



Blockchain & its impact on the electronics industry

Lalit Wadhwa

<https://www.linkedin.com/in/lalitwadhwa/>



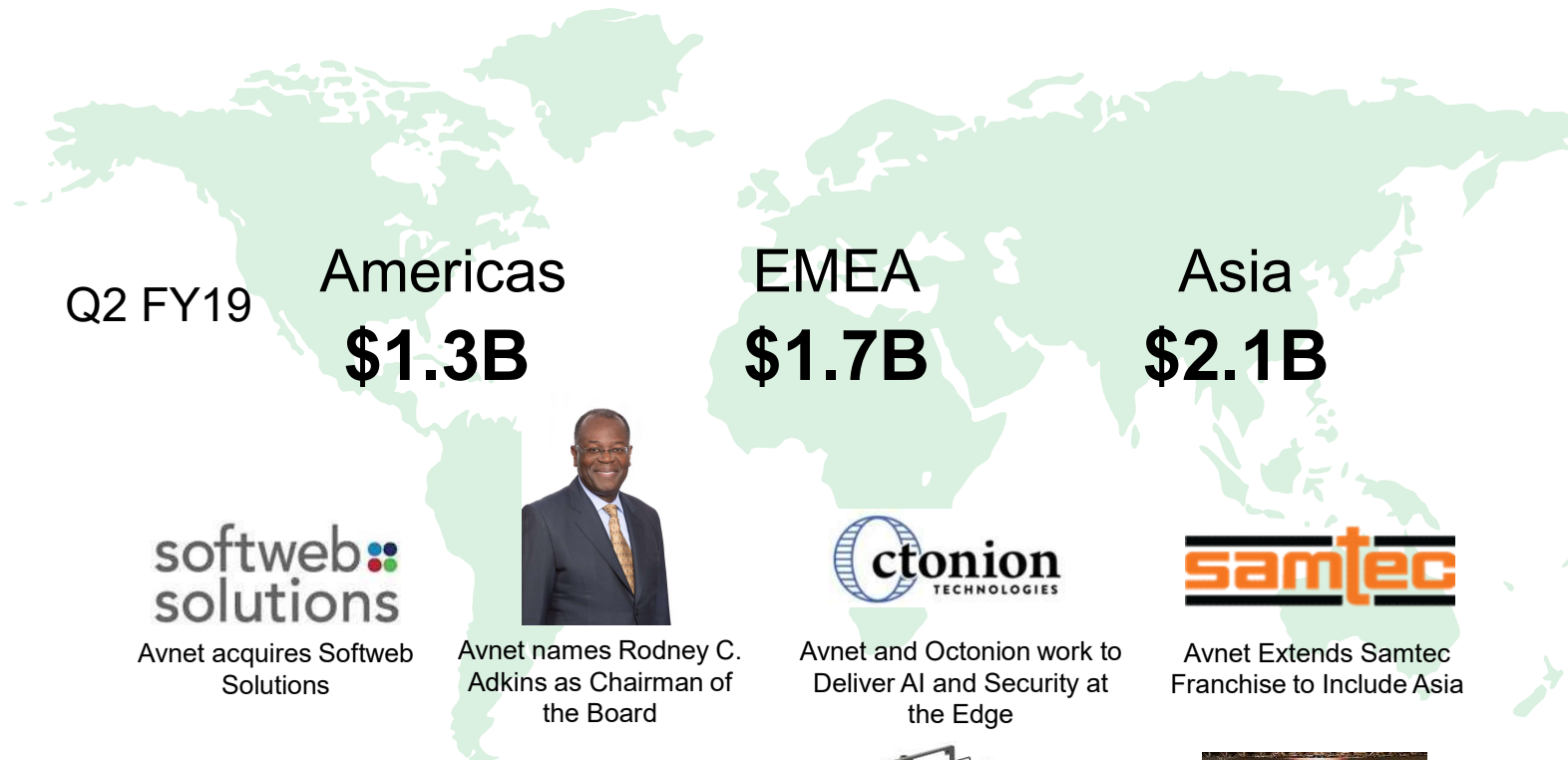
_Reach Further

A wide banner image spans the width of the slide, showing a majestic, snow-covered mountain peak under a cloudy sky. The text "_Reach Further" is overlaid on the left side of the banner in a large, white, sans-serif font.



