Blockchain

Cruise Ship
Enrichment Talk

Presented by Sonja Bernhardt OAM

Agenda – Blockchain

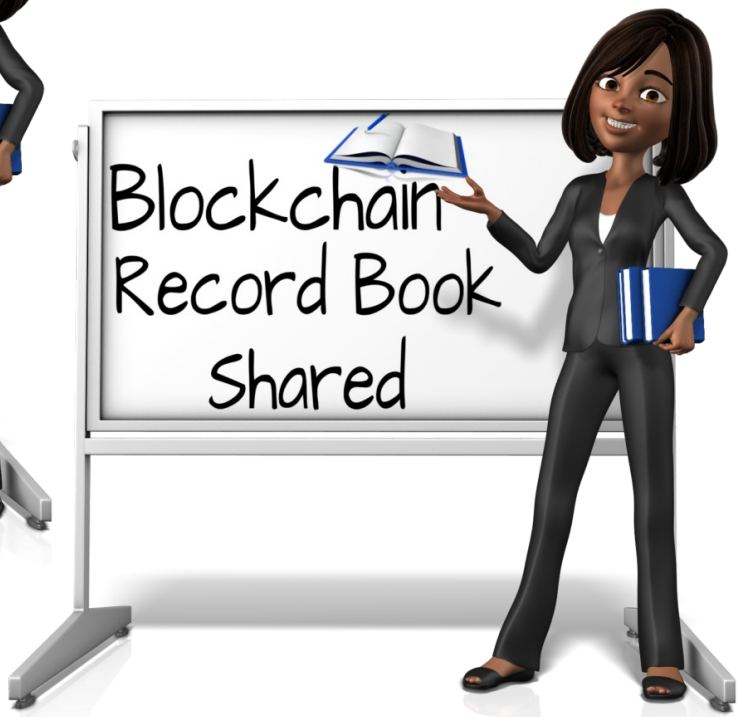
1. Use Cases (Blockchain Why)
2. Blockchain 101 (What and How)
3. The Issues
4. The Future

Cruise Ship
Enrichment Talk

Bitcoin: A Peer-to-Peer Electronic Cash System

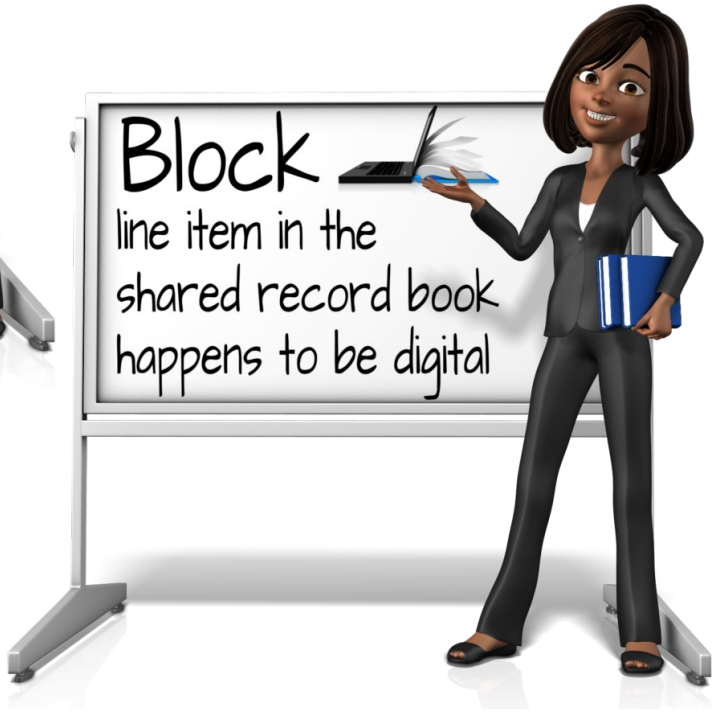
Satoshi Nakamoto
satoshin@gmx.com
www.bitcoin.org

Abstract. A purely peer-to-peer version of electronic cash would allow online payments to be sent directly from one party to another without going through a financial institution. Digital signatures provide part of the solution, but the main benefits are lost if a trusted third party is still required to prevent double-spending. We propose a solution to the double-spending problem using a peer-to-peer network. The network timestamps transactions by hashing them into an ongoing chain of hash-based proof-of-work, forming a record that cannot be changed without redoing the proof-of-work. The longest chain not only serves as proof of the sequence of events witnessed, but proof that it came from the largest pool of CPU power. As long as a majority of CPU power is controlled by nodes that are not cooperating to attack the network, they'll generate the longest chain and outpace attackers. The network itself requires minimal structure. Messages are broadcast on a best effort basis, and nodes can leave and rejoin the network at will, accepting the longest proof-of-work chain as proof of what happened while they were gone.

