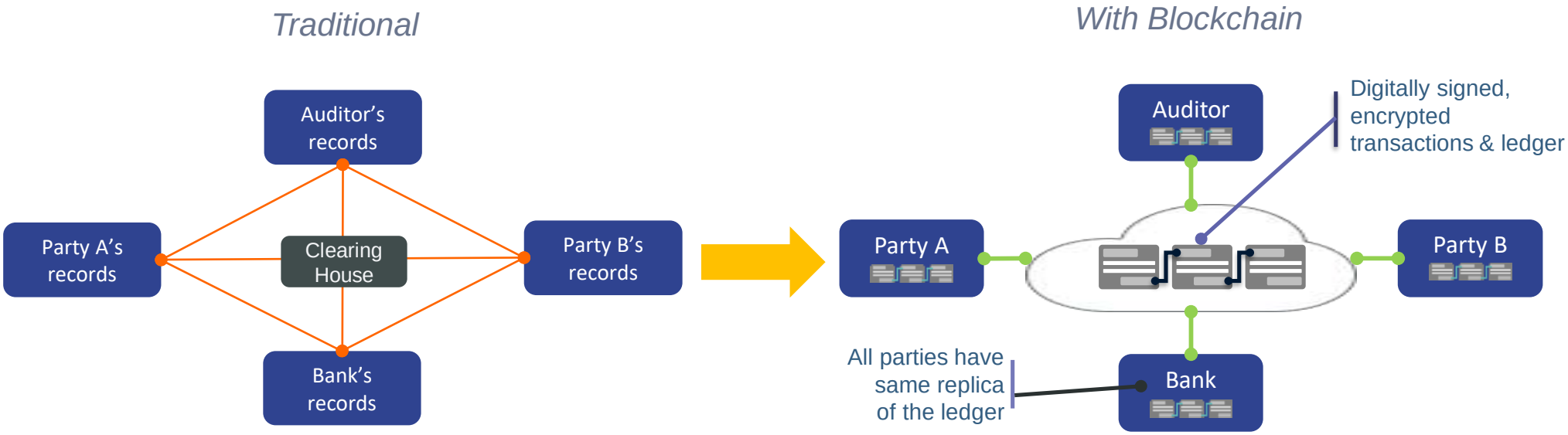
IBM Blockchain Point of View

February 9, 2018

Marie Wieck, General Manager IBM Blockchain

Blockchain will fundamentally change business processes



… Inefficient, expensive, vulnerable

… Consensus, provenance, immutability, finality

Blockchain creates a new style of network – transforming business processes & transactions

Key Concepts

Append-only distributed system of record shared across business network

Shared Ledger

Permissions

Ensuring appropriate visibility; transactions are secure, authenticated & verifiable

