New Approach to SCM (Supply Chain Management) using Blockchain.

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Area :- Blockchain

Content

Abstract

Blockchain is a recently introduced concept . Initially popularized by Bitcoin , Blockchain is more than the foundation of cryptocurrency . It offers a secure way to exchange any kind of good, services or transaction .It felicitates smart contract, engagements and agreements with inherent , robustness .

Introduction

Wikipedia defines Blockchain as “A decentralized and distributed digital ledger that is used to record transactions across many computers so that the record cannot be altered retroactively without the alteration of all subsequent blocks and the collusion of the network.”

Introduction

Append-only distributed system of record shared across business network

A network of trusted, neutral participants maintains a distributed, permissioned ledger with copies of document filings, relevant supply chain events, authority approval status, and full audit history; every change results in a new, immutable block.

Ensuring appropriate visibility; transactions are secure, authenticated & verifiable

Cryptography enables permissioned access for only participating parties in a specific shipment can submit, edit or approve related data

Business terms embedded in transaction database & executed with transactions

The export and import documentation requirements and authority approvals are pre-programmed and built into Blockchain and distributed to and endorsed by the network

Transactions are endorsed by relevant participants

Information such as documentation filings and authority approvals can only be changed if endorsed by the parties taking part in the shipment; full audit history maintained on the Blockchain

Introduction

Supply chain management (SCM) is the active management of supply chain activities to maximize customer value and achieve a sustainable competitive advantage SCM involves a series of key activities and processes that must be completed in an efficient and timely manner. Otherwise, product will not be available when needed by consumers.

Introduction

The Early Years

In the 1940s and 1950s, the focus of logistics research was on how to use mechanization to improve the very labor intensive processes of material handling and how to take better advantage of space using racking.

The Technology Revolution

The logistics boom was fueled further in the 1990s by the emergence of Enterprise Resource Planning (ERP) systems, result of this change to ERP systems was a tremendous improvement in data to gain a competitive edge.

Logistics Comes of Age

Early 1980s provided tremendously better computer access to planners and a new graphical environment for planning. Company executives became aware of logistics as an area where they had the opportunity to significantly improve the bottom line

Introduction

Globalization and Supply Chains

Recognition of the term "supply chain" has come primarily as a result of the globalization of manufacturing This growing association of supply chain management with strategy is reflected in the Council of Logistics Management's changing

Future

Mathematical algorithms will automate Supply Chain planning processes and accelerate the decision-making The technology and analytics will fuel algorithmic business, that means hiring data scientists and investing in advanced business intelligence tools is must.

Now

Today Supply Chain Management is expanding its domain and also includes services such as:

- Operational Analysis and Design Materials Handling
- Distribution Strategy
- Warehouse Design Project Management

Literature Survey

Sr No.	Name Of Author	Paper	Year	Applications	Reference Links
1	S. Nakamoto	Bitcoin: A Peer-to-Peer Electronic Cash System,	Oct,2008.	cryptocurrency	https://bitcoin.org/bitcoin.pdf
2	IBM	THE SMARTER SUPPLY CHAIN OF THE FUTURE	2017	Trace drug in every stage of supply chain	https://www-03.ibm.com/
3	Aziz Muysinaliyev, Sherzod Aktamov	Supply chain management concepts: literature review	Jan. 2014	SCM	http://www.iosrjournals.org/iosr-jbm/papers/Vol15-issue6/I01566066.pdf