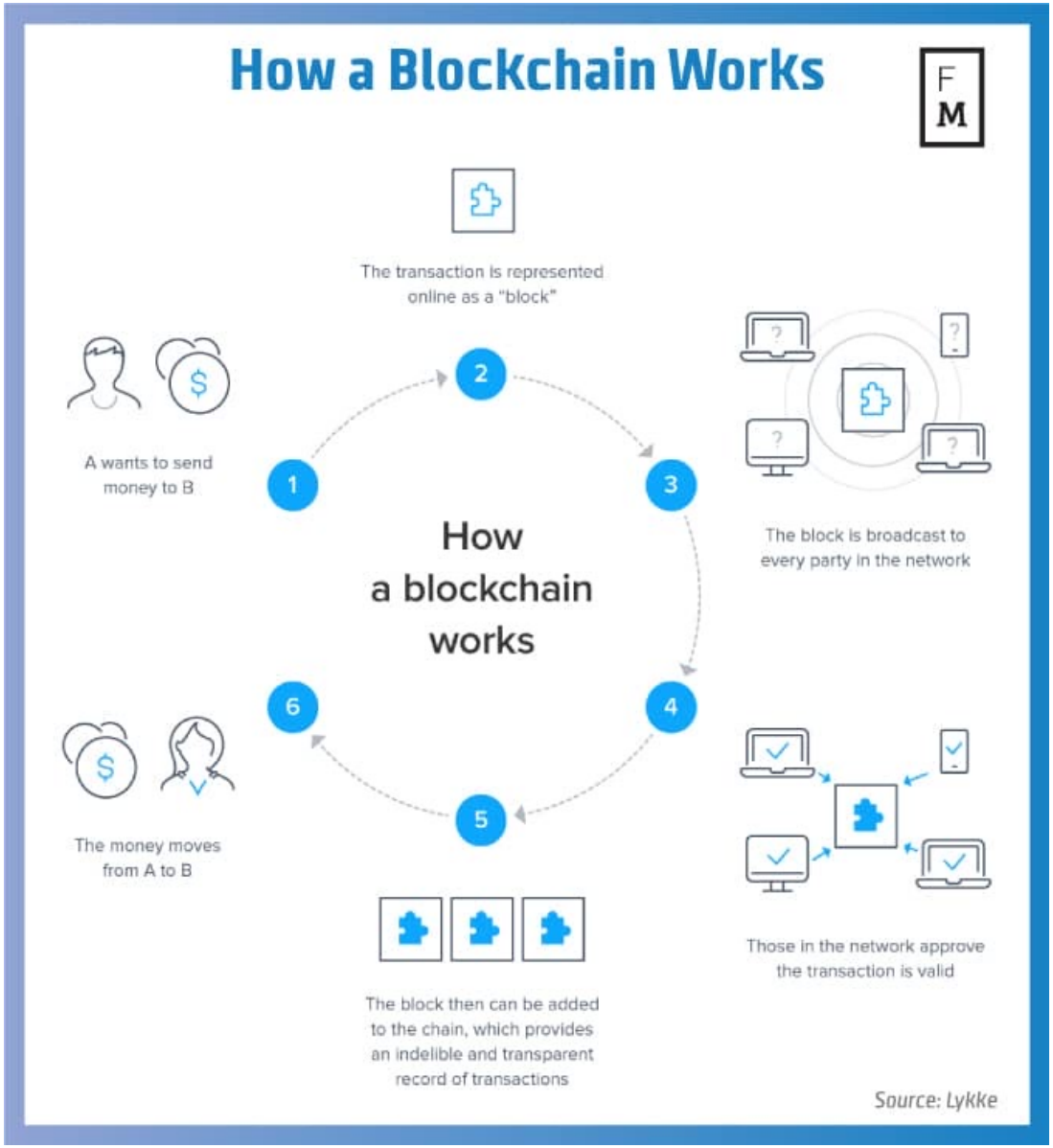


LEDGER

DIGITAL RECORD
Decentralised &
Distributed



Data is stored in BLOCKs and linked together via a CHAIN



Puzzles and Problem Solving – maths, detective PoW Proof Of Work

Transaction verified, proven and also New Minted for miner(s)

