

How Blockchain Technology is Revolutionizing Business and the Law

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Agenda

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3. What is an ICO?
4. What are Smart Contracts?
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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).**

The practical consequence [...is...] for the first time, a way for one Internet user to transfer a unique piece of digital property to another Internet user, such that the transfer is guaranteed to be safe and secure, everyone knows that the transfer has taken place, and nobody can challenge the legitimacy of the transfer. The consequences of this breakthrough are hard to overstate.

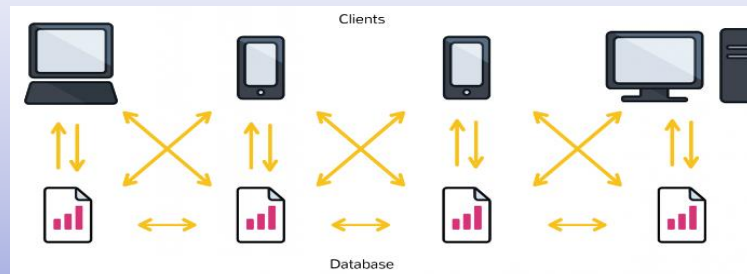
Marc Andreessen, entrepreneur, investor and software engineer and current or former director of Facebook, eBay and Hewlett Packard Enterprise

What is Blockchain?

