Blockchain for Supply chain

Vignesh Pethuraja
Blockchain Advisor & Consulting Partner – MENA
24/10/18

Agenda

1   **Introduction to Blockchain**

2   **Blockchain for Supply Chain**

3   **Case Studies**

What is blockchain?

Blockchain Building blocks

- **Disintermediation:** enables peer-to-peer transactions between third parties without the need of a centralized authority

- **Transparency:** All the transactions are completely transparent enabling real time auditing

- **Security:** The blockchain network is cryptographically secure & uses 256 SHA Algorithm to encrypt the data

- **Immutability:** The Database records are tamper-proof making it impossible for the parties to change the state and data at any point of time

- **Smart Contracts:** virtual pre-programmed agreements encoded that can be automatically triggered based set business conditions

Centralized Verification

Distributed Verification
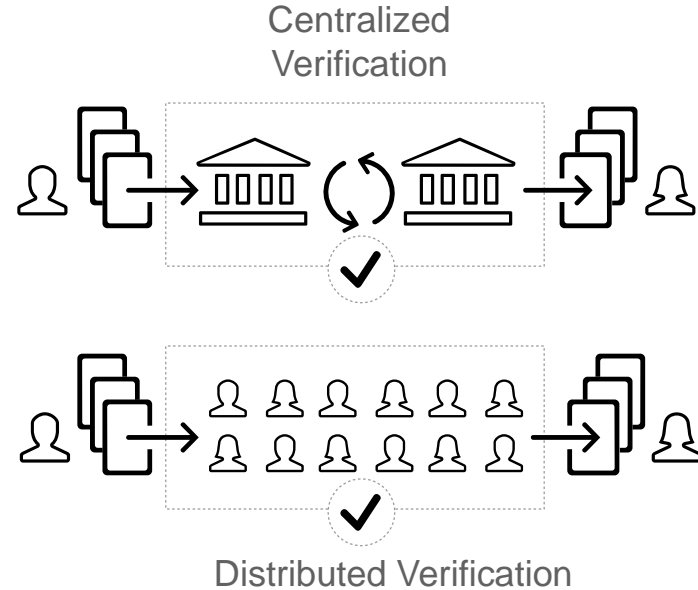
Types of blockchain

Type	Characteristics
Public Blockchain	• Considered as "fully decentralized" blockchains • Anyone in the world can participate to read, send transactions or participate in the consensus process • A public ledger of transactions for cryptocurrencies, such as bitcoin • Parties need not trust each other (trustless) and there are no intermediaries • Involves proof of work as a mechanism that ties mining capability to computational power • The trust and integrity is maintained by the network involving miners who are anonymous • The blockchain network is hack-proof and its integrity can only be attacked if at least 51% of the miners work in collusion
Permissioned Blockchain	• Considered as "partially decentralized" blockchains • The decentralized participants who maintain the trust and integrity of the blockchain network are authorized users (usually employees who were verified after Know Your Miner process) • The write permission to the blockchain will be restricted, the read permission can be made unrestricted depending on the implementation strategy • Some of these blockchains are tokenless distributed ledgers • An intra company permissioned blockchain is referred to as "private blockchain"

Key application areas of blockchain

| Type of blockchain applications	Description	Use Cases
Value Transfer	Exchange of value and data between 2 participants	• Smart Payments • Micro payments for digital assets • Cross Border Remittance • Royalty Distribution
Registry	Maintenance and managing digital assets	• Digital Rights Management • Content Management
Contracts	Management of contracts between two or multiple parties	• Roaming Contracts • Tower sharing Contracts • Managed Services Contracts • B2B Contracts
Identity	Providing identification, verification and authentication	• Digital Identity for devices and apps • IoT Connectivity • KYC
Storage	Storing and sharing of documents	• Document Management solution • Data Management Utilities

