



maeil^{||}



#blockchain in Transportation and Logistics

NEXUS eBL and NEXUS eCMR





Agenda

eBL & eCMR

Problems/Challenges with BL and CMR
Strengths of eBL and eCMR

Blockchain

Problems/Challenges with regular solutions
Benefits of using Blockchain

Project State

Calendar
Prototype

Interoperability

DCSA Standards
Other blockchain solutions

SWOT Analyses

CargoX
WaveBL

BL

A bill of lading is a document accompanying freight that states the agreement between the shipper and the carrier and governs their relationship when goods are transported.

1. always, as a **receipt** that the goods have been loaded as per the contract and the goods are received in good condition;
2. sometimes, as an **evidence** of the terms of the carriage contract;
3. sometimes, as a **document** of title to the goods

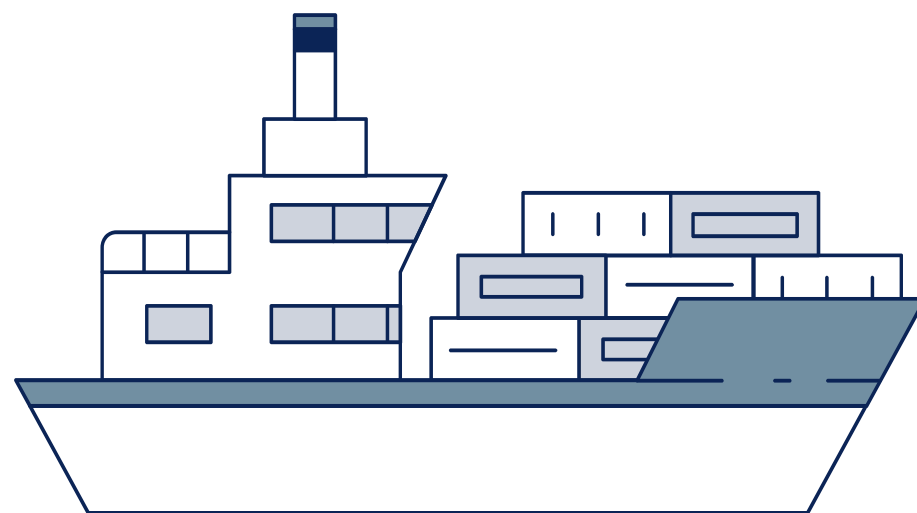
It's still not digital, is printed in several copies (6) and sent by plane to the final destination to the company which the cargo is consigned, to collect the goods!

BL exists (in paper) since 1600's.

Date: _____		BILL OF LADING				Page 1 of _____					
SHIP FROM						Bill of Lading Number: _____ BAR CODE SPACE					
Name: _____											
Address: _____						CARRIER NAME: _____ Trailer number: _____ Seal number(s): _____					
City/State/Zip: _____											
SID#: _____		FOB: <input type="checkbox"/>				SCAC: _____ Pro number: _____					
SHIP TO											
Name: _____		Location #: _____				BAR CODE SPACE					
Address: _____											
City/State/Zip: _____						Freight Charge Terms: (freight charges are prepaid unless marked otherwise) Prepaid _____ Collect _____ 3 rd Party _____					
CID#: _____		FOB: <input type="checkbox"/>									
THIRD PARTY FREIGHT CHARGES BILL TO:						Master Bill of Lading: with attached underlying Bills of Lading <input type="checkbox"/> (check box)					
Name: _____											
Address: _____						SPECIAL INSTRUCTIONS: _____					
City/State/Zip: _____											
CUSTOMER ORDER INFORMATION											
CUSTOMER ORDER NUMBER	# PKGS	WEIGHT	PALLET/SLIP (CIRCLE ONE)		ADDITIONAL SHIPPER INFO						
			Y	N							
			Y	N							
			Y	N							
			Y	N							
			Y	N							
			Y	N							
			Y	N							
			Y	N							
GRAND TOTAL											
CARRIER INFORMATION											
HANDLING UNIT		PACKAGE		WEIGHT	H.M. (X)	COMMODITY DESCRIPTION		LTL ONLY			
QTY	TYPE	QTY	TYPE			<small>Commodities requiring special or additional care or attention in handling or stowing must be so marked and packaged as to ensure safe transportation with ordinary care. <i>See Section 2(e) of NMFC Item 380</i></small>		NMFC #	CLASS		
RECEIVING STAMP SPACE											
GRAND TOTAL											
Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property as follows: "The agreed or declared value of the property is specifically stated by the shipper to be not exceeding _____ per _____."						COD Amount: \$ _____					
						Fee Terms: Collect: <input type="checkbox"/> Prepaid: <input type="checkbox"/> Customer check acceptable: <input type="checkbox"/>					
NOTE Liability Limitation for loss or damage in this shipment may be applicable. See 49 U.S.C. = 14706(c)(1)(A) and (B).											
RECEIVED, subject to individually determined rates or contracts that have been agreed upon in writing between the carrier and shipper, if applicable, otherwise to the rates, classifications and rules that have been established by the carrier and are available to the shipper, on request, and to all applicable state and federal regulations.						The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.					
SHIPPER SIGNATURE / DATE						Trailer Loaded:		Freight Counted:		CARRIER SIGNATURE / PICKUP DATE	
<small>This is to certify that the above named materials are properly classified, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the DOT.</small>						<input type="checkbox"/> By Shipper <input type="checkbox"/> By Driver		<input type="checkbox"/> By Shipper <input type="checkbox"/> By Driver/pallets said to contain <input type="checkbox"/> By Driver/Pieces		<small>Carrier acknowledges receipt of packages and required placards. Carrier certifies emergency response information was made available and/or carrier has the DOT emergency response guidebook or equivalent documentation in the vehicle. <i>Property described above is received in good order, except as noted.</i></small>	

