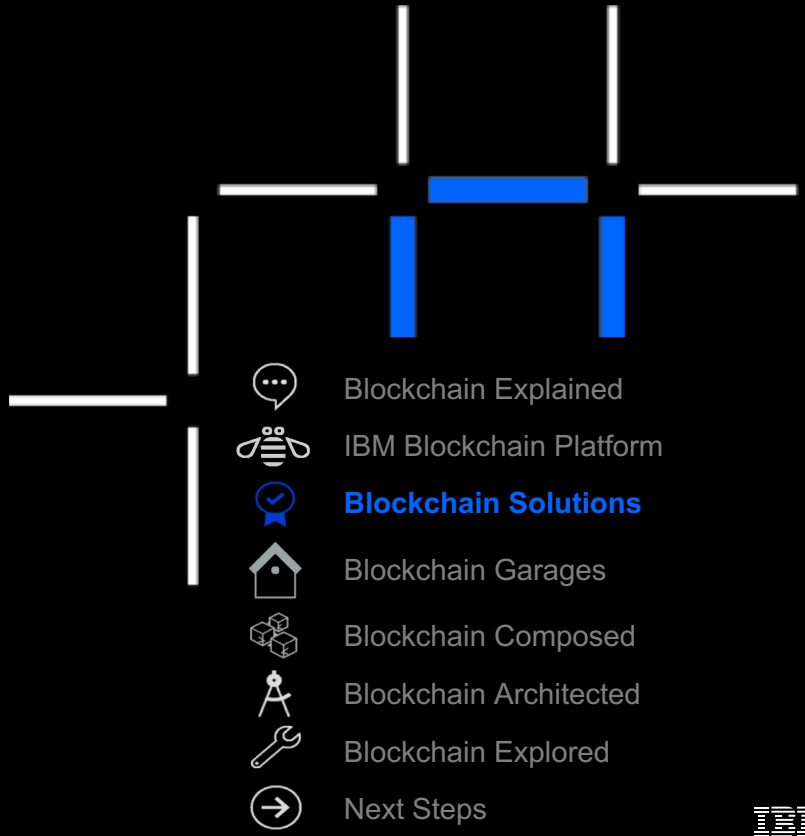
Blockchain Solutions

Use-Cases, References and How IBM Can Help



What makes a good blockchain solution?

Examples of good blockchain solutions

How can IBM help?

Good blockchain use-case or bad?

Dispute resolution

Holiday Tracking Tool

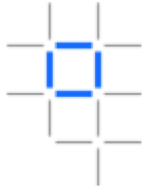
Know Your Customer

Food Provenance

Track Your Child

Electronic Medical Records

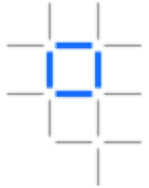
What makes a good blockchain use case?



– Identifying a good blockchain use-case is not always easy!
  – However there should always be:

1. A **business problem** to be solved
   - That cannot be more efficiently solved with other technologies
2. An identifiable **business network**
   - With Participants, Assets and Transactions
3. A need for **trust**
   - Consensus, Immutability, Finality or Provenance

What makes a good first blockchain use case?



– First use-cases are even more difficult to identify!

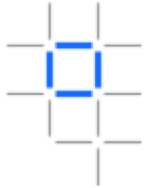
1. A **limited scope**, but still solves a real business problem
   - Minimum Viable Product in a few weeks of effort

2. A smaller **business network**
   - Usually without requiring regulators and consortia

3. Allows for **scaling with more participants and scenarios**
   - Consider shadow chains to mitigate risks

Start small, succeed and grow fast!

Ten questions to ask for the selected use case:



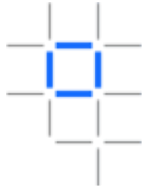
Understanding the business problem

1. What is the **specific business problem** / challenge that the first project will address?
   - Scope the business challenge up front

2. What is the **current way** of solving this business problem?
   - Understand current systems and areas for improvement

3. Assuming the business problem is large, **what specific aspects** of this business problem will be addressed?

Ten questions to ask for the selected use case:

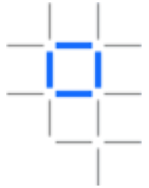


Understanding the participants

4. Who are the business network **participants** (organizations) involved and what are their roles?
   - If there is no business network involved, then this is not a good use case

5. Who are the **specific people** within the organization and what are their job roles?
   - Understand the key users in a business network.

Ten questions to ask for the selected use case:

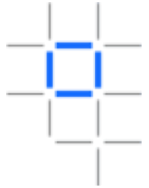


Understanding the assets and transactions

6. What **assets** are involved and what is the key information associated with the assets?

7. What are the **transactions** involved, between whom, and what assets are associated with transactions?
   - Understand under what business or contractual conditions assets are under as they transfer from one owner to another.

