BlockDelhi

BLACK ARROW

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BLOCKCHAIN, DISTRIBUTED LEDGERS, DEVICE MANAGEMENT, AND
NEW BUSINESS MODELS

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DANA FARBO – COO, AUGMATE

- Digital since 1995
- Entrepreneur
- Author
- Teacher
- Investor

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Must adapt to disruptive tech like blockchain & IoT at work

Millennium Post
February 19

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Vison

Simplified management of IoT devices and their data without fear of compromise.

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Organizations that Run the Augmate Platform

IoT is Perfect for Disruptive Business Models

PROBLEMS TO SOLVE

ISSUE 01

SECURITY

Protect data and prevent unintended usage of devices

ISSUE 02

SCALABILITY

Monitor and manage a fleet of devices, data, and usage

ISSUE 03

INTEGRATION

Get hardware and software systems to work together

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"In the next 20 years, we will see ***one trillion***

Internet of Things devices"

—Masayoshi Son, CEO of Softbank

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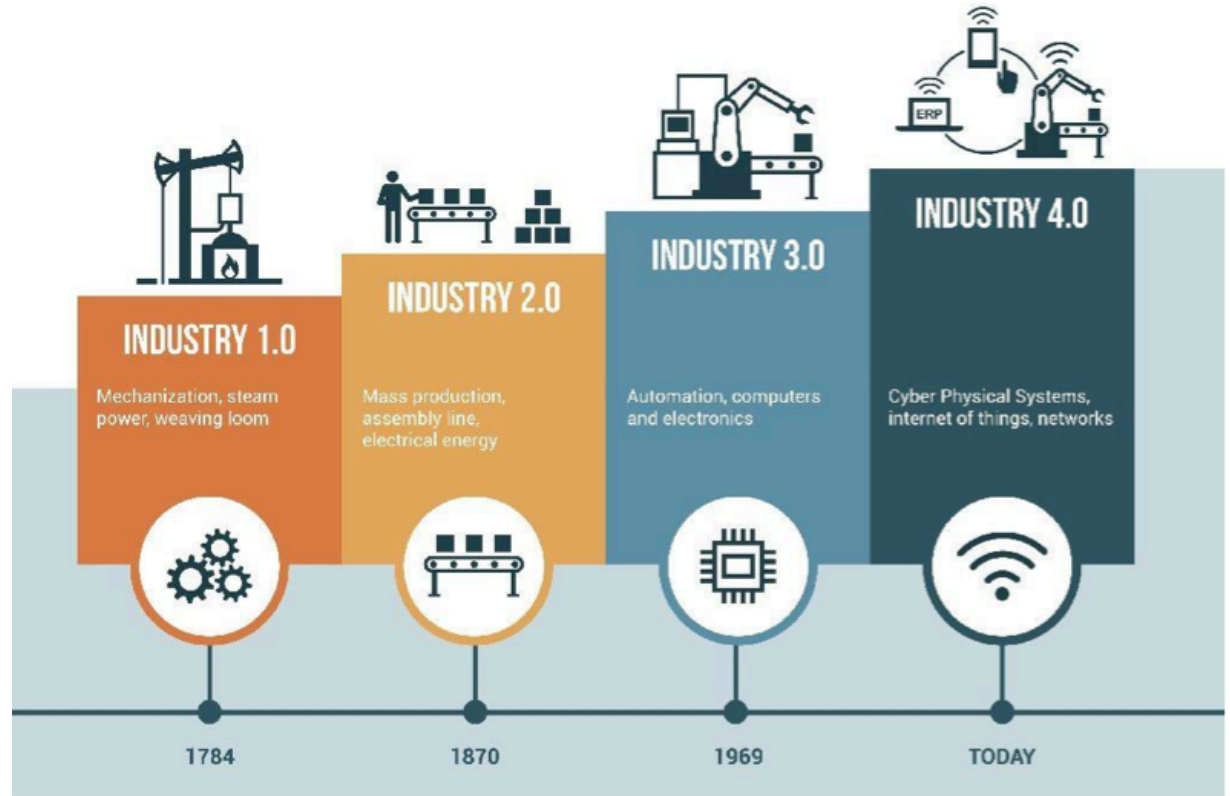# Industry 4.0 Provides Efficiency & Productivity Gains of 30%

Industry 4.0

Born out of Germany by the marriage of science and manufacturing.