eBL

An electronic Bill of Lading (eBL) is a paperless Bill of Lading electronically issued instead of a traditional one, printed on paper and physically issued as a hard copy, shared with all entities, guaranteeing same functionality.



CMR

The CMR note is the standard contract of carriage for goods being transported internationally by road.

The CMR was signed in Geneva, 19 May 1956. According to this convention, the CMR document is obligatory if either the country of departure or destination has signed the convention.

CMR logistics regulates the entirety of the general conditions relative to international transport of goods by road.

1. Sender (Name, Address, Country) Godsavsändare (namn, adress, land)		INTERNATIONAL CONSIGNMENT NOTE INTERNATIONELL FRAKTSEDEL				
Arapak AB Skepptuna Borgen 131 S-195 93 Märsta Sweden		16. Carrier (Name, Address, Country) Fraktörare (namn, adress, land)		This carriage is subject, notwithstanding any clause to the contrary to the Convention on the Contract for the International Carriage of goods by road (CMR). Denna transport är utan hinder av annat må vara avtalat, underkastad bestämmelserna i Konventionen om fraktavtalet vid internationell godsbefordran på väg (C.M.R.).		
2. Consignee (Name, Address, Country) Godsmottagare (namn, adress, land)		17. Successive carriers (Name, Address, Country) Efterföljande fraktörare (namn, adress, land)				
3. Place of delivery of the goods Godsets leveransort		18. Carrier's reservations and observations Fraktörarens reservationer och anmärkningar				
4. Place and date of taking over of the goods Plats och datum för övertagande av godset						
5. Annexed documents Bifogade dokument						
6. Marks and Nos Märke och nummer	7. Number of packages Antal kולי	8. Method of packing Emballeringsätt	9. Nature of the goods * Godsets art	10. Statistical num. Statistiskt nr.	11. Gross weight in Bruttovikt i kg	12. Volume in m3 Volym i m3
CMR						
13. Sender's instructions (Customs and other formalities) Avsändarens instruktioner (tull och andra formaliteter)		19. To be paid by: Att betala av:		10. Statistical num. Statistiskt nr.		
		Carriage charges Frakt		Sender avsändare		
		Supplem charges Tillägg		Currency kurs		
		Other charges Extra kostnader		Consignee mottagare		
		Miscellaneous Diverse				
		Total to be paid Totalt att betala				
14. Cash on delivery Efterkrav		20. Special agreements Särskilda överenskommelser (se även baksidan)				
15. Directions as to payment for carriage Fraktbetalningsföreskrift (leveransklausul)		21. Established in Utfärdat i		24. Goods received Godset mottaget		
		on datum		Date datum		
22. Signature and stamp of the sender Avsändarens underskrift och stämpel		23. Signature and stamp of the carrier Fraktörarens underskrift och stämpel		Signature and stamp of the consignee Underskrift		

