Blockchain - Use Cases, Litmus Test and Engagement Model

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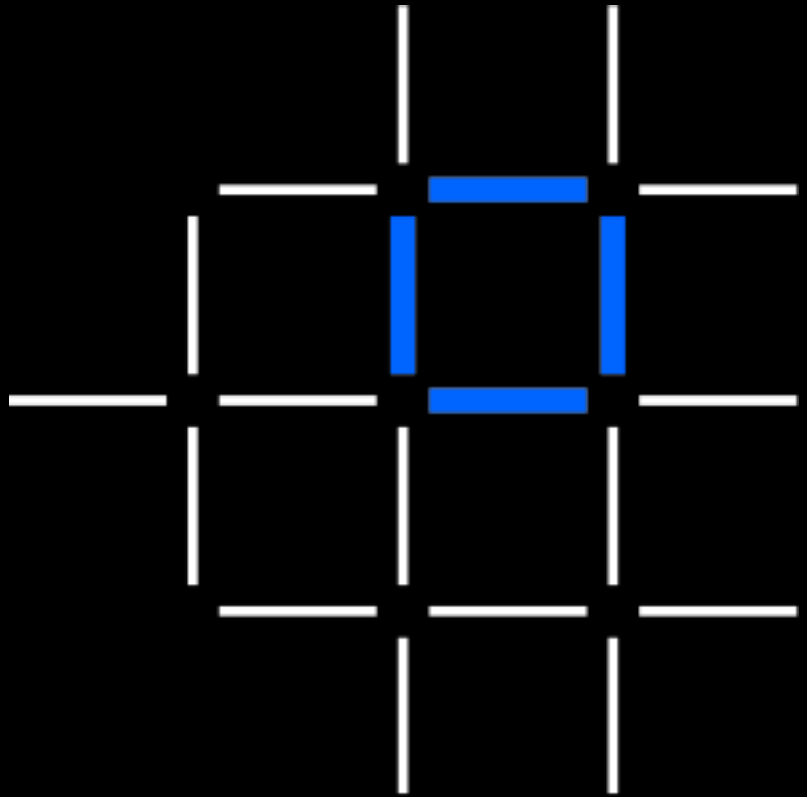
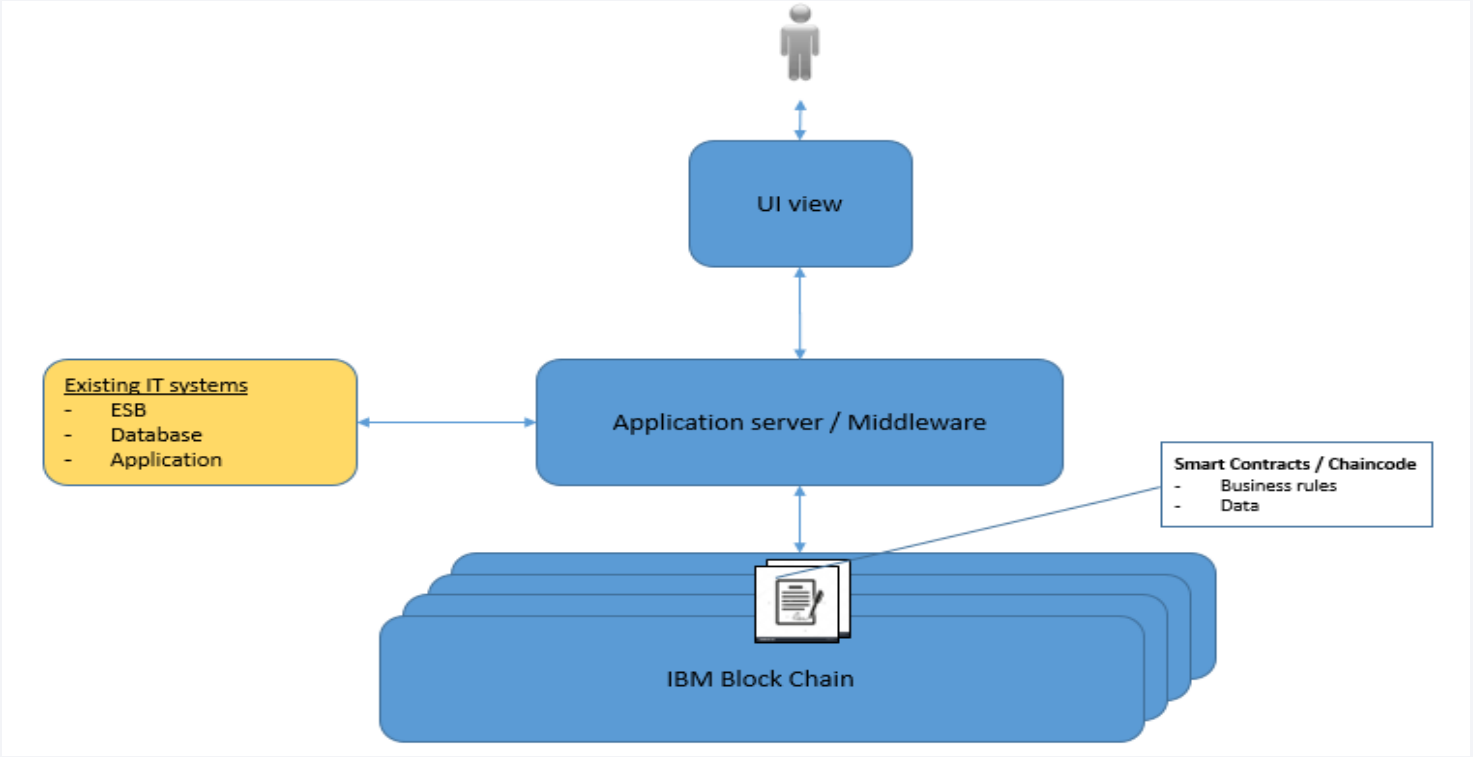


