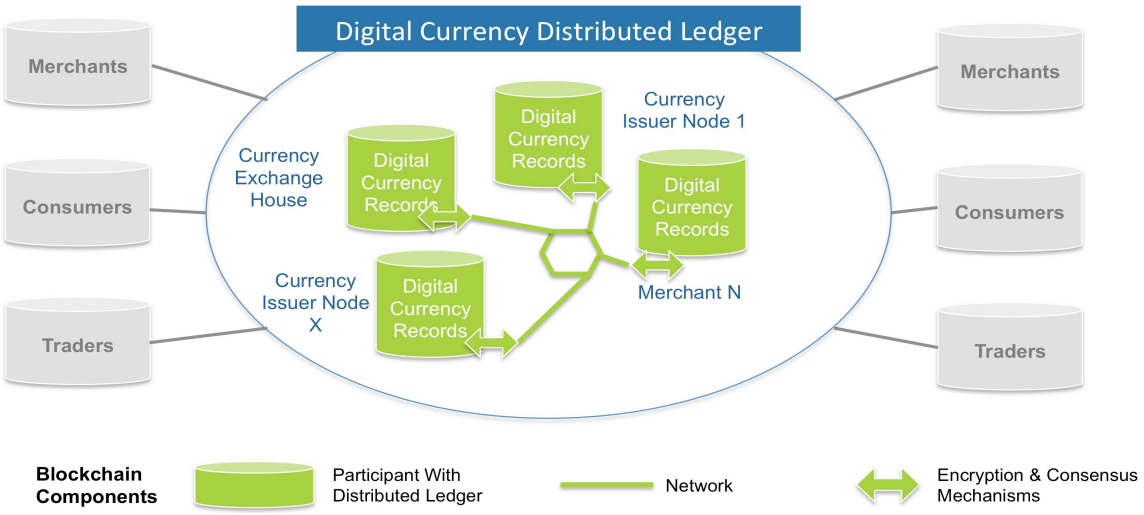
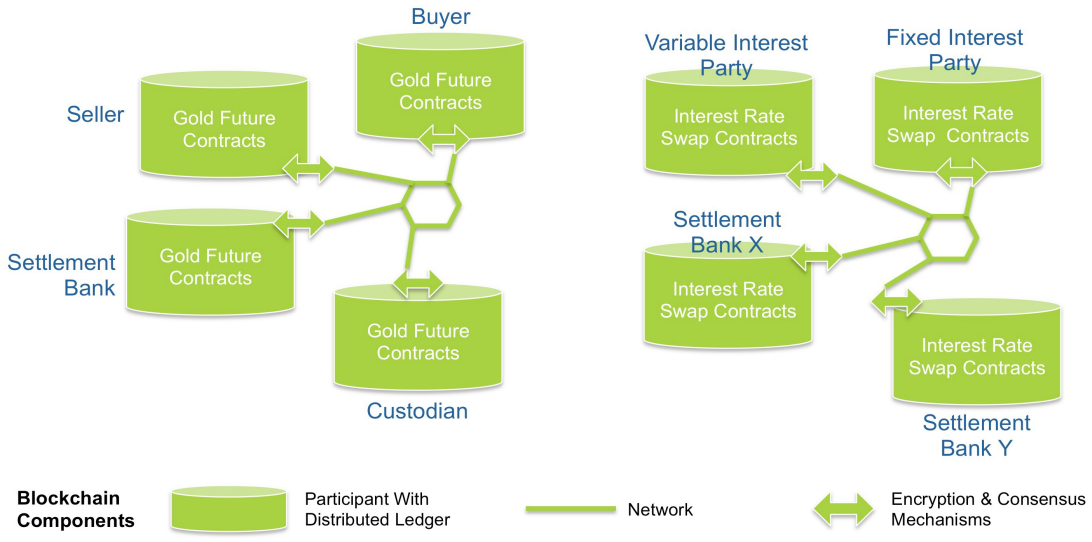


Figure 3: Blockchain As Smart Contracts To Facilitate Trading Of Complex Assets

A contract to trade various types of assets (e.g. Gold versus Cash, Oil Versus Cash, Interest Rate Swap) typically specify the terms (e.g. corporate credit rating) and events (e.g. settlement date, price fixing date) of a transaction. The Terms and Events are recorded in a distributed ledger using the Blockchain technology. Participants (i.e. nodes) of the distributed ledger can validate the agreed contracts, while executing the various terms at the designated events.



Using Blockchain in the above examples delivers key benefits to the participants, including:

- *Resiliency*; there is no single point of failure as all participants hold the same information and can recover such information in case of any of the participants failed.
- *Enhanced Protection*; an attack or vandalism of a participant's system does not cause an instant and permanent loss of data.
- *Efficiency*; participants need not design and deploy customized processes for data reconciliation, back-up and recovery.

Applying the "**CEO Perspective**", organization profitability may be improved due to cost reduction due to efficiencies. Also, organization sustainability is likely to benefit, as the resiliency and enhanced protection mitigate operational risks.

