

# Enterprise Blockchain Applications

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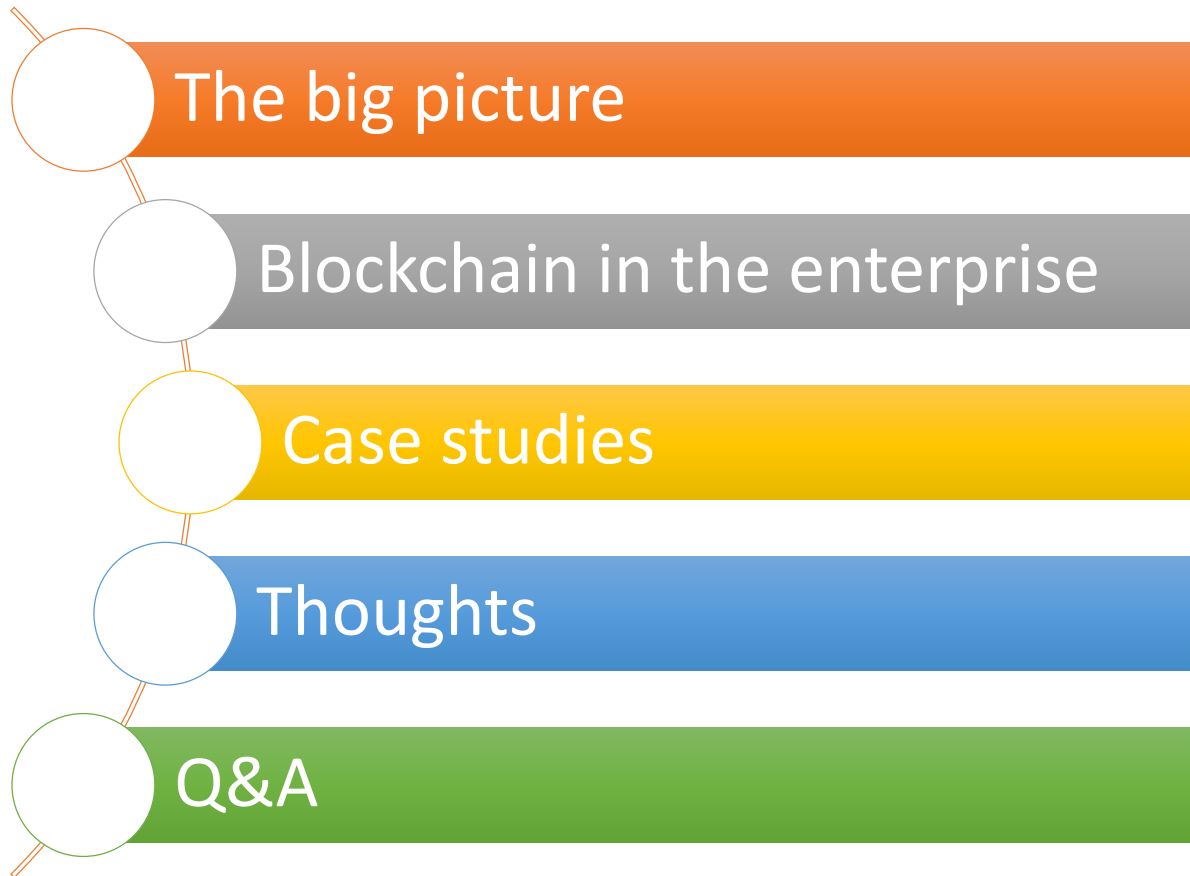
Director, blockchain & IoT Industry Solutions  
Oracle



2018 IEEE Global Blockchain Summit



# Agenda



The big picture

# Technology leaps rewrite transactional costs

When the **cost of transaction** changes,  
the underlying **economic order** of the transaction changes as well

*- Oliver Williamson, economist and 2009 Nobel Prize winner*

“ **IoT** lowers the cost of **monitoring**  
**AI** lowers the cost of **prediction**  
**AR** lowers the cost of **interaction**  
**Blockchain** lowers the cost of **trust** ”

*-@akadiyala*

# Scaling trust => larger TAM

## Artisan age



Local knowhow  
Local commerce  
Local trust  
Local scale

Trust is codified via  
local social signals

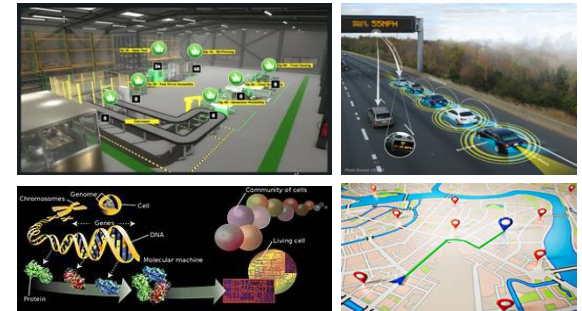
## Industrial age



Regional knowledge & knowhow  
Inter-regional commerce  
Inter-regional trust  
Inter-regional scale  
Hard to scale

