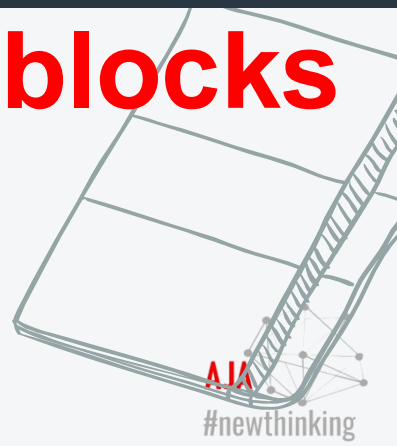




Demystifying blockchain | **Unlocking the blocks**

Presented by : CA Anand Prakash Jangid

Dt: 15th June, 2019



AIA
#newthinking

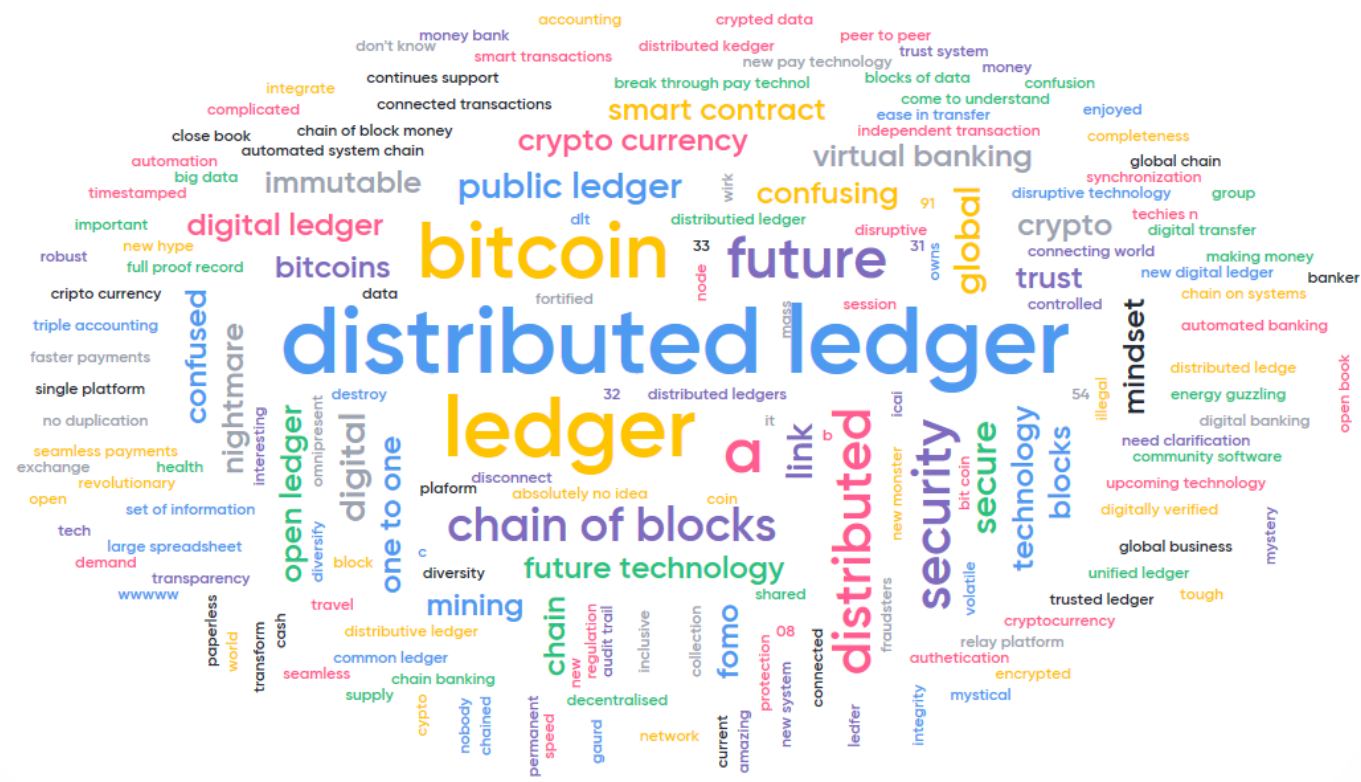
Disclaimer

This material is used by Anand P Jangid during an oral presentation; it is not a complete record of the discussion. This presentation is for informational purposes and does not contain or convey specific advice. It should not be used or relied upon in regard to any particular situation or circumstances without first consulting the appropriate advisor. No part of the presentation may be circulated, quoted, or reproduced for distribution without prior written approval from Anand Prakash Jangid.

Go to www.menti.com and use the code **33 54 32**

Please put three words to explain how you perceive Blockchain?

