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Blockchain

Decentralization of Trust

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The next wave of the internet

Internet of Information
Everyone is sender and receiver of **information**

Internet of Things
Everything is sender and receiver of **information**

Internet of Value
Everyone and **everything** is sender and receiver of **value**

"**By 2025**, the business value added by blockchain will grow to slightly over **$176 billion**, then surge to exceed **$3.1 trillion by 2030**."[1]

"**By 2030**, **30%** of the global customer base will be made up of things, and those things will use blockchain as a foundational technology with which to conduct commercial activity."[1]

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[1] Gartner Forecast: Blockchain Business Value, Worldwide, 2017-2030 - March 2017

The next wave of the internet and their phases of adoption

Internet of Value

Everyone and **everything** is sender and receiver of **value**
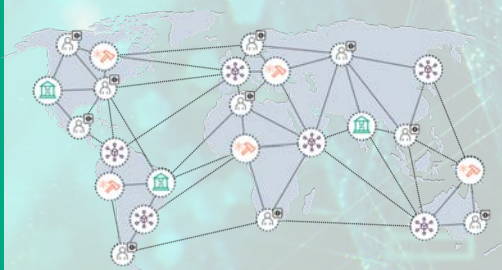
Blockchain 1.0: People transacting with People

Blockchain 2.0: Enterprises transacting with Enterprises

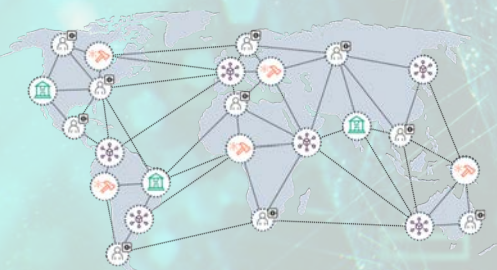Blockchain 3.0: Things transacting with Everything

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The Blockchain Ingredients

Peer-to-Peer Networking

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The Blockchain Ingredients
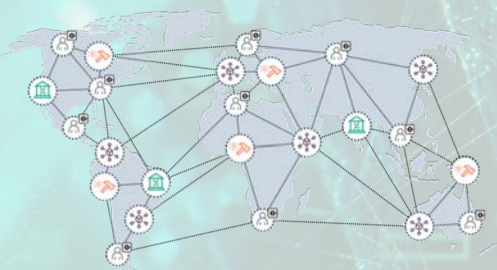
Peer-to-Peer Networking

Cryptographic hash functions

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92427ae41e4649b934ca495991b
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Public Key Cryptography

Private Key

5Jza1DZn2mBvrm
MdBLVbQjSu33oKC
jpkVbwo8jX6vEtZB
pSsaEt

Public Key

1QGGBQEKgxxjqth
4QTbiqz1UFpu1pco
TGF

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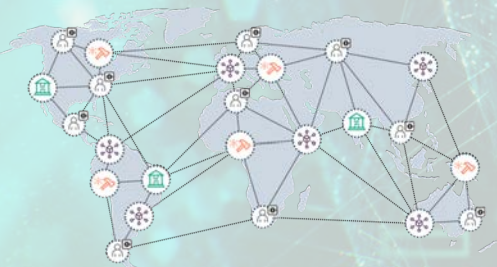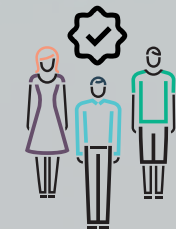MdBLVbQjSu33oKC
jpkVbwo8jX6vEtZB
pSsaEt

