

2019 National Cyber Summit

Blockchain and Cryptocurrency Strategic Initiatives

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Agenda



Who Is This Course For?



Sonia Mundra

- President, Chenega Analytic Business Solutions (CABS)
- 8(a) Certified, Alaska Native Corp (ANC)
- Records Management & IT for Federal Government
- Based out of Lorton, VA
- Venturi local office here in HSV

Jonathan Hard

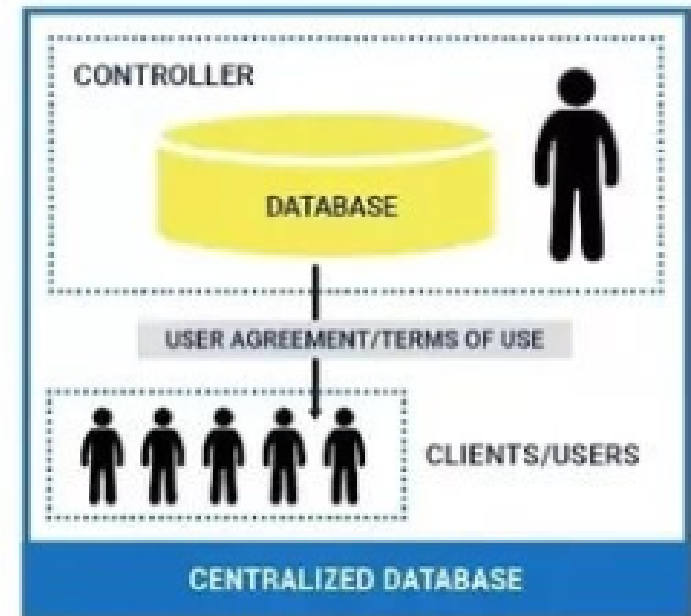
- President and CEO, H2L Solutions
- SDVOSB & HUBZone
- RMF, Pen Testing, IA and Threat Assessments
- Local to HSV

Key Terms

- **Blockchain**
 - A distributed (decentralized) database, and the new standard for storing data
- **Crypto(currency)**
 - Digital asset used as a medium of exchange
- **Bitcoin**
 - The most famous of cryptocurrencies
- **Initial Coin Offering (ICO)**
 - Method of raising capital by issuance of coins

