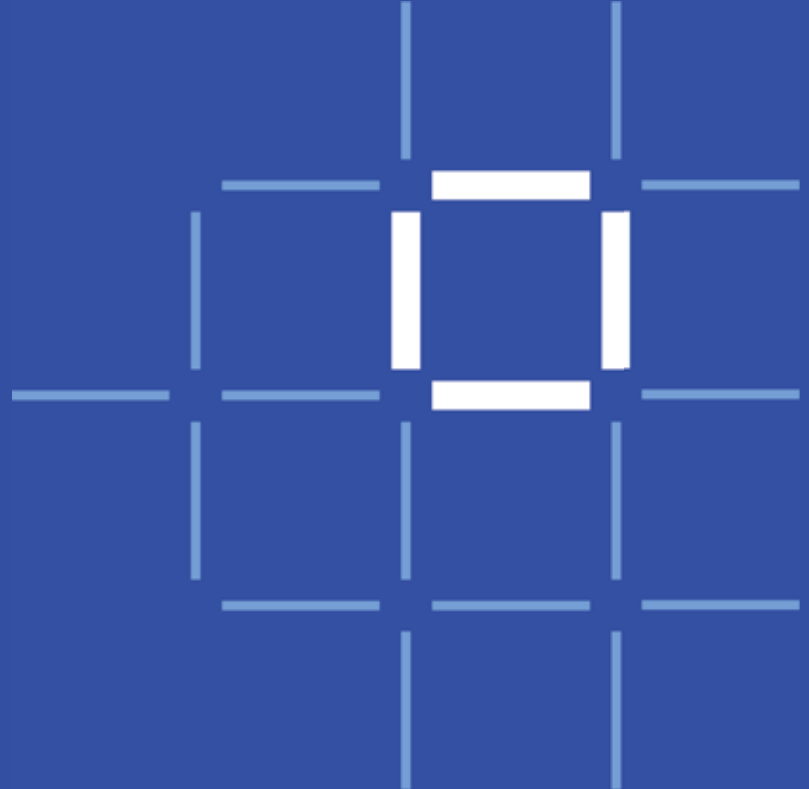


IBM Blockchain

What will we
solve together?

Stephen Rogers
*VP of Blockchain Initiatives for Supply
Chain*



Blockchain – The Promise: A distributed, shared, ledger.

Saves Time



Transaction time
from days to near
instantaneous

Removes Cost



Overheads and
cost intermediaries

Reduces Risk



Tampering, fraud
& cyber crime

Increases Trust



Through shared processes
and recordkeeping

Blockchain holds records of digital transactions in such a way that makes them **accessible and visible to multiple participants** in a network, while keeping them **secure**.

The digital shared ledger is updated and validated with each transaction, resulting in a secure, permanently recorded exchange.

The result? Faster, permissioned, and auditable B2B interactions between parties such as passengers, buyers, sellers and logistics providers

Key Features of **Blockchain** for business networks.



Shared Ledger

Append-only distributed system of record shared across business network



Smart Contract

Business terms embedded in transaction database & executed with transactions



Privacy

Ensuring appropriate visibility, transactions are secure, authenticated and verifiable



Consensus

All parties agree to network verified transaction

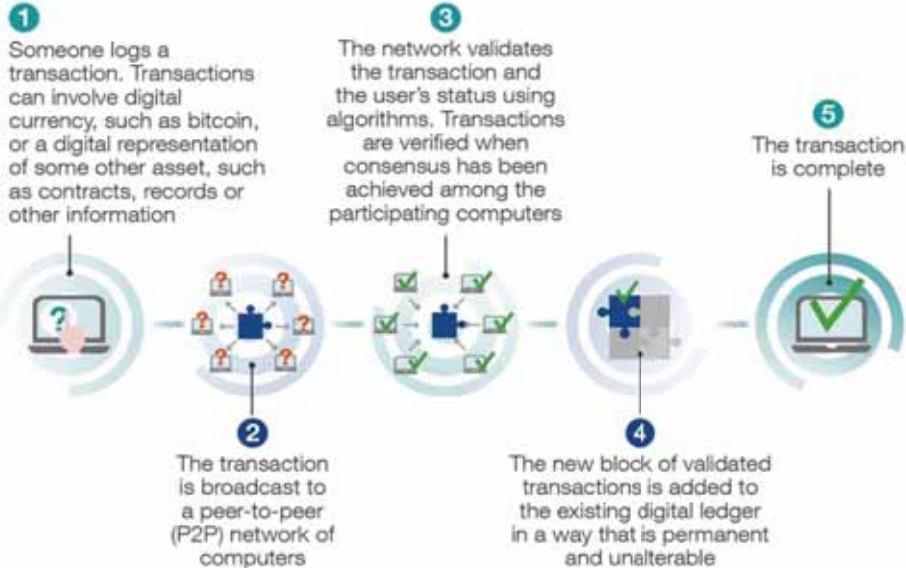
Blockchain establishes a shared, secure record of information flows; a 'shared version of events' across networks for supply chain transactions, processes and partners.

