INTRODUCTION TO BLOCKCHAIN





JANUARY 17, 2018



Preface

Blockchain is a new type of technology that enables a shared, distributed database of transactions among parties that is designed to increase transparency, security, and efficiency. The use of distributed and decentralized public and private ledgers has the potential to replace the need for a central authority or middleman to transfer and record value. Computer code and cryptography are much safer conduits for the facilitation of transactions than middlemen. This foundational shift in the way the economy operates has the potential to transform economic, financial, and political institutions.

Blockchain technology solves a unique set of challenges in the economy, facilitating trust between two or more parties to support transactions. For instance, the root problem with conventional currency is all the trust that's required to make it work. The central bank must be trusted not to debase the currency, but the history of fiat currencies is full of breaches of that trust. Banks must be trusted to hold our money and transfer it electronically, but they lend it out in waves of credit bubbles with barely a fraction in reserve.¹

More concerning, this issue of trust (and breach of trust) is pervasive and is not limited to currency. Middlemen and trust play a central role in many areas of society, including real estate transactions, contract execution, and other aspects of the economy. Where there is trust, there is room for human error or outright fraud. Blockchain solves this problem and democratizes how we exchange value by providing "Trust-as-a-Service" via the distributed ledger technology.

Although there is a lot of hype and many speculate a bubble has formed in the blockchain market, the technology is fundamentally new and has the potential to be disruptive. Likely keys to success include ecosystem architecture, use case feasibility, and collaboration with public and private incumbents.

This presentation provides a high level overview on blockchain and venture capital investments in the sector. It is unclear which projects and what sectors will support sustainable business models perpetuated by real world use cases. Certainly, many (likely most) blockchain projects will fail. However, it is expected that over the next 5 to 10 years, several blockchain projects will gain meaningful market adoption and generate significant long term value.

1 <u>Satoshi Nakamoto 2009.</u>



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Let's Talk Blockchain

Block.chain

noun: **blockchain**; plural noun: **blockchains**; noun: **block-chain**; plural noun: block-chains

Refers to a type of data structure that enables identifying and tracking transactions digitally and sharing this information across a distributed and decentralized network of computers, creating in a sense a distributed trust network. The distributed ledger technology offered by blockchain provides a transparent and secure means for tracking the ownership and transfer of assets.

compliance transparent

- expedite and verify transactions

(via Webopedia)



• Transactions are immutable, making auditing and future government

• The point of blockchain is to decentralize markets, processes, and records so that transactions are independent of externalities

• Blocks of information are approved by users in a matter of seconds to

Learn the Lingo...

- Initial Coin Offering (ICO) Means of crowd funding centered around crypto currency, which can be a source of capital for blockchain projects. In an ICO, some quantity of the crowd funded cryptocurrency is preallocated to investors in the form of "tokens" in exchange for legal tender or other crypto currencies such as Bitcoin or Ethereum. The tokens become functional units of currency if or when the ICO's funding goal is met and the project launches.
- Fiat Currency Currency that a government has declared to be legal tender, but is not backed by a physical commodity. It has an assigned value because of government regulation or because the exchanging parties agree to its value.
- Governance Mechanism Process of decision making within blockchain protocol that defines how rules are created, changed, agreed upon and implemented.

- of middlemen.
- minutes.



• Decentralization in blockchain - Blockchains are politically decentralized (no single entity controls them) and architecturally decentralized (no infrastructural central point of failure) but they are logically centralized (there is a commonly agreed state and the system behaves like a single computer). This enables the transfer and recoding of value without the need

• Distributed Ledger - Database that is consensually shared and synchronized across a network spread across multiple sites, institutions or geographies. It allows transactions to have public "witnesses" thereby making a cyberattack more difficult. The participant at each node of the network can access the recordings shared across that network and can own an identical copy of it. Further, any changes or additions made to the ledger are reflected and copied to all participants in a matter of seconds or

How It Works







cryptocurrency

Has no intrinsic value in that is not redeemable for another commodity such as gold.

Has no physical form and exists only in the network.

Its supply is not determined by a central bank and the network is completely decentralized.

Why Use Blockchain?

