

Explore Blockchain



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Blockchain Elevator Pitch

(audience
dependent)

Market Maker (Business / Legal)

A Capability which
allows me to build new
Business Networks
between semi-trusted
entities that want to
transact business

(Trusted, Accountable,
Transparent)

Technologist

A New Internet Trust
Protocol

(e.g. HTTP) - The
Internet of the Future
with Blockchain

(Cryptographically
Secure, Distributed,
Scalable)

The *Internet of Value*
is being built on
Blockchain enabled
by trust,
accountability, and
transparency and
providing secure,
scalable distributed
transactions

Three Government imperatives are underpinning the vision of Blockchain



Open Government

As Government agencies increasingly **collaborate** with private sector and NGOs to drive economic growth and vitality, the need for **transparency and trust** in data becomes all the more important.



Cyber Security and Privacy

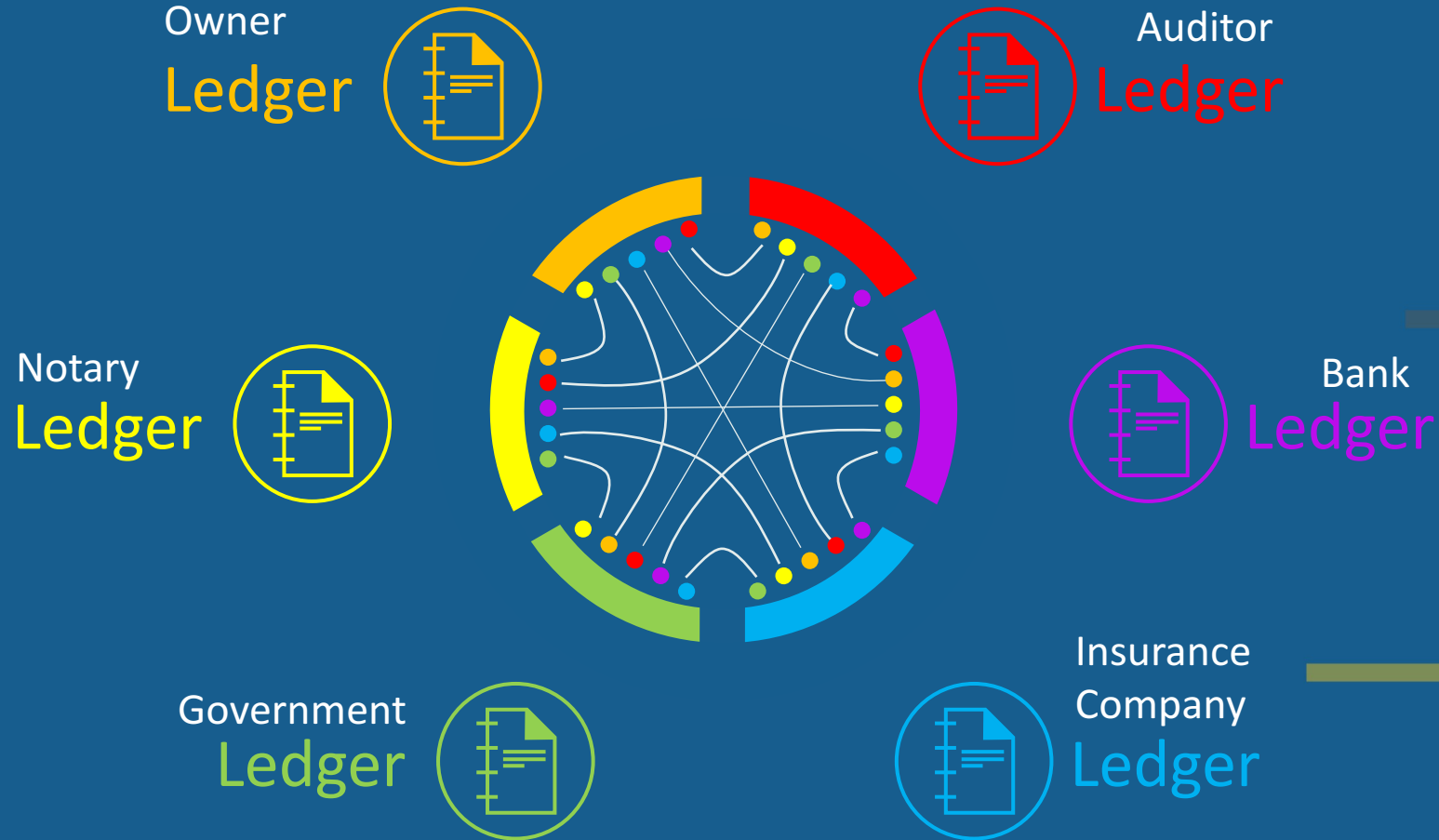
As cyber attacks on Government agencies increase, security of **Government** systems and data becomes fundamental to the Governments ability to provide **safe communities** and protected **critical infrastructure**.



Regulations and Compliance

Governments need to **minimize regulations** to enhance **economic vitality** while at the same time ensure **regulatory compliance**. Governments will not only create but also need to manage the implementation of **policy changes at speed**.