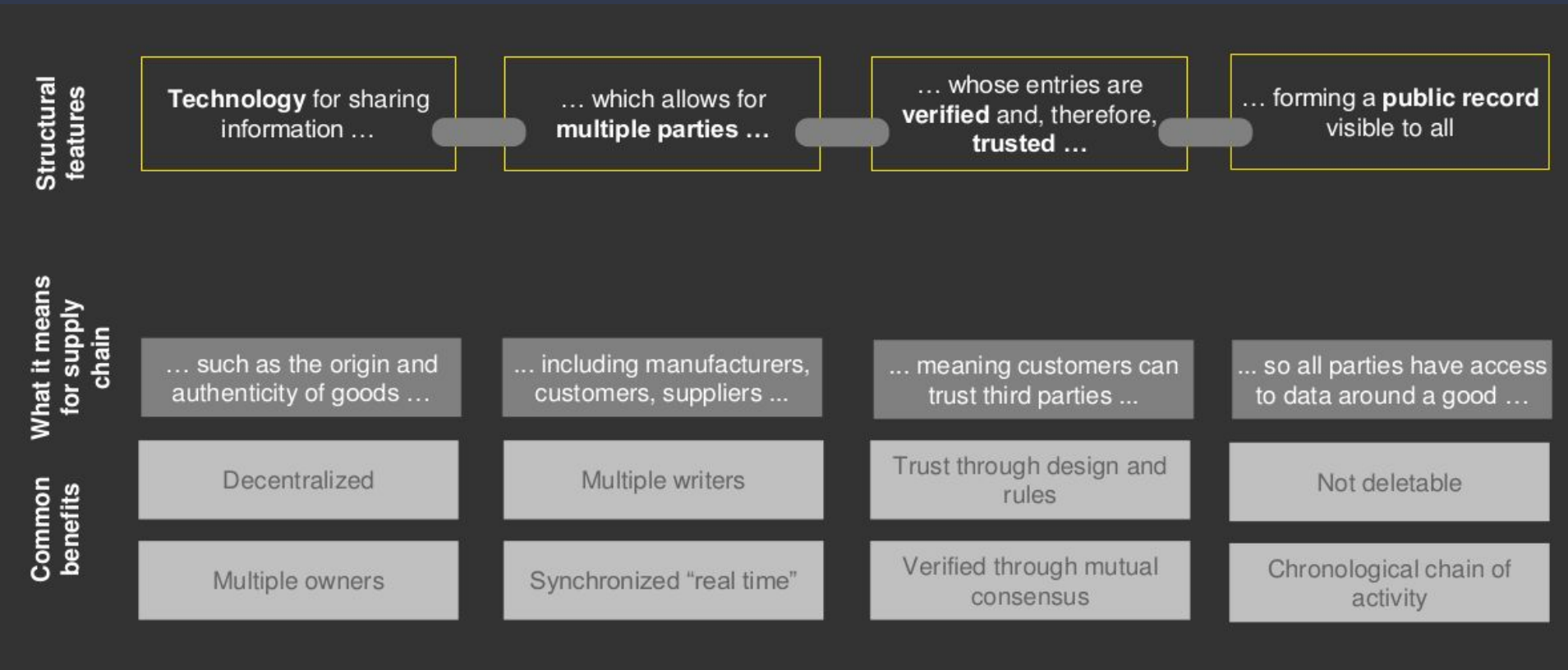
Literature Survey

Sr No.	Name Of Author	Paper	Year	Applications	Reference Links
4	Mayra Samaniego , Ralph Deters	Blockchain Based Framework For Data Sharing	Dec. 2016	IOT	https://ieeexplore.ieee.org/document/7917130
5	SHANGPING .W YINGLONG .Z, YALING ZHANG	Blockchain Framework For Data Sharing	2018	Secure Data Transfer	https://ieeexplore.ieee.org/document/8292361
6	Stefan Hickmott, Chad Fernandez, Alex Norta	Commercial Property Tokenizing With Smart Contracts	2018	Real-Estate Market	https://ieeexplore.ieee.org/document/8489534