Architecture Overview – Typical Blockchain Application

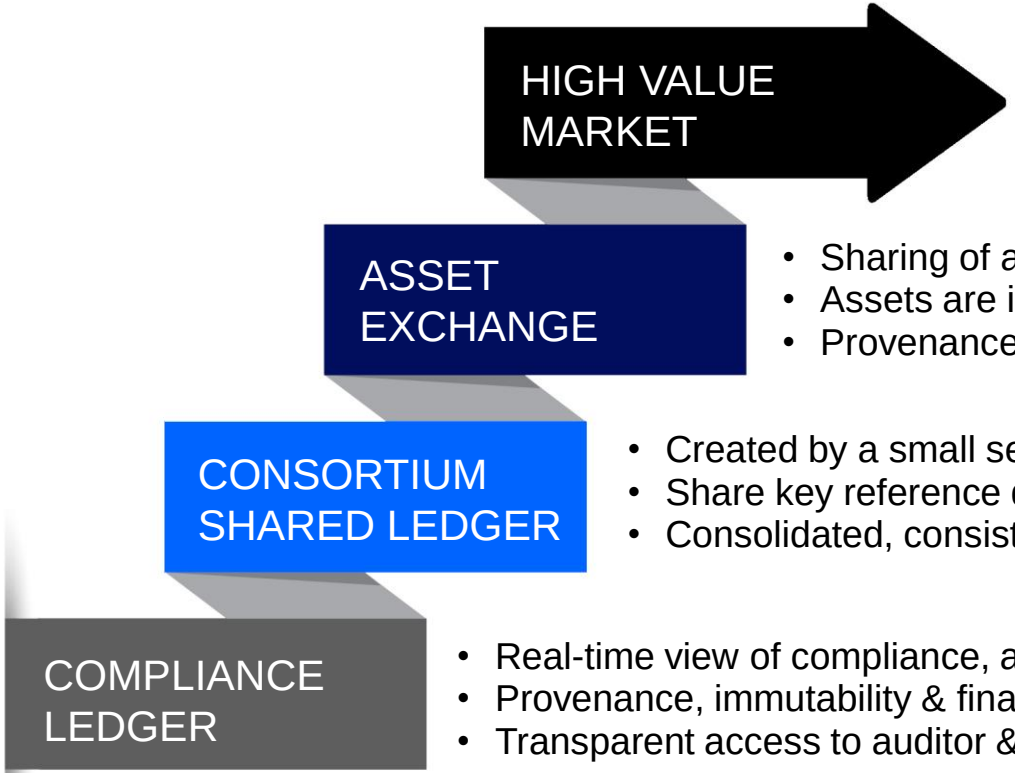


Not for all . . .

Blockchain is NOT

- ✗ Suited to high performance (millisecond) transactions
- ✗ For just one participant (no business network)
- ✗ A replicated database replacement
- ✗ A messaging solution
- ✗ A transaction processing replacement
- ✗ Suited for low value, high volume transactions

Patterns for Blockchain Adoption



- Transfer of high value assets
- Between many participants in a market
- Regulatory timeframes

- Sharing of assets (voting, dividend notification)
- Assets are intangible
- Provenance & finality are key

- Created by a small set of participants
- Share key reference data
- Consolidated, consistent real-time view

- Real-time view of compliance, audit & risk data
- Provenance, immutability & finality are key
- Transparent access to auditor & regulator

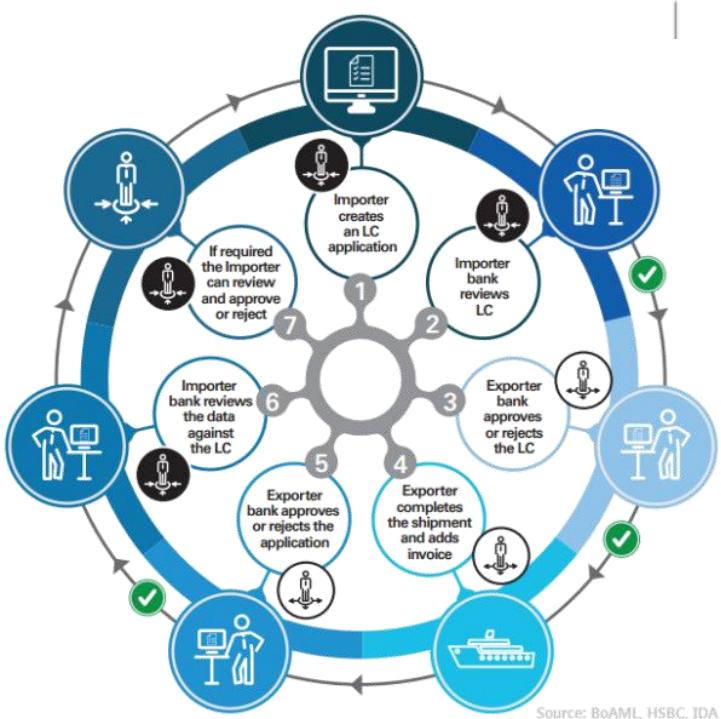
we.trade – Digital Trade Chain

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, and UniCredit**
- 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



Legitimize Diamonds and Reduce Fraud

PROVENANCE

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

Global Digitized Trade

What?

