RAISING THE BAR

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What is Blockchain and Why is it Critical to the Future of Your Domestic and International Business?

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Overview

- Blockchain 101
  - What is it?
  - How does it work?
- Implementation
  - Potential uses
  - Potential advantages

Blockchain 101 – What is it?

- Blockchain technology is the architecture upon which “cryptocurrencies” and “smart contracts” are based
- At its core, it is a distributed, consensus-based, immutable, chronological ledger of data that relies upon cryptography to ensure its stability and security rather than the interference of a central authority

Blockchain 101 – What is it?

- "…distributed, consensus-based, immutable, **chronological ledger** of data…"
- Ledger
  - Transactions in a bank account
    - The central authority—the bank—has a ledger
    - The user—you—has a separate and likely different ledger
  - Credit card statement
    - Central authority—the issuer
    - Due to fraudulent or forgotten charges, user likely has a different list
  - Ordered chronologically

Blockchain 101 – What is it?

- "…**distributed**, consensus-based, immutable, chronological ledger of data…"
- Distributed
  - All users of the blockchain have access to the ledger
  - Each ledger is exactly the same
- "Permissioned" vs. "Permissionless"
  - The architecture of the particular blockchain used may allow for private (permissioned) or public (permissionless) access to the full blockchain, or may open only portions of it up to public view

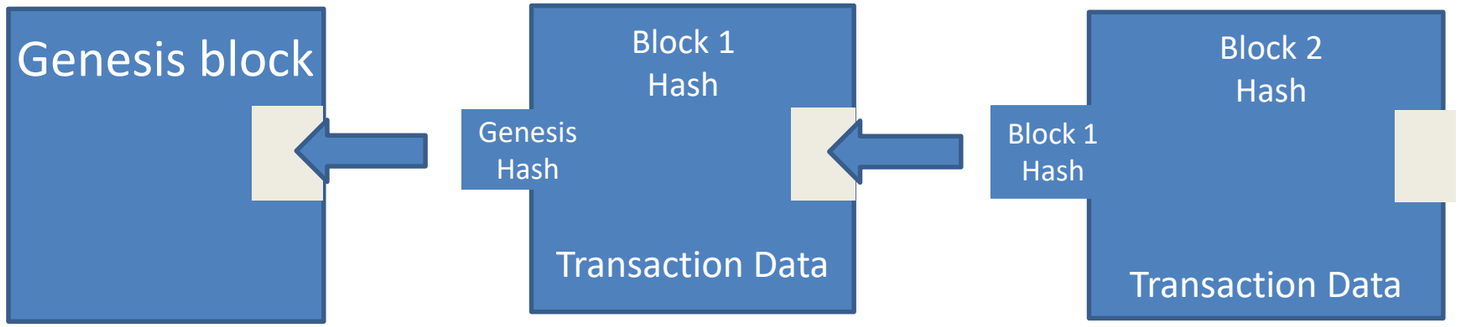
Blockchain 101 – What is it?

- "…distributed, consensus-based, **immutable**, chronological ledger of data…"
- Immutable
  - Once included in the blockchain, transactions cannot be changed
  - Blocks are permanent, even if they contain errors
  - Prevents fraud following the completion of a transaction

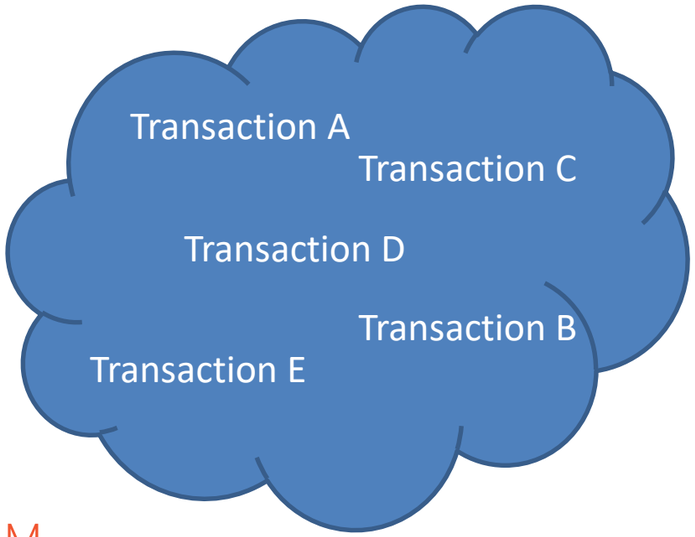
Blockchain 101 – What is it?

- "…distributed, **consensus-based**, immutable, chronological ledger of data…"
- Consensus-based
  - Participants in the blockchain build their shared ledgers together and therefore must agree as to the validity of each block that is added
  - Incentive for participants to perform verifiable work to build
  - No central authority makes authenticity decisions for the group — a majority rules
  - Scale of the blockchain (inability to manufacturer majority with increased size) enhances security

Blockchain 101 – How does it work?



Pool of Proposed Transactions



Nodes – Full, Mining, Lightweight

Blockchain 101 – How does it work?