Fourth Revolution

Industry 4.0 leverages cyber-physical systems, embedded computing, and Internet of Things technologies

- Flow of Data and Interconnectivity
- Making of Many Products
- Efficiently Produced Products

INDUSTRY 1.0
Mechanization, steam power, weaving loom

INDUSTRY 2.0
Mass production, assembly line, electrical energy

INDUSTRY 3.0
Automation, computers and electronics

INDUSTRY 4.0
Cyber Physical Systems, internet of things, networks

1784   1870   1969   TODAY

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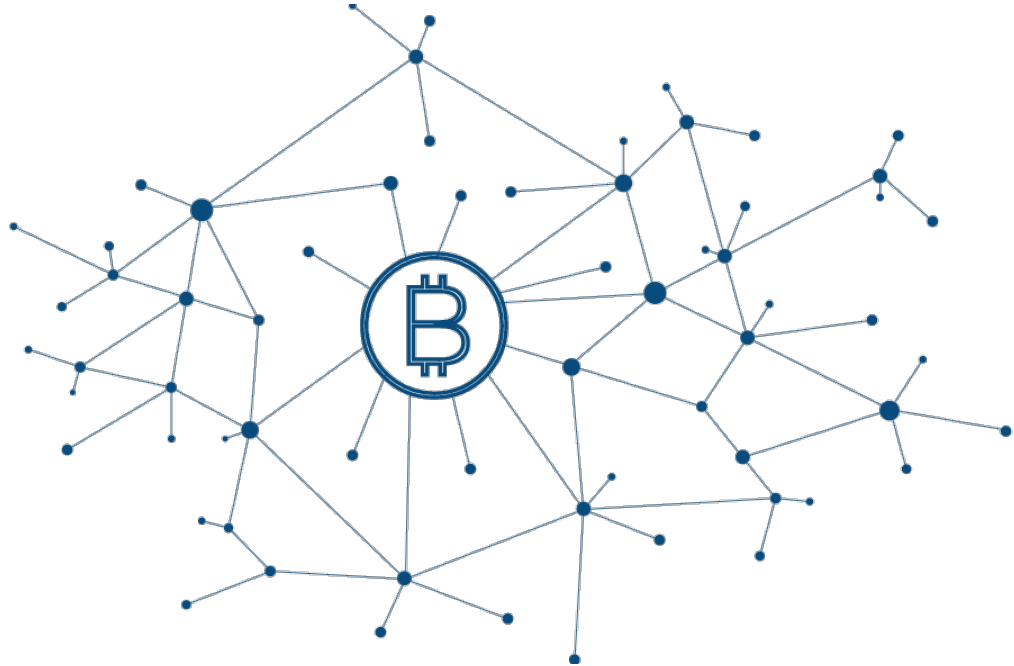## Gartner Market Research on IOT

- Companies expect Industry 4.0 to increase revenues by **23 percent**

- Companies expect Industry 4.0 to increase productivity by **26 percent**

- Typically, predictive maintenance decreases the total machine downtime by **30 to 50 percent** and increases machine life by **20 to 40 percent**

- **80 percent** of companies expect Industry 4.0 to impact their business model

- **92 percent** of Industry 4.0 suppliers expect Industry 4.0 to have an impact on their business model

- **74 percent** of manufacturers expect Industry 4.0 to have an impact on their business model