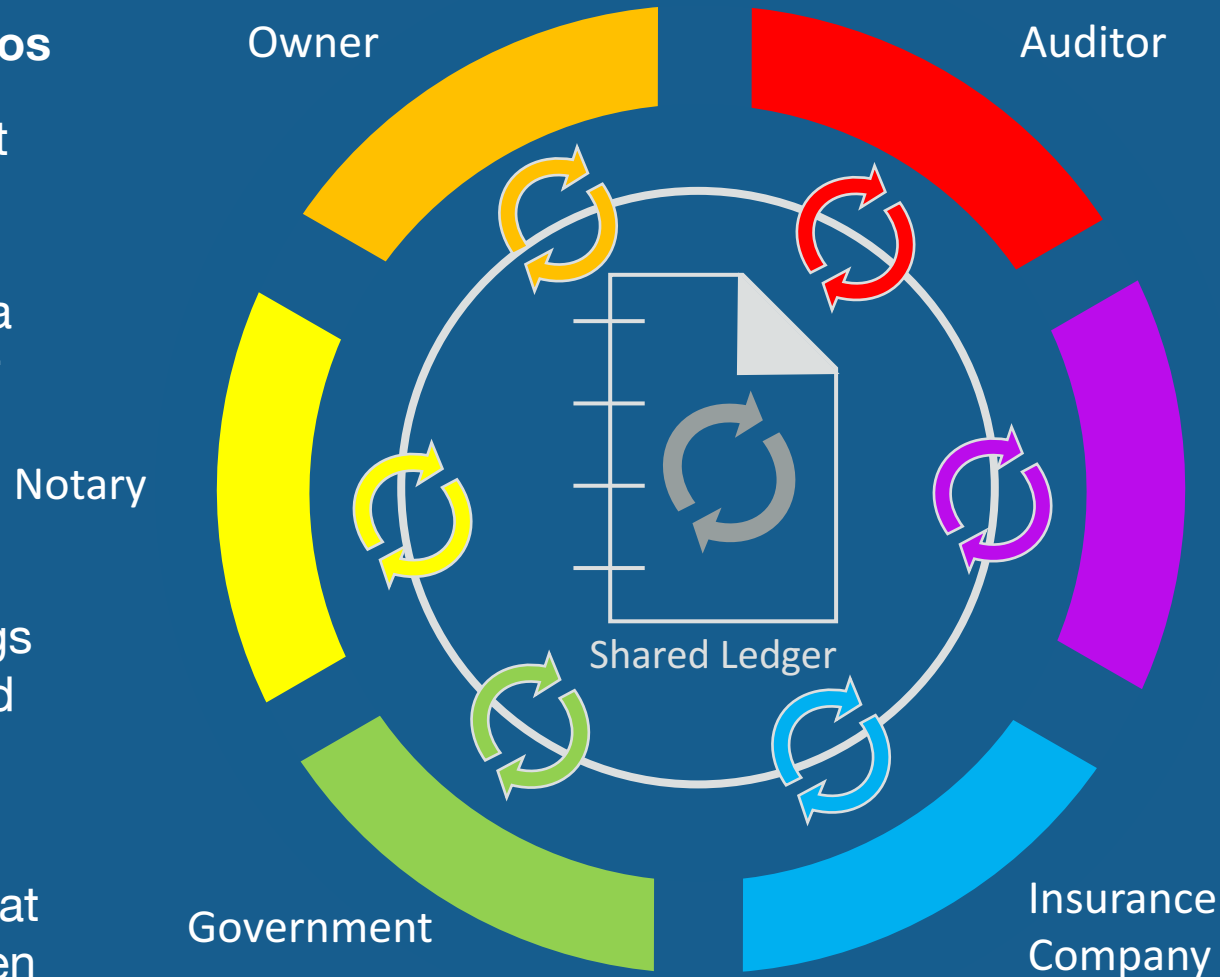
The ability to share data is fundamental to Open Government...