Business terms embedded in transaction database & executed with transactions

Smart Contracts

Consensus

All parties agree to network verified transaction

Benefits

Transaction time from days to near instantaneous

Reduce Time

Removes Costs

Overheads and cost intermediaries

Data loss, Tampering, fraud, cyber crime

Reduce Risks

New Business Models

IoT Integration into supply chain

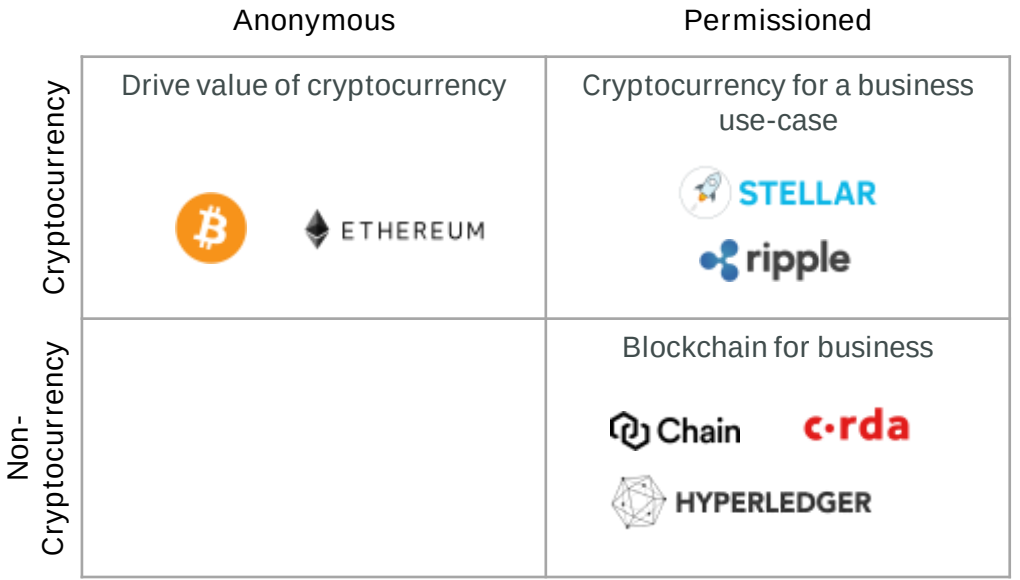
Blockchain Landscape

Distributed ledger market encompasses a range of technologies and organizations with different objectives

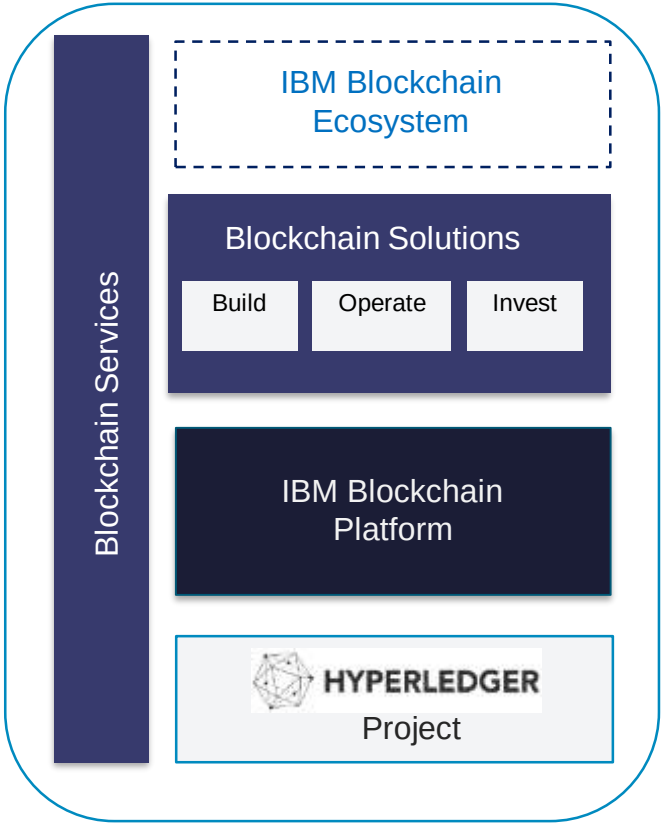
DLT Alternatives

Bitcoin
Chain
Corda
Ethereum
Hyperledger Fabric
R3
Enterprise Ethereum Alliance
Stellar
Ripple
DAH
Quorum

Categorization



IBM Strategy: Transforming Industries and Business Processes with Blockchain



Support — Education, support and partner services to create a thriving ecosystem for Blockchain

Provide — Solutions to transform business processes and industries by creating and operating Blockchain Business Networks with enterprise participants

Provide — Secure Blockchain Platform on the Cloud with developer services and production grade capabilities to enable the creation and management of Blockchain business networks

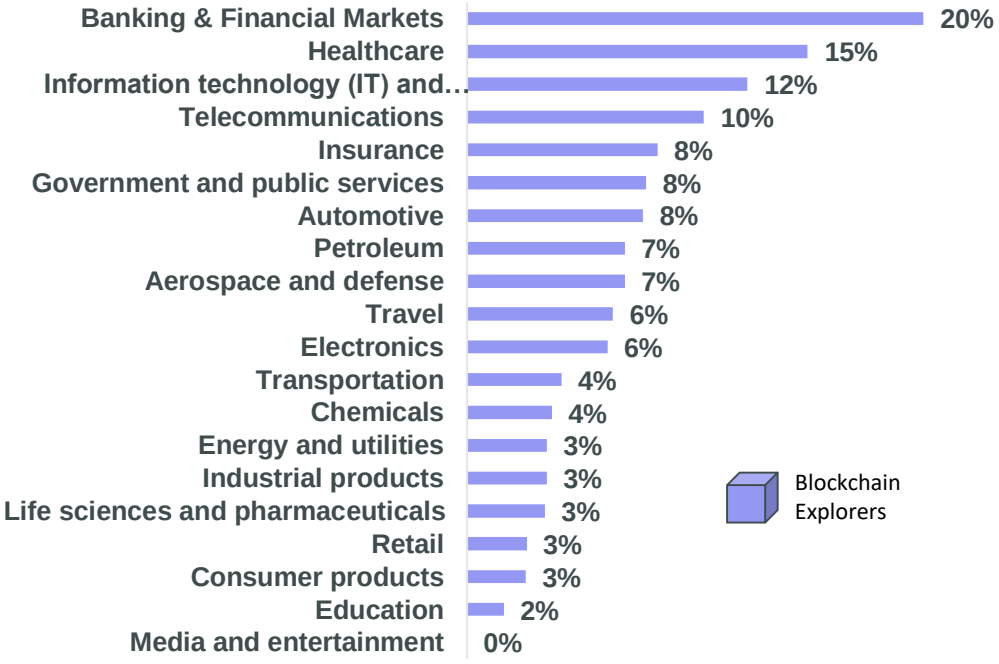
Invest — With The Linux Foundation community to ensure the best possible foundation for Blockchain in a commitment to open standards, open source and open governance