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NODE 02

NODE 03

NODE 06

NODE 06

BLOCK 01

BLOCK 01

BLOCK 01

NODE 06

NODE 06

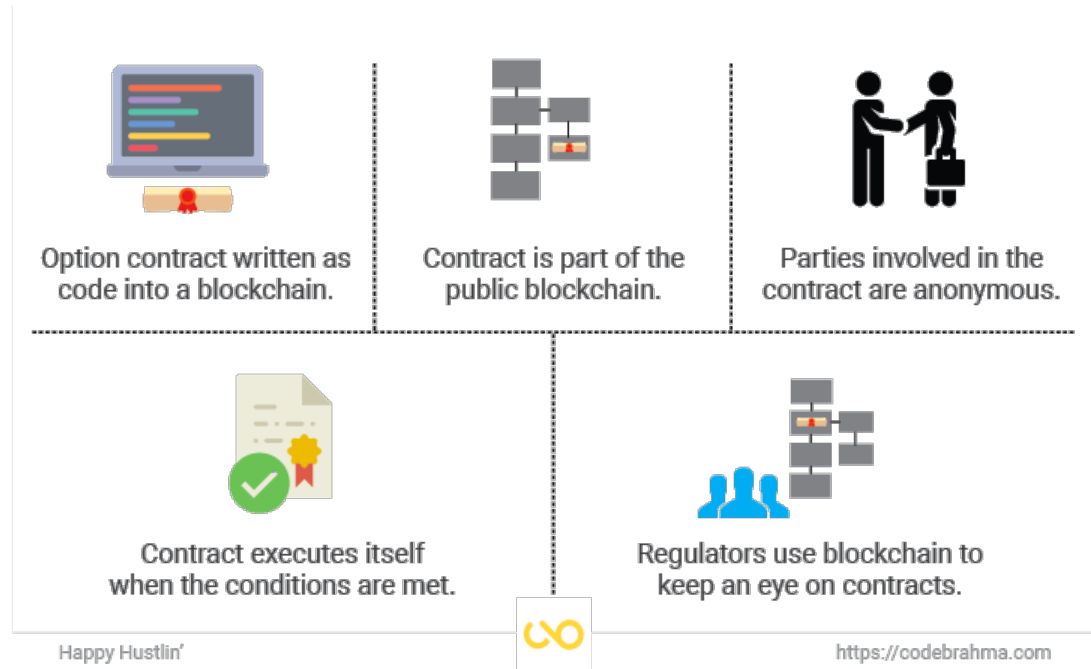*Distributed Ledger: "Protection, Privacy and Peace of Mind."*

Bitcoin, Ethereum

- Proof of Stake, Proof of Work

  - Trust-less networks
  - Validated transactions
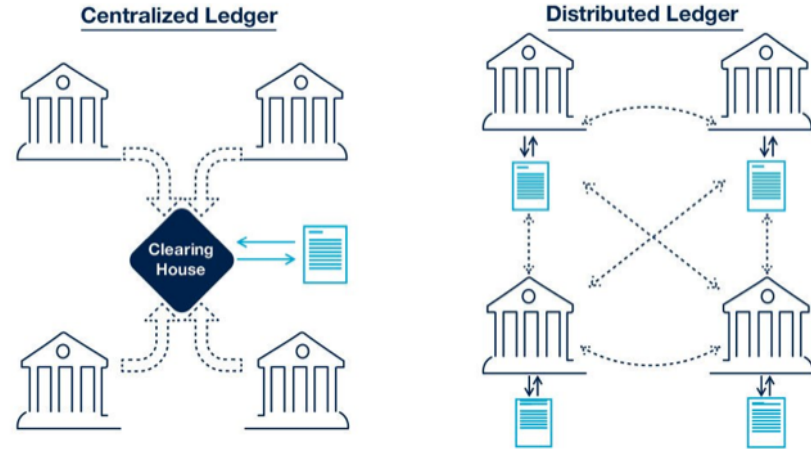 - Public consensus
  - Transaction history

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Smart Contracts

- Computer program
- Facilitate, verify and enforce agreement
- Self-executing

Option contract written as code into a blockchain.

Contract is part of the public blockchain.

Parties involved in the contract are anonymous.

Contract executes itself when the conditions are met.

Regulators use blockchain to keep an eye on contracts.