As organizations implement new supply chain technologies (ex: IoT) for improved logistics processes monitoring, **Blockchain** will be used to provide a synthesized record of information flows.

This level of shared visibility will offer organizations an opportunity to optimize multi-party supply chain processes.

Blockchain: here is how it works

- explained in a simple way



In simple terms, it works like this: digital assets – cryptocurrency, property titles, identities, contracts – are recorded on a ledger.

The ledger can be global as with bitcoin, a public blockchain accessible by anyone with an internet connection; local, a private blockchain on an intranet network of select participants or some hybrid of the two, depending on information sensitivity and access permissions. When a transaction is conducted, it is recorded in a 'block', essentially a discrete bundle of information.

The ledger is a chain of validated blocks, i.e., a set of immutable data. In order for a new block to be added to this chain, it must be verified by the participants using a pre-agreed consensus mechanism.

This security measure ensures the integrity of the data contained in the new block and that it matches what the existing chain trusts to be true. Once the new block has been objectively and collectively verified via a set of complex computing criteria, it is added to the blockchain with a time stamp.

Blockchain Types

There are two main types of Blockchain systems: permissionless and permissioned

Permissionless – a permissionless system is one where anyone can join the network and participate fully in the network – e.g., read and write any transaction.

It is also known as a public network. The best example of a permissionless blockchain is the Bitcoin blockchain, which underlies the world's most famous cryptocurrency, Bitcoin.

Permissioned – a permissioned network is one in which permission needs to be given to perform certain tasks. For example, permission may be needed to read certain transactions, it may limit who you can deal with and it may also state who can add and validate blocks to the chain. An example of a permissioned blockchain network is Ripple, where Ripple determines the scope and role of the users on the system.



At IBM we have a tiered strategy

Drive the development of **applications** for specific business value, to be deployed to active **blockchain networks**



Collaborate with comprehensive services teams from ideation all the way to production and management



Tap into our diverse ecosystem to develop strategic partnerships and create your competitive advantage



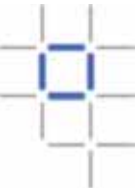
Solve critical industry challenges by building and joining new business networks and applications



Develop, govern and operate enterprise blockchain networks with speed and security



As a founding and premier member of Hyperledger, we're committed to open source, standards and governance



- Permissioned
- Highly modular
- Smart contracts in general purpose languages
- Pluggable consensus
- Privacy
- No “mining” or native crypto-currency required for consensus
- Execute-order-validate vs order-execute

IBM Blockchain Core Capabilities for 2018

The IBM Blockchain Platform will give users the ability to...



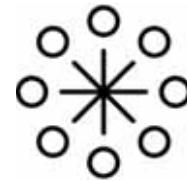
Build Apps & Networks

- **Development tools** to create applications which leverage blockchain networks
- **API endpoints and SDKs** for building and monetizing blockchain apps
- **Model for founders** to create business models enabled by blockchain



Grow Networks

- **Operational tools** to test, manage, monitor, troubleshoot, deploy, migrate and upgrade blockchain networks
- **Governance tools** to create and manage governance policies on permissioned networks



Accelerate Ecosystems

- **Network registry** to discover and join existing blockchain networks
- **Marketplace** to discover and use APIs, service components and applications
- **Public networks** to accelerate blockchain ecosystems



