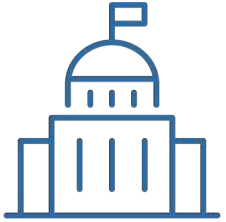


# Where are Government Agencies Sponsoring Blockchain Initiatives?



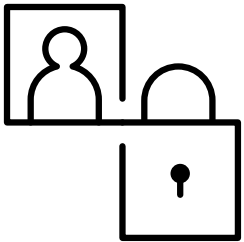
Mark Fisk  
Partner IBM Digital  
Blockchain Leader  
IBM Public Service  
fiskm@us.ibm.com  
@fiskm2000

# 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**.

# Production Blockchain Examples are Driving Key Design Patterns in Government Blockchain Discussions

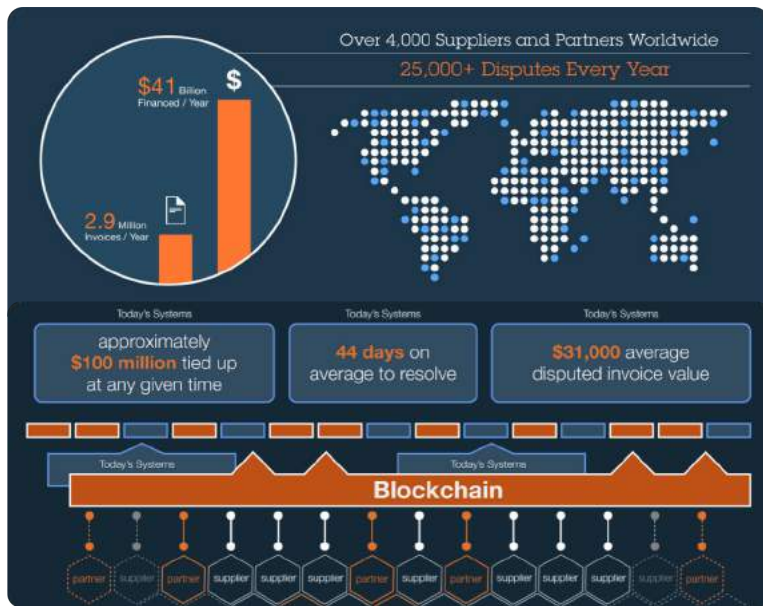
Providing Value to Extended Business Network Participants:

we.trade



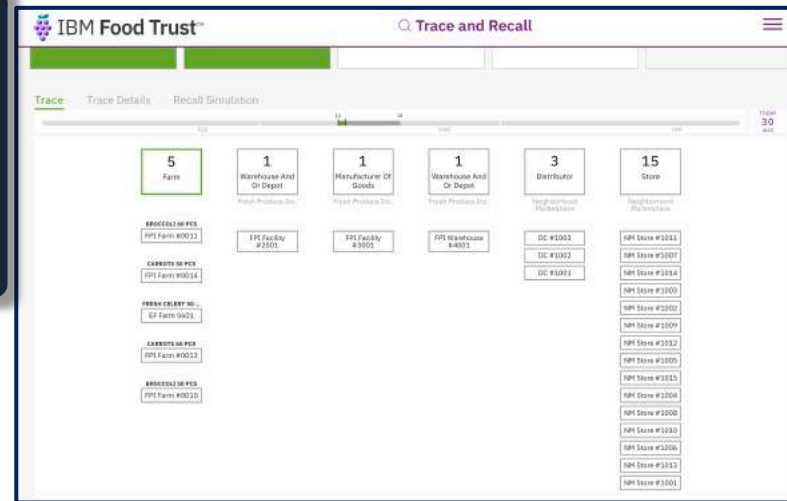
Creating a Shadow Chain to Tie into Legacy Systems:

IBM Global Finance



Digitizing the Global Supply Chain:

TradeLens



Extending the Business Network:  
Global Food Trade

# Where can Government Leverage Blockchain Capabilities?

## Ledger

- Dispute Resolution and Visibility

## Supply Chain / Asset Management

- Provenance

## IoT Configuration

- Security and Transparency

## Data Sharing / Governance

- Blockchain-based Access Control and Auditing

## Registries

- Digital Transformation/Digitization and Smart Contracts

## Additive Manufacturing

- Provenance and Visibility (including 3-D printing of Digital Assets)