Trust is codified via  
social & legal frameworks

## Intelligence age



Global knowledge & knowhow  
Global commerce  
Global/regional trust  
Global scale & very rapid scaling

Trust via laws, contracts, ~~social~~ cryptography

# Scaling trust => larger TAM

Artisan age



Industrial age



Intelligence age



Trust automation slashes transaction cost (and business risk) by orders of magnitude

Local scale

Hard to scale

Global scale & very rapid scaling

Trust is codified via local social signals

Trust is codified via social & legal frameworks

Trust via laws, contracts, ~~social~~ cryptography

# Blockchain in the enterprise

# Conversations are shifting





# Blockchain

## Not just about the ledger

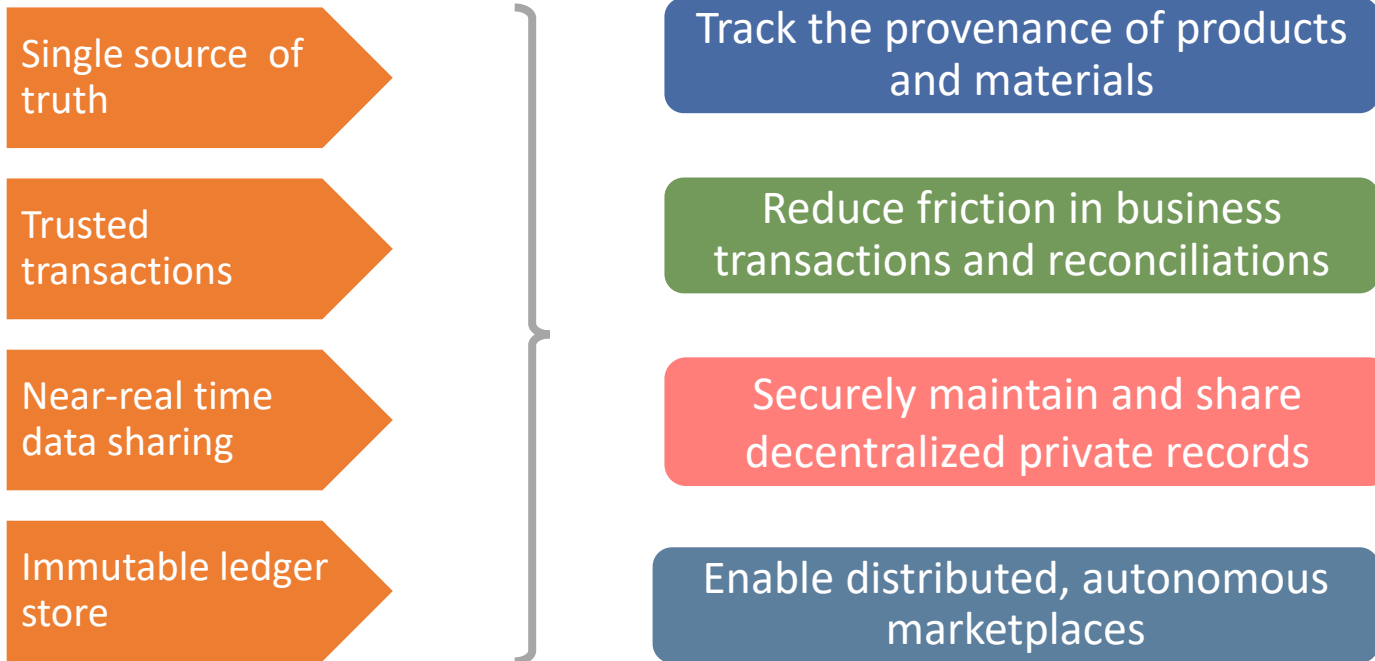
### What we hear today

- ▶ Distributed
- ▶ P2P
- ▶ Immutable
- ▶ Cryptography
- ▶ Smart contracts / chaincode
- ▶ Consensus
- ▶ Side chains
- ▶ Forking (soft & hard)

### Emerging concepts

- ▶ Zero Knowledge proofs
- ▶ Zk-SNARKs
- ▶ Homomorphic encryption
- ▶ Elliptic curve cryptography
- ▶ Quadratic voting
- ▶ Prediction markets
- ▶ Schnorr signatures
- ▶ Self-sovereign identity

# What are enterprises using blockchain for?



# Blockchain use cases in the enterprise

## Financial Services

- Intra-Bank Cross Border Payments/Remittances
- Inter-Bank National Payments
- Brokerage funds transfer
- Corporate B2B Payments
- Bank Guarantee
- Supplier / Vendor Finance
- Invoice Factoring
- Full Trade Lifecycle Mgmt
- Securitization
- Customer onboarding/KYC
- Lending/Credit Advance
- Loyalty points networks