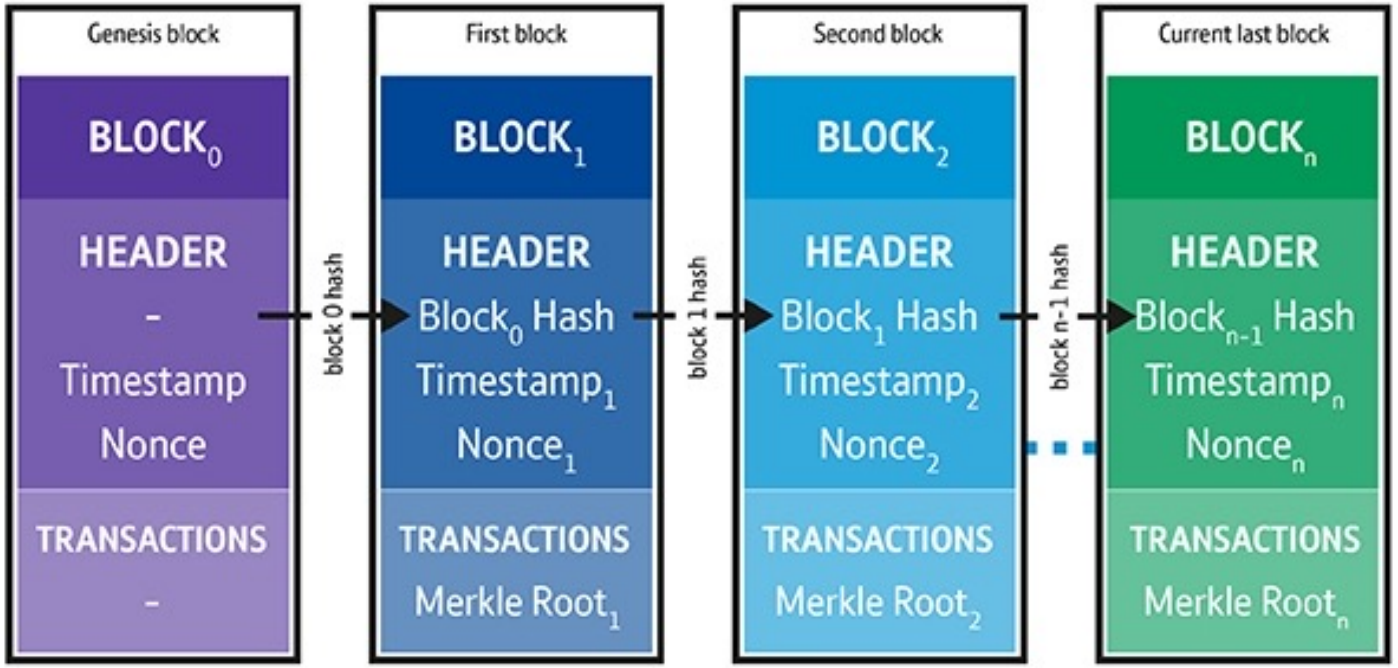
Blockchain101: What and How

Hash – Algorithm:

(input string any length – output fixed length (max 256)

Nonce – random string

Merkle Root – the starting (node) of a tree



Immutable,
Transparent
and
Tamper Free

Sort of….

3 Reasons Blockchains are Tough to Tamper With

1

All blockchain activity is transparent and traceable to users.

2

Information cannot be altered once it's recorded.

3

Blockchains are decentralized, so there is no single entry point to their database.

How it came about

Separate Blockchain from Crypto

Shiba Inu to Solana: Strong Predictions for December's Real Gem in Blockchain Innovation