Public Key

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4QTbiqz1UFpu1pco
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Consensus Mechanism
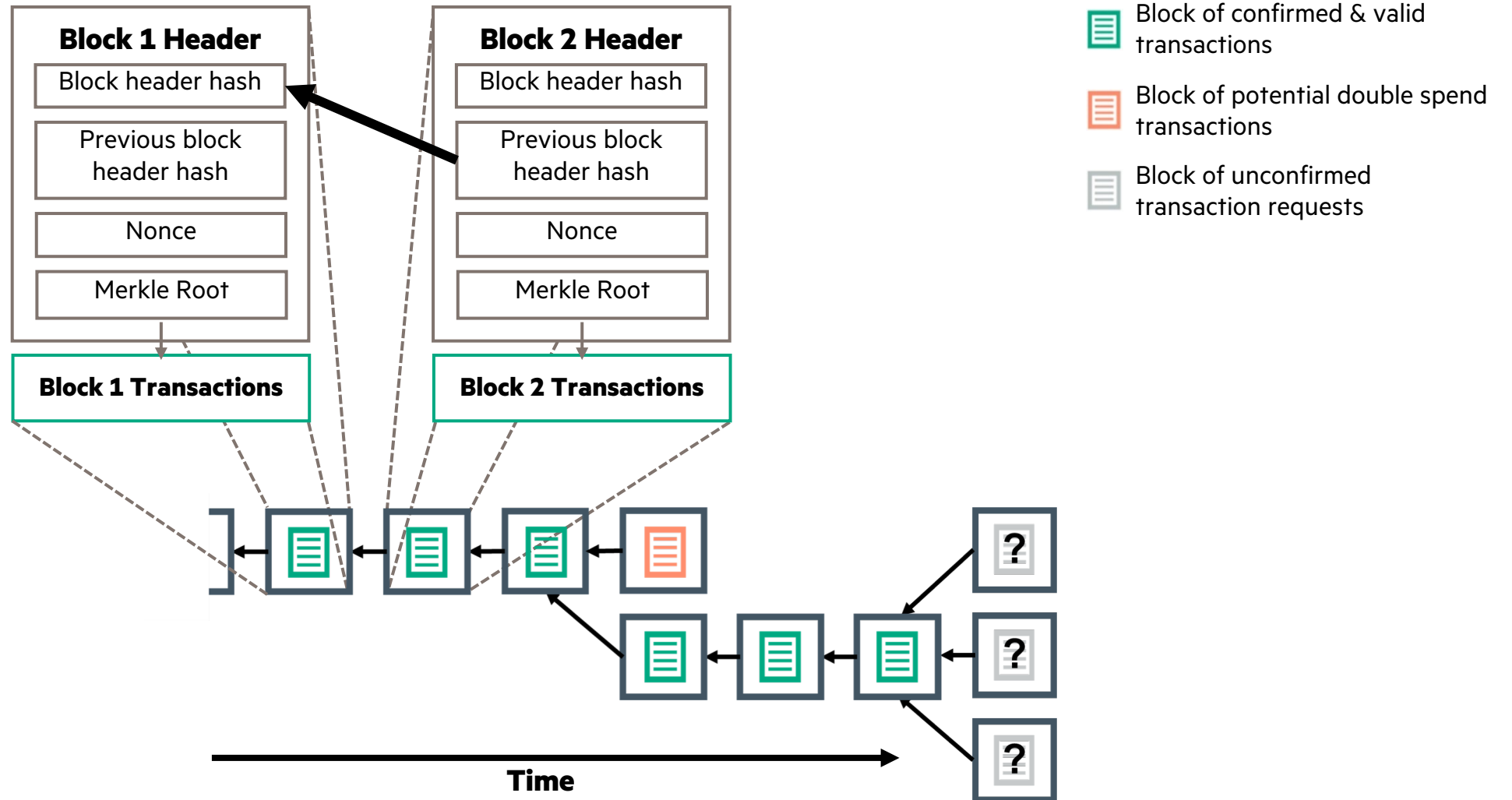
Proof of Work