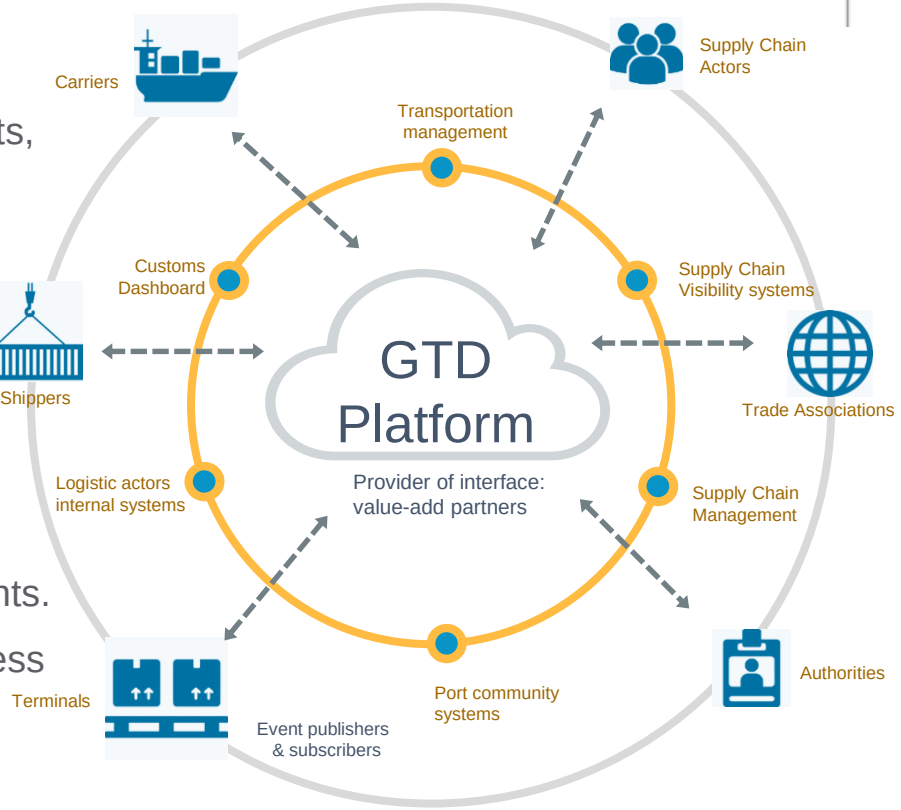
- An open, extensible platform for sharing shipping events, messages, and documents across all the actors and systems in the supply chain ecosystem.

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



Food Safety

PROVENANCE

What?

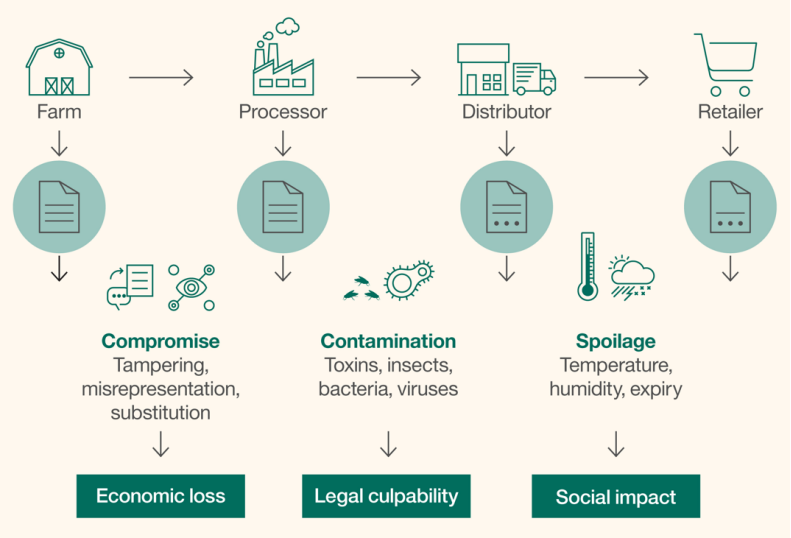
- Provide a trusted source of information and traceability to improve transparency and efficiency across the food network.

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.



IBM Food Trust provides value to the entire food ecosystem

- Prove farm is not a source of outbreak
- Ease of connectivity to the supply chain

Growers

- Instill trust between retails, suppliers & customers
- Automate & reduce manual certificate management

Food Manufacturers/CPGs

- Conduct targeted recalls
- Enable internal data sharing

Wholesalers/ Distributors

- Enhance ability to meet compliance standards
- Reduce manual processes

Food Logistics

- Assure customers food supplied is safe
- Conduct targeted recalls quickly

Food Retailers

- Learn about recalls and increased transparency
- Reduce risk of being victimized by food fraud

Consumers

- Reduce fraudulent certificates
- Increase renewal speed

Certification Bodies

- Assure customers food supplied Is safe
- Reduce wasted food

Food Service

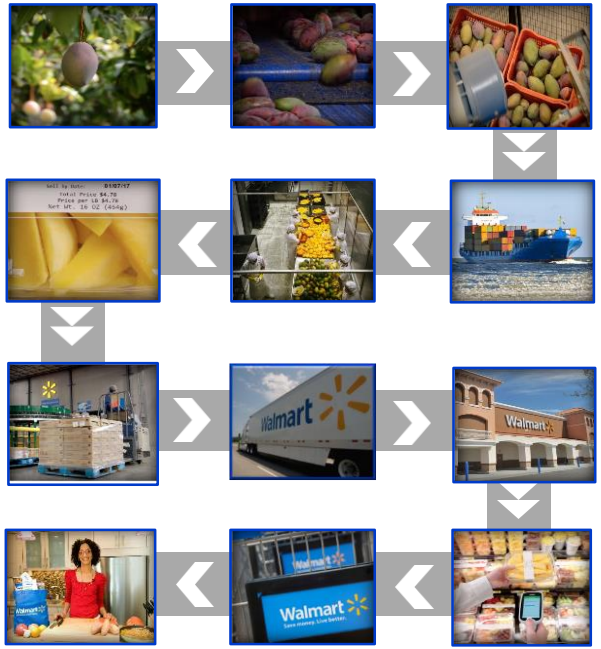
- Identify contamination quickly
- Reduce unnecessary testing

Regulators

IBM IFT - Walmart mango pilot Supply Chain

Pilot Test Case

How long does it take to trace a package of sliced mangoes back to the farm?



Results

Typical manual, mixed digital and paper-based method

6 days
18 hours
26 minutes

IBM Food Trust digital solution

2.2 seconds

Supply Chain Financing (Financial Services)

What?