Blockchain for supply chain

Value Proposition

Industry

Industrial Manufacturing

Healthcare

FMCG

Ecommerce

Automotive

Aerospace

Pharmaceutical

Logistics

Sample Use cases

Provenance Tracking on end to end supply chain	Cold chain tracking	Reverse Logistics Audit Trail
P2P on Blockchain	Blockchain enabled Procurement for Direct Shipping	Trade Facilitation
Certificate Tracking (Airworthiness , Quality)	License and Royalties management	Invoice Reconciliation on chain
Trade Finance	Contract authoring and management	Vendor performance management
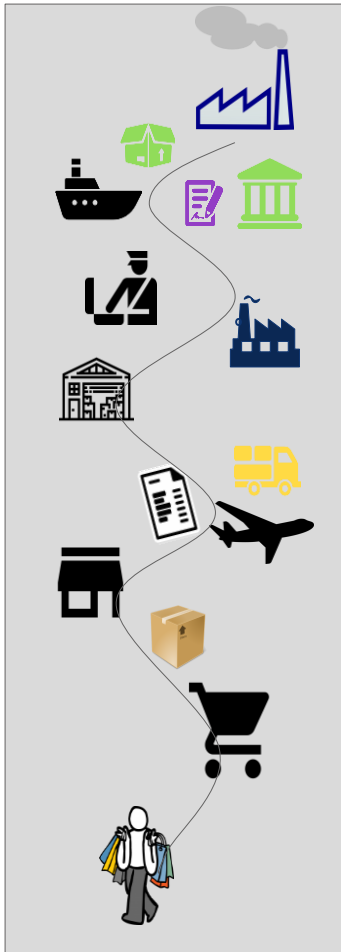
Cuts across different industry verticals

Automation and Process streamlining

Significant impact on Topline and Bottom line

Engenders Trust between non trusting stakeholders

Visibility , Transparency to authorized stakeholders

Enhanced security through cryptographic access management

Automatic immutable Audit Trail

Solution can be deployed in Blockchain Platform of choice

Framework and Solutions

Where to use Blockchain in Supply chain –A Framework

Stakeholders

- **2 or more stakeholders** should be involved as part of network
- **Trust deficit** between the stakeholders is critical consideration
- Stakeholders participating in network should benefit from the network /incentivized to be part of the network

Information

- The exchange of information/IP between stakeholders is **confidential**
- Information/IP exchanged should **be digital** . In case its physical it should be convertible to digital format

Business Scenarios

Process streamlining

- Disparate internal systems to enable E2E processes
- Unstandardized means of communication with external stakeholders (e.g. email , physical documents)
- Multiple & disparate external stakeholder systems interacting with current system
- Inefficient E2E process

Supply chain visibility

- Inability to trace product end to end
- Counterfeit products entering supply chain
- Wastage /thefts due to lack of visibility
- Reputation management
- Lack of Immutable Audit Trail

IP Management

- Unstandardized means of sharing confidential documents
- Instances of tampering of these documents
- Delays caused due to disintegrated means of transfer
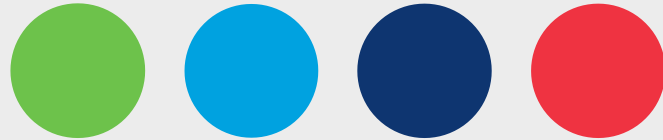- Lack of Audit trail/ real time visibility of documents

Contract Management

- Cumbersome and slow contract authoring process
- Inability to track T & C of contracts

IOT Blockchain for Supply chain

- IoT captures confidential data
- IoT security is a concern

Case Studies

Dubai Based Trade Facilitator

BACKGROUND

The client is a global trade and logistic firms at one of the largest ports. Their biggest concern is to reduce the approval time during any transaction. They manage all the crucial details of the trade operations such as voyage details, cargo & berth ops via legacy systems and are looking for a more reliable and faster means to expedite the clearance process

CHALLENGES

- Delay in information passed to the outside stakeholders

- Information silos between participating entities

SOLUTION

One stop Trade Facilitation e- portal integrated with private permissioned blockchain to record trade transactions and keep track of logistics process in real-time.

BENEFITS

- Real time Information Exchange

- Reduction in approval delays and other manual overheads

- Authorities are provided with real time information 24*7

Port Authority

Freight Forwarders/ Haulers/Agents

Vessel Authority

Customs
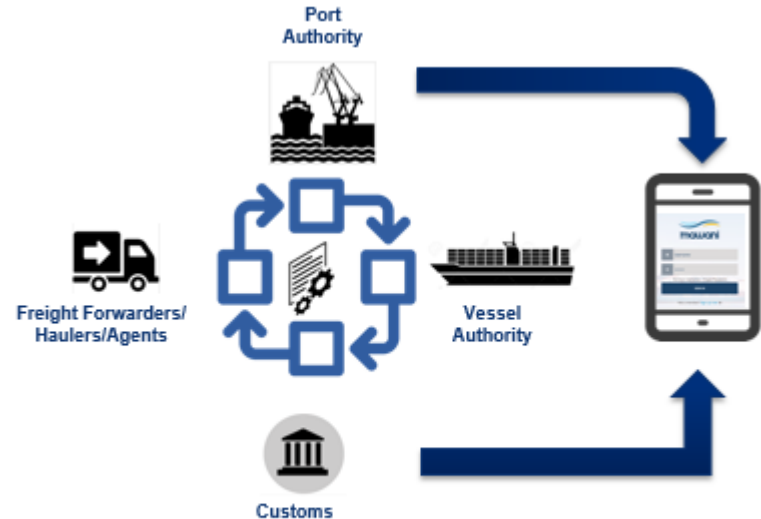
Track and Trace for a FMCG client