...but current technologies create unique challenges

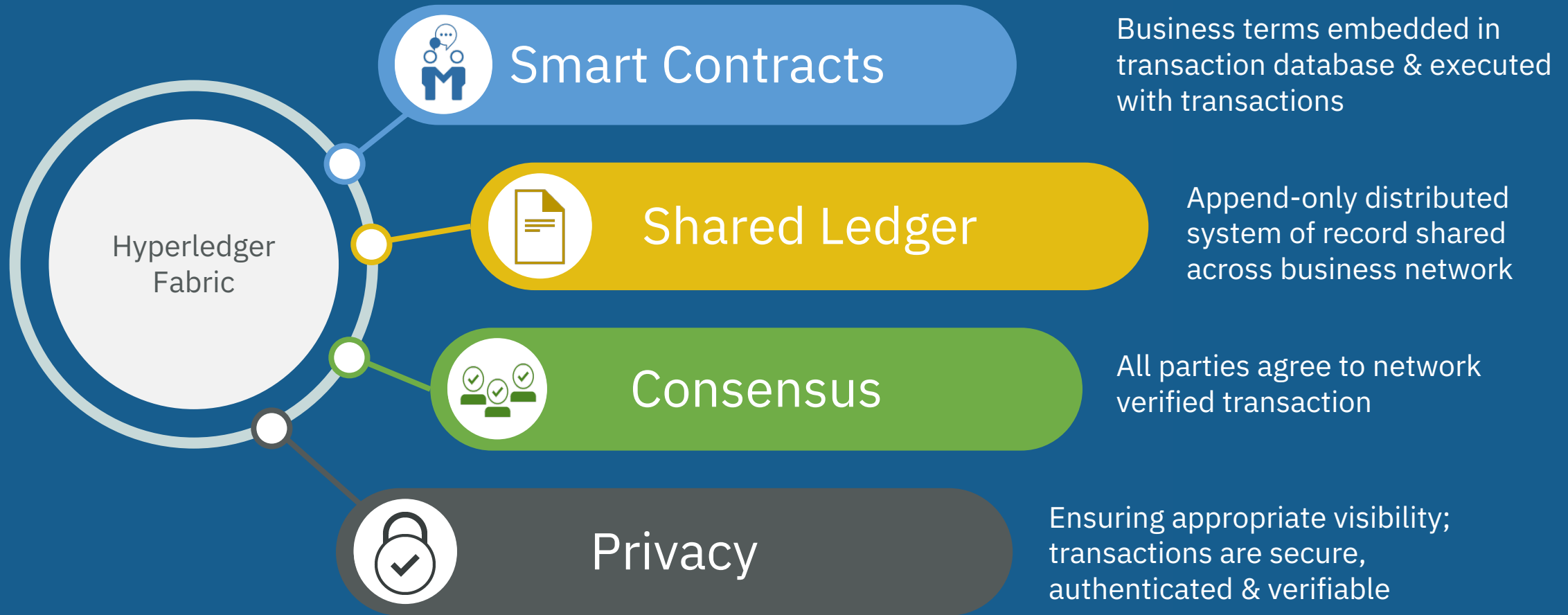
Blockchain eliminates these issues

- Eliminates **data silos**
- Allows government agencies to **share networks** without compromising data privacy, security or integrity.
- Supports **data encryption** and **permission** settings for participants and third parties
- Provides **provenance** of what happened and when



- Allows a Government regulator to view transactions **at any time** and be certain they are looking at the **single version of the truth**
- Ensures immutability of the chain which eradicates **fraud and abuse**
- Enables immediate **deployment of policy** to all members of a network at the same time

Blockchain for Business



- IBM is a founding member of the Linux Foundation's Hyperledger project and has been a leading voice in developing collaborative open standards for distributed ledgers and smart contracts

Permissioned vs Non-Permissioned Blockchains

- Permissioned blockchain is designed for use in government applications
 - Non-Permissioned Blockchains – such as bitcoin – are computationally expensive and use non-central authorities
- Permissioned Blockchains allow easy addition of the Consumer/Citizen
 - Can leverage an existing identity management solution or building capability into the Blockchain itself
 - Adding Consumer/Citizen interaction in the Blockchain unlocks a whole new set of use cases and value
- The Hyperledger Project uses permissioned blockchain implementations

Key patterns we are seeing in Government Blockchain

Shadow Chain

- Minimal impact to existing legacy systems
- Example: IGF Dispute Resolution

Use Case: Blockchain Solution for IBM Global Financing

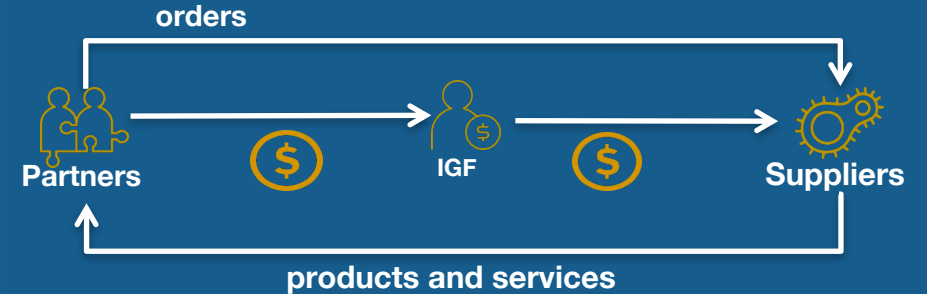
Our Commercial Financing business provides working capital to IT suppliers, distributors and partners through financing of inventory and accounts receivables

What? Improve the efficiency of our commercial financing business by sharing data in a secure and transparent manner on Blockchain

How? Blockchain enables Comprehensive View of key operational data: Purchase Order > Transaction Approval > Shipments > Invoices > Remittances