Proof of Authority

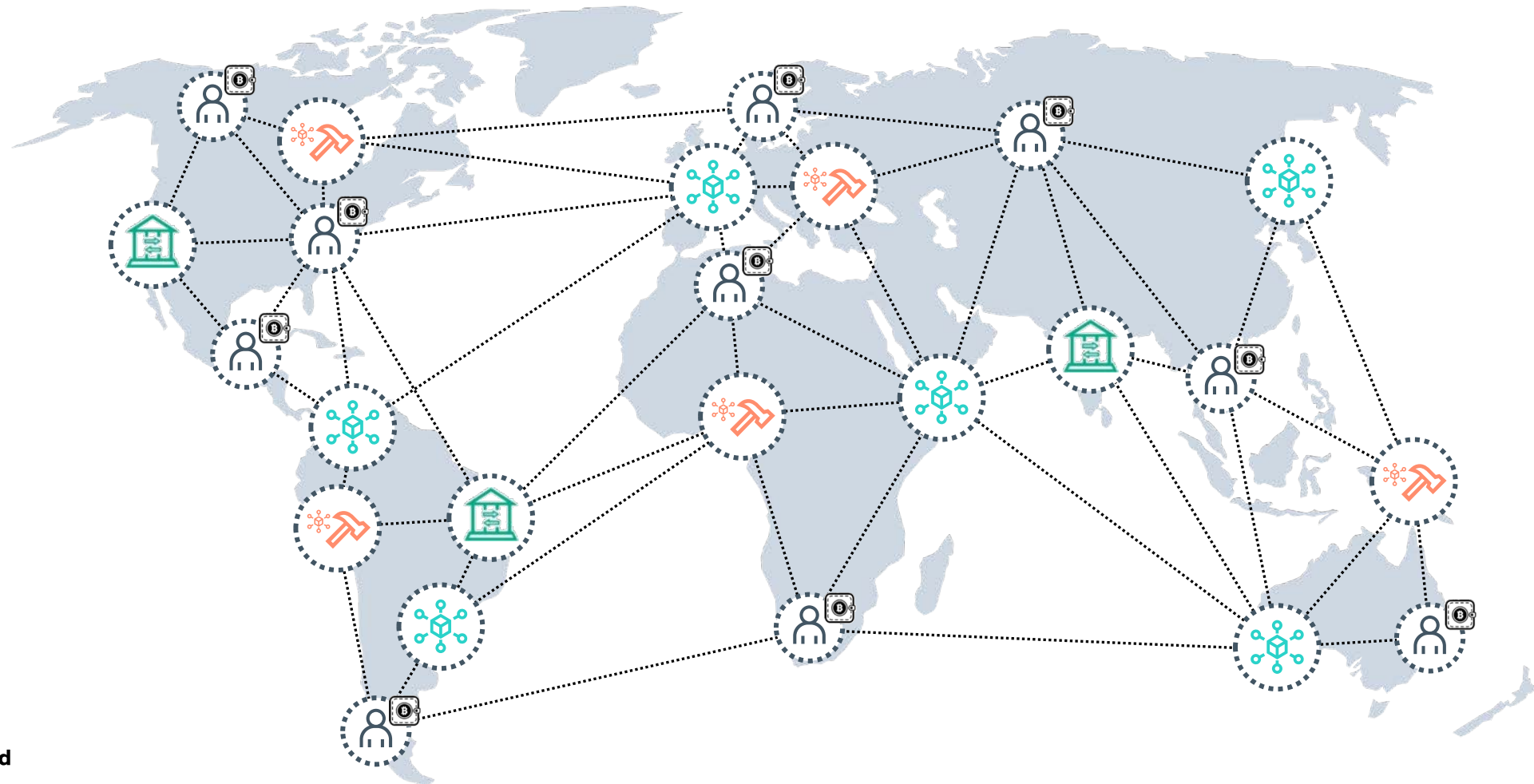**Blockchain automatically establishes the essentials necessary for any transaction**

Trust

+

Single set of facts

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Why is it called a Blockchain?

Block 1 Header
- Block header hash
- Previous block header hash
- Nonce
- Merkle Root

Block 1 Transactions

Block 2 Header
- Block header hash
- Previous block header hash
- Nonce
- Merkle Root

Block 2 Transactions

Block of confirmed & valid transactions

Block of potential double spend transactions

Block of unconfirmed transaction requests

?

?

?

Time

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Blockchain Ecosystem

User & Developer   Wallet   Node   Exchange   Node & Miner

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Blockchain is a fundamental shift in how business is transacted

Increases innovation

Lowers barrier to entry and increases competition from new entrants, generating greater business value

Reduces operation costs

Blockchain lowers operating costs, improves efficiency, and reduces transaction cycle times