*Hyperledger Fabric is a blockchain framework implementation and Hyperledger Composer is a tooling environment for blockchain and two of the projects hosted by The Linux Foundation.

Blockchain is a C-Suite Initiative across all Industries

IBV Global C-Suite Study "Forward Together" found 8% of Companies have Blockchain projects underway, & 34% expect to this year

% Blockchain Explorers across industries



IBV C-Suite Blockchain Survey, n=2965 May 2017

Best Practices from Blockchain Explorers

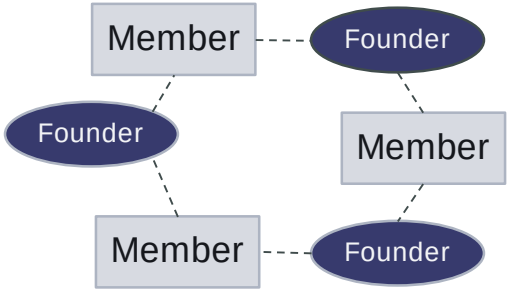
- Orchestrate for economic advantage: Get the business model right and make sure all participants, not just the founders, see economic benefit.
- Establish a circle of trust: Blockchain is all about the network. Test the linkage with a "minimum viable ecosystem", not just a minimum viable product. Consider including competitors as well.
- Learn fast & keep an open mind: There is an opportunity for a first mover advantage, if only to develop skills and test use cases. But expect new learnings and be prepared to pivot quickly.

Examples of client engagements and active blockchain networks

Trade Finance	Pre and Post Trade	Complex Risk Coverage
Digital Trade Chain, MIZUHO, NATIXIS, TRAFIGURA	DTCC, CLS Fundamental to FX, Bolsa Comercio Santiago, JPX	AIG, Standard Chartered
Identity/ Know your customer (KYC)	**Unlisted Securities/ Private Equity Funds**	**Loyalty Program**
SECURE KEY, Crédit Mutuel ARKEA, DIACC	NORTHERN TRUST, BORSA ITALIANA, SBI証券	UnionPay 銀联
Medicated Health Data Exchange	**Fraud/ Compliance Registry**	**Distributed Energy/ Carbon Credit**
FDA	دبي الذكية SMART DUBAI	TenneT, ENERGY BLOCKCHAIN LABS
Supply Chain	**Food Safety**	**Provenance/ Traceability**
MÆRSK, PSA	Walmart, Driscoll's, Tyson, McLANE, Dole, Kroger, Nestlé, gsf golden state foods	everledger

Building Communities in Blockchain Networks

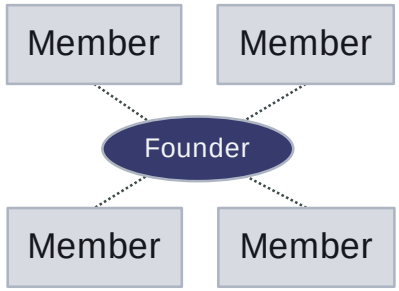
Consortium Based Network



Founders are equal among other participants, may include a joint legal entity among the founders (e.g. – JV)

Examples: JPX, we.trade, IBM Food Safety

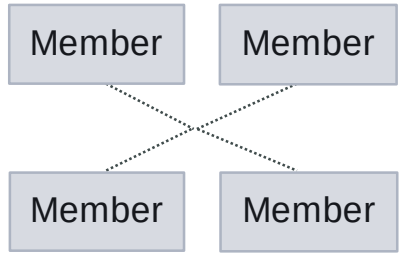
Founder Directed Network



Individual founder in a position to provide strong direction

Examples: Northern Trust, CLS Fundamental to FX

Community Based Network



Driven by industry standards bodies or existing non-blockchain network owners

Examples: IBM Watson Supply Chain, SWIFT

Food Traceability

What?