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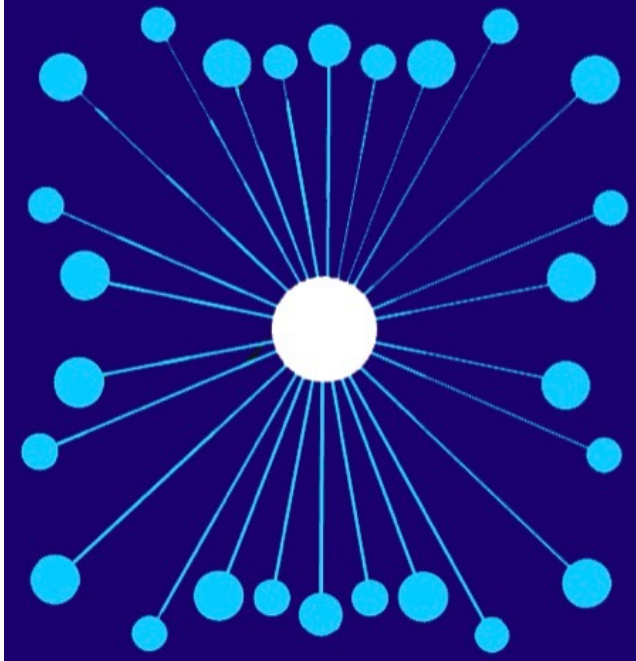
PTI

