HITS: Fall 2017 - Innovation & Technology: Hollywood 2025

October 18, 2017
2:50 – 3:10 PM
Skirball Cultural Center
Los Angeles, CA

Blockchain & The Hollywood Supply Chain

Steve Wong
DXC Technology
Cloud, Platforms & IT Outsourcing (CPI) Group

@SteveWongLA   **#HITSFall17 #Blockchain**

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Agenda

Goal of today:

Start a conversation about the possibilities for Blockchain in Hollywood.

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Who in the audience knows the term Blockchain?

Has anyone in the audience done a transaction paying with bitcoin?

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Is anyone a Bitcoin miner in the audience?

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What the Internet did for information, Blockchain will do for transactions

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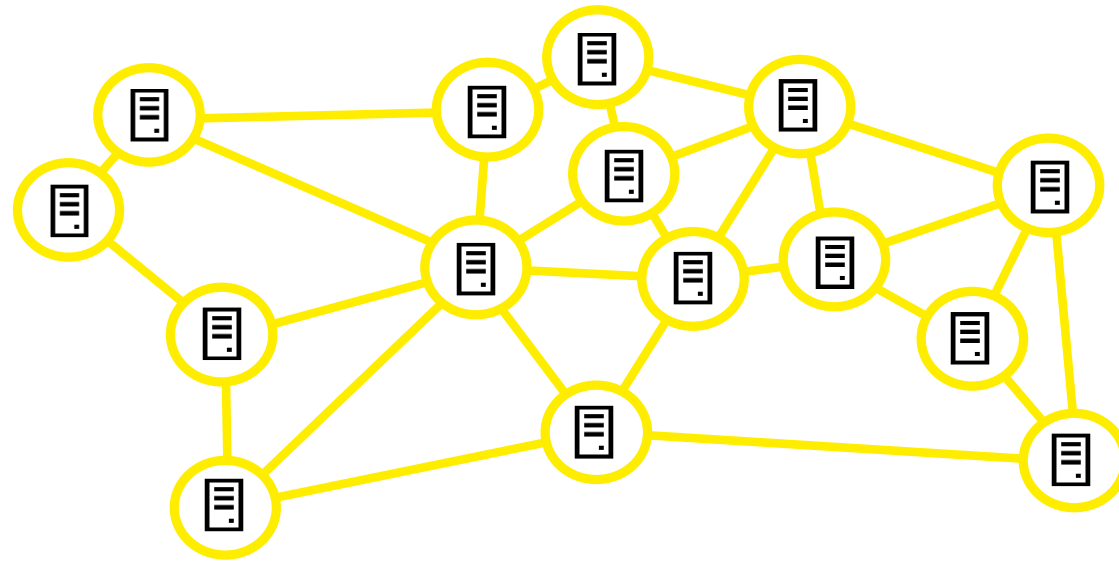**"Blockchain allows for one Internet user to transfer a unique piece of digital property to another Internet user such that the transfer is guaranteed to be safe and secure... The consequences of this breakthrough are hard to overstate."**

- Marc L. Andreessen, Co-founder Andreessen Horowitz & HPE Board of Directors

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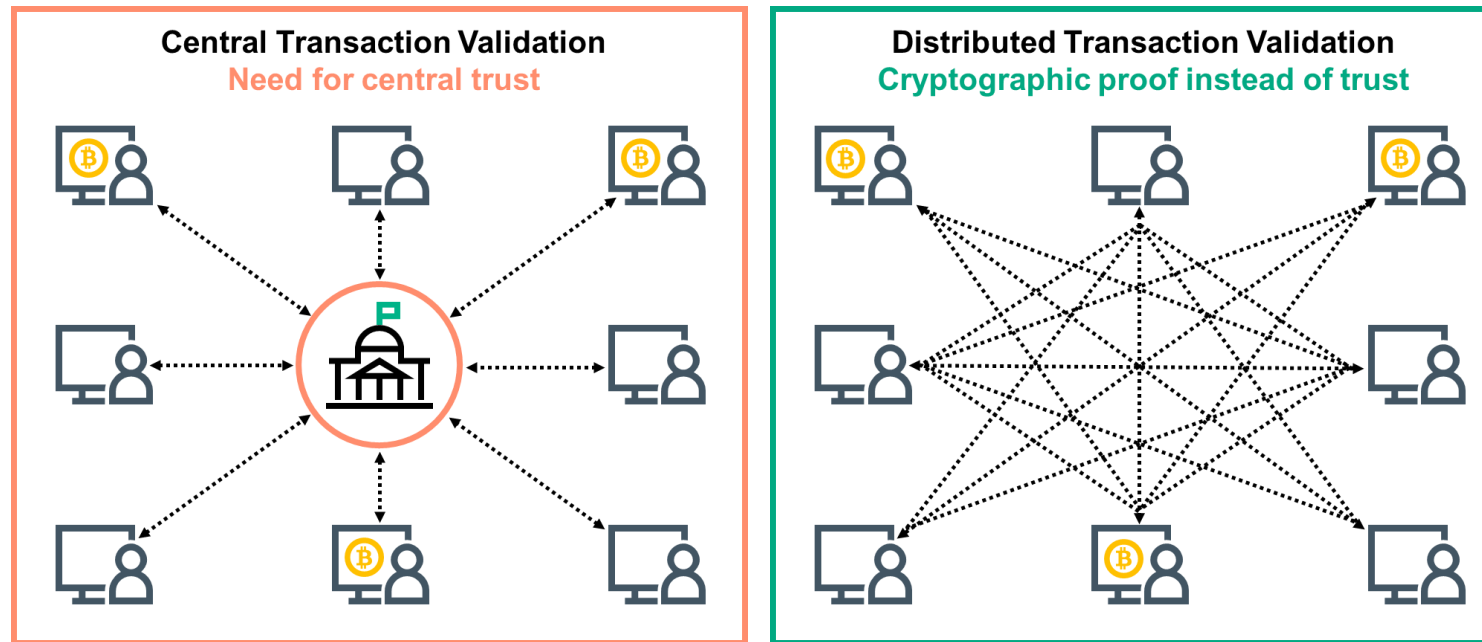|	
1	What is Blockchain?
2	How does Blockchain work?
3	The Blockchain Evolution
4	Blockchain Business Benefits
5	Implementation Considerations
6	DXC Point of View

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What is Blockchain?