IBM **Blockchain**

The Founder's Handbook

Your guide to getting started
With blockchain

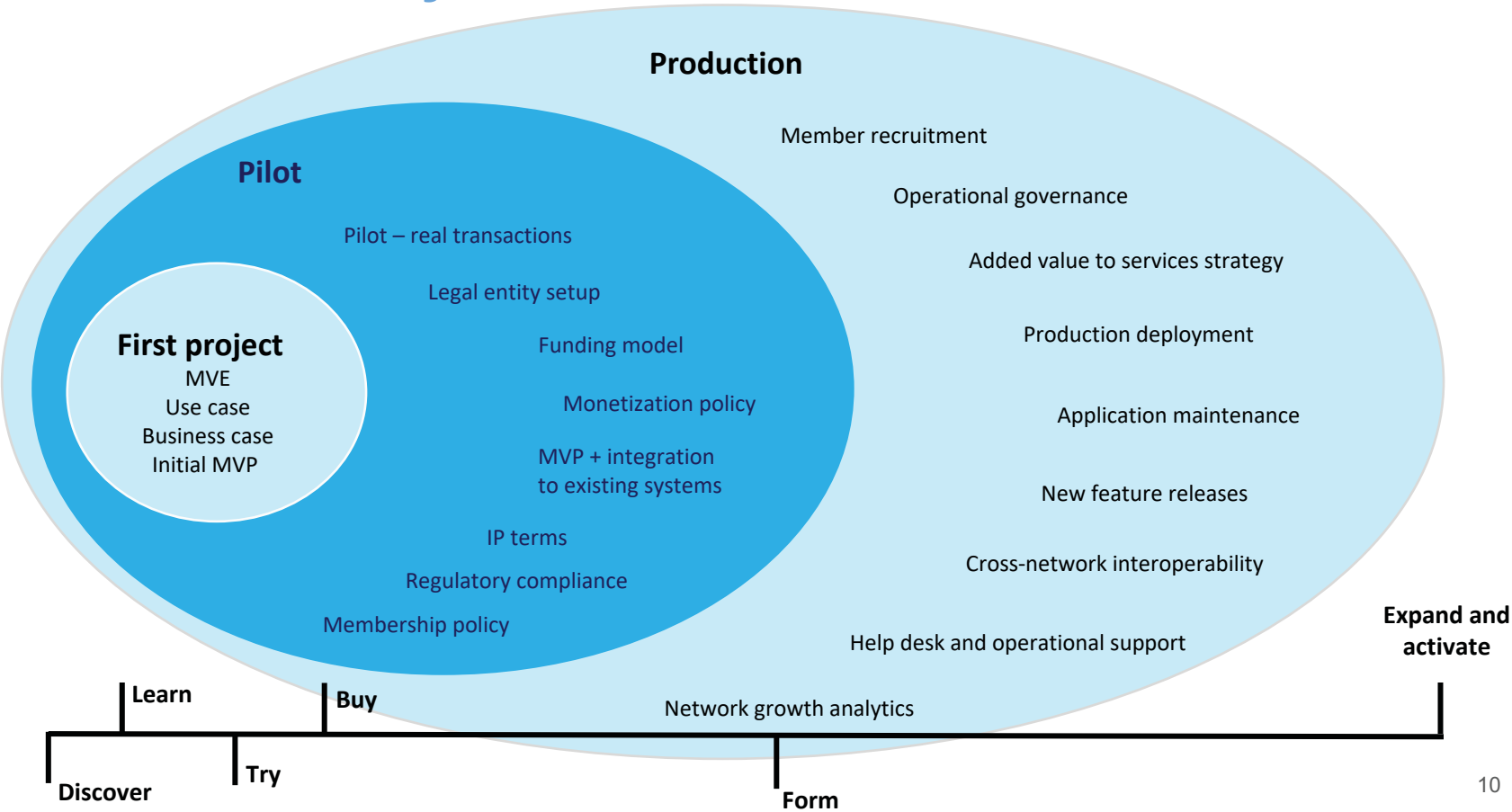
IBM

Scope

Motivation

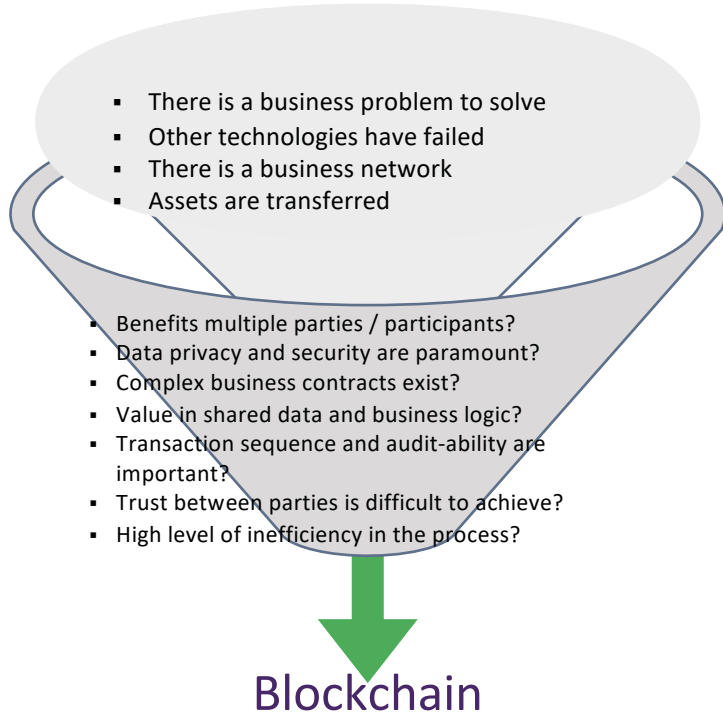
Governance

Blockchain maturity model



What makes a good use case for Blockchain?