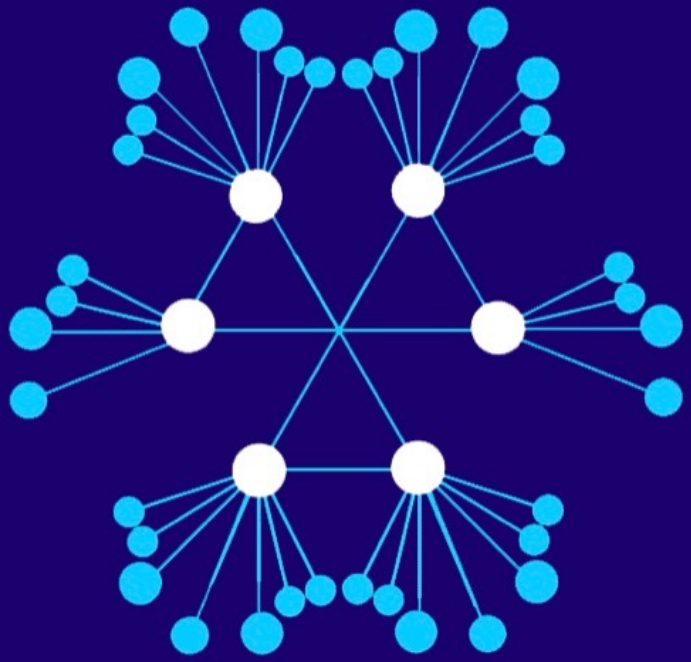
Updated • 4 Dec 2024, 11:49 AM IST

Centralized vs Decentralized vs Distributed Network: An Overview



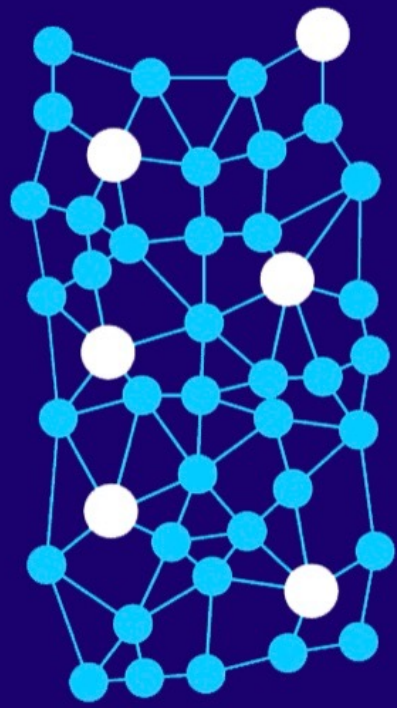
Centralized Network

All the nodes are connected under a single authority



Decentralized Network

No single authority server controls the nodes, they all have individual entity

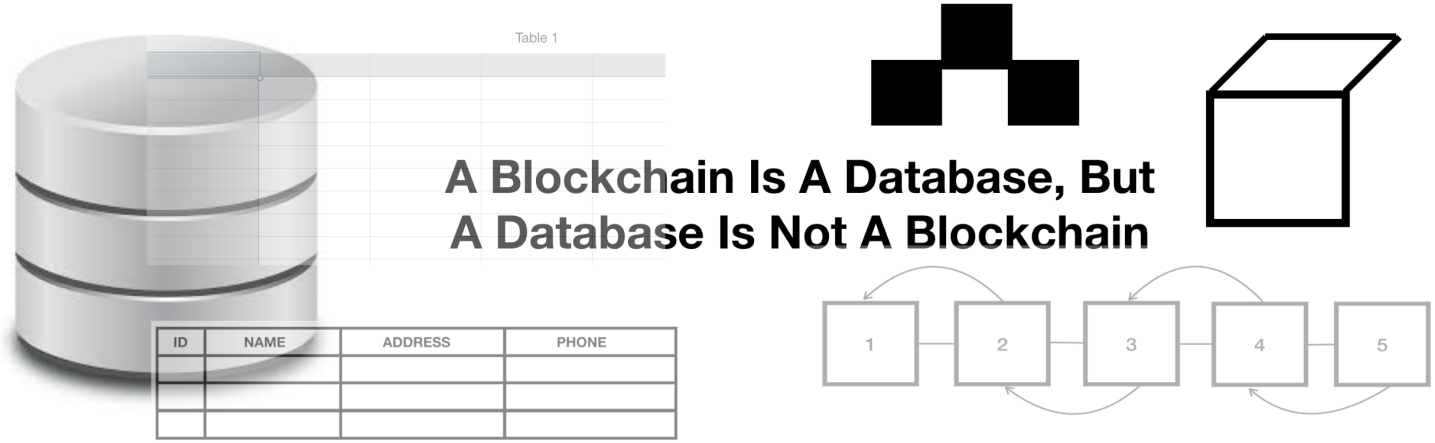


Distributed Network

Every node is independent and interconnected with each other

The Issues

1. Separate Blockchain from Crypto
   - TECHNOLOGY - Blockchain
2. Blockchain scalability and size not at database level – YET!



Database ideal for data that needs continuous updating updating e.g., monitoring and sensors

Blockchain ideal for verification of trusted data: identity, reputation, credibility, integrity

The Issues

3. Trust

A **trustless** system means that the participants involved **do not need** to know or trust each other or a third party for the system to function.

Move to a Trustless Community

Historically we have moved from trusting individuals to trusting centralised institutes as the intermediary.

Now need to shift away from ‘trusted’ gatekeepers to direct via technology.

The Future

- Current Identity versus Self-Sovereign Identity

The Future

- Eliminate the ‘middle man’ across industries
- Digital Identity: Unique
  - Banking, Healthcare, National Security, Citizenship documentation (birth certificates, passports, wedding certificates), online retail…

- Contracts: smart contracts
  - Mortgages, wills, legal contracts, timestamp notary
- Democracy: eVoting System (Estonia. Trials: Malta, Korea, Russia, India, West Virginia USA)
- Music: Pay artists directly for specific uses
- NFT’s (Non-Fungible Tokens)

The Future

fungible

[**fuhn**-*juh*-b*uh*l]

adjective

being of such nature or kind as to be freely exchangeable or replaceable, in whole or in part, for another of like nature or kind.