**CRYPTOGRAPHIC
IDENTITY
(Public Key &
Private Key)**



**DISTRIBUTED
LEDGER
(Decentralized
Record of
Transactions)**



**Updates
P2P in
real time**

**NETWORK
SERVICING
PROTOCOL
(Rules Governing
the System)**

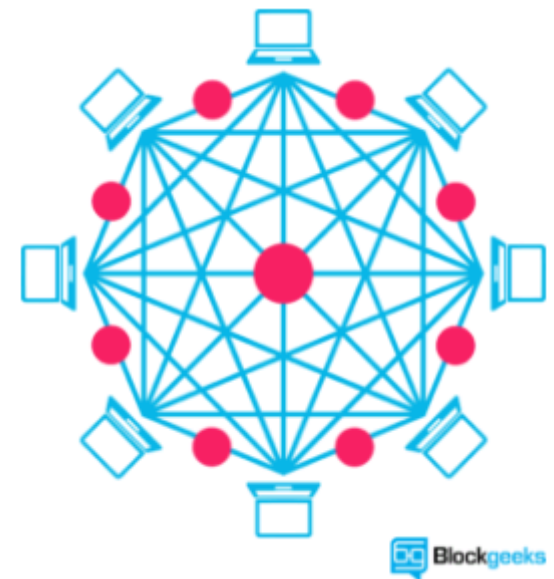
**Bitcoin
Ethereum
Ripple**

**Public
Private
Consortium**

**Proof of Work
Proof of Stake
Proof of Authority**

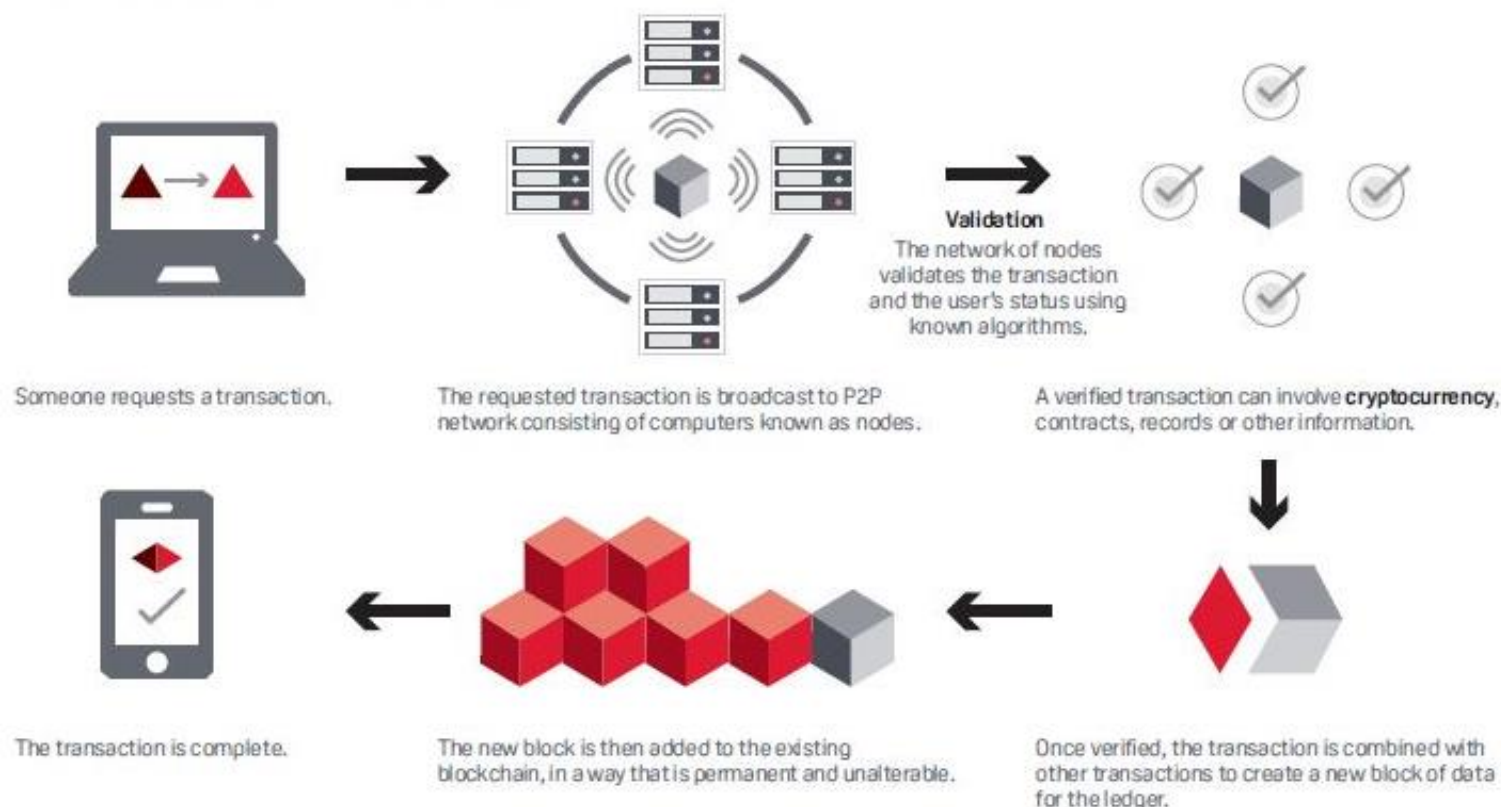
How Blockchain Works?

- A blockchain network is comprised of many **nodes**, each with a unique public/private key combination to validate and prove its identity.
- A node is a computer or device connected to the blockchain network using a client that performs the task of validating and relaying transactions.
- Each node gets a copy of the blockchain, which updates as each new block of transactions is added to the chain.
- A blockchain has no single point of failure and cannot be controlled by any single node.



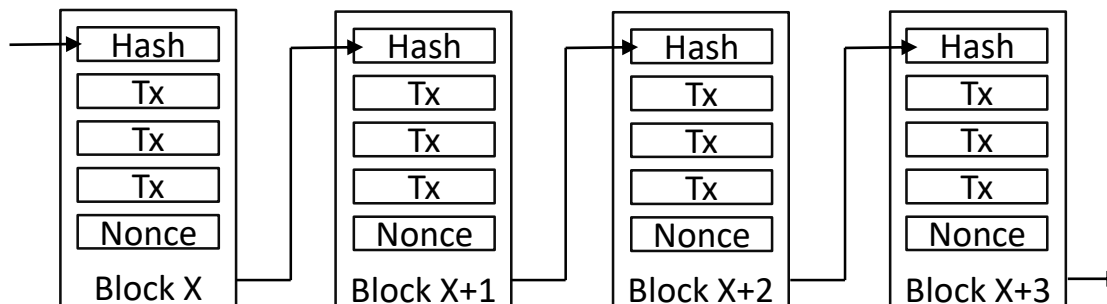
How Blockchain Works?

Each new transaction is checked against the decentralized record of every transaction that has ever taken place. Valid transactions are settled and recorded.



How Blockchain Works?

- Blockchain uses cryptographic hash functions to create a unique hash of each block.
 - One-way function: input cannot be derived from output, but output can be verified if input is known.
 - Small changes in input result in changes to output that are (generally) impossible to predict.
- Each block's hash is included in the subsequent block of data. This means one small change to any transaction would change that block's hash, rendering the record virtually tamper-proof.
- The process of forming new blocks of transactions and verifying the ledger is “mining.”



Types of Blockchains – Benefits

Blockchain lives in code and can be designed to meet the specific goals of a particular network.

Public/Permissionless

- Completely open and anyone can join and participate in the network.
- Typically has an incentivizing mechanism to encourage more participants to join the network.
- Bitcoin is one of the largest public blockchain networks in production today.
- Decentralized control over the network.