Ten questions to ask for the selected use case:



Additional points of understanding

8. What are the main steps in the **current workflow** and how are these executed by the business network participants?

9. What is the expected **benefit of applying blockchain** technology to the business problem for each of the network participants?

10. What **legacy systems** are involved? What degree of integration with the legacy systems is needed?

It is important to ideate potential use-cases

Day 1

[A] Use Case	
Blockchain Recap	30
Use Case Selection	30
Blockchain Fit	20
Business Network	15

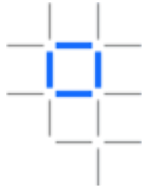
[B] User	
Design Thinking	30
Empathy Mapping	45
As-is Experience	45
Explore Possibilities	30
Focus Outcomes	15

Day 2

[C] Hills	
Formulating Hills	60
Playback Hills	15
Refine Hills & Check Fit	35
Prioritize Hills	15

[D] Going Agile	
Storyboarding	45
First Project Method	30
Sprint Zero	20
Non-functional Details	15
Action Plan	20

Assessing Business Value



- It can be difficult to accurately quantify investment case for blockchain

- Things to consider:
  - Existing Pain Points
  - Scope – participants, assets, transactions
  - Benefits: baseline, minimum viable ecosystem (MVE) & mature network
  - Blockchain Design Points
  - References

Blockchain Value Design (BVD) activity will help elaborate these items!

Template – example only (Cross Border Supply Chain)

Problem	90% of goods in global trade are carried by the ocean shipping industry each year. Costs associated with trade documentation processing and administration are estimated to be up to 20% the actual physical transportation costs.
Solution	Manage and track the paper trail of tens of millions of shipping containers across the world by digitizing the supply chain process
Participants	Supplier, couriers (*2), customs (*2) , ports (*2), shipper and retailer ….
Asset & Trust	Need for trust around paperwork associated with a container
Transactions	Supplier prepares to ship, release container to courier, load to ship, clear customs, retailer receipt

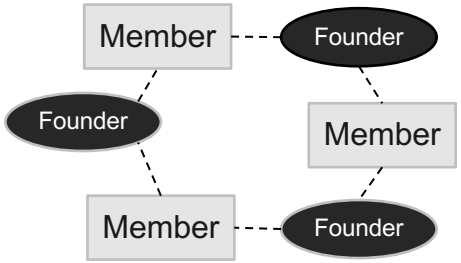
Pain Points

- Transport remains highly dependant on a flood of paper that is never digitised
- Shipping information must pass through many hands, increasing potential for delays in transport.
- One shipment can require sign-off from 30 unique organizations and up to 200 communications.
- One lost form or late approval could leave the container stuck in port
- The entire process can take more than one month..
- Fraudulent changes may be made to the Bill of Lading

Benefits benchmarks - Value Tree KPI's (e.g.)		Baseline	Phase 1	Phase 2-3	Blockchain : Design Points	References
New revenue	# new value propositions	-	-	1 to 3	• Find new value propositions to exploit the network effect between members	
Improve client experience	Increase in customer satisfaction	-	5%	10%	• Securely and transparently trace the container's path through the supply chain on the blockchain • Add trust (Immutability and Provenance) around the Bill of Lading and other container paperwork • Automate the transit and shipping process with Smart Contracts reducing cycle times and delays • No reconciliation or matching of documentation with near instant updates - eliminates the need for audit and verification • Removes paper and intermediaries	ANO -1 ANO -2
	Increase in trade volumes	-	+5%	+15%		
	Cycle times (transit & shipping)	30 days	25 days	10 days		
Reduce transport costs	Waste as % of total shipped	6%	5%	1%		
	Fraud and errors as % of total costs	5%	4%	0.5%		
	Documentation admin. as % of total costs	20%	15%	5%		

Building Communities in Blockchain Networks

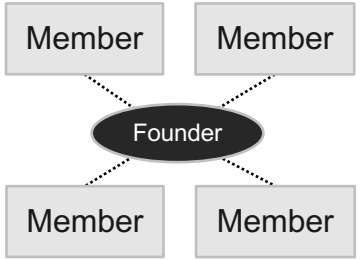
Consortium Based Network



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

Examples: JPX, we.trade

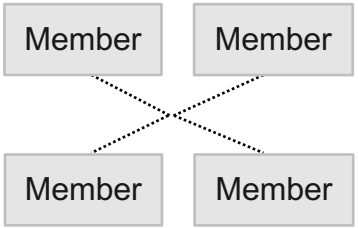
Founder Directed Network



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

What makes a good blockchain solution?

Examples of good blockchain solutions

How can IBM help?

we.trade
more trust. more trade.

Trade Finance

What?

- 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, Santander, UniCredit and Nordea**
- Enables accurate trading posture information, order to settlement control, risk coverage, track and trace options

Benefits

- 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

Accelerating Global Payments

What?