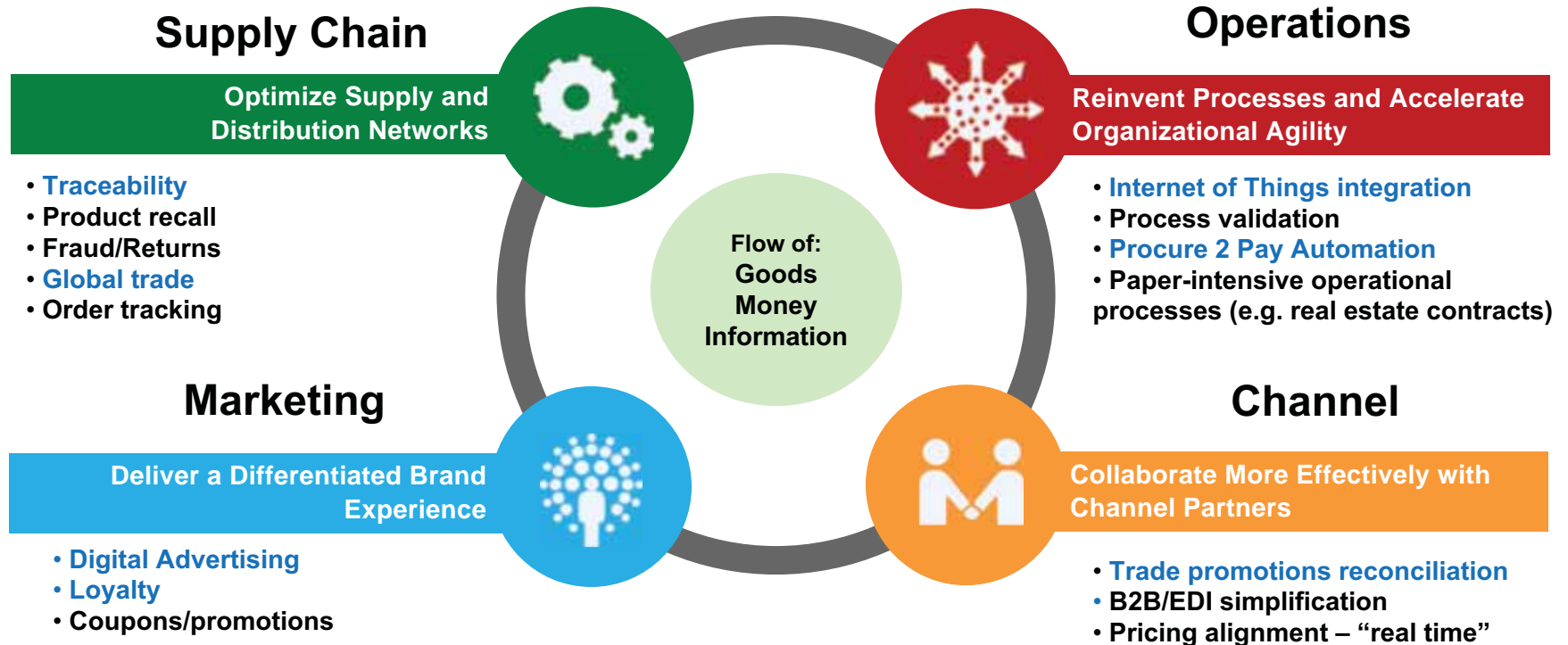
✓ Positive Indicators



✗ NEGATIVE Indicators

- ✗ Need high performance (millisecond) transactions
- ✗ Small organization (no business network)
- ✗ Looking for a database replacement
- ✗ Looking for a messaging replacement
- ✗ Looking for transaction processing replacement
- ✗ Process and metrics are not clear within the ecosystem
- ✗ Value, velocity and/or variability are not present

How Blockchain is being leveraged in multiple areas of business



Making blockchain real for business with cross-industry solutions and dozens of active networks.