- Consensus and conflicts
  - It is critical in a blockchain for all users to have the same blockchain; thus, all blockchains need some methodology (such as solving a puzzle) to create consensus
  - Every blockchain contains some mechanism for testing consensus
  - If participants propose blocks at the same time, different blocks could be accepted by different subsets of nodes, which must be avoided
  - Permissionless (public) blockchains incentivize consensus mechanisms — e.g., bitcoin mining. Permissioned (private) networks can set up own ways of validating transaction blocks and restrict users who determine consensus

Global Supply Chains Are About To Get Better, Thanks To Blockchain

Ethereum

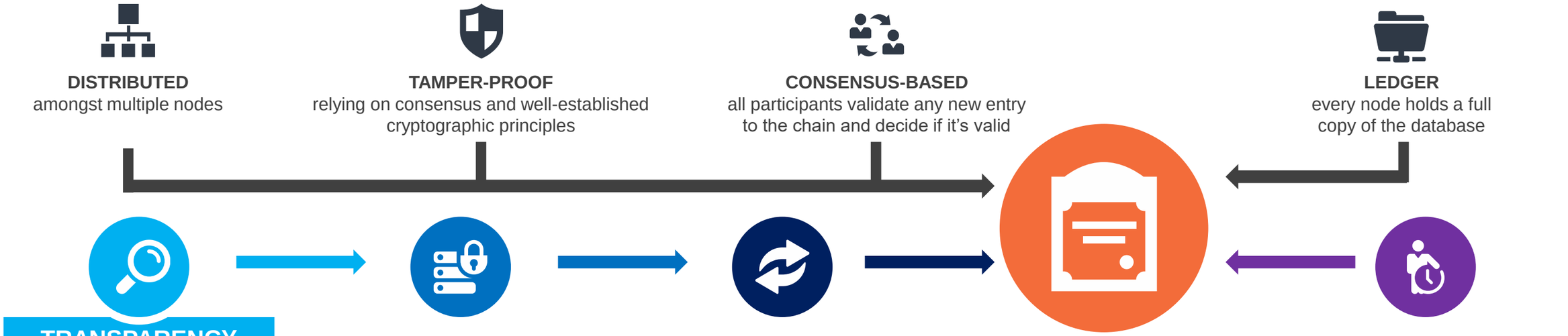
- Ethereum is most prominent public blockchain for smart contracts, providing a decentralized virtual machine to execute peer-to-peer contracts and utilizing nodes to maintain and update the database.

- Smart contracts are executed through internal codes in a contract account.

- When a transaction is sent to a contract account, users can create new smart contracts by deploying code to Ethereum.

The First Smart Contract

Smart Contracts Enabled Through A Blockchain By Being:



TRANSPARENCY

All Blockchain participants are able to view data added to the chain—while the chain improves data integrity by being the single source of truth—private data can be made visible only to participants as well.

TRUST

Blockchain's connected data blocks and distributed validation structure establishes trust between participants without them having to know one another.

DISINTERMEDIATION

By enabling transparency and trust, the Blockchain can fulfill the roles that intermediaries traditionally provide.

SMART CONTRACT ENABLED

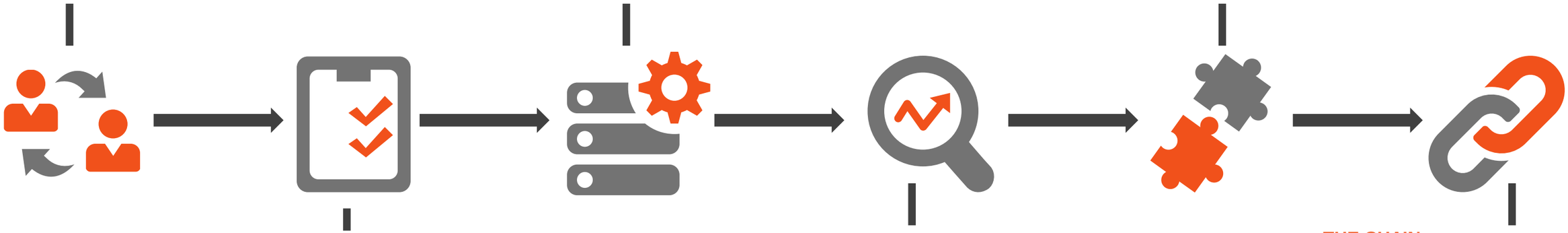
A smart contract is an executable program to trigger transfer of value and information under certain conditions—smart contracts can be developed, exchanged and automatically executed on decentralized systems.

AUDITABILITY

Blockchain records are immutable, timestamped and everlasting, creating an exhaustive means of record keeping.

Role Of The Smart Contract In A Blockchain Transaction

Once a transaction is posted on the network, several activities occur in order for that transaction to be processed and recorded on the blockchain



1 TRANSACTION
Two parties exchange data; this could represent money, contracts, deeds, medical records, customer details, etc.