## Supply Chain

- Genealogy and traceability of parts, components, ingredients
- Maintenance parts tracking in multi-layered distribution
- Parts & maintenance tracking for aircraft & other regulated assets
- Farm-to-table food provenance
- Country of origin traceability
- Electronic compliance records
- Quality control records
- Tamper-proof IoT sensor data, non-repudiation of monitored activities

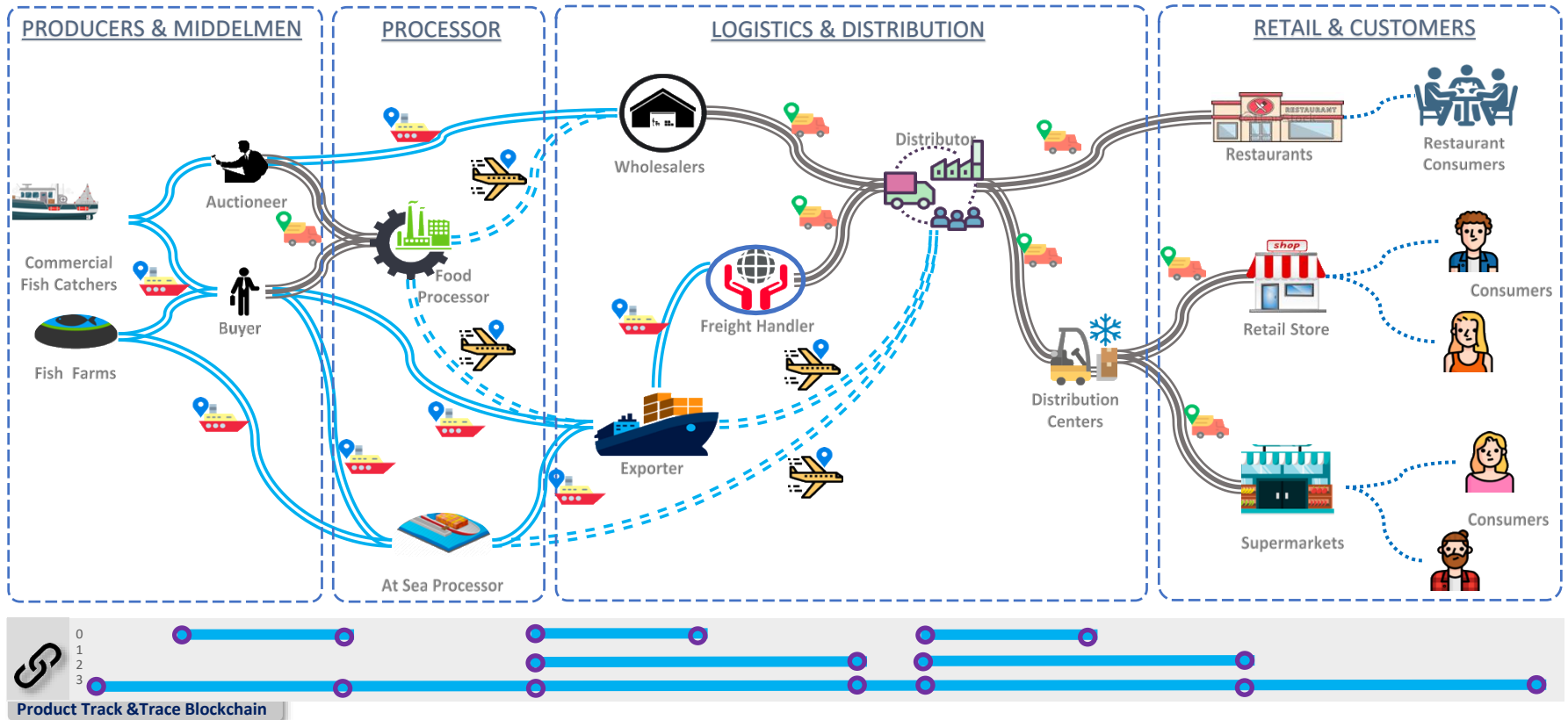
## Public Sector

- Government records (titles, birth certificates, licenses, etc.) sharing
- Customs (import/export licensing, excise taxes)
- Regulatory certifications (food, pharma, etc.)
- Procurement/Acquisition
- Citizen services, e.g., benefits, multi-agency programs
- Digital Employee Records
- Digital Identity and Identity Proofing

## Healthcare

- Electronic Health Records
- Service provider credential management
- Revenue cycle – claims adjudication, disputes
- Clinical Tamper-proof IoT sensor data, non-repudiation of monitored activities, trials
- Anti-counterfeit track & trace for drugs
- Cold chain track & trace
- Integration with IoT devices monitoring health or equipment