## Identity

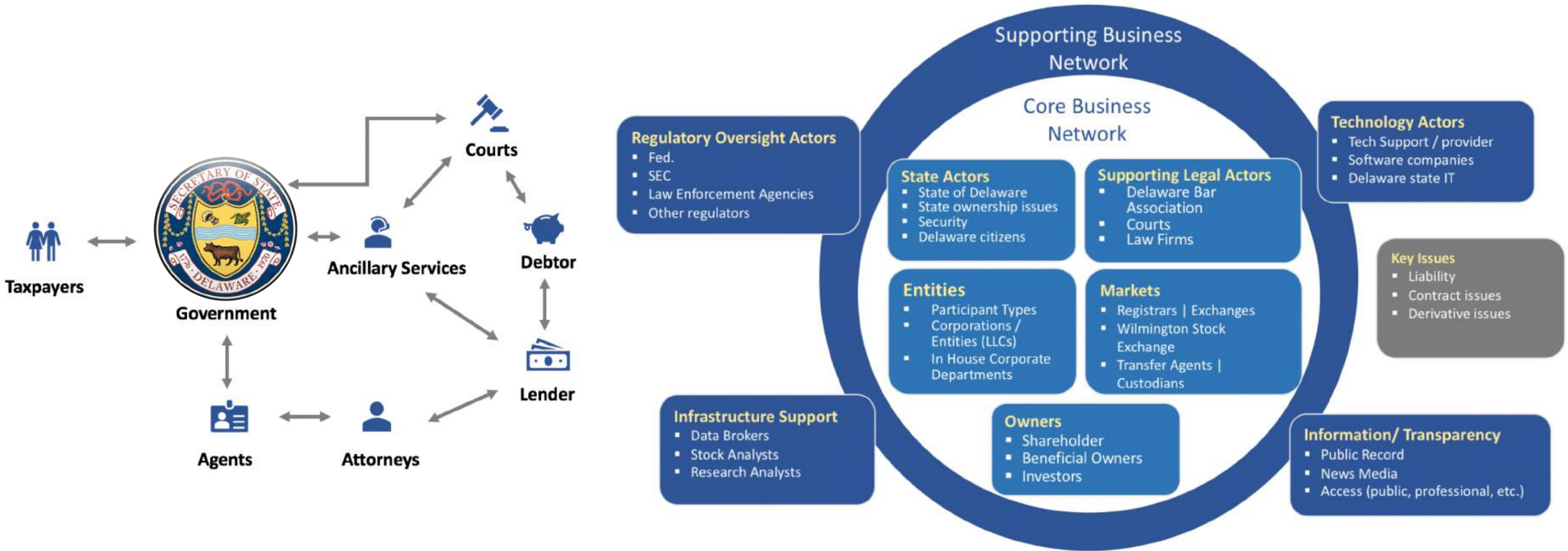
- Adding the value of blockchain to the Service Member

## “And Blockchain”

- Cognitive and Analytics to drive value for Business Network members



# Designing a Blockchain Solution for Delaware's Business Network





# UCC Filings and Stock Ledger - Paths to Production

- Facilitate a Design Thinking session & construct an initial proof of concept (POC) environment with limited functionality

## Month 2-3: Full Proof of Concept

- Implement a production Blockchain on top of existing processes to mitigate process changes / risk, while gradually scaling up the number of entities participating

## Month 4-11: Production Pilot

## Month 12-18: Production Process Transformation

Ongoing  
functionality  
updates

## Month 1: Initial Proof of Concept

- Construct a full POC, building on the initial work completed, which addresses specific UCC pain points
- Build UCC Roadmap

- Include UCC filing on the Blockchain as an alternative to traditional electronic or paper filing
- Introduce UCC process changes to further increase efficiency