Q2 FY19
Sales

\$5.1B



Avnet acquires Softweb Solutions



Avnet names Rodney C. Adkins as Chairman of the Board



Avnet and Optonion work to Deliver AI and Security at the Edge



Avnet Extends Samtec Franchise to Include Asia



Avnet Commended as One of the Best Companies to Work for in Asia



Avnet and Nexperia Celebrate 50 Years of Success



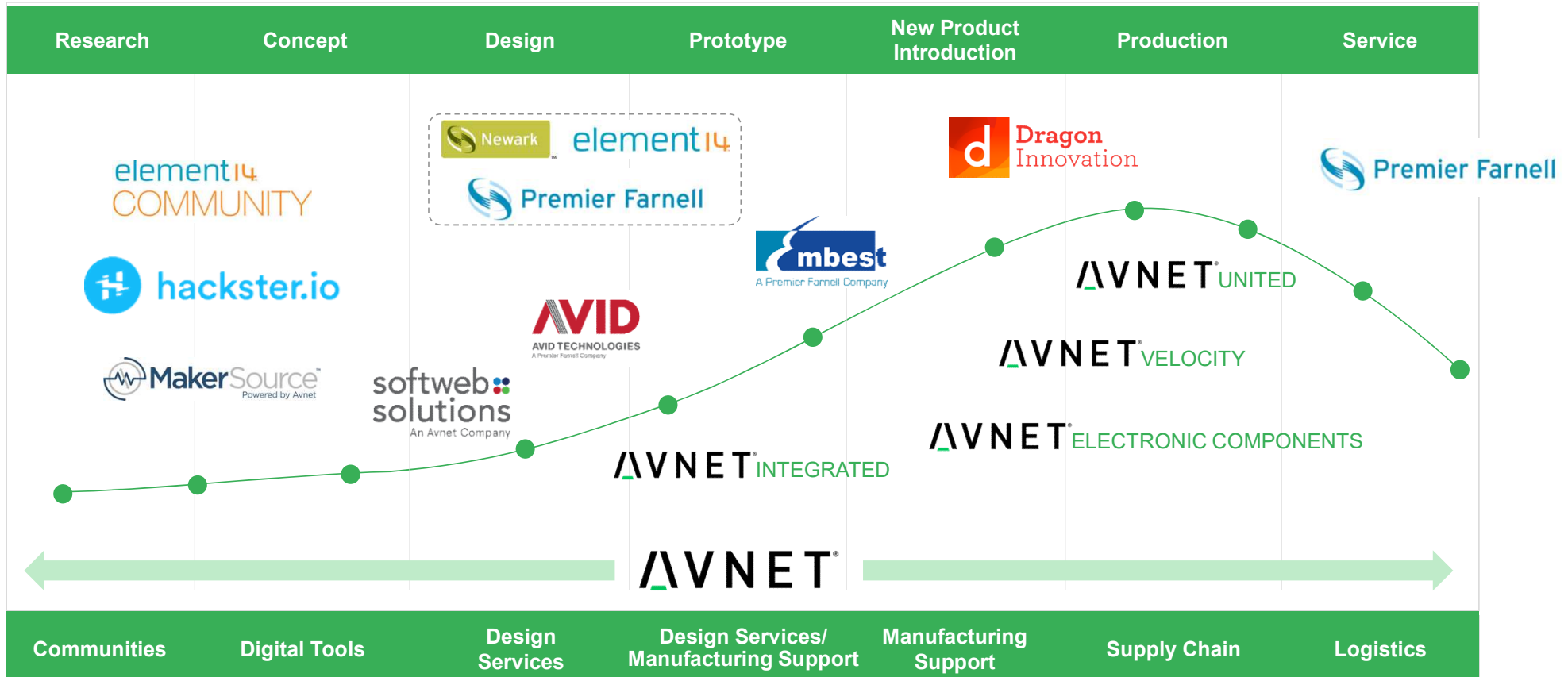
Avnet Introduces New Development Platform for Custom LCD Display Solutions



Avnet Named Top 10 International Branded Distributor for the 17th Year



The Avnet ecosystem



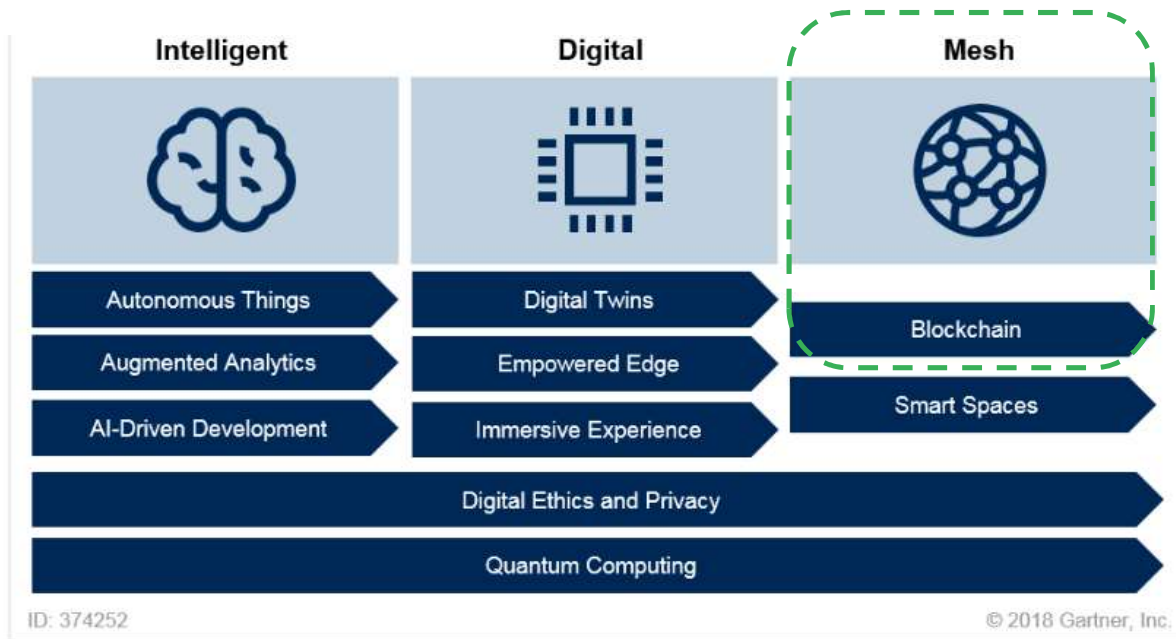
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Topics

- Blockchain in the news
- Introduction to blockchain
- Anatomy of a business blockchain
- Use cases across industries
- Use cases in our industry
- Current limitations of blockchain & alternatives
- Wrap-up
- More resources

Top 10 strategic technology trends for 2019



Source: Gartner (October 2018)

- Business value-add of blockchain
 - \$176B by 2025
 - \$3.1T by 2030
- Key areas of value-add
 - Manufacturing
 - Banking & finance
 - Supply chains

Source: Gartner (October 2018)

Blockchain in the news (1)

3,895 views | Feb 14, 2019, 05:05pm

Jamie Dimon's Cryptocurrency Master Plan Swipes At Swift



By Marie Hullet

FEB 15, 2019

Hyundai Commercial Partners With IBM to Accelerate Blockchain Development

Cryptocurrencies

JPMorgan Says Blockchain Is Making Progress Outside Crypto

By Joanna Ossinger

January 29, 2019, 8:57 AM MST Updated on January 29, 2019, 6:39 PM MST

Google Enters Crypto and Blockchain Search Business With New Tools

MARTIN YOUNG | FEBRUARY 7, 2019 | 8:00 AM

BITCOIN

Bitcoin crashes 37 percent in November, wiping \$70 billion off of cryptocurrencies' market value

Morgan Creek's Venture Fund Raised \$40 Million to Invest in Blockchain and Cryptocurrency



Mitchell Moos

February 12, 2019

2 min read

'Already Live': Signature Bank Is Moving Millions on a JPMorgan-Like Private, Dollar-Backed Cryptocurrency

B2B PAYMENTS

Alipay In X-Border Blockchain Pact

By PYMNTS

Posted on January 10, 2019



US SEC Seeking Big Data Tool for Major Blockchains

NASDAQ to Add Liquid Indices Tracking Value of BTC and ETH

New regulation legalises cryptocurrency exchanges in Indonesia

Cryptocurrency exchanges already existed but were previously unregulated.