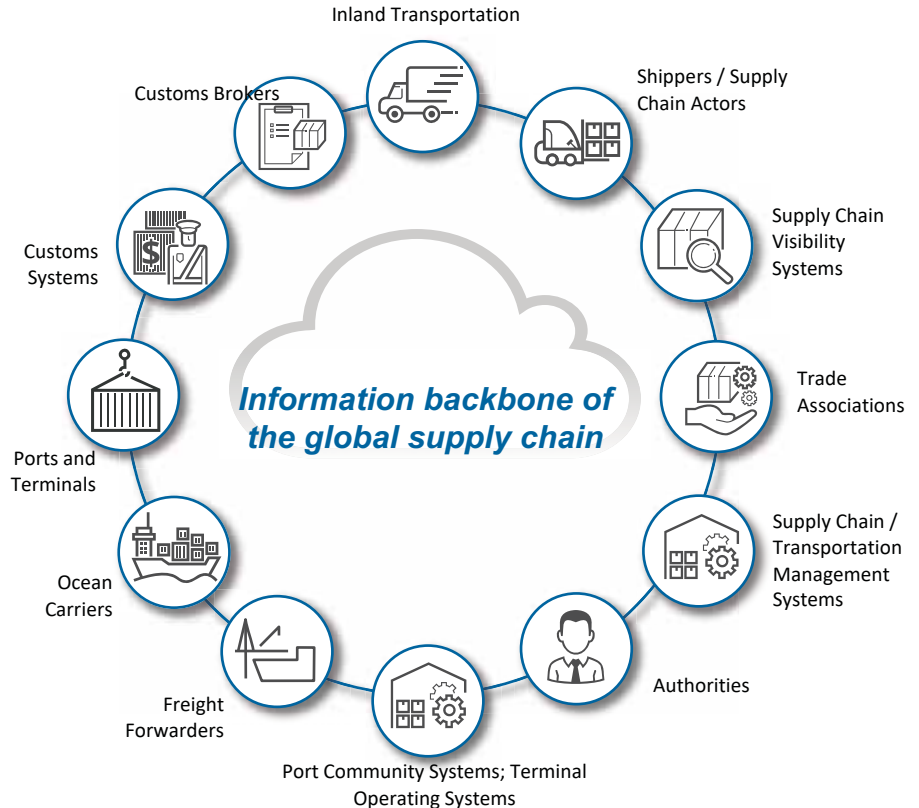


Tomorrow: we will bring to market a trade platform for containerized shipping connecting the entire supply chain ecosystem

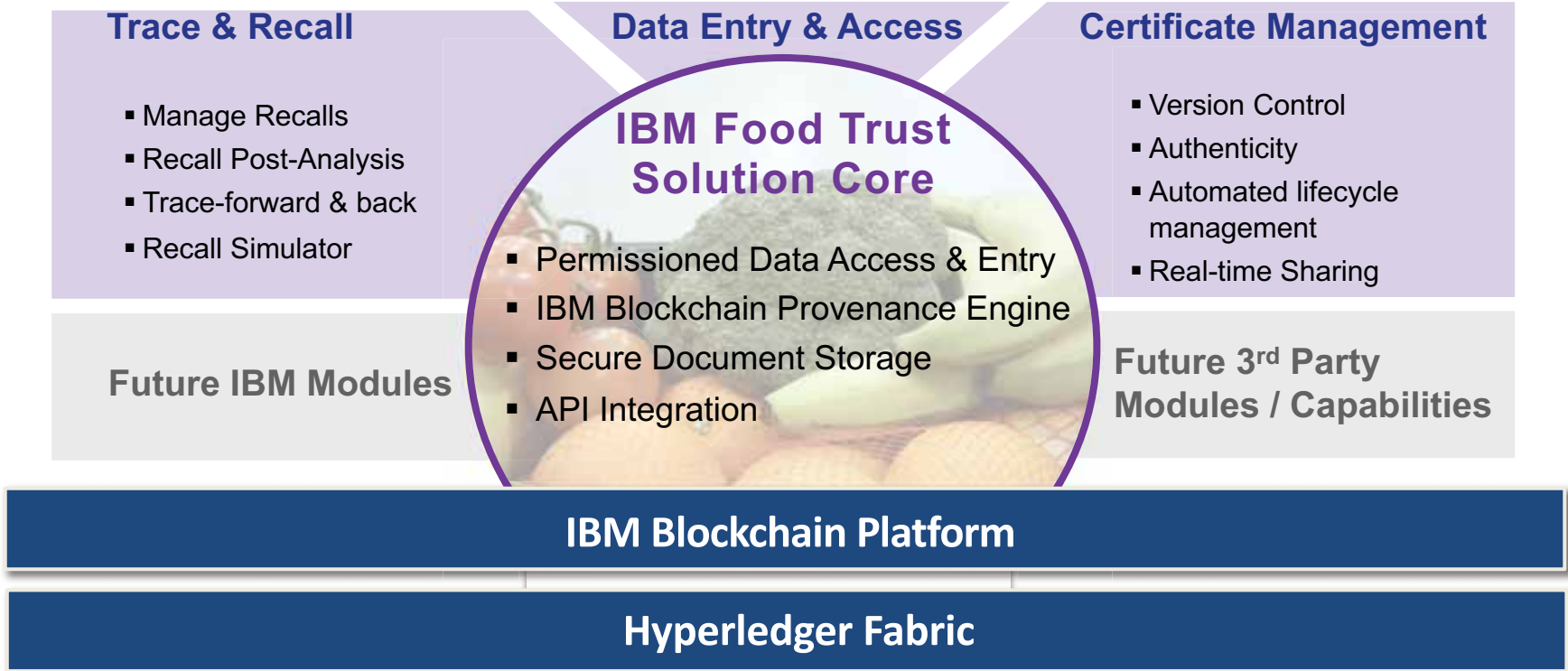
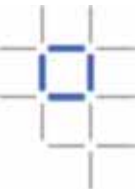
- An open, neutral, and distributed platform underpinned by Blockchain technology
- Seamless, permissioned document and data sharing with a common access control structure
- Ecosystem participants access the platform via open APIs