# Supply Chain: Hook to Fork



# IoT + blockchain in Supply Chain

- Product journey and lifecycle
- Point-of-origin
- Change of custody and ownership
- Tampering and counterfeiting attempts
- Global Trade Compliance
- Automated Bill of Lading and Customs
- Supplier performance management
- Trade Finance

# Blockchain in HR



Skill Passport



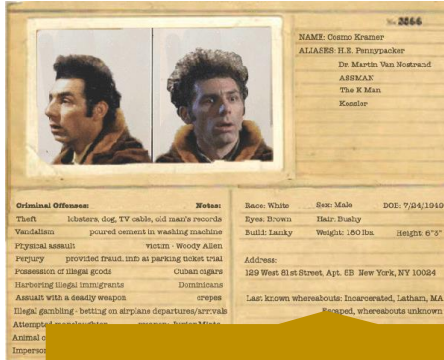
Talent markets



Smart Contracting



Employee workflows



Background Checks



Cross border payments

# Case studies

# Oracle blockchain Cloud (GA in July 2018)



Maritime shipping documentation



## CORP. FINANCE & FINANCIAL SERVICES



Bank Guarantee



Funds Transfer



## PROJECT MANAGEMENT



Solar Energy Project Tracking & Rewards Solution



## IMPORT/EXPORT



FEDERAL GOVERNMENT OF NIGERIA  
FEDERAL MINISTRY OF FINANCE  
NIGERIA CUSTOMS SERVICE (NCS)

Excise Licensing and Taxes



## E-COMMERCE



Multi-brand loyalty network



## PHARMACEUTICALS



NITI Aayog  
(National Institution for Transforming India),  
Government of India



Anti-counterfeit drugs tracking



## SUPPLY CHAIN



Food Provenance & Quality Tracking



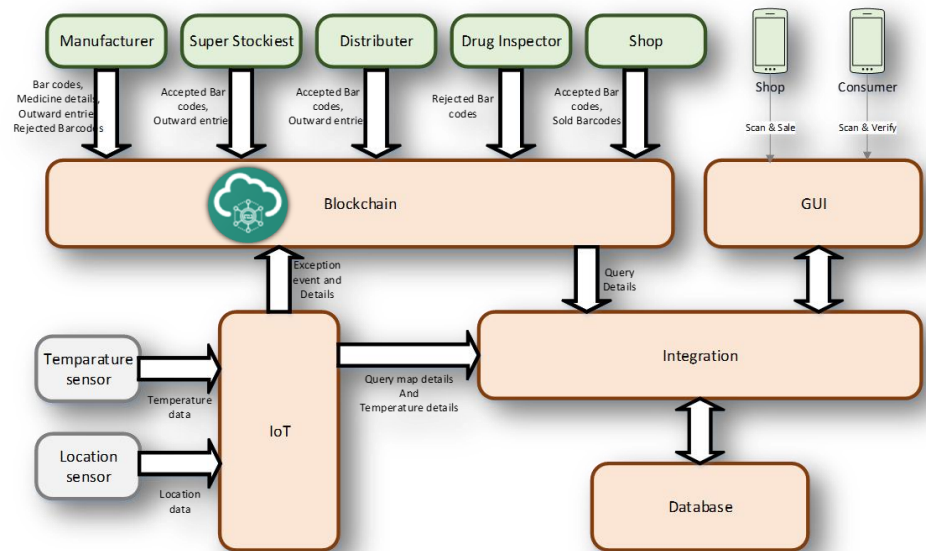
# Ag: Food Provenance & Quality Certification