Fungible

My $10 is the exact same as your $10

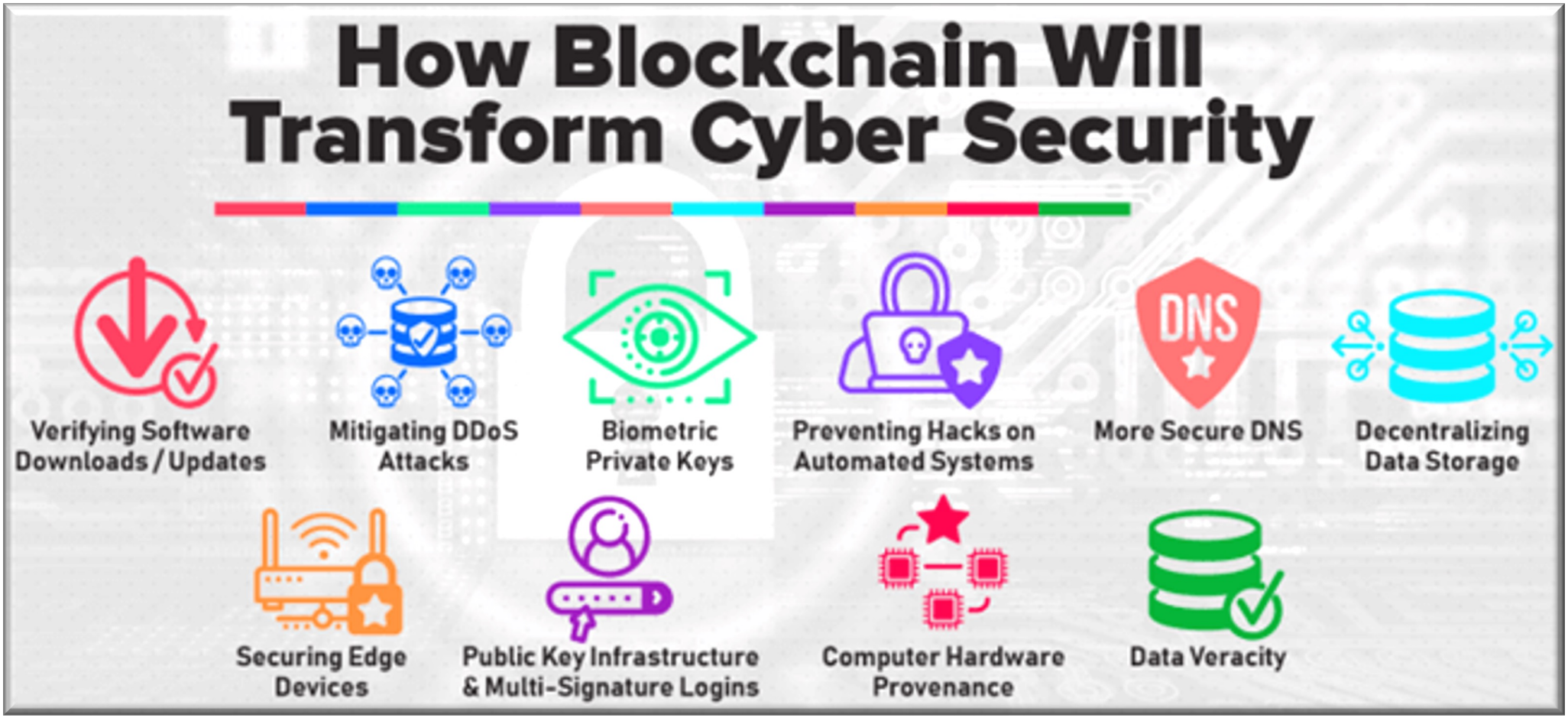
Semi-fungible

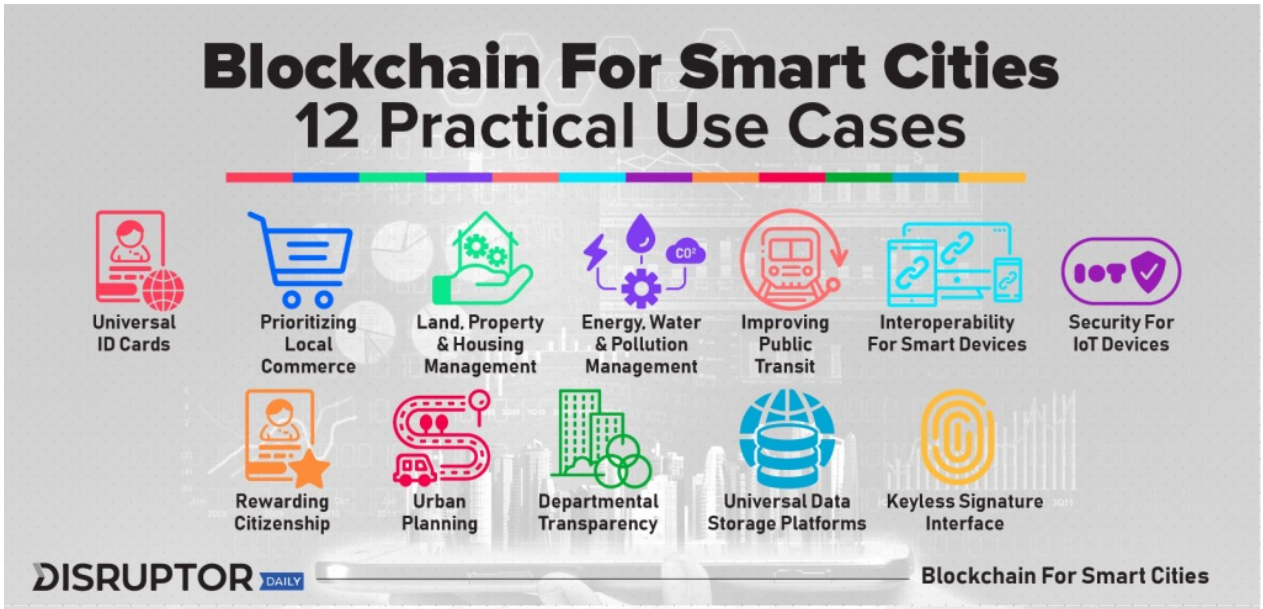
All general admission tickets get each person in to the same specific concert, but may not work for a different concert or date.