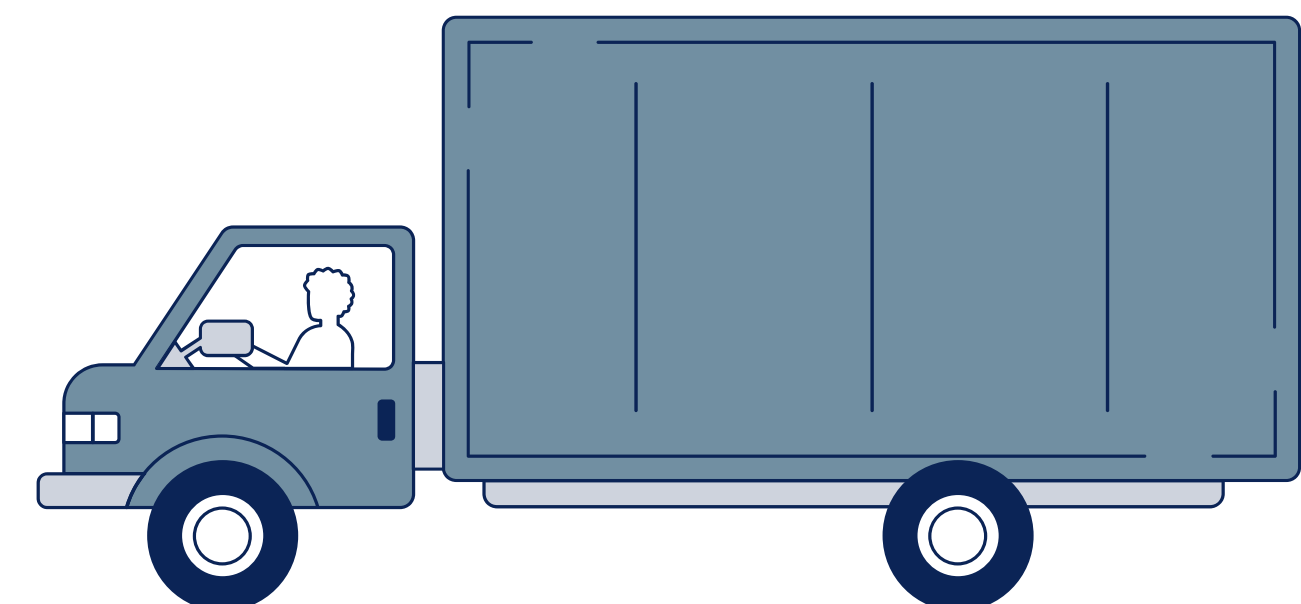


eCMR

An electronic CMR (eCMR) is a paperless CMR electronically issued instead of a traditional one, printed on paper and physically issued as a hard copy.

Ratified by 33 countries worldwide.

On Wednesday 27th of November 2019, the European Parliament and the European Council have agreed and accepted on making the use of digital consignment notes mandatory. The digital consignment note is expected **to be mandatory in 2026**.



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Printed BL/CMR Challenge/Problem

* Delivery

The cargo may arrive before the BL is in possession of the importer.

* Cost/Time

A Bill of Lading is usually sent three times through a courier, each time costing a certain amount of money and time.

* Document integrity

It can be lost, damaged, or destroyed during transport.

* Data security

Can be forged.



eBL/eCMR Strenghts

* Instant delivery

A Bill of Lading is usually sent three times through a courier, each time costing a certain amount of money and time.

* Document integrity

Another important strength is that it cannot be lost, damaged or destroyed during transport

* Low cost

Since there are no courier fees or insurance costs, the Digital Container Shipping Association estimated a total of four billion dollars annual savings at a 50% adoption rate for the container shipping industry alone (DCSA, 2020)

* Data security

Forgery is way more difficult in eBLs when compared to paper ones.



Technology ⁰¹

Challenge/Problem



Mutable Data

Changes to data are allowed in regular databases.

02

Transparency

Only allowed players can see the data.

03

Auditability

No way to ensure data has not changed.

04

Centralized

Regular systems are controlled by either a single or a select group of organizations

05

Security

It can be hard to ensure the origin and state of the document is valid and audited

Why Blockchain



01

Immutable

The use of timestamps and cryptographic mechanisms render the ledger virtually immutable.

02

Transparency

All the players can read the information.