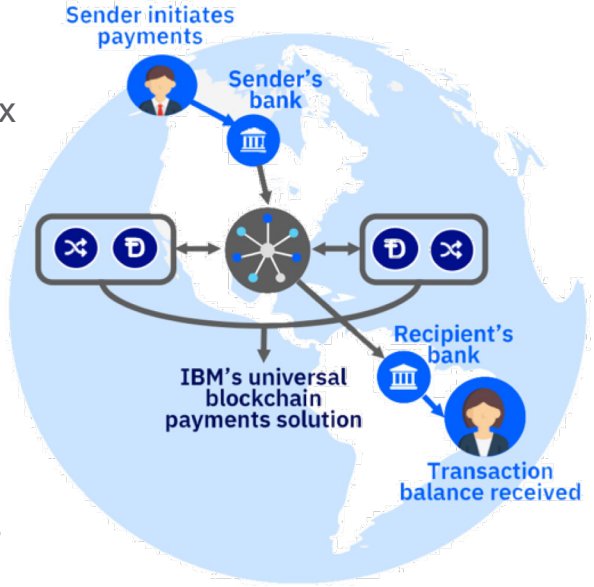
- A universal rail for real-time clearing and settlement on an integrated Blockchain network

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
- Aim: near real-time international payments



ABN·AMRO Financial Audit and Compliance Ledger

What?

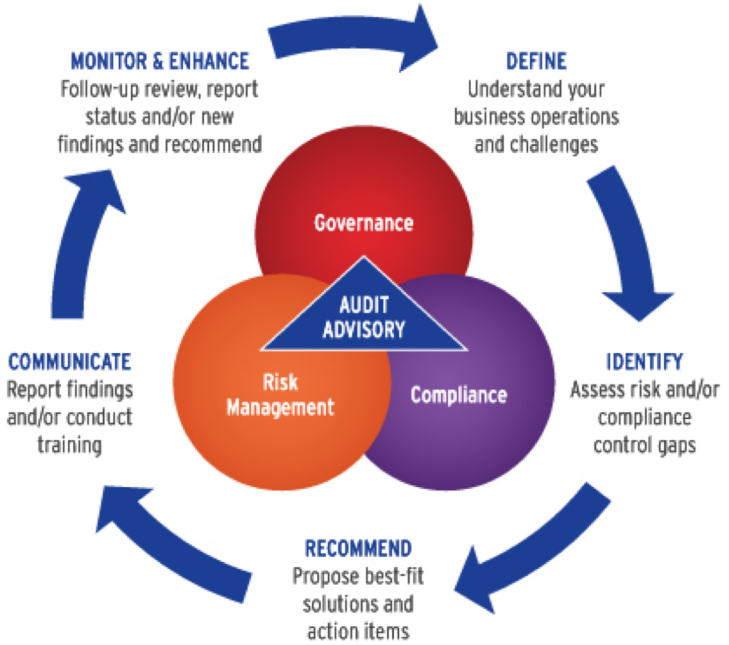
- Reimagine current expensive audit process requiring integrating data – often inconsistent and outdated - from various sources on the blockchain

How?

- Shared replicated ledger serves as single point of truth
- Auditors are guaranteed that no one has tampered the data via immutability of blockchain

Benefits

- Clients, bank and regulators all see single version of truth
- No data inconsistencies => clear audit trail
- Enables efficient lower-cost Asset Quality Reviews (AQR)



Global Financing: Dispute Resolution

What?

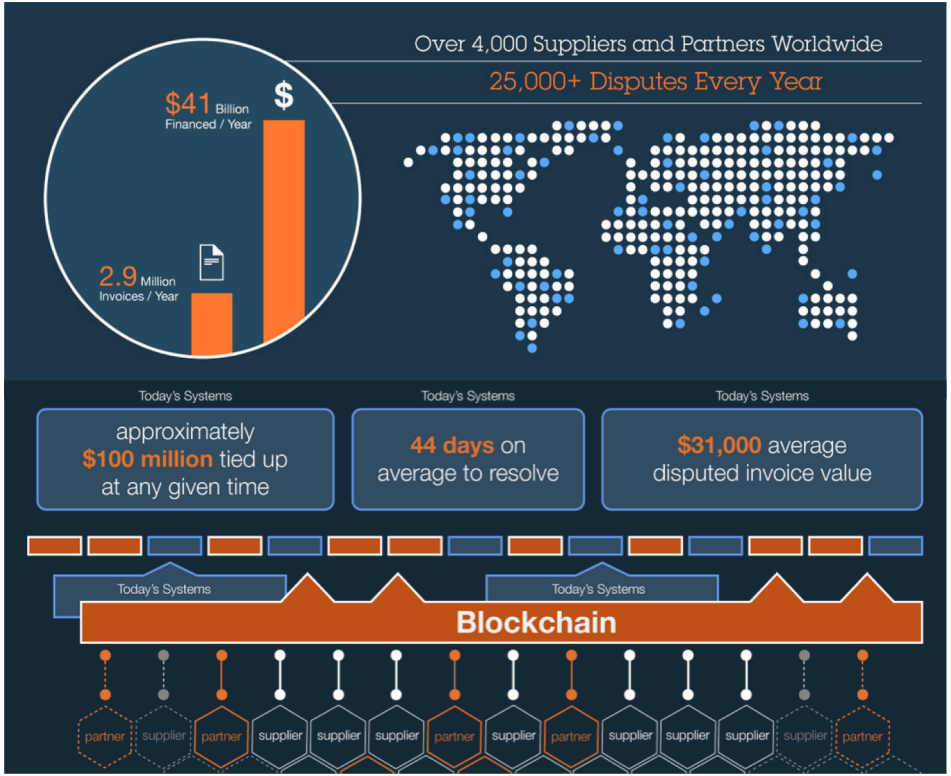
- IBM Global Finance provides a $41bn channel financing per year. There are a number of disputes that take time to resolve and can lock up transactions costing time and money