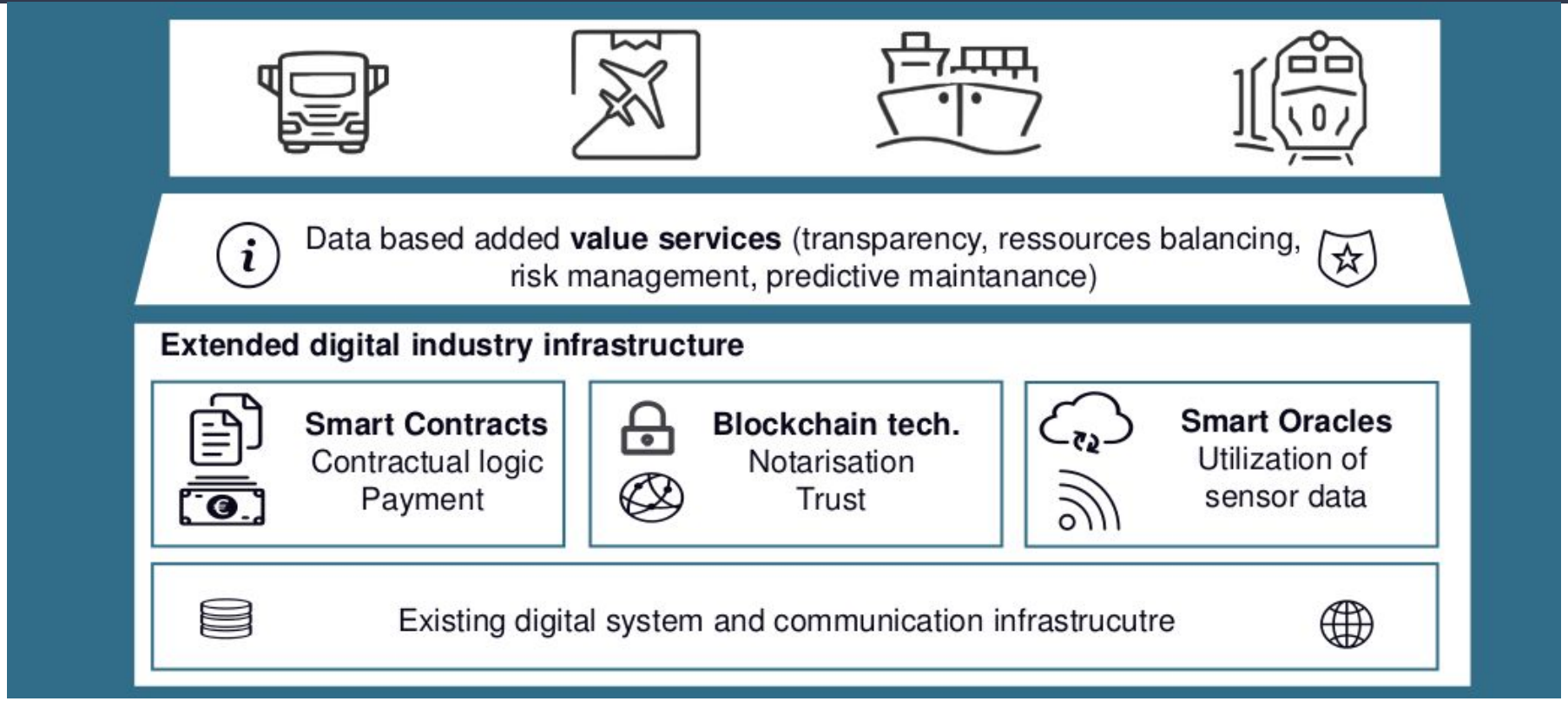
Motivation

- **Margin erosion and sudden demand changes:** Rapidly changing environments requires businesses to quickly react to sudden demand changes on an increasing frequency. With globalization came fiercer competition that put pressure on margins.
- **Ripple effect due to extended value chain:** Due to extensive supply chains, companies are facing significant variability risks. Several layers of stakeholders, including suppliers, distributors, and customers, significantly increase the supply chain risk.
- **Ineffective supply chain risk management:** Building effective supply chain risk management programs are key to accurately monitor and predict risk in order to react properly.
- **Lack of end-to-end visibility:** Companies are struggling to have a clear overview on their supply chains—both internally and externally. This exposes them to different kinds of risks such as fraud, code of conduct violations, andmore.
- **Obsolescence of technologies:** Advanced supply chain management tools require significant and continuous investment. This also goes with inherent implementation risks that pose a major challenge for most businesses.