Transactions are currently inefficient

- Participants use their own separate ledger, increasing the possibility of human error or fraud
- Reliance on intermediaries for validation creates inefficiencies
- This paper-laden process results in frequent delays and potential losses for all stakeholders

Blockchain makes them efficient

- The blockchain enables near real time settlement of transactions
- Cryptographic proof allows any 2 parties to transact directly
- The peer-to-peer distributed network records a history and source of proof of all transaction details automatically
- Risk of double spending, abuse, and transaction manipulation is mitigated
- Reduces paper processes, speeding up transaction times



Categories

Cryptocurrency

The transfer of value has always been an expensive and slow process. This is particularly true for cross-border payments. The blockchain is able to speed up and simplify this process and also reduces the costs significantly.

- DELOITTE

VIEW SOURCE

Utility Tokens

 BAT token functions as a medium exchange between users, advertisers, and publishers who participate in the Brave browser ecosystem. Advertisers purchase ads using BAT tokens, which are then distributed among both publishers and browser users as compensation for hosting the ads and viewing them, respectively.

-STRATEGIC COIN

VIEW SOURCE



Smart Contracts

One of the most promising applications of blockchain technology is the smart contract. It can execute commercial transactions and agreements automatically. It also enforces the obligations of all parties in a contract – without the added expense of a middleman.

- DELOITTE

VIEW SOURCE

Intro to Cryptocurrency

A DIGITAL CURRENCY IN WHICH ENCRYPTION TECHNIQUES ARE USED TO REGULATE THE GENERATION OF UNITS OF CURRENCY AND VERIFY THE TRANSFER OF FUNDS, OPERATING INDEPENDENTLY OF A CENTRAL BANK

- In direct competition with traditional fiat currencies such as the USD, EURO, FRANC, and others.
- The market cap for all currencies is nearly 90 trillion dollars. The market cap of cryptocurrencies recently obtained a market cap of \$700 billion in 2018.
- Infrastructure and payments are the two largest markets in blockchain.

Chart of the Week





Intro to Utility Tokens

CRYPTOASSETS THAT REPRESENT FUTURE ACCESS TO A PRODUCT OR SERVICE

- The status of a utility token largely impacts it's capabilities:
 - Private- Invite only, used to interact on that specific platform
 - Public- Used for platform interaction but tradeable on exchanges and open to the public
- Due to the need for communal concurrence on a lot of platforms, utility tokens are typically able to out maneuver the competition on a private blockchain
- Companies may go from private to public, typically falling in-line with releasing voting rights to token holders
- Many utility tokens often improve throughout the product life cycle as community contributors add on to the project, integrate, and update.



1. PUT: Clients send information about the file, storage duration, and a small amount of filecoin to the Storage Market as a bid. Simultaneously, Miners submit asks, competing to offer low cost storage. Deals are made in the Storage Market, on the blockchain.





Intro to Smart Contracts

COMPUTER PROTOCOL INTENDED TO DIGITALLY FACILITATE, VERIFY, OR ENFORCE THE NEGOTIATION OR PERFORMANCE OF A CONTRACT

- Pre-written logic (computer code)
- Stored and replicated on a distributed and decentralized storage platform
- Executed/run by a network of computers, typically the same ones running the blockchain
- Can result in ledger updates such as cryptocurrency payments and more



An option contact between parties is written as code into the blockchain. The individuals involved are anonymous, but the contact is the public ledger.

Source: BlockGeeks





A triggering event like an expiration date and strike price is hit and the contract executes itself according to the coded terms. Regulators can use the blockchain to understand the activity in the market while maintaining the privacy of individual actors' positions

Real-world Applications and Benefits

- Building trust between counterparties in the Sharing Economy: P2P lodging sites like Airbnb have already begun to transform the lodging industry by making a public market in private housing. We believe blockchain could help accelerate the adoption of P2P lodging and generate \$3 - \$9 billion in incremental revenue opportunity through 2020.
- Transforming the US electricity industry by enabling distributed markets: • We think blockchain could be used to facilitate secure transactions of power between individuals on a distributed network who do not have an existing relationship — a **\$2.5 - \$7 billion annual opportunity**.
- Reducing transaction costs in underwriting title insurance: Blockchain could reduce title insurance premiums and generate **\$2 - \$4 billion** in cost savings in the US.

- **\$11 \$12 billion in fees**

• Improving efficiency in anti-money laundering (AML) and "know your customer" (KYC) compliance: Storing account and payment information in a blockchain could standardize the data required for an account, thereby improving data quality and reducing the number of falsely identified "suspicious" transactions. A tamper-proof record could also ease the process of getting to know a client and demonstrating compliance with AML regulations – generating **\$3 - \$5 billion in cost savings**.