Happy Hustlin'

https://codebrahma.com

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All Approaches

- Distribution, verification and recordkeeping more quickly and effectively due to decentralized environment
- Opportunity for exponential scale in transactional capability with corresponding security

Centralized Ledger

Distributed Ledger

Clearing House

Source: Capgemini Financial Services Analysis, 2015; "The Fintech 2.0 Paper: rebooting financial services", Santander InnoVentures, Oliver Wyman, and Anthemis Group, 2015

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Decentralization of Interactions

- Scalability
- Standardization
- Interoperability
- Transparency
- Privacy
- Lack of Downtime
- Immune to Censorship

Before 2005 — Closed and centralized IoT networks

Today — Open access IoT networks, centralized cloud

2025 and beyond — Open access IoT networks, distributed cloud

https://www.rs-online.com/designspark/when-the-blockchain-technology-meets-the-internet-of-things

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Business Models

Decentralized Workforces

- Insurance
- Service Support
- Contract Employees
- Hospital Staff
- Salespeople
- Cleaners
- Everybody

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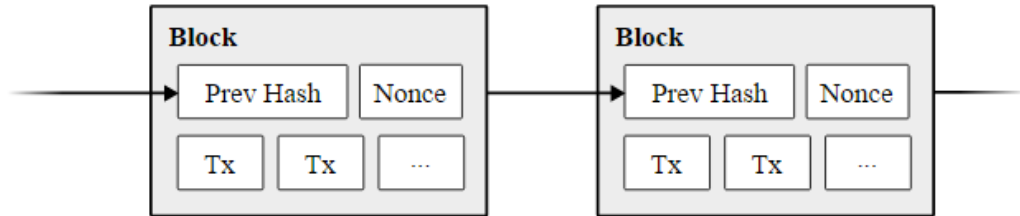## Tokenization

- ICO
- Security Tokens
- Utility Tokens

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- A decentralized transaction layer
- A decentralized file storage layer
- A decentralized messaging layer
- A high throughput computing resource

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Bitcoin, Ethereum

- Proof of Work – Satoshi Nakamoto Bitcoin Whitepaper

1. New transactions are broadcast to all nodes.
2. Each node collects new transactions into a block.
3. Each node works on finding a difficult proof-of-work for its block.
4. When a node finds a proof-of-work, it broadcasts the block to all nodes.
5. Nodes accept the block only if all transactions in it are valid and not already spent.
6. Nodes express their acceptance of the block by working on creating the next block in the chain, using the hash of the accepted block as the previous hash.
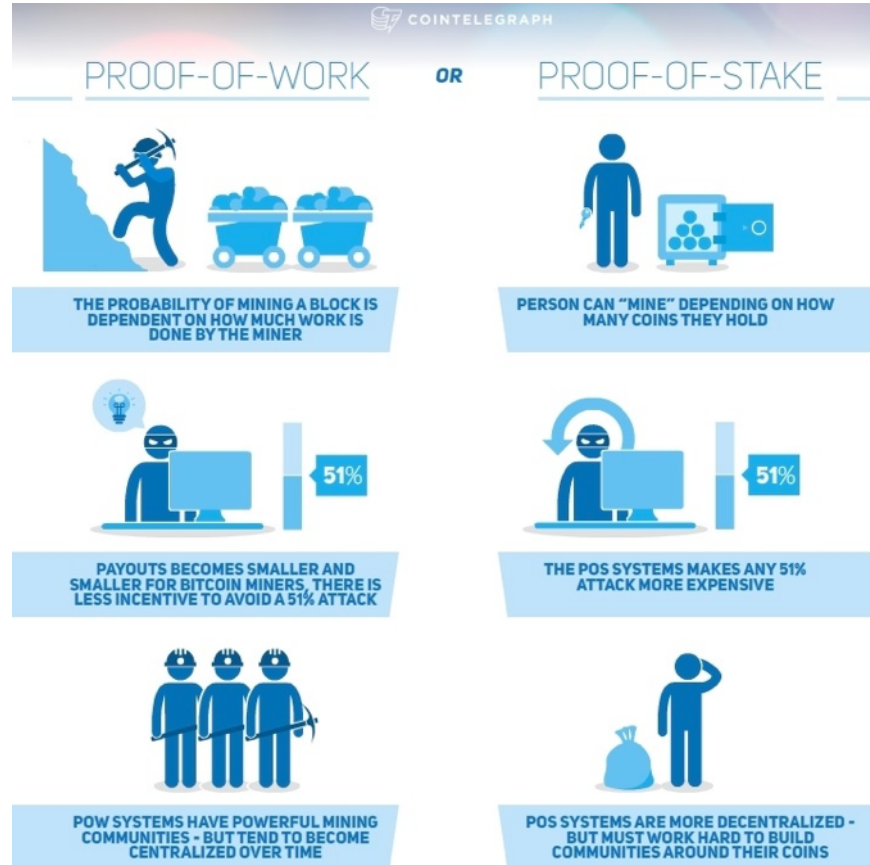
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Ethereum and Others