Two initial applications will be deployed on the platform:

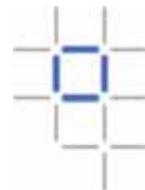
1. **Shipping Information Pipeline:** Will provide real-time, secure access to end-to-end supply chain information to all actors involved in a global shipping transaction
2. **Paperless Trade:** Will automate filings for the import and export of goods by enabling end users to securely submit, stamp and approve documents across national and organizational boundaries



The IBM Food Trust solution is a set of modules built for the industry



Tennet Renewable Energy Flexibility



What?

- Tennet must match supply & demand of electricity. This new era of renewable energy meant that existing systems are under strain to keep up.
- New battery technology enables a new near-instantaneous source of power to adapt to requirements

How?

- The blockchain presents the operator from Tennet with a view of the available pool of flexibility, ready to activate at the push of the button
- This then signals batteries in Electric Vehicles connected to the grid (Vandebron) or distributed power banks in consumers homes (Sonnen)



Benefits

- Giving the flexibility to match supply & demand
- Rapidly understanding the resources available



Purpose of POC: Understand benefits of leveraging IBM Blockchain in our Business / Technical environments to drive parts provenance of spare parts thru the distribution channel

1: Parts Provenance

Aftermarket parts business is a high value area. Provenance of parts will enable measurable benefits: reduced time, cost, and risk in managing the transfer of parts between parties.

Participants

- Manufacturer / Part OEM
- Parts supplier / Repair services
- Equipment Operator

Key Objectives/Concerns

- Reduced stock held by parties
- Parts Warranty, trust
- Parts counterfeiting / authenticity
- Anticipating business disruption
- Accessing emergent distribution methods
- Cultural issues around trust
- Cost of managing the exchange of information

2: Manufacturing

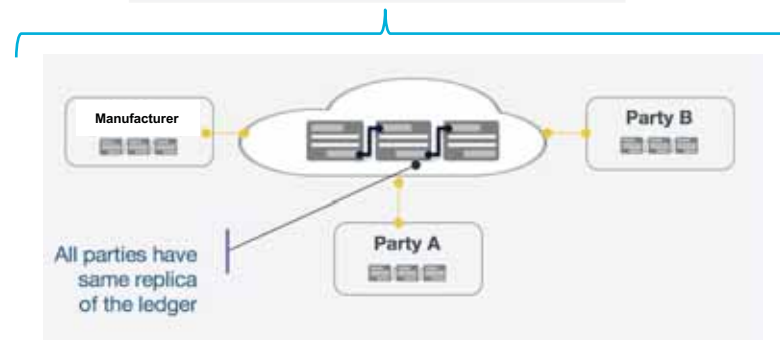
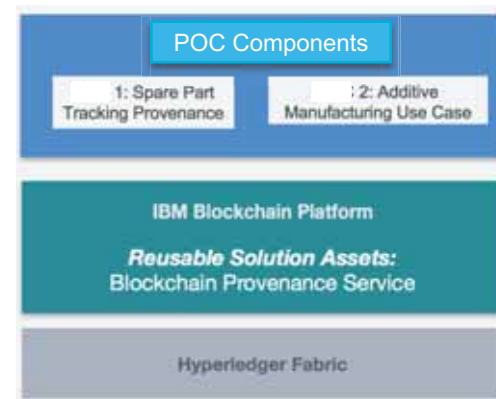
Manage control and enable efficiencies in supply chain for AM. E.g., trusted digital designs transfer, process control, process efficiencies.

Participants

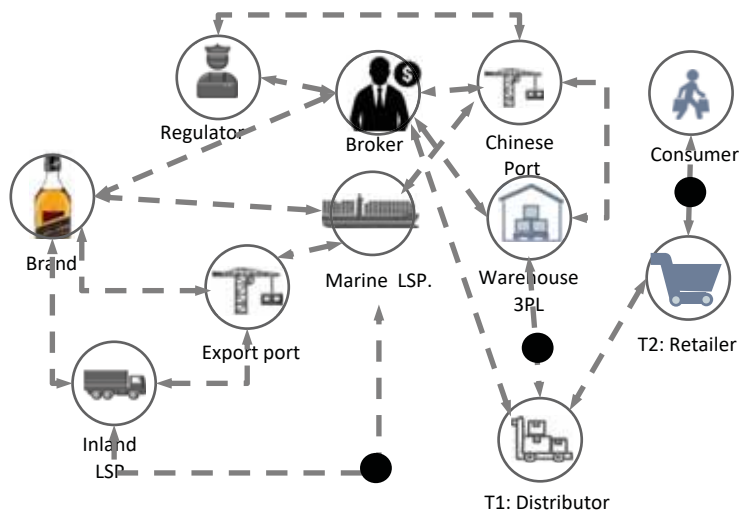
- Manufacturer
- 3D Printer partners
- Equipment Operator