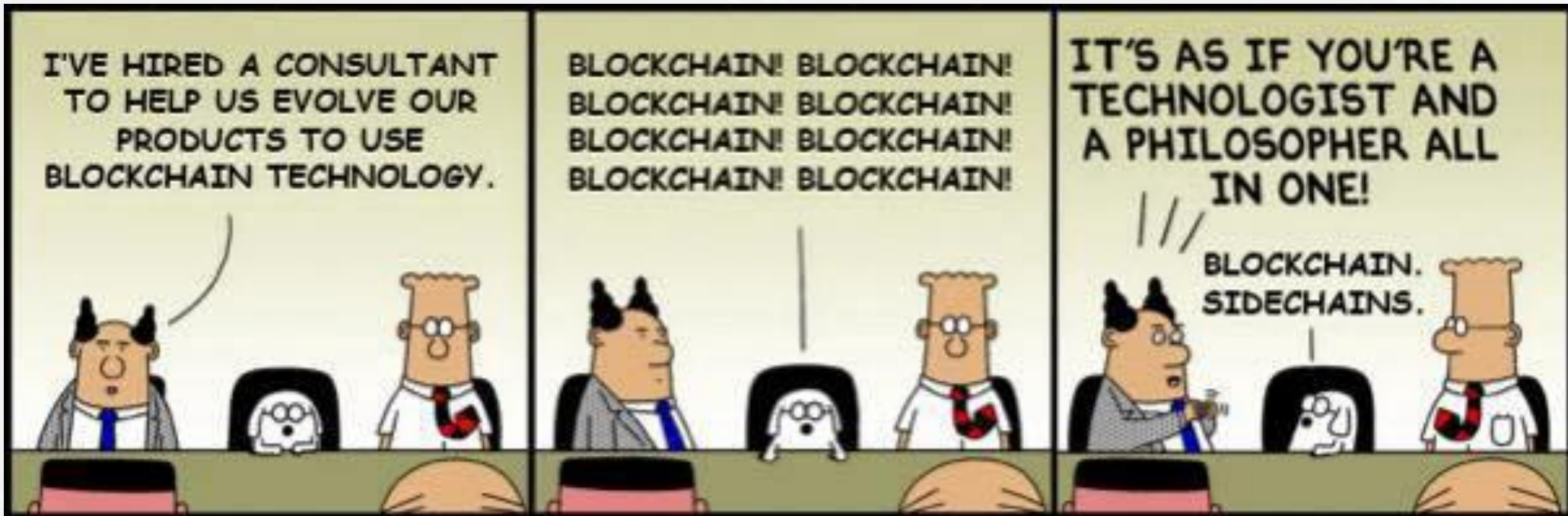
Mentimeter



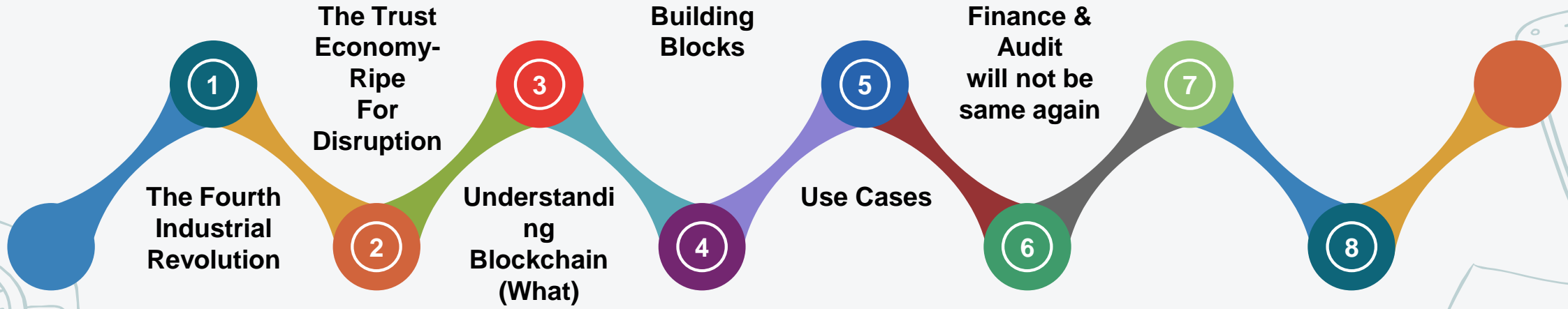
122

#newthinking

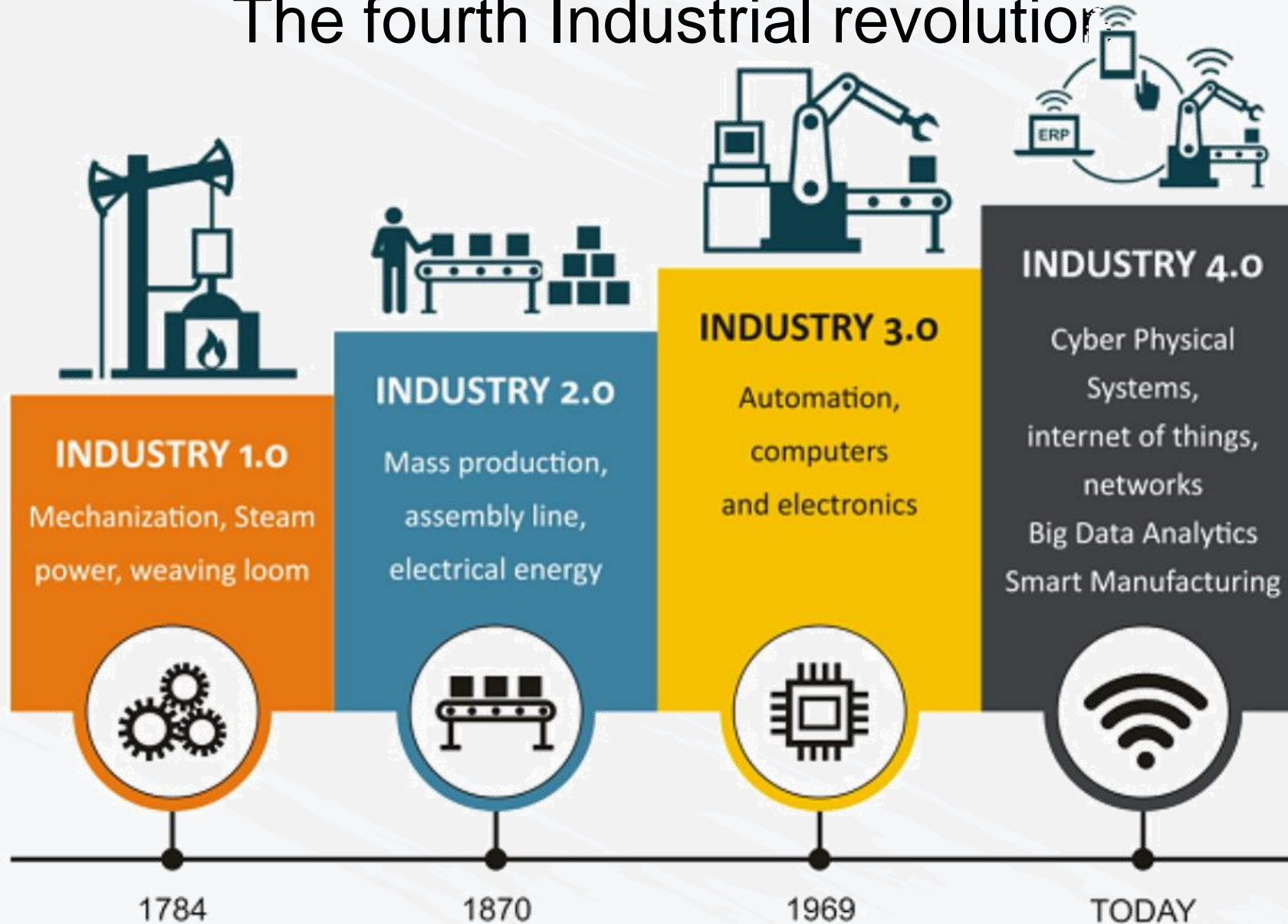
Some food for thought



Roadmap For Today's Discussion



The fourth Industrial revolution



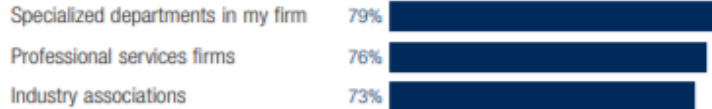
Disruption

UBS trading floor 2005 and 2016

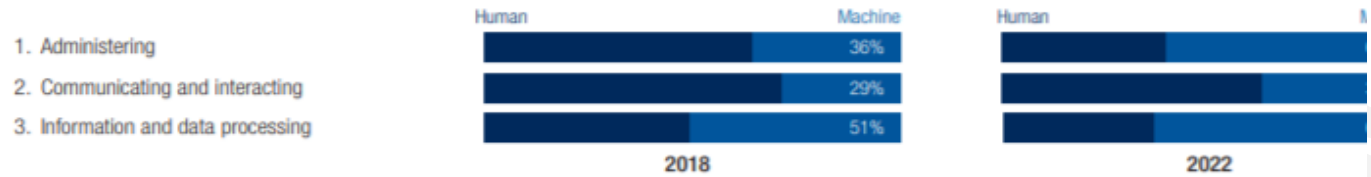


Financial Services & Investors (WEF-Future of Job Report)

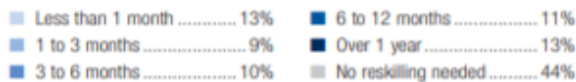
Projected adaptation partners



Augmentation of key job tasks in 2018 and 2022 (share of task hours)



Average reskilling needs (share of workforce)



Workforce in 2018 and 2022

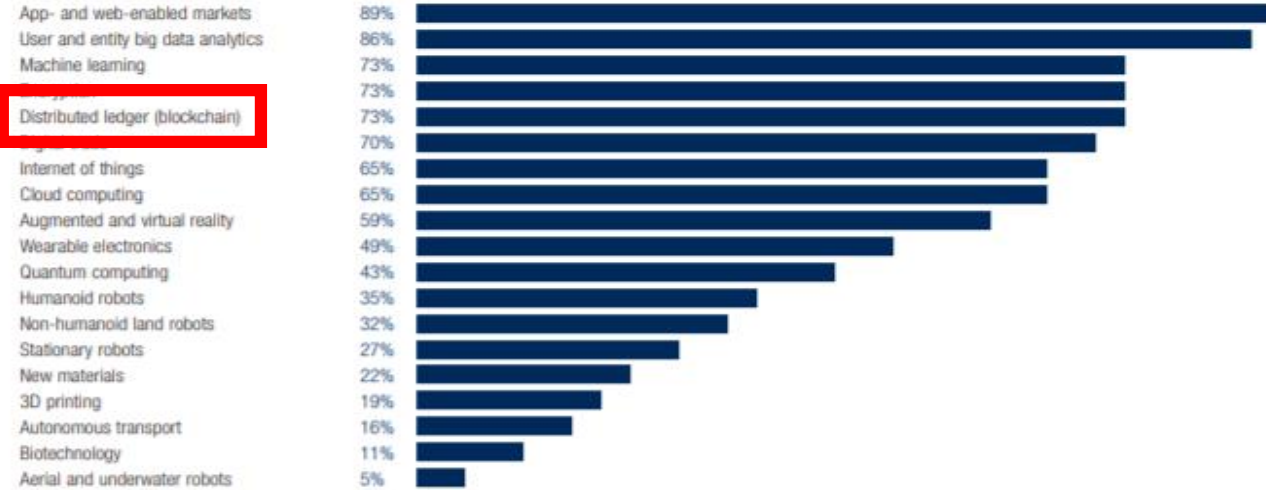


Financial Services & Investors

Trends driving industry growth

1. Advances in mobile internet
2. Increasing availability of big data
3. Increasing adoption of new technology
4. Advances in artificial intelligence
5. Advances in cloud technology
6. Advances in computing power
7. Expansion of affluence in developing economies
8. Expansion of education
9. Expansion of the middle classes
10. Shifts of mindset among the new generation

Technology adoption in industry *(share of companies surveyed)*



Expected impact on workforce *(share of companies surveyed)*



Barriers to adoption of new technologies *(share of companies surveyed)*



Challenges Today

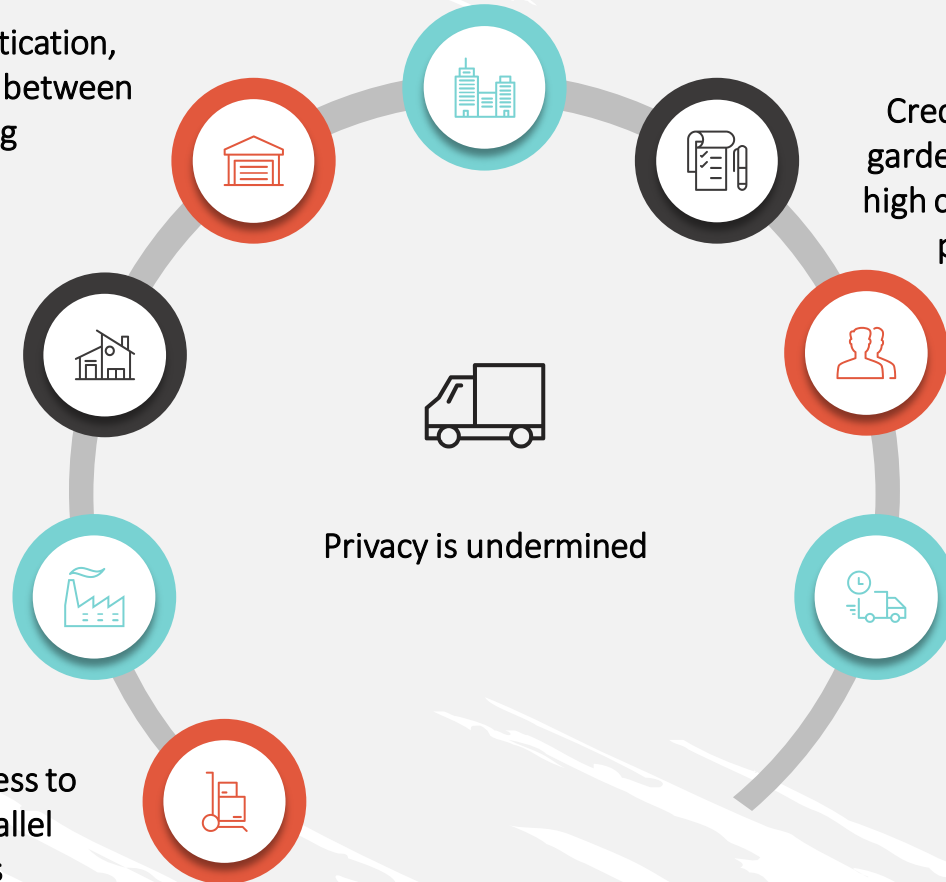
Cost- Transferring money take time and cost (3 to 16%)