03

Auditability

Previously written information cannot be deleted or modified

04

Interoperability

Different systems and application can access a comun data point.

05

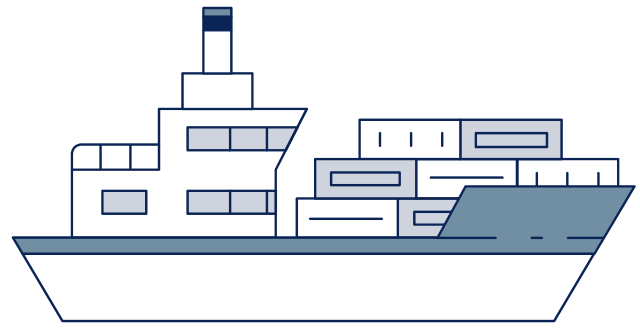
Decentralized

Does not require full trust on a single entity.

06

Security

Digital signatures are much more secure than the traditional company rubber stamps and handwritten signatures.



Project State



SWOT analysis

Current blockchain solutions

Decisions

Definition of preferred solutions and technical specifications

Next steps...

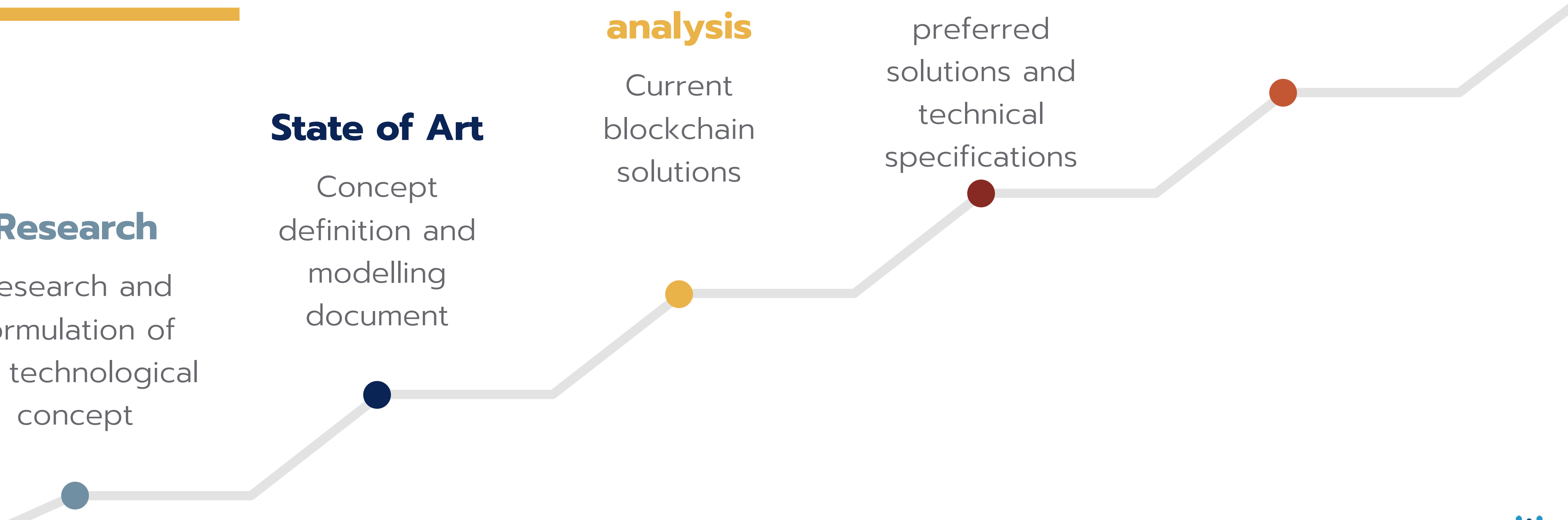
Development,
Testing,
Promoting...