Creates new business models

Blockchain will bring to life new business models and shift how business is done
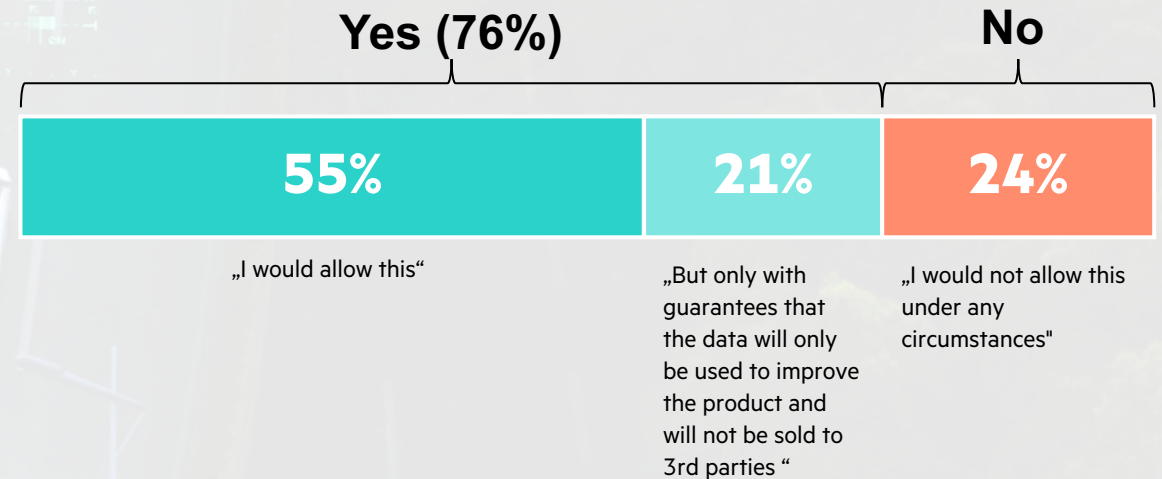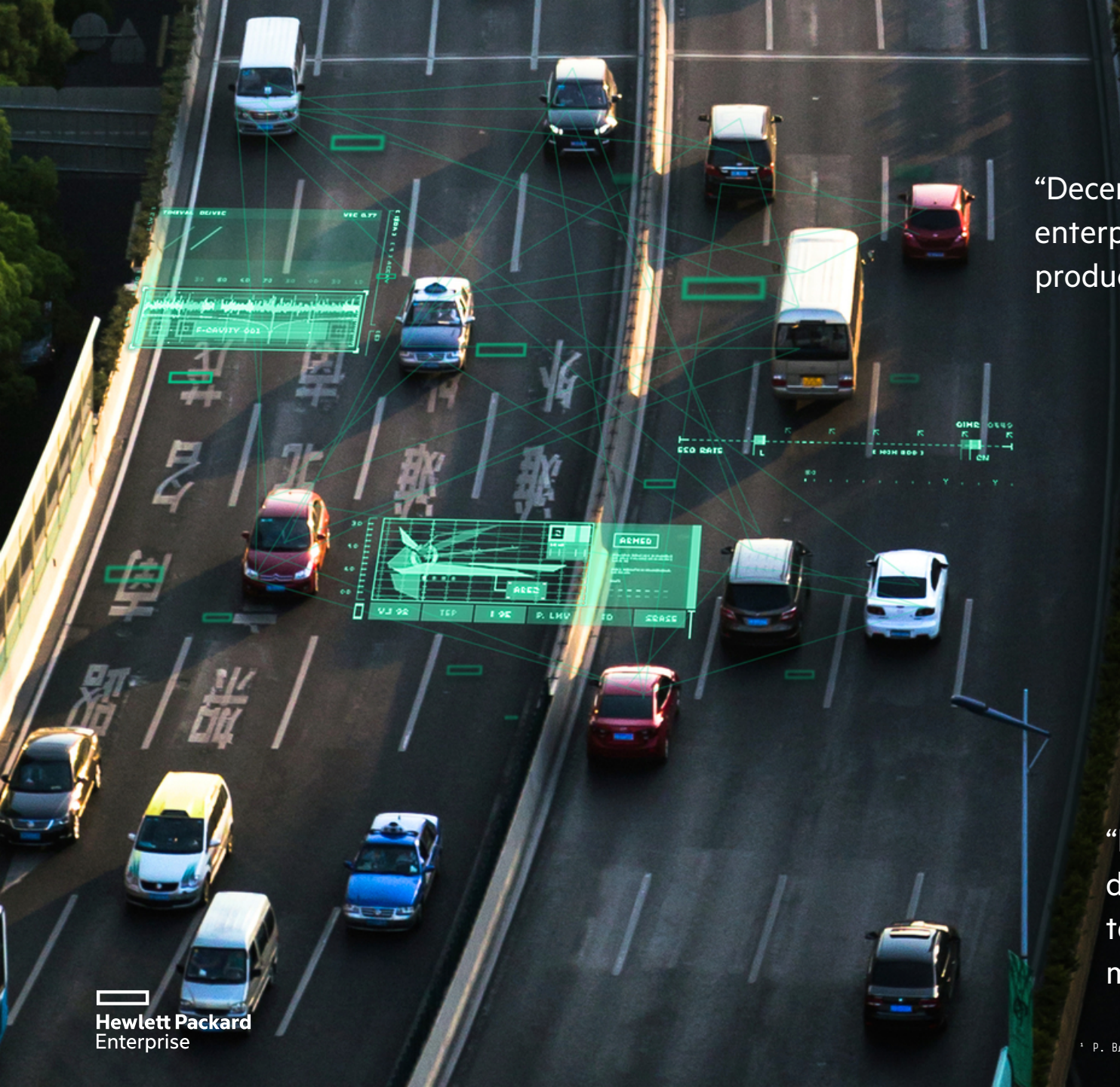
Willingness to share personal data