Intermediaries are slow in their task- Authentication, Identification, Clearing , Settling etc. The time between transaction and settlement can be long

Fraud, cyber-attacks and even simple mistakes add to the cost and complexity of doing business, and they expose all participants in the network to risk if a central system, such as a bank, is compromised

They are centralized and hence can be hacked

Half of the people in the world don't have access to a bank account and have had to develop parallel payment systems to conduct transactions



Credit card organizations have essentially created walled gardens with a high price of entry. Merchants must pay the high costs of onboarding, which often involves considerable paperwork and a time-consuming vetting process

Duplication of effort and the need for third-party validation and/or the presence of intermediaries add to the inefficiencies

Privacy is undermined

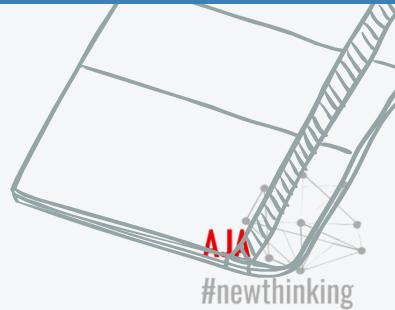
Sending a PPT to you vs sending you a Asset/currency (Intellectual)



The Disruption has begun

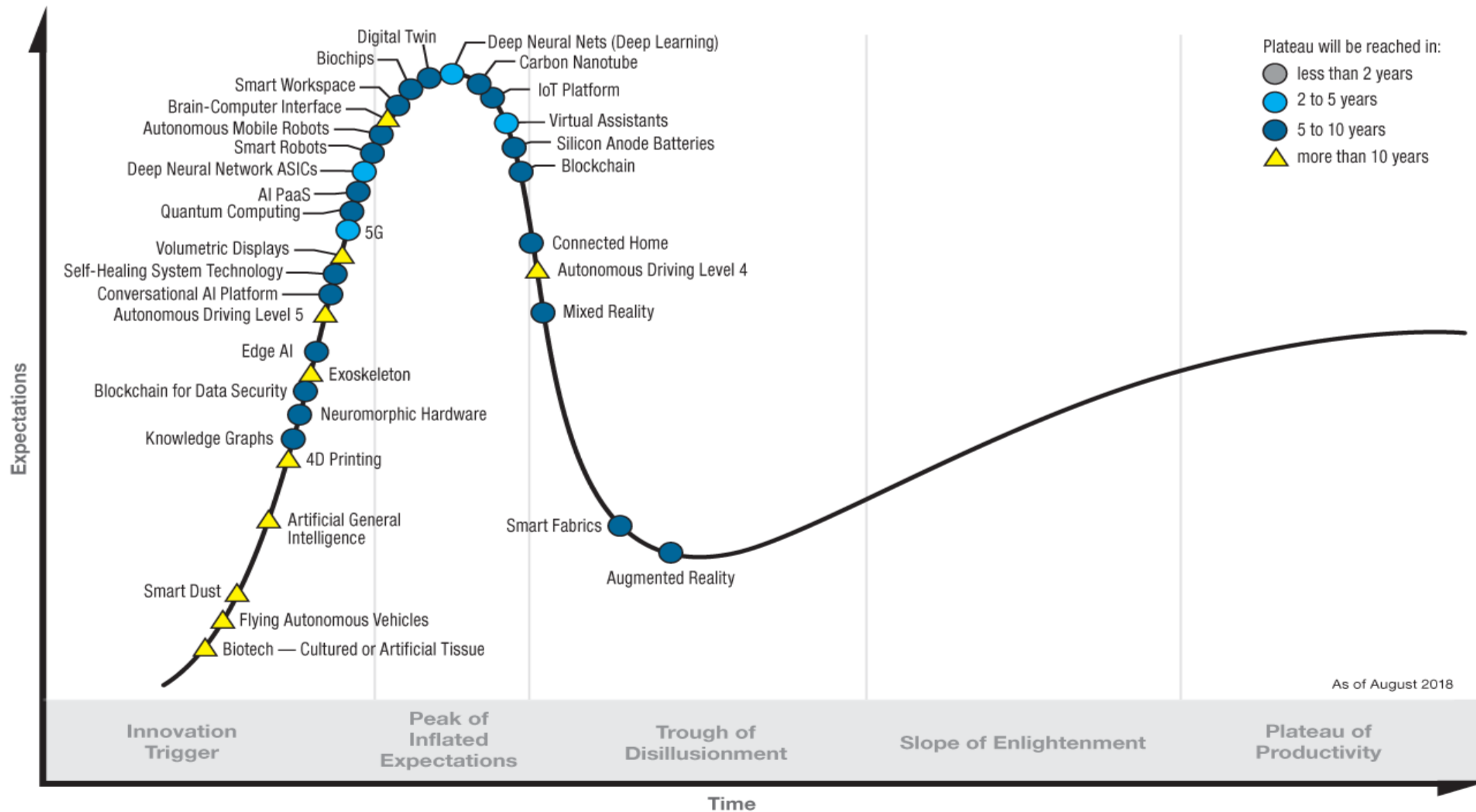
The blockchain will do to the financial system what the internet did to media”

Joi Ito, Neha Narula and Robleh Ali - Harvard Business Review





The Gartner Hype cycle 2018





02

Understanding Blockchain Essentials



Satoshi Nakamoto: Bitcoin P2P e-cash paper October 31, 2008

“I've been working on a new electronic cash system that's fully peer-to-peer, with no trusted third party.”



BLOCKCHAIN TIMELINE



October 2008:

Bitcoin whitepaper by the nom-de-plume Satoshi Nakamoto is published.

LHVpank

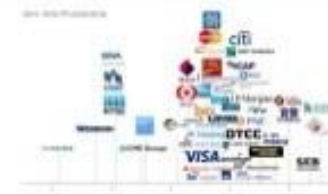
June 2014:

LHVpank starts research on Blockchain and its digital security with their app "Cuber Wallet".



September 2015:

Major financial companies form R3 – a consortium of over 40 institutions committed to exploring and implementing Blockchain technology.



September 2016:

Over 40 financial service institutions have invested in a Blockchain or Bitcoin startup since 2014.

May 2010:

First Bitcoin purchase: BTC 10k for a \$25 pizza. Today BTC 10k is worth \$10m! Bitcoin is known as the first use case of Blockchain technology.



July 2014:

Ethereum Project – a Blockchain platform with the ability to build decentralized applications – is funded by a crowd sale.



September 2015:

Visa, Citi, Nasdaq, Capital One and Fiserv invest \$30m in the Blockchain startup Chain.com.



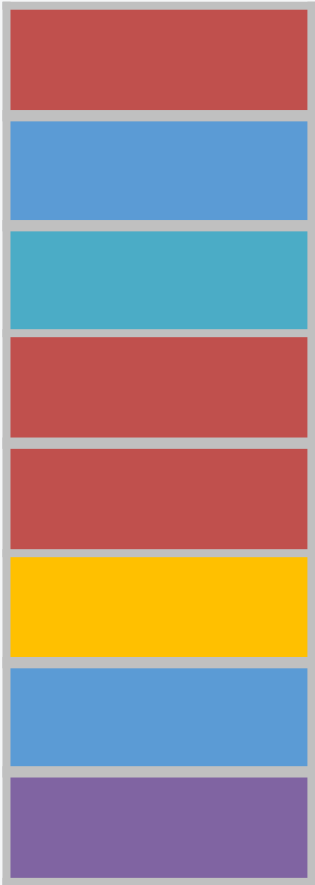
2018:

WEC estimates that 80% of all banks will initiate projects concerning distributed ledger technology – the underlying technology supporting Blockchain.



What is a blockchain?