By Khamila Mulia Thu Feb 14 2019

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Blockchain in the news (2)



By Adrian Zmudzinski

4 HOURS AGO

Waste Management Firm Launches Blockchain Platform in UAE City

MIT Says 2019 the Year That Blockchain Goes Mainstream

by IRIS.XYZ on FEBRUARY 17, 2019

How Blockchain Is Changing The Face Of Oil Trading

By Irina Slav - Feb 14, 2019, 5:00 PM CST

Amazon gets into the blockchain with Quantum Ledger Database & Managed Blockchain

Sarah Perez @sarahintampa / 3 months ago

Comment

From Farm to Blockchain: Walmart Tracks Its Lettuce

The giant retailer will begin requiring lettuce and spinach suppliers to contribute to a blockchain database that can rapidly pinpoint contamination.

Land On Blockchain? County Of Wyoming Puts Real Estate Records On Blockchain

By Bitcoin Exchange Guide News Team - December 21, 2018

BRIEF

FedEx joins open source blockchain initiative

Blockchain Adoption Levels Highest in the Semiconductor Industry: Accenture

Mark Emem 02/10/2018 Blockchain News, News



By Max Yakubowski

China: Guangdong Province to Use Blockchain-Based Electronic Tax Invoices for E-Commerce

The coffee farmers betting on blockchain to boost business

Thin Lei Win

6 MIN READ



2,251 views | Feb 16, 2019, 10:00am

Cigna and Sentara Healthcare Join IBM's Blockchain Health Utility Network To Improve Data Sharing



Rachel Wolfson Contributor
Crypto & Blockchain
I write about crypto, women in crypto and blockchain technology.

Blockchain in Electric Utilities: Emerging Use Cases

By CIOReview | Monday, February 18, 2019

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Blockchain in the news (3)



By Marie Huillet

FEB 14, 2019

Chinese Tech Giant Baidu Launches Blockchain OS to Support DApp Development

Research: Mere 10% Of Ethereum (ETH) DApps Are Active Daily



By Nick Chong - February 10, 2019

China is Dominating Gambling Dapps, Despite its Strict Policy

SV Insight

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Nov 27, 2018 · 3 min read

Decentralized Applications (dApps) Made \$6.7 Billion in 2018

Euro Banking Giant ING Signs Up With R3 For Fintech DApps

Dutch Bank takes another step towards widespread financial acceptance of DLT.

By Andrew Ancheta — On Jan 23, 2019

| Jan 21, 12:03 GMT

Justin Sun believes Tron (TRX) will have 2,000 DApps in 2019 – Focus on niTron Summit

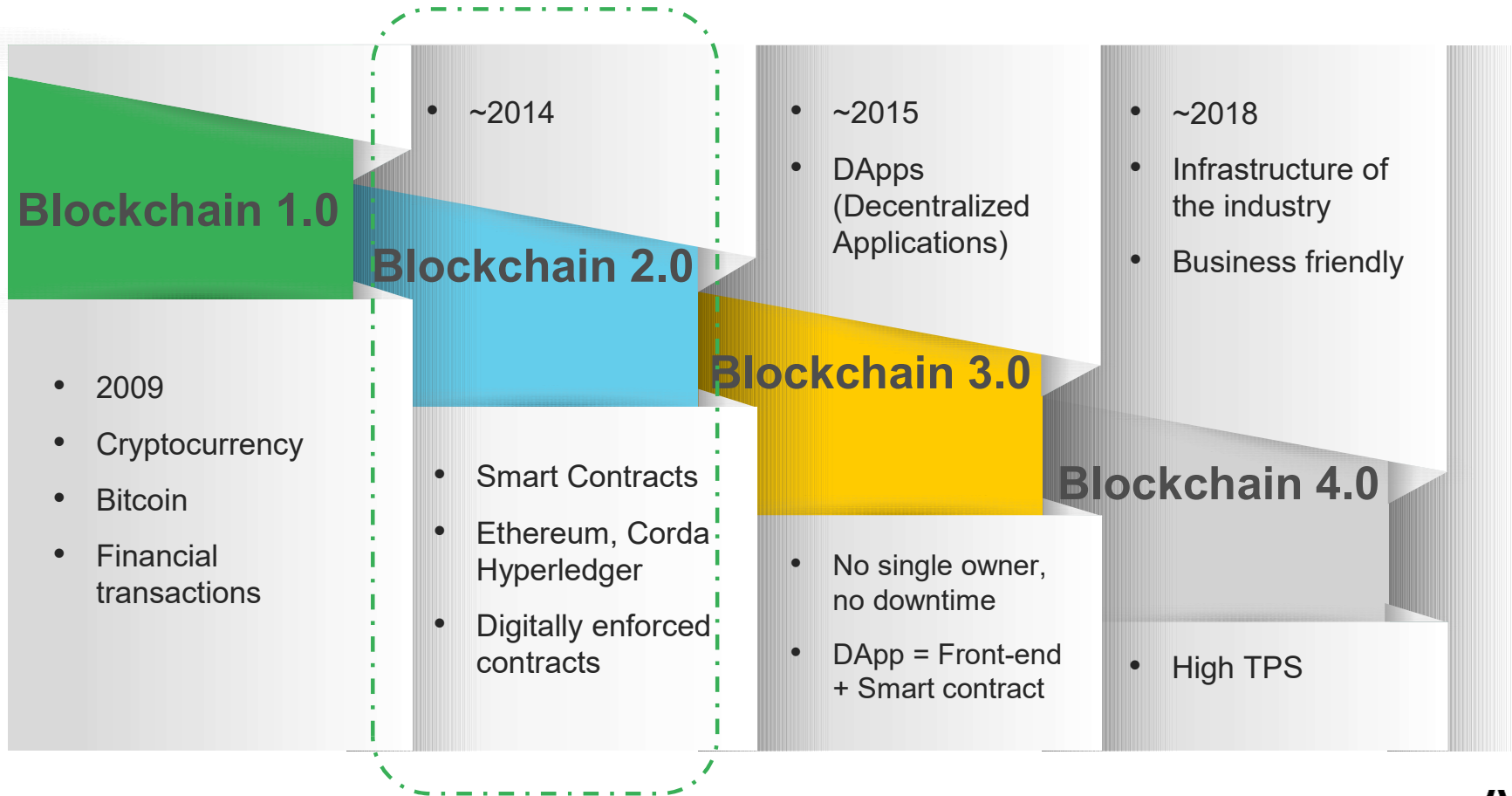
Less Than 1.5 Million People Used dApps in 2018