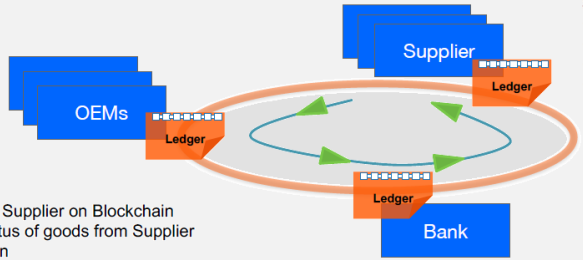
Today suppliers have a long, uncertain wait to get financing for invoices. Current process is cumbersome, paper intensive and involves longer turn around time.

How?

Bring all the participants (suppliers, OEM & financier) in the value chain to blockchain, thereby, improve transparency. Enable end to end visibility on purchase order issuance, invoice generation, shipment status, GR status & financial approvals to make invoice discounting more efficient.

Benefits

- Improves transparency and trust in the business network
- Lowers turn around time
- Automates business processes via smart contracts
- Enhances reconciliation amongst participants
- Ensures data privacy amongst network participants via permissioned ledged



SUPPLIERS:
- ✓ Receive PO from OEM
- ✓ Provide regular view of PO goods status
- ✓ Issue invoices against shipped goods
- ✓ View status of invoices and is updated of changes as they happen across the lifecycle

OEMs:
- ✓ Issue PO to Supplier on Blockchain
- ✓ Receive status of goods from Supplier on blockchain
- ✓ Post GR and subsequent inspection send invoices to Bank via blockchain instead of upload to the portal
- ✓ Monitor current state of play via the blockchain that updates near real time
- ✓ Reconcile which is simplified since the invoice and settlement tracked via blockchain

BANK:
- ✓ Receive and process invoices after OEM send it onwards via the blockchain
- ✓ Initiate validations in on receipt of invoices
- ✓ Proactively provide visibility to the OEM & Supplier about potential rejection / failure scenarios and prevents failure
- ✓ Settle Supplier and update OEM
- ✓ Forward invoice payment advice to OEMs via blockchain
- ✓ Reconciliation made easier

Dealership Financing

What?

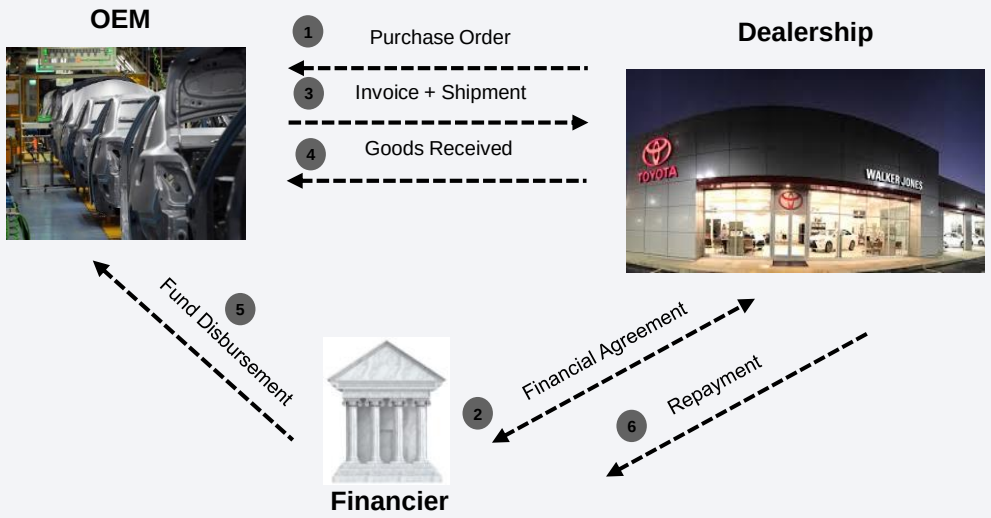
- Single view of truth between the Dealerships, Financiers and Original Equipment Manufacturers missing
- Dealer finance management from Inception to Repayment
- Digitization of Purchase Order, Invoice, Financial Agreement
- Near real time notification of significant milestones in financing lifecycle to network participants

How?

- Blockchain based network between OEM, Dealer & Financier
- Tracking of significant milestones on the blockchain
- Electronic exchange of documentation between counter parties

Benefits

- Enhanced line of credit management
- Single View of Truth
- Reconciliation hassles eased
- Faster processes due to digitization
- Next best action based on network notifications
- Risk reduction because of transparency and visibility



Derivatives Processing

What?

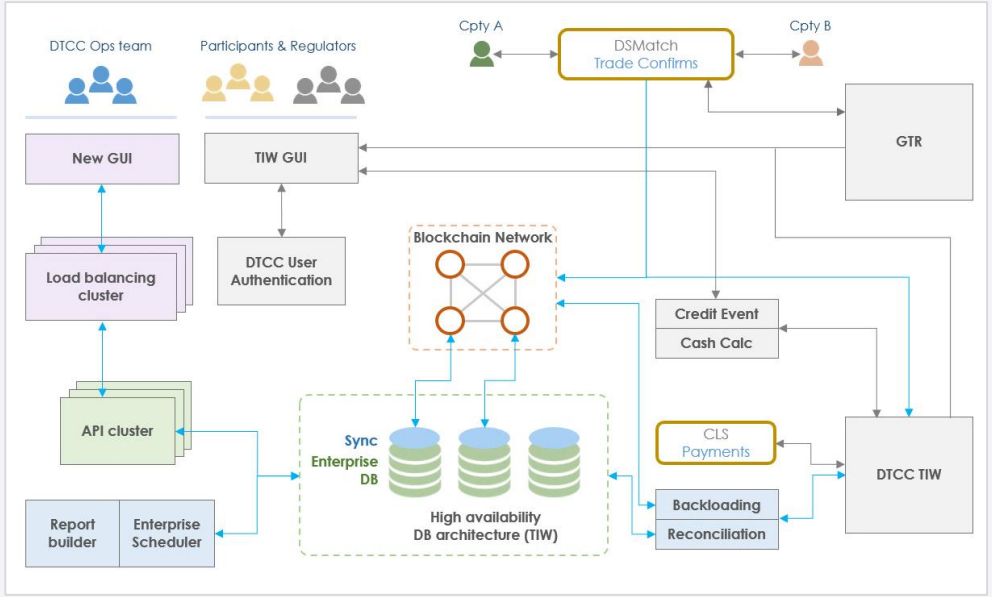
Trade Information Warehouse (TIW) service manages record keeping & payments for $11 trillion of credit derivatives and used by 2500 buyside firms, including mutual & pension funds in more than 70 countries.