- Traceability of food from “farm to fork”

How?

- Blockchain holds history of food items processed through entire supply chain

Offerings

- Product Recall Assistant
- Free Data Entry & Access
- Certificate Manager

Benefits

- Increased trust – multiplied by each participant in food supply chain
- Pinpoint source of compromised food, reducing the unnecessarily broad recall
- Improved co-ordination in food supply chain

Global Trade Digitization

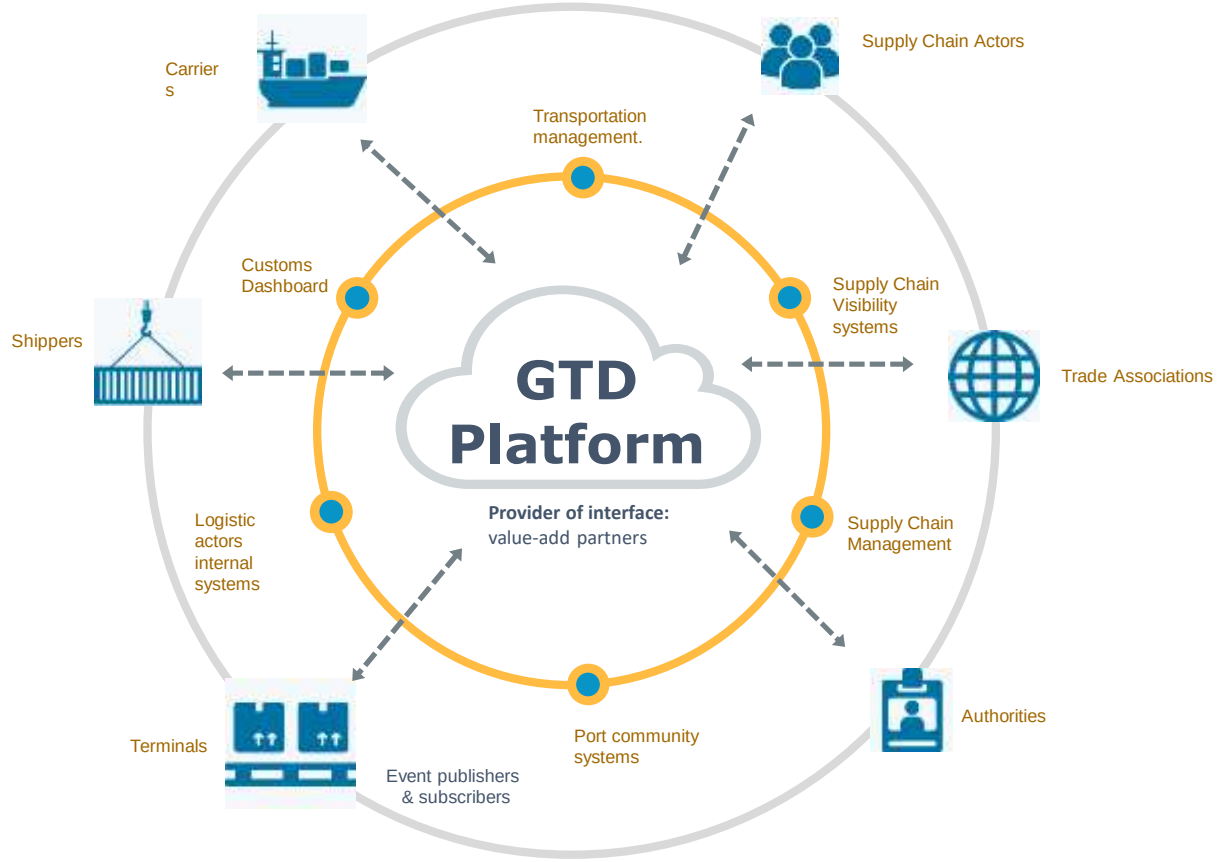
An open, extensible platform for sharing shipping events, messages, and documents across all the actors and systems in the supply chain ecosystem.