By P. H. Madore

16/01/2019

Altcoin News, News, Smart Contracts

Blockchain evolution



Characteristics of blockchain network

Immutability

- No one can modify an existing transaction
- In case of error, new transaction must be used to reverse the error

Provenance

- Traceability of assets and ownership

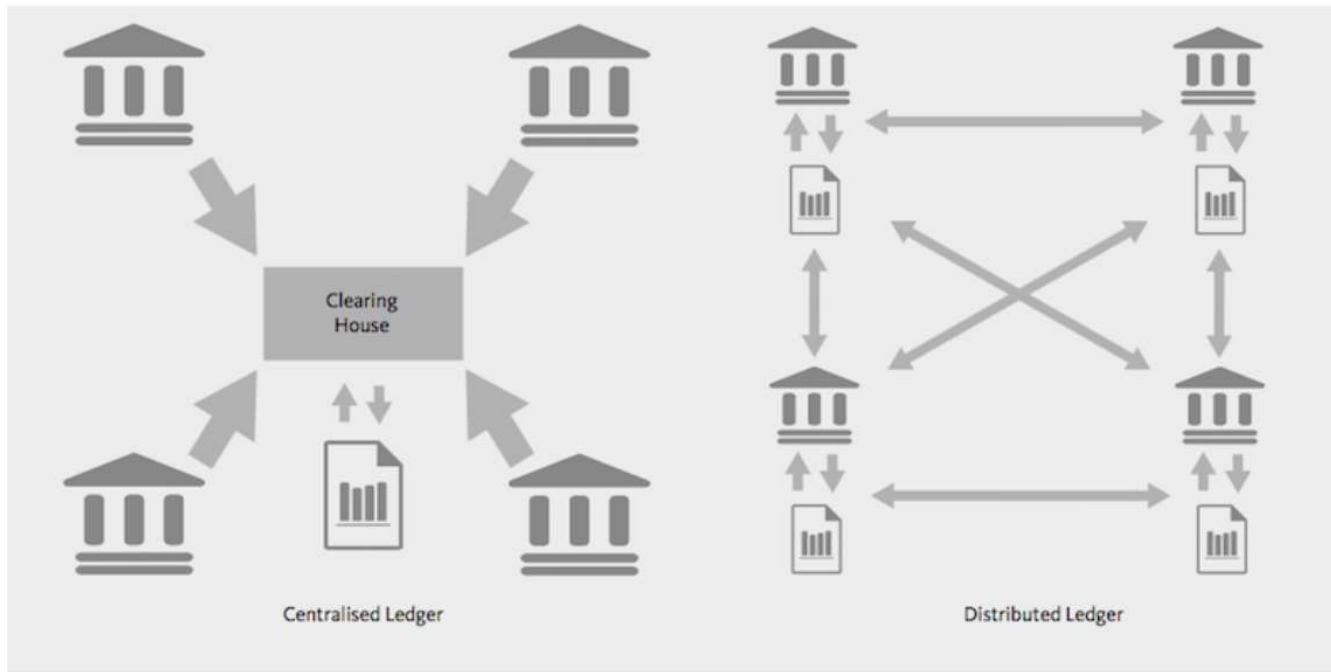
Consensus

- Common set of rules for all participants in the network
- New transactions must meet consensus rules before being added to the network

Finality

- One ledger for the entire network
- Single source of truth

Key concept #1 – Distributed Ledger



- Every network participant has a copy of all transactions
- Information in the ledger is append-only, using cryptographic techniques
- Any attempt to change past transaction information exposes tampering (property of hash chain)
- Every hash chain record contains commitment to all prior records

Image source: Ripple.com

Key concept #2 – Smart Contracts

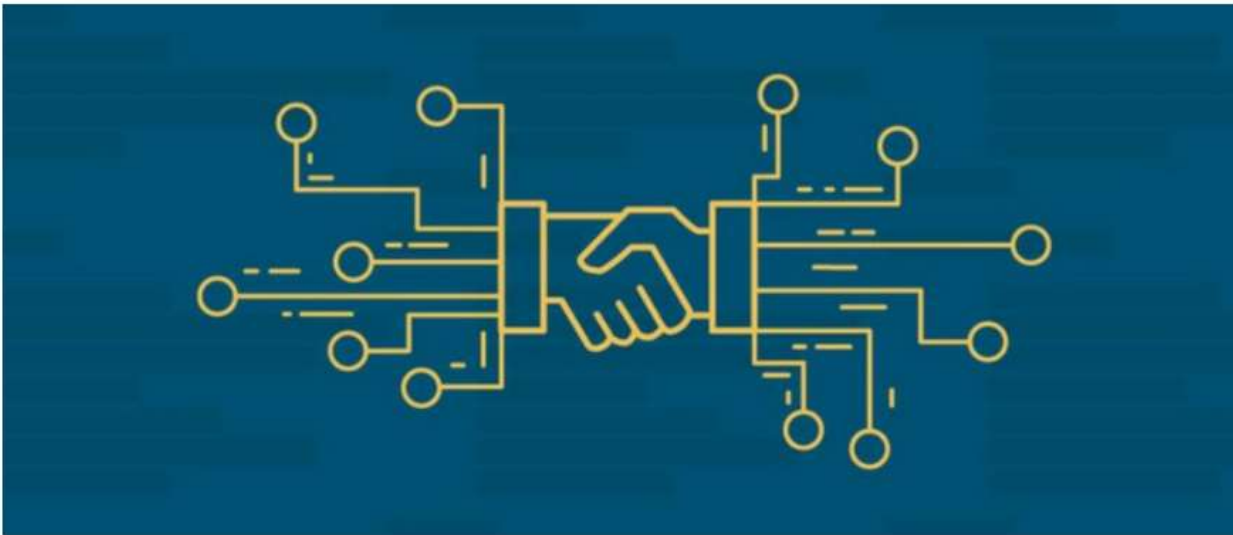


Image source: modex.tech

- Computer code running on blockchain with pre-determined business rules.
- When rules are met, pre-defined actions are automatically enforced.
- Smart contracts are self-verifying, self-executing and tamper-resistant.
- Use cases range from simple to complex, two-party to multi-party.