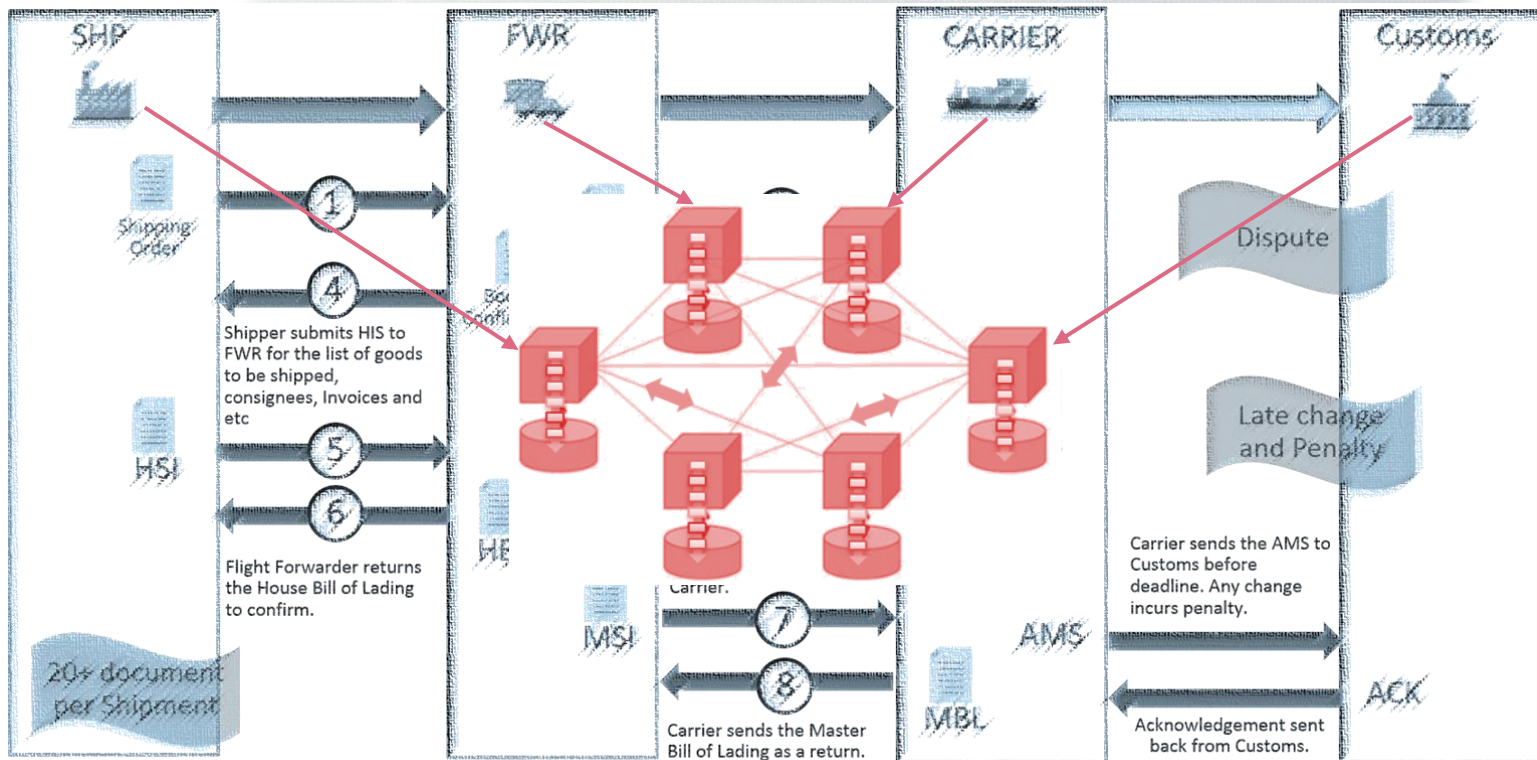
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# Anti-counterfeit Drugs Tracking in India

- Problem by the numbers:
  - India accounts for 10% of WW production
  - WHO estimates 20% of all drugs sold in India are fake
  - As the largest producer of generic drugs in the world, India is reported to be the source of 35% of all counterfeit drugs sold worldwide
- Solution
  - Track drugs from Mfg to Distribution & Retail using IOT and Blockchain
  - Pilot involves premier super specialty hospital, Apollo Hospitals and a global pharma company, Strides Pharma Sciences

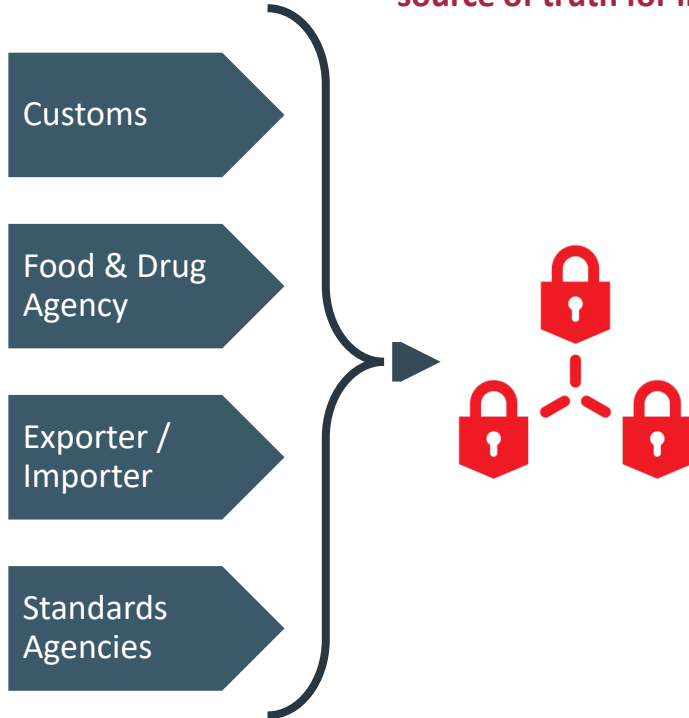


# Logistics: Maritime Shipping Documentation



# Trade: Customs Service Excise Licensing and Taxes

Moving from a paper based excise duty collection and licensing process to utilizing a blockchain network built on Oracle Autonomous Blockchain Cloud Service as the single source of truth for license issuance and excise duty payments



