Building the Chain: Beyond the Basics of Blockchain Technology

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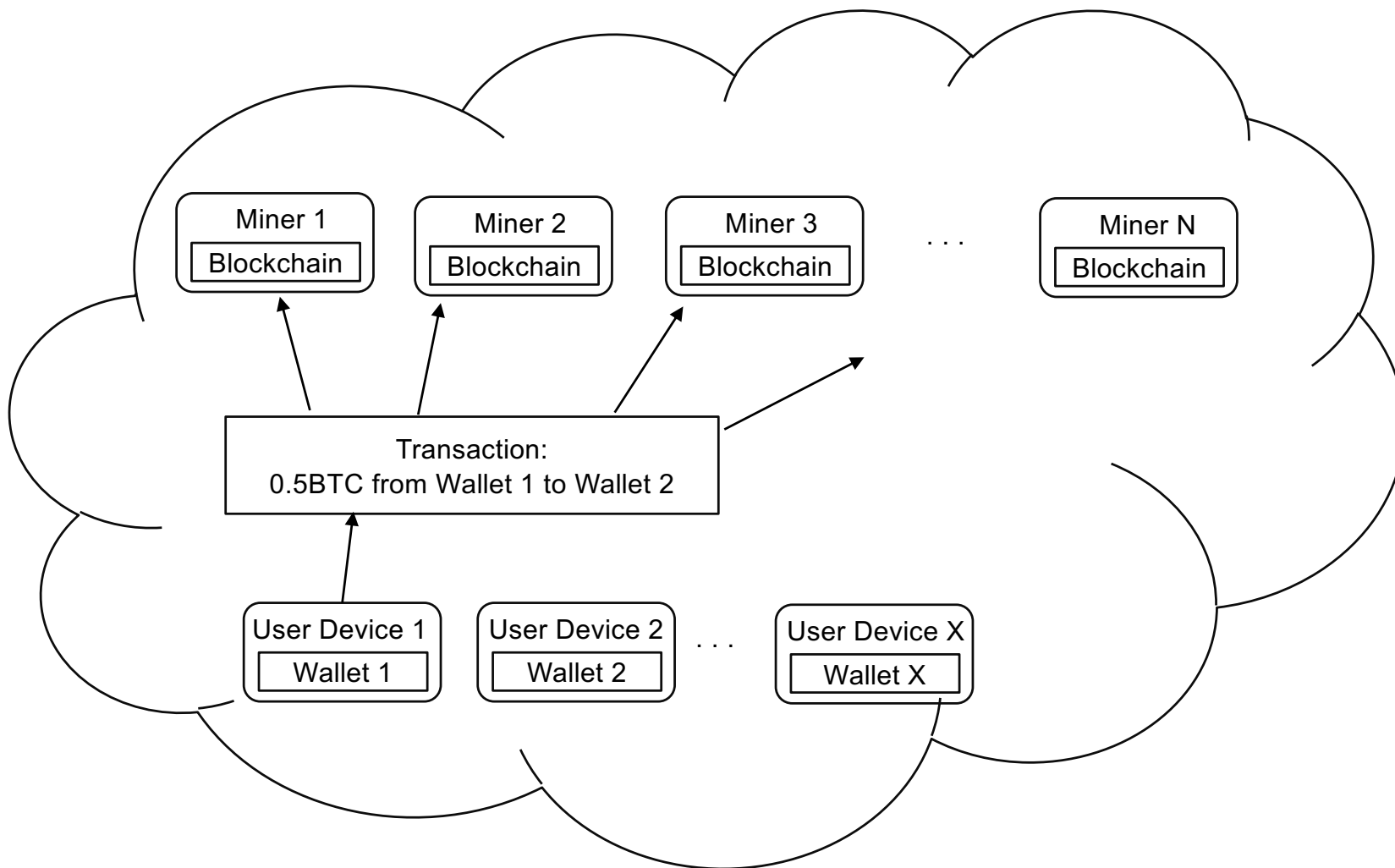Nasdaq, Inc.