Key concept #3 - Consensus

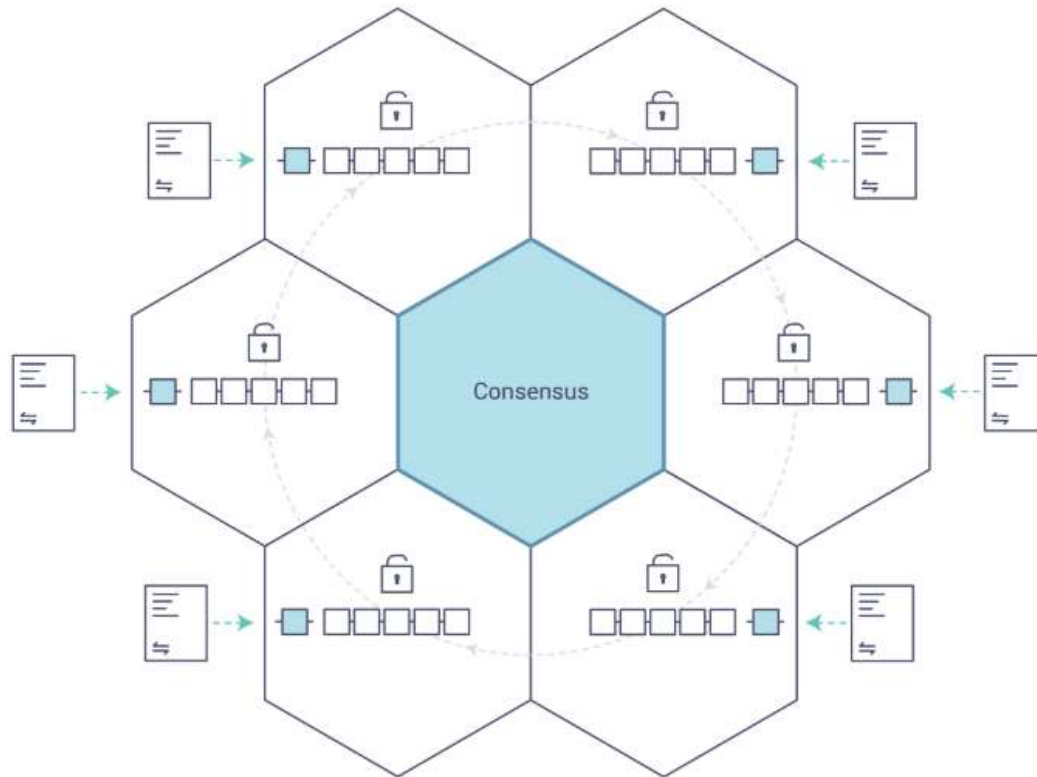
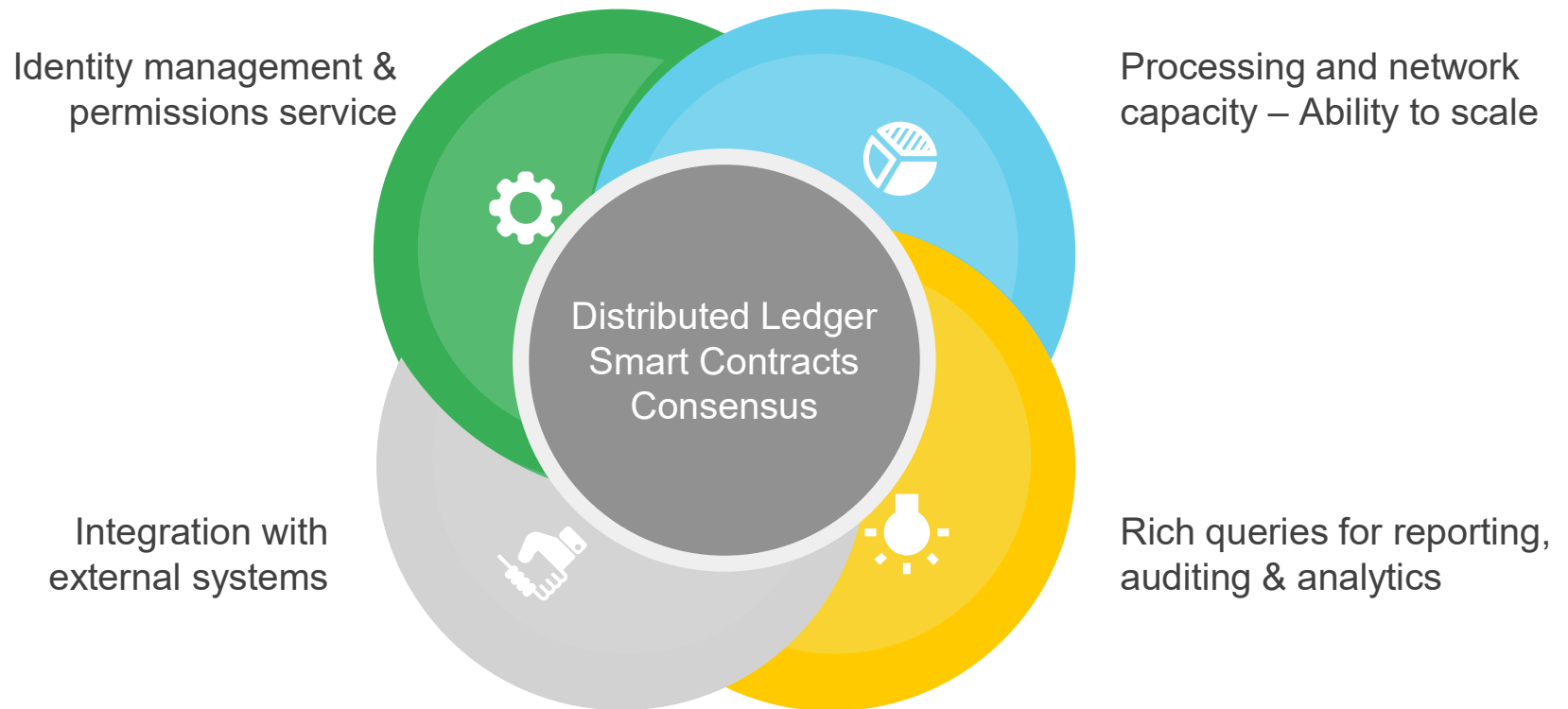