## Before Blockchain

- Paper based records
- Records often lost in transit
- Complicated and error-prone reconciliation processes
- Delayed settlement
- Manual on-boarding of excise traders
- Limited scale to collect duty
- Largely a manual process
- Low transparency for government and regulatory bodies

## Blockchain Benefits

- Digital immutable records
- Digital delivery of records
- No reconciliation required
- Faster settlement
- Automated on-boarding
- Scalable solution to collect duty
- Automated processes
- Greater transparency to government and regulatory bodies

# Banks: Global Loyalty Network (GLN)

Bank-anchored global integrated platform that offers **cross-border use of loyalty points and benefits around the world**



## BENEFITS

### Enhance Customer Experience

- Can use your country points in other countries.
- Typical use cases – payments, offline/online shopping, remittance
- No complex transfers that take weeks or months to complete

### Increase Operational Excellence

- All participating companies simultaneously store identical transaction data -> enables accurate settlement without additional reconciliations

### Create Business Value

- Good way to consume debt
- New business model based on exchange of digital currencies between global financial institutions
- Your customers → My customers → Our customers

# Oil & Gas: Bank Guarantee

- Current process is paper based and manual
- Beneficiary is dependent on the Vendor for interactions with the Banks

- Discrepancies after they receive the hard copy from the bank take time and effort to correct
- Potential tampering with the content, requires extra verification steps
- Lack of tracking makes proactive actions (invoke, amend or return) impossible
- Lack of Transparency between all parties
- Errors in manual interactions to correct or verify BG

The screenshot displays two dashboards: the IOC DASHBOARD and the BANK DASHBOARD. The IOC DASHBOARD features a 'CONTRACT LIST' table with columns for ID, STATUS, and DETAILS, and a 'BANK GUARANTEE' table with columns for ID, STATUS, and DETAILS. The BANK DASHBOARD features a 'BANK GUARANTEE LIST' table with columns for ID, STATUS, and DETAILS, and a 'SYSTEM ALERT' table with columns for ID, STATUS, and DETAILS. A 'PUBLIC LEDGER' table is also visible at the bottom of the BANK DASHBOARD.

ID	STATUS	DETAILS
#CT-00101518	Approved	
#CT-00101505	Approved	
#CT-00101490	Approved	

ID	STATUS	DETAILS
#BG-21100155	Resend New BG	
#BG-21100010	Issued	
#BG-21009770	Issued	
#BG-20980125	Accepted	

ID	STATUS	DETAILS
#BG-21100155	Pending	
#BG-21100010	Issued	
#BG-21009770	Issued	
#BG-20980125	Accepted	

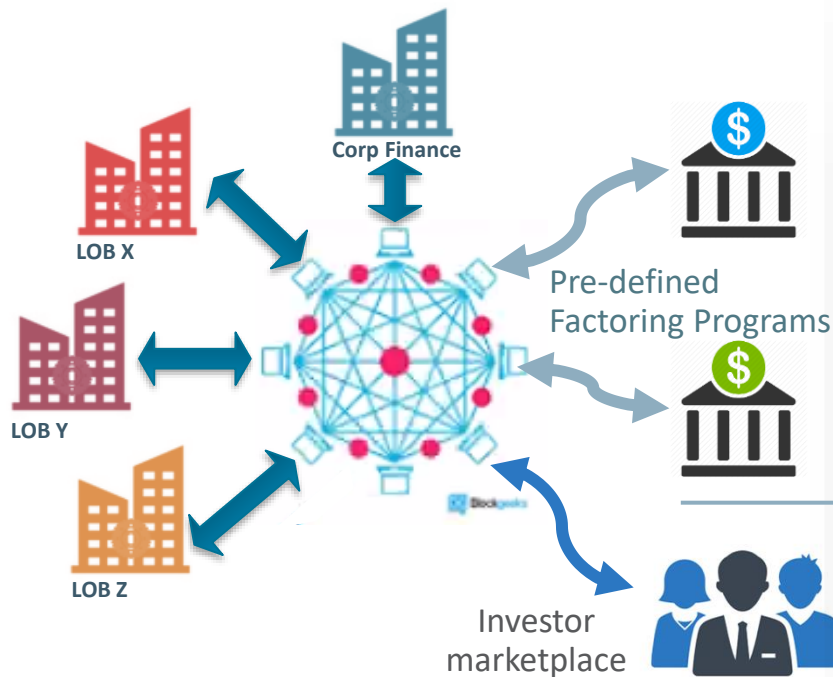
ID	STATUS	DETAILS
#BG-20711201	Due in 60 days	
#BG-20708874	Due in 30 days	
#BG-20691142	Due in 30 days	