How?

- Blockchain provides visibility and provenance end-to-end across supply chain

Benefits

- Reduced dispute resolution time by 75%
- Released working capital from $100m
- Combine IGF and Supplier info to further expand benefits further
- In production since Sept 2016



Private Equity Administration

What?

- Infrastructure supporting private equity has seen little innovation in recent years at a time when investors are seeking greater transparency, security and efficiency.

How?

- Creation of an innovative private equity ecosystem designed to deliver increased efficiency, security and transparency.

Benefits

- Provides real-time insight and transparency to all parties, including the fund managers and investors.
- Designed to allow regulatory access as required.
- Support compliance of local regulations.
- In production

Common KYC Data

What?

- View of customer identity to enable compliance with Know Your Customer (KYC)

How?

- A complete view of customers' documents across a distributed network

Benefits

- Creation of a single but cross-businesses KYC platform to inform all of the banks processes.
- Crédit Mutuel Arkéa could enable its customers to deliver proof of their identity to third-parties such as local utilities, retailers or regulated service providers.

BlueAudit – Intercompany Supply Chain Optimization

What?

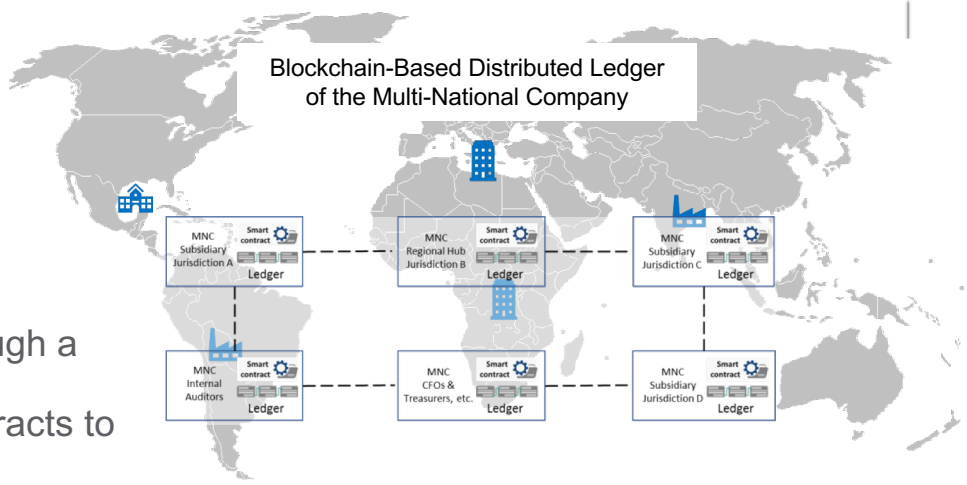
- Transactions over the intercompany supply chain are subject to compliance and audit on finance, accounting, transfer pricing, capital control, etc., in each Jurisdiction.

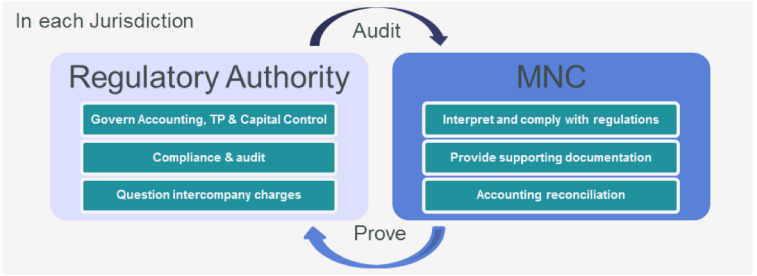
How?

- 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.





Legitimize Diamonds and Reduce Fraud

What?

- Track diamonds across supply chain from mine to retail

How?

