



PROGRAM MATERIALS

Program #2917

February 5, 2019

Blockchain 201: Technical Concepts, Legal and Business Issues, Emerging Use Cases

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Blockchain 201: Technical Concepts, Legal and Business Issues, Emerging Use Cases

Blockchain Technology and Digital Currencies

Today's Agenda

1. Why Blockchain? Why Now?
2. Introduction to Blockchain
3. Bitcoin: The “Proof of Concept”
4. Legal and Accounting Issues
5. Blockchain for Litigators
6. Enterprise Applications
7. Vulnerabilities and Cybersecurity
8. Emerging Use Cases

Why Blockchain? Why Now?



Testing on the Rise Across Industries

DELOITTE SURVEY May 2018

Scalable, Disruptor and a Priority:

- **84% Agreed that blockchain is scalable** and will reach mainstream adoption.
- **59% Believe in blockchain's potential to disrupt** and revolutionize their industries.
- **43% say blockchain is a "top five strategic priority."**

Top Project Focus:

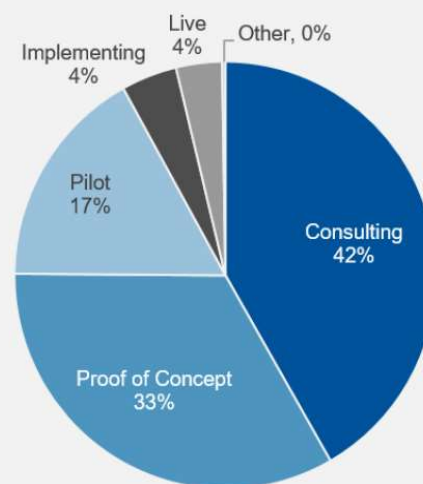
- Supply chain-focused systems: 53%
- Internet of Things integration: 51%
- Digital records: 40%
- Digital currency projects: 40%
- Payments applications: 30%

Participation in Consortia:

- **30% have already joined.**
- **45% likely to join** one within the next year.
- **13% to start consortium of their own.**

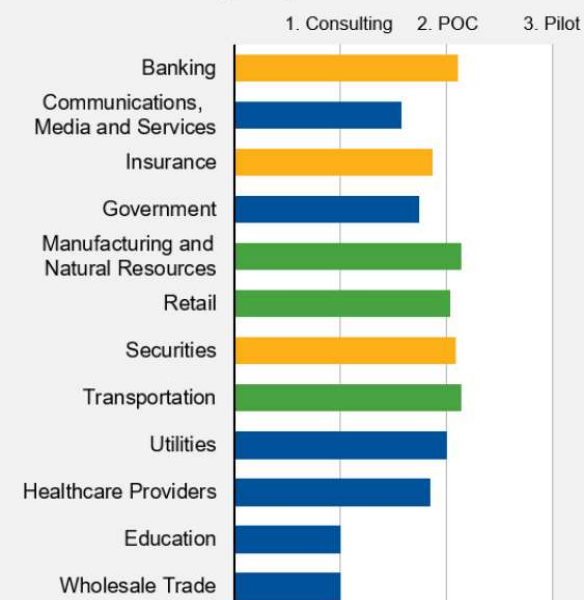
Average Process of Blockchain Engagements

Current Implementation Status



ID: 352760

Average Progress Score



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Blockchain Continues to Gain Attention

On **August 28, 2018**, both PwC and Deloitte published the results of their **global executive surveys on blockchain**. Highlights include the following:

- **84%** are actively involved with blockchain.
- **84%** believe blockchain will achieve mainstream adoption.
- **74%** see a compelling business case for blockchain.
- **69%** anticipate replacing current recordkeeping systems with blockchain.
- **68%** perceive a competitive disadvantage if they do not adopt blockchain.

<https://www.pwc.com/gx/en/issues/blockchain/blockchain-in-business.html>

<https://www2.deloitte.com/content/dam/Deloitte/us/Documents/financial-services/us-fsi-2018-global-blockchain-survey-report.pdf>

What is a Blockchain?

A blockchain is a cryptographically secured transaction network and ledger that is shared among and verified by all computer nodes participating in a distributed system.

Key characteristics of blockchain include ...

1

Distributed Network

Multiple independent computer nodes support the network and verify updates.

2

Cryptography

The integrity of information stored on a blockchain is secured by public-private key cryptography.

3

Immutability

Every transaction is linked to the previous transaction, making it (practically) impossible to alter network data.

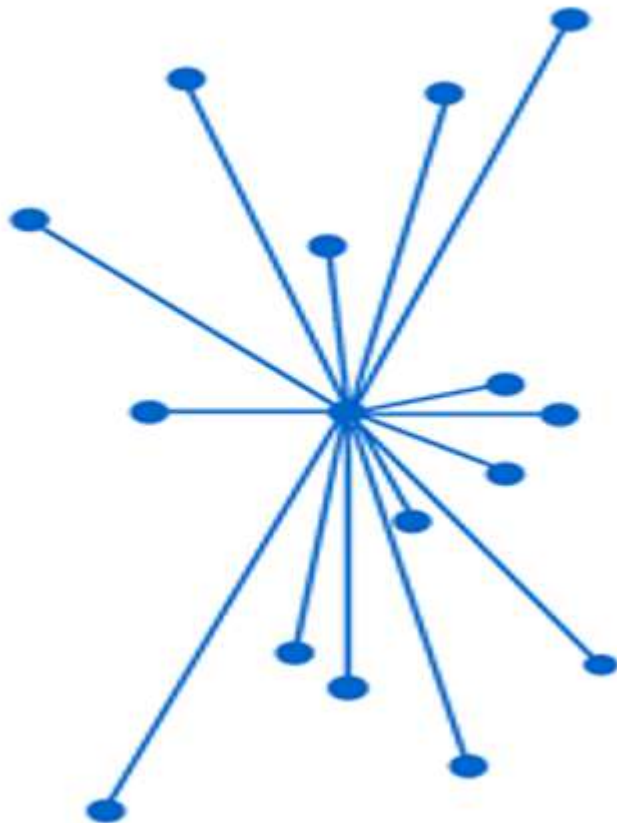
4

Disintermediation

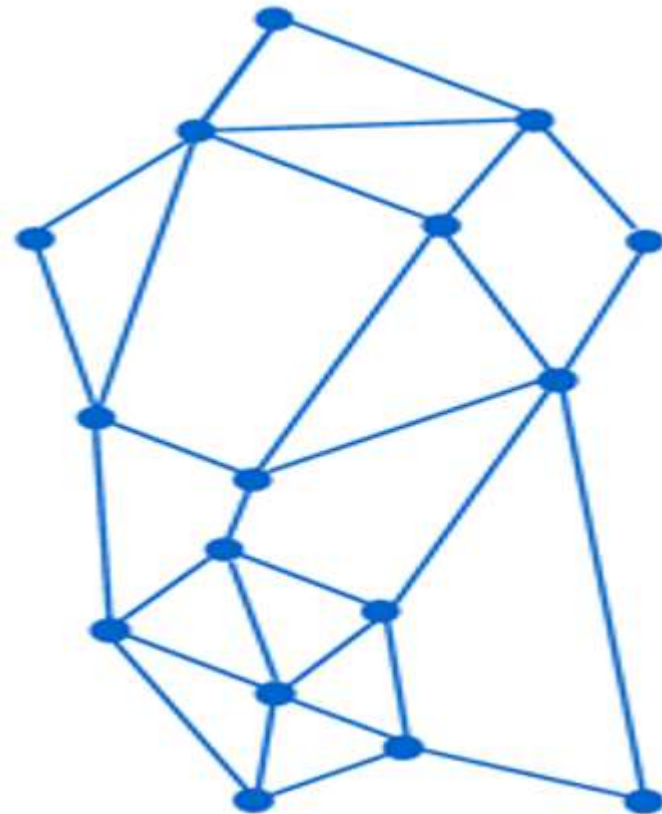
Characteristics 1-3 enable trusted peer-to-peer transactions, without using a central authority as intermediary.

① Distributed Network

Traditional Centralized Network

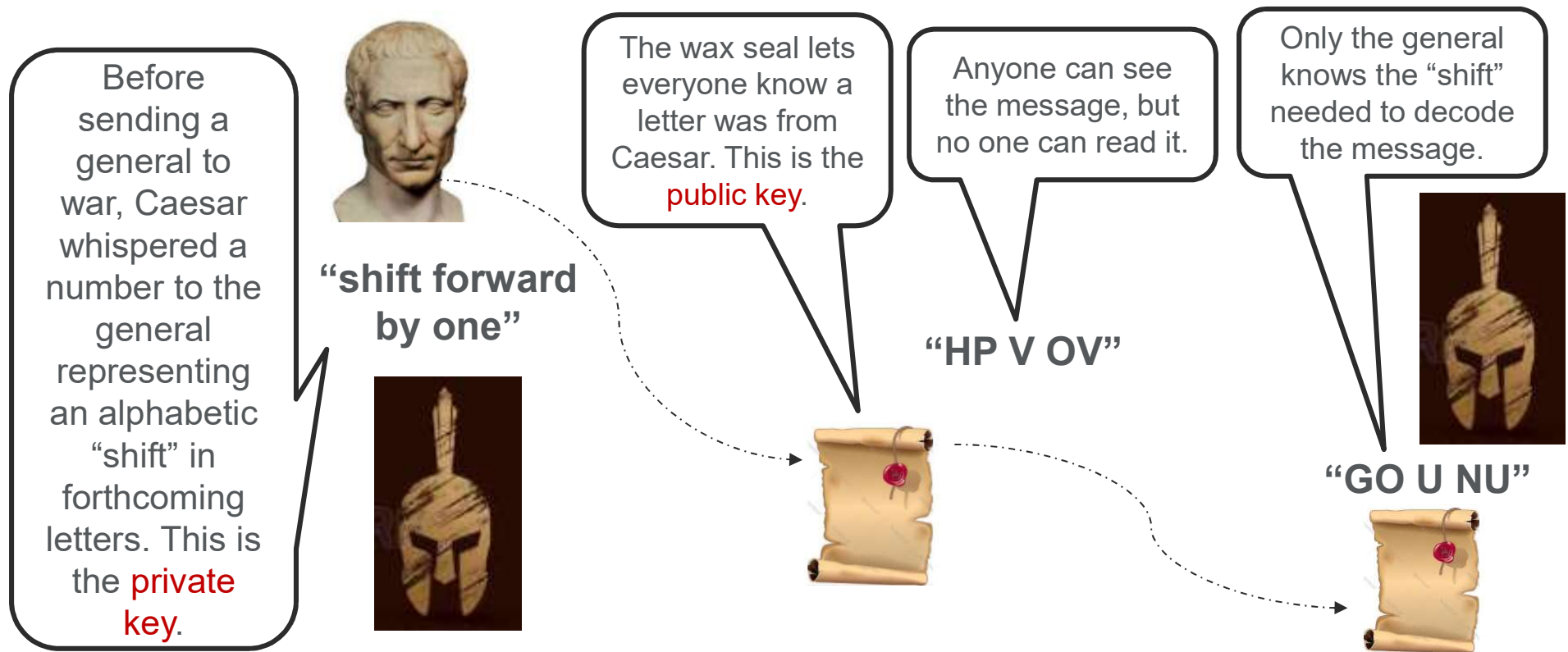


Distributed Network



2 Public-Private Key Cryptography

Public-private key cryptography was formalized in the 1970s but can arguably be traced back to Julius Caesar, who in 58 B.C. is claimed to have invented the **Caesar Cipher**, a technique used to encrypt Roman military communications.



2 Public-Private Key Cryptography

The Roman military used the **Caesar Cipher** technique for almost 800 years, until **Al-Kindi**, an Arab mathematician, cracked the code. **Al-Kindi** analyzed the frequency with which each letter in the Latin language was used, then systematically applied the most probable “shifts” until a message was decoded.

Hp! V Opsuixftufso!
 Csfb! sjhiu uispvhi uibu
 mjo**f**.
 Xjui pvs dpmpst gmzjoh,
 X**f** xjmm di**ffs** zpv bmm
 ui**f** ujn**f**.
 V! Sbi! Sbi!
 Hp! V Opsuixftufso!
 Gjhiu gps wjdupsx.
 Tqs**f**be gbs ui**f** gbn**f** pg pvs
 gbjs obn**f**.
 Hp Opsuixftufso, xjo uibu
 hbn**f**!