How?

Re-platform TIW onto distributed ledger to reduce the efforts towards reconciliation & dispute resolution.

Benefits

- Improved availability and trust in the business network
- Significantly lower the cost of derivative processing for DTCC as well as the member firms



Contracts Management

What?

Current Contract Management Process:

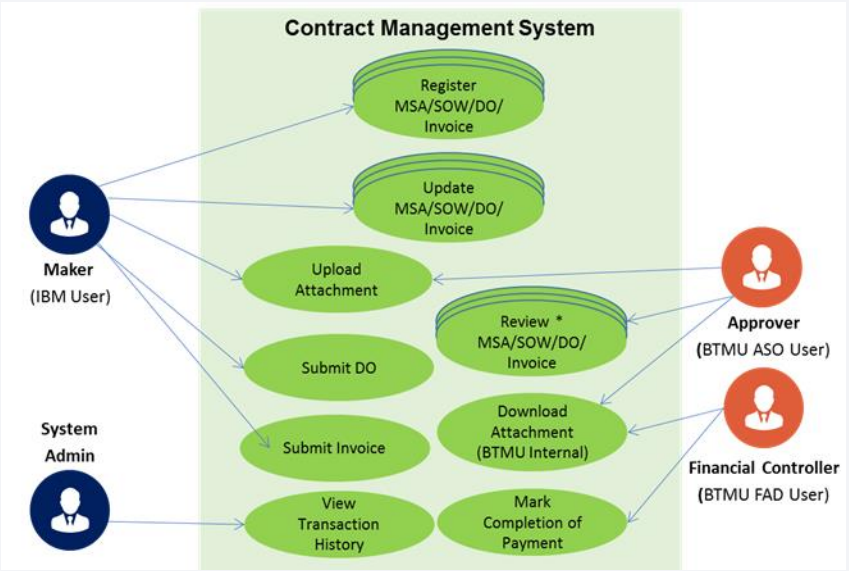
- Is manual, tedious, requiring approval from multiple stakeholders finance/procurement, legal reps, the management
- Interactions run the risk of fraud, tampering as it requires ink signatures & transfer of documents
- Lengthy process as back and forth transfer of these documents during the approval process

How?

Brings all the vendor and supplier participant in the value chain to blockchain, thereby, improving transparency, efficiency, and security to the complete process.

Benefits

- Improves efficiency and accountability
- Digitizes the contract management process between the vendor and supplier
- Increases trust through shared processing and record keeping
- Makes the business process secure & auditable
- Reduces process time from days to near instantaneous
- Monitors the status of contract process



Multi Partner Loyalty Points Sharing

What?

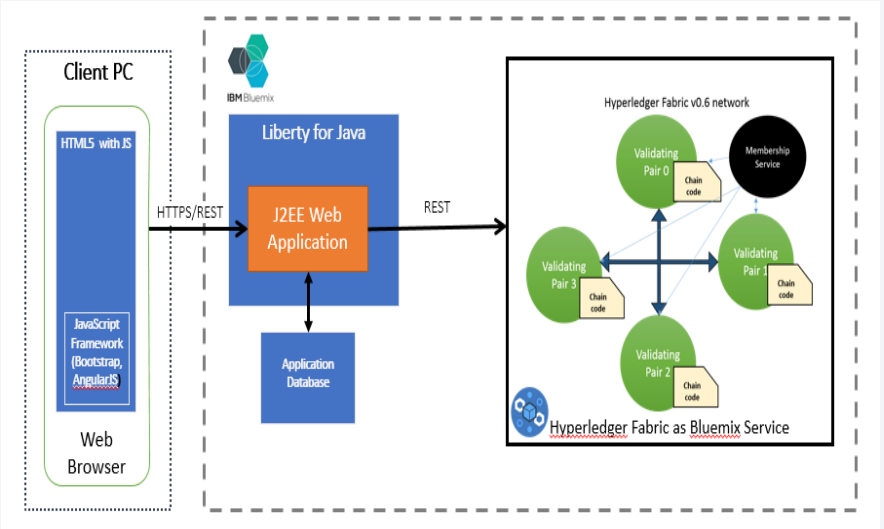
- Absence of a single consolidated loyalty platform for all airline partners makes customer's accrual and redemption cumbersome
- Customer's do not get a real time experience and have to wait until settlement from one partner to redeem with another
- Non interoperability between partners also makes customer experience disjointed when redeeming points across partners

How?

- Blockchain enables airlines and its partners to create a secured, reliable and lower cost distributed transactional system
- Allows customers to accrue & redeem loyalty points across multiple partners.
- Smart contracts enable multiple partners to establish partnership for their customers to share loyalty points

Benefits

- Enhances customer experience because of near instant accrual of loyalty points and reduction in claim for accrual / redemption
- Pooling of partners sharing loyalty programs enables customers to reuse points across broader space



Reverse Supply Chain Management (Pharma)

What?