- The technology behind Bitcoin
- A **ledger of transactions** replicated to all servers
- Distributed, **peer-to-peer network**
- Requires no central authority

- **Digital cryptography** ensures
    - Transactions are verifiable
    - System is tamper-proof
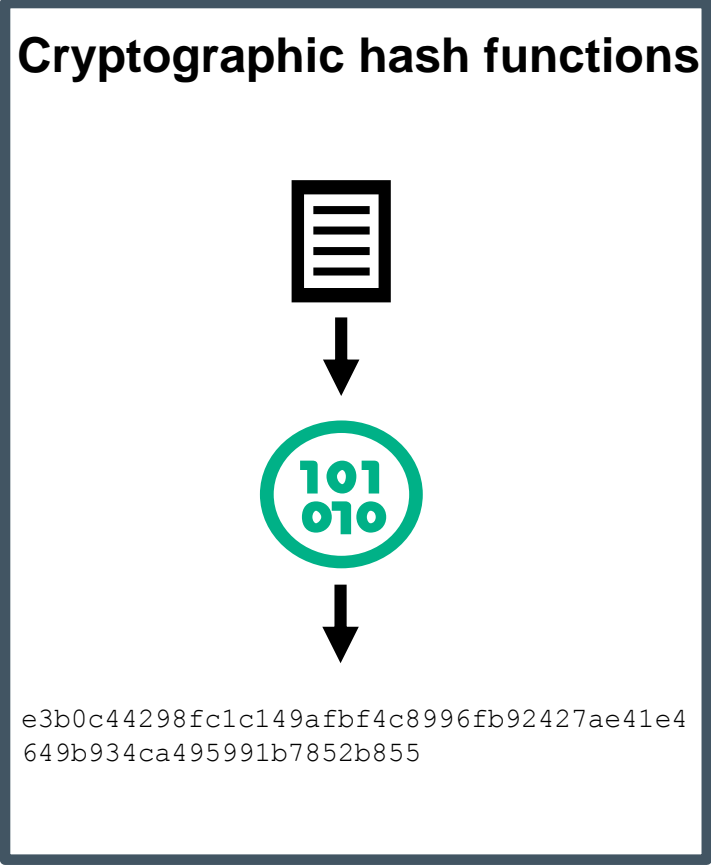- Ledger updates are applied through automated network consensus

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Blockchain: Why was it invented?

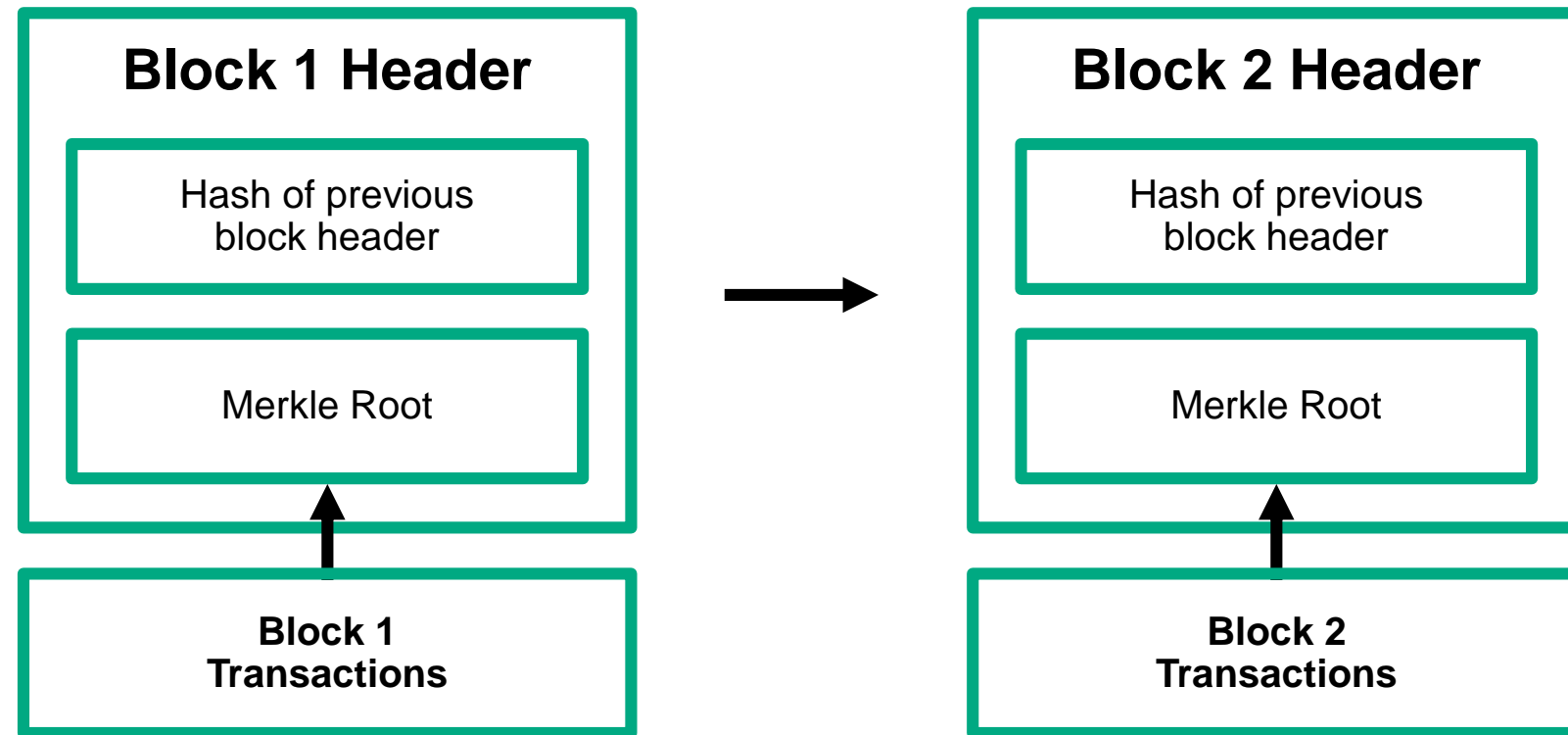**Because "… no mechanism exists to make payments over a communications channel without a trusted party"**

Central Transaction Validation
Need for central trust

Distributed Transaction Validation
Cryptographic proof instead of trust

How does Blockchain work?