Agenda

1. What is Blockchain?
2. Regulatory Update
3. Crypto Update
4. When to Consider Blockchain?
5. Blockchain in Real Estate
6. Blockchain in Consumer Lending
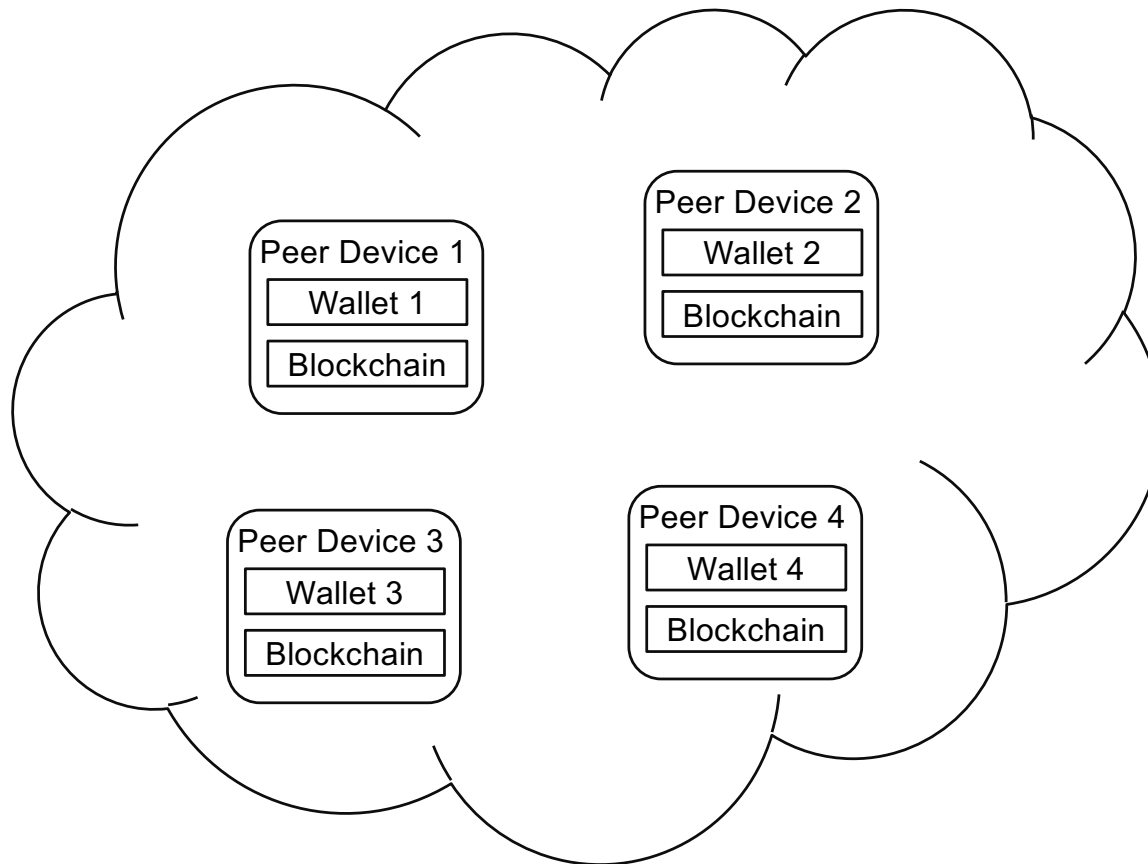7. Blockchain in Supply Chain
8. Questions?

What is Blockchain?

➢ Generally, blockchain is a distributed ledger that:

- records transactions (arranged in "blocks" - "chained" together);
- is replicated across a peer-to-peer network in real-time;
- uses cryptography to prove identity and control access; and
- is immutable (i.e., it's difficult to change historical records).

➢ There are many distinct blockchain platforms / implementations.

- Have varying degrees of centralization / permissions.
- Some allow for smart contracts and/or other applications ("dApps").

HYPERLEDGER   E O S™   ethereum   c•rda

Decentralized / No-Trust Blockchain Example

Miner 1
Blockchain

Miner 2
Blockchain

Miner 3
Blockchain

. . .

Miner N
Blockchain

Transaction:
0.5BTC from Wallet 1 to Wallet 2

User Device 1
Wallet 1

User Device 2
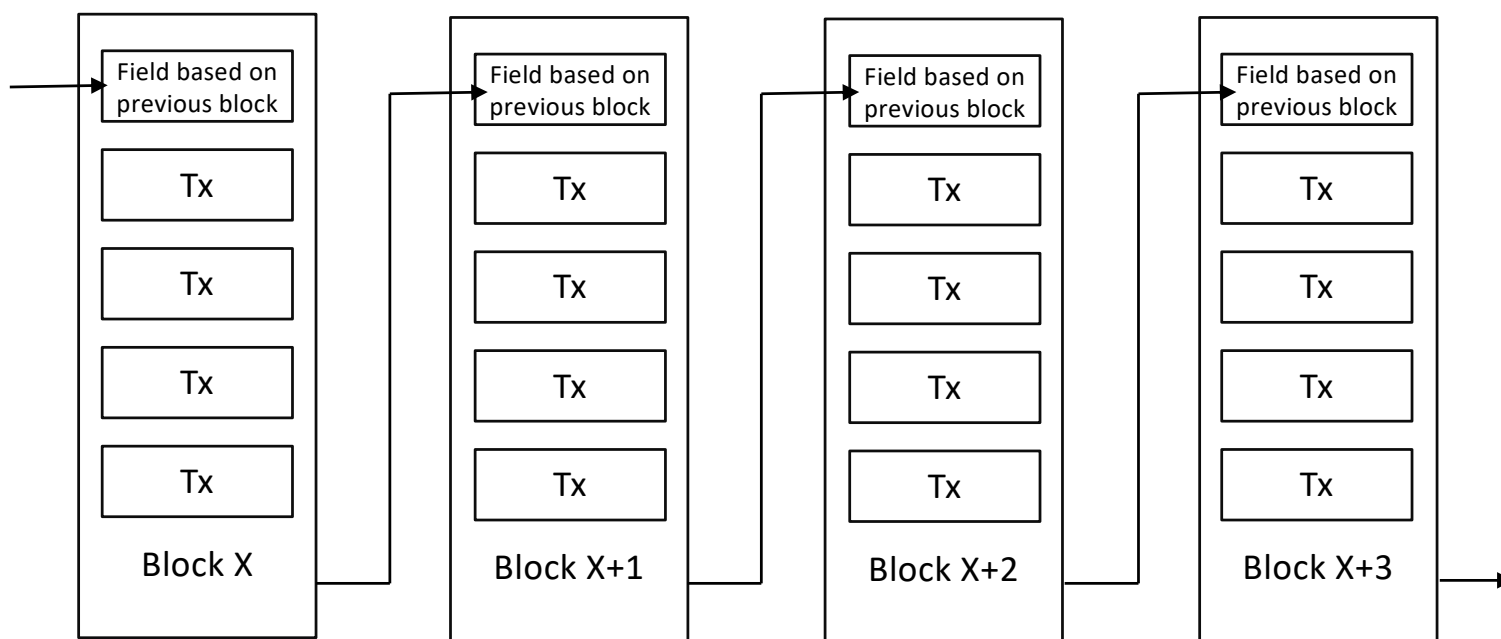Wallet 2

. . .