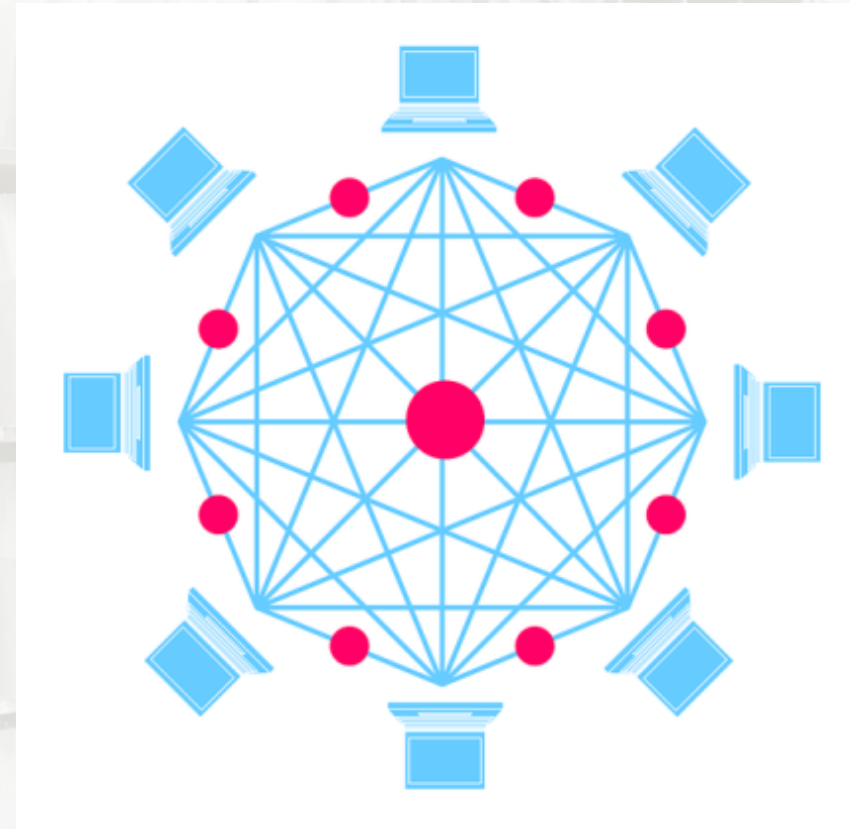
Traditional Storage Description

- Traditionally, data has been stored in a **centralized database** with a single (human) system administrator or **central authority**
- Centralized data warehouse storage is viewed as inferior to blockchain, because it has a **single point of failure**, which can be penetrated or hacked
- Databases with a **central authority** also require special skills of a system administrator, bank, lawyer or notary; **which increases both costs and time to market** for goods and services



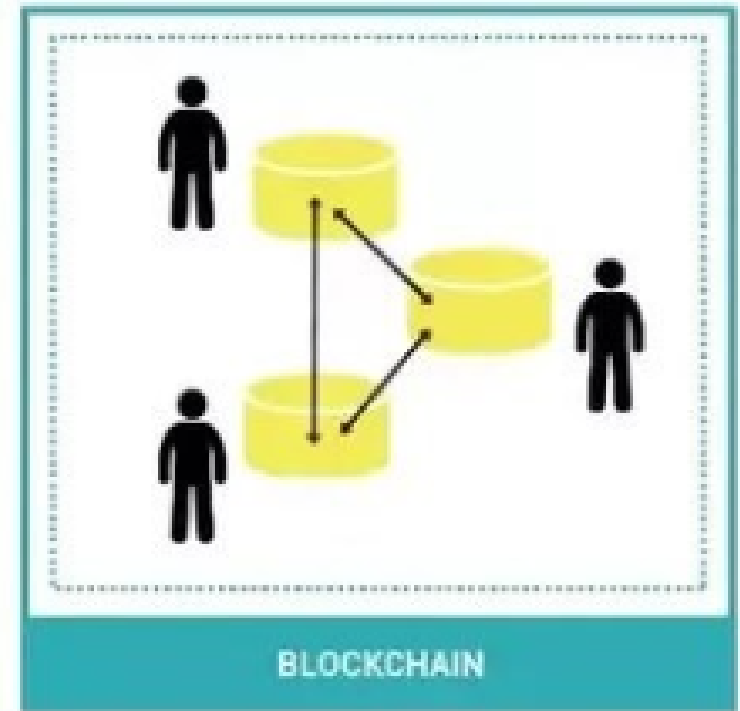
Blockchain Storage Description

- Blockchain can be defined as a distributed, or **decentralized**, database
- Both physical (tangible) and intangible assets can be **digitized** and the digital footprint of the asset can be **stored on a blockchain**
- The digital blockchain that is used to represent the asset in question is stored on **multiple systems and computers**. Each computer system has a designated user, or administrator

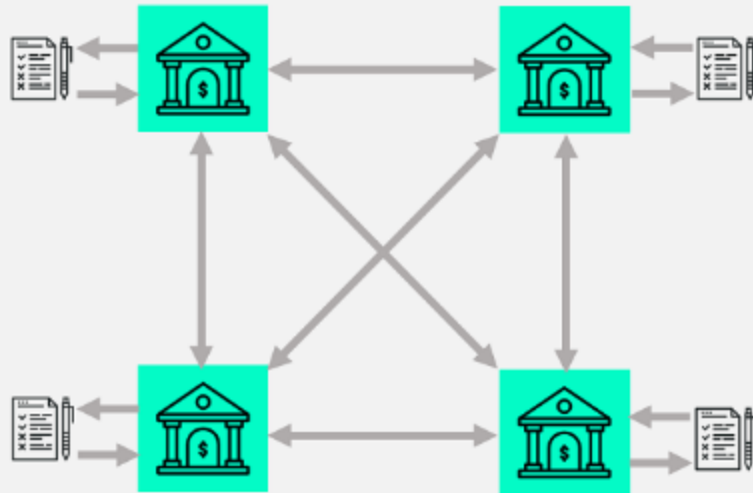


Blockchain Storage Description (Cont.)