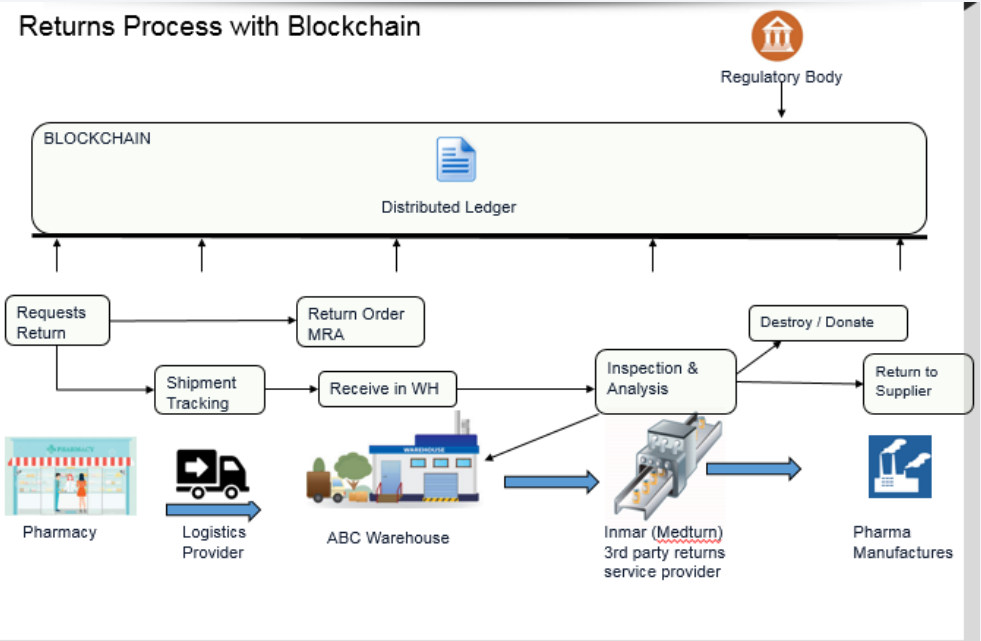
- The lack of traceability in customer & supplier return process and involvement of multiple parties makes it more difficult to discover counterfeit drugs.
- Lack of end to end visibility & transparency poses challenges for supply chain members

How?

- Blockchain shared ledger makes reverse logistics more transparent by making it easier to track the flow of returned products.
- All parties involved in the ecosystem get good visibility of transactions performed over secured network
- Regulatory bodies get accurate information instantly

Benefits

- Better transparency & tracking in the entire returns process
- Better protection against counterfeit drugs
- Better compliance to regulatory bodies with end to end visibility
- Tamper proof single source of truth for all transactional details



Provenance Baggage Management : IoT Enabled (Travel)

What?

- Track status of each piece of baggage in order to ease baggage claim
- The Challenges:
  - Messages are either delayed or do not arrive at all so that subsequent status changes have to be “assumed” or concluded
  - No reliable information
  - Many partners: airports, ground handlers, airlines using various technologies, different networks
  - Thousands of messages moved/exchanged across partner

How?

- Blockchain manages Electronic Baggage Tag (EBT) information
- EBT has RFID or similar device to retrieve ID
- Blockchain tracks associated validity period, travel & passenger information

Benefits

- Protects EBT against tampering and misuse
- Enables distribution of trustable information about baggage routing
- Enables participating partners to validate an EBT and check integrity/authenticity

Conflict Mineral Management (Industrial)

What?

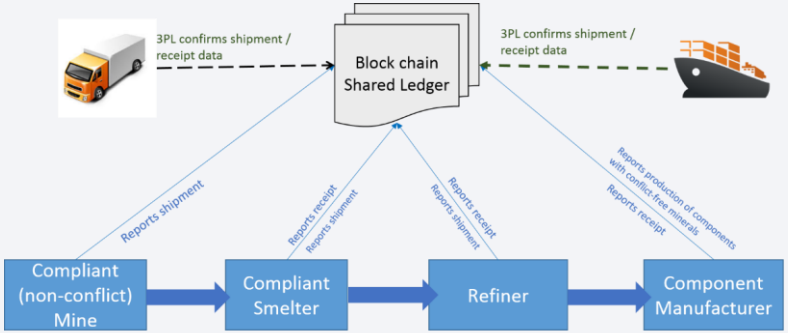
Electronic products rely on minerals which may be build with “conflict minerals” extracted from “conflict-free zones”. Legislation in Europe and the US requires that manufacturers audit their supply chains and report use of conflict minerals. Companies are attempting to use certifications & audit processes to comply, but these are only a partial solution for the existing problem of tracking of conflict minerals.

How?

Uses Blockchain’s “Provenance” (asset tracking) capabilities to track and trace minerals all the way from (compliant, non-conflict) mines to smelters to component manufacturing to the product assembler enabling a highly validated audit

Benefits

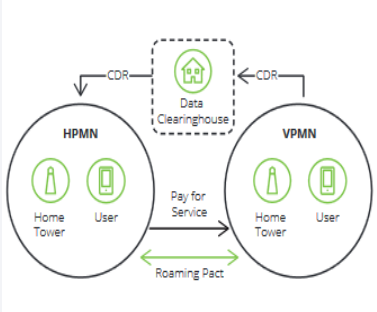
- Enables end to end tracking of conflict minerals capability that is not available in the existing solutions
- Provides compliance to existing standards (e.g. Dodd-Frank Act)
- Enables tracking of all the transactions performed by all the entities in the supply chain starting from mine to electronic component manufacturer including the 3rd party logistics provider.

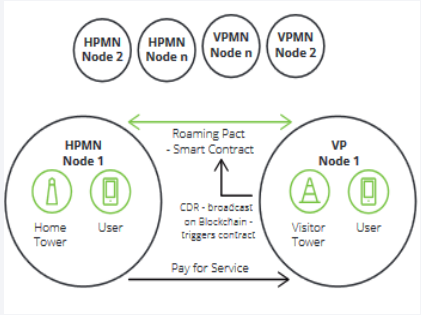


Transparent Roaming Charge Settlement (Telecom)

What?