- Shared ledger for storing digital certification with supporting material

Benefits

- Protect against the occurrence of fraud, theft, trafficking and black markets
- Assist in the identification and reduction of synthetic stones being labelled as authentic
- Increase speed of transparency for cross border transactions for insurance companies, banks and claimants

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

sonnen

vandebron

Food Trust

What?

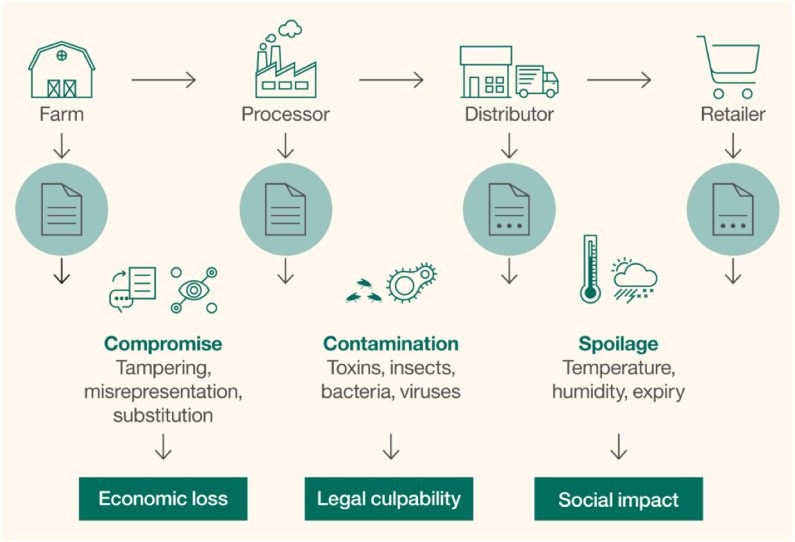
- Provide a trusted source of information and traceability to improve transparency and efficiency across the food network.

How?

- Shared ledger for storing digital compliance documentation, test results and audit certificates network.

Benefits

- Reduce impact of food recalls through instant access to end-to-end traceability data to verify history in the food network and supply chain.
- Help to address the 1 in 10 people sickened and 400,000 fatalities WW which occur every year from food-born illnesses.



Global Digitized Trade

What?

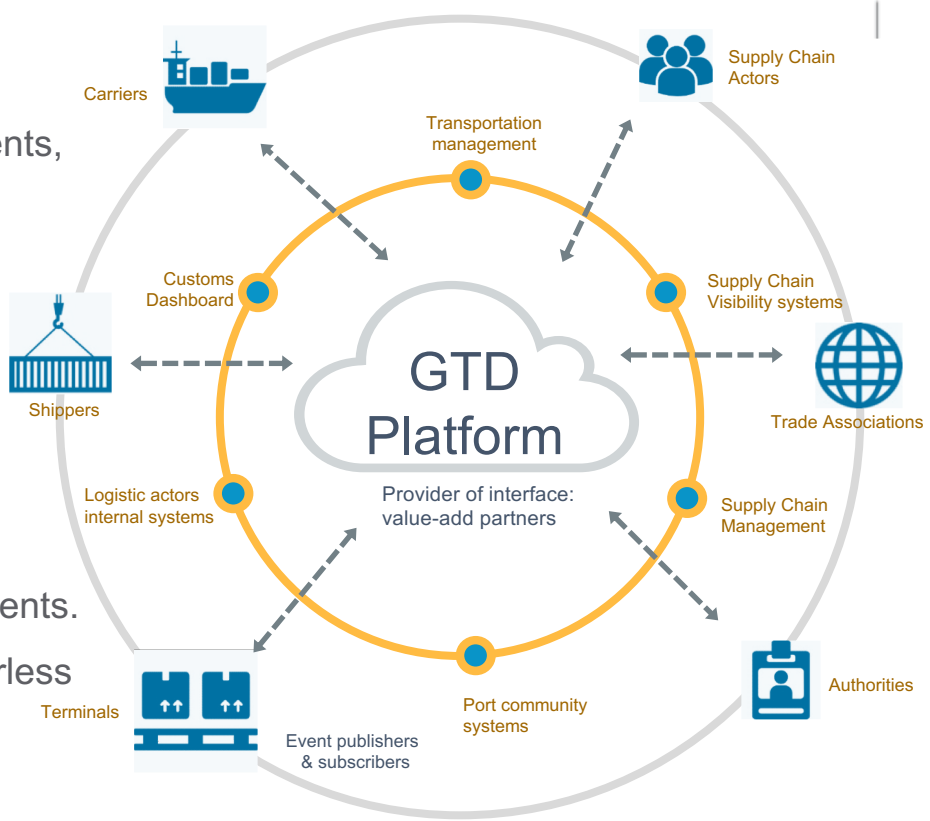
- An open, extensible platform for sharing shipping events, messages, and documents across all the actors and systems in the supply chain ecosystem.