Offerings:

- Paperless Trade
- Shipping Information Pipeline

Important principles

- Detailed information remains under the control of the owner
- Neutral
- Fault Tolerant
- Everyone can work in their own systems



Trusted Identity

What?

New experience for consumers to effortlessly sign-on to digital services, while remaining in control of their identity attributes.

How?

Blockchain enables

- No central database or identity honeypots
- No central point of failure
- “Triple Blind” data sharing – PRIVACY

Benefits

Institutions that participate in an ecosystem benefit with increased customer satisfaction, reduced risk in identity theft, and new revenue sources to institutions

IBM and FDA partnership

What

- Create and promote a secure, efficient and scalable exchange of health data using blockchain technology.

How

- Blockchain technology will be used to create an electronic ledger of where and how data is transferred and exchanged
- Initial trial focus on oncology data

Benefit

- Creating an audit trail through the ledger, healthcare professionals will be able to:
  - hold information leakers accountable
  - maintain transparency in what data is going where
  - secure weak spots in the sharing process.

ZDNet CLOUD INNOVATION SECURITY TECH PRO MORE

IBM bets on the blockchain to keep your medical data safe

Big Blue believes the secure transfer of medical information can be achieved through technology associated with Bitcoin.

IBM has announced a new partnership with the US Food and Drug Administration (FDA) in a study designed to determine whether blockchain technology can be used to keep medical data transfers safe from theft or exploit.

CDC Use Case: EHR Reference Data Chain of Custody and Consent

What

- Track the chain of custody of the EHRs and how they are stored, accessed and moved through the lifecycle in compliance with specific governmental regulations
- Manage consent and sharing of EHRs

How

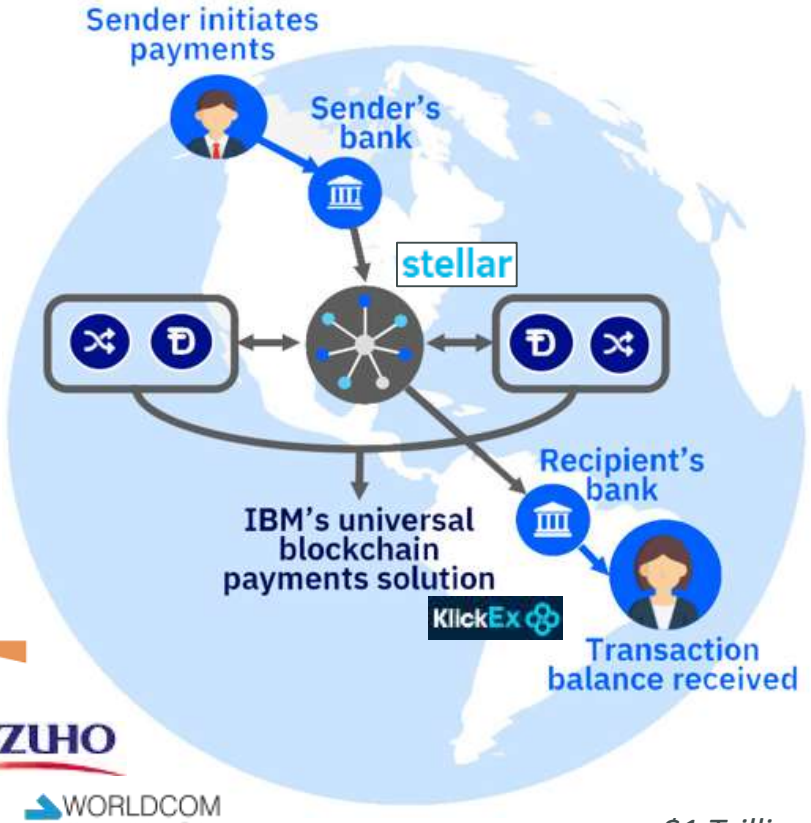
- Each participant agrees to capture the access and storage of HER data on the blockchain
- Blockchain creates single view of the EHR reference data
- Include consent model so that owners of data can quickly and easily provide consent for others to access their data and then record consent to avoid dispute

IBM's universal blockchain payment strategy announced at SIBOS

A universal rail for real-time clearing and settlement on an integrated Blockchain network

Tomorrow's Process:

Near real-time international payments



Banking Leaders Involved

BBVA, nab, TD, ธนาคารกสิกรไทย KASIKORNBANK, Danamon, BNI, mandiri, MIZUHO, BANK BRI, RCBC We believe in you., WORLDCOM FINANCE