Technology Basics

Peer-to-Peer Networking

Cryptographic hash functions

e3b0c44298fc1c149afbf4c8996fb92427ae41e4
649b934ca495991b7852b855

Public Key Cryptography

Private Key

5Jza1DZn2mBvrmMdBLVbQ
jSu33oKCjpkVbwo8jX6vE
tZBpSsaEt

Public Key

1QGGBQEKgxxjqth4QTbiq
z1UFpu1pcoTGF

How does a Blockchain work?

Block 1 Header

Hash of previous block header

Merkle Root

Block 1 Transactions

→

Block 2 Header

Hash of previous block header

Merkle Root

Block 2 Transactions

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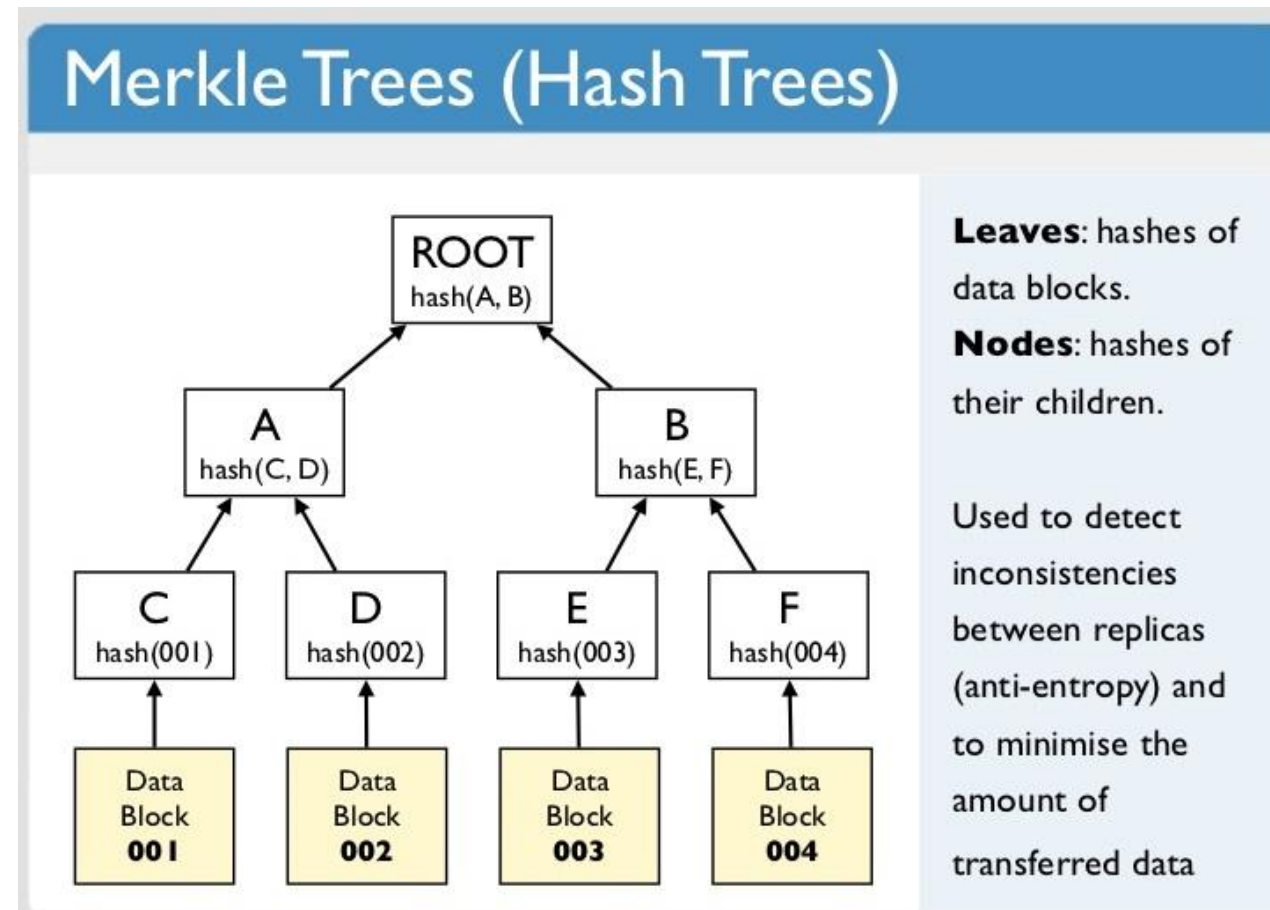IT SOCIETY

How does a Blockchain work?

