

Blockchain Workshop/Conference

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Chapter 8 - Maritime – Use of Blockchain

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Most of the world's foreign trade is transported by sea

In recent years, there has been an increase in maritime trade.

- The rapid expansion of e-commerce
- Larger ships and Expansion of container terminals.
- liner shipping alliances

The supply chain in maritime trade involves many parties

Direct partners: Carriers, Ships agents, Forwarding agents, Shippers/consignees /notify, Terminal operators, Warehouse storage keepers

- **Service providers:** Boatmen, Pilots, Tugboats, Lashers
- **Hinterland transport operators:** Road, Rail, Barge
- **Government agencies/ Inspection authorities**
Customs, Veterinary, Police, Ministry of transport/health/
Environmental Protection, Port authorities, Coastguard, Emergency services
- **Supporting services:** Banks, Insurance companies

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Existing digital solutions at the maritime trade

- 1. Shipping portals (Intra, GT Nexus, Cargo Smart and others)** . electronic transaction platforms, which provide essential digital processes for booking, tracking & tracing and documentation between customers and carriers.
- 2. National Single Window (NSW)** an environment for the collection, dissemination and exchange of vessel information and/or cargo declarations with a commonly defined data structure, rules and management of access rights, which are in accordance with relevant international, national and local legal requirements.
- 3. Port Community Systems (PCS)** Open electronic platforms enabling real-time intelligent and secure exchange of information between public and private stakeholders in order to improve the competitive position of sea and air port communities.

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BLOCKCHAIN OPPORTUNITIES FOR MARITIME TRADE

increases transparency , availability and reliability for all participants.

Blockchain Technology based on the fact that:

A valid transaction stored in a shared ledger will exist in everyone's copy of that ledger

- Transactions saved to a ledger which is then sent to everyone on the network with its updates.
- Enables traceability and preventing manipulation through the public auditability of the system
- Each party know who is handling the document at a given moment.
- Sharing an updated information (container loading, verifies a vessel has actually departed)

BLOCKCHAIN OPPORTUNITIES FOR MARITIME TRADE

More efficient transfer of digital assets

The need for intermediaries as a result of Lack of efficient options to ensure the security of assets (cargo ownership, payments)

Blockchain digital transfer of assets could provide the benefits of quick transfer, and security to both parties.

In case of the loss of a bill of lading, Blockchain allows a carrier to track if an asset (the tokenized bill of lading) was indeed transferred to someone else.

Everything can become an asset

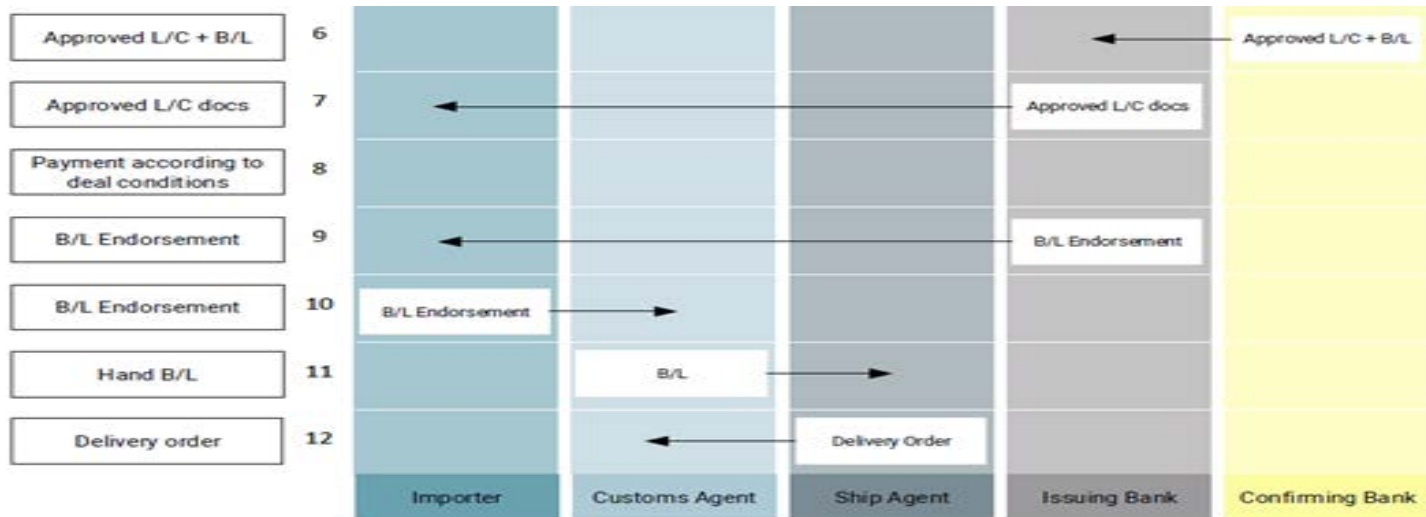
A space reservation, an allocation agreement, the right to pick up or drop-off a container at a terminal, time-slots in terminals



BLOCKCHAIN OPPORTUNITIES FOR MARITIME TRADE

Automation of contractual obligations through Smart Contracts

Current process automation stops at the point, where assets and their legal ownership must be exchanged.