What:
A multi-ledger, single network for real-time atomic clearing and settlement using IBM Blockchain technology

How:
- Collaboration between IBM and technology partners Stellar.org and KlickEx Group
- Initial participants include over 13 financial institutions

Benefits:
- Create secure, high volume, low-cost cross-border payments services without sacrificing margins
- Access new markets and currencies with limited risk
- Generate new sources of revenue with value-added products and services

$1 Trillion business in Cross-border Payments growing at 20+%

we.trade – Digital Trade Chain

Project Background

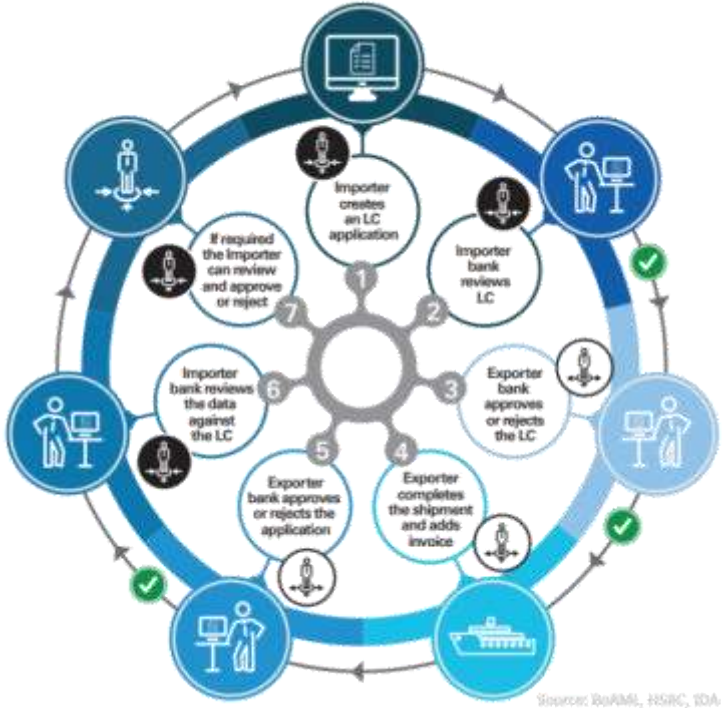
- Digital Trade Chain (DTC), is a blockchain-based international trading system for a consortium of major world banks including Deutsche Bank, HSBC, KBC, Natixis, Rabobank, Société Générale & UniCredit

Solution

- Connects all parties involved in international trade — banks, importers, exporters, buyers, sellers, transporters, and other appropriate participants
- Built on Hyperledger Fabric and IBM Blockchain, DTC allows banks to extend services and provide more efficient use of capital – fostering greater participation by small and medium businesses and end-users
- Allows rapid deployment of "Smart Contracts" and other tangible aids to innovative emerging business, trading, and financial activity
- Enables accurate trading posture information, order to settlement control, risk coverage, track and trace options

Target Outcomes

- Near-real time exchange of information on a secure platform that digitizes transactional financing and other complex processes
- Continual business and compliance readiness in any regulatory environment
- Scalability that allows for rapid international expansion as business, regulatory, and security opportunities converge



Source: IBM Institute for Business Value

BlueAudit – Intercompany Supply Chain Optimization

Project Background

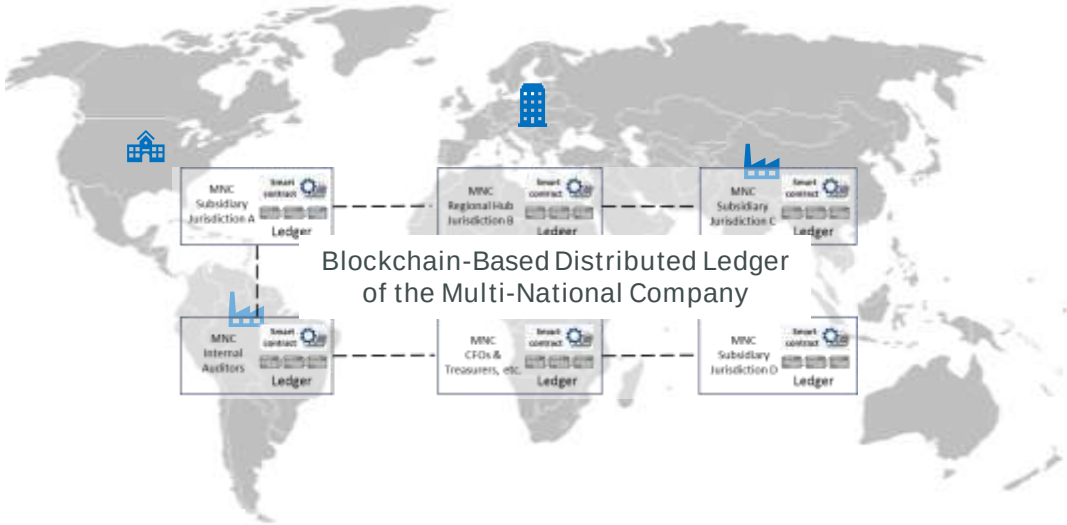
- Transactions over the intercompany supply chain are subject to compliance and audit on finance, accounting, transfer pricing, capital control, etc., in each Jurisdiction.