User Device X
Wallet X

Semi-Centralized / Semi-Trust Blockchain Examples

➢ Consensus algorithms may use concepts such as voting and round-robin assignments.

Immutability and Why It's Called "Blockchain"

Block X	Block X+1	Block X+2	Block X+3
Field based on previous block	Field based on previous block	Field based on previous block	Field based on previous block
Tx	Tx	Tx	Tx
Tx	Tx	Tx	Tx
Tx	Tx	Tx	Tx
Tx	Tx	Tx	Tx

When to Consider Blockchain?

Factors to consider:

➤ Are there multiple writers?

➤ Trust:

- Are all writers known?
- Are all writers fully trusted?

➤ Technical considerations:

- Amount of data
- Speed

What is a Digital Token?

➢ **Tokenization** is the process of creating a digital representation, or "token," of the rights to an asset.

- Tokenized assets can exist and be traded on a blockchain.

- You get all the benefits of blockchain (immutability, transparency, immediacy, trust, fractional ownership).

- But, tokenizing a physical asset is imperfect. For example, what happens if the physical asset is destroyed but the digital token is immutable?

➢ There are many types of tokens: Utility Tokens; Security Tokens; Currency Tokens; Asset Tokens…

TOKEN

TOKENIZATION SIMPLIFIED
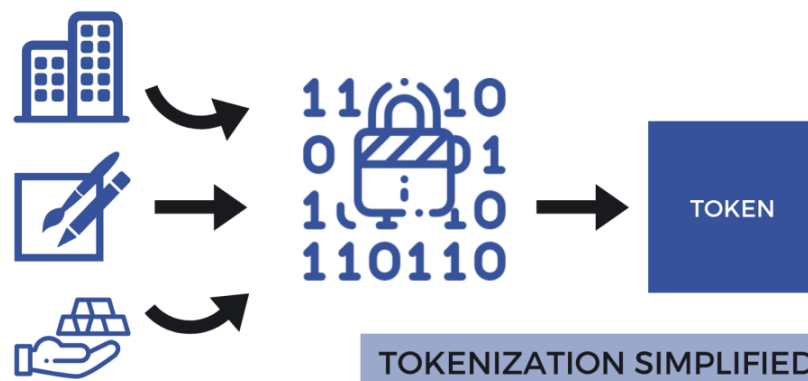
What is the Internet of Things?

➢ **IoT is as a network of connected devices with 1) unique identifiers in the form of an IP address which 2) have embedded technologies or are equiped with technologies that enable them to sense, gather data and communicate about the environment in which they reside and/or themselves.**
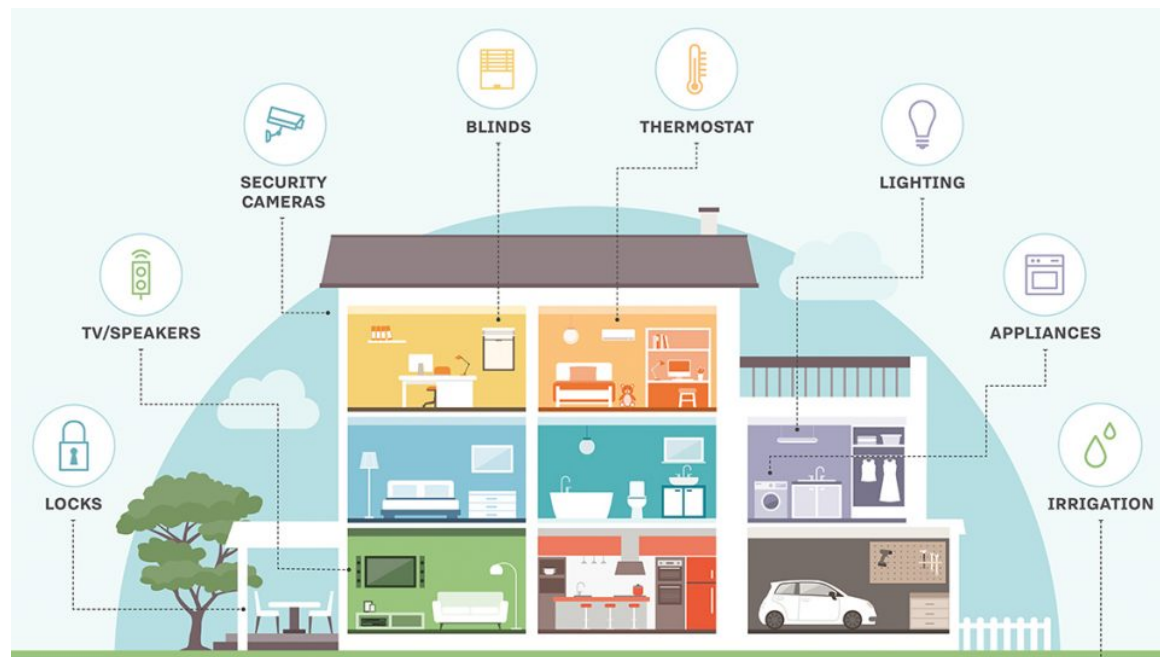
Blockchain Regulatory Update

➢ SEC Framework for "Investment Contract" Analysis of Digital Assets (April 3, 2019

➢ Application of FinCEN's Regulations to Certain Business Models Involving Convertible Currencies (May 9, 2019)

➢ A Framework for OFAC Compliance Commitments (May 2, 2019)

➢ NYAG Enforcement Against Bitfinex (April 25, 2019)

➢ FinCEN's first action against a P2P Virtual Currency Exchanger for failure to file Suspicious Activity Reports (SARs) and Currency Transaction Reports (CTRs) (April 18, 2019)

➢ Colorado Digital Token Act (March 2019)

➢ Wyoming Legislation on Digital Assets (March 2019)

Regulation – Overview

➢ SEC – applies the *Howey* test to determine if digital tokens are securities; Bitcoin and Ether are not securities

➢ CFTC – digital tokens may be commodities or derivatives

➢ FinCEN – ICOs and crytpo-exchanges must register as Money Services Businesses.