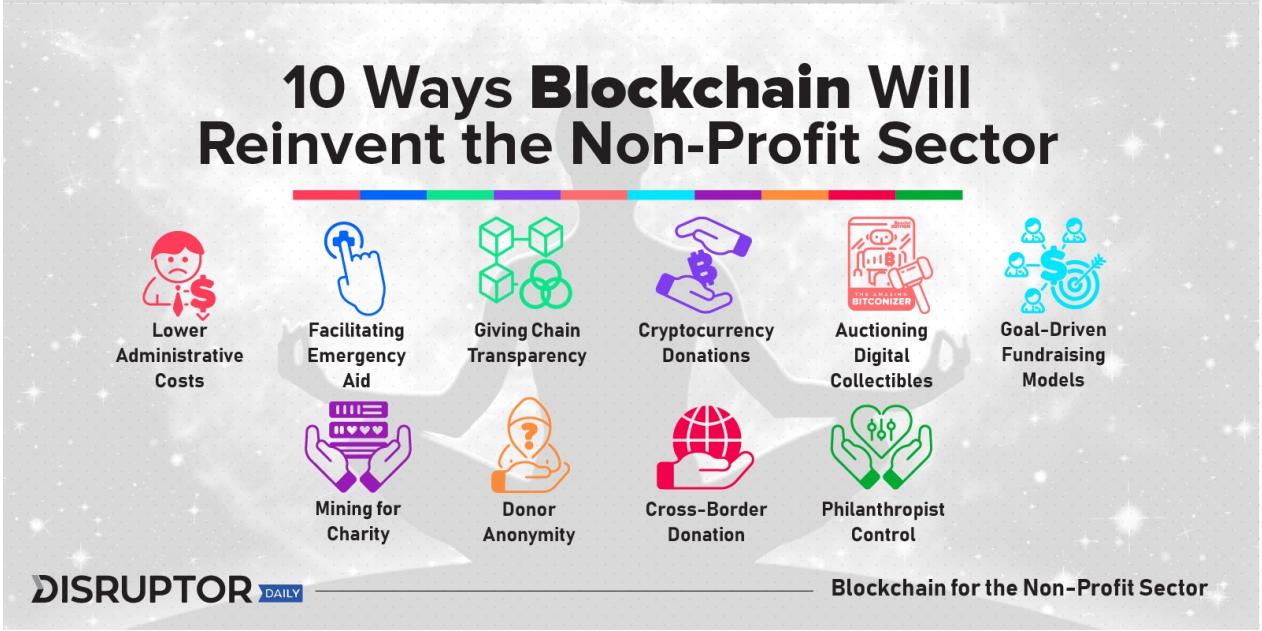
Non-fungible

Represents something unique and 1-of-1!

13 Ways **Blockchain** Will Transform Supply Chain Management


How Blockchain Will Transform Cyber Security
Verifying Software Downloads / Updates
Mitigating DDoS Attacks
Biometric Private Keys
Preventing Hacks on Automated Systems
DNS
More Secure DNS
Decentralizing Data Storage
Securing Edge Devices
Public Key Infrastructure & Multi-Signature Logins
Computer Hardware Provenance
Data Veracity


Blockchain For Smart Cities
12 Practical Use Cases
Universal ID Cards
Prioritizing Local Commerce
Land, Property & Housing Management
Energy, Water & Pollution Management
Improving Public Transit
Interoperability For Smart Devices
Security For IoT Devices
Rewarding Citizenship
Urban Planning
Departmental Transparency
Universal Data Storage Platforms
Keyless Signature Interface
DISRUPTOR DAILY
Blockchain For Smart Cities