- If the owner of the digital asset wishes to make a change to the asset (for example, transfer of ownership), then the change must be **approved by all system users**, for the transaction to be validated
- Every change in the asset becomes another block in the blockchain, with each block having its own special key
- Recording of changes provides a **clear audit trail** for executive leadership, and for external audits



Blockchain Storage Description (Cont.)

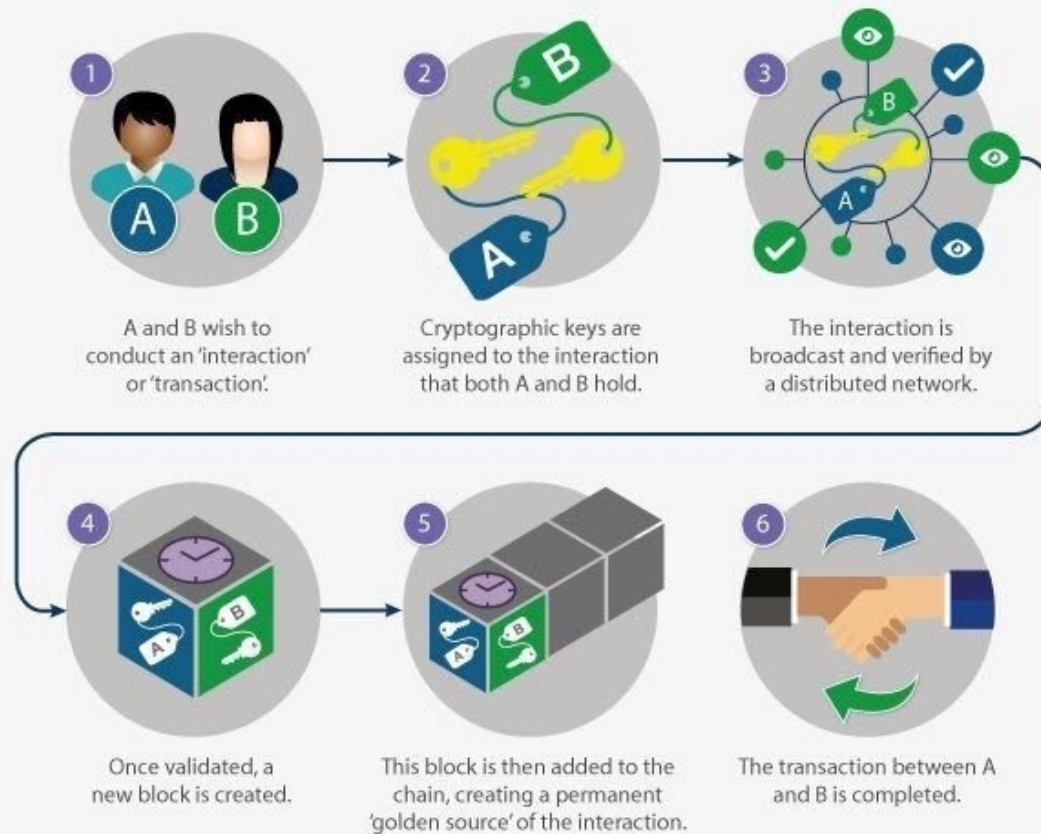


Distributed Ledger

- Blockchain distributed ledgers provide what is known as “**consensus based permission**”
- If a hacker attempts to alter one blockchain, secure blockchain technology will not permit the change; since all the distributed **blockchains must sync or reconcile** to each other, for the change to be considered valid

Blockchain Storage Description (Cont.)

How a blockchain transaction works



Blockchain Storage Description (Cont.)