# 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

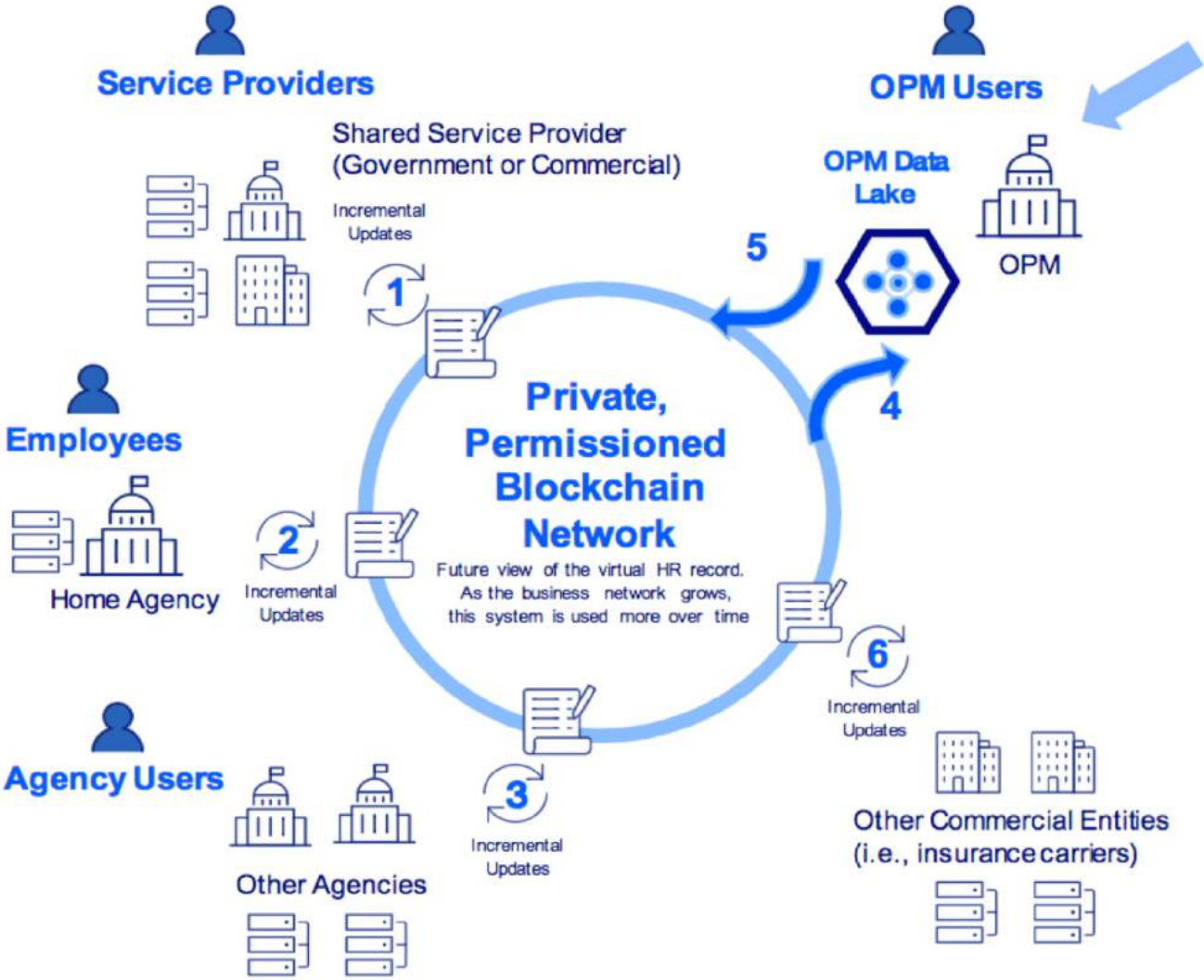
## How

- Each participant agrees to capture the access and storage of EHR data on the blockchain via smart contracts
- 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

## Benefits

1. Easier to manage consent and share data
2. Improved data governance
3. Mitigate risk
4. More data, more frequently
5. Improved healthcare
6. Improved public health

# Case Study: OPM Federal Employee HR Data Landscape with Blockchain





# Employee Transfer – the Value of Blockchain to a Distributed Business Process

- Changes, Updates, and Historical Data
- Corrections and Errors
- Validation of Changes
- Access
- Forms