BACKGROUND
Huge number of original products being replaced by counterfeit products during shipping. In some cases, the product inside the genuine packaging was replaced with a counterfeit, in other cases, the packaging itself was copied to look like genuine and a fake product was placed inside

CHALLENGES
- Determining the exact location where the counterfeiting took place.
- Lack of a channel which would assure the customers that they are buying a genuine product.

SOLUTION
- Blockchain based tracking solution that enables each supply chain partner to update the status of the item as it traverses from point of manufacture to point of sale
- Business logic that determines if the product is genuine / counterfeit – logic would be embedded in the smart contracts
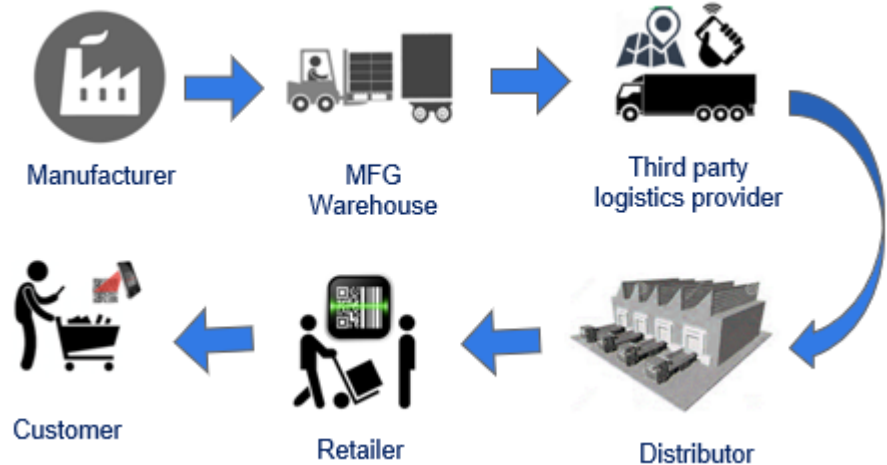
BENEFITS
- Real time tracking of goods
- Ease of use for all parties in the supply chain
- Greater trust between participants
- Customer facing solution that enhances the brand value for the client and increases customer confidence.

Manufacturer → MFG Warehouse → Third party logistics provider → Distributor → Retailer → Customer

# Information Exchange for a pharma Company

BACKGROUND

The client is a global Pharmacy giant based out of Germany focused on building pharma products. The client was in look out for a solution that can help them in seamless exchange of information between internal and external departments during drug launch process and providing them with real time visibility

CHALLENGES

- This is extremely labor and time intensive process for the involved departments.

- The current departments work in silos.

- Thus, each department maintains their own source of data.

- There is a lot of data overlap and inconsistencies, without any clear visibility across the organization of the one true picture

SOLUTION

Private blockchain based network consisting of key stakeholders for seamless transfer of information and between the involved entities and departments

Regulatory Access

Market Access

Blockchain network

Marketing Department

Medical Department

Sales

SCM
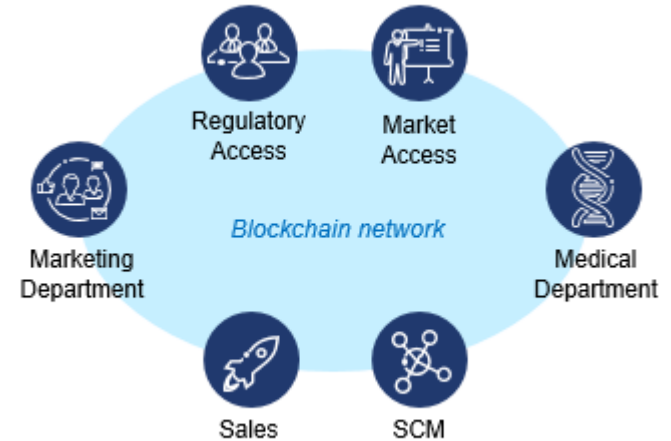
BENEFITS

- All the approval process activities and information get tracked real-time.

- The common repository of the approval process across all entities gives an instant trace on the latest status of the process

Thank You