Date	Contract ID	Activity
13/02/2018	CT-00101525	Assigned to Contract No
14/02/2018	CT-00101525	Oracle Requested BG
15/02/2018	CT-00101525	
16/02/2018	CT-00101525	

## Blockchain Benefits

- Establish trusted network to allow only authorized transactions
- Reduce the dependency, allowing direct interactions between parties
- Allow verification of the Digital BG before requesting a hard copy.
- Digital BG copy stored in the public ledger as a tamper proof immutable record
- Provide visibility into status and delays through a dashboard

# Mfg: Invoice Factoring in a Multi-LOB Conglomerate



## Before Blockchain

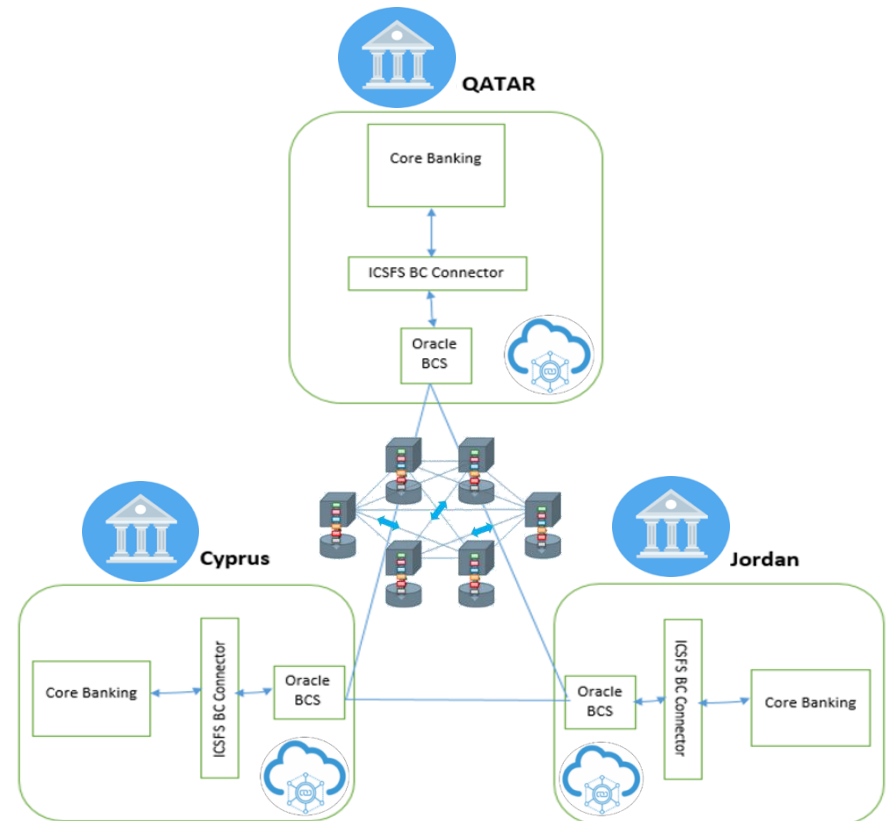
- Internal validations
- Costly and error prone reconciliations
- Manual submission to investors
- Delayed settlement

## Blockchain Benefits

- Improved visibility & pool management
  - No reconciliations
  - Automated reports
  - Faster settlement
- 
- Manual on-boarding of investors
  - Limited to bigger investors
  - Largely a manual process
  - Limited liquidity
- Automated on-boarding
  - Easier to bring on smaller investors
  - Better pricing using bids
  - Faster settlement