The exchange of goods against payment process is handled through different financial and physical flows. These two flows can be synchronized if both assets exist in a digital form. Swapping of assets can happen through smart contracts.

A bill of lading may be swapped against the payment obligation of the party financing the trade.



BLOCKCHAIN OPPORTUNITIES FOR MARITIME TRADE

Increased security

- Reduce risk of the dependency on physical documents. Lose, forgery, human errors, delay in delivery of physical document.
- Reduce risk of commercial disputes.
 - Original status of BoL or other documents known by all parties.
- Multiple sources to validate and verified information – making forgery much more complex.
- Smart contracts accepted by all members of the consortium
 - A bill of lading may be issued by one party only
- Data verification, using real Port data (through PCS) like arrival/departure time, reduces risk by receiving online first hand information.

BLOCKCHAIN OPPORTUNITIES FOR MARITIME TRADE

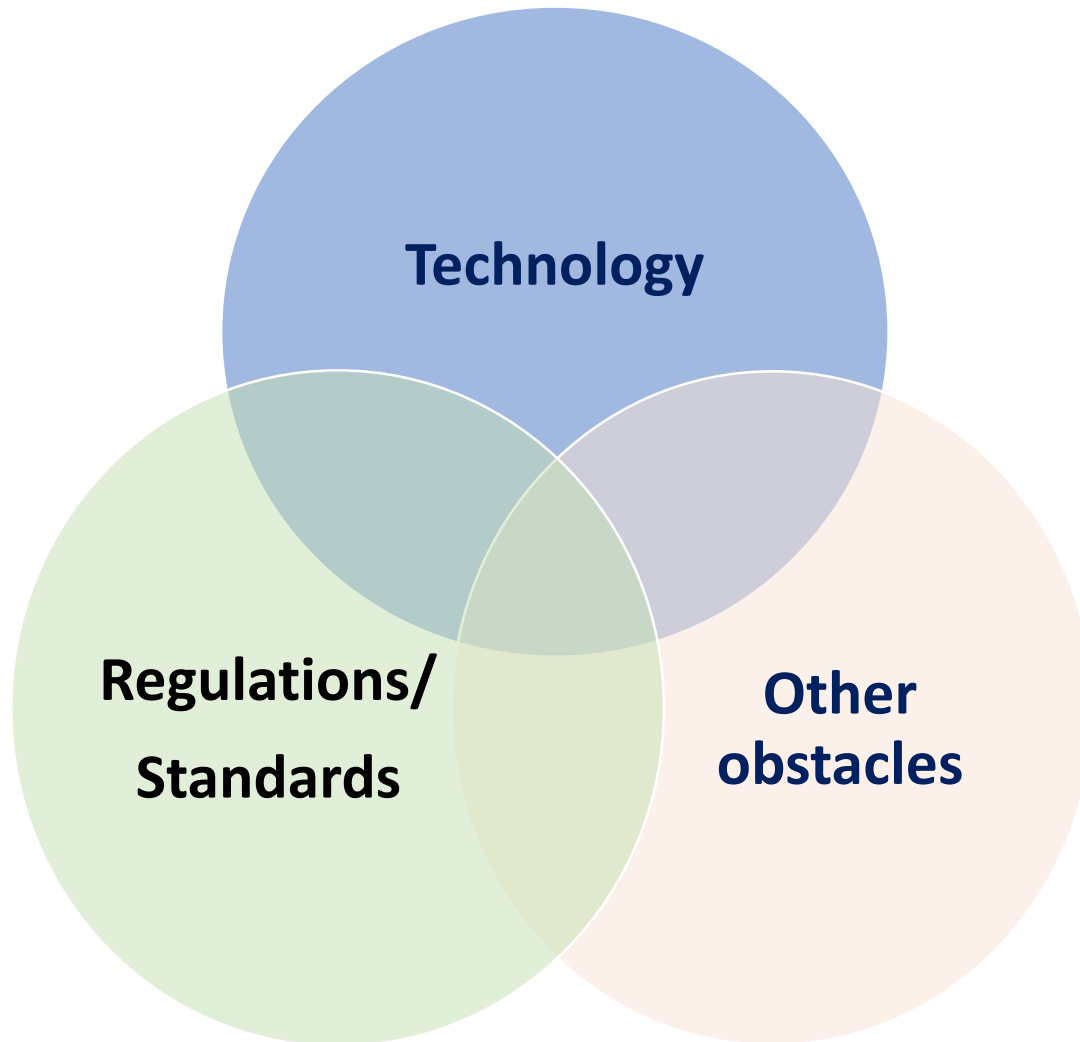
Time and cost reductions



- Reducing documents issuing and delivery costs.
- Reducing handling time (Validate, compare, etc) May lead to reducing handling fees.
- Reduce additional storage fees due to delays. Especially important at short range voyages and where the cargo might wait for the physical documents to arrive. It is even more important with perishable cargo.