Al-Kindi first identified the most frequent letter used in the coded message.

*assume “f”
is “e”*



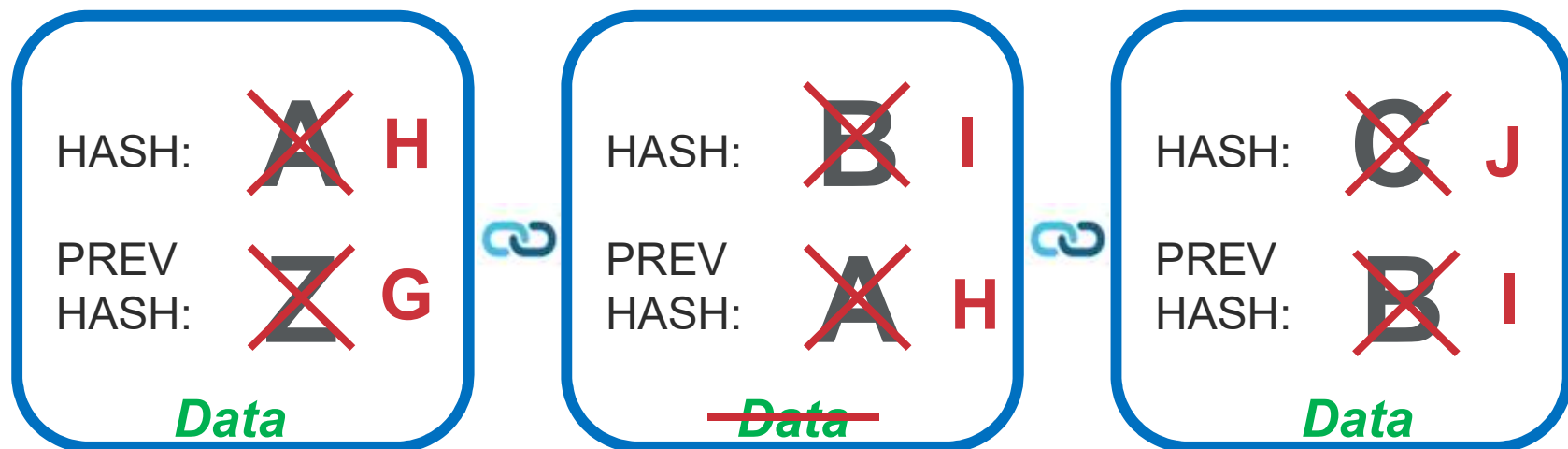
*shift back
by one*

He then substituted the most frequent letter used in the language, identified the shift, and shifted all other letters accordingly.

Go! U Northw**est**ern!
 Bre**a**k right through that
 line.
 With our colors flying,
 We will che**e**r you all the
 time.
 U! Rah! Rah!
 Go! U Northw**est**ern!
 Fight for victory.
 Spre**a**d far the**e** fame**e** of our
 fair name.
 Go Northw**est**ern, win
 that game**e**!

3 Hashing and Data Immutability

Each “block” contains its own unique hash (which is dependent on the hash of the previous block) as well as the actual hash of the previous block. Altering the data in a block will alter its hash – thereby altering the hashes of all other blocks in the blockchain.

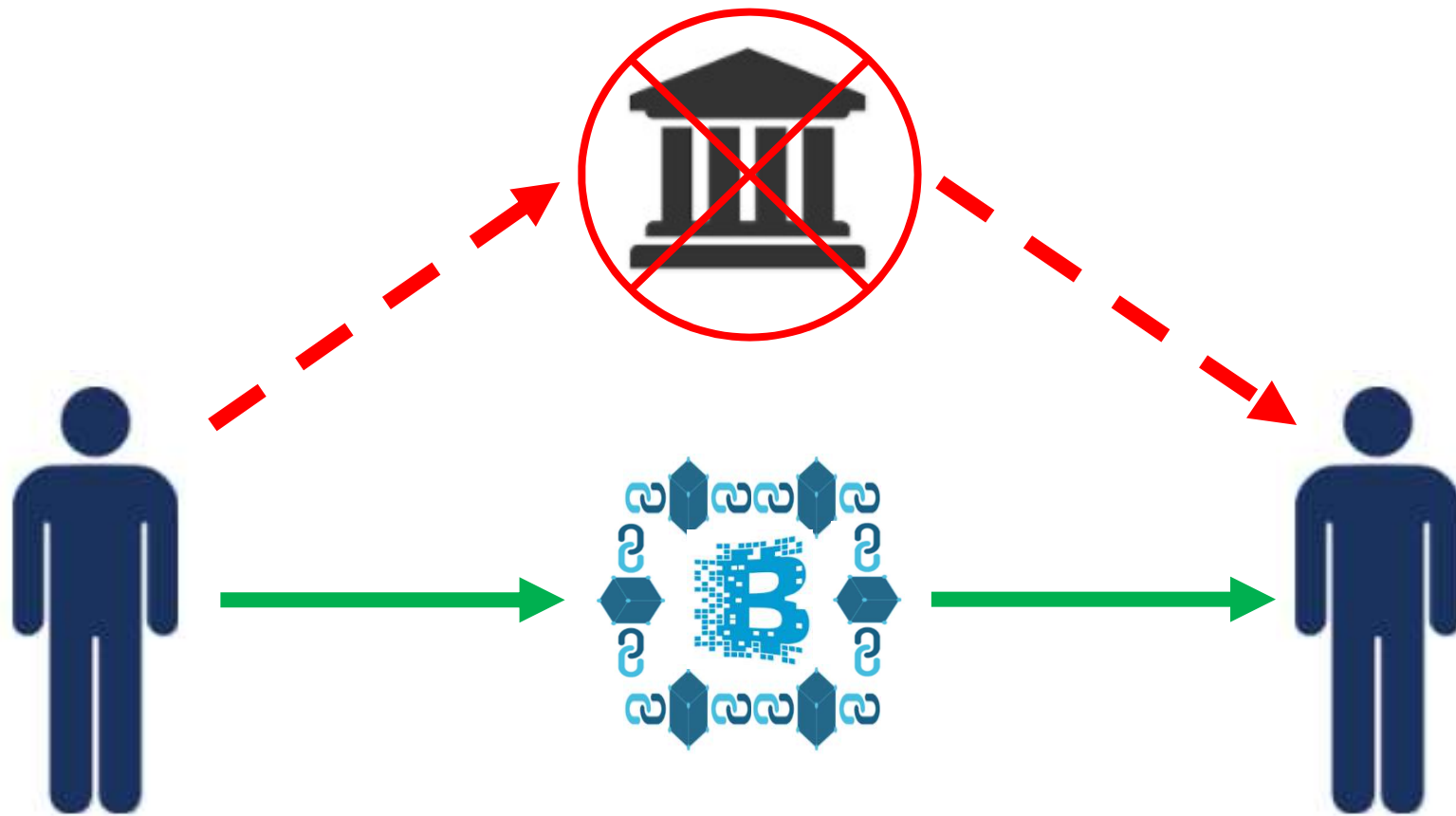


Sample Hash From the Bitcoin Blockchain:

00000000000000000000098983c6e67bec9488da5f55f2842e2f01cf7188f33912

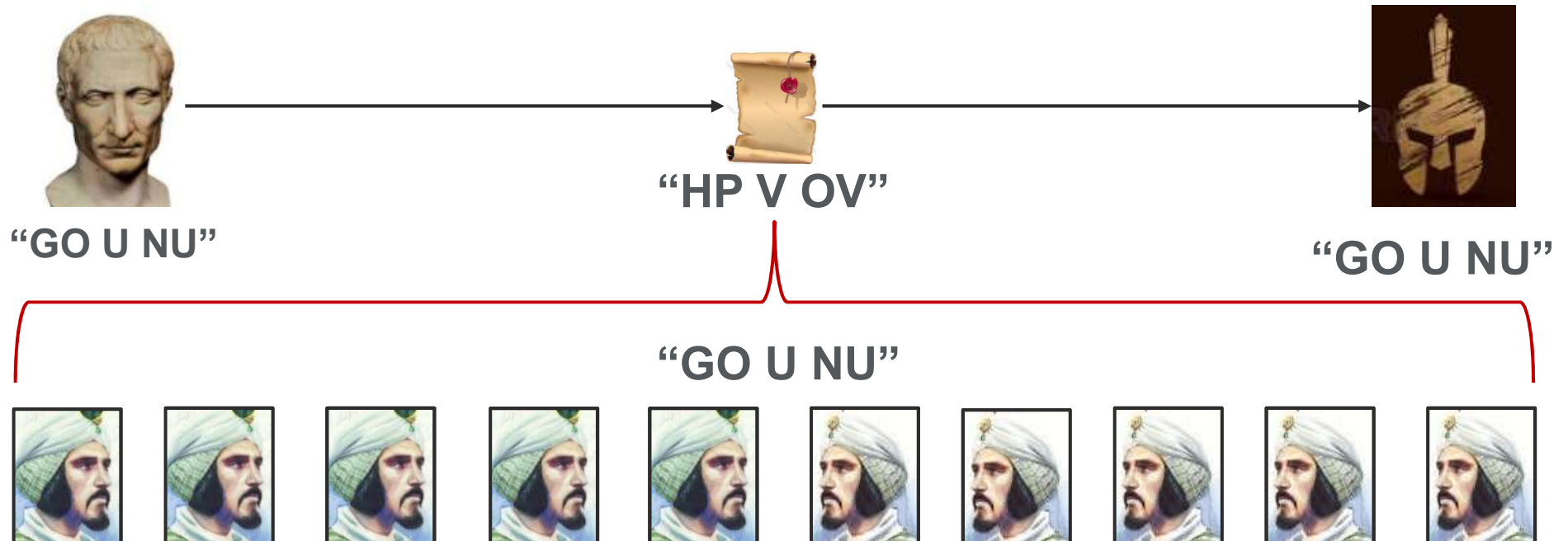
4 Disintermediation

Distributed networks take control away from any single party, cryptography secures P2P transactions, and hashing makes the data trustworthy. The result: *Third parties are no longer needed to facilitate internet-based transactions.*



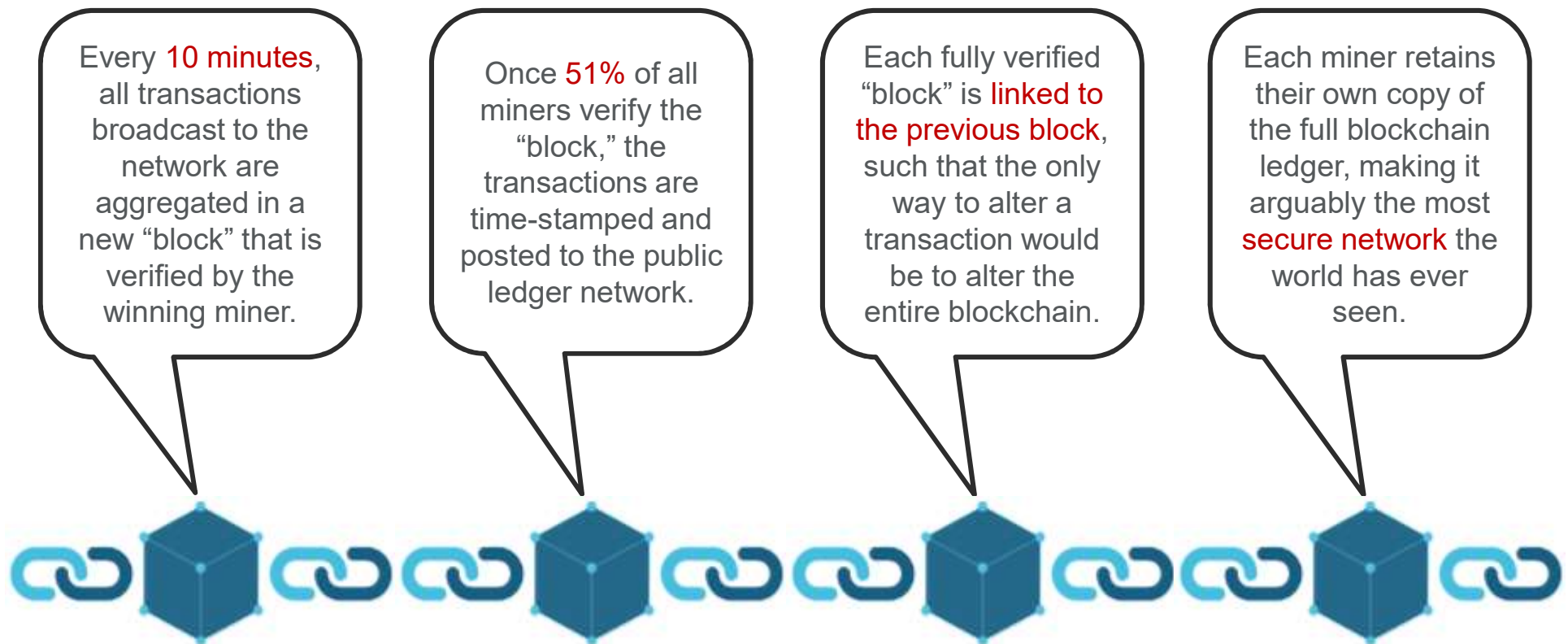
Bitcoin: The “Proof of Concept”

Bitcoin is the world’s first implementation of blockchain. The bitcoin network is supported by “miners” who download open source software and compete to solve complex algorithms that verify the integrity of transactions among network participants, like Al-Kindi decoding an encrypted message.