Image source: Hyperledger Fabric

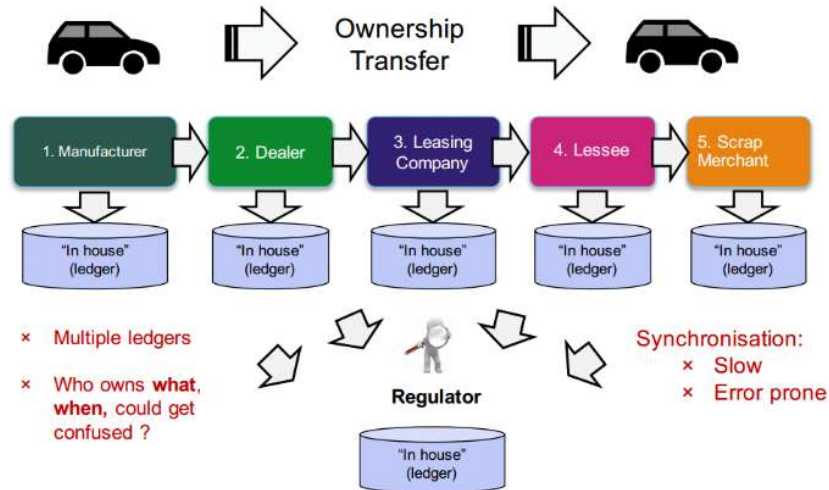
- Process that ensures ledger transactions stay synchronized across the network.
- Ledgers are updated only when multiple approved participants confirm through a majority vote.
- Ledgers are always updated with the same transactions in the same order.
- Examples of consensus algorithms: Proof of Work, Proof of Stake, Proof of Authority

B2B Blockchain network



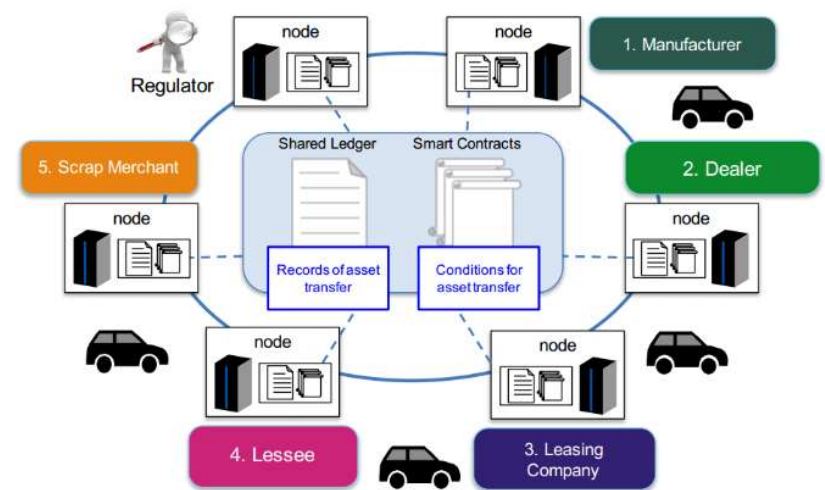
High-level view: How does a blockchain work?

Car Leasing Business Network



11

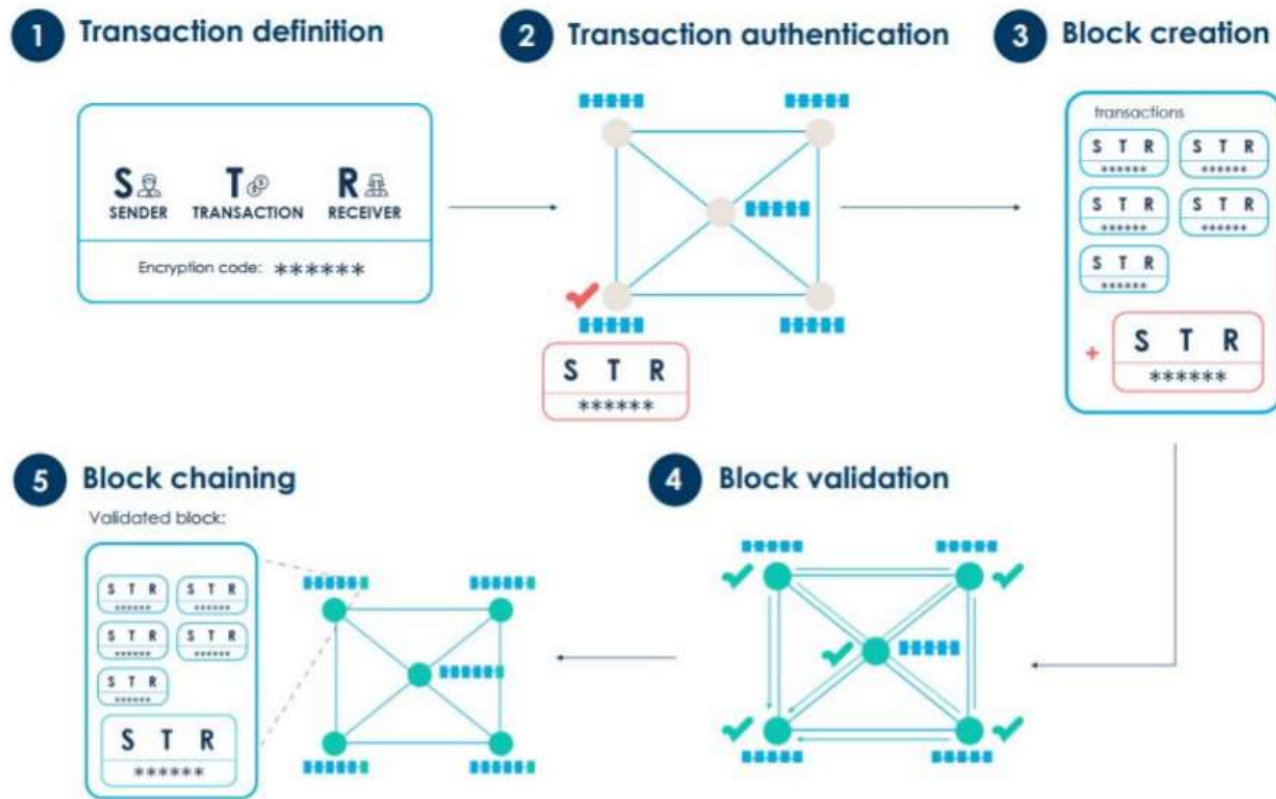
Car Leasing Business Network with Blockchain



12

Source: IBM

High-level view: Blockchain transaction flow



Source: Froystad & Holm, 2016

Blockchain types

Permissionless	Permissioned
Public ownership	Managed ownership
Open & transparent	Private membership
Trust-free	Trusted
Slower	Faster



Source: Gavin Wood, co-founder Ethereum



When is blockchain the right solution?