➢ FTC – enforcement actions against fraudsters; formed the FTC Blockchain Working Group in March 2018

➢ IRS – virtual currency transactions are taxable as property.

➢ States – regulation varies depending on state law

➢ Congress – Committee hearings to learn more

Regulation – SEC

➢ Applies the *Howey* test for investment contracts when determining whether a token is a security:

- an investment of money

- in a common enterprise

- with a reasonable expectation of profits

- to be derived from the entrepreneurial or managerial efforts of others.

➢ Has distinguished certain cryptocurrencies, like Bitcoin, as not being securities

➢ Other cryptocurrencies and digital assets are evaluated on a case by case basis

➢ Staff has issued numerous interpretive guidance documents

Regulation – CFTC

➢ In 2014, the CFTC declared virtual currencies to be a "commodity" subject to oversight under its authority under the Commodity Exchange Act

➢ Clarified in 2017 that virtual tokens may be commodities or derivatives contracts depending on the particular facts and circumstances

➢ Since 2014, the CFTC has taken action against unregistered Bitcoin futures exchanges (BitFinex), enforced the laws prohibiting wash trading and prearranged trades on a derivatives platform and issued proposed guidance on what is a derivative market and what is a spot market in the virtual currency context

Regulation – FinCEN

➢ The Treasury's Financial Crimes Enforcement Network (FinCEN) monitors Bitcoin and other virtual currency transfers for anti-money laundering purposes

➢ In May 2019 FinCEN issued two new interpretive guidance documents on convertible virtual currency (CVC):

- Discusses regulations concerning money transmission activities, including trading platforms, digital wallet services, electronic terminals, payment processors and online casinos
- Clear concern about potential of CVC to facilitate money laundering

Regulation – FTC

➢ Established the FTC Blockchain Working Group in March 2018.

➢ The FTC has prosecuted several cryptocurrency-related cases since 2015

➢ For example, the FTC brought a case against Butterfly Labs alleging that the company charged consumers thousands of dollars for its Bitcoin mining machines, but then failed to deliver the computers until they were practically useless, or in many cases, did not provide the computers at all

➢ ◦In another FTC case, an app company allegedly claimed that its "Prized" mobile phone app was a rewards program, but in fact the app used devices' computing resources to "mine" for virtual currencies like DogeCoin, LiteCoin and QuarkCoin

Regulation – IRS

➢ "Virtual currency transactions are taxable by law just like transactions in any other property"

➢ General tax principles that apply to property transactions apply to transactions using virtual currency

➢ That means you pay the long-term capital rate (typically 20%) if you sold it after a year, or the ordinary income rate if you sold it before then

➢ In 2017, the IRS subpoenaed CoinBase for over 14,000 user data files

Regulation – Other

➢ States and private plaintiffs are beginning to sue ICOs in greater number

➢ Foreign governments have varying positions on tokens and cryptocurrencies

- Some are moving to ban cryptoassets
- Others are encouraging innovation and even attempting to create national cryptocurrencies

➢ Congress has held numerous hearings on token offerings, cryptocurrencies and other blockchain applications, like supply chain

Crypto Update

➢ First Generation: Initial Coin Offerings

- Many did not comply with securities laws and were subject of SEC interest

➢ Second Generation: Security Token Offerings

- Structured to comply with securities laws

➢ Next Generation: Initial Exchange Offerings

- Involve crypto exchange in marketing efforts to stimulate demand and improve liquidity
- Renewed concerns about SEC compliance

Practical Applications of Blockchain

➢ Initial blockchain applications were developed for finance and banking, but financial transactions are just one type of transaction that can be recorded and settled using blockchain

➢ Combination of smart contracts operating on a blockchain permanently record and secure the automated transactions

"What the Internet did for communications, I think blockchain will do for trusted transactions."

Ginni Rometty
Chair, President and CEO of IBM

Blockchain in Real Estate

- **Title/Land Records**

- **Escrow Services**

- **Loan Securitization**

- **Tokenization of Interests in Real Estate**
  - How it works?
  - Challenges?
  - Securities Laws?