Bitcoin: The “Proof of Concept”

Bitcoin solved the problem of “double spending” by enabling direct peer-to-peer transfer of the asset itself – rather than a copy of the asset.



Bitcoin: The “Proof of Concept”

The early years of bitcoin were marked by excitement over the disintermediation of the financial services industry, concerns over illegal activity and new disruptive businesses.

The new technology offered by bitcoin was embraced by both criminal actors and mainstream businesses ...



Bitcoin: The “Proof of Concept”

More recently, bitcoin has been marked by wild price fluctuations and institutional trading.

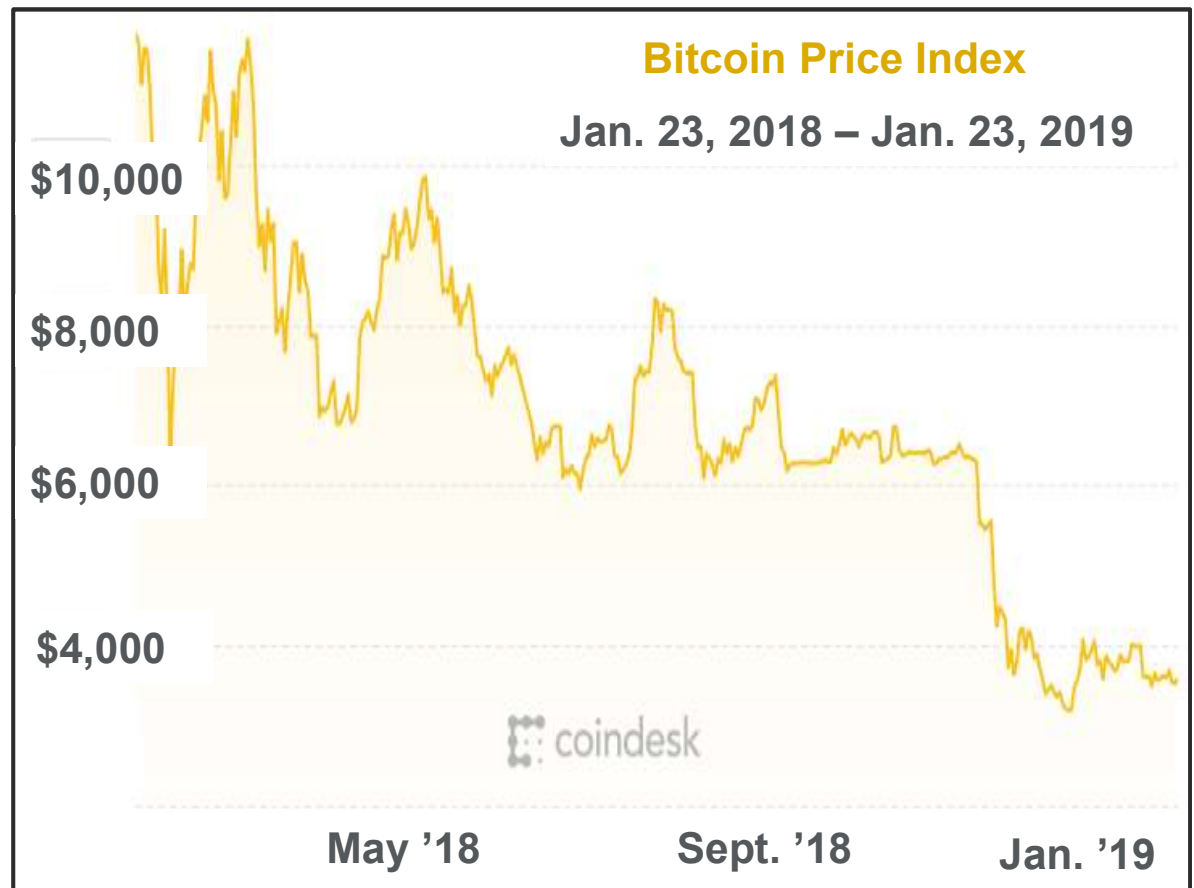
2014 – Institutional bitcoin trading firms emerge.



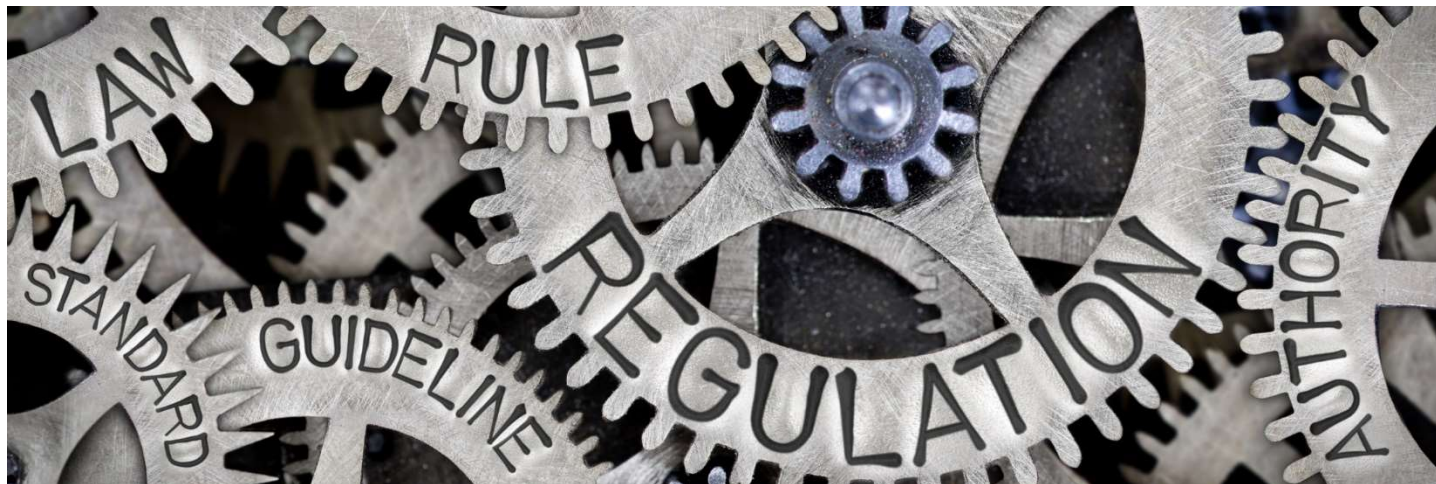
Dec. 2017 – CBOE, CME launch bitcoin futures.



May 2018 – Goldman to begin trading bitcoin.



Legal and Accounting Issues



U.S. and Foreign Regulation

In the U.S., various federal agencies and courts have defined cryptocurrencies as falling into a variety of legal asset classes, depending on the situation. Similarly, international legal frameworks are inconsistent and constantly evolving.



Cryptocurrencies
are
“money”

Cryptocurrencies
are
“commodities”

Cryptocurrencies
are
“property”

Cryptocurrencies
are
“securities”



Key FinCEN Guidance

FIN-2013-G001; FIN-2014-R001



Money Services Businesses (MSBs)

- ❖ “Exchanger” – A person engaged as a business in the exchange of virtual currency for real currency, funds, or other virtual currency
- ❖ “Administrator” – A person engaged as a business in issuing (putting into circulation) a virtual currency, and who has the authority to redeem (to withdraw from circulation) such virtual currency

Not Money Services Businesses

- ❖ “User” – A person that obtains virtual currency to purchase goods or services
- ❖ “Miner” – A miner of virtual currency is a “user” and is not considered to be an MSB

FinCEN Enforcement

Recent Enforcement: BTC-e



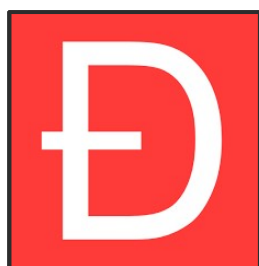
July 27, 2017

- FinCEN and other U.S. and international enforcement agencies shut down BTC-e, a foreign cryptocurrency exchange
- FinCEN assessed a **\$110 million penalty** against BTC-e, and a **\$12 million penalty** against Russian national Alexander Vinnik



SEC Guidance

SEC Report on The DAO token sale (July 2017)



B. DAO Tokens Are Securities

1. *Foundational Principles of the Securities Laws Apply to Virtual Organizations or Capital Raising Entities Making Use of Distributed Ledger Technology*

The DAO, an unincorporated organization, was an issuer of securities.

The Platforms that traded DAO Tokens appear to have satisfied the criteria of Rule 3b-16(a) and do not appear to have been excluded from Rule 3b-16(b). As described above, the

A system that meets the criteria of Rule 3b-16(a), and is not excluded under Rule 3b-16(b), must register as a national securities exchange pursuant to Sections 5 and 6 of the Exchange Act⁴¹ or operate pursuant to an appropriate exemption. One frequently used exemption is for alternative trading systems ("ATS").⁴² Rule 3a1-1(a)(2) exempts from the

Cease-and-Desist Order – Munchee, Inc. (Dec. 2017)



"Even if MUN tokens had a practical use at the time of the offering, it would not preclude the token from being a security." Determining whether a transaction involves a security does not turn on labeling – such as characterizing an ICO as involving a "utility token" – but instead requires an assessment of "the economic realities underlying a transaction."

SEC Enforcement: Fraud

AriseBank - \$600M ICO



SEC Action – Jan. 2018

IN THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF TEXAS DALLAS DIVISION	
SECURITIES AND EXCHANGE COMMISSION,	§
Plaintiff,	§
vs.	§
ARISEBANK, JARED RICE SR., and STANLEY FORD,	§ Civil Action No.:
Defendants.	§ FILED UNDER SEAL

Centra Tech - \$32M ICO



SEC Action – April 2018

UNITED STATES DISTRICT COURT SOUTHERN DISTRICT OF NEW YORK	
SECURITIES AND EXCHANGE COMMISSION,	:
Plaintiff,	:
- against -	:
SOHRAB ("SAM") SHARMA and ROBERT FARKAS,	:
Defendants.	:
18 Civ. ()	:
COMPLAINT	:
JURY TRIAL DEMANDED	:

Titanium - \$21M ICO



SEC Action – May 2018

2018 MAY 15 U.S. DISTRICT COURT CENTRAL DISTRICT OF CALIFORNIA	
UNITED STATES DISTRICT COURT CENTRAL DISTRICT OF CALIFORNIA	
SECURITIES AND EXCHANGE COMMISSION,	Case No. CV18-4315
Plaintiff,	COMPLAINT
vs.	(FILED UNDER SEAL)
TITANIUM BLOCKCHAIN INFRASTRUCTURE SERVICES, INC.; EHI INTERNETWORK AND SYSTEMS MANAGEMENT, INC. aka EHI-INSM, INC.; and MICHAEL ALAN STOLLERY aka MICHAEL STOLLAIRE,	
Defendants.	

Recent Statements From the SEC

“There are different types of crypto-assets [...] Then there are tokens which are used to finance projects [...] **There are none that I’ve seen that are not securities.**” – SEC Chairman Jay Clayton, April 26, 2018

“Cryptocurrencies: These are replacements for sovereign currencies, replace the dollar, the euro, the yen with **bitcoin** ... That type of currency is **not a security.**” – SEC Chairman Jay Clayton, June 6, 2018

“[C]urrent offers and sales of **Ether are not securities** transactions.”
– SEC Director William Hinman, June 14, 2018



SEC “FINHUB” Request Portal

“We welcome requests for meetings and other assistance relating to FinTech issues arising under the federal securities laws ... Please use the form below to request a meeting or assistance from SEC staff.”