- Blockchains help manage online exchanges by keeping a ledger showing every state in the transaction history – **transparency**
- All participants have an identical copy of this ledger — that’s the “distributed” in distributed ledger technology, thus eliminating the need for **trust** of the third-party intermediary
- Blockchains tackle the current trust gap for online transactions.
 - How can we be sure the books have not been manipulated without relying on a third-party auditor?
 - How much can we rely on the auditor?
 - Blockchains achieve this by being **tamper-resistant**
- Blockchains are designed to be immutable. Data in a blockchain can only be added and read, but never deleted or modified - It’s **time-stamped**

Blockchain Storage Description (Cont.)

Benefits



Increased
transparency



Accurate
tracking



Permanent
ledger



Cost
reduction

Unknowns



Complex
technology



Regulatory
implications



Implementation
challenges



Competing
platforms

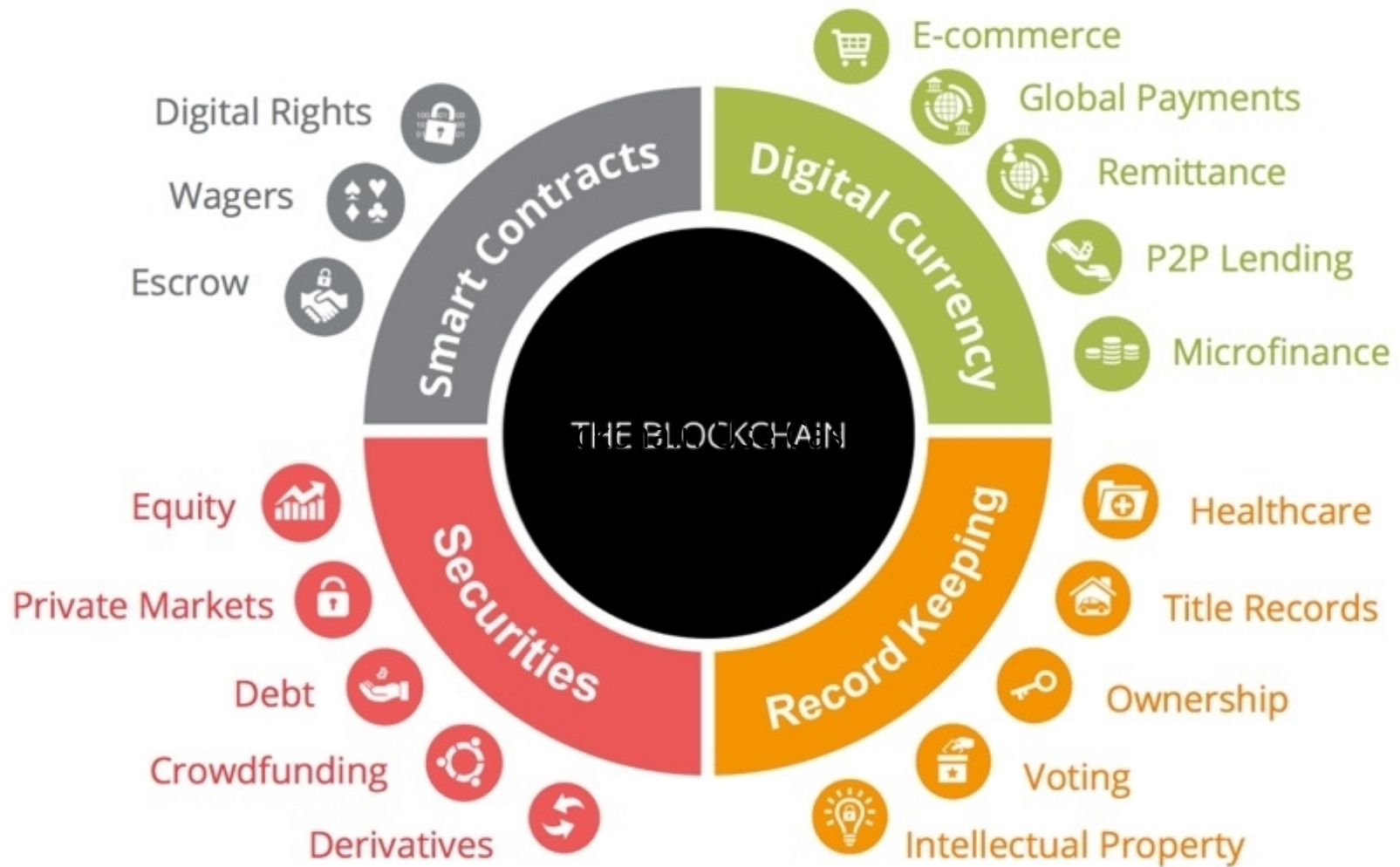
Factors Giving Rise to Blockchain



Who's Looking at Blockchain?



Blockchain Use Cases



What's a Cryptocurrency?

- Cryptocurrency gets its name because tokens are secured by public key private key cryptography. Therefore, "cryptography" plus "currency" equals **cryptocurrency**
- Instead of a fiat currency, people conduct financial transactions using **tokens** that eventually can be exchanged for their currency of choice, like the U.S. dollar or the Norwegian kroner
- While anyone can see the transaction, **cryptography** ensures that the token being transferred can only be accessed by the recipient

What's a Cryptocurrency? (Cont.)

- Each participant has their own copy of the ledger, identical to everyone else. The record of transactions is **immutable**, meaning it can never be deleted or changed
- This method includes a way to ensure **consensus** among the participants as to what should get recorded in the ledger. The system pays the participants for their **work** to enable this consensus
- Many participants **compete** to earn this payment, breaking the monopoly of the central intermediary

How Does Bitcoin Work?

- Bitcoin is **fungible**. That means the value of one Bitcoin is the same as any other Bitcoin
- With blockchain, an **unalterable record** of the transactions is kept on identical copies of a ledger. The underlying protocol in Bitcoin keeps all these ledger copies current with the latest updates