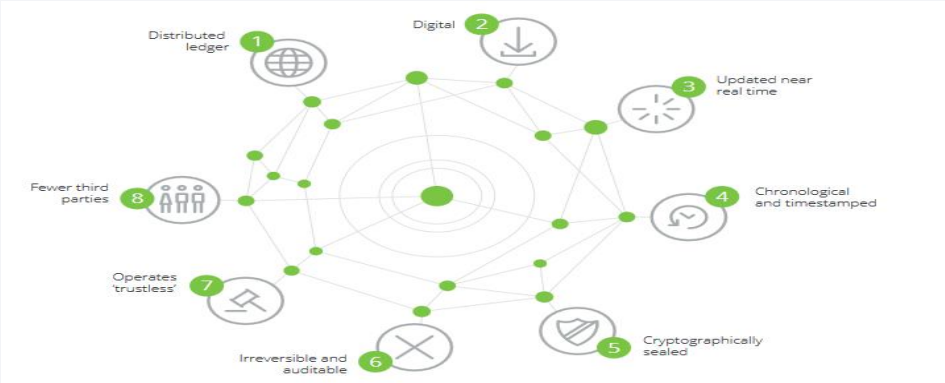
Telecommunication sector encounters huge number of Roaming settlement between service providers each minute. Service providers need to go through some 3rd party called Data Clearing House to settle the amount. There are chances of data tamper and fraudulent activities due to that 3rd party dependency and Centralized system. This phenomenon incurs huge expenses on Cellphone Service Providers (CSPs).





How?

Blockchain provides provenance and security for this event . It improves turn around time and trust between CSPs in the roaming settlement process.



Benefits

- Eliminates roaming frauds
- Reduces roaming settlement time to few seconds
- Decreases settlement cost, benefitting both subscriber and CSP

Pre-Authorization (Healthcare)

What?

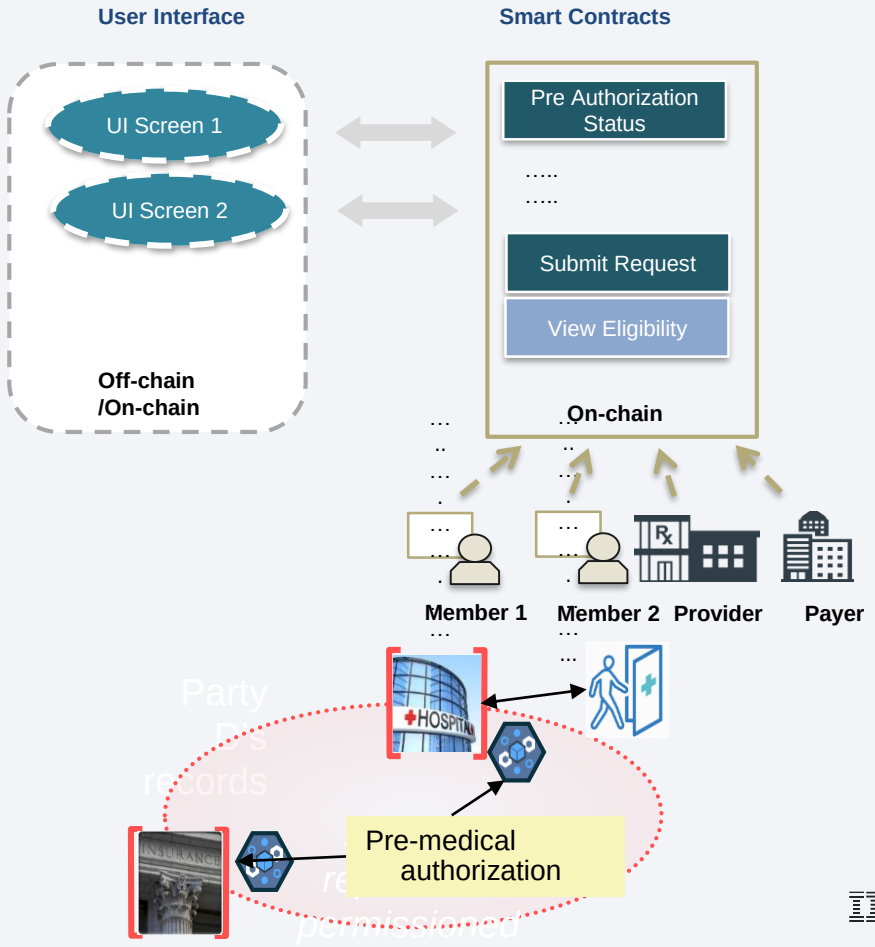
Currently Pre-Authorization for a medical condition is a slow process because there may be a possibility of multiple Payers being involved in this process and the coverage amounts are a function of the relationship between the Payer and Provider (whether in-network or outside).

How?

A blockchain based network connecting the Patient, the Provider and Payer gives each entity a near real time single view of the truth should be able to expedite the As-Is processes while benefiting each entity involved.

Benefits

- Smart Contracts enable quicker and near real time decisioning
- Access based permissions to entities for respective business functions
- Fraud and Tamper proof
- Facilitates better co-ordination between entities in the network
- Expedited response times



Inter-plan claim (Healthcare)

What?

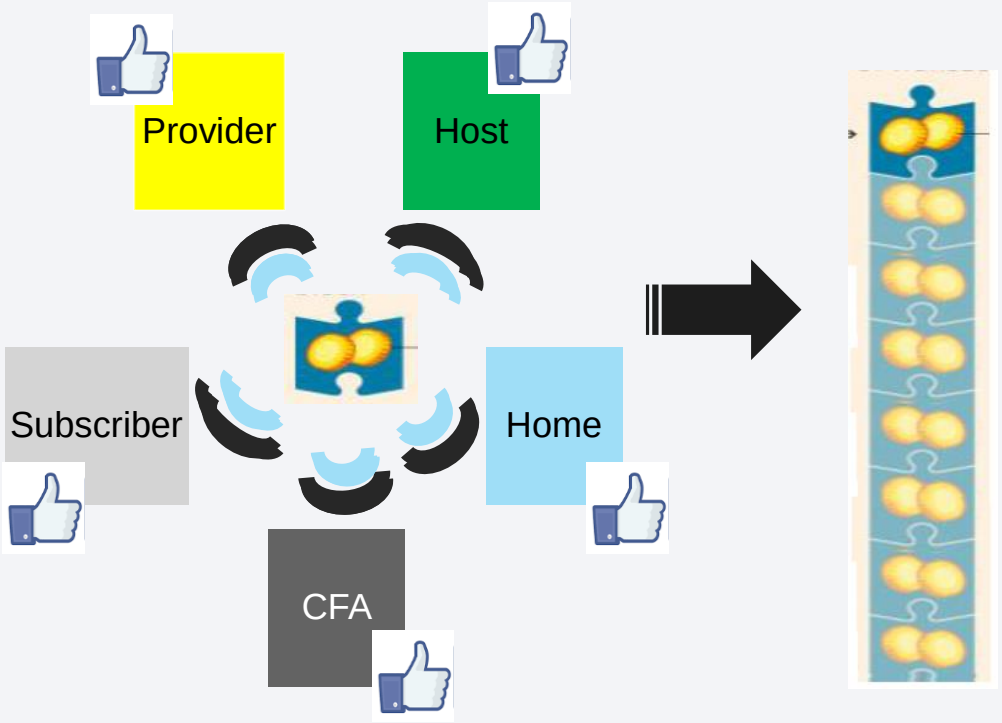
Inter-state plan claim processing is a cumbersome, costly and slow process that involves replication of data across home, host and central financing agency (CFA)