Solution

- Document intercompany transactions, linkage, supporting documents contemporaneously through a blockchain-based application.
- Encode regulatory and trade rules in smart contracts to enhance control and compliance
- Complement exiting systems with minimal disruption

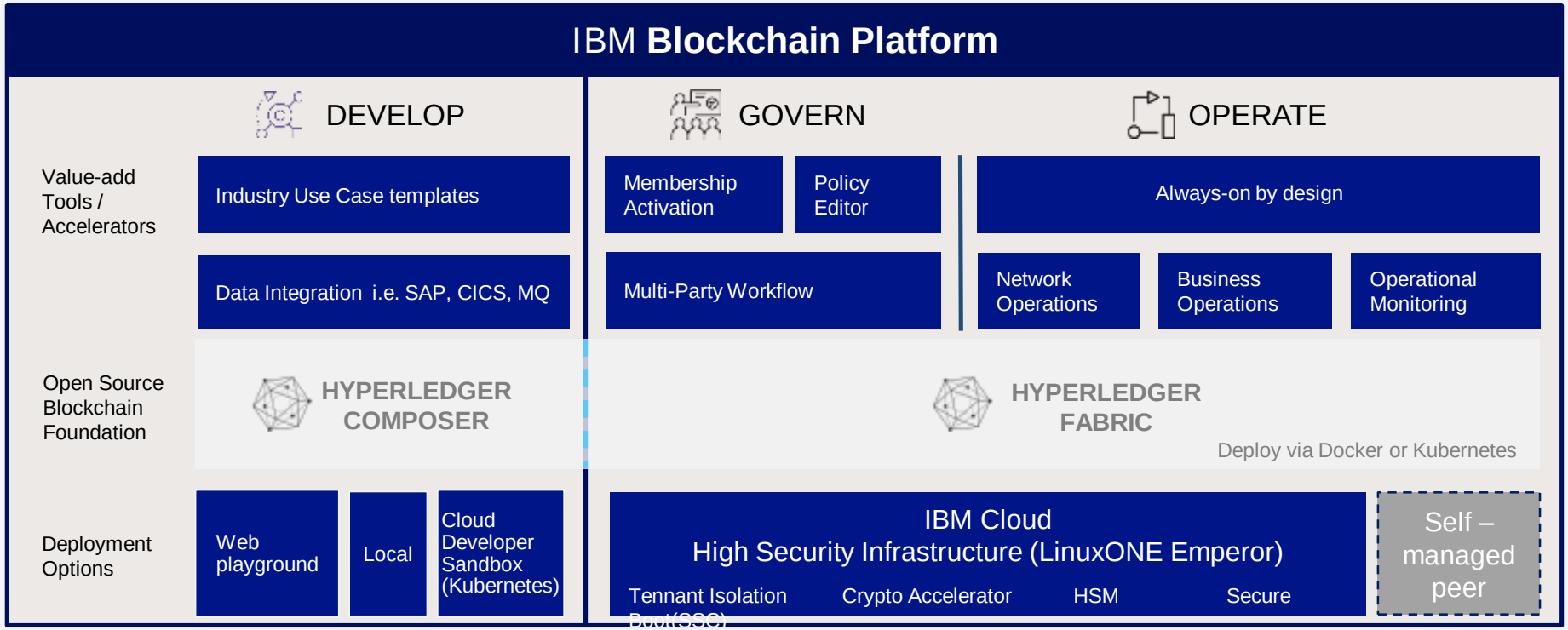
Benefits

- End-to-end traceability & tamper-proof documentation for external auditing.
- End-to-end visibility with resolution preserved for CFOs, Treasurers, & Internal Auditors, etc.