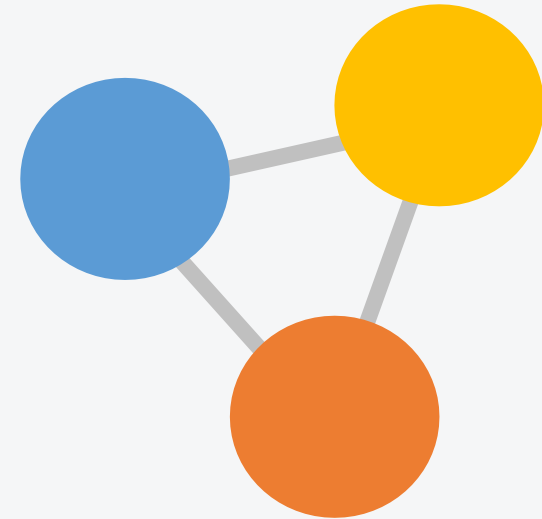
timestamped
append-only log



auditable database



consensus protocol



Secured via cryptography

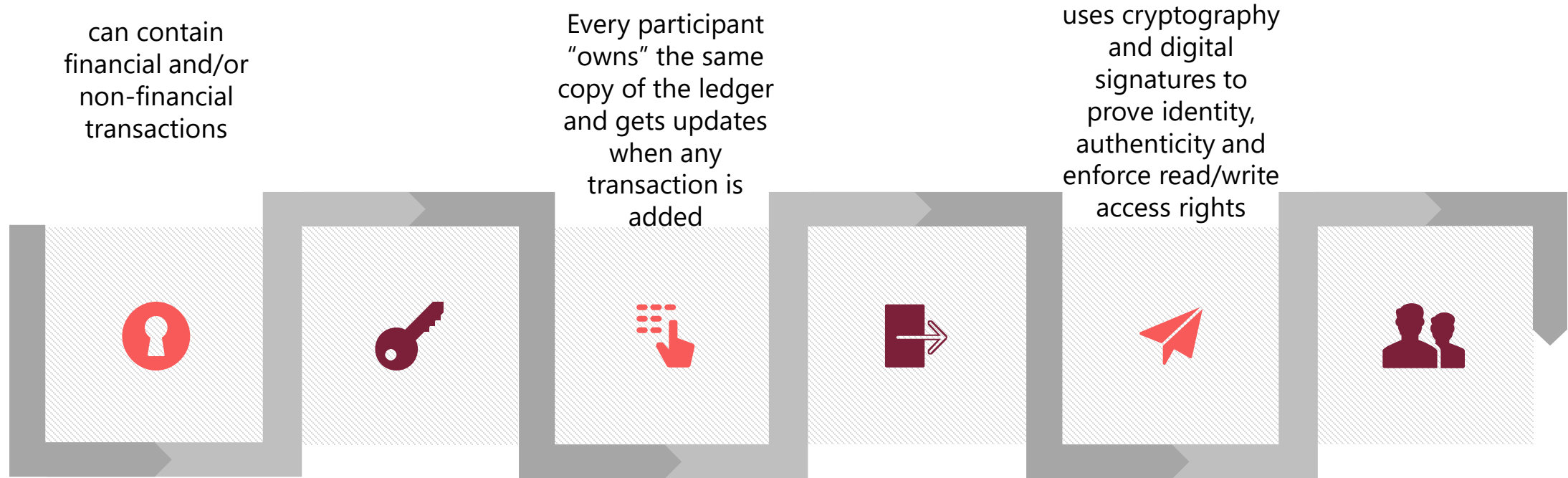
- Hash functions for **tamper resistance** and **integrity**
- Digital signatures for **consent**
- Consensus for **agreement**

Addresses '**cost of trust**'
(Byzantine Generals problem)

- Permissioned
- Permissionless

Blockchain (Over)simplified

Blockchain is a distributed ledger that...

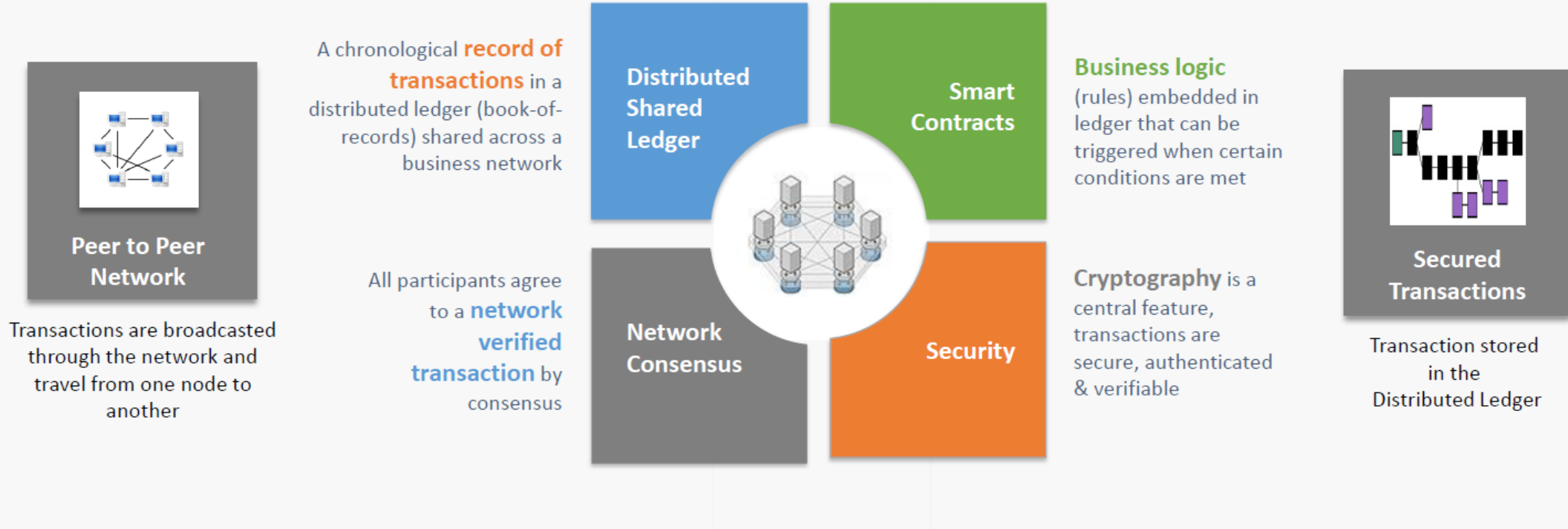


is replicated (distributed) across a number of systems in near real-time over a peer-to-peer network

Every participant helps determine the intrinsic "immutability" of all existing records

has mechanisms to make it hard to change historical records, or at least make it easy to detect when someone is trying to change it

Key constructs of Blockchain technology



Lower Cost



Increased Transparency



Greater Security



Faster Settlement

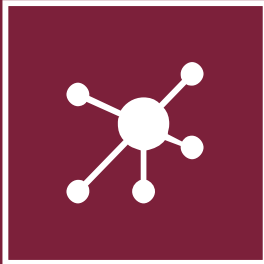
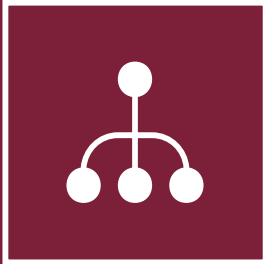
Roadmap for Today's Workshop



03 Building blocks



Five Key Component of a Blockchain



CRYPTOGRAPHY

Use of a variety of cryptographic techniques including cryptographic one-way hash functions, Merkle trees and public key infrastructure (private-public key pairs)



P2P NETWORK

Network for peer discovery and data sharing in a peer-to-peer fashion



CONSENSUS MECHANISM

Algorithm that determines the ordering of transactions in an adversarial environment (i.e., assuming not every participant is honest)



LEDGER

List of transactions bundled together in cryptographically linked 'blocks'

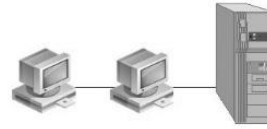


VALIDITY RULES

Common set of rules of the network (i.e., what transactions are considered valid, how the ledger gets updated, etc.)