Real Estate Tokenization

- Switch from manually-managed cap table to automated

- Automate compliance restrictions

- Ease international investment

- Create liquidity

- Unlock new structures
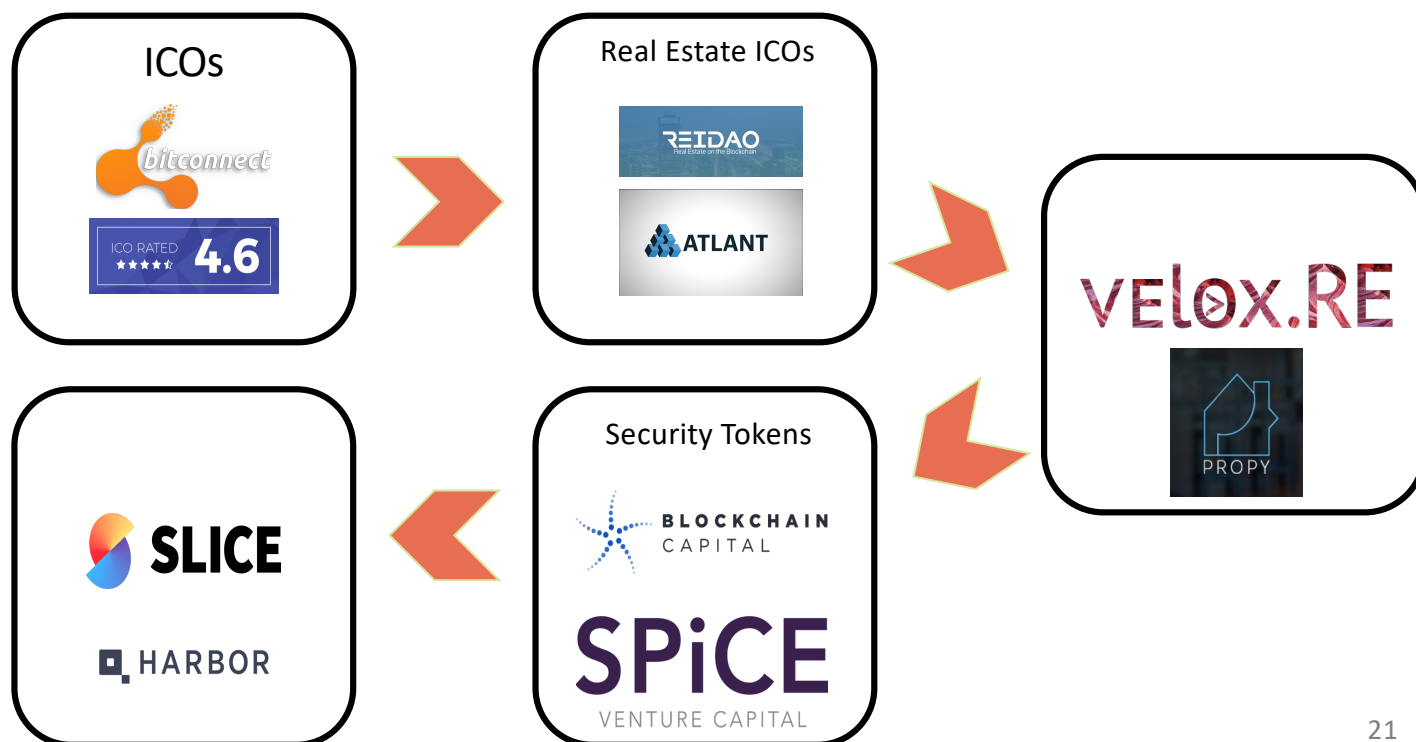
Case Study: Slice

➢ **Slice Manhattan One**

➢ **NYC Ground-Up Development**

➢ **Built by HAP**

➢ **Tokenization Process**

➢ **International Token Distribution**

➢ **Lessons Learned**

- Early

- Education

- Liquidity

Case Study: Propellr

- **Thirteen East+West**

- **Two-Token Waterfall**

- **Equity + Debt**

- **Propellr History**

- **Lessons Learned**

  - Market Maturity

  - Education

  - Experience

Case Study: Harbor

- ➢ **The Hub at Columbia**
- ➢ **Structure**
- ➢ **Harbor History**
- ➢ **Partners**
- ➢ **Lessons Learned**
  - • Pre-selling
 - • Team
  - • Timing

Challenges to Real Estate Tokenization

➢ **Creating an active and centralized marketplace where investments will not trade at a significant discount to NAV**

➢ **Unproven advantages to investors and deal sponsors**

➢ **Securities laws limit liquidity of tokenized investments**

- Interests in RE would represent security tokens, and thus must be registered with the SEC or qualify for an exemption, typically under Rule 506(b)

- Private offerings limit "public solicitation", though recent crowd funding rules like 506(c) and Reg A/A+ have made investment in RE more accessible under certain conditions

- Private offerings are typically illiquid and held to maturity

Consumer Lending: Figure

➢ **Figure's mission** is "to build and promote innovative financial products on blockchain that benefit consumers and eliminate rent-seeking, illiquidity and other inefficiencies present in current financial markets"

➢ **Figure Home Equity Loan Plus product**
  • Fixed-rate loan collateralized by home equity
  • Online approval in as little as 5 minutes and funding in 5 days
  • Originated $59 million in HELOCs in April 2019
  • Runs on Provenance blockchain, leveraging security and efficiencies of blockchain for loan origination, financing and sales
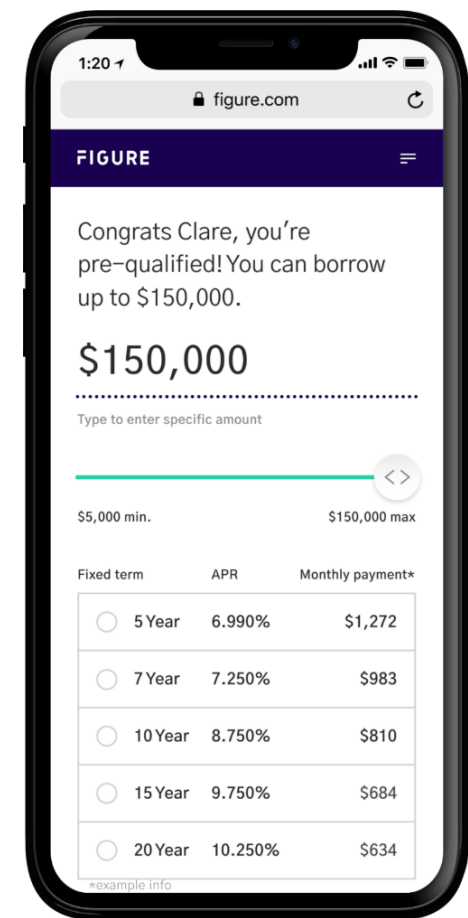
Consumer Lending: Figure