Merkle tree: every leaf node is labelled with a data block and every non-leaf node is labelled with the cryptographic hash of the labels of its child nodes.
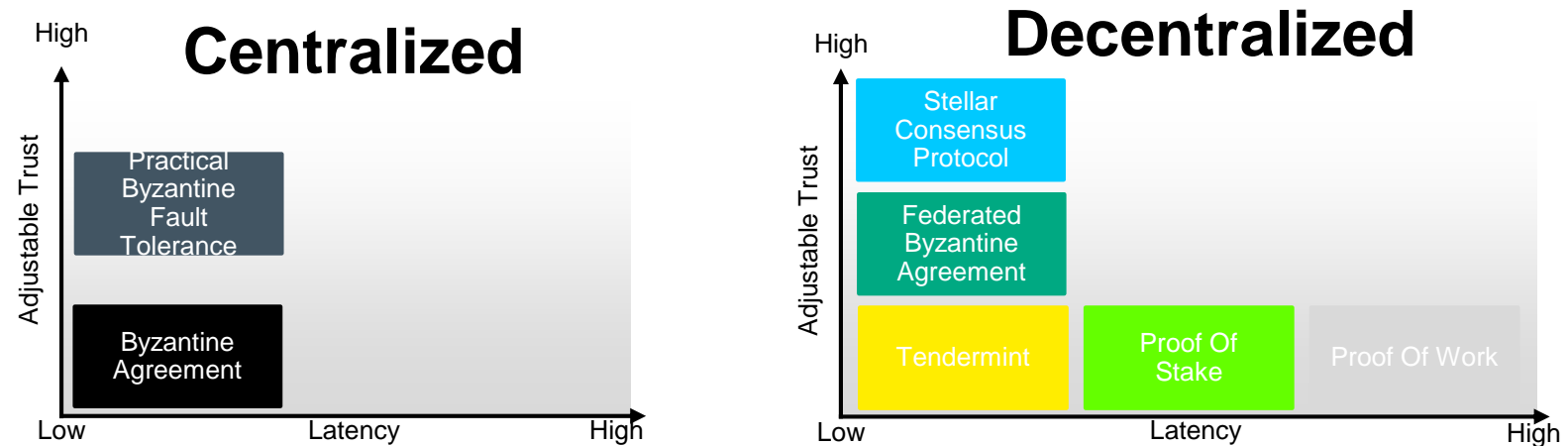
How does a Blockchain work?

Byzantium (Constantinople) May 1453 AD.
Blockchain Consensus Mechanisms

Centralized

Adjustable Trust (vertical axis, Low to High)

- Practical Byzantine Fault Tolerance
- Byzantine Agreement

Latency (horizontal axis, Low to High)

Decentralized

Adjustable Trust (vertical axis, Low to High)

- Stellar Consensus Protocol
- Federated Byzantine Agreement
- Tendermint
- Proof Of Stake
- Proof Of Work
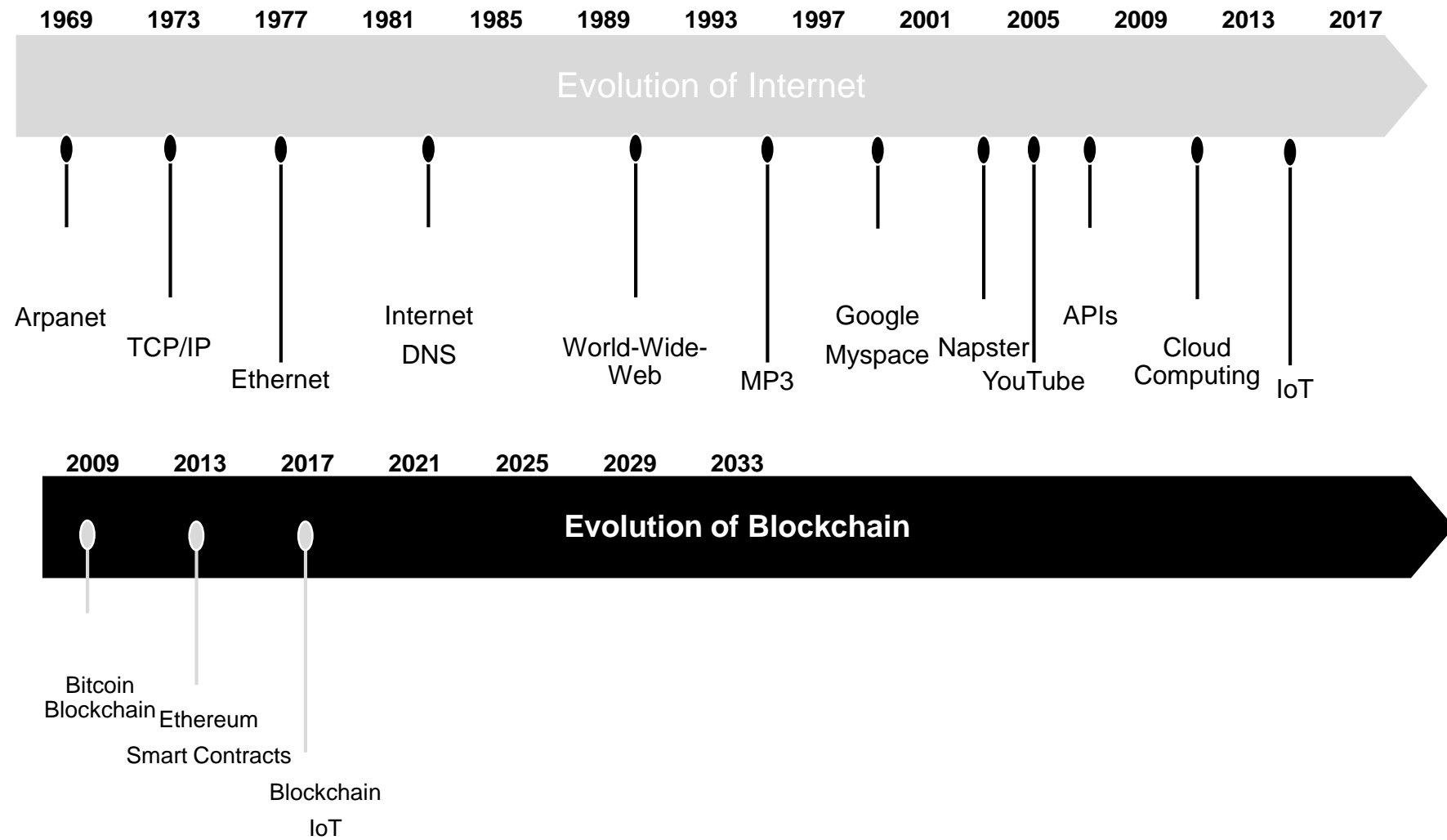
Latency (horizontal axis, Low to High)

Non-triviality : If all generals have the same input bit b then, the only possible decision value of the loyal generals is b. More formally, $\forall G_i, x_i = b \Rightarrow \forall G_j \in L, d_j = b$