General Subject Matter of Your Request *

Please select at least one of the listed options below for the general subject matter of your meeting request.
To select multiple options, hold down the (CTRL - PC) or (Command - Mac) key

- Advisory Services Related to Digital Assets
- Automated Investment Tools / Robo-Advisers
- Digital Assets**
- Digital Asset Trading Platforms
- Digital Marketplace Financing
- Funding Portals

Purpose of the Requested Meeting *

Please select at least one of the listed options below for the purpose of your meeting request.
To select multiple options, hold down the (CTRL - PC) or (Command - Mac) key

- Accounting-related Inquiry
- Interpretation of Rules and Forms**
- Custody Inquiry
- Determination of Instrument as a “Security”
- Funding Portal Registration
- Intermediary Registration

**Launched
October 18, 2018**

<https://www.sec.gov/finhub-form#no-back>

More SEC Fraud Actions

- Aug. 2018** ✓ SEC announces permanent officer-and-director and penny stock bars against the founder of a company who perpetrated a fraudulent ICO.
- Sept. 2018** ✓ Crypto Asset Management LP agreed to pay a \$200,000 penalty to settle charges that it operated as an unregistered investment company while falsely marketing that it was the “first regulated crypto asset fund in the United States.”
- Oct. 2018**
- ✓ Subpoena enforcement action against an investment trust related to an alleged \$100 million commitment to launch an ICO.
 - ✓ Court order preventing ICO that falsely claimed SEC approval
 - ✓ Suspended trading in securities of a U.S.-based retail company, alleging false claims that it was conducting an SEC registered token offering.
- Nov. 2018** ✓ Consent orders against Floyd Mayweather Jr. and Khaled Khaled (also known as “D.J. Khaled”) related to charges of promoting securities issued in ICOs without fully disclosing that they were being compensated by the entities offering the ICO tokens.

SEC: Unregistered Securities

- Sept. 2018**
- ✓ TokenLot LLC and its owners agreed to pay more than \$500,000 in penalties to settle charges that they acted as unregistered broker-dealers in the sale and trading of securities. TokenLot LLC, a self-described “ICO Superstore” where investors could purchase digital tokens and engage in secondary trading, handled more than 200 different digital tokens for more than 6,000 retail investors from July 2017 until February 2018.
 - ✓ SEC and CFTC charged 1pool Ltd. (aka 1Broker) and its CEO with offenses related to its actions to solicit U.S. investors to purchase swaps and commodity transactions, allow investors to open trading accounts by providing only a username and email address, and require customers to fund their accounts using bitcoin. According to the complaint, 1Broker’s actions violated federal securities laws requiring broker-dealer registration and customer identity verification.
- Nov. 2018**
- ✓ SEC settled charges against the founder of EtherDelt, a digital token trading platform for blockchain-based tokens commonly issued in ICOs, for operating an unregistered national securities exchange.

SEC: Unregistered Securities

- Dec. 2018** ✓ CoinAlpha Advisors LLC (CoinAlpha) settled registration violation charges when it agreed to return \$600,000 raised from 22 investors from several U.S. states. The SEC alleged that CoinAlpha engaged in a general solicitation of unregistered securities and failed to take reasonable steps to ensure only accredited investors purchased interests in its fund.
- Nov. 2018** ✓ SEC announced that it had settled charges against two companies – Carriereq Inc., d/b/a Airfox, and Paragon Coin Inc. – for securities registration violations arising out of previously conducted initial coin offerings (ICOs). The SEC published the cease-and-desist orders, which both:
1. Imposed \$250,000 penalties;
 2. Required the companies to register the tokens under the Exchange Act by filing a form 10;
 3. Required the companies to implement an online claims process allowing token purchasers to recover amounts paid for the tokens.

Internal Revenue Service

IRS Notice 2014-21 – April 2014



SECTION 4. FREQUENTLY ASKED QUESTIONS

Q-1: How is virtual currency treated for federal tax purposes?

A-1: For federal tax purposes, virtual currency is treated as property. General tax principles applicable to property transactions apply to transactions using virtual currency.

Internal Revenue Service

“John Doe” summons

- The IRS filed a motion to enforce a “**John Doe**” **summons** on cryptocurrency exchange Coinbase for information regarding U.S. persons who conducted cryptocurrency transactions on the platform at any time between 2013 and 2015.
- In November 2017, the Northern District of California ordered **Coinbase to produce documents for accounts with at least the equivalent of \$20,000** in any one transaction type (buy, sell, send or receive) from 2013 to 2015.



CFTC Investigations



- ✓ On December 6, 2017 the CFTC sent subpoenas to Bitfinex and Tether. Although the subject of the subpoenas is unknown, some have speculated that they relate to a possible bitcoin price manipulation scheme.
- ✓ Bitfinex has denied any wrongdoing and in June 2018 Tether announced that a U.S. law firm confirmed that Tether's bank deposits had U.S. dollars sufficient to back every unit of Tether cryptocurrency in circulation. An analysis by *Bloomberg* appears to support a similar conclusion.
- ✓ Suspicions of price manipulation have continued amid Tether's issuance of \$250 million worth of new Tether cryptocurrency units on May 20, as well as the departure of a senior Bitfinex executive and allegations of price manipulation in an analysis published on June 25 by two professors at the University of Texas at Austin.

CFTC Price Manipulation Investigation

The CFTC recently subpoenaed trading data of four major cryptocurrency exchanges as it investigates potential price manipulation in bitcoin futures products listed on the CME.



The Bitstamp logo consists of the word "Bitstamp" in a bold, sans-serif font. The "i" and "t" are green, while the rest of the letters are black. A thin green line is positioned below the text.

The itBit logo features the word "itBit" in a bold, sans-serif font. The "i" and "t" are white, and the "Bit" is black. The logo is set against a solid black rectangular background.

The Coinbase logo displays the word "coinbase" in a bold, sans-serif font. The "c" and "o" are white, and the rest of the letters are blue. The logo is set against a solid blue rectangular background.

The Kraken logo shows the word "kraken" in a bold, sans-serif font. The "k" is blue, and the rest of the letters are black. To the left of the text is a small blue icon of a kraken.

Price Index

The CME Group logo features a blue globe icon to the left of the words "CME Group" in a bold, sans-serif font. The entire logo is enclosed in a black rectangular border.

The Chicago Mercantile Exchange (CME) determines the price of bitcoin futures based on its “Bitcoin Real Time Index” (BRTI), which uses pricing data from Bitstamp, GDAX (Coinbase), itBit and Kraken – all of which were subjects of subpoenas.

CFTC Enforcement



- Oct. 2018** ✓ CFTC announced that a federal district court had ordered a New York-based corporation and its CEO to pay more than \$2.5 million in civil penalties and restitution in what the CFTC called its first-ever anti-fraud enforcement action involving bitcoin.
- ✓ The CFTC brought the action in response to a Ponzi scheme in which the defendants generated false statements showing gains from bitcoin trading to solicit more than \$600,000 from at least 80 investors between 2014 and 2016.
- Nov. 2018** ✓ CFTC ordered an individual to pay more than \$1.1 million in restitution to his former employer, a Chicago-based proprietary trading firm, and its individual customers, arising out of a fraud scheme based on trading bitcoin and litecoin.

FTC Enforcement Actions

The FTC has actively prosecuted fraud schemes involving cryptocurrencies and has formed an FTC Blockchain Working Group.



FEDERAL TRADE COMMISSION
PROTECTING AMERICA'S CONSUMERS

June 2015

*FTC and New Jersey attorney sue company that marketed mobile app promising rewards points for online activity, but in fact ran **malware to mine cryptocurrencies via user devices.***

February 2016

*FTC settles suit against **Butterfly Labs** alleging seller of bitcoin mining equipment failed to deliver bitcoin mining hardware until after computers were practically useless.*

March 2018

*FTC files suit against individuals promoting **fraudulent "chain referral schemes" involving bitcoin** and launches **FTC Blockchain Working Group.***

June 2018

*FTC states **consumers lost \$532 million to cryptocurrency related scams** in the first two months of 2018 and will lose \$3 billion by the end of the year.*

Foreign Regulatory Landscape



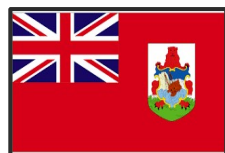
Switzerland

- Seeking to attract blockchain firms with friendly regulation
- Haven for ICO events



Gibraltar

- Plans to regulate ICO tokens as commercial products
- GBX: Gibraltar Blockchain Exchange



Bermuda

- Exploring blockchain land registry
- Recent economic development agreements with Binance, Shyft



Malta

- New headquarters of Binance and OKEx, two of the largest exchanges
- Recently enacted friendly ICO regulations



China

- Leader in cryptocurrency mining hardware and mining operations
- High demand for arbitrage trading



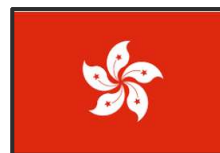
Dubai

- Blockchain for property records and business registries
- Global Blockchain Council



Japan

- Feb. 2014: Mt Gox - \$400M hack
- Jan. 2018: Coincheck - \$530M hack
- Banks testing blockchain payments
- Regulations for AML, ICOs



Hong Kong

- One-time ICO haven
- Feb. 2018 – Orders exchanges to delist securities tokens

Accounting Treatment is Undefined

With little or no guidance under GAAP and IFRS, the proper accounting treatment for cryptocurrencies is largely unknown.

<i>Cash, Cash Equivalents, and Foreign Currency</i>	Cryptocurrencies are not backed by a government and generally are not accepted as legal tender, so cannot be cash or foreign currency. They cannot be cash equivalents because they are not (1) readily convertible to cash or (2) so near maturity that they have insignificant risk.
<i>Financial Instrument</i>	Cryptocurrencies cannot be a financial instrument because they do not represent the contractual right to receive or exchange cash or a financial instrument.
<i>Commodity</i>	“Commodity” is not a defined term in accounting. Rather, commodities are generally accounted for as inventory.
<i>Inventory</i>	Cryptocurrencies carry some characteristics of inventory in that they are often purchased or mined with the intent to sell them. However, because cryptocurrencies are not tangible assets, they cannot be inventory.
<i>Intangible Asset</i>	Because cryptocurrencies lack physical substance and have no prescribed life, they appear to be <i>indefinite-lived intangible assets</i> . Under this definition, value is recorded at cost of acquisition and is subject to impairment in value, but not increases in value. <i>Fair value measurement might be more a more accurate method.</i>

Boon to Bitcoin Payment Processors

Complications over accounting treatment have made public companies afraid to hold cryptocurrencies, resulting in a huge benefit to cryptocurrency payment processors.



Starbucks, Microsoft, and Intercontinental Exchange are currently working to launch physical bitcoin futures contracts.

Recent Commercial Litigation Involving Blockchain



ICOs and Securities Class Actions

In 2018 there have been multiple private securities actions filed against companies that have previously conducted ICOs, alleging violations of federal and state laws based on the offering and sale of unregistered securities.

Moss v. Giga Watt, E.D.Wa., 18-cv-100; 18-cv-103, March 19, 2018

- ❖ ICO investors received the future right to receive Giga Watt tokens or mining equipment.
- ❖ Giga Watt retained in its sole discretion the ability to determine when, if ever, an investor token release would occur or when mining equipment would be set up and deployed.
- ❖ Plaintiff that contributed \$1.5 million to the ICO alleges offering and sale of unregistered securities in violation of the Federal Securities Act and the Washington Securities Act.

John Hastings, et al. v. Unikrn, et al., S.C. Wa., 18-2-20306-6 SEA, Aug 13, 2018

- ❖ Unikrn boasted that it was “the most technologically-advanced wagering platform for esports”
- ❖ ICO raised \$29 million and characterized UKG as a utility token, but the token had no functionality.
- ❖ Complaint alleges violations of the Securities Act by offering and selling unregistered securities.