Question 2 - Where Does The Blockchain Market Stand Today?

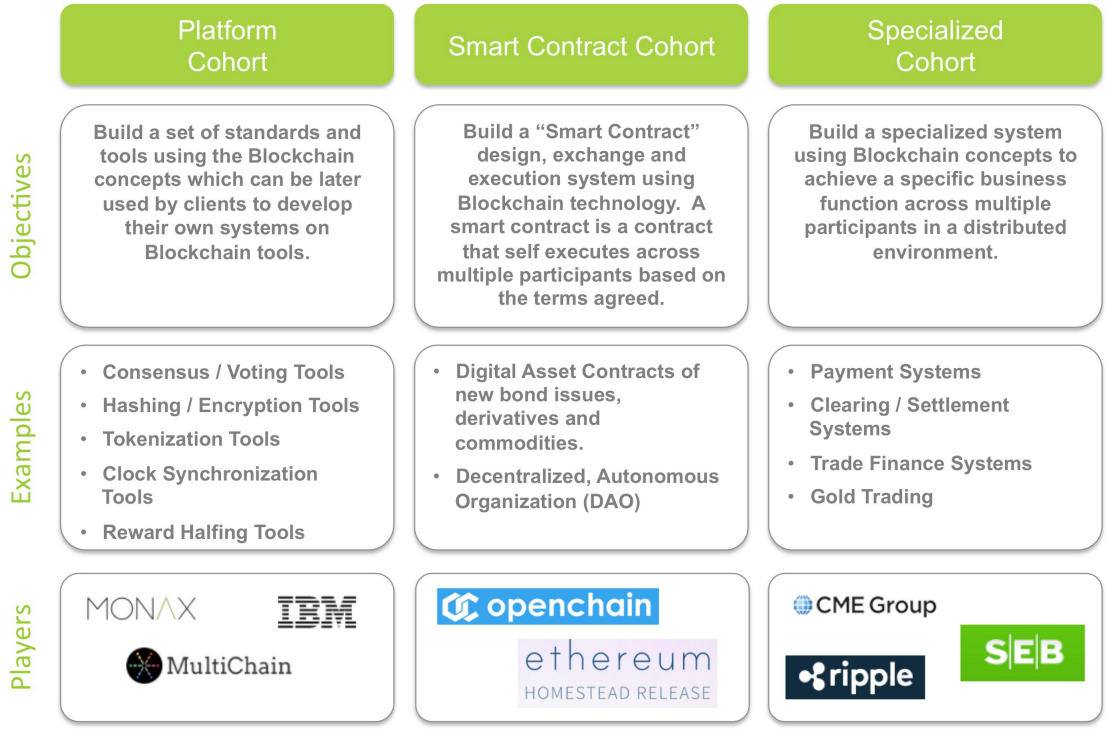
Blockchain is currently at infancy stage and needs at least 5 years to hit mainstream

Source: Mckinsey & Company / Gartner

Poring over scores of news, research and industry articles reveal one solid fact that is "*Blockchain is currently at Infancy stage*". Many banks, technology firms and consortia are trying to evolve the technology concept and the many open source implementations into a robust technology solution to fulfill a specific business need with a tangible return on investment.

The runners in this race can be pragmatically categorized into three (3) groups as shown in Figure 4 below. The categorization is based on the degree of specialization of the developed solutions. They range from Generic Platforms, through Smart Contract / Digital Asset Solution to Specialized Business Function systems.

Figure 4: Three Visible Cohorts Racing Into Blockchain Development



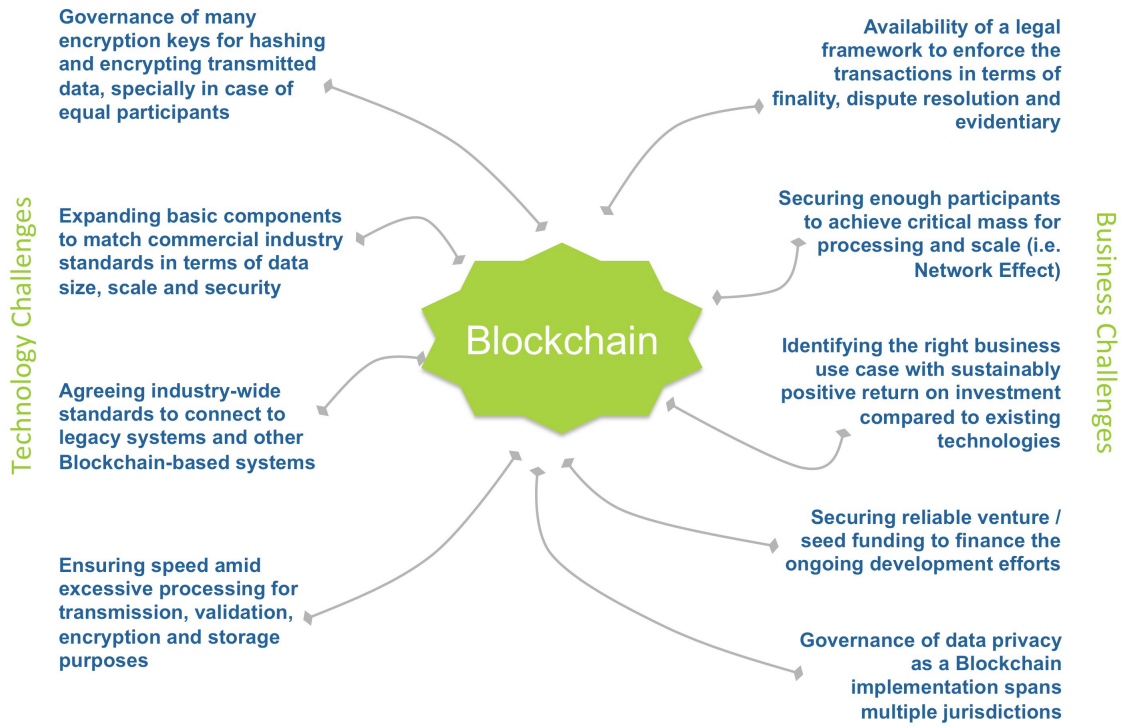
Two (2) common traits emerge among all cohorts of Blockchain racerunners. These are:

- Thirst for venture / seed capital to finance the expansion of existing Blockchain open source technology platforms into commercial solutions.

- Fervent desire to try and test the commercial solutions into the real market to gauge the market pulse for business priorities, adoption barriers and adoption rates.

The early successful pilots are spotted in the financial services industry in the areas of- gold trading (e.g. EuroClear Bankchain) and payment processing (e.g. Singapore Central Bank). These pilots also revealed a slew of challenges as depicted in Figure 5 overleaf.

Figure 5: Common Challenges Of Blockchain Pilot Implementation



Applying the "**CEO Perspective**", Blockchain – as it stands today – is another Research & Development (R&D) expense that is unlikely to improve a company's profitability and sustainability in a 2-3 year horizon. Rather, it's a test bed to exploit future cost optimization in the areas of- transaction validation, record keeping and reconciliation.

Question 3 – How Would Blockchain Impact My Business?

Blockchain Is already a USD 1 Billion Industry
Source: www.businessinsider.com

Before we embark on sketching the future of blockchain, we should warrant that any depiction of the future at this stage is purely speculative and is based on the emergence of blockchain systems effectively surmounting the business and technology challenges depicted in Figure 5 above.

Withstanding the above safe harbor clause, early market indicators reveal three (3) possible areas of impact-

- Optimization of industry intermediaries whose role is limited to authenticating parties, validating transactions, reconciling trades and centralized reporting. Such services can be provided by the Blockchain community participants on a peer-to-peer basis without the need of a centralized authority. This *might* span a wide spectrum of government services (e.g. title deed registration, licensing, identity validation, attestation, disclosure reporting), banking services (e.g. payments, custody, trade finance) and raw material trading.

- Optimization of data administration backup, recovery and reconciliation processes in case of transactions spanning multiple counterparties and multiple jurisdictions. This *might* render some dedicated disaster/recovery centers and data backup cabinets/stores to be obsolete.

- Expansion of commerce into new counterparties and jurisdictions adopting Blockchain as a global value system for trading. This *might* abate the demand over commercial brokerage, legal counseling and document handling as smart contracts provide uniform terms and automated/autonomous execution mechanisms across multiple jurisdictions, assets and counterparties.

Applying the "**CEO Perspective**", Blockchain will threaten any revenues generated from information mediation services offered by the organization. Conversely, it can expand an organization's customer base, suppliers network and geographical reach if the organization is able to effectively adopt the concept of smart contracts to trade its products and services on a global scale.

Question 4 – Shall I Plunge in?

Check your Business Risk Appetite And R&D budget Before Taking The Plunge Into Blockchain

Considering the information presented earlier, this is a question best answered today by conjuring the Internet spirits, looking at crystal balls and consulting with trust worthy seers!

Yet, we advise CEOs to follow three (3) steps when pondering a Blockchain initiative-

- Set-up a cross-functional team of all business, control and support functions to look at the various aspects of the initiative. Technology is merely one cog in the Blockchain machine.
- Analyze the return on investment data collected from failed and successful pilots in the industry, some of which are quoted in this research paper.
- Adopt the simple "Decision Making Check List" included in Figure 6 below.

Figure 6: Should A CEO Plunge Into Blockchain?

		No (0)	Maybe (1)	Yes (2)
1	Is any of my major services threatened by Blockchain?			
2	Is any of my major markets threatened by Blockchain?			
3	Is Blockchain The Only Technology Available To Realize Our Goals?			
4	Can Our R&D Support The Blockchain Seed Capital?			
5	Can Our Risk Appetite Accommodate Blockchain Challenges?			
6	Can We Wait For 5 Years To Recover Our Blockchain Seed Capital?			
				Score:

0 – 5	Do NOT Invest
5 – 8	Explore With Minimal Investment
> 8	Plunge In

End Of Report