The above observations extend to other documents used in the maritime transportation, such as certificates of origin, packing lists, dangerous goods declarations, customs bond documents etc.

CHALLENGES TO IMPLEMENTING BLOCKCHAIN IN MARITIME TRADE



CHALLENGES TO IMPLEMENTING BLOCKCHAIN IN MARITIME TRADE

Technology

- Technology maturity
- Lack of expert developers
- Long transaction confirmation time (Affected by parameters such as Smart contract complexity, validators number, the technology used, etc)
- Interoperability of Blockchain networks- number of co-existing solutions

CHALLENGES TO IMPLEMENTING BLOCKCHAIN IN MARITIME TRADE

Regulations /Standards

- Legal recognition – carriers, Insurance companies, banks and countries are required to adopt new regulations.
- Data ownership, personal privacy, general data protection regulation.
- Multiple players with different technology adoption.
- Missing open standards - Data Definitions should comply with currently used international standards (maritime industry is UN/EDIFACT and the Core Component Library of UN/CEFACT).

CHALLENGES TO IMPLEMENTING BLOCKCHAIN IN MARITIME TRADE

Other obstacles

- Need to change business processes
- Creation of EcoSystem on both sides of the ocean
- Using blockchain when needed

BLOCKCHAIN INITIATIVES IN MARITIME TRADE

The projects focus primarily on two related elements:

1. Paperless Trade digitizes and automates paperwork filings
2. Improving operational processes

ANNEX 8.1 – Blockchain based Digital Bill of Lading – IPCSA initiative

ANNEX 8.2 – Global Trade Digitization (GTD) – Maersk and IBM initiative

ANNEX 8.3 – Blockfreight.com - Open Blockchain & Network for Containers

ANNEX 8.4 –WaveBL – Blockchain Bill of Lading

ANNEX 8.5 – Port of Antwerp blockchain pilot

ANNEX 8.6 – 300cubits – TEU cryptocurrency

ANNEX 8.7 – SmartLog - Muuga Harbour, Tallin, Estonia

ANNEX 8.8 – SOLAS VGM

ANNEX 8.9 – SAP Blockchain based ocean shipping in international trade

USE CASES (1)

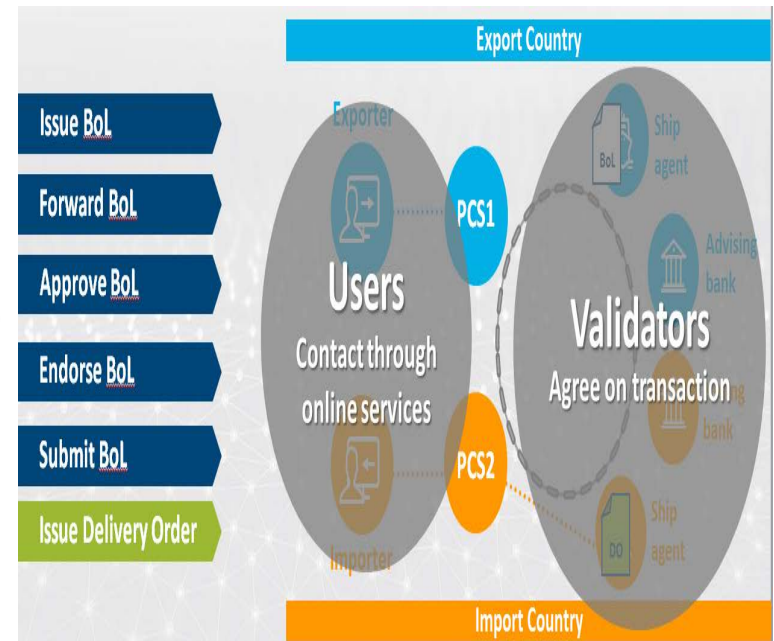
Blockchain based Digital Bill of Lading – IPCSA initiative

BoL - A negotiable document ,used in international trade to ensure receiving payment against receiving merchandise.

PCSs added value to Blockchain processes

- Existing trusted networks for process harmonization and integration
- Adding real time port processes information to reduce risk
- Bridge different technology adoption levels
- Gateway for local and global network
- Gateway to government authorities

Permissioned Blockchain





USE CASES (2)

SmartLog - Muuga Harbour, Tallin, Estonia

Monitoring in real time loading, customs processing and pre-shipment of export containers.



Permissioned Blockchain , IBM Hyperledger (local not IBM cloud services)

Status:

- The project was planned for three years ending in December 2019.
- demonstration was performed at Muuga Harbour in Estonia (Estonian customs weren't integrated).

Benefits from blockchain use

No automated data exchange link between

- trucking companies and other participants
- two digital ecosystems - customs system and port's single window platform





Recommendations



Blockchain **is** a Game Changer in the Maritime trade
But it is not the solution for all problems

Progress is required on two main issues





Thank you

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