How?

- Providing Shared Visibility and Shared State for Container Shipments

Benefits

- Increase speed and transparency for cross border transactions through real time access to container events.
- Reduced cost and increased efficiency through paperless trade



Trusted Identity

What?

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

How?

- 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

Benefits

- 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: Reference Data Chain of Custody & Consent for EHR

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
- 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

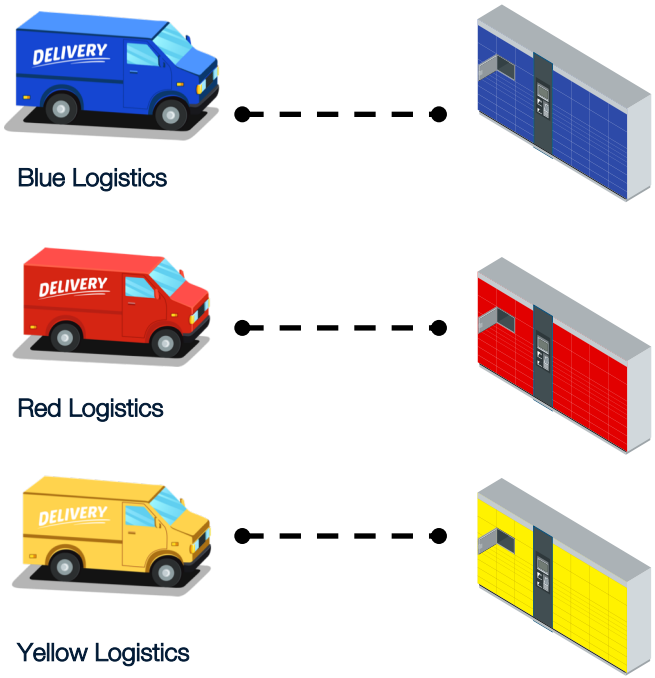
Fresh Turf

Last-mile fulfillment in Retail Logistics

Fresh Turf is a Singapore-based startup that is working with IBM to tackle the challenges with last-mile fulfilment in retail logistics.

To help solve this void in the market, Fresh Turf turned to the IBM Garage, immersing in a unique, user-centric approach with IBM Design Thinking to design which helped to rapidly identify and build the Minimum Viable Product to test their hypothesis.

"We chose IBM because they are a global leader in building blockchain on the cloud, with vast experience in blockchain projects around the world and across multiple industries. IBM Cloud is also the most convenient way to test a blockchain network on the cloud."
– Kevin Lim, co-founder, FreshTurf



IBM **Blockchain**

Learn and read more at:
https://www.youtube.com/watch?v=DgS8jBwSX3c
https://www.dealstreetasia.com/stories/ibm-partners-singapore-start-up-freshturf-to-use-ibm-cloud-and-blockchain-technologies-for-secure-storage-lockers-network-56215

AIG with Standard Chartered Bank

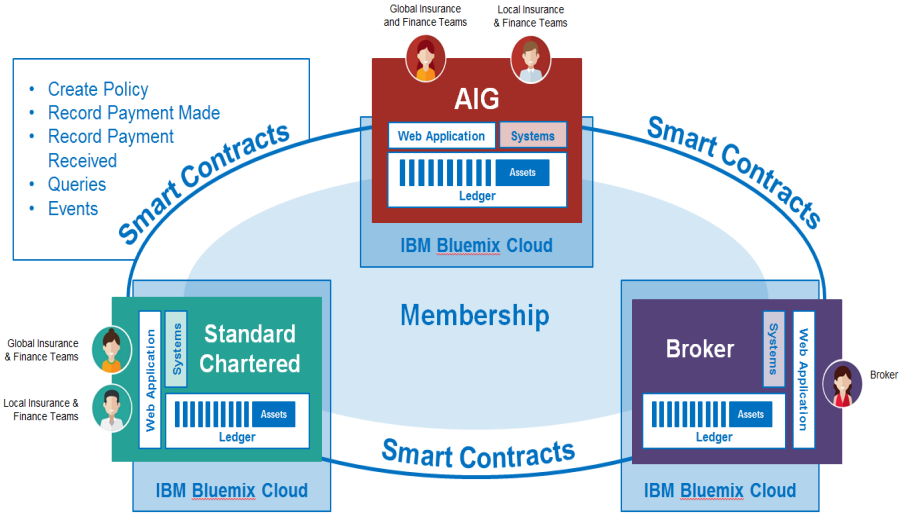
Multinational Blockchain Initiative

IBM created a Minimum Viable Business Network between AIG, Standard Chartered Bank, and Regulators to provide full transparency around the “Master” & “Local” Policies, their associated premiums & payments, and Policy Issuance

The project converted a controlled D&O master policy (UK), and three local underliers (Kenya, US, Singapore)

Engagement Details:
- 2-day Design Thinking Workshop in the London Garage
- Multiple key AIG stakeholders drove the implementation of the 8-week MVP in the Blockchain Garage along with GBS

Client Video:
https://www.youtube.com/watch?v=mgUK0cPoasw



IBM Cloud

Cloudant

IBM Blockchain Platform

Availability Monitoring

What makes a good blockchain solution?