10 Ways Blockchain Will
Reinvent the Non-Profit Sector
Lower Administrative Costs
Facilitating Emergency Aid
Giving Chain Transparency
Cryptocurrency Donations
Auctioning Digital Collectibles
Goal-Driven Fundraising Models
Mining for Charity
Donor Anonymity
Cross-Border Donation
Philanthropist Control
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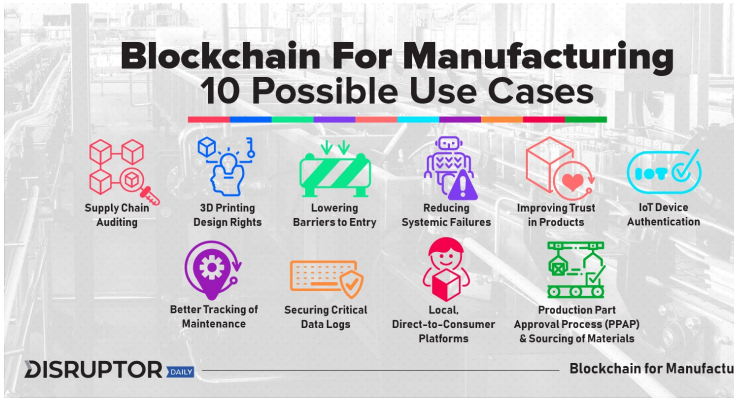
Blockchain for the Non-Profit Sector


Blockchain For Manufacturing
10 Possible Use Cases
Supply Chain Auditing
3D Printing Design Rights
Lowering Barriers to Entry
Reducing Systemic Failures
Improving Trust in Products
IoT Device Authentication
Better Tracking of Maintenance
Securing Critical Data Logs
Local, Direct-to-Consumer Platforms
Production Part Approval Process (PPAP) & Sourcing of Materials
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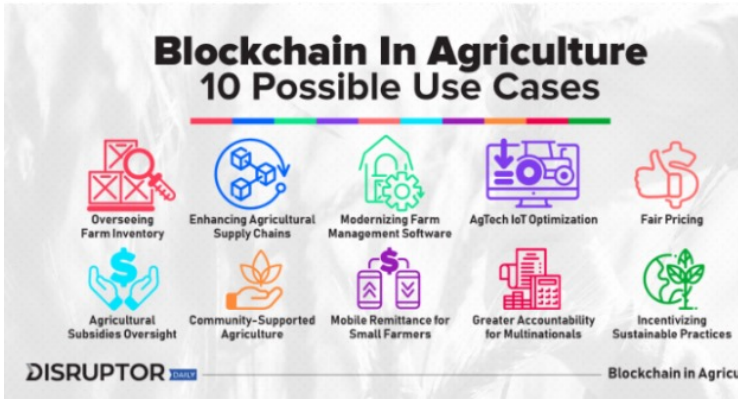
Blockchain for Manufactu


Blockchain In Agriculture
10 Possible Use Cases
Overseeing Farm Inventory
Enhancing Agricultural Supply Chains
Modernizing Farm Management Software
AgTech IoT Optimization
Fair Pricing
Agricultural Subsidies Oversight
Community-Supported Agriculture
Mobile Remittance for Small Farmers
Greater Accountability for Multinationals
Incentivizing Sustainable Practices
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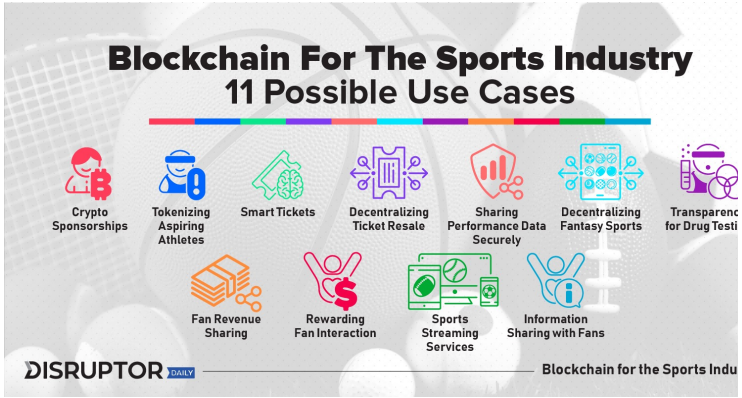
Blockchain in Agricu


Blockchain For The Sports Industry
11 Possible Use Cases
Crypto Sponsorships
Tokenizing Aspiring Athletes
Smart Tickets
Decentralizing Ticket Resale
Sharing Performance Data Securely
Decentralizing Fantasy Sports
Fan Revenue Sharing
Rewarding Fan Interaction
Sports Streaming Services
Information Sharing with Fans
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Blockchain for the Sports Indu