➢ **Figure has raised $120 million in venture capital financing**

➢ **In May 2019, completed $1 billion asset-based financing facility**
  - Can make periodic advances under a variable funding note secured by Figure HELOCs
  - Paves the way for future securitizations

➢ **Figure Home Advantage product**
  - Reverse mortgage product
  - Homeowner sells home to Figure and stays in place as renter
  - Figure covers most expenses, including property taxes, upkeep and insurance
  - Also runs on Provenance blockchain

Supply Chain Management

➢ **Permanent record of the journey of the assets**

➢ **Shared among all network participants**

➢ **Timestamped for real-time tracking of assets**

➢ **Smart contracts can automate approvals, paperwork and payments**
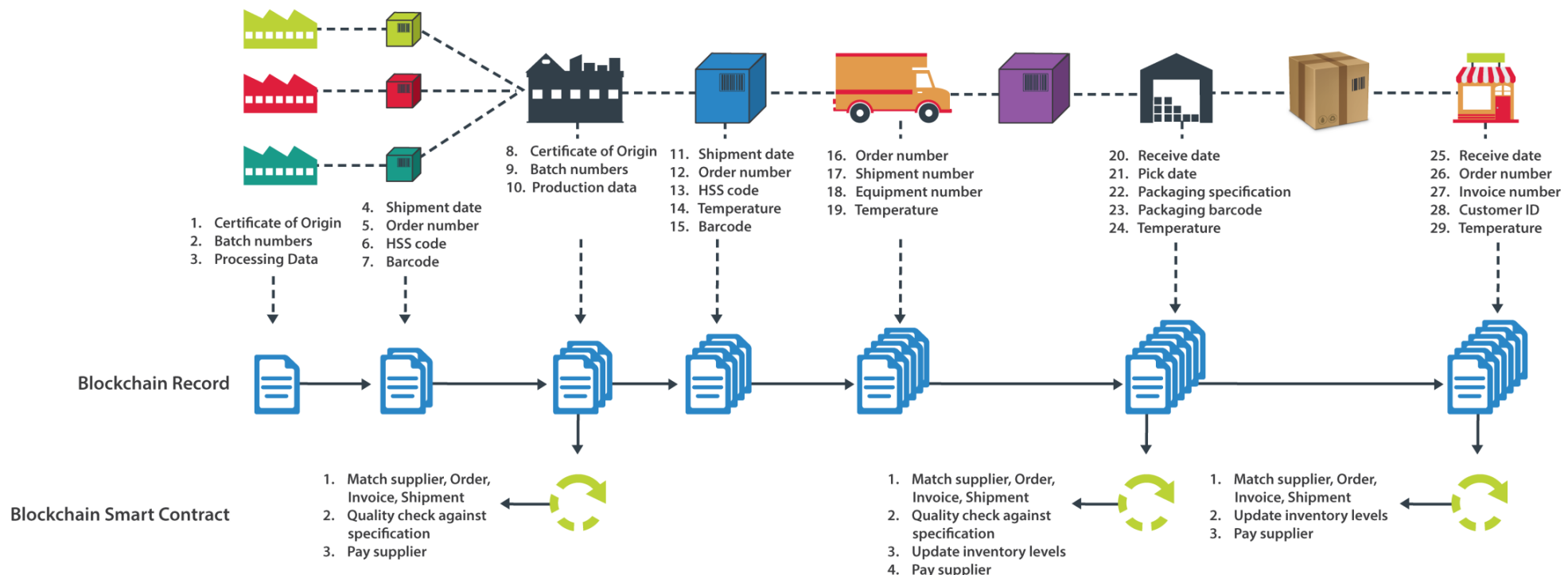
Source: Resolve Solution Partners

Food and Product Safety

➢ **Traces the origin and source of each item at retail**

➢ **Faster identification of contaminated or defective products**

➢ **Detailed info follows the product: farm/factory origin, batch numbers, processing data, expiration dates, storage temperatures, shipping details, etc.**