IBM Blockchain

Solutions	Food Safety, Universal Blockchain Payments Network, Identity, Private Equity etc…
IBM Extensions	Watson IOT, API Management, Messaging, Workflow etc...

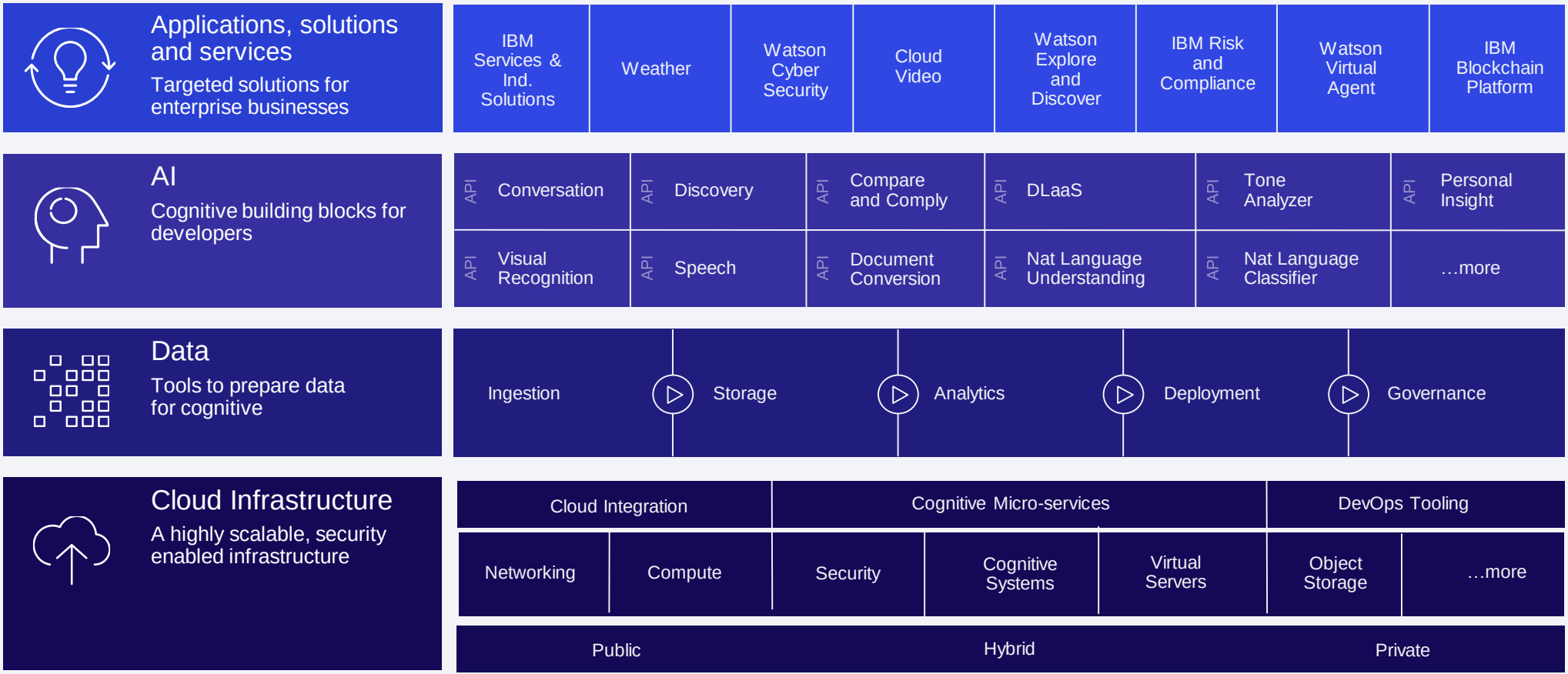


Included in IBM Blockchain Platform

Supported via IBM Certified Docker Images

Coming soon

Only IBM delivers an architecture engineered for business optimization and delivering signature customer experiences.



Getting started on your blockchain journey

Learn More About Blockchain

Schedule an IBM Blockchain Workshop

Develop a Blockchain Application

Activate and Grow your Blockchain Network

Thank you!

https://www.ibm.com/blockchain/

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