Key Objectives/Concerns

- End-2-end process visibility
- Trust / Compliance / Digital rights management
- Process effectiveness / efficiency
- Anticipating business disruption
- Accessing emergent distribution methods
- Cost of managing the exchange of information



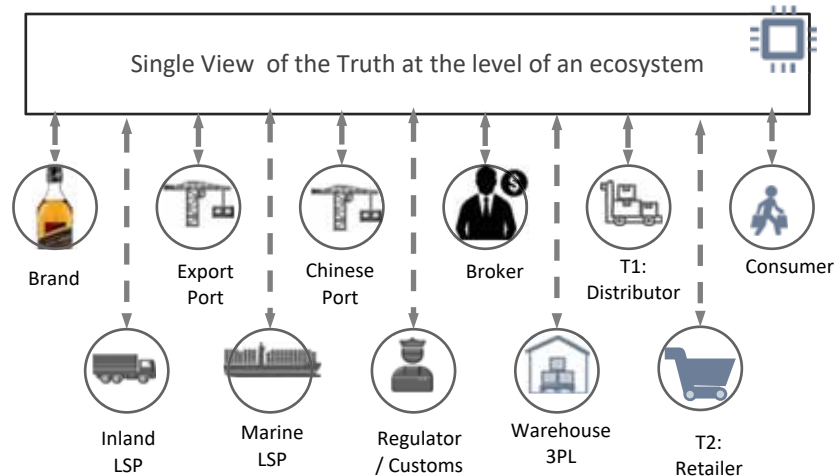
Transactions without blockchain



- **Customer experience** – lack of proactive event mgt.
- **Discrepancies** with bottling dates impacts 30% of shipments
- Inaccurate **depletion** figures