# Banks: Cross Border Funds Transfer for Subsidiaries

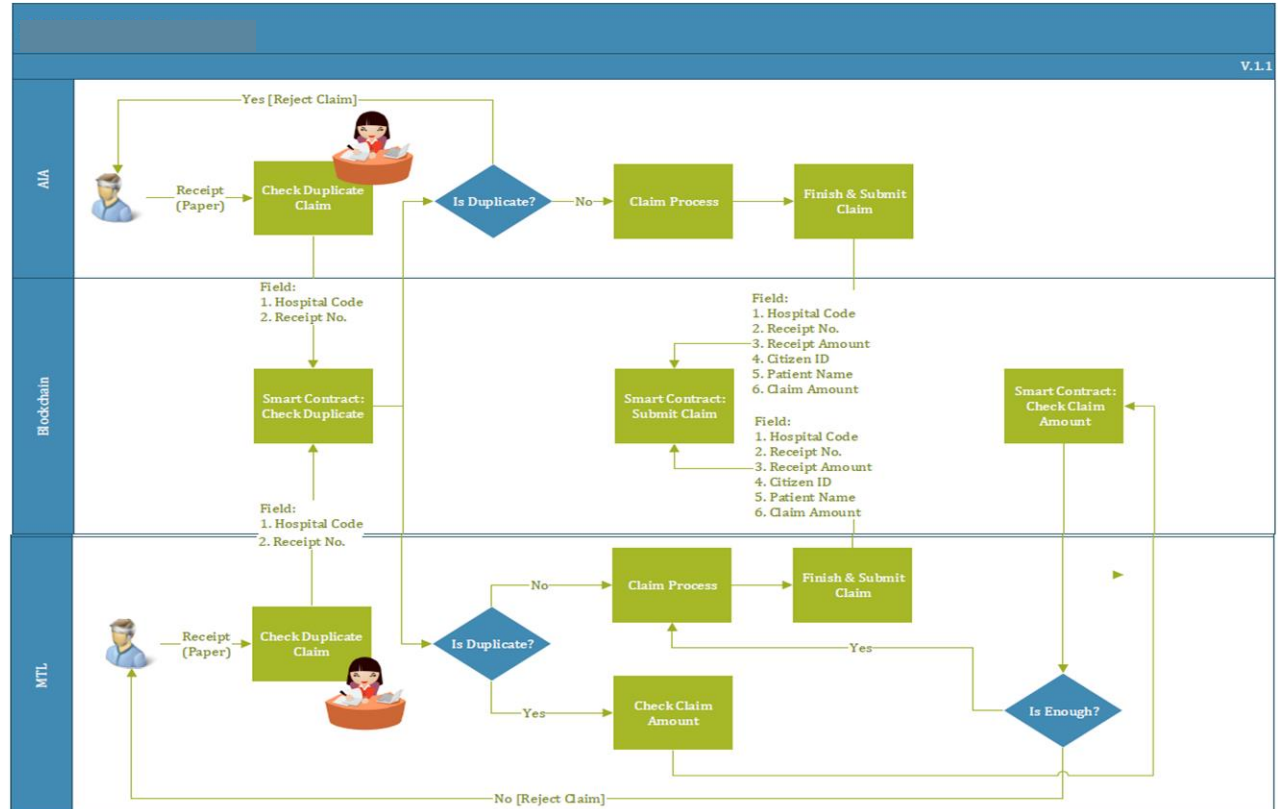
- A large bank with multiple regional subsidiaries
- Current cross-border transfers between the subsidiaries use SWIFT services, which
  - Are not real-time and require too many manual interventions
  - Charge fees and other expenses
- Blockchain benefits
  - Smart contracts enable automated transfers based on rules
  - Real-time handling of transfers
  - Integrated audit trail of transfer requests and confirmations, available to clients through mobile and Internet banking interfaces





# Fighting Fraud in Insurance Claims

- Claim Details are owned by different insurance corporations
- Potential fraud cases due to duplicate claim against multiple insurance corporations
- Access to claim details is restricted and based on permission
- Automation & audit



Thoughts

# Solutions needed to cross the chasm

## TOOLS

- Better developer tools for faster, smoother dev cycles
- Operations: Member on-boarding, monitoring, supportability, lifecycle management, and Key management

## GOVERNANCE

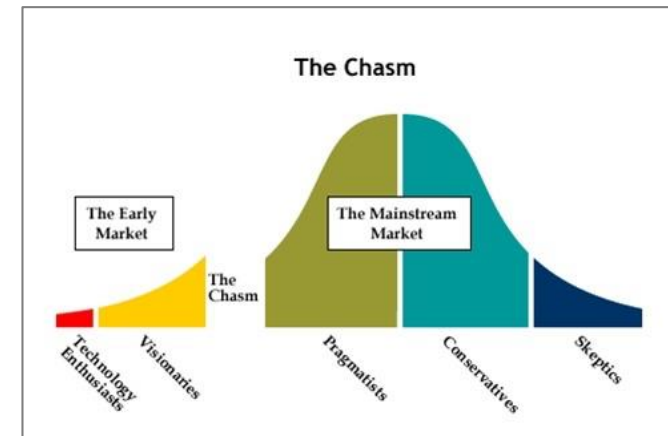
- On blockchain & for blockchain
- Configuration management, workflows, reporting, recovery

## IDENTITY

- Retail, government, travel, conglomerates
- Cyberphysical world needs granular, user-managed identities for multitude of use cases

## PAYMENTS & CRYPTOCURRENCY

- Unit of account/exchange



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# Government: Identity Tracking and Asylum Case Status Sharing

- A major European country handling large influx of refugees
  - Identity proofing and tracking across multiple federal and state agencies
  - Case status and benefits coordination across multiple agencies
- Expected blockchain benefits
  - Single source of truth reconciled between multiple ministries at the federal and state level
  - Better integration of benefits eligibility and access to eliminate gaps and fraud in the system
  - Automatic notifications across agencies on status changes in near real-time