Benefits

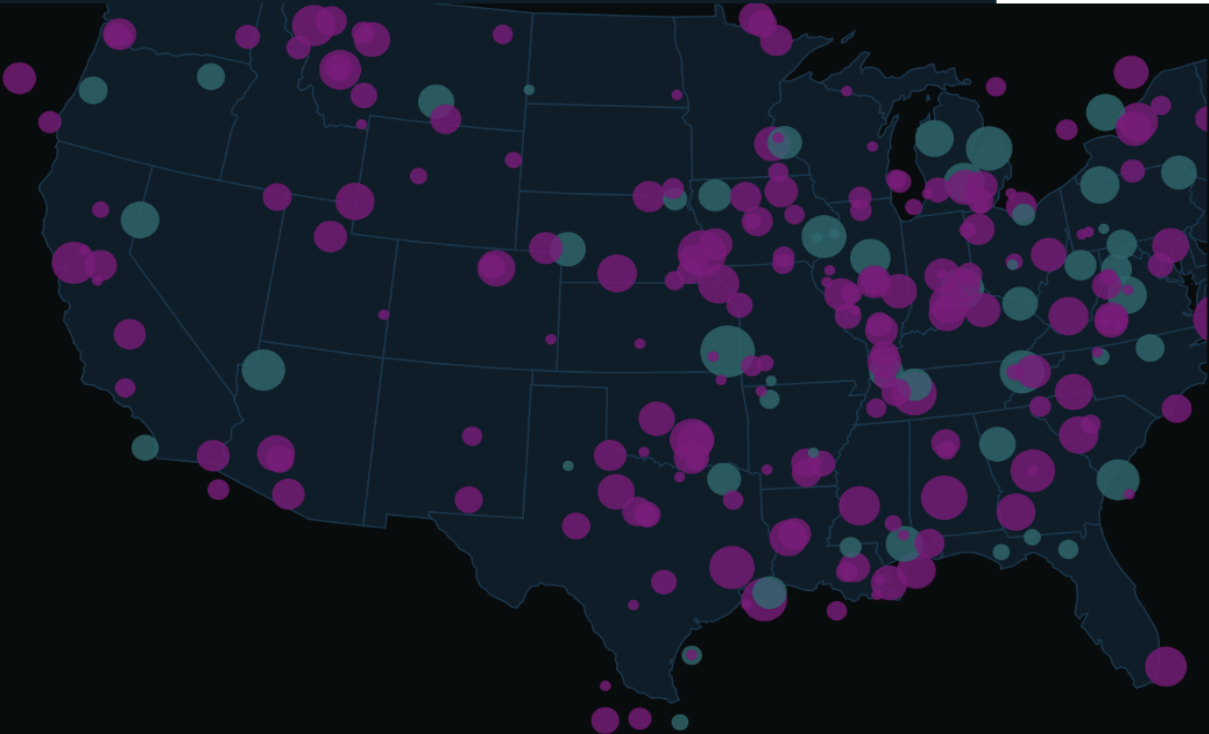
- Fewer disputes & faster settlement
- Reduction in dispute resolution time: 40+ days to under 10 days
- Improved capital efficiency; freer flow of capital



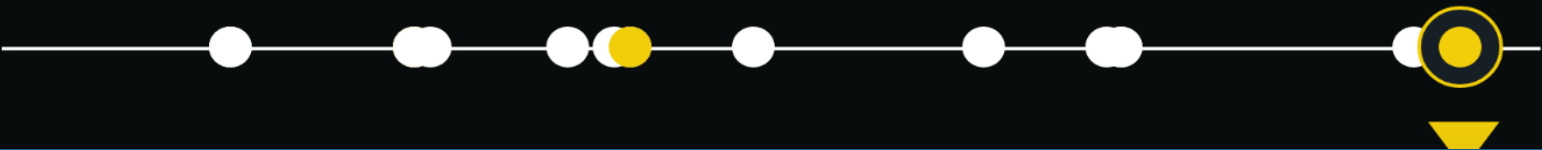
IGF world-wide statistics			
4000+ Partners and Suppliers	2.9M Invoices / year	\$44B Financed / Year	
\$100M Capital tied up any time!	25,000 Disputes / year	\$31K Avg. disputed invoice value	44 days Avg. time to resolve a dispute

Partner 945

Number of Transactions							Total	Total \$
Supplier	Jul	Aug	Sep	Oct	Nov	Dec		
Supplier 307	1	1	1	1	1	1	89	55398448
Supplier 308			5	5			5	60600
Supplier 3574	1	1	1	1	1	1	103	7136289
Supplier 389		2					2	62000
Supplier 2201	1	1	1	1	1	1	66	19023152
Supplier 2849	2		1				2	455328



There were 17 transactions between **Partner 945** and **Supplier 3574** in August 2015