VIEW SOURCE



• Streamlining clearing and settlement of cash securities: By applying blockchain to the clearing and settlement of cash securities – specifically, equities, repo, and leveraged loans – we estimate the industry could save



Regulation & Compliance

SEC Investigation:

The investigation raised questions regarding the application of the U.S. federal securities laws to the offer and sale of DAO Tokens, including the threshold question whether DAO Tokens are securities. **Based on the investigation**, **and under the facts presented, the Commission has determined that DAO Tokens are securities** under the Securities Act of 1933 ("Securities Act") and the Securities Exchange Act of 1934 ("Exchange Act"). The Commission deems it appropriate and in the public interest to issue this report of investigation ("Report") pursuant to. This Report does not analyze the question whether The DAO was an "investment company," as defined under Section 3(a) of the Investment Company Act of 1940 ("Investment Company Act"), in part, because The DAO never commenced its business operations funding projects. Those who would use virtual organizations should consider their obligations under the Investment Company Act. 2 Section 21(a) of the Exchange Act to advise those who would use a Decentralized Autonomous Organization ("DAO Entity"), or other distributed ledger or blockchain-enabled means for capital raising, to take appropriate steps to ensure compliance with the U.S. federal securities laws. All securities offered and sold in the United States must be registered with the Commission or must qualify for an exemption from the registration requirements. In addition, any entity or person engaging in the activities of an exchange must register as a national securities exchange or operate pursuant to an exemption from such registration. RELEASE NO. 81207 // JULY 25, 2017

VIEW SOURCE



Post-Investigation

Outcome

Specifically, the DAO platform was deemed a security under federal law. However the CFTC has designated Bitcoin as a commodity. Ambiguity remains as to the methodology for classifying tokens as securities or commodities.

Ongoing Focus

Regulators are monitoring activity in the ICO market and may take enforcement action against violators of securities laws.

Ongoing Concern

What is a security? What is subjectNew laws not anticipated in the US.to US securities laws?Internal expectation that regulatorswill enforce existing securities laws.

* OPINION FROM UNNAMED ACCOUNTING EMPLOYEE WITH THE SECURITIES AND EXCHANGE COMMISSION



Future Regulation

Investment Approaches

Speculation / Trading of Crypto Assets

- Conventional Buy and Hold of Crypto Assets
- Participation in Initial Coin Offerings (ICOs)
- Hedge Funds
- Exchange-Traded Fund (ETF)

Public Equities / Adjacent Markets

- Rising popularity in Blockchain will increase demand for higher powered Graphic Processing Units (GPUs) as companies seek to optimize mining process
 - Companies like NVIDA have seen recent exponential growth as a byproduct of blockchain
- As blockchain removes the necessity of a middleman in currency transactions, companies like Western Union may face challenges in adjusting to the technology



Direct Private Investments

- VC and angel direct investment in blockchain technology companies is accelerating
- Accredited investors seeking to fund companies are investing in venture fund vehicles to gain access to deal flow

Investment History







Largest ICOs





GNOSIS

\$312 million raised



TEZOS \$230 million raised

Active VCs in the Space

Bitcoin & Blockchain Most Active Investors

INVESTORS RANKED BY UNIQUE BITCOIN AND BLOCKCHAIN INVESTMENTS 2012-2017 YTD

RANK	INVESTOR	SELECT COMPANIES
1	DIGITAL CURRENCY GROUP	Circle Coinbase Blockstream
2	BLOCKCHAIN	Circle Coinbase Blockstream
3	Sociates	BitPesa Wyre Funderbeam
4	PANŦERA	Circle ChangeTip Korbit
5	RRE Ventures	Gem Abra Case Wallet



VIEW SOURCE

Corporate Investments



Most active corporate blockchain investors 2012 2017 YID (10/03/2017)

Investor	Rank	Select Con	npanies				
		Orb	83	Rippie	Kraken	Colleptug	Veem
SBI Holdings	1	orb	rz.	🔩 ripple	кгакеп	coinplug	veem
		Storj Labs	Blockchain	Ripple	LedgerX	Buttercoin	Veem
Google	2	STOR 2.10	🔶 BLOCKCHAIN	🔩 ripple	dledgerX	\$	veem
		Settlemint	Factor	Ripio	Symbiont	Bitt	Peernova
overstock.com	J	\$	FACTOM	ripio	symbiont	bitt	PEERNOVA
		Digital Asset	R3	Axoni	Cohali	Chain	
cîtî	4	Digital Asset Holdings	rz.	X axoni	Cobalt 😳	ල Chain	
		liigital Asset	83	Axoni	Orele		
Goldman Sachs	5	Digital Asset Holdings	r3.	X axoni	🔘 CIRCLE		
Note: Coldman Sachs has left 183							6