Private/Permissioned

- Requires an invitation and approval to join the network.
- Used for business enterprise solutions – like the IBM Food Safety Blockchain.
- Like a company's intranet site vs. its public internet site.
- Centralized control over the network.

What is Cryptocurrency?

- AKA “Digital Currency” and “Virtual Currency”
- IRS definition:
 - A digital representation of value that functions as a medium of exchange, a unit of account, and/or a store of value.
 - In some environments, it operates like ‘real’ currency, but it does not have legal tender status in the U.S.
 - Virtual currency that has an equivalent value in real currency, or that acts as a substitute for real currency, is referred to as “convertible” virtual currency.
 - Bitcoin is one example of a convertible virtual currency.
 - Bitcoin can be digitally traded between users and can be purchased for, or exchanged into, U.S. dollars, Euros, and other real or virtual currencies.

What is Bitcoin?

- Created in 2008 by a person or group that used the pseudonym “Satoshi Nakamoto.”
- Is “pseudonymous” (i.e., partially anonymous) in that an individual is identified by an alpha-numeric public key/address.
- Relies on cryptography for security based on public and private keys and complex mathematical algorithms.
- Runs on a decentralized peer-to-peer network of computers.
- By solving complicated mathematical problems, miners can earn new Bitcoin.
- Enables the transfer of ownership without the need for a central intermediary.



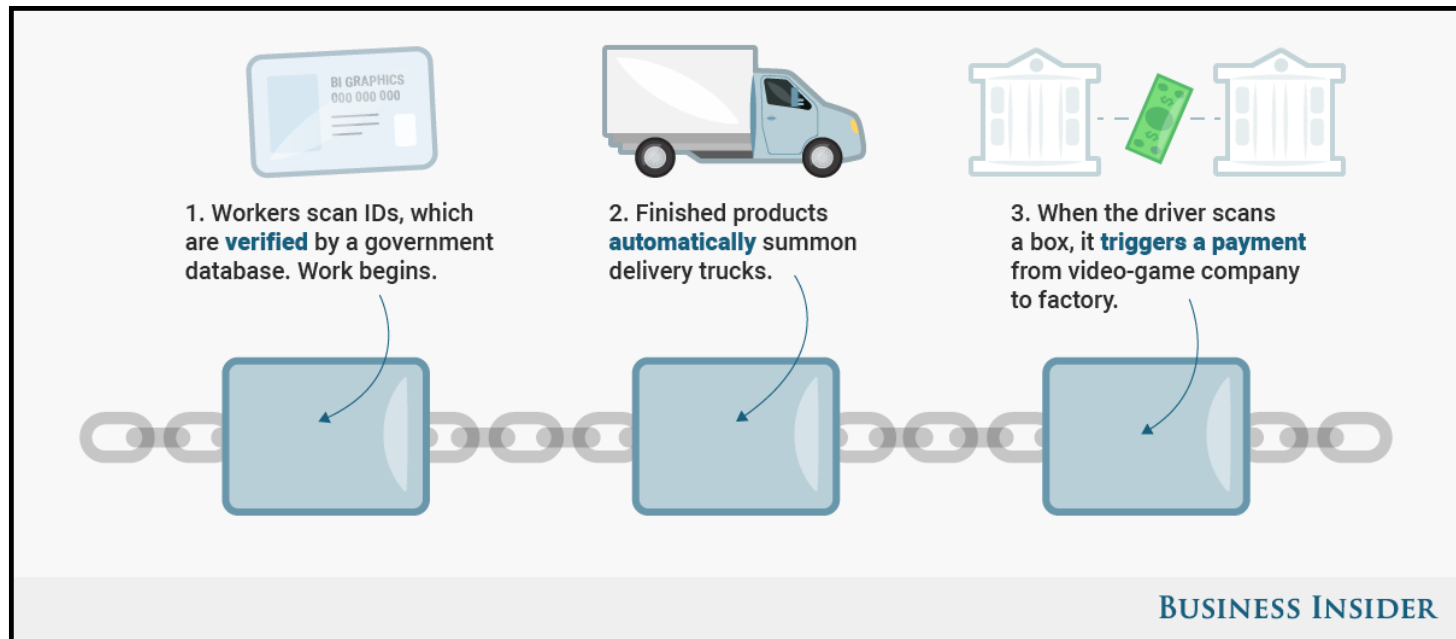
What is an ICO?