Network Evolution History

Phase 1 : 50's - 60's



Phase 2 : 70's - 80's

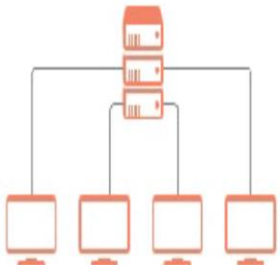


Phase 4 : 80's till now



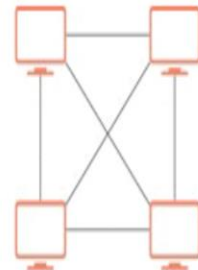
CLIENT/SERVER

Central Server

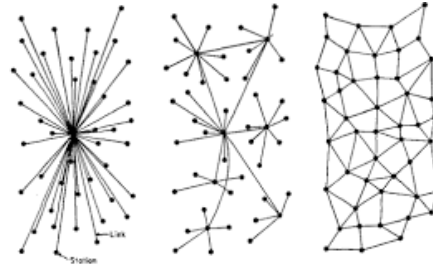


Clients

PEER TO PEER



Distributed Clients



Centralised

Decentralised

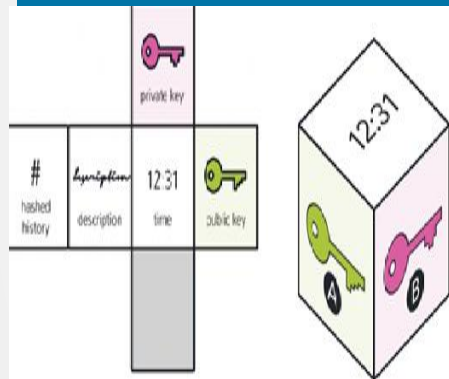
Distributed

Distributed or P2P Computing

MEET THE CHILD – BLOCKCHAIN

1

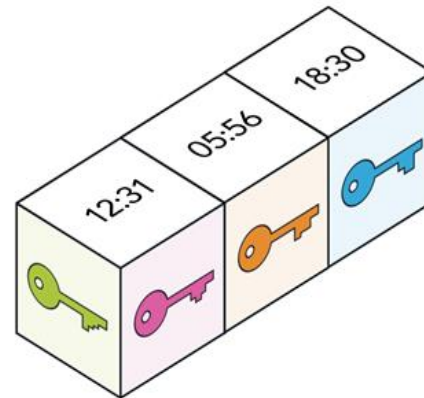
Step ONE



Creation of a block

2

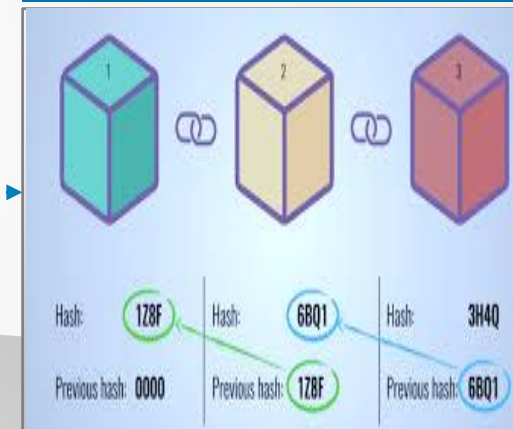
Step TWO



Assembling of blocks

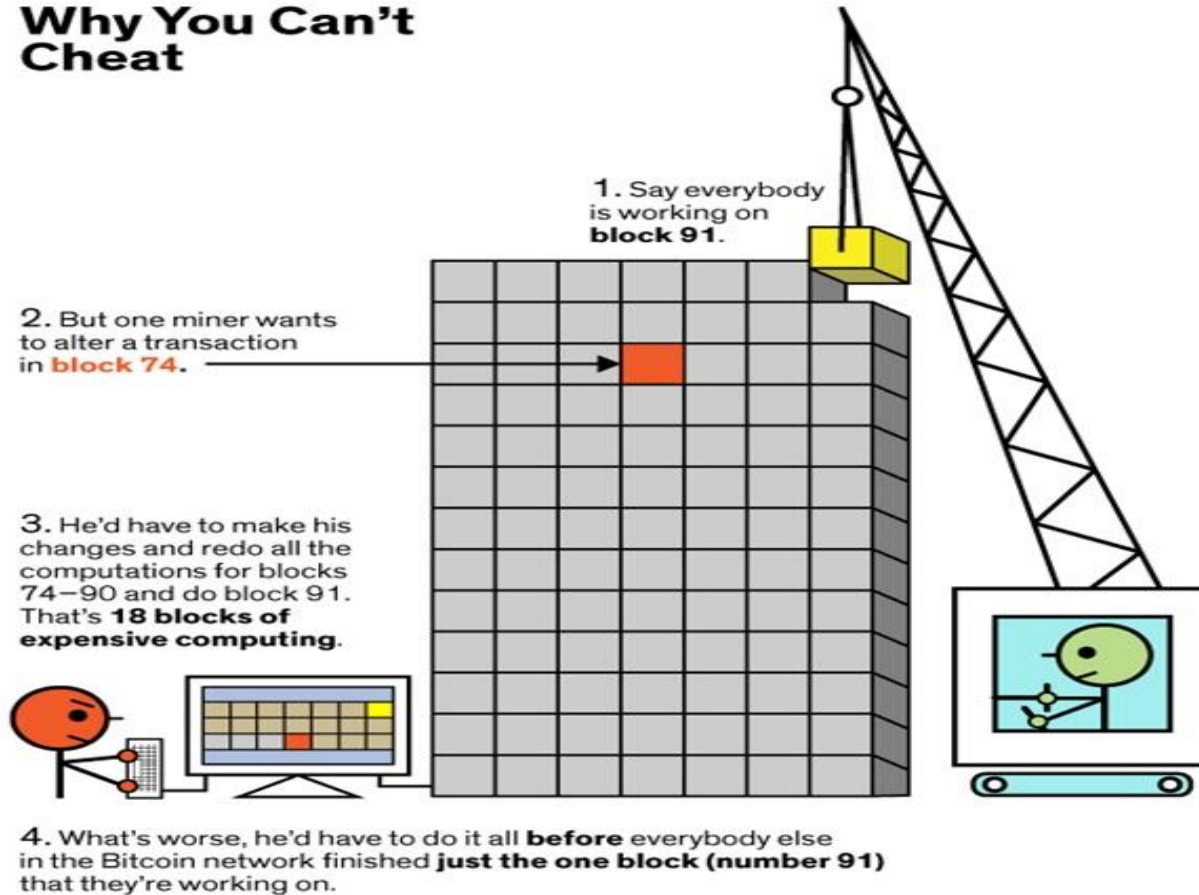
3

Step THREE



Chaining of blocks

Why You Can't Cheat

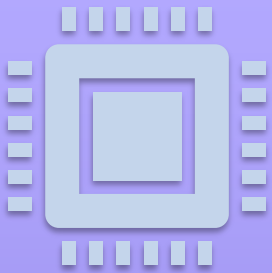


BLOCKCHAIN is a TRUST PROTOCOL using technology, maths and coding resulting in elimination of MIDDLEMEN and addressing such concerns as:

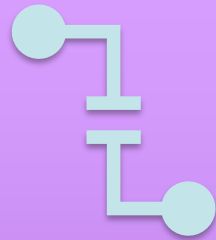
- **Trust of Safety** - my bank is not subtracting value from my bank balance
- **Trust of Issuance** – my bank is not printing money from nowhere
- **Trust of correctness** – my bank ensures consistency & correctness of information

SMART CONTRACTS

enabling trust with trust-less network



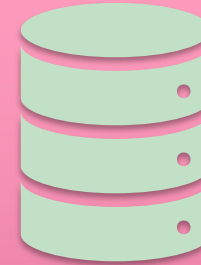
What WINDOWS did to adoption of computers, SMART CONTRACTS are doing the same for adoption of blockchain based applications



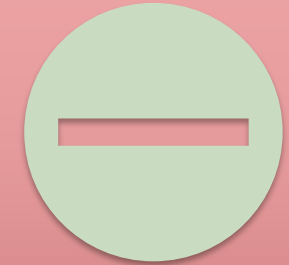
Smart contracts are a piece of code which gets executed on occurrence of a pre-defined trigger and operate in complete autonomy and decentralized mode - *trackable and irreversible*



Automated buying & selling, exchange of shares, making payments, updating land titles *without any intermediaries*



All the core blockchains including Bitcoin, Ethereum, Neo allow users to program Smart contracts on their platform

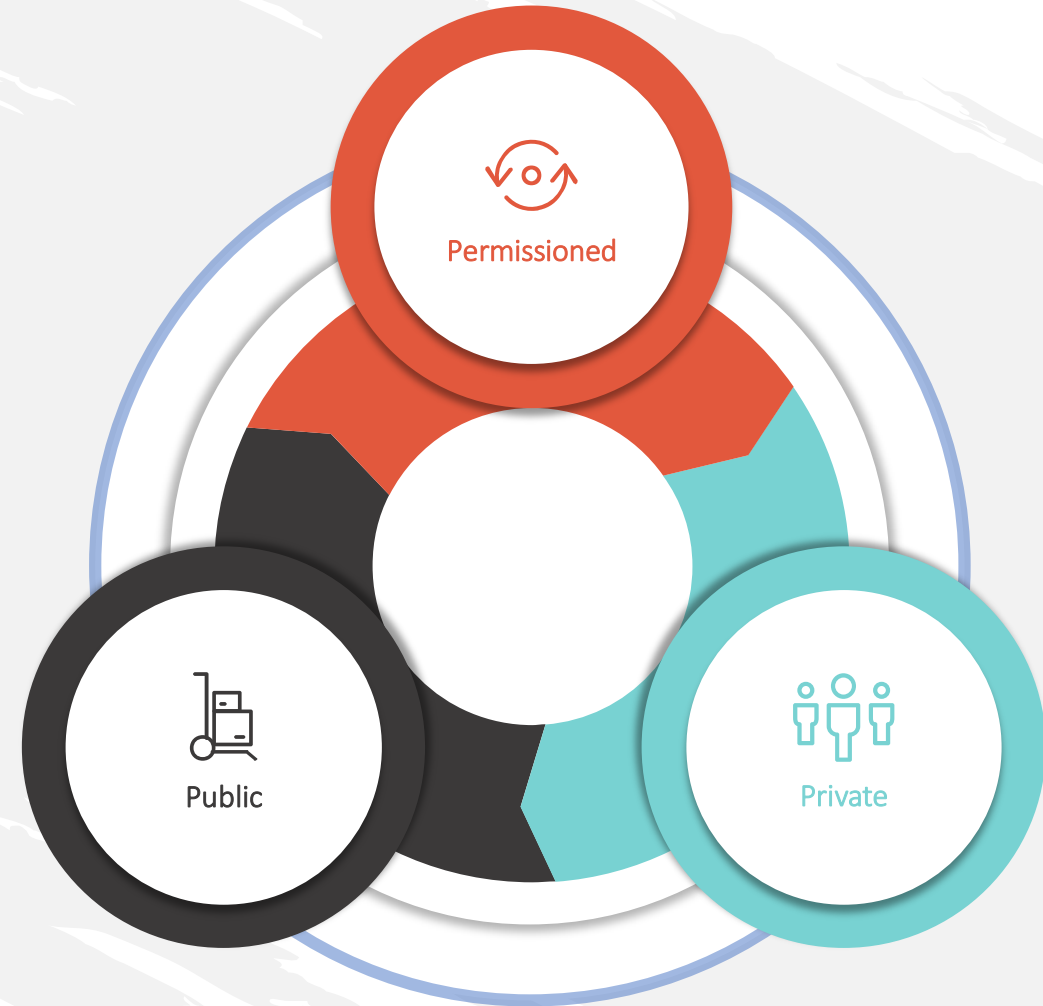


If Blockchain are roads, smart contracts are pods!