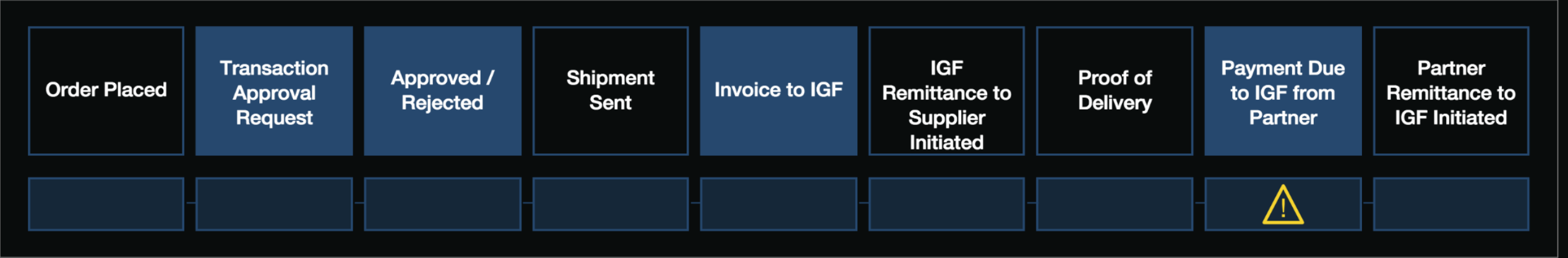




Information Available in the Current System



No Information Available in the Current System



Partner 945
Business Partner

Dispute: Proof of Delivery / Not Received

Dispute ID:	279283
Invoice / Loan:	11679040
Amount:	\$ 1088.36

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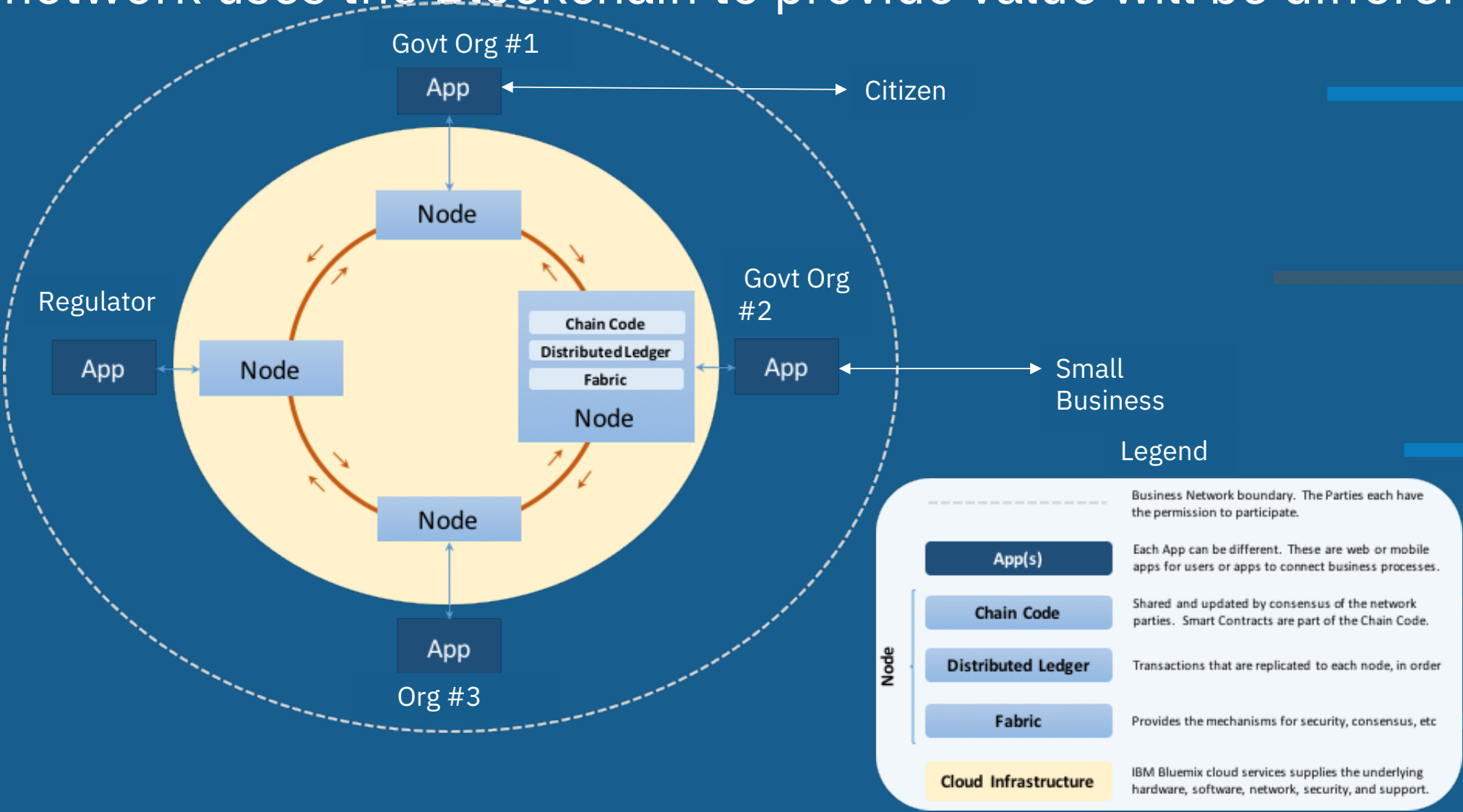
Shadow Chain

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- Example: IGF Dispute Resolution

Providing Value to Extended Business Network Participants

- Connecting Citizens, Small Businesses, and other participants through one or more members of the business network
- Example: Digital Trade Chain Consortium

While Blockchain components are shared, how each member of the network uses the Blockchain to provide value will be different