- Acronym for “Initial Coin Offering”
- Form of financing technique in which a company (typically operating in the digital currency space) makes a “token” available for sale.
- The token gives the purchaser some future right in the business or other benefit.
- ICO promoters prepare white paper describing token technology and market the offering on the basis of the white paper.



What are Smart Contracts?

- Computer code that automatically executes certain transactions triggered by predetermined inputs.
- Distinct from traditional legal contracts (i.e. offer, acceptance, consideration).
- Can't automatically execute transactions requiring discretion.

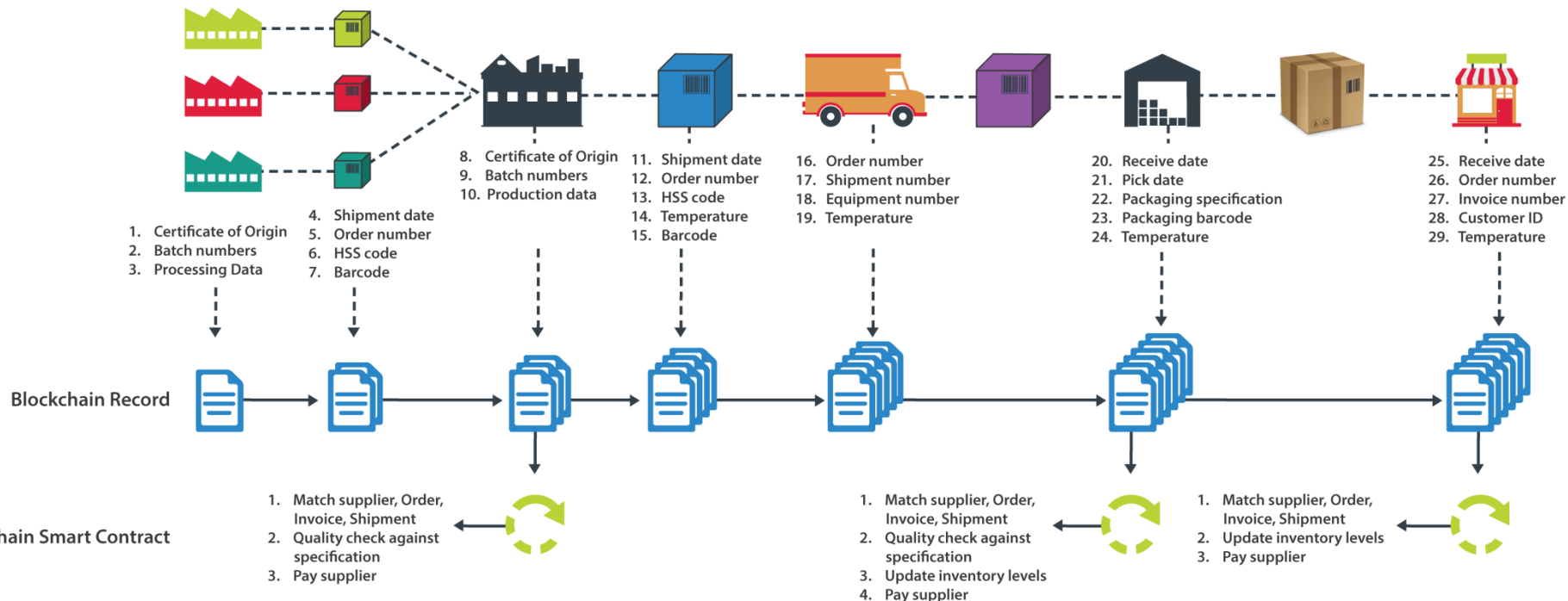


Practical Applications of Blockchain

- Initial blockchain applications were developed for finance and banking.
- Financial transactions are just one type of transaction that can be recorded and settled using blockchain.
- Blockchain solutions are being developed across industries to solve inefficient systems.
- Combination of smart contracts operating on a blockchain permanently record and secure the automated transactions.
- BUT – beware of the hype. It is not the solution for everything.