Types of Blockchain

Blockchains are differentiated based on the types of nodes or users who **validates** the transactions but fundamental architecture of the blockchain remaining the same



Roadmap for Today's Workshop

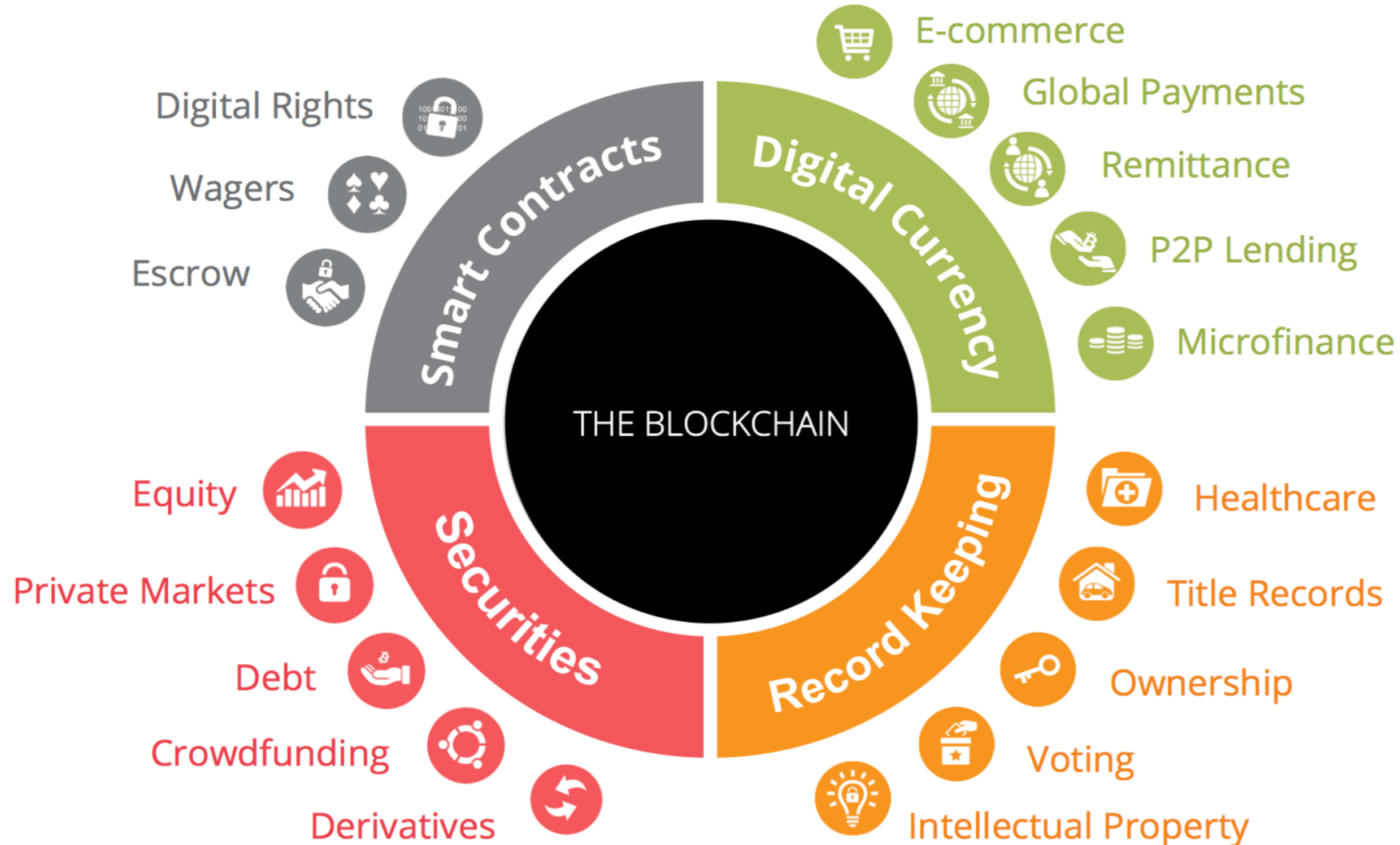


05 Use Cases



Blockchain Potential Applications & Disruption

The blockchain is radically changing the future of transaction based industries



BLOCKCHAIN

REAL WORLD USES CASES

BORDER CONTROL

Essentia has devised a border control system that would use blockchain to store passenger data in the Netherlands.



IDENTIFICATION

Voter registration is being facilitated via a blockchain project in Switzerland spearheaded by Uport.



MOBILE PAYMENTS

The blockchain ledger that Ripple uses has been latched onto by a group of Japanese banks, who will be using it for quick mobile payments.




INSURANCE

A smart contract-based blockchain is being used by Insurer American International Group Inc as a means of saving costs and increasing transparency.



ENDANGERED SPECIES PROTECTION

The protection of endangered species is being facilitated via a blockchain project that records the activities of these rare animals.



CARBON OFFSETS

IBM is using the Hyperledger Fabric blockchain in China to monitor carbon offset trading.



ENTERPRISE

Ethereum's blockchain can be accessed as a cloud-based service courtesy of Microsoft Azure.



GOVERNMENT

Essentia is developing an e-government pilot with Finland's Central Union of Agricultural Producers and Forest Owners that will enable urban and rural citizens to access public records.



SUPPLY CHAINS

IBM and Walmart have partnered in China to create a blockchain project that will monitor food safety.



HEALTHCARE

A number of healthcare systems that store data on the blockchain have been pioneered including MedRec.



SHIPPING

Shipping is a natural fit for blockchain, and Maersk have been trialling a blockchain-based project within the maritime logistics industry.



REAL ESTATE

Blockchain is now being used to complete real estate deals, the first of which was conducted in Kiev by Propy.



ENERGY

Essentia is developing a test project that will help energy suppliers track the distribution of their resources in real time, whilst maintaining data confidentiality.



LAND REGISTRY

Land registry titles are now being stored on the blockchain in Georgia in a project developed by the National Agency of Public Registry.



COMPUTATION

Digital Currency Group are helping Amazon Web Services examine ways in which the distributed ledger technology can help improve database security.



ADVERTISING

New York Interactive Advertising Exchange has been experimenting with blockchain as a means of providing an ads marketplace for publishers.




BORDER CONTROL

Essentia is developing a blockchain project for border control that will allow customs agents to record passenger data from an array of inputs and safely store it.



JOURNALISM

Decentralized journalism, as enabled by blockchain technology, has the potential to prevent censorship and increase transparency, as Civil has shown.




WASTE MANAGEMENT

Waltonchain is using RFID technology to store waste management data on the blockchain in China.



ENERGY

Food importation is another industry where blockchain is proving its worth, with Louis Dreyfus Co trialling a soybean importation operation using this technology.




DIAMONDS

The De Beers Group is using blockchain to track the importation and sale of diamonds.



FINE ART

By storing certificates of authenticity on the blockchain, it's possible to dramatically reduce art forgeries, as one blockchain project is proving.



NATIONAL SECURITY

For the past two years, the US Department of Homeland Security has been using blockchain to record and safely store data captured from its security cameras.



TOURISM

In a bid to boost its tourism economy, Hawaii is examining ways in which blockchain-based cryptocurrencies can be adopted throughout the US state.




TAXATION

In China, a tax-based initiative is using blockchain to store tax records and electronic invoices led by Miaocal Network.



ENERGY

Chile's National Energy Commission has started using blockchain technology as a way of certifying data pertaining to the country's energy usage as it seeks to update its electrical infrastructure.



RAILWAYS

Russian rail operator Novotrans is storing inventory data on a blockchain pertaining to repair requests and rolling stock.



ENTERPRISE

Google is building its own blockchain which will be integrated into its cloud-based services, enabling businesses to store data on it, and to request their own white label version developed by Alphabet Inc.




MUSIC

Arbit is a blockchain-based project led by former Guns N Roses drummer Matt Sorum seeking a fairer way to reward musicians for their creative efforts.



FISHING

Blockchain technology has been used to provide a transparent record of where fish was caught, as a means of ensuring it was legally landed.