2 VERIFICATION
Nodes smart contract determine if the transactions are valid based on a set of rules agreed to by the network.

3 STRUCTURE
All verified transactions within a specified time limit will be bundled together into a block for execution.

4 VALIDATION
Blocks must be validated to be added to the blockchain via a “consensus” mechanism.

5 MINING
Miners try to “solve” the block using a consensus mechanism to determine the block’s validity.

6 THE CHAIN
Once the block is distributed through the network and added, creating a secure, independent chain.

Law Applying to Smart Contracts

- Common Law of Contracts
- UETA — Uniform Electronic Transactions Act
- E-Sign — Electronic Signatures Recording Act
- State Laws — Arizona, Colorado, Delaware, Florida, Nebraska, New York, Nevada, Tennessee, Vermont, and Wyoming
- Federal Legislation — Senate Bill 1662

Code-Only vs. Complement/Supplement to Traditional Contract

- Smart contracts created and deployed without enforceable text-based contracts known as “code-only” contracts. The contract is reduced to executable code.

- To improve enforceability, a written contract would be embedded into a smart contract. *E.g.*, if flight insurance is purchased to insure against delays, the written contract would say what certain terms mean (like “delay”) or premium to pay, and actual payment would take place via the smart contract. Payout would be automatic once the pre-determined delay occurs.

- Years away from smart contracts being able to be used for subjective decisions (*e.g.*, a condition of best efforts or reasonable efforts by a party, whether an indemnity provision has been triggered and payment should be made, etc.)

Possible Disruptions in the Use of Smart Contracts

- Expert Needed to Write and Translate Code
- Enforcement of Consumer Smart Contracts
- Need for Court-Appointed Experts to Decipher
- Reliance on Off-Chain Resources
- Conflicts Between Smart Contract and Written Contract
- Ad Hoc Business Actions
- Complications of Amending or Terminating

Risk in Enforcement of Smart Contracts

- Jurisdiction
  - Questions surrounding enforceability and jurisdiction issues, specifically subject matter jurisdiction, diversity jurisdiction, personal jurisdiction, and federal question jurisdiction are present with smart contracts and best addressed in a text contract.
- Distributed Jurisdiction
- Dispute Resolution
  - Compelling case for customized dispute resolution mechanisms. Using smart contracts as a complement to a written contract is attractive because a traditional written contract can anticipate the need for subjectivity inherent in business relationships like mistakes, intent and standards of decision-making such as reasonableness, best efforts and materiality.

The “Key” — Authenticity and Auditing

- Authentication is provided in the form of an unforgettable digital structure.
- A digital key required per interaction. Owner must cryptographically prove ownership of the account. No way to interfere in this requirement being met.
- Because each individual operation is recorded and archived, auditing is achieved by participating in the blockchain. Allows participants to replay the input and operations to build model of transactions.

Franchising and Supply Chain Industry Use Cases

- **Digitizing warranties** for improved management
- Preventing trade of **stolen goods**
- Distributing and trading in **digital assets**

- Managing **registered IDs**
- Creating **secure voting platforms**
- **Time stamping** of certifications
- Impact on **human trafficking**

- **Transferring existing land deeds**
- **Migrating the land registry** onto a transparent, immutable ledger

- Verifying **media authenticity**
- Creating a **decentralized, shared economy**
- Transforming phones to **portable blockchain wallets**

- Managing devices such as **sensors**
- Enabling machinery to **autonomously manage service times** and supply schedules
- Creating transparency and **secure traceability of materials**

- Supporting seamless **cross currency transactions**
- Facilitating direct **peer-to-peer payments**

- Preventing **medical data forgery**
- Tracing and **preventing counterfeit pharmaceuticals**
- Creating and recording a person's **genetic map**

- **Integrating cryptocurrencies** into existing gas station infrastructure
- Enabling **oil commodities investment** trading in **carbon emissions**

What is a digital asset?

- A digital asset is a smart contract, which normally would be blockchain-enabled, representing something of value. The thing of value could include:
  - The ability to make payments generally (cryptocurrency)
  - Something representing an interest in a company or asset (security token)
  - The ability to use on a platform (utility token)
  - Establishing proof of identity or individual characteristics (identity token)
  - Combination of the above, or other uses

US securities law treatment of digital assets

- Has been a serious impediment to adoption
- Almost any virtual asset sold is currently deemed a security
- Use the Howey test along with new guidance for determination

The *Howey* test

1. an investment of money
2. in a common enterprise
3. with profits solely due to the efforts of others

Over time, some of these have been loosened

Current views in the US

- Bitcoin and Ethereum are not securities
- Turnkey Jet — Opens the door for permissioned virtual assets
- Ability to change characteristics over time
- Treasury deems some to be currency
- CFTC deems some to be commodities
- IRS deems all virtual assets to be property
- Internationally — many countries have more permissive regimes

Application of digital assets to franchisors and franchisees

- Means of raising capital
- Brand loyalty
- Identity and subscription confirmation
- Risk management
- Tokenized franchises
- Acceptance of cryptocurrency as payment