● Blind spots lack of visibility

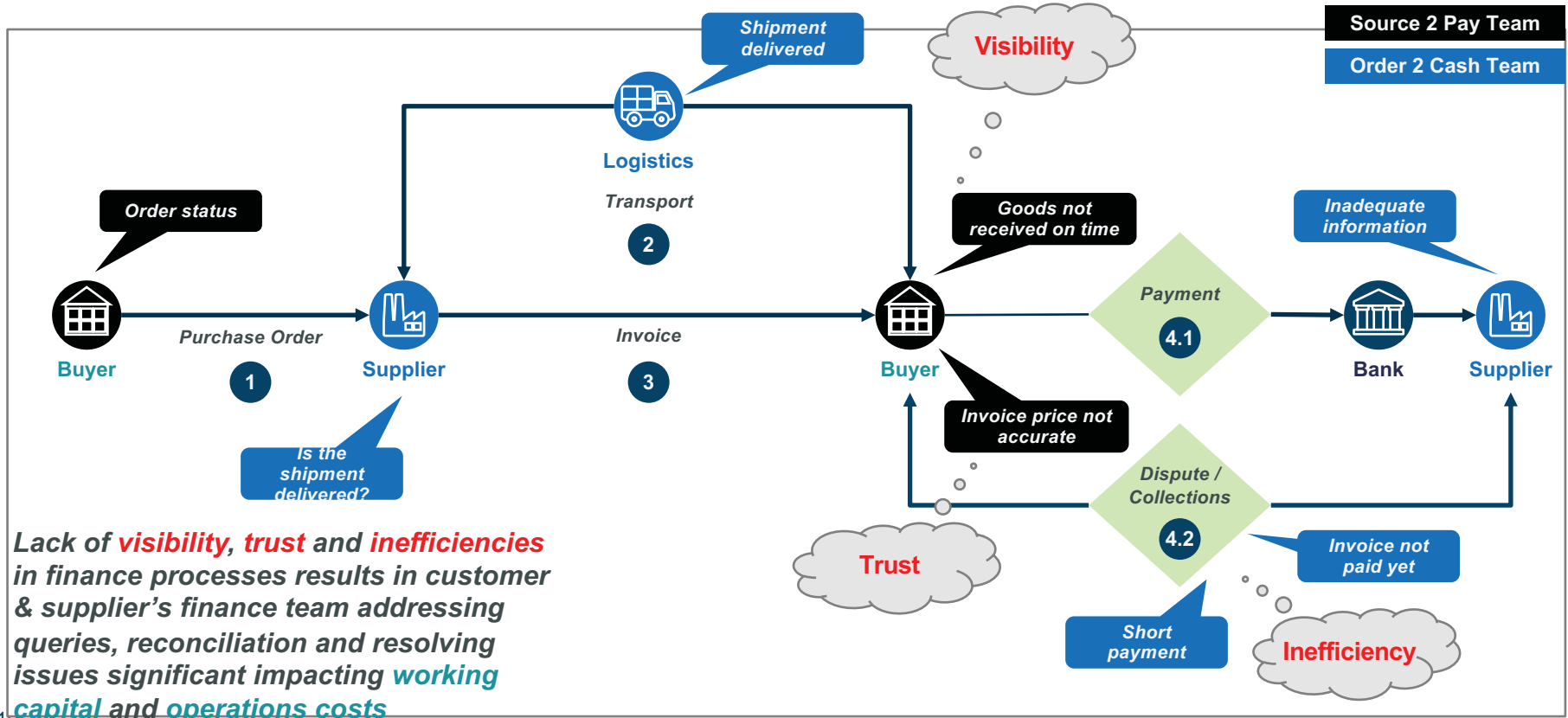
Transactions with blockchain



- **Quality** – provenance ensures authenticity
- **Service** – visibility and digitalisation of transit times
- **Security** – safe routes, safe port authorities

Procure 2 Pay/Order 2 Cash

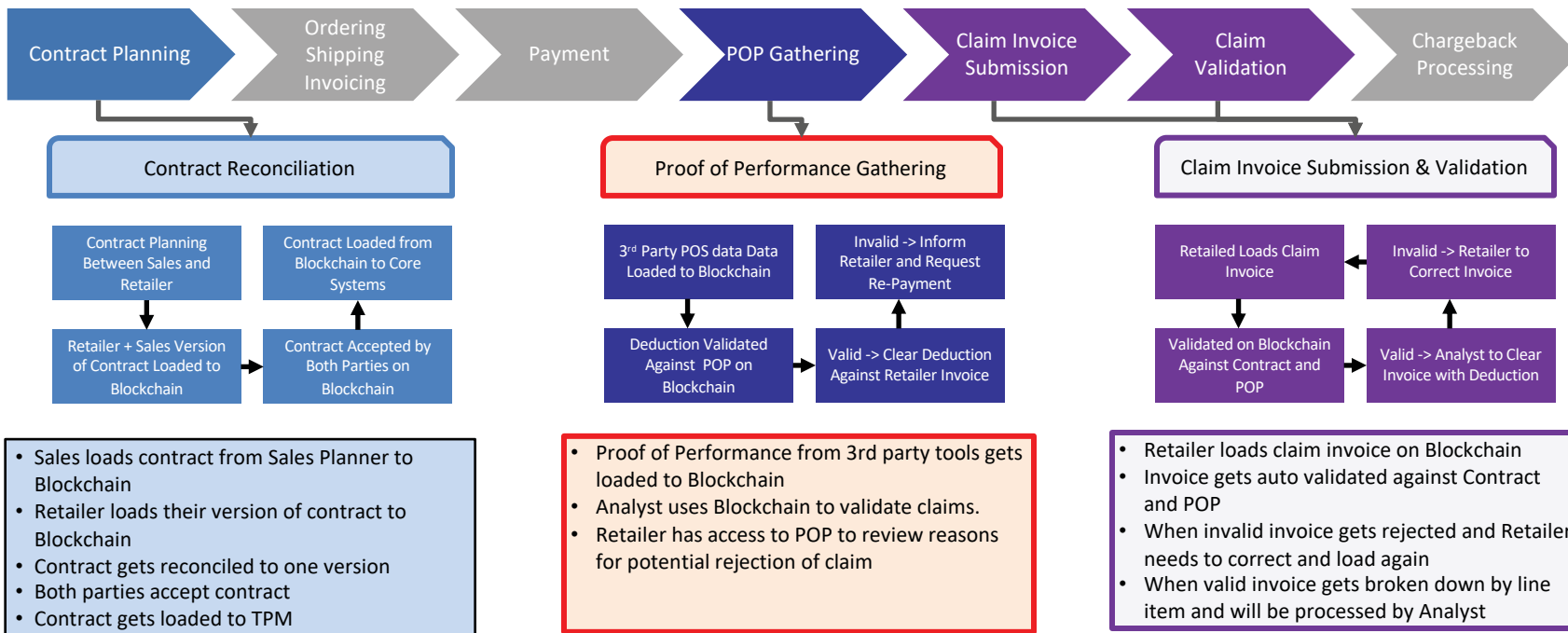
Shared Platform = Shared Economy



Lack of **visibility**, **trust** and **inefficiencies** in finance processes results in customer & supplier's finance team addressing queries, reconciliation and resolving issues significant impacting **working capital and operations costs**



Trade Promotions: \$1.5T spent and 8 out of 10 are unhappy



Process Impact: 1. Speed to Execute & Reconcile 2. Pay for Performance 3. Reduce Friction

Thank you!

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