Examples of good blockchain solutions

How can IBM help?

IBM Blockchain brings together the world's most advanced expertise, technology and ecosystem to transform industries

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

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

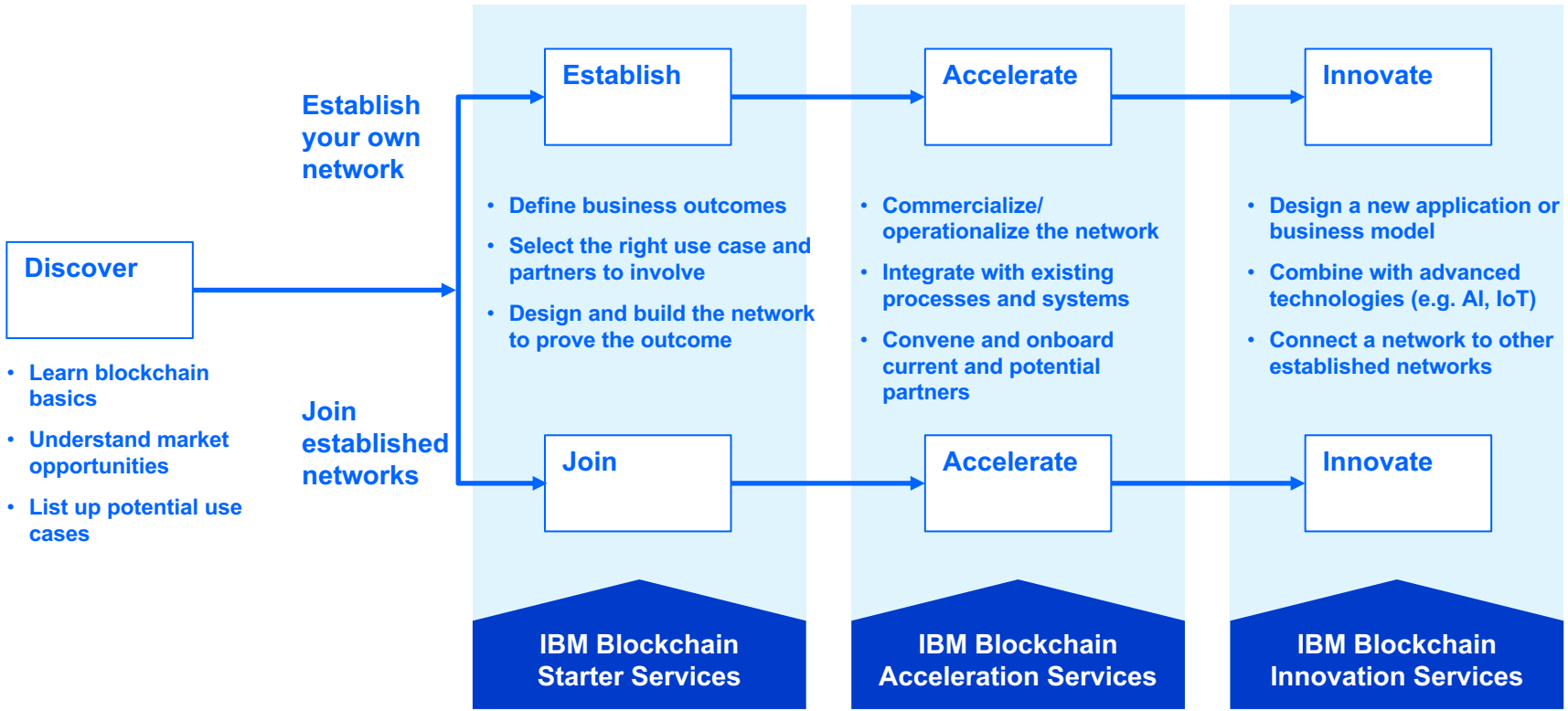
HYPERLEDGER
As a founding and premier member of Hyperledger, we're committed to open source, standards and governance

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

Introducing the IBM Blockchain Platform

- **IBM Blockchain Platform is a fully integrated enterprise-ready blockchain platform designed to accelerate the development, governance, and operation of a multi-institution business network**
  - Full lifecycle tooling to speed activation and management of your network
  - Specialized compute for security, performance and resilience
  - Delivered via the IBM Cloud on a global footprint with 24x7 Integrated Support
  - Based on Hyperledger Fabric V1 runtime and using Hyperledger Composer development tools

IBM Blockchain Services: Blockchain Network Journey



IBM Cloud Garage for Blockchain

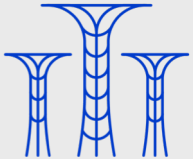
Dubai

London

Munich

New York

San Francisco



Singapore

Tokyo

Toronto

… Or we can bring a pop-up location to you!