°PAYBACK ⬤⬤⬤⬤⬤⬤⬤⬤

— Start in Germany: **2000**

— Active PAYBACK users in Germany: **30 Mio.**

— Usage (scan at checkout): **≈ 4 Mio. / Day**

— Intensify revenues from purchases (2017): **29,8 Mrd. Euro**

— PAYBACK App Downloads: **14,5 Mio.**

— Participating partners (off-, online & mobile): **>650**

Would you allow your car to track your location and report it anonymously, e.g., to enable your carmaker to improve the next generation of your car?

Yes (76%)   No

55%	21%	24%

„I would allow this"

„But only with guarantees that the data will only be used to improve the product and will not be sold to 3rd parties "

„I would not allow this under any circumstances"

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"Decentralized public blockchains are the only way by which enterprises will truly and deeply commit to digitizing their products and services in a fully interoperable manner." [1]

Vehicle data revenue ~350,-€ per car/ year [2]

"Most of the disruptive technologies where illegal when they started – Skype was partially illegal" [3]

"Because blockchains benefits come from decentralization there is little point replacing one technology with another without changing the business model." [4]

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[1] P. Brody, Ernst & Young, 2018 [2] BMVI, 2017 [3] Dr. Jutta Steiner, Parity Technologies [4] R. Crook, Royal Bank of Scotland, 2018

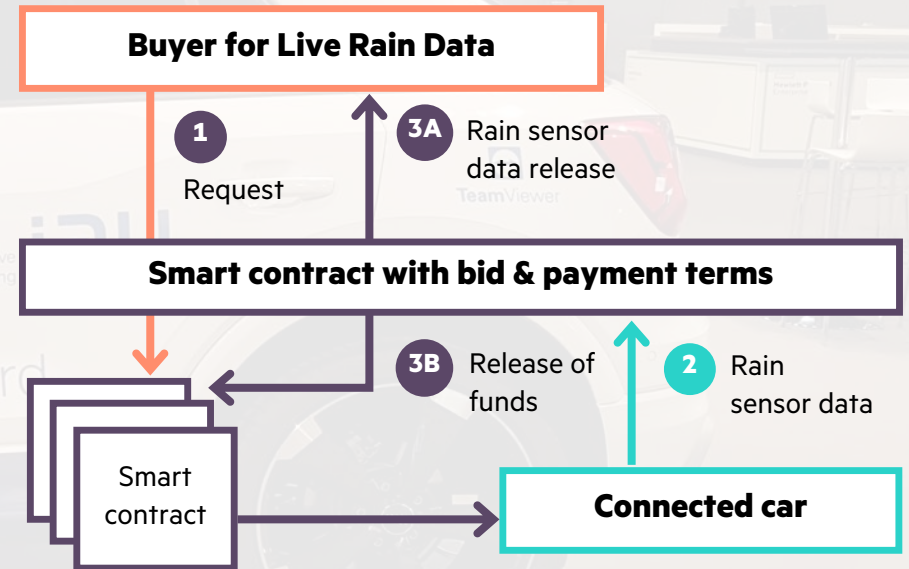# Monetization of sensor data puts Blockchain at the edge