How?

Blockchain network between Home, Host and CFA shares a common single format across plans over the network therefore making process transparent and maintainable

Benefits

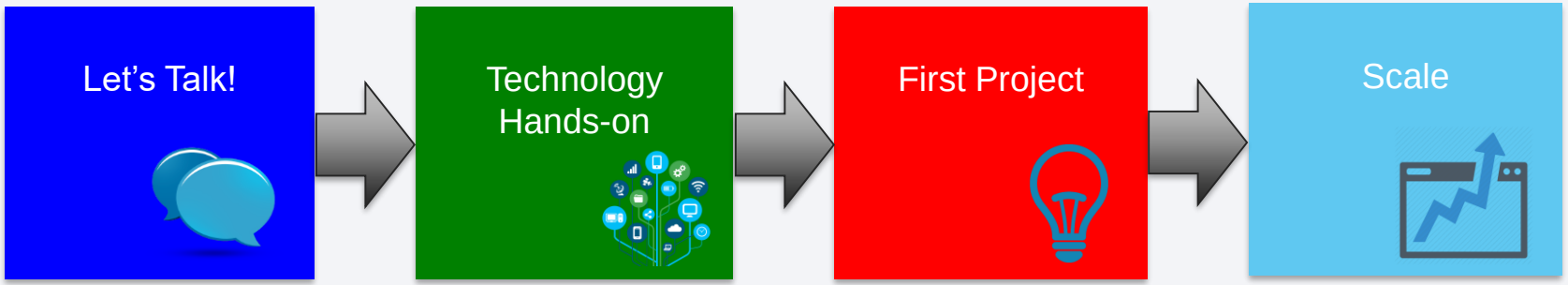
- Removal of redundant data storage
- No need of format reconciliation in case of disparate plans at home and host
- Lowers the cost of operation and therefore benefit to the end customer



Blockchain Use Case – A Litmus Test

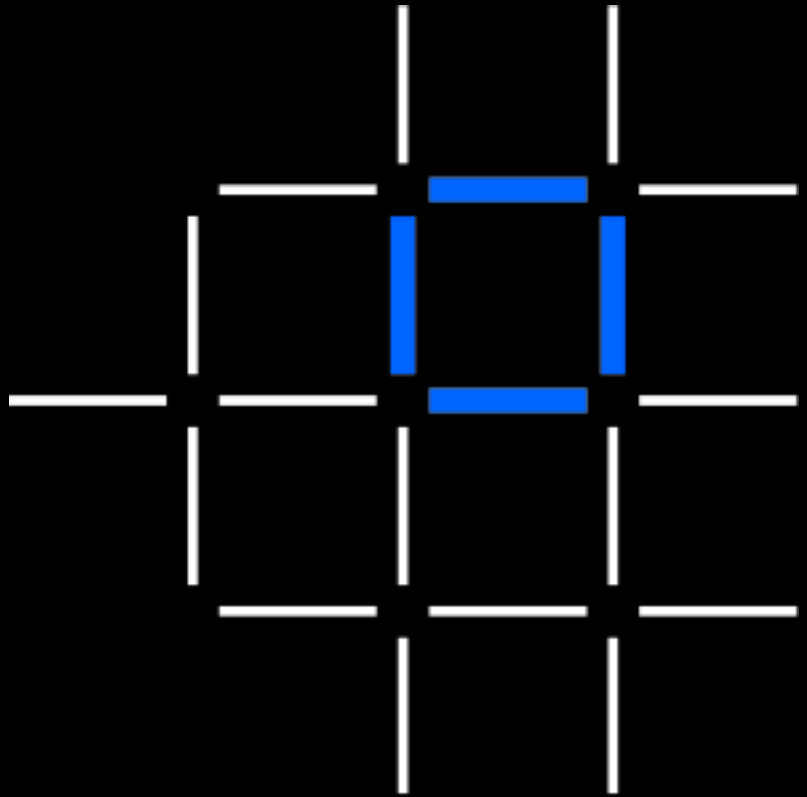
- Is there a valid business case?
- Does the current business network lack 'trust'?
- Is the lifecycle of an asset clearly defined?
- Is there a need to maintain separate copied of ledger (distributed ledger)?
- Is there a need to maintain the history of all updates to the assets (provenance)?
- Is there a need for tamper proofing of the transactions related to assets (immutability)?
- Is there a need for isolation of data between different parties (privacy)?
- What will Smart Contracts comprise of?
- Is this being considered for high volume transactions scenario?

Engagement Model



1. Discuss Blockchain technology 2. Explore customer business model 3. Show Blockchain Application demo	1. Understand Blockchain concepts & elements 2. Hands on with Blockchain technology 3. Standard demo customization	1. Design Thinking workshop to define business challenge 2. Agile iterations incrementally build project functionality 3. Enterprise integration	1. Scale up pilot or Scale out to new projects 2. Business Process Re-engineering 3. Systems Integration
Remote or face to face	*Remote or face to face*	*Face to face*	*Face to face*
Free of charge	*Free of charge*	*For fee*	*For fee*

Thank you



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