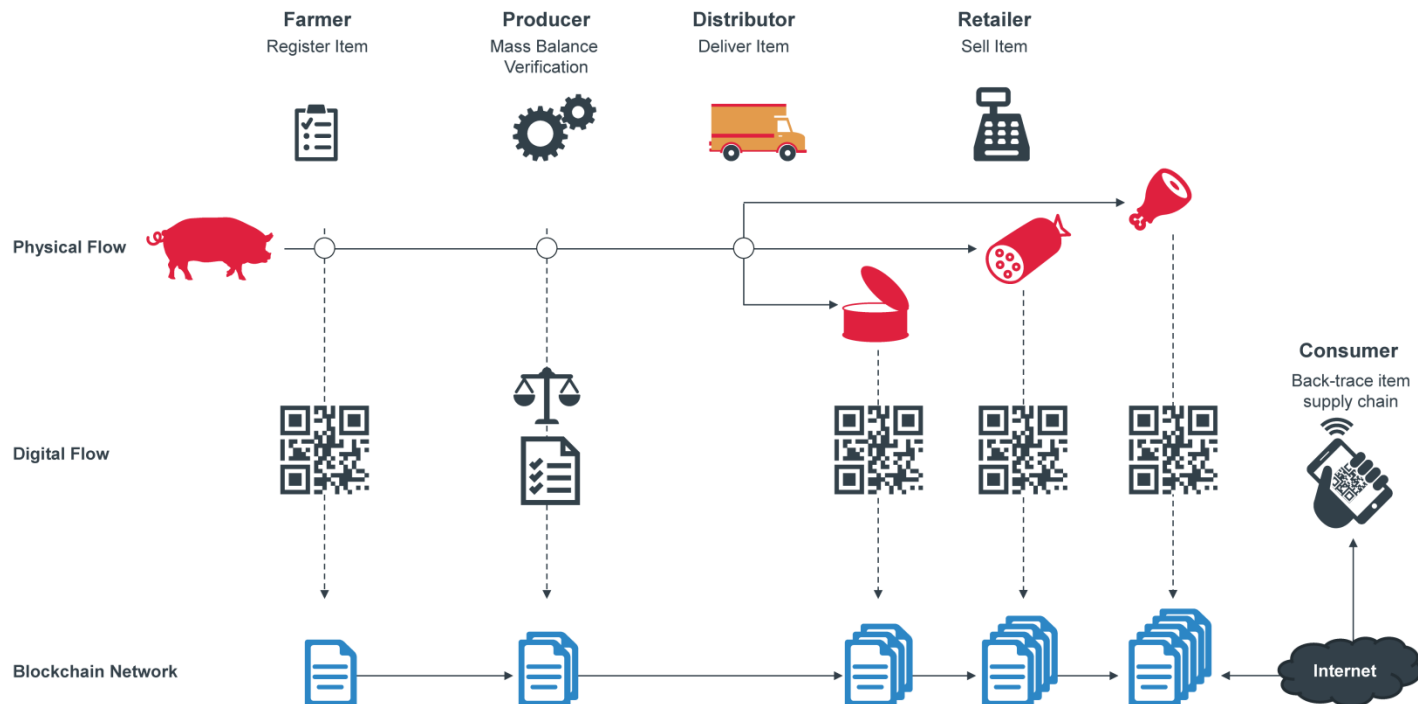
Supply Chain Management

- 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.



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.



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.

Energy

- Improved grid management.
 - Sun Pacific recently integrated blockchain into its renewable energy grid management.
- Peer-to-Peer Energy Trading.
 - Brooklyn Microgrid allows participants to generate, store, buy and sell energy at the local level.
- Energy Commodities Trading.
 - BP, Shell and Statoil are working on a blockchain-based digital platform for post-transaction management of physical energy commodities trading.

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.

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.
 - 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.

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.

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 March, FinCEN sent a letter to Senator Ron Wyden indicating that it will apply its regulations to individuals conducting ICOs.
 - Both developers and exchanges involved in the sale of an ICO-derived token would be liable to register as a money transmitter and comply with the relevant statutes around anti-money laundering (AML) and know-your-customer (KYC) rules.

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.

Privacy and Cybersecurity

- At a high level, concerns include:
 - Privacy and anonymity of information
 - Preserving data integrity
 - Cybersecurity risks and safeguards

- Blockchains may adopt varying levels of “permissions”
 - Permissioned blockchains allow for greater privacy
 - Bitcoin is an example of a “permissionless” blockchain

Privacy and Cybersecurity

- Data integrity is a key security risk that can be managed with blockchain technology
 - Data contained in a blockchain is unalterable
 - Data can only be added to a blockchain; it cannot be modified or removed
 - All systems maintaining the blockchain must agree on changes
 - Data stored in a blockchain can be encrypted as an added security layer

Privacy and Cybersecurity

- A key benefit of blockchain technology is its security
 - Blockchain is decentralized and transparent
 - These security features reduce blockchain technology's vulnerability to cyberattacks

- But key risks still exist
 - Vulnerabilities at the intermediary level—target of hacker attacks
 - Use of blockchain technology to facilitate cyberattacks (such as ransomware) by preserving a bad actor's anonymity

Questions?

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



<https://www.blockchainlegalresource.com/>

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