Other Recent Cases

Coffey v. Ripple Labs, et al., N.D.Ca., 18-cv-03286, May 3, 2018

Davy v. Paragon Coin, Inc., N.D.Ca., 18-cv-671, January 30, 2018

Rensel v. Centra Tech, et al., S.D.Fla., 17-cv-24500, June 25, 2018

Balestra v. Cloud With Me LTD, et al., W.D.Pa., 05-mc-02025, June 19, 2018

Disputes Involving Blockchain Startups

Recent litigation has also involved disputes common to the startup space, including copyright/trademark infringement and disputes between founders.

Hamel v. Poutre, et al., C.D.Ca., 18-cv-616, January 24, 2018

- ❖ Shareholder derivative action on behalf of The Crypto Company against certain of its officers and directors for breach of their fiduciary duties.
- ❖ Defendant company advises on investing in and developing source code for digital assets.
- ❖ Defendants allegedly made materially false and misleading statements about the business, operational and compliance policies, leading to SEC suspension of The Crypto Company stock.

Telegram Messenger Inc. v. Lantah, LLC, N.D.Ca., 18-cv-02811, August 8, 2018

- ❖ Complaint alleging claims for false designation of origin, trademark infringement and statutory unfair competition in relation to the use of “GRAM.”
- ❖ Both parties were using GRAM as the symbol for their cryptocurrency.
- ❖ In 2018 Telegram raised \$1.7 billion from private investors. It has yet to release its GRAM token.

Other Recent Cases

Founder Starcoin, Inc. v. Launch Labs, Inc., S.D.Ca., 18-cv-972, July 9, 2018

Liston v. Peterson, et al., S.C.Ca., CGC-18-565915, April 9, 2018

Kleiman v. Wright, S.D.Fla, 18-cv-80176, February 14, 2018

Epic Games, Inc., et al. v. Josefsson, et al., N.D.Ca., 17-cv-05961, January 2, 2018

Suits Against Cryptocurrency Exchanges

Recent actions against cryptocurrency exchanges have presented novel issues related to the evolving concepts of “hard forks” and custody of assets.

Brola, et al. v. Nano, et al., E.D.NY, 18-cv-02049, April 6, 2018

- ❖ Class action filed by investors against NANO related to representations NANO made as to the security of BitGrail, a cryptocurrency exchange that NANO promoted to sell its XRB currency.
- ❖ The BitGrail exchange “lost” \$170 million of XRB; NANO disavowed responsibility for the loss.
- ❖ Plaintiffs allege securities violations and seek rescission, compensatory damages or that NANO restore ownership of XRB through a “rescue fork” similar to the remedy taken after the DAO hack.

Berk, et al. v. Coinbase, Inc., N.D.Ca., 18-cv-01364, March 1, 2018

- ❖ Class action alleging violations of California’s unfair competition law and breach of duty in relation to Coinbase’s launch of Bitcoin Cash (BCH) during a two-day period in December 2017.

Faasse, et al. v. Coinbase, Inc., N.D.Ca., 18-cv-01382, March 2, 2018

- ❖ Class action seeking to recover unclaimed cryptocurrencies or alternatively, to turn over the cryptocurrencies to the State of California as unclaimed property.

Other Recent Cases

Shaw, et al. v. Vircorex, et al., S.D.Co., 18-cv-00067, January 10, 2018

In Re Mt. Gox Bitcoin Exchange Litigation, 291 F.Supp.3d 1370, April 3, 2018

Suing Banks and Telecom Providers

Lawsuits against telecom providers have centered around security measures on wireless accounts, while lawsuits against banks have focused on cash advance fees charged in connection with the purchase of cryptocurrency.

Terpin v. AT&T, et al., C.D.CA, 2:18-cv-6975, August 15, 2018

- ❖ In June 2017, Plaintiff's phone was hacked, with the hackers stealing a substantial amount of cryptocurrency funds. Following the hack, Plaintiff received assurances of increased security.
- ❖ In January 2018, an AT&T employee ported over Plaintiff's phone number to an imposter, resulting in another hack of Plaintiff's device and allowing hackers to steal \$24 million in cryptocurrency.

Tucker v. Chase Bank USA, N.A., S.D.N.Y., 18-cv-3155

- ❖ In January 2018, Chase Bank began treating credit card purchases of cryptocurrencies from exchanges as "personal cash loans," resulting in cash advance fees and higher interest rates.
- ❖ Class action by Plaintiffs who incurred cash advance fees allege Chase Bank violated The Truth in Lending Act, which requires a written notification for changes in cardholder agreements.

Other Recent Cases

Tapang v. T-Mobile USA, Inc., W.D.Wa.,
18-cv-167, February 4, 2018

Denke v. Citibank, S.D.N.Y., 18-cv-
4133, May 8, 2018

Donte McClellon v. Wells Fargo Bank, N.A.,
W.D.Wa, C18-0851-JCC, July 31, 2018

Disputes Involving Investments

Various lawsuits concern claims by investors in companies that allegedly perpetrated fraud schemes based on exploiting the hype around cryptocurrency.

Bitconnect – various lawsuits

- ❖ Class action on behalf of investors in a cryptocurrency trading and lending program alleging fraud, including a Ponzi scheme.
- ❖ Bitconnect guaranteed investors up to a 40% total return per month on investments, purportedly generated by its own proprietary trading bot and volatility software.
- ❖ Bitconnect required investors to purchase its token, which only had value on the Bitconnect platform.
- ❖ Bitconnect enlisted an army of marketers who were paid to recruit new investors through social media channels.
- ❖ In January 2018, Bitconnect shut down its trading and lending program, causing the value of its holdings to fall 90%.

Other Recent Cases

Peng Li, et al. v. Xunlei Ltd., et al.,
S.D.N.Y., 18-cv-00646, January 24, 2018
Rothsay Ltd., et al. v. O'Brien, et al.,
C.A.DA, 2018-0674, September 12, 2018

Bevand v. BF Labs Inc., et al., W.D.Mo., 16-1115-CV-W-FJG, September 26, 2017

Blockchain for Litigators



Authenticity and Admissibility

Does data stored on a blockchain meet the Federal Rules of Evidence standards of authentication and admissibility? What issues may affect this analysis?

Rule 901 – Authentication

- ✓ Authentication requires proponent of evidence to show that the evidence is what it is claimed to be.
- ✓ Must show that a machine is reliable, correctly calibrated and accurate.
- ✓ Allows for authentication of a process or system with evidence describing the process and showing that it produces an accurate result.
- ✓ Judicial notice may also be taken of the process' reliability.

Rule 803(6) - Admissibility

- ✓ (A) the record was made at or near the time by — or from information transmitted by — someone with knowledge;
- ✓ (B) the record was kept in the course of a regularly conducted activity of a business, organization, occupation, or calling, whether or not for profit;
- ✓ (C) making the record was a regular practice of that activity;
- ✓ (D) all these conditions are shown by the testimony of the custodian or another qualified witness . . . ; and
- ✓ (E) the opponent does not show that the source of information or the method or circumstances of preparation indicate a lack of trustworthiness.

E-Discovery

Blockchain derives security from total transparency, preserving data across a permanent distributed ledger, while e-discovery aims to preserve security through confidentiality. Is this a conflict? Key issues to consider include the following:

- **What information is being kept in blockchain-based records?**
- **Is blockchain-based data anonymized, tokenized, or otherwise protected?**
- **Are any blockchain records being distributed outside the client's primary (or contractually defined) environment?**
- **When dealing with cloud service providers:**
 - ✓ Is the cloud provider utilizing blockchain distributed ledger technology or practices to maintain logs, user records or even backup data?
 - ✓ How, if at all, are the cloud provider's and client's information life cycles applied to those records?

Document Production

Emerging issues include “off-chain” data linked to public blockchain transactions, and the rights of private blockchain consortia members that are not parties to litigation.

Public Blockchains

- ❖ As access to blockchain analytics tools increases, financial relationships between actors on public blockchains may assist in identifying targets for discovery.
- ❖ Non-financial data stored on Ethereum is increasingly becoming linked to “off-chain” data stored in other distributed databases.
- ❖ How will relevant “off-chain” data be identified and produced?

Private Blockchains

- ❖ How will enterprise consortia react to requests to produce blockchain data in the context of litigation involving a consortium member?
- ❖ Producing the entirety of a private blockchain may disclose proprietary information on entities not subject to the litigation.
- ❖ Data analytics based on blockchain data may reveal insights on behavior of parties.



Asset Tracing & Investigations

Several technology startups have emerged that offer tools for analyzing blockchain data. Initially developed to aid law enforcement investigations, these tools may prove valuable in private investigations and litigation.

Heuristic algorithms are used to group public keys into “clusters” of addresses that are likely to be controlled by the same person or entity.

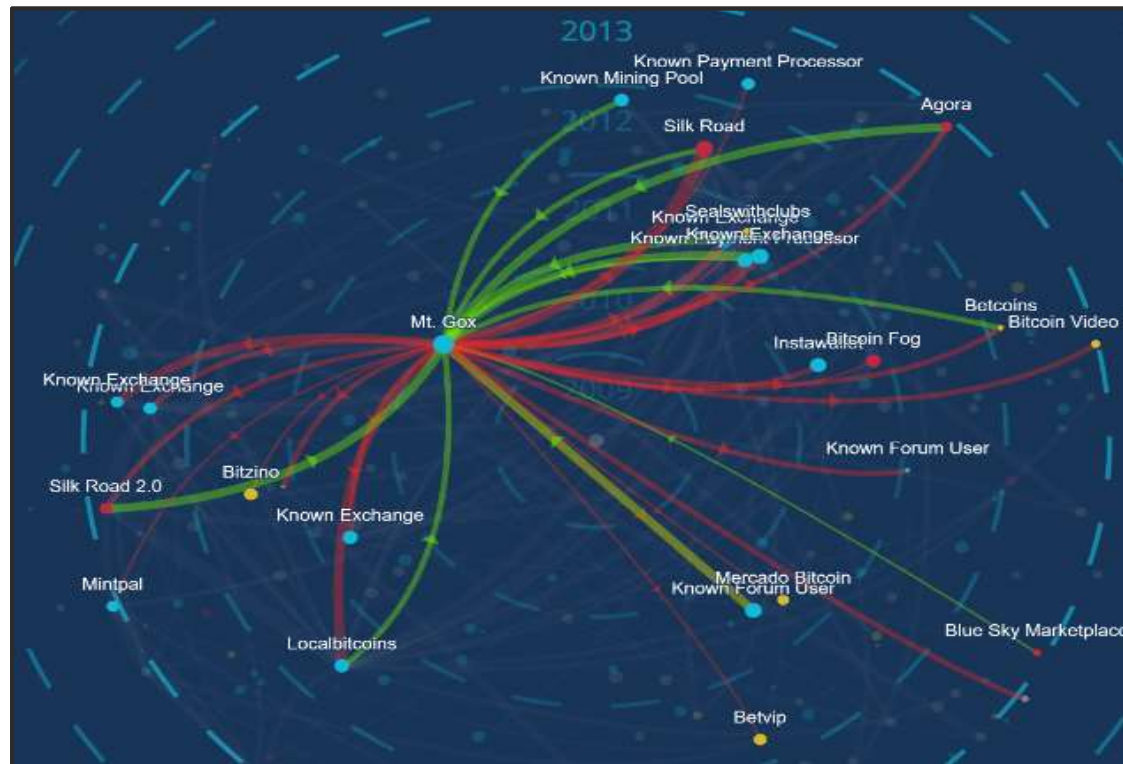


Image: Elliptic

By tracing the history of transactions from one “cluster” to the next, relationships emerge among participants on the blockchain.

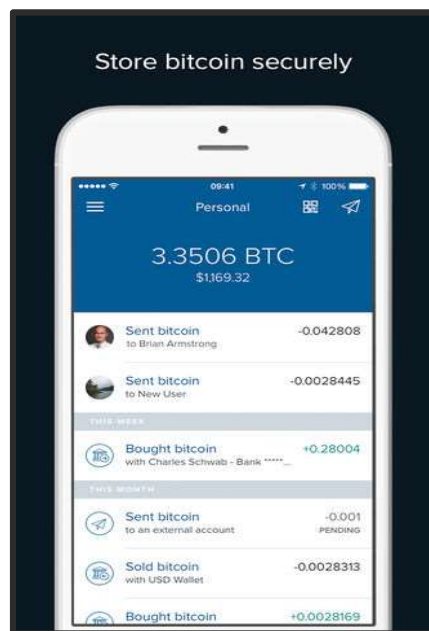
Taking Custody of Cryptocurrency

An emerging issue for both private sector entities and government agencies is how to store cryptocurrency once custody is taken.