Discovery Workshop

FREE

Design Thinking Workshop

$32,200 USD

Minimum Viable Product Buildup (MVP)

$200K+ USD

Architectural Consultation

$14,200 USD

IBM Institute for Business Value

Blockchain

Discover emerging trends, business innovations and success patterns

- Part of IBM Global Business Services
- Produces reports across topic areas and industry sectors
- Includes more than 13 reports dedicated to blockchain
- Global C-Suite study reports based on conversations with more than 12,000 CxOs in 2017
- To download the latest reports go to: http://www.ibm.com/iibv

Why Hyperledger Fabric?

Open Governance
Anyone can join or contribute

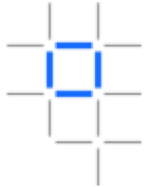
Built from the ground up for enterprise
With a maturity model to help companies move to production

Performance
Supports up to 1000 tps*

Confidentiality and privacy
Built-in channels for isolation and membership services for signing and encryption. Supports IBM Blockchain Platform.

Modularity and flexibility
Choice of consensus algorithms and programming languages

Why IBM?



Industry Expert

- Hundreds of experienced consultants, researchers and developers
- Deep systems integration and middleware experience

Secure by Design

- IBM Blockchain High Security Business Network
- Dedicated compute, cryptography hardware, tamper-resistant container.

Open By Design

- Linux Foundation Hyperledger founding member
- Ongoing donation of code, developers and intellectual property to Hyperledger

Fast Start

- 400+ clients in engagement pipeline in 2016
- IBM Blockchain Garage engagement model to implement MVP rapidly

Hyper Scale

- Choice of deployment including on-prem, off-prem, self-managed or *aaS
- Supports rapid expansion of initial solution.

IBM is investing heavily in Blockchain

"IBM is clearly regarded as having the strongest credentials in the blockchain sector, well ahead of competitor" – Juniper Research

Our People

24,000+
People enabled through IBM blockchain training

~6000
Practitioners trained at IBM

~3000
Consultants

~2500
Developers

700+
SME's in hiring pipeline

Our Experience

500+
Blockchain Engagements to learn from

35
IBM enabled active business networks

Reducing Your Risk

#1
Blockchain Expert (Juniper and HFS)

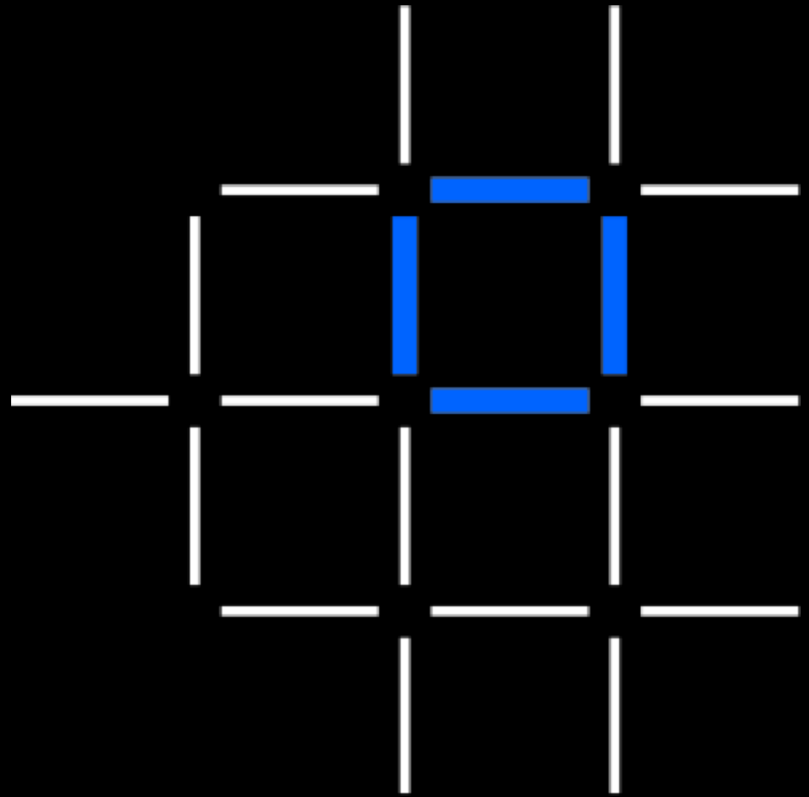
100+
Years of being a safe and reliable brand

3
Years supporting worlds largest networks e.g. LSE

9000+
Patents in 2017

27
Patents in 2017 for BC

Thank you



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