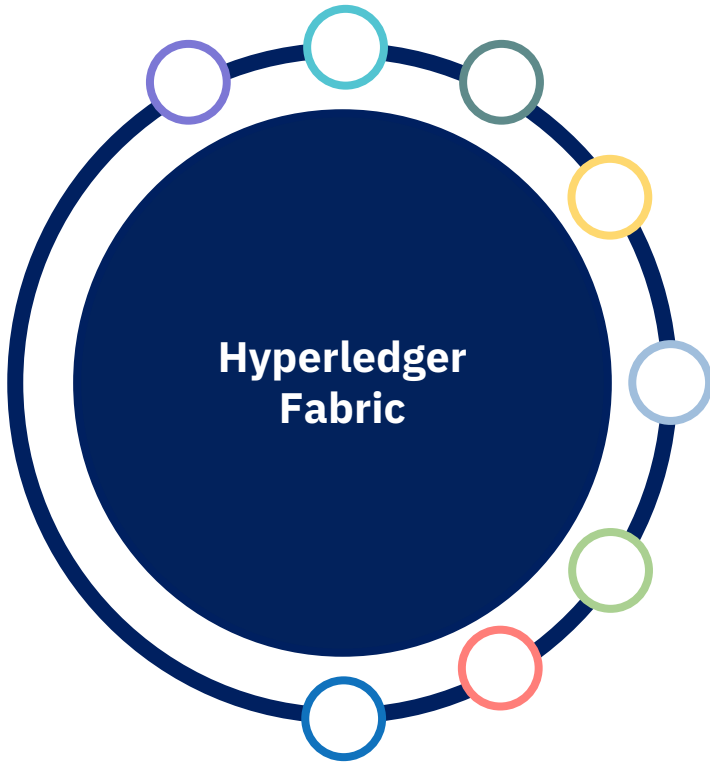
The top screenshot displays the 'Person' profile for Sofia Castillo Longworth. It includes a profile picture, a confirmation message 'The blockchain has validated the edr data is safe to use.', and a 'Transfer Complete' banner. The profile details are as follows:

Field	Value
Name	Sofia Castillo Longworth
SSN	XXX-XX-5555
Gender	Female
Date of birth	06/21/1974
Citizenship	U.S. Citizen
Current address	5901 N Cherokee Avenue, Tampa FL 33604
Email	Sofia.Longworth@HHS.gov
Phone	813-555-1889
Birth location	

The bottom screenshot displays the 'Position' profile for the same employee. It includes a confirmation message and a 'Transfer Complete' banner. The profile details are as follows:

Field	Value
Official title	Physician (Orthopedic Surgery)
Physician (Orthopedic Surgery)	VA 03/06/2018
Physician (Orthopedic Surgery)	VA 09/05/2010
General Medical Officer- AOC 62B	DOD 06/28/2006
Orthopedic Surgeon (Resident)	DOD 07/06/2000
Agency organization name	HHS
Assigned Department	Indian Health Service
Occupational series	0602
Organization location duty station code	673
Employee location duty station code	673
Agency code	VATA
Work schedule code	F
Position service designator	1
Personnel office id	4922
On-file in this office	

# Hyperledger Fabric is the Blockchain for Business



## Smart Contracts

Business terms embedded in transaction database & executed with transactions



## Shared Ledger

Append-only distributed system of record shared across business network



## Consensus

All parties agree to network verified transactions that are committed when validated by endorsing nodes



## Audit

Immutable, query-able ledger with user and timestamped updates makes auditing instant and trusted



## Privacy

Ensuring appropriate visibility; transactions are secure, authenticated & verifiable



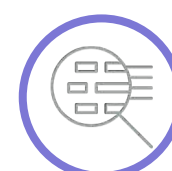
## Channels

Allowing participants to share and view only what is pertinent to their transactions



## Access Controls

Built-in access controls determine how blockchain participants audit, update, and interact with the ledger



## Private Data Collections

A way to keep certain data and transactions confidential among a subset of channel members.

# Useful Links

- Hyperledger Composer Playground - <https://composer-playground.mybluemix.net/login>
- Walmart + IBM Food Trust – <https://www.youtube.com/watch?v=QWijlTDHLMQ&feature=youtu.be>
- TradeLens Announcement - <https://www.marketwatch.com/press-release/maersk-and-ibm-introduce-tradelens-blockchain-shipping-solution-2018-08-09>
- Blockchain Applications Overview - <https://www.comptia.org/resources/harnessing-the-blockchain-revolution-comptia-s-practical-guide-for-the-public-sector>
- Delaware Project Introduction - <https://www.computerworld.com/article/3289484/blockchain/delaware-to-test-blockchain-based-business-filing-system.html>
- Food Safety Introduction - <https://www.youtube.com/watch?v=SV0KXBxSoio&app=desktop>
- Maersk Blockchain Supply Chain Use Case Introduction - <https://www.youtube.com/watch?v=dcddYatMCGQ&app=desktop>
- IGF Dispute Resolution Use Case Introduction - <https://www.youtube.com/watch?v=0DSNdLDOZ5w&index=3>
- IBM Blockchain video - <https://www.youtube.com/watch?v=2O2CLoCxAWA>
- ACT-IAC Whitepaper on Blockchain - <https://www.actiac.org/act-iac-white-paper-enabling-blockchain-innovation-us-federal-government>

# Thank You