Paper Wallets



Online “Hot” Wallets



Offline “Cold” Wallets



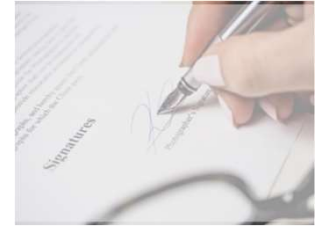
Chain of Custody

Collecting evidence and maintaining appropriate chain of custody will involve a combination of traditional computer forensics and new blockchain-based concepts.

- **Any object connected to the internet may lead to evidence**
 - ✓ Cell phones, laptops, tablets, mining equipment, etc.
 - ✓ Hot storage vs. cold storage
- **Analysis of wallets, public and private key information**
 - ✓ Extracting wallet files and public/private keys from devices
 - ✓ Searching for blockchain addresses
 - ✓ Accessing encrypted wallets
- **Critical evidence may reside on a system's physical memory (RAM)**
 - ✓ Running blockchain processes
 - ✓ System and registry information, user logins
 - ✓ Communications on social media and internet forums
 - ✓ Web browsing activities, cloud service information

What is a Smart Contract?

Smart contracts can encode business logic to automate execution of business processes and reduce friction in multiparty transactions.



Example: Automated Insurance Payments

Airline notifies insurance carrier and ticket holder of delay.



Ticketholder receives simultaneous notice of delay and receipt of payment.

Smart contract sends payment to ticket holder.



Compensation for delay appears on credit card account.



Smart Contracts: Legal Issues



*Despite promising benefits for streamlining business processes, smart contracts have been proven to be susceptible to **manipulation and unintended functionality**.*



Are agreements embedded in computer logic valid?

- ❖ Offer and acceptance
- ❖ Intent
- ❖ Mutual consent
- ❖ Consideration
- ❖ Competency/Capacity
- ❖ Legality
- ❖ Authority

Establishing rights, remedies and damages

- ❖ Do parties “assume the risk” of smart contract malfunction or manipulation?
- ❖ Claims arising from effects on consortia members and other parties lacking privity

Industry-Specific Issues



Payments, Value Storage

- ✓ Consumer rights when using exchanges and wallet services
- ✓ Irreversible payments



Enterprise Applications

- ✓ Smart contracts disputes
- ✓ Private blockchain data access
- ✓ Disputes among consortia firms



Capital Markets

- ✓ ICO class actions will continue
- ✓ Emerging platforms for securities, commodities trading



Fraud, Corruption and Investigations

- ✓ Litigation arising out of hacks
- ✓ Paying bribes and hiding assets
- ✓ Asset tracing and recovery

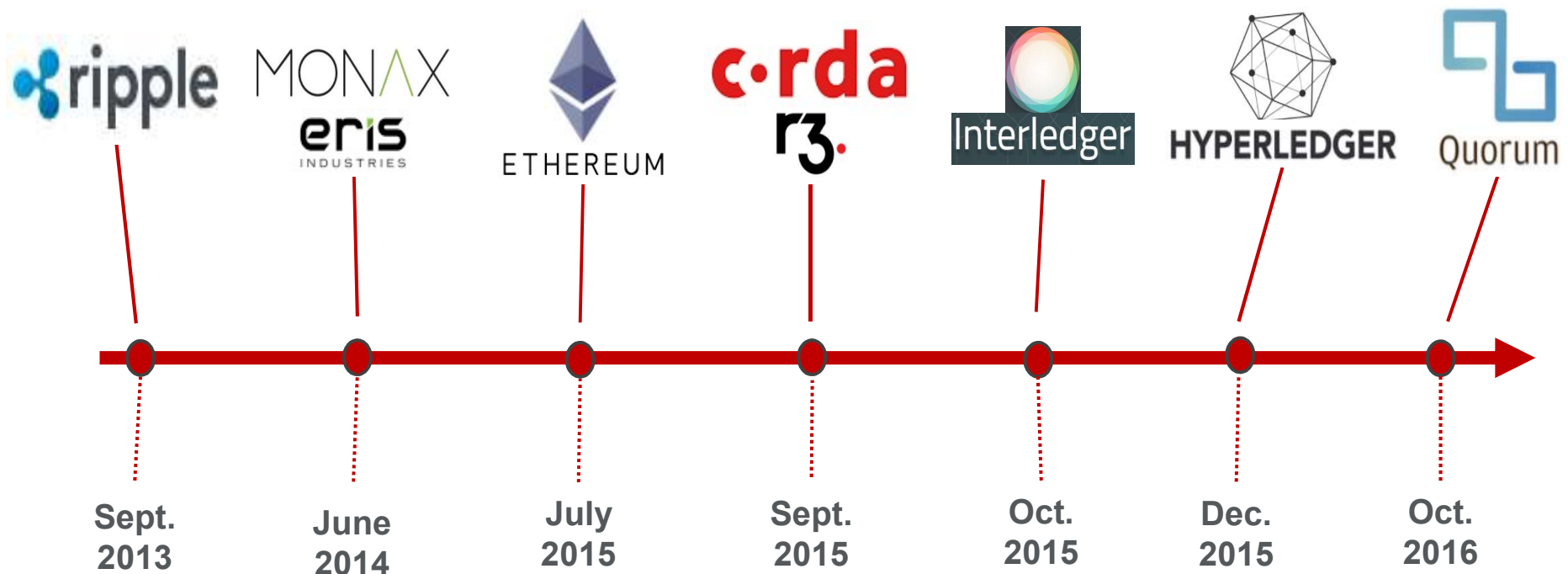


Blockchain for Enterprise



Blockchain for Enterprise

By 2015, technologists studying bitcoin and its underlying technology collectively came to two simple yet groundbreaking revelations:
“Cryptocurrencies” need not have anything to do with currency, and
blockchain technology could be engineered and implemented independently of the bitcoin blockchain.



Blockchain for Enterprise

Today, there are more than two dozen blockchains that are readily deployable for enterprise applications.

PUBLIC (PERMISSIONLESS)



PRIVATE (PERMISSIONED)

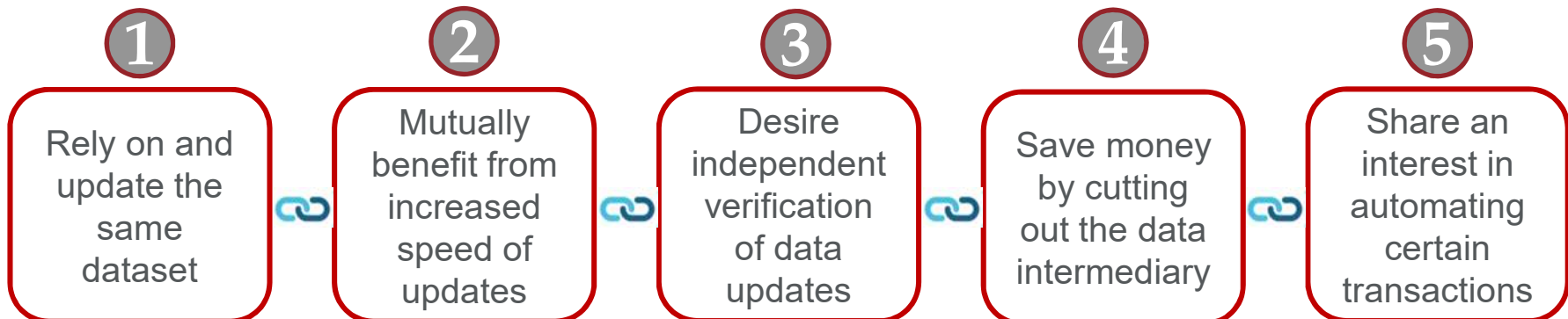


Blockchain for Enterprise

When multiple parties use the same dataset, blockchain may reduce costs, enhance security, and increase data accuracy and auditability. A key threshold question is whether to implement a public/permissionless or a private/permissioned blockchain.



Blockchain may drive efficiencies in situations where multiple business entities:



Ethereum: Public Blockchain 2.0

Financed by crowdfunding and launched in July 2015, Ethereum seeks to harness the inherent characteristics of bitcoin to create a new public, permissionless blockchain network intended to be used as a public platform for enterprise application development – in contrast to the payment system intended by bitcoin.

Some of the key innovations offered by Ethereum



Smart Contracts

Logic rules can be programmed into the Ethereum blockchain to automatically execute specific transactions upon the occurrence of predefined criteria.



Token Creation

Anyone can create their own new and unique “cryptocurrency” or “digital token” which can be traded on the Ethereum blockchain.



DAOs

Distributed Autonomous Organizations are intended to be self-governing entities that operate on smart contracts, without the need for human decision-making.



Cloud Service Providers as “Foundational Nodes”

AWS, Microsoft Azure, Oracle and SAP have all launched solutions to support enterprise blockchains on their cloud service platforms.



Two Types of Vulnerabilities

As blockchains are deployed in business applications, there are two primary areas of cybersecurity concern.

Wallet Attacks

Hackers have proven capable of hacking into blockchain user wallets, allowing diversion of digital assets.



51% Attack

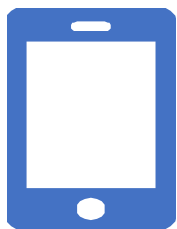
By taking control of 51% or more of the network's processing power, the attacker can manipulate the blockchain.



Data Privacy and Security

The newly effective European General Data Protection Regulation (**GDPR**) and the forthcoming California Consumer Privacy Act (**CCPA**) threaten to create complex compliance challenges for blockchain solutions.

A blockchain public key that can be identified with “off-chain” personal data is GDPR “personal data.”



Preserving the ability to have blockchain public keys “rendered anonymous” is of critical importance.



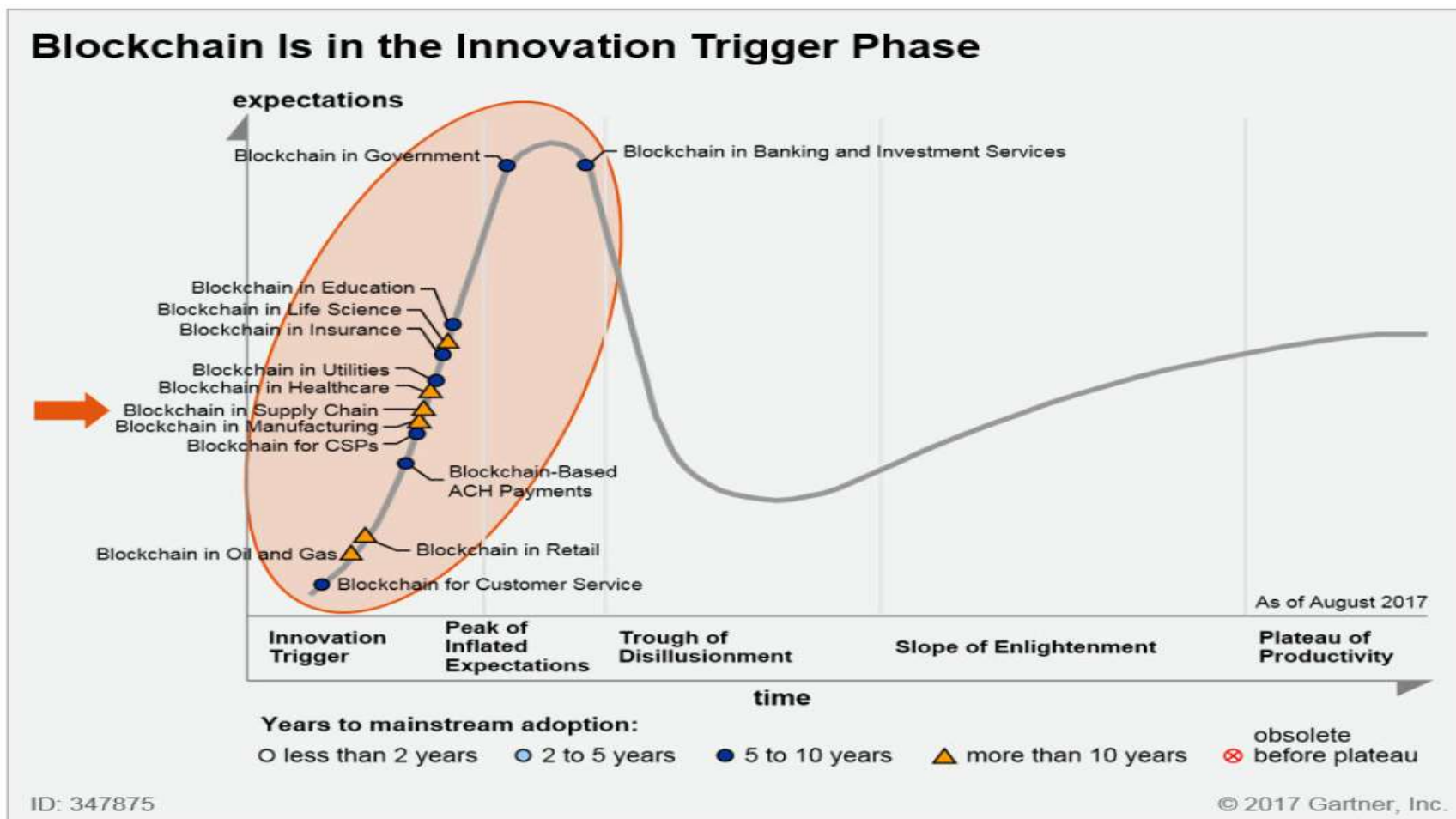
Blockchain-based systems should be designed to avoid determining how and why data is processed.