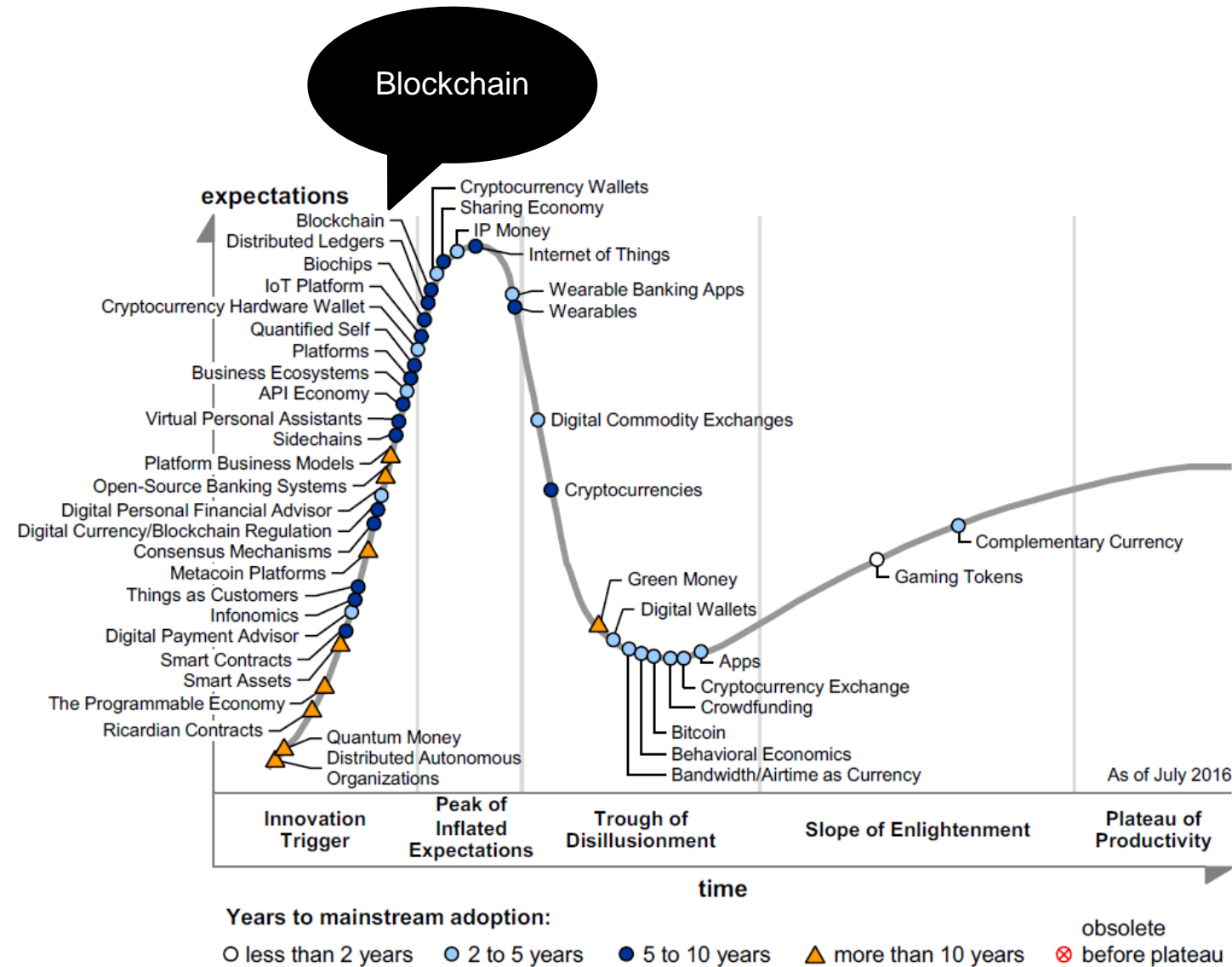**Agreement :** The loyal generals should agree on the decision. That is, $\forall G_i, G_j \in L, \; d_i = d_j$

Limited bureaucracy : The protocol must terminate.

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Where is Blockchain right now?

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The Evolution

Evolution of Internet

| 1969 | 1973 | 1977 | 1981 | 1985 | 1989 | 1993 | 1997 | 2001 | 2005 | 2009 | 2013 | 2017 |

Arpanet

TCP/IP

Ethernet

Internet
DNS

World-Wide-
Web

MP3

Google
Myspace   Napster

APIs

YouTube

Cloud
Computing

IoT

Evolution of Blockchain

| 2009 | 2013 | 2017 | 2021 | 2025 | 2029 | 2033 |

Bitcoin
Blockchain Ethereum

Smart Contracts

Blockchain

IoT

Hype Cycle for Emerging Technologies

Blockchain Business Benefits

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Blockchain Business Benefits

Assurance
- Decentralization
- Data Reliability
- Transparency
- Data Protection
- Attestation

Amplification
- IoT integration
- Collaboration
- Empowered Consumer
- Cross-Economy Interoperability