Rewards for sensor data in connected cars

Blockchain 3.0 (IoT use case)

In a connected car, HPE demonstrated a blockchain solution enabling monetization of sensor data, laying the foundation for a full ecosystem

Drivers

— Data is the new currency, and in the hands of a few global 'brokers'

— The number of sensors & sensor data is increasing exponentially

— People are willing to share their data for perks

— Data stewards control and secure the data (do not necessarily have authority to use)

Buyer for Live Rain Data

① Request

3A Rain sensor data release

Smart contract with bid & payment terms

3B Release of funds

② Rain sensor data

Smart contract

Connected car

Challenges to Blockchain adoption

Customers struggle to adopt Blockchain as a solution

The current Blockchain ecosystem is fragmented, immature and mainly consists of startups

90%
of enterprise Blockchain projects will **fail** in 18 to 24 months[1]

9 out of 10
start-ups **fail**, leading to a lack of trust and confidence in this new system[2]

The current set of platforms are not enterprise-ready

– Immature offerings
– Unproven for mission-critical applications
– Limited scalability
– Lack resiliency and proper security features

Broader adoption is slow due to protocol uncertainty

– Lack of industry standards
– Long-term impact of regulation is unknown
– Financial and technical stability of platforms/startups
– Governance in a decentralize operating model

1   Gartner – "Top 10 Mistakes in Enterprise Blockchain Projects" (2 Feb 2017)
2   Fortune - "Conventional Wisdom Says 90% of Startups Fail. Data Says Otherwise" (27 Jun 2017)

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HPE is providing enterprise-ready Blockchain solutions

Enterprise-grade solutions

Designed and implemented for large business transactions and mission critical operations across people, processes and technology

Accelerate with confidence

**Faster time-to-value with simplified advisory services** to securely implement Blockchain innovations

Scale to meet demands

Meet requirements of unique business operations, driving financial and business growth

A network of partners to deliver complete Blockchain solutions

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HPE Pointnext services help you on your Blockchain journey
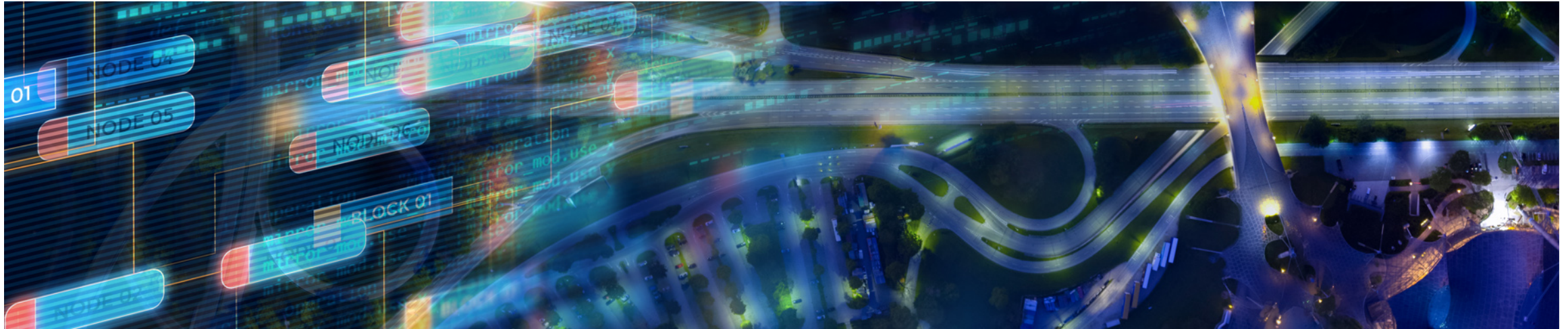
Explore

HPE Blockchain Transformation Workshop is a one-day interactive session designed to help customers understanding blockchain outcomes and challenges, align to a vision and strategy and identify best use cases and technologies

Experiment

HPE Blockchain Platform Assessment and HPE Blockchain Proof-of Value will gather and validate your use cases, demonstrate technology capabilities and provide a proof-of-value for select use case