Source: Resolve Solution Partners
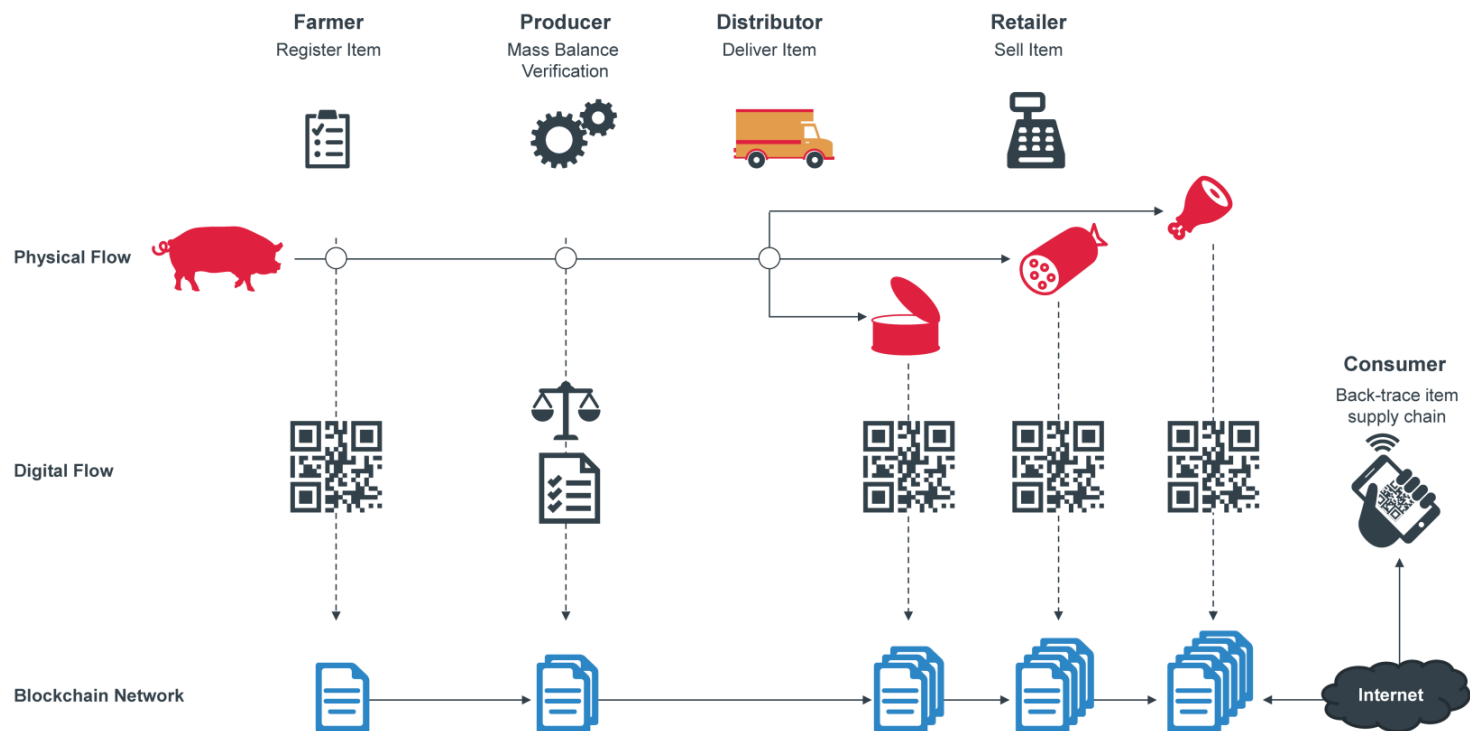
Challenges to Implementation

Scalability

Upfront CapEx

Data Migration: Garbage In, Garbage Out

Enterprise Blockchain Governance
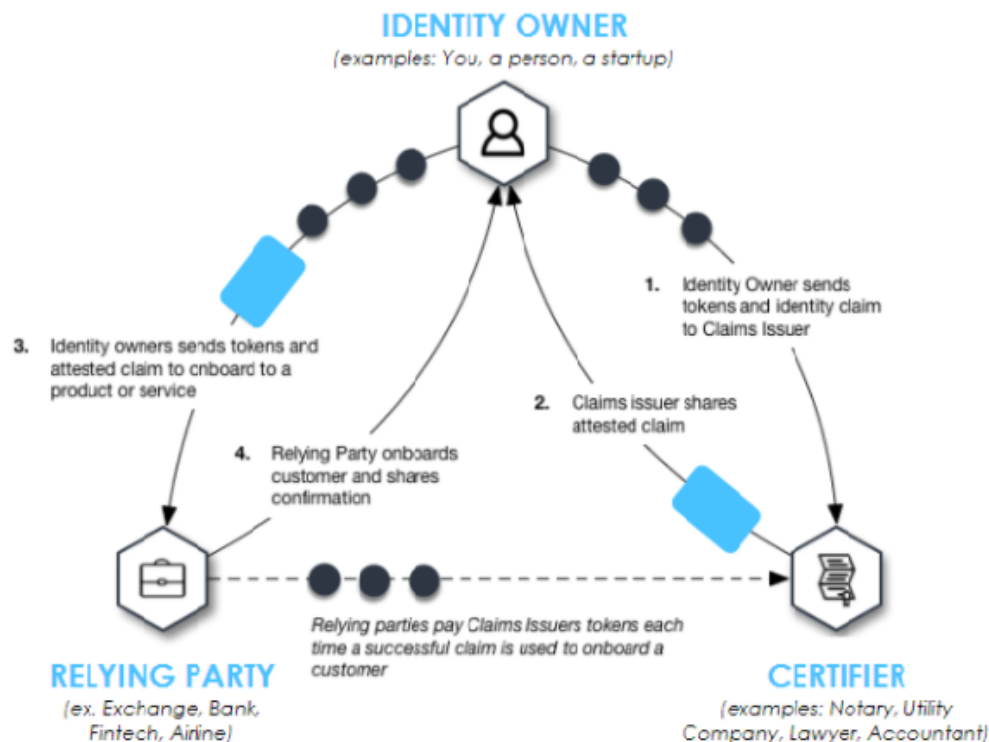
Lag in Regulation

Competition vs. Cooperation

…Other?

Legal Issue Spotting

Issue	Considerations
Immutability	• One of blockchain's biggest advantages also makes it extremely difficult to correct an erroneous record. • Method in place to detect/correct errors? • Safeguards to ensure veracity of the record?
Decentralization	• How do you manage/oversee each entity in the network? • Separate agreements with parties able to add to the record?
Governance	• Two levels of governance: (1) the rules of the system and (2) how the rules of the system are created/enforced. • What level of control does your business require?
Backup	• What happens in a system failure? • How easy is it to gain access to the record?
Accountability	• When no single player is in control, who is held accountable for failures and losses?
Regulations	• How will existing regulations in your industry treat a blockchain-based system?