Serenity
- Cryptographic Reputation
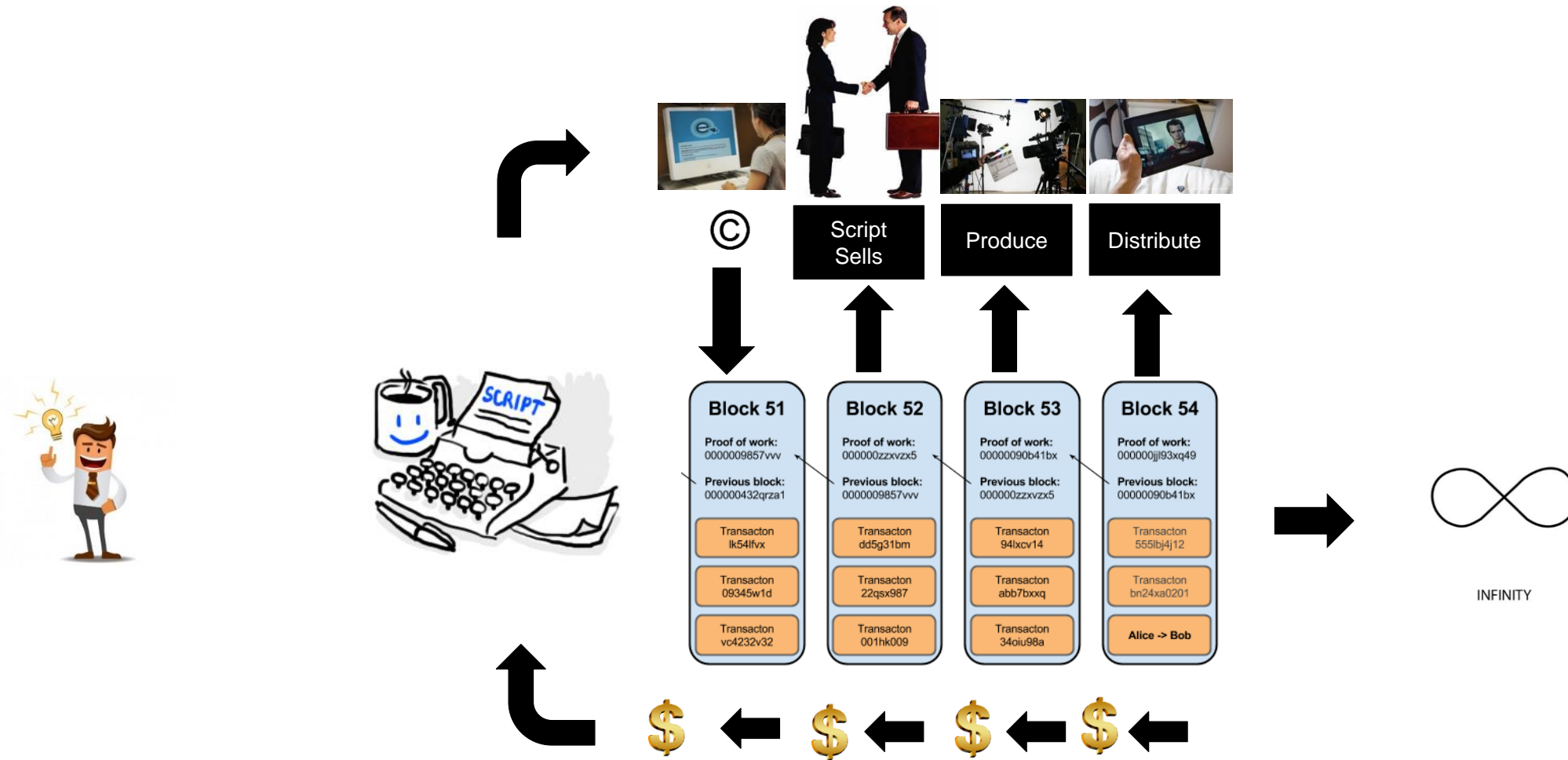- Public Transparency
- Business Confidence

Efficiency
- New forms of value interpretation
- Optimized time to value
- Continuous and autonomous markets

Business Intelligence
- Programmable Business through Smart Contracts
- Decentralized Autonomous Organizations
- Autonomous and decentralized value creation collaboration platforms

The Hollywood Hustle

The Hollywood Hustle

Writer
1d3981ba1e1892a8754666
6766b83d6a10a6341db303
863a19fd63c2e90598e1

Production
9cb2832ca2366f088a8eab
3657dd395794381c3a0c23
8bb224d7a730ca8a96d4

Distribution
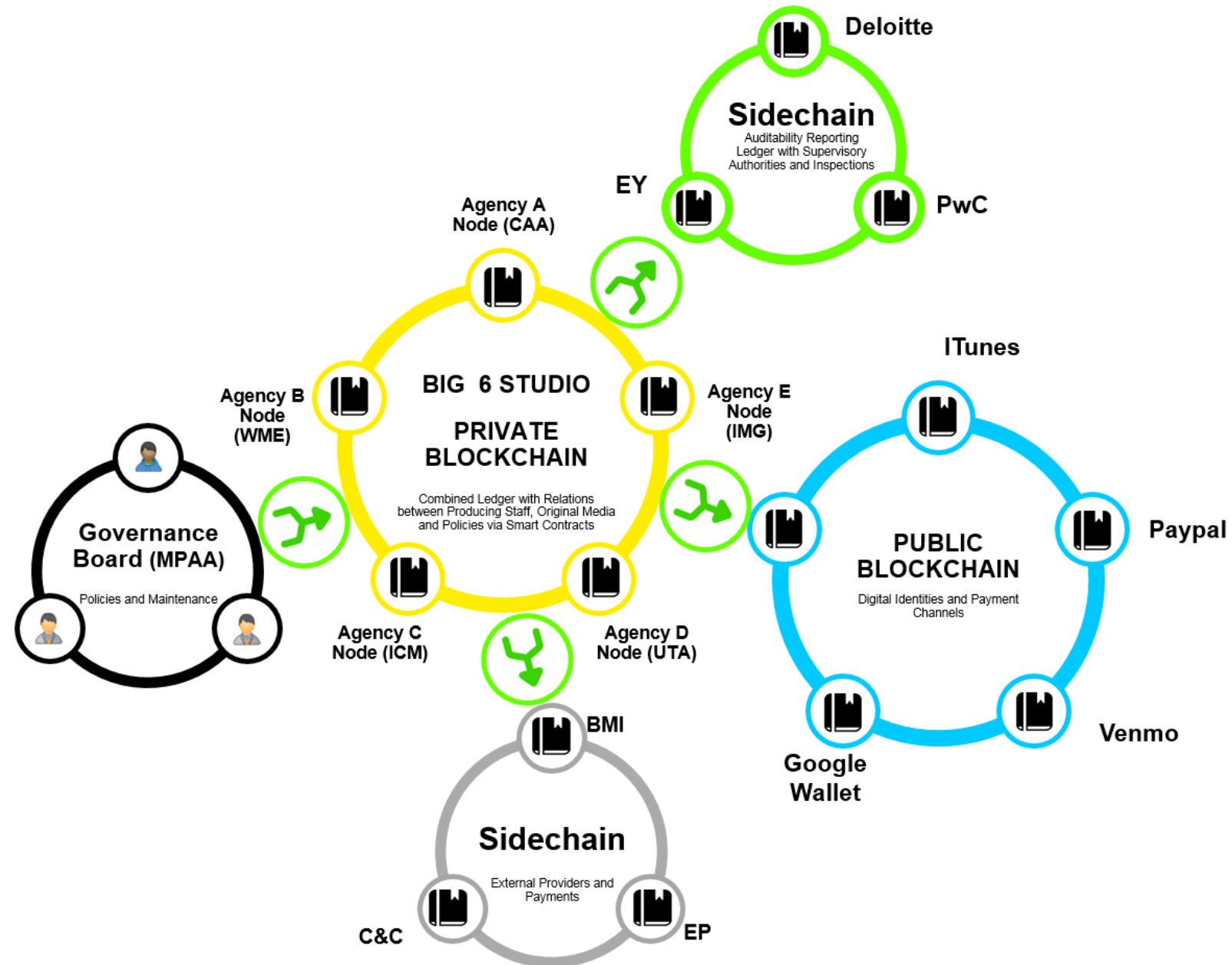98ee4021c6f1b0e4e4ad7c
b7a1dcca8b61530b695d5a
6e9fea8a5d3a6af77358