Evolve

HPE Blockchain Implementation to get you up and running with your blockchain solution: design & implement production-ready system, manage change and train teams and help you evolve for additional use cases

Partnerships support full integration of blockchain solutions

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Mission Critical Distributed Ledger Technology (DLT)

Integration of R3 Corda and HPE's Mission Critical NonStop platform

Available as-a-service and on premise

Designed specifically to address the functional and non-functional requirements of enterprise customers

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R3 Corda is meeting functional requirements for decentralized business models

- Record, manage and synchronize nodes
- Contracts between trading partners
- Uses distributed ledgers
- Privacy matters – data is shared only between parties who need to know

r3. + **Hewlett Packard** Enterprise

An enterprise ready solution powers HPE's Mission Critical technology

- Resilient and linear scalability
- Integrated fault-tolerant SQL/MX database
- Highly secure platform
- Empowered by HPE Pointnext services

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Delivering Enterprise-grade Blockchain at scale

Infrastructure for fundamental customer needs, while leveraging Blockchain platforms of today

Customer Challenge

Current set of platforms are not enterprise-ready

— Resiliency for mission critical applications
— Scalability
— Performance for industrial use cases
— Security

Fragmented landscape and platform uncertainty is a barrier to adoption

Solution:
Blockchain 2.0 (Enterprise Use Case)

Enterprise-grade NonStop infrastructure optimized to run R3 Corda charted a clear path to production

Resiliency and linear scalability enhancements that improve production readiness of the solution

Partnered with the customer to lower the risk of their incubation effort

r3.   Hewlett Packard Enterprise   DXC.technology

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Why HPE?
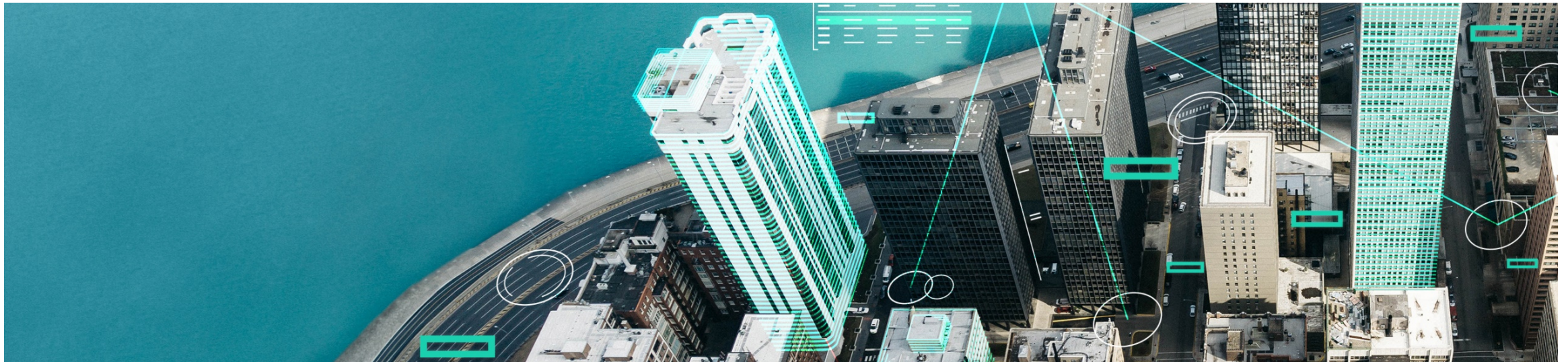
Deep expertise

- #1 trusted platform for Mission Critical workloads
- Integrated partner ecosystem ranging from emerging companies to industry leaders
- Dedicated HPE Blockchain team

Built for the enterprise

- HPE believes blockchain will be a foundational technology for enterprises
- Integrates with Hybrid IT operating models
- Designed for the requirements of Enterprise IT
- HPE investing to drive Blockchain innovation across our business

Industry leading services

- HPE Pointnext end-to-end services driving Blockchain solution for customers
- Hybrid IT delivery models
- Consumption models will be available
- Expansive experience designing, building and running Enterprise IT

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HPE Transformation Workshop for Blockchain

The starting point on your journey – educating and aligning the business

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Thank you

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