Blockchain as a solution

Multiple participants

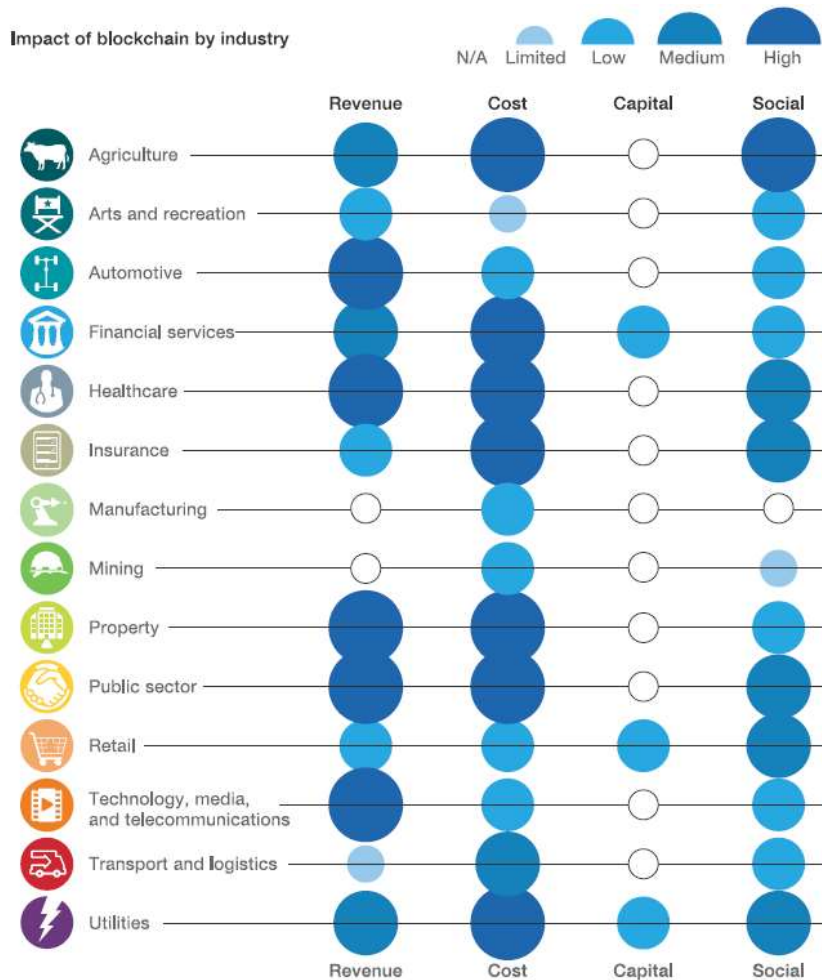
Trust amongst participants is an issue

Participants share business processes to exchange information, monetary or physical assets

Existing multi-participant shared processes have significant friction

Shared processes can be triggered by complex business logic

Blockchain impact across industries



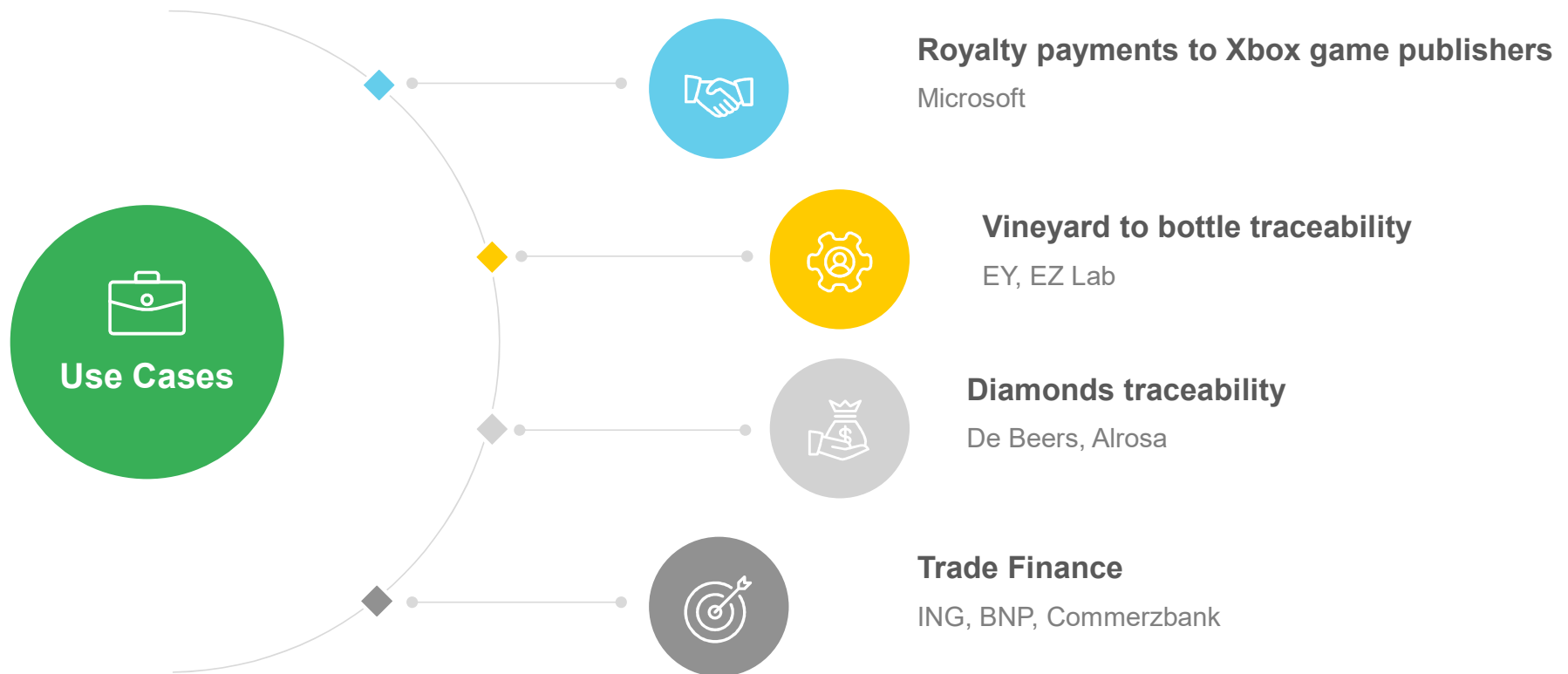
- Probable blockchain impact is highest in financial services, insurance, healthcare, government and real estate.
- Common standards in industries / ecosystem drives blockchain scalability.
- Building alliances to develop blockchain solutions drives adoption.