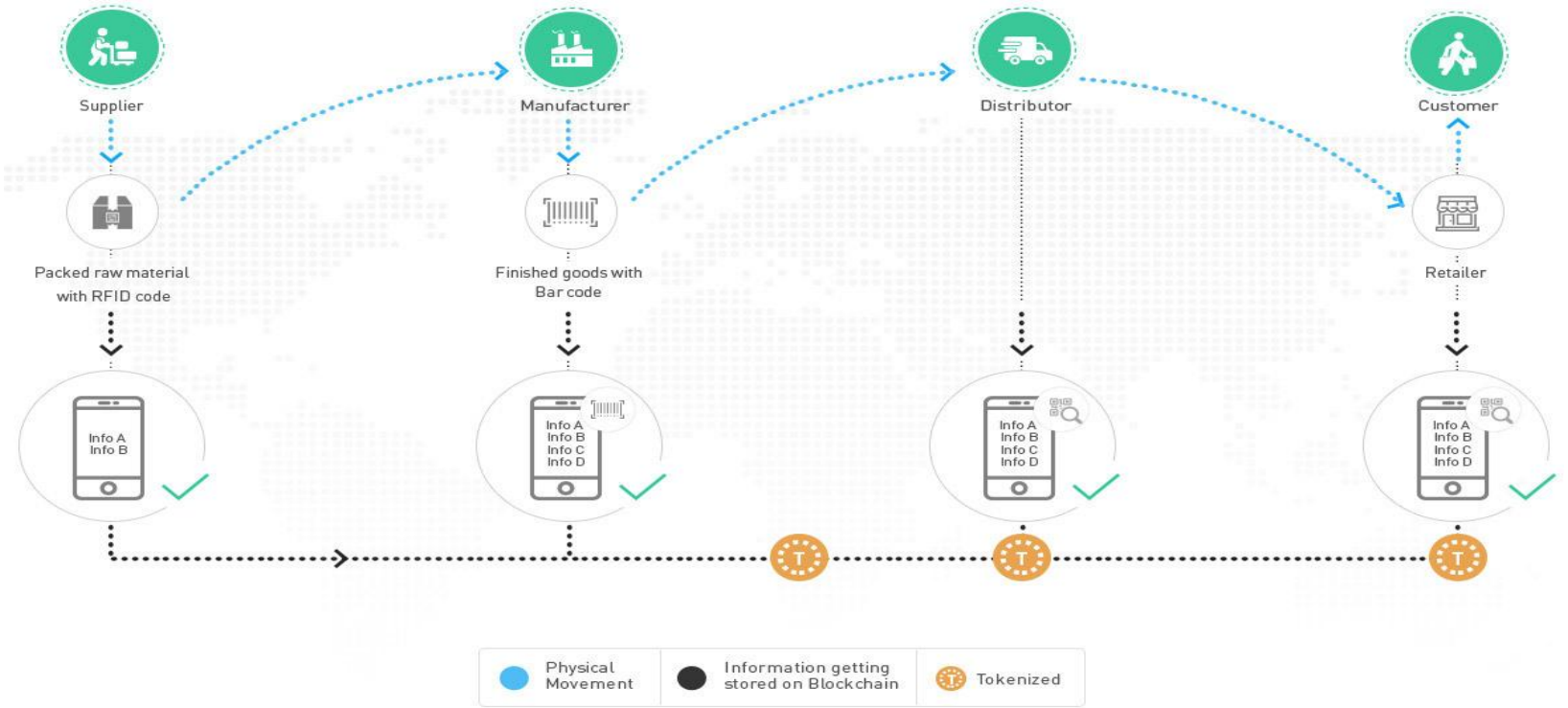
Blockchain solution



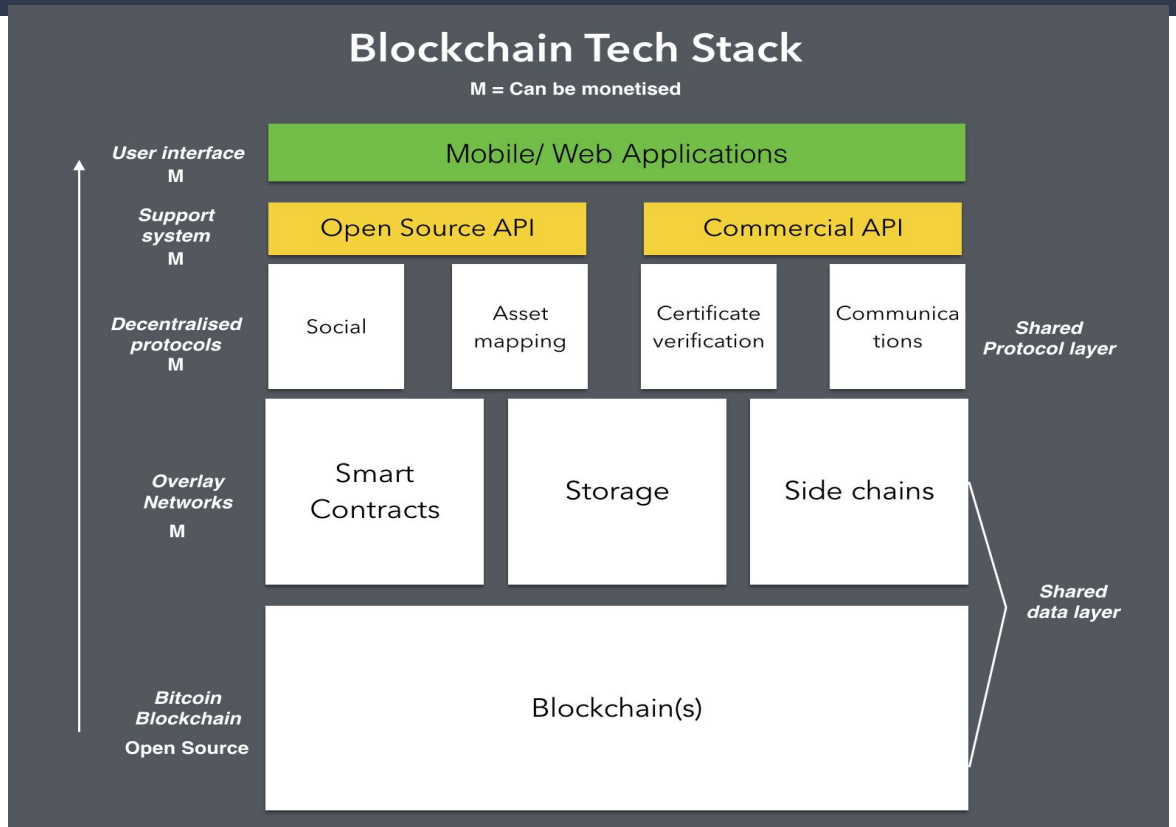
Proposed system



Flow of proposed system



Technology stack



Advantages

- 1. Automating the purchase process
- 2. Improving transaction flow
- 3. Securing the supply chain
- 4. Ensuring integral traceability
- 5. Being more reactive
- 6. Streamlining internal documents

Disadvantages

- Ecosystem still in progress
- Technology and knowhow
- Initial Costs
- Awareness and understanding

Applications

- Supply chain product certification
- blockchain-powered, industrial Internet of Things
- tracking and traceability of goods
- supply chain smart contracts
- Chain of shipping

THANK YOU