- Anyone engaged in Bitcoin transactions has their own copy of this ledger. The ledger contains every transaction ever made using Bitcoin so any tampering with one copy is easily caught

How Does Bitcoin Work? (Cont.)

- In a traditional setting, a bank or payment processor determines which transactions are valid and should be recorded
- With Bitcoin, participants called **miners** compete for the privilege of recording transactions. The transactions are compiled into batches and recorded in a block of data
- **51 percent** or more of the miners must agree on the data content in the block before it is accepted as valid. The miner whose block is accepted into the blockchain is paid in Bitcoin for doing the work

How Does Bitcoin Work? (Cont.)

- Bitcoin was designed to have just 21 million coins. It's this finite supply that tends to push up the value of Bitcoin over time
- Also, the adoption of Bitcoin for various transactions can drive up or drive down its value. We are seeing more "Bitcoin accepted here" signs, and there are ATMs out there where you can collect on your Bitcoins
- Many cryptocurrencies sprang up in response to Bitcoin's success. In January 2019, Coindesk listed 2120 cryptocurrencies with a total market cap of over \$112.6 trillion

What's an ICO?

- Bitcoin gave people the idea that they could use tokens to raise money to fund their own startup blockchain systems
- They called these crowdfunding events **Initial Coin Offerings, or ICOs**
- Some were wildly successful in raising money from investors who had caught the blockchain bug
- Unfortunately, some ICOs were associated with very shaky startups and a number of investors lost a great deal of money

What's an ICO?

- The Securities and Exchange Commission (SEC) stepped in recognizing ICOs and related tokens as securities that required appropriate SEC filings to protect investors
- Some countries even outright banned ICOs
- If you're thinking of investing in ICOs or cryptocurrencies, be sure to treat them like any other investment and understand your investment

- ***Chenega International*** has a partnership with Ulster University in Belfast, and provides online masterclasses on the following topics:
 - ***Blockchain***
 - ***OSINT***
 - ***Law Enforcement***
 - ***Deep & Dark Web***
- For more information and to sign up:
<http://www.chenegainternational.com/chenega-training/>

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Thank you

Q & A