• Proof of Stake– Vitalik Buterin

Potentially faster, more economic and secure than Proof of Work

COINTELEGRAPH

PROOF-OF-WORK OR PROOF-OF-STAKE

THE PROBABILITY OF MINING A BLOCK IS DEPENDENT ON HOW MUCH WORK IS DONE BY THE MINER

PERSON CAN "MINE" DEPENDING ON HOW MANY COINS THEY HOLD

51%

51%

PAYOUTS BECOMES SMALLER AND SMALLER FOR BITCOIN MINERS, THERE IS LESS INCENTIVE TO AVOID A 51% ATTACK

THE POS SYSTEMS MAKES ANY 51% ATTACK MORE EXPENSIVE

POW SYSTEMS HAVE POWERFUL MINING COMMUNITIES – BUT TEND TO BECOME CENTRALIZED OVER TIME

POS SYSTEMS ARE MORE DECENTRALIZED – BUT MUST WORK HARD TO BUILD COMMUNITIES AROUND THEIR COINS
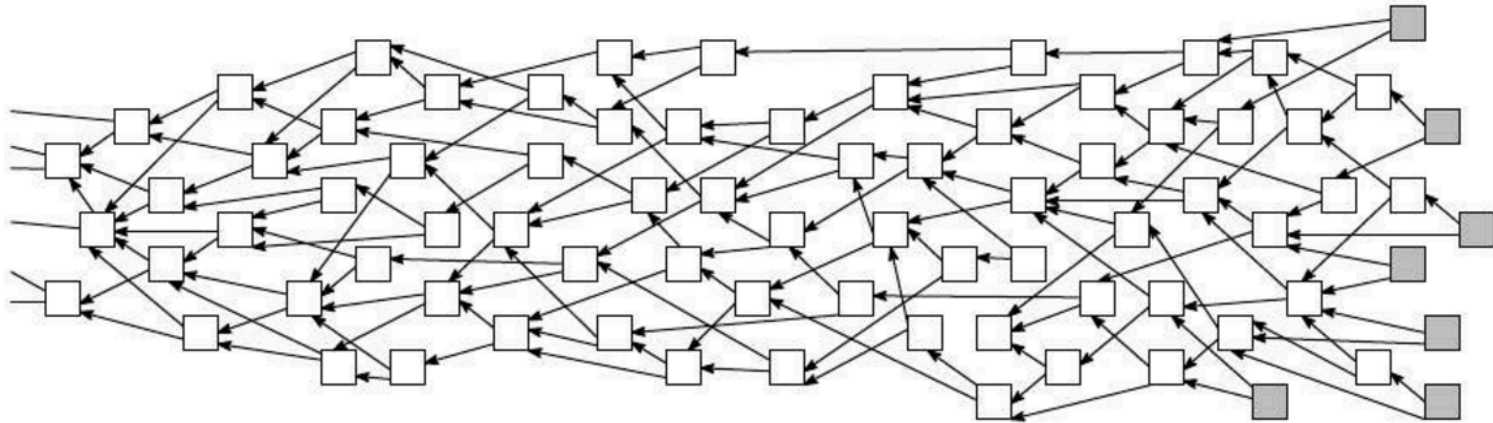
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EOS, Bitshares, Steem

- Faster yet and more economic
- Elected witnesses
- Consensus protocol – examples:
  - Who should produce the next block of updates to apply to the database?
  - When should the next block be produced?
  - What transactions should be included in the block?
  - How are changes to the protocol applied?
  - How should competing transaction histories be resolved?
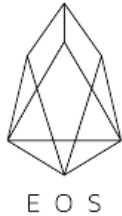
DPOS

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IOTA Tangle

- Bundles all transactions in a Directed Acyclic Graph.
- Completely self-regulating, consensus no longer decoupled.
- Very scalable. Low overhead Proof of Work to prevent spam.