Blockchain Market Map







Bancor







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Decentraland

-THE DOI

ESPORTS



DREAMTEAM compound @JOSH_NUSSBAUM

ICO Disrupting Traditional Funding Model

IN THE FISCAL YEAR OF 2016-2017, THE AMOUNT OF CAPITAL RAISED THROUGH ICO'S NEARLY TRIPLES VC INVESTMENTS IN THE BLOCKCHAIN SPACE. THIS NUMBER IS INDICATIVE OF THE AMOUNT OF PRE-PRODUCT LAUNCHES OCCURING DUE TO FASE OF FUNDRALSING THROUGH ICOs.





SWOT

Strengths

- Digital decentralized and distributed ledger (eliminates middlemen in the transfer and record of value)
- Immutable (unchangeable, resistant to manipulation)
- Open source (technology can be used / further developed)
- Real time access of global network (removes friction and increases liquidity)

Weaknesses

- Useful applications not yet proven
- Nascent adoption and high complexity (institutions and the public lack understanding of the technology and how to use applications)
- Customer unfamiliarity and poor user experience
- Skills scarcity and cost
- Lack of intraledger and interleger governance

Opportunities

- Avoidance of intermediaries (unlocks value that is lost to inefficiency and lack of trust)
- Fundraising (token sales disrupt traditional financing models)
- Value creation (potential for large return on investment)
- Foundational technology (potential to disrupt many market segments)



Threats

- Regulation (ambiguity in policy and governments are struggling to respond to the market)
- Hubris (scope of possibilities overestimated)
- Hype (overvaluation of projects and potential for significant losses)
- Fraud (scams, 'pump and dump' schemes)
- Illicit activity (bad actors using blockchain technology to avoid law enforcement)

Point of View

Blockchain decentralizes the recording and settlement of consideration in transactions in a similar way to how TCP/IP decentralized communication infrastructure. With a similar pattern of adoption, it is expected that implementations of blockchain technology will succeed chronologically as follows:

- 1. Single use case applications
- 2. Localized networks built for single-use applications
- 3. Substitution of legacy applications
- 4. Transformation of systems that can reshape the nature of economic, financial, social, and even political systems

This evolution could take decades before transformational systems are successfully deployed and mature.

Source: Harvard Business Review

Given the novelty and nascent stage of the technology and market adoption, companies that will be successful in the near term will likely build protocol layer solutions or single use case networks. The SafeChain investment is an example of a belief in this investment thesis.

-CALVIN COOPER, NCT VENTURES



About Us

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About Safechain

SafeChain facilitates safer and more efficient real estate transactions. Through its network of public and private partnerships, SafeChain is working to incorporate the efficiencies of blockchain technology into land registry systems and the real estate process.

About NCT Ventures

Located in Columbus, Ohio, NCT is a Midwest focused venture capital firm that backs seed and early stage technology companies disrupting major industries. With over 20 years of entrepreneurial experience, we partner with innovators and bring hands-on operational support to help visionary entrepreneurs succeed.

Resources

- 1. CB Insights Blockchain Investing Report https://www.cbinsights.com/research/report/blockchain-trends-opportunities/
- Cryptoassets by Chris Burniske & Jack Tatar <u>https://www.amazon.com/Cryptoassets-Innovative-Investors-Bitcoin-Beyond/</u> <u>dp/1260026671</u>
- 3. Dictionary definition for blockchain <u>https://www.webopedia.com/TERM/B/blockchain.html</u>
- 4. Understand The Blockchain in Two Minutes– Institute for the Future https://www.youtube.com/watch?v=r43LhSUUGTQ
- 5. Bitcoin Whitepaper

https://bitcoin.org/bitcoin.pdf

6. Goldamn Sachs Profiles in Innovation: Blockchain, Putting Theory into Practice <u>https://www.scribd.com/doc/313839001/Profiles-in-Innovation-May-24-2016-1</u>