Licensee
681927e34b77e4b91b1f6f
305d9ede004ad0b02f7c81
ff74d8f7015e1b8f9c4e

Viewer
fefb4ac0bc602c600d94d9
f7b6c3faefce6ec1dfd18f
0feb7e9a8395eeb81e03

Sidechain
Auditability Reporting Ledger with Supervisory Authorities and Inspections

Deloitte

EY

PwC

Agency A Node (CAA)

Agency B Node (WME)

BIG 6 STUDIO
PRIVATE BLOCKCHAIN
Combined Ledger with Relations between Producing Staff, Original Media and Policies via Smart Contracts

Agency E Node (IMG)

ITunes

PUBLIC BLOCKCHAIN
Digital Identities and Payment Channels

Paypal

Venmo

Google Wallet

Governance Board (MPAA)
Policies and Maintenance

Agency C Node (ICM)

Agency D Node (UTA)

Sidechain
External Providers and Payments

BMI

C&C

EP
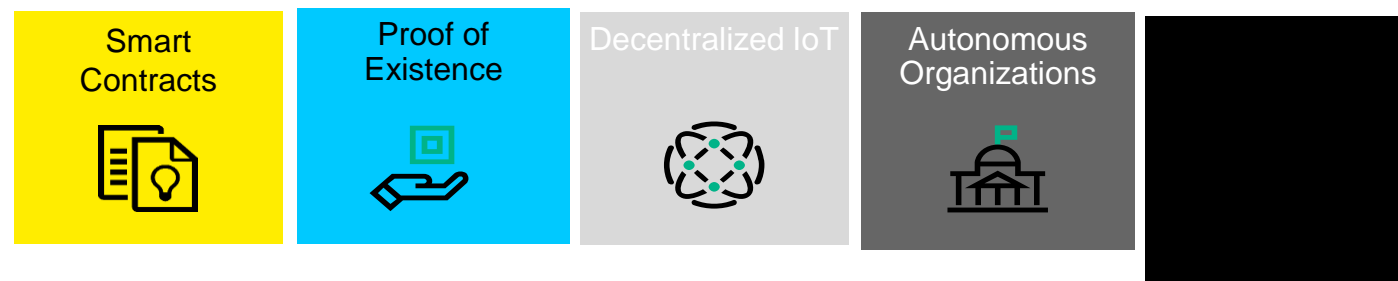
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22

Blockchain Applications

BITCOIN is the first APPLICATION on Blockchain

Many more applications on many more Blockchains are being developed!

Smart Contracts	Proof of Existence	Decentralized IoT	Autonomous Organizations	

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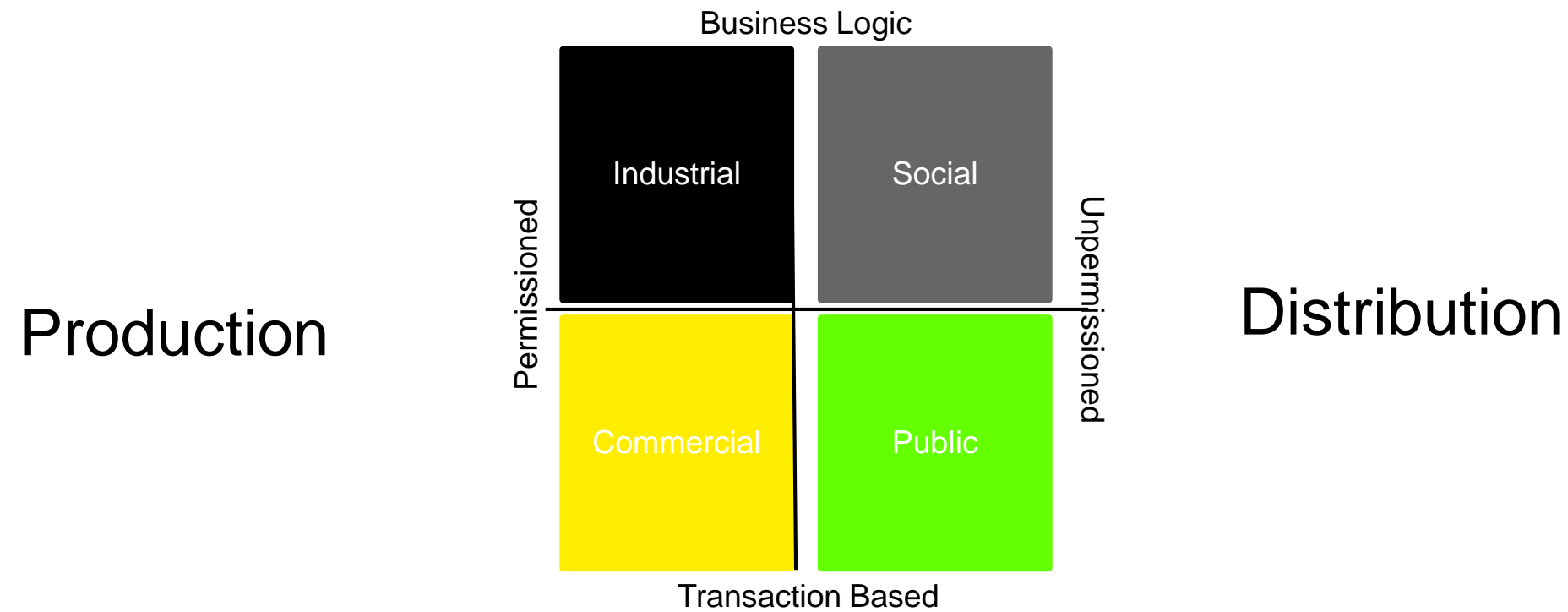IT SOCIETY