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bitcoin

EOS

FUTURE
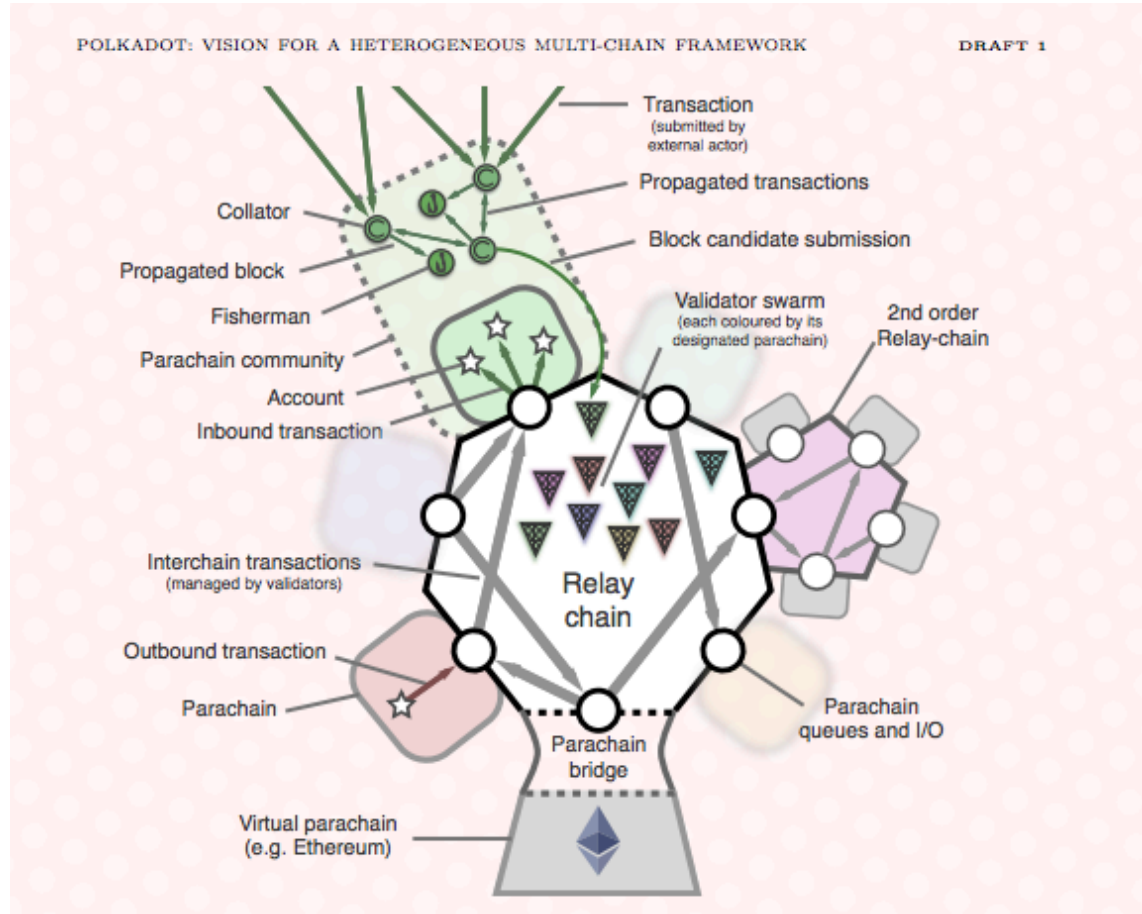
ethereum

IOTA

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Interoperability

Multi-chain Connectivity

- Heterogeneous nature of architecture

Solve for:
- Scalability
- Isolatability
- Developability
- Governance
- Applicability

DApps and Dapp Stores – A Developers Bonanza

Decentralized Applications

- Built on the protocols that are in development and in the future
- Require vetting for enterprise use
- Security needs to be built into the Dapp and the platform used
- Use of a Dapp store for rapid and secure deployment

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