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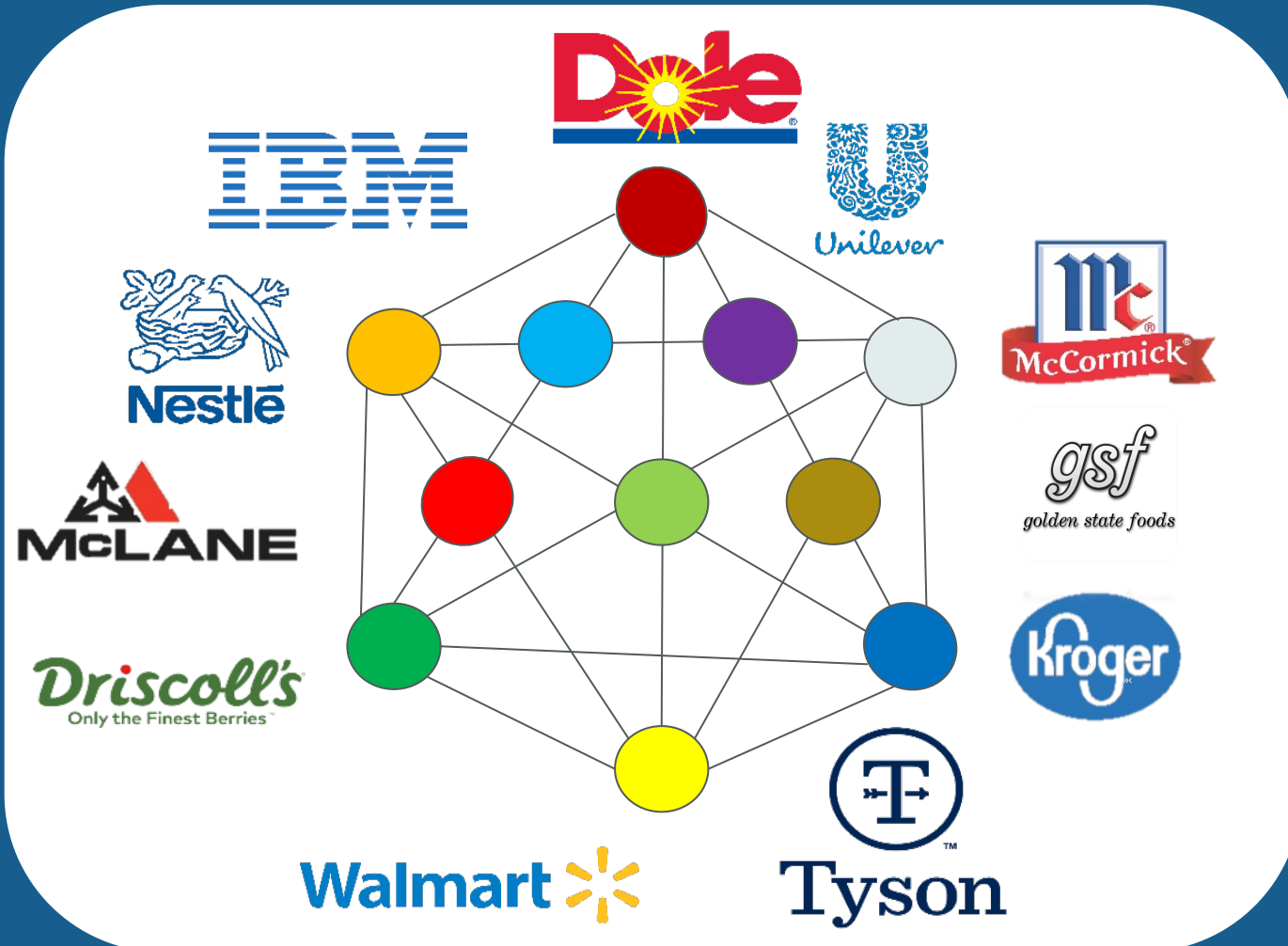
Extending the Business Network

- Start with a tactical blockchain project, grow/leverage in a larger blockchain network
- Example: Walmart/Global Food Safety Network

Walmart - provenance and authenticity

Problem Statement	Food incident disaster scenarios Losses associated with product waste in case of food incidents Inefficiency of existing systems to identify and track products in question quickly Consumers demand for transparency about product quality and origin Food safety mandates
Solution Overview	First Trials: Pork in China; Mangos from South America Expanded Scope: Based on success of the pilot program is a success, then Walmart will consider expanding trials to include more foodstuffs Expanding footprint of Walmart partners who now want to be part of this program
Benefits	Ensure consumer confidence by tracking and identifying where products came from faster in case of food incidents Transparency about food quality and origins Substantial improvement over earlier projects that solely used barcodes and radio ID tags through a shared forum among various companies Fraud and inaccuracies reduced or eliminated

Now see how Walmart extended a tactical blockchain into a broader business network with the IBM Blockchain Platform



Develop

Explore and accelerate development leveraging Hyperledger technologies with cloud sandbox and inter-active playground

Govern

Create and govern blockchain consortium for democratic, multi-party management and tooling

Operate

Deploy and operate always-on networks with enterprise and production-ready performance and security