Roadmap for Today's Workshop



06

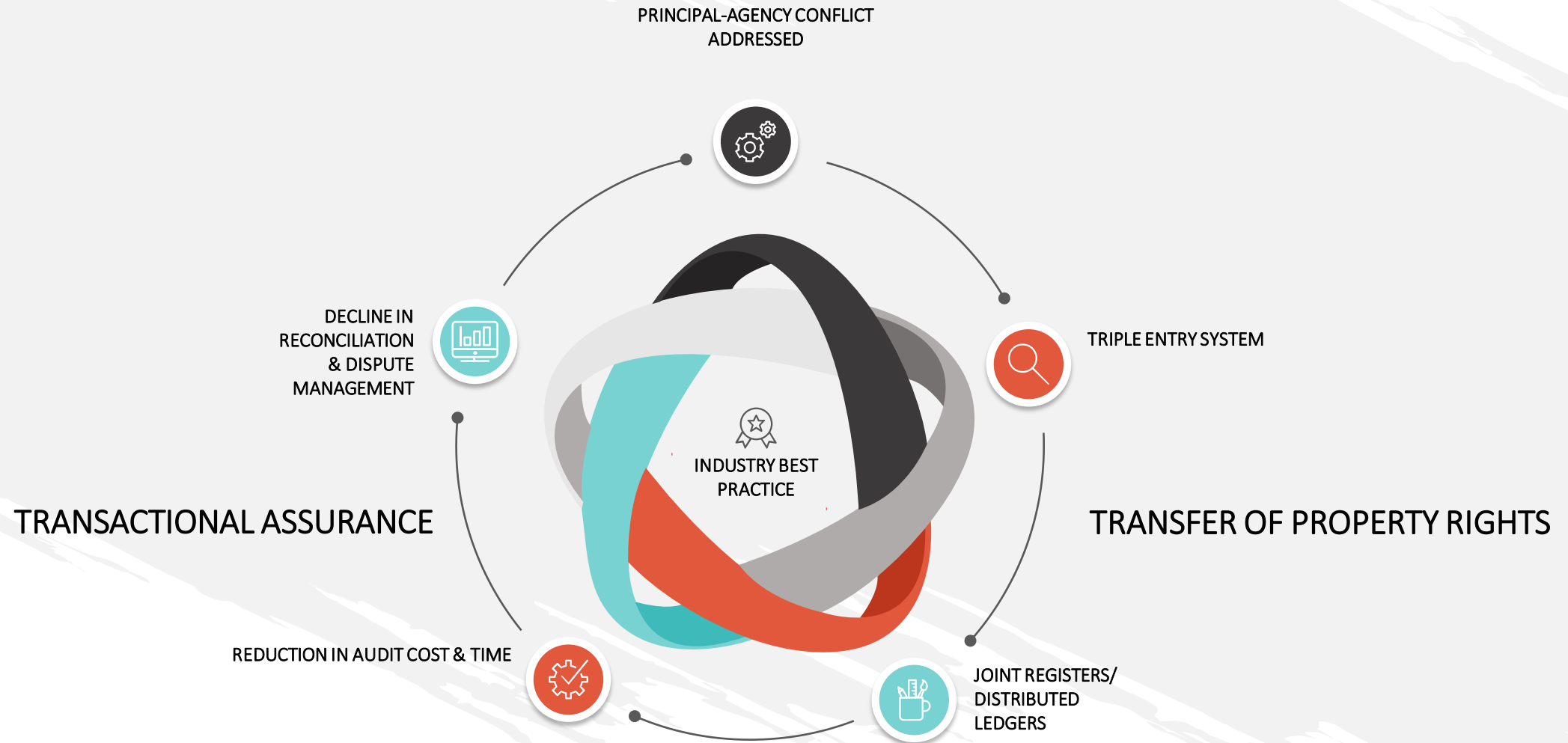
Finance & Audit
will not be same again



CRITICISIM AND CHALLENGES



ACCOUNTING IN BLOCKCHAIN ERA



AUDITING IN BLOCKCHAIN ERA

NEAR REAL TIME DATA ACCESS



REDUCING LAG BETWEEN TRANSACTION & VERIFICATION



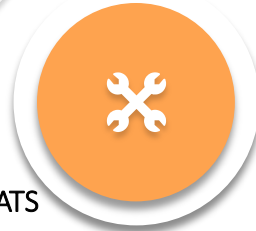
AUTO ALERT ABOUT UNUSUAL TRANSACTIONS



JUDGEMENTAL ELEMENTS, ESTIMATES & VALUATION



CONSISTENT & RECURRING FORMATS



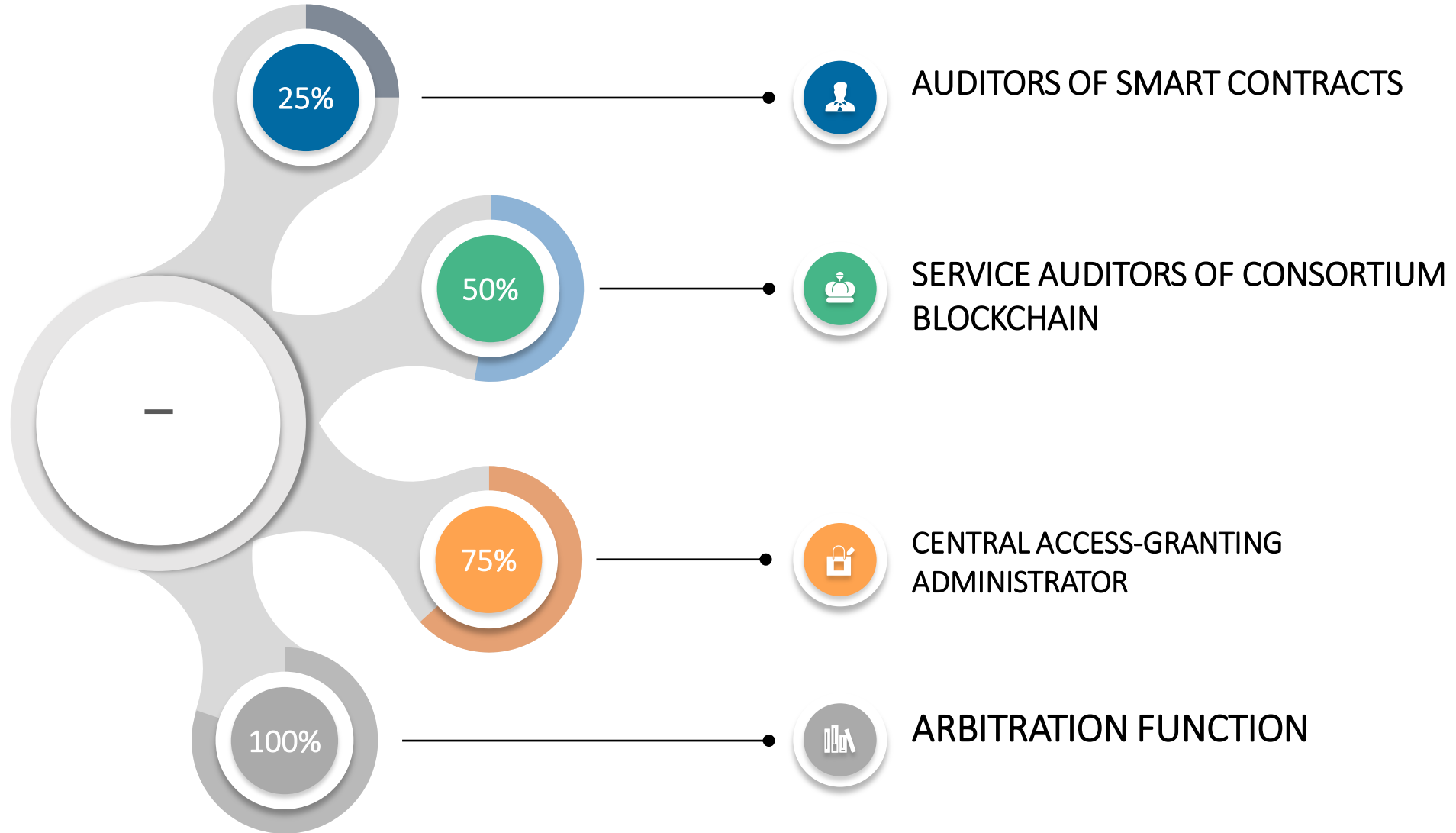
SPEEDING-UP AUDIT PREPARATION



CONTINUOUS INDUSTRY AUDIT

MORE AUDIT TIME FOR COMPLEX TRANSACTIONS

FUTURE ROLES FOR AUDITORS IN BLOCKCHAIN

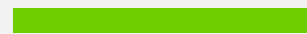


Phase wise
adoption of
Blockchain



Phase 01

Present Time –
Early Adoption



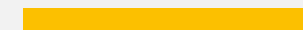
Phase 02

Critical Mass in 3
to 5 YRS –
Mainstream
Adoption



Phase 03

Maturity by 2025
– Global Adoption



PHASE 1 – PRESENT TIME – EARLY ADOPTION



VULCAN – ‘multi asset’ platform to hold various digital currencies

Facilities in Ireland & New York to develop ‘ready-to-integrate’ blockchains



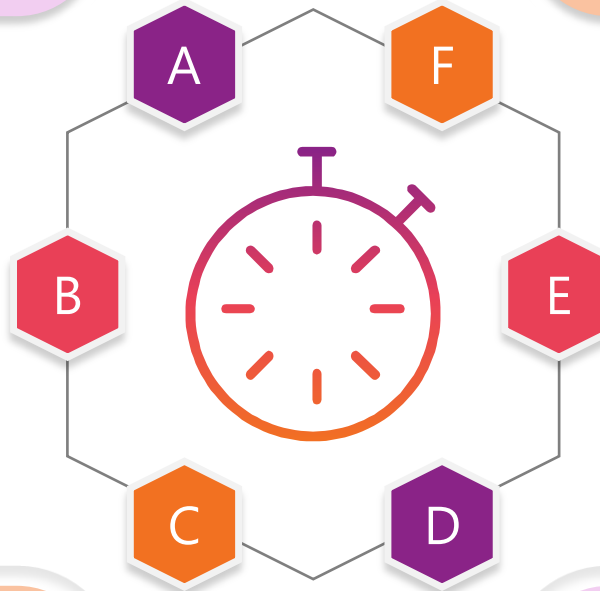
RUBIX – simplifying audit process of blockchain transactions