Emerging Use Cases



Trajectory of Blockchain Adoption



Source: Gartner (December 2017)

Self-Sovereign Identity (SSI)

Lifetime portable digital identity for any person, organization or thing that does not depend on any centralized authority and can never be taken away.

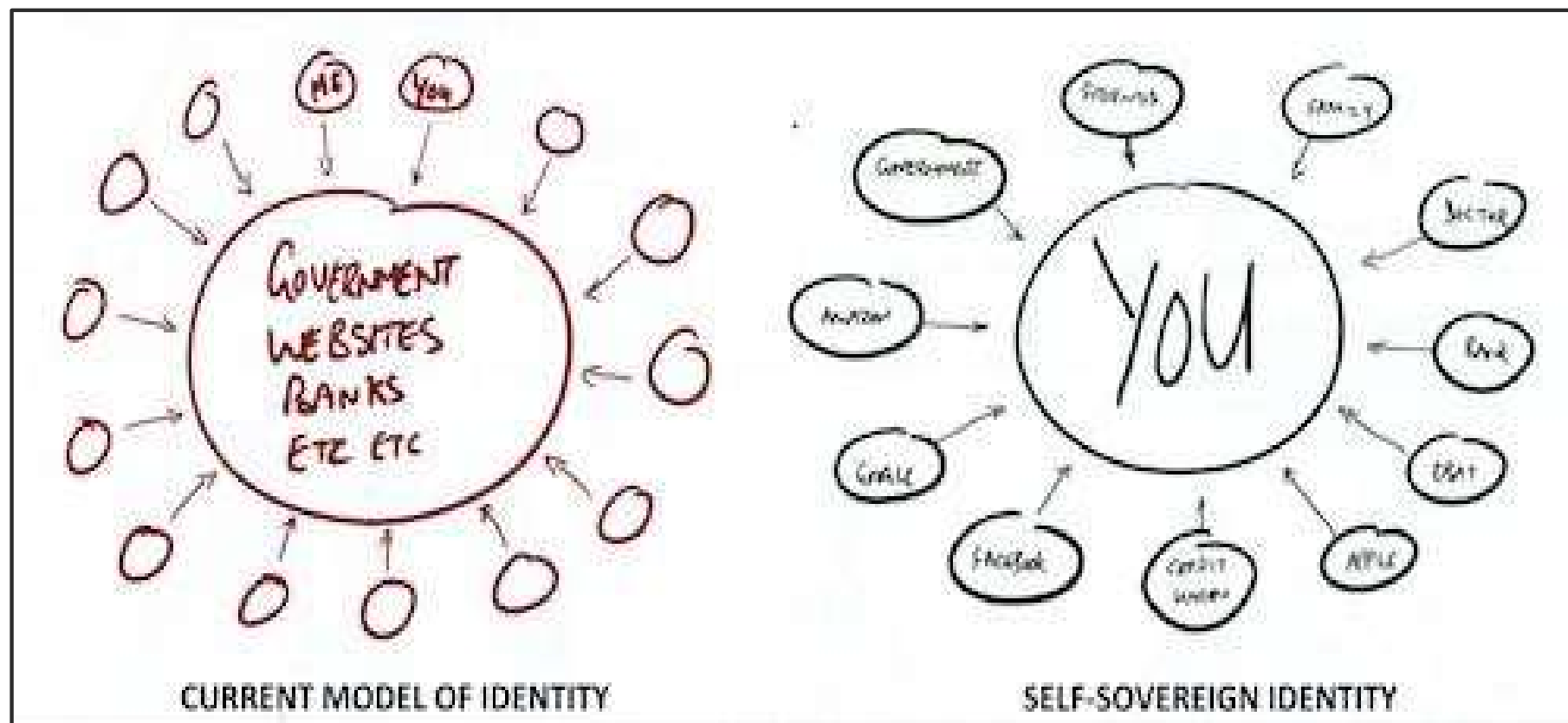
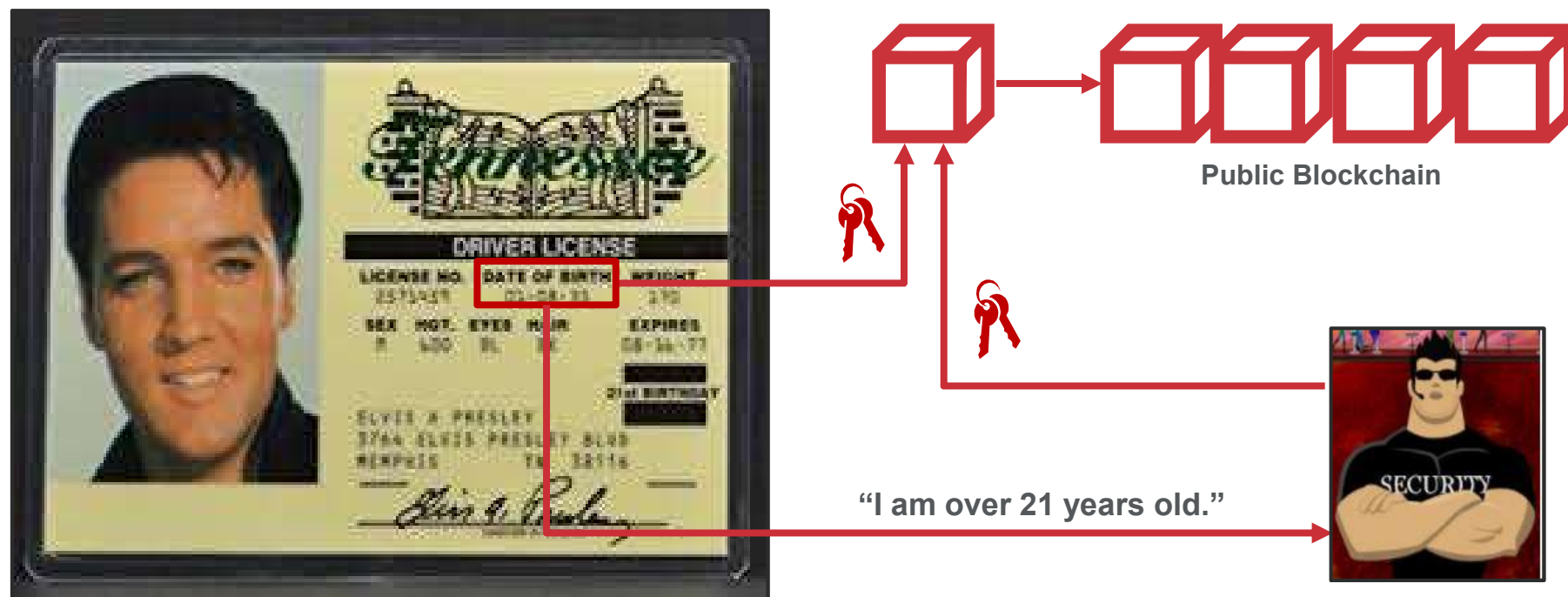


Image: Consensys

How Self-Sovereign Identity Works

Individuals provide only the minimum personal information needed to complete a transaction. The individual validates the authenticity of the data provided by using their private key to complete a blockchain transaction, where the public key serves to validate their identity.



Property Registry Pilots

Blockchain property registry pilots are underway in various cities across the globe. According to a recent report from Moody's, blockchain has the potential to drive efficiencies in the title transfer and mortgage process that could result in annual savings of \$840 million – \$1.7 billion.

Bermuda



Jan 2018 – Government official reports plans to move property deeds system to blockchain.

Ghana



Aug 2018 – Ghana startup Bitland begins working with national property records agency to pilot blockchain land registry.

Sweden



Mar 2018 – National land registry announced partnership w/ startup **ChromaWay** to build blockchain platform for real estate transfers.

Dubai



Oct 2018 – Dubai Land Department announces it is developing system to record real estate transactions on blockchain.

Vermont



Mar 2018 – Pilot program completed first U.S. real estate deed transfer on Ethereum-based blockchain built by startup **Propy**.

India



Oct 2018 – Andhra Pradesh announces partnership with Swedish startup **ChromaWay** to launch land registry pilot.

Zambia



Aug 2018 – Overstock subsidiary Medici Land Governance signs MOU w/ Zambia to build blockchain land title registry system.

Australia



Oct 2018 – New South Wales reports expected move to blockchain system by Summer 2019, with help from **ChromaWay**.

Voting Systems



West Virginia

- ❖ **May 2018** – Completed successful pilot of blockchain-based mobile app for absentee voting by military personnel and their dependents.
- ❖ **Nov 2018** – West Virginia reports successful pilot in the November midterm election to cast absentee votes from 144 military personnel stationed overseas from 24 counties.
- ❖ System developed in partnership with **Voatz**, a startup that raised \$2.2 million from Medici Ventures, the VC arm of Overstock.com.



Switzerland

- ❖ **July 2018** – Swiss city of Zug announced successful completion of a blockchain-based “test vote” that leveraged a **uPort** digital ID system.
- ❖ The blockchain votes were nonbinding and unrelated to the actual election.
- ❖ E-voting system developed by Zug-based software company **Luxoft**.
- ❖ Technical details of the 72 votes cast in the pilot are now being evaluated.



South Korea

- ❖ **Nov 2018** – South Korea National Election Commission announces plans to pilot a blockchain-based online voting system.
- ❖ South Korea currently uses an online voting system, **K-voting**, that is reportedly used by 5.64 million people, but there have been concerns that the system may be susceptible to hacking and fraud.
- ❖ If successful, the blockchain pilot system may eventually be integrated into the existing K-voting system.

Public Health Records

Clinical Research Data



Food Safety Data

 **Aug 2018 – U.S. Centers for Disease Control** and Prevention (CDC) announces pilot with National Center for Health Statistics and IBM to incorporate blockchain into the CDC electronic health record data sharing system.

 **May 2018 – European Parliament** votes in favor of a resolution to explore blockchain use cases for clinical trials and public health data.

 **May 2018 – Australian Department of Health** announces work on PoC that will use blockchain to better enable medical research while maintaining privacy of citizens' health data.

 **Jun 2018 – South Indian state of Kerala** announces project seeking to use blockchain to manage dairy, vegetable and fish supply chains.

 **July 2018 – UK Food Standards Agency (FSA)** announces blockchain pilot for tracing meat from cattle slaughterhouses through full supply chain.

 **Sept 2018 – United Nations World Food Program** announces plans for blockchain pilot to track and monitor food shipments from port in Djibouti to UN operations bases in Ethiopia.

 **Nov 2018 – South Korea** government announces blockchain pilot for tracking beef supply chain.

Corporate and Academic Records

Corporate Registries



- ❖ **Aug 2017** – Amendments to the **Delaware General Corporation Law** allow stock ledgers, UCC filings and other corporate records to be recorded and maintained “on a blockchain to better track and verify stock ownership, and improve transaction time and proxy voting.”
- ❖ **July 2018** – Delaware awarded a \$738,000 contract to **IBM** to design a private/permissioned blockchain system for corporate records, based on **Hyperledger Fabric**.
- ❖ **May 2018** – Dubai announces project with **IBM** to build the **Dubai Blockchain Business Registry** to streamline corporate registry systems.