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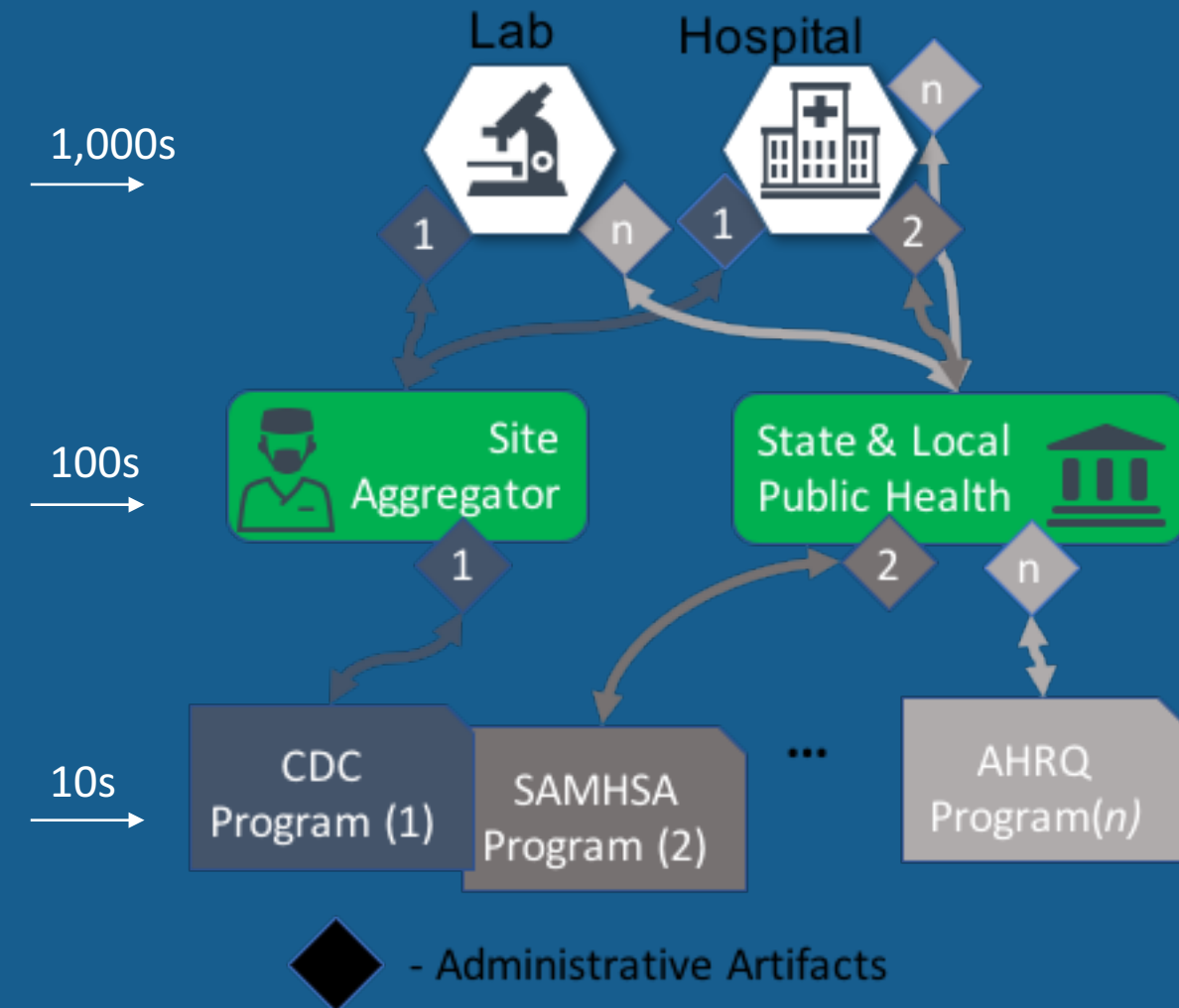
Other Government Focus Areas

Use Case:

Blockchain for Data Usage Agreements



Data Use Agreements - Business Process Challenges



- Lack of standardized processes creates problems around visibility, workflow, community status, etc.
- Incomplete and inaccurate Master Facility Tables complicates managing programs at the national level
- Change request process is slow and lacks visibility with several months of delay typically written into the DUAs
- As new surveillance tools are created; the networks of sites have to update the DUAs
- Any changes (e.g. site name changes) require a DUA addendum

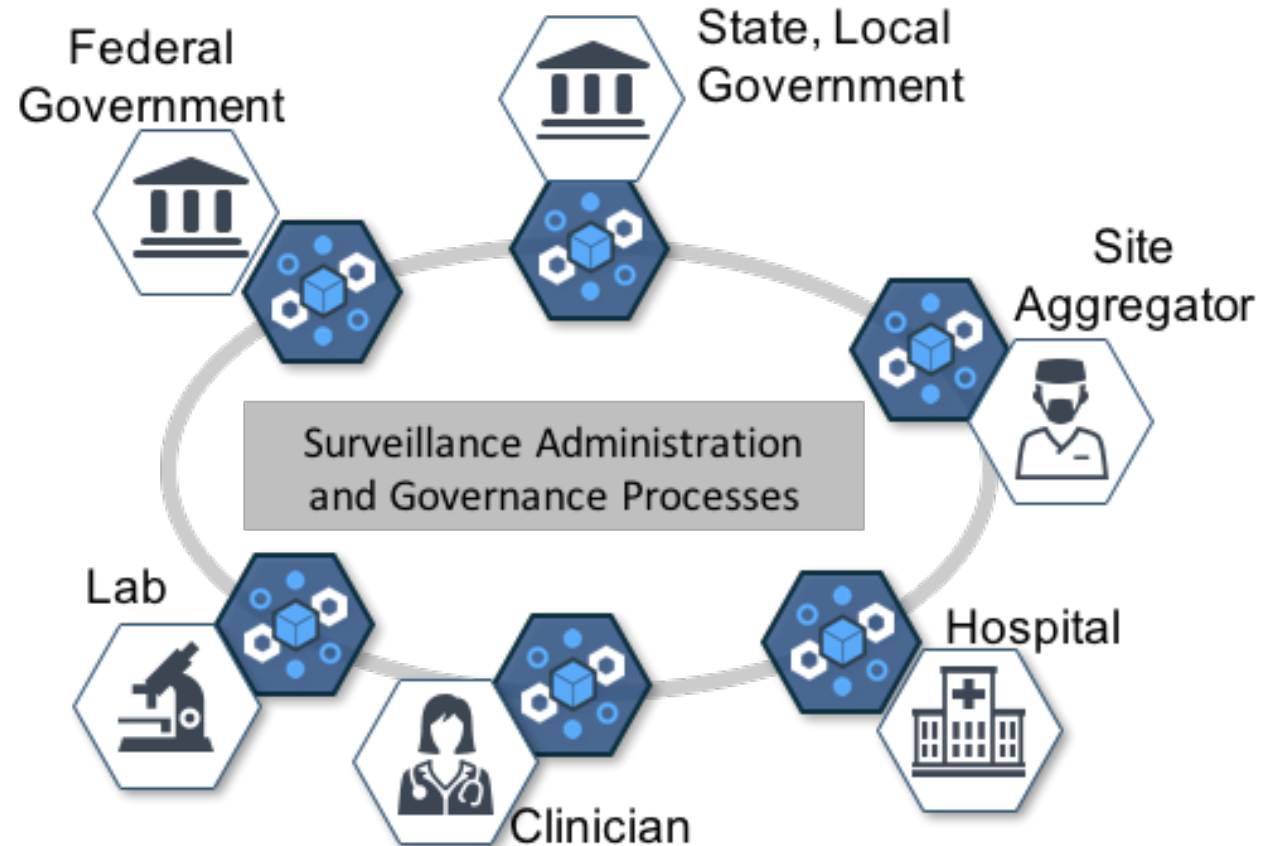
Business Goals and Future Plans:

- Decrease the time and effort for the administration of DUAs between different level agencies
- Enable better data sharing practices and record-keeping among different members of the business network
- Create a cross-agency micro-service that will simplify provider and lab program participation efforts

General Cases Applied:

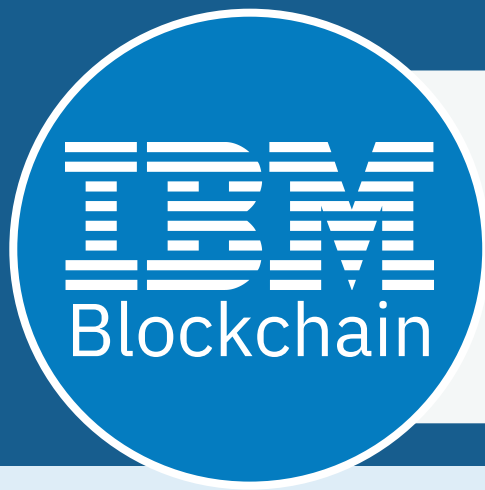
- Smart Contracts
- Immutability
- Data Sharing

Blockchain Business Network Map



CDC Case Summary:

Blockchain is used in this case to provide a streamlined way for members of the business network to request data from other members through data use agreements (DUAs). For example if the CDC, a federal organization, needs to get state or local level data they can use a smart contract to set up the request and pull data from any relevant member of the blockchain. Because these transactions happen on the blockchain, there is also an immutable record of the organizations that have accessed any given data set. This record can then be used as a template for future DUA queries to the same data source for different projects.



Takeaway:

Blockchain will turn the DUA process into a Smart Contract, facilitating data sharing and creating an immutable record that can be deployed across multiple projects, reducing transaction time.

Customer Challenges:

1. Complexity and burden of Data Usage Agreement (DUA) administration
2. Need to get the correct data to the appropriate level: there are departments at federal, state, and local levels
3. Each government program engages independently with data source organizations like providers and labs

Blockchain Capability and relation to challenge:

1. Using the capability to store data off-chain, blockchain can reference data without having to store medical information on-chain
2. By implementing DUAs as smart contracts, the business network can reduce time and effort to establish DUAs
3. Because a smart contract can serve as a template, DUAs can be deployed and re-used across multiple projects

Pain Points by Business Network Member

1. CDC Division of Health and Information Services (DHIS) – rely on sites to corral facilities, get contributors, and to participate in data sharing
2. Specific Surveillance Program –administrative burden, inconsistent/dirty data, efficiency, budget, staffing
3. State and Local Agencies –covering a large population, decentralized data/larger IT footprint at individual sites
4. Facility (hospital or physician) –varied, have different electronic health record (EHR) vendors
5. Individuals –consent and data usage

Data Use Agreements - Why Blockchain?

- Constitutionally, governance for Public Health is at the state level, with many states delegating to counties. There are many 3rd party intermediaries involved.
- There is currently a lack of trust across many of the organizations due to compliance requirements, intellectual property protection, data loss liability, IT security access protection, and the burden of interference in operations
- Data Use Agreements (DUA) are contracts that are fundamental to sharing health data according to HIPAA standards
- Hospitals must document claims for EHR incentive payments, which require secure and accurate documented public health use cases
- The onboarding process for Data Use Agreements currently is a manual process through emails and service desks which could be partially automated through the use of smart contracts
- With the need for a DUA from each site; there is a scaling requirement and need for consistent, streamline processes

What makes for a great Blockchain use case?

Provenance

Enable any asset to be secured to a Blockchain ledger, physical or virtual.

Immutability

Once data has been written no one, not even a system administrator, can change it.

Finality

Once an operation is completed, that operation is completed for good.

Controlled Access & Transformation

Smart agreements on how to use the data embedded in transaction database & executed with transactions.

Consensus

All parties agree to network verified transactions.

Private & permissioned

Ensure appropriate visibility; transactions are secure, authenticated & verifiable.

Results

- Removing Friction
- Getting rid of the “middle man”
- Leveraging an Existing Business Network but not a Closed Network
- Valuing Transparency and History of a Shared Ledger to all participants
- Adding the Citizen/Customer to the value chain