Differentiated approach on editable blockchains



Prototypes & pilot projects in digital identity, management of loyalty points

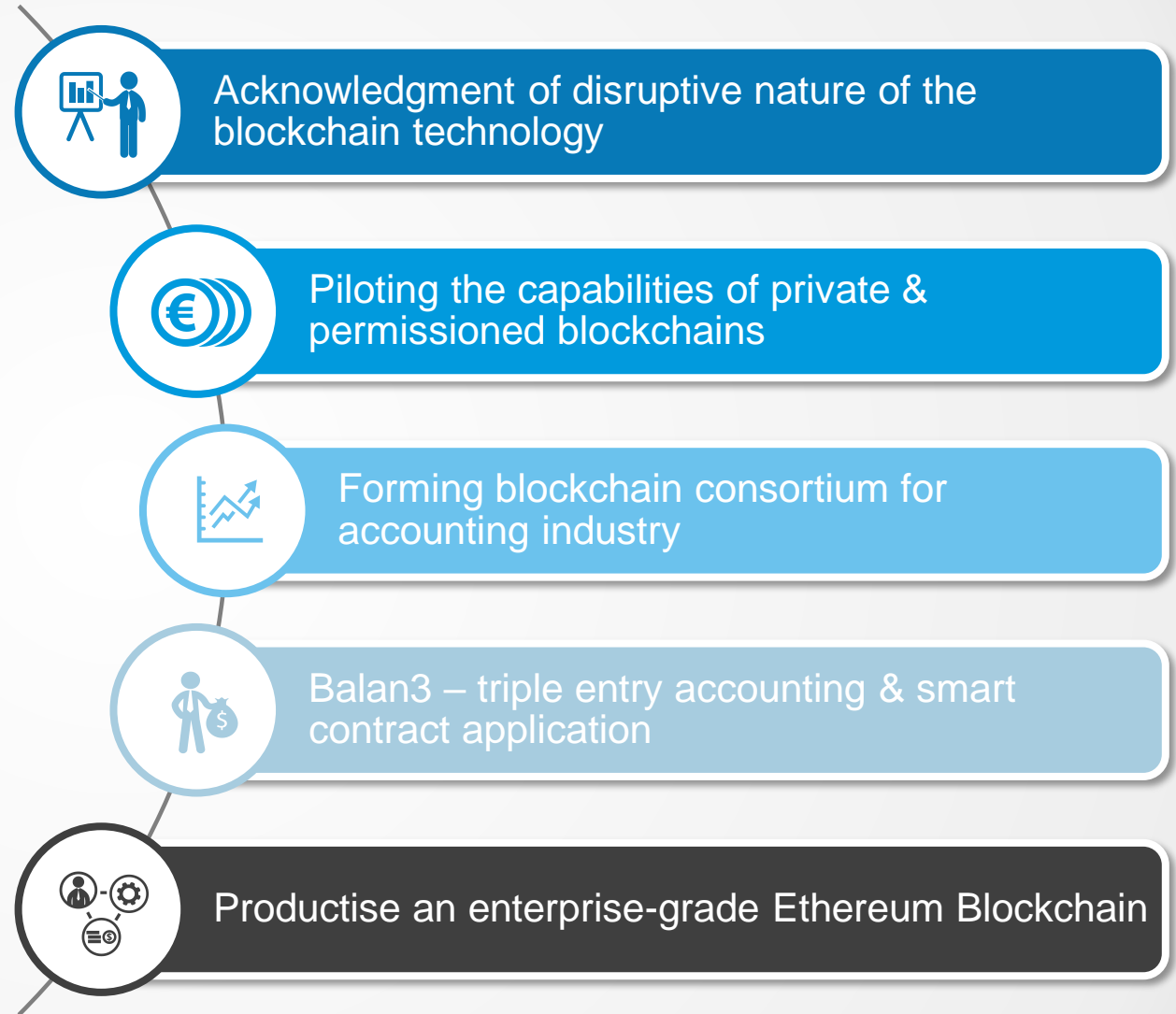
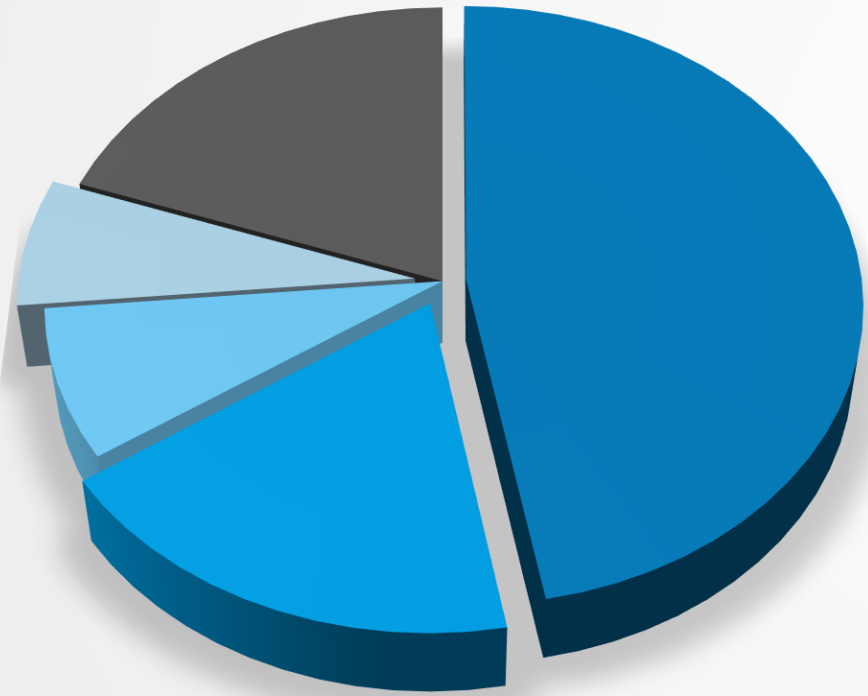
Microsoft Azure – Blockchain as a Services (BaaS)



Accounting firms have already started research on Blockchain

PHASE 1 – PRESENT TIME – EARLY ADOPTION

Recurring pattern among all accounting & audit firms



Benefits of the first mover advantage far exceed the risks
R3 Corda would help in creation of compatible and uniform finance & accounting Blockchain platforms

PHASE 2 – APPROACHING MAINSTREAM ADOPTION

Streamlining internal accounting practices and processes

- Blockchain can remove **Rube Goldberg processes** (complicated tools/processes doing simple jobs) specifically in the areas of tax & assurance
- Current double entry bookkeeping method creates an agency problem for accountants
- Blockchain has the seller/service provider **log a debit** and the purchaser **log a credit**
- **TRIPLE ENTRY ACCOUNTING** - a self-auditing third entry is cryptographically secured by the Blockchain platform



Real-time Audit trail & Assurance

- Overall risk of making incorrect entries is significantly reduced
- “Cooking the books” nearly impossible
- Real-time entries can also help draw attention to hidden accounts and minute details
- Accountants can focus on value-added work - providing useful information for management regarding wasted resources, redundant practices, and bottleneck processes that might be hindering performance
- The scope of auditing drastically increases since the audit trail becomes more aggregated and accessible - improves auditors’ chances of uncovering fraudulent activities

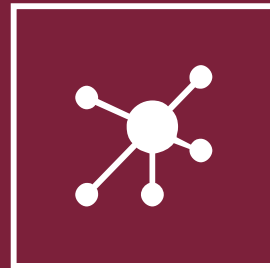
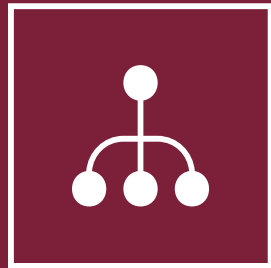
PHASE 3 – GLOBAL ADOPTION (2025)



Completely
reshaping
capital
markets

Asset exchanges,
global remittance
networks, and
foreign
exchanges could
all be moved to
Blockchain
through peer-to-
peer lending

Questions?



THANK
YOU

CA ANAND PRAKASH JANGID

+91-9620233516 , +1-6303987329

anand@ajafirm.com