Academic Records



- ❖ **Oct 2017** – **Massachusetts Institute of Technology** completes pilot with startup **Learning Machine** to issue “digital diplomas” on a blockchain to over 100 graduates.
- ❖ **Oct 2017** – **University of Melbourne in Australia** and the **Malta Ministry of Education** announce similar pilots with **Learning Machine**, modeled after the MIT initiative.



Example: Tracking Laptops

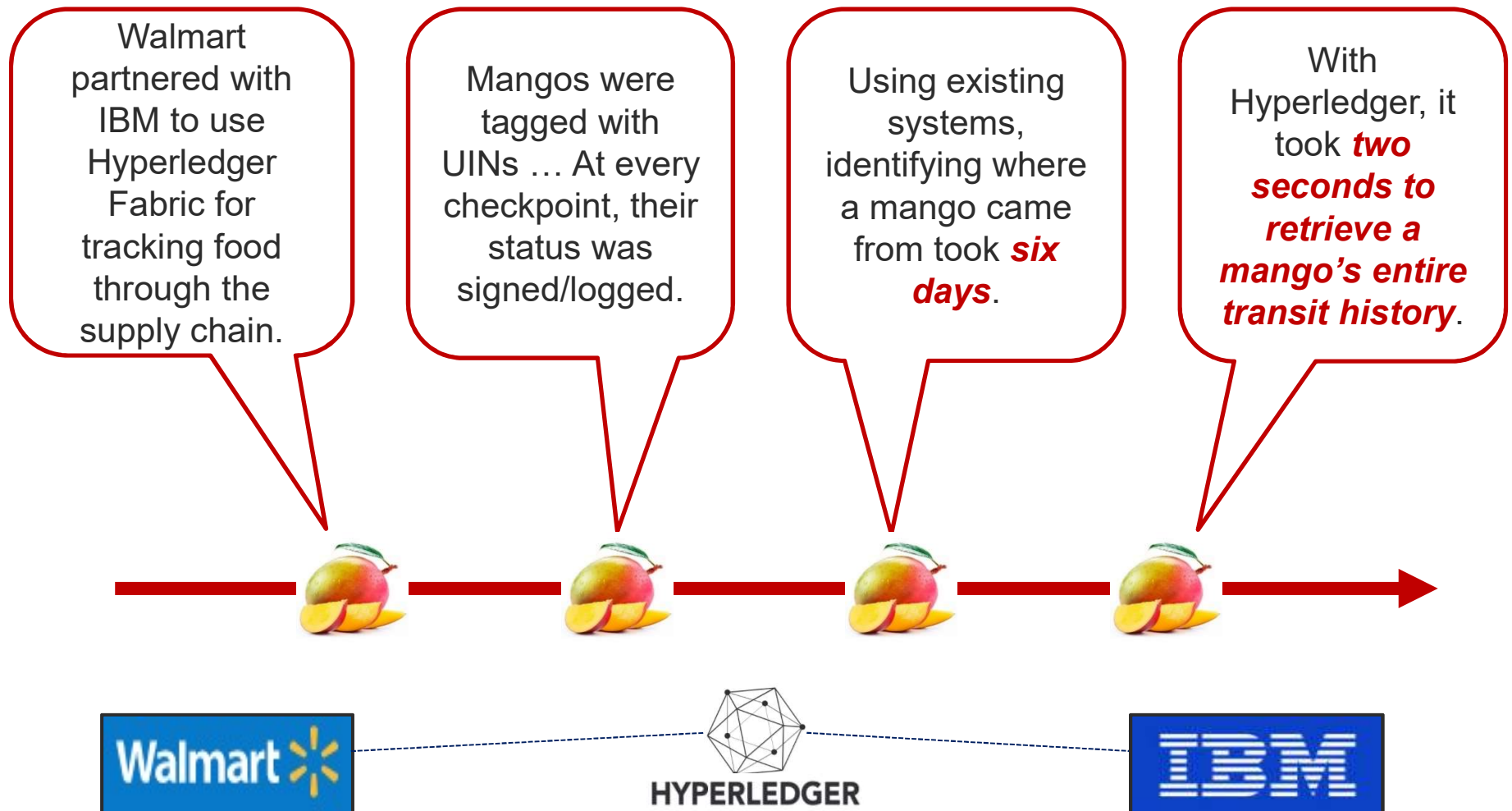
In summer 2017, the U.S. Department of the Treasury, Bureau of the Fiscal Service, developed and piloted a blockchain prototype to track and manage government laptops.

“The pilot project will test whether the inventory of an agency’s physical assets can be continuously monitored and reconciled in real time as the physical assets are transferred from person to person throughout the pilot.”



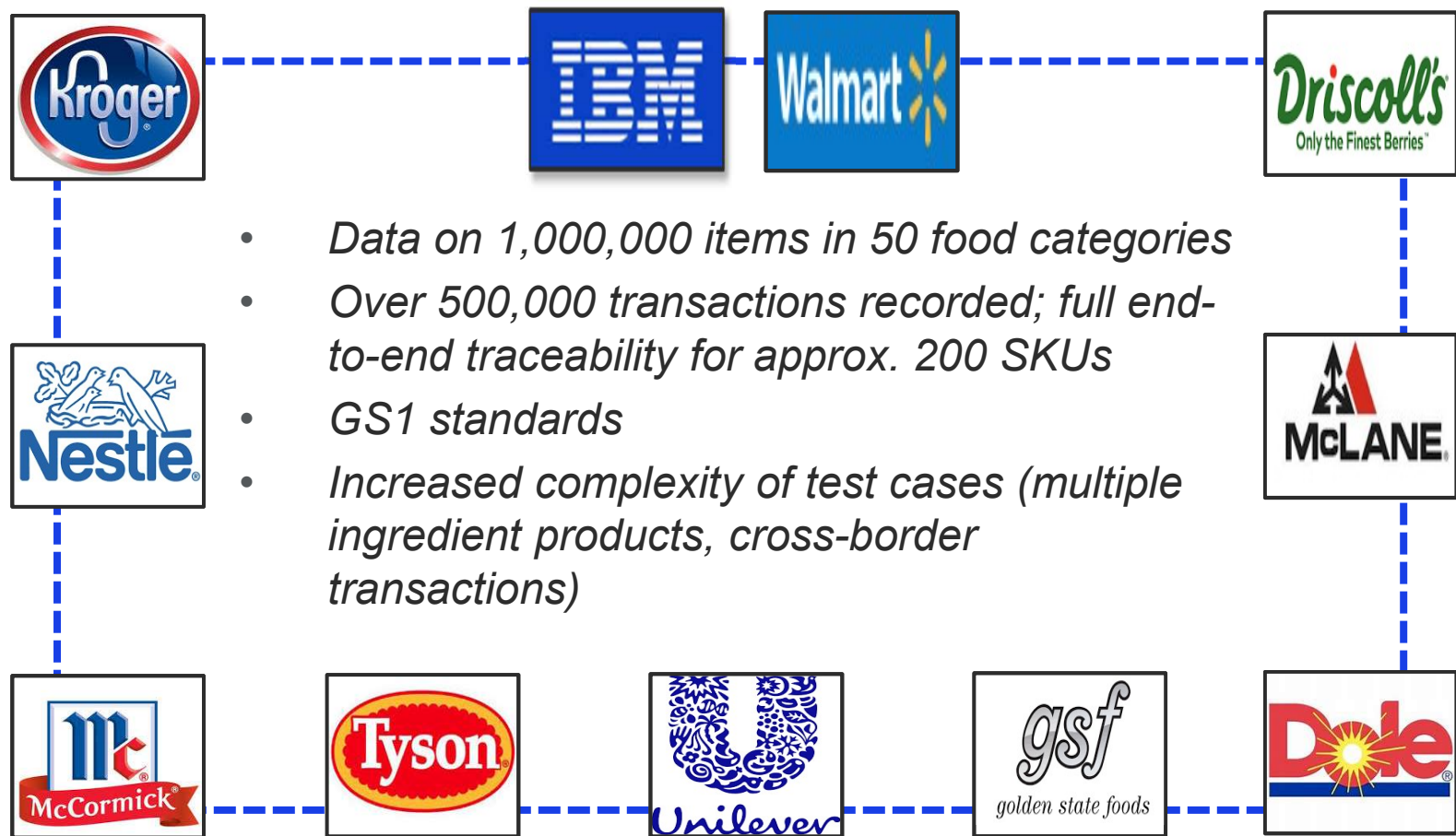
“... nearly half of our project was devoted to understanding and documenting our processes (and uncovering surprising friction points).”

Example: Tracing Mangos with Blockchain



IBM Food Trust: Food Traceability Solution

The Food Trust is a consortium of 10 major food suppliers working with IBM to build a blockchain-based system to create a farm-to-grocery view of the food supply chain.



Supply Chain Pilots: Commodities

Several pilots are seeking to track metals, precious stones and jewelry on blockchains. These pilots may pave the way for eventual integration with the manufacturing sector.

 Minerac	 TrustChain	 TRACR
❖ Consortium of mining companies and banks ❖ Ethereum-based platform for secure exchange of critical trade documents ❖ Launched with Open Mineral, a metal concentrates exchange	❖ Consortium of jewelry retailers, metal refiners and manufacturers ❖ Permissioned blockchain based on Hyperledger Fabric ❖ Seeks to track diamonds and metals from “mine to market”	❖ Pilot tracked 100 high-value diamonds from mine to retailer ❖ Developed with five leading diamond manufacturers ❖ Seeks to enhance consumer trust in “conflict-free” diamonds

Maritime Shipping: TradeLens

Launched in January 2018, TradeLens seeks to leverage blockchain to provide more efficient and secure systems for tracking global supply chains. As of August 2018, 94 firms have signed up to use the platform.

The TradeLens logo features the word "TRADE" in a bold, sans-serif font, followed by a small orange square with a white plus sign, and then the word "LENS" in the same font.The IBM logo is the word "IBM" in a bold, blue, sans-serif font.

- TradeLens platform is built on IBM Blockchain using Hyperledger Fabric
- Jointly developed by a collaboration team of Maersk and IBM employees
- Maersk engages TradeLens through a subsidiary to ensure independence from other Maersk business units
- IBM hosts, operates and supports the platform
- IBM and Maersk jointly own the IP and independently market, sell and contract TradeLens through their own sales channels

Customs and Ports

Several port authorities around the globe have begun to implement blockchain pilots for managing port clearance, shipping and handling documentation.



“Really what the government’s trying to do is twofold: One is to help blockchain along in a healthy manner for increasing market adoption, and the other thing is we’re trying to prepare ourselves in a proactive way to be ready for when private industry begins to really take off with this technology.” – U.S. Customs official, August 2018



Oct. 2018 – Port of Valencia announces “smart port” initiative using blockchain and AI.



Sept. 2018 – APMEM JV seeks to apply blockchain, AI to port clearance systems in Shanghai.



June 2018 – Port of Antwerp joins blockchain pilot with New Zealand fruit/vegetable importer.



Sept. 2018 – S. Korea to use Samsung Nexledger blockchain for customs clearance system.



June 2018 – Denmark intends to use blockchain to register ships in Danish ship registers.



June 2018 – Abu Dhabi Ports to deploy blockchain developed by Dubai Digital Innovation Lab.

Anti-trust Concerns



FEDERAL TRADE COMMISSION
PROTECTING AMERICA'S CONSUMERS

As blockchain enterprise consortia begin to deploy production level solutions, anti-trust concerns are likely to arise.

Antitrust Guidelines for Collaborations Among Competitors

Nature of the Agreement

- ✓ **Define relevant markets and calculate market shares and concentration.**
- ✓ Is the relevant agreement **reasonably necessary to achieve procompetitive benefits** that likely would offset anticompetitive harms?
- ✓ “An agreement also may increase the likelihood of an exercise of market power by **facilitating explicit or tacit collusion**, either through facilitating practices such as an exchange of competitively sensitive information or through increased market concentration.”

R&D Collaborations

- ✓ **“Most such agreements are procompetitive ... Joint R&D agreements, however, can create or increase market power or facilitate its exercise by **limiting independent decision making or by combining ... control over competitively significant assets**”**
- ✓ **“[T]he sharing of information** related to a market in which the collaboration operates or in which the participants are actual or potential competitors **may increase the likelihood of collusion on ... price, output, or other competitively sensitive variables.**”

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