Source: McKinsey & Company

Recent blockchain use cases



Recent blockchain use cases





Possible use cases in our industry

- Blockchain in IoT
- Product traceability & counterfeit prevention
- Reverse supply chain
- 3D printing
- E-waste management
- Know Your Customer / Supplier during onboarding
- Responsible sourcing
- Material content declaration

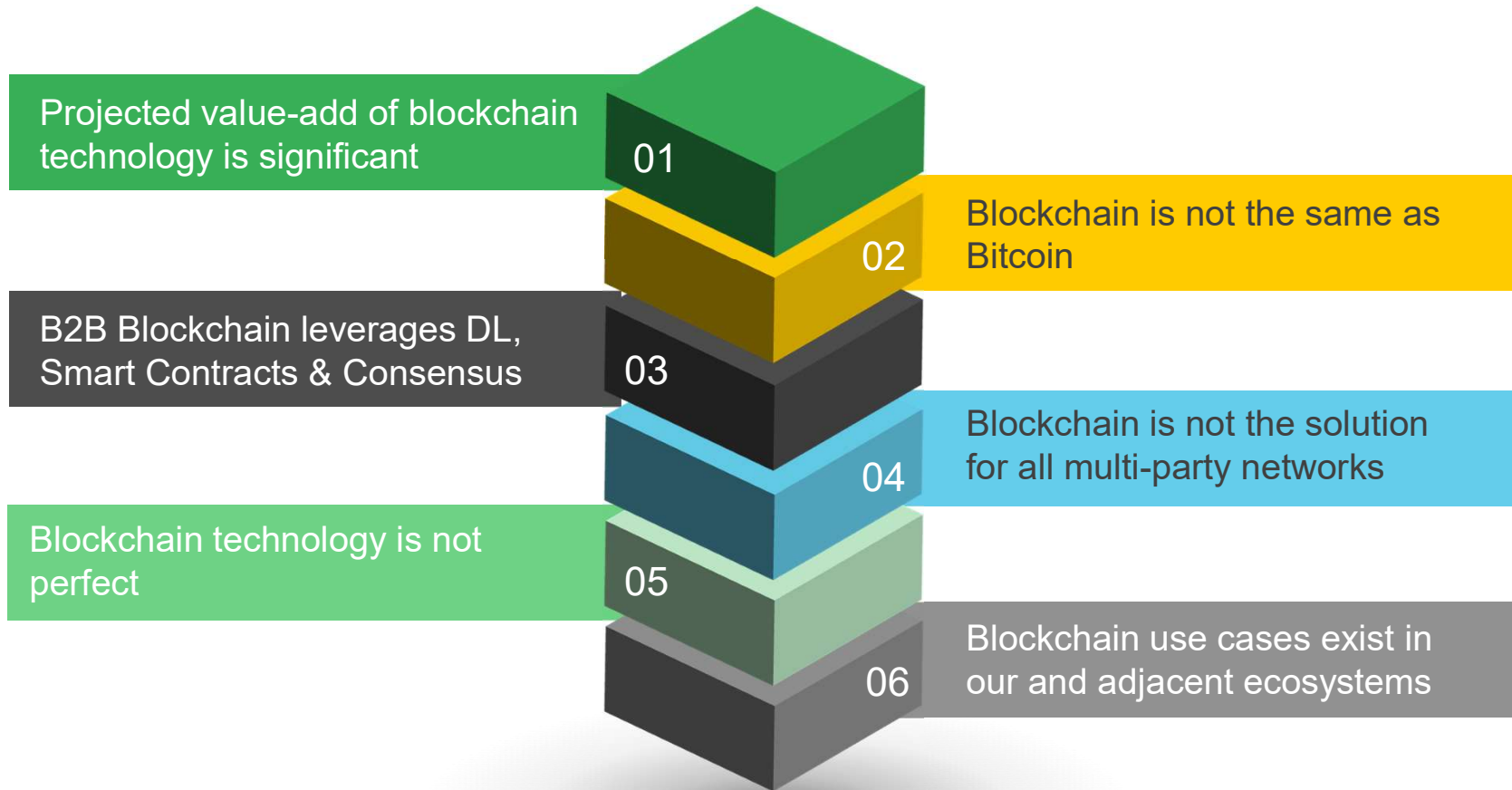


Current challenges of blockchain technology

- Performance / Throughput
- Cost & complexity
- Interoperability
- Missing regulations around smart contracts
- Security
- Collaboration in the ecosystem / value chain

All above challenges are being addressed actively

Wrap-up





Other resources

Blockchain benefits for electronics

<https://www.ibm.com/downloads/cas/G985VKKE>

Counterfeiting: Why blockchain is a solution for the semiconductor industry

<https://blog.precogs.com/https-medium-com-precogs-counterfeiting-why-blockchain-is-the-solution-1fbe7e6d020>

Blockchain in logistics

<https://www.logistics.dhl/content/dam/dhl/global/core/documents/pdf/glo-core-blockchain-trend-report.pdf>

IEEE – Blockchain opportunities

https://blockchain.ieee.org/images/files/pdf/201710-consumer-electronics-vehicular-tech-blockchain_-_p-corcoran_j-irvine.pdf

Blockchain by Cisco

<https://www.cisco.com/c/dam/en/us/solutions/collateral/digital-transformation/blockchain-whitepaper.pdf>