Identity Management

➢ **Self-Sovereign Identity** – an identity and personal data that is fully controlled and maintained personally by the individual

- Potential to create a tamper-proof reference point to verify personal data without having to expose the actual data to a service provider
- A tokenized identity is verifiable by designated blockchain participants

➢ **Identity fraud** is similarly hampered by the fact that blockchain is inherently resistant to tampering

IDENTITY OWNER
(examples: You, a person, a startup)

1. Identity Owner sends tokens and identity claim to Claims Issuer

2. Claims issuer shares attested claim

3. Identity owners sends tokens and attested claim to onboard to a product or service

4. Relying Party onboards customer and shares confirmation

Relying parties pay Claims Issuers tokens each time a successful claim is used to onboard a customer

RELYING PARTY
(ex. Exchange, Bank, Fintech, Airline)

CERTIFIER
(examples: Notary, Utility Company, Lawyer, Accountant)

Energy

➢ **Brooklyn Microgrid:**
utility grid connects people who have solar panels on their roofs in several parts of Brooklyn with neighbors who want to buy locally generated green energy


President ST, Park slope, Brooklyn

➢ **Commodity Trading:** Vakt is a blockchain-driven energy commodity trading platform created by BP, Shell and Equinor along with major banks

➢ **Demand Response & Grid Management:** Leap is a startup in CA that secured a contract with the state's utilities to provide 90MW of demand response capacity

Consumer Confidence and Loyalty

➤ **Verify authenticity of rare and valuable products**

- Same concept as the supply chain and food safety uses
- Allows customers to scan barcodes in the retail environment and verify the origin and other key features of products

➤ **Consumer rewards programs**

- Issue, track and spend rewards points on blockchain
- Reduces balance of unspent or unused rewards
- Improve targeted communications based on individual behavior

loyyal

Healthcare

➤ Pharmaceuticals supply chain – MediLedger – built to the requirements of the U.S. Drug Supply Chain Security Act

➤ Testing applications for Electronic Medical Records

➤ Health insurance applications and payer administration

➤ Healthcare provider licensure and credentialing – being tested by Illinois with the Hashed Health consortium

➤ Revenue cycle management and fraud prevention
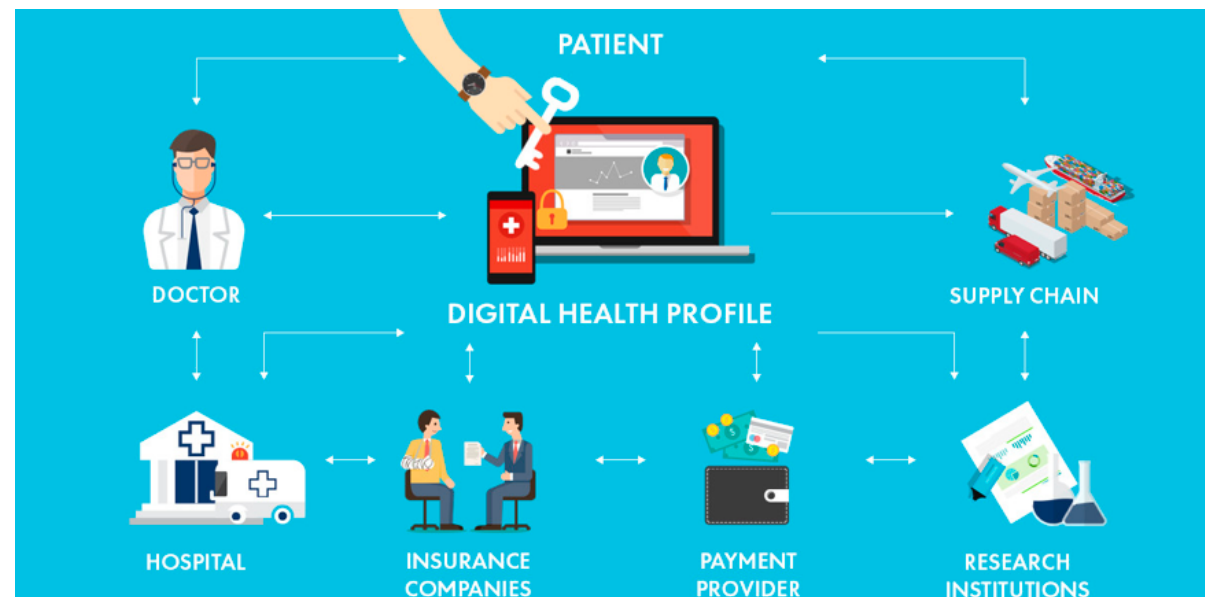
Source: medgadget.com

Government and Administrative

➢ **Register Title to Real Property Assets**

- Cook County Recorder of Deeds Blockchain Pilot Program – *"designed a blockchain real estate conveyance software workflow that can be a framework for the first legal blockchain conveyance in Illinois (and possibly the US)"*

➢ **UCC Filings and Other Records**

- Delaware Blockchain Initiative – "smart UCC" filings intended to (1) automate the release or renewal of UCC filings and related collateral, (2) increase the speed of searching UCC records, (3) reduce mistakes and fraud and (4) cut cost

➢ **Other applications like voting and ID verification**

Questions?

Stay up-to-date on notable legal and regulatory developments in the blockchain space at Hunton Andrews Kurth's blog, Blockchain Legal Resource.

https://www.blockchainlegalresource.com/