Blockchain Implementation Considerations

Permissionless vs Permissioned Blockchains

A question of control and trust

Permissionless Blockchains

Trust is enforced by Cryptographic proof from the Software Protocol

Permissioned Blockchains

Trust is enforced through restricted access to transaction validation

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Blockchain Fundamentals

Business Logic

	Industrial	Social	
Permissioned			Unpermissioned
	Commercial	Public	

Production

Distribution

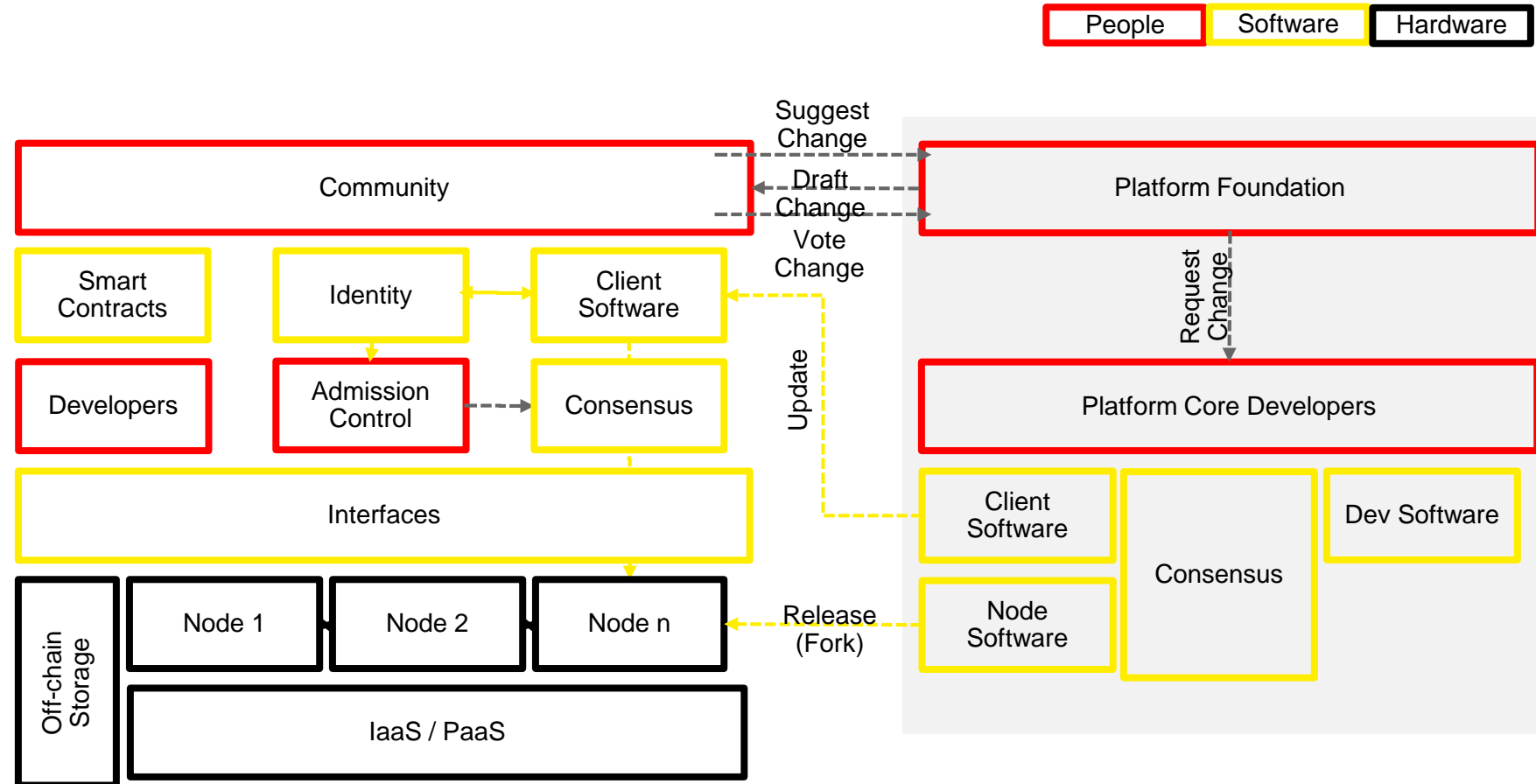Transaction Based

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Blockchain Implementation Considerations

Governance

- Admission/qualification of network participants
- Policy definition and administration
- Data and interoperability standards
- Dispute resolution
- Change control

Data Privacy

- On chain vs off chain storage
- Transparency vs privacy
- Transaction data encryption
- Data leakage

Security

- Key management (issuance, revocation)
- Lost/compromised keys
- Unknown threat vectors
- Decentralized Security

Scalability

- Requirements on compute, bandwidth and storage can lead to centralization
- Viability of different consensus models

Regulatory/ Compliance

- Impact of digital currency to systemic risk
- Incorporation of AML/KYC into digital payments systems
- Regulator access to data
- New regulations required?

DXC Point of View

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Blockchain Functional View

People | Software | Hardware

Community

Suggest Change

Draft Change

Vote Change

Platform Foundation

Smart Contracts

Identity → Client Software

Developers

Admission Control → Consensus

Update

Request Change

Platform Core Developers

Interfaces

Client Software

Consensus

Dev Software

Off-chain Storage | Node 1 | Node 2 | Node n

Release (Fork)

Node Software

IaaS / PaaS

Thank you for your time!

Steve Wong

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