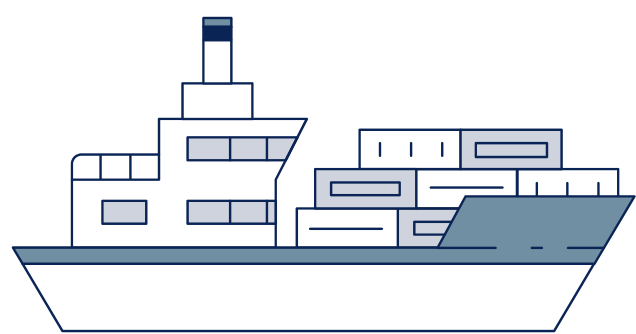
State of Art

Concept definition and modelling document

Research

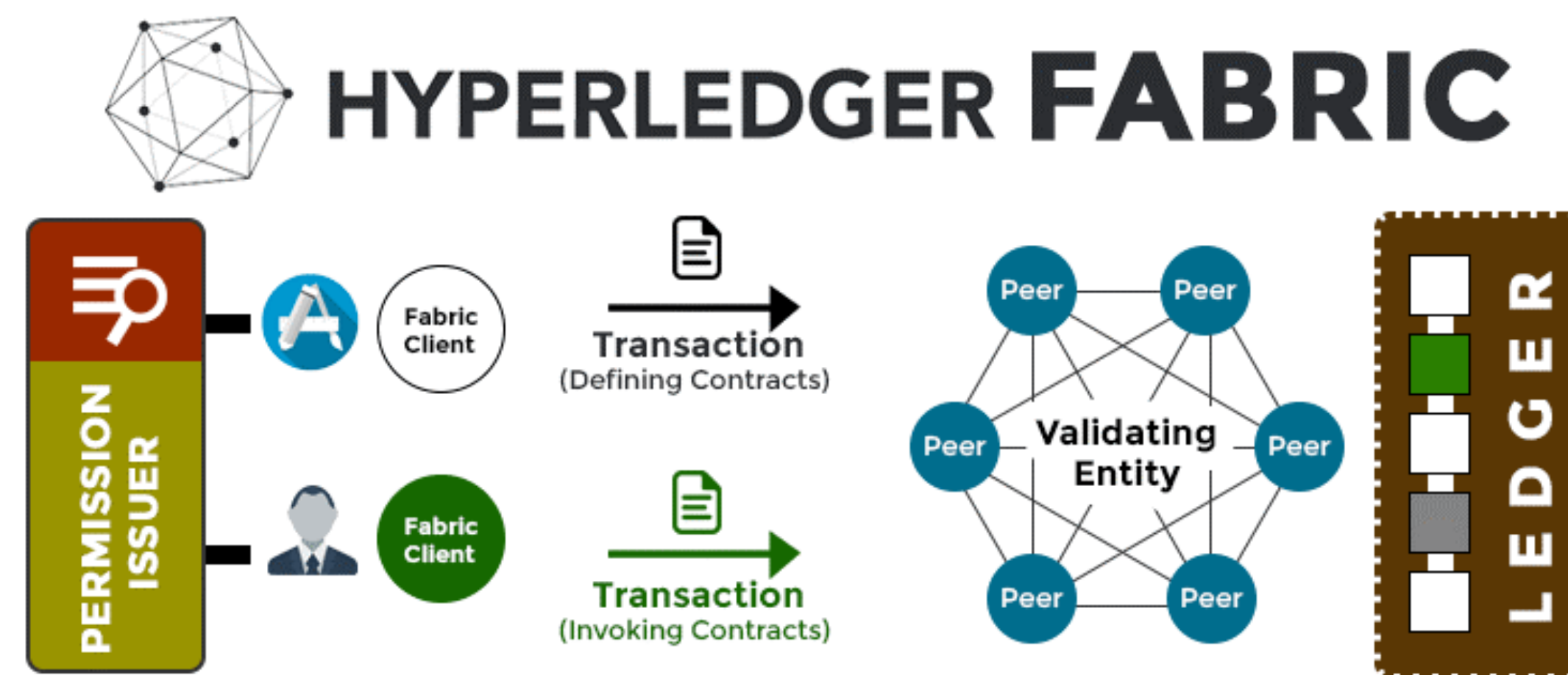
Research and formulation of the technological concept





Project Prototype

We have made a prototype project consisting on a Hyperledger/Sawtooth blockchain node network with a transaction processor and an application that implements an electronic Bill of Lading system.



Interoperability DCSA Standards

PRESS RELEASE

DCSA's member carriers commit to a fully standardised, electronic bill of lading by 2030

15 FEB 2023

Nine ocean carriers commit to converting 50% of original bills of lading to digital within five years and 100% by 2030 to accelerate the digitalisation of container trade

The purpose is to facilitate digital interconnectivity and seamless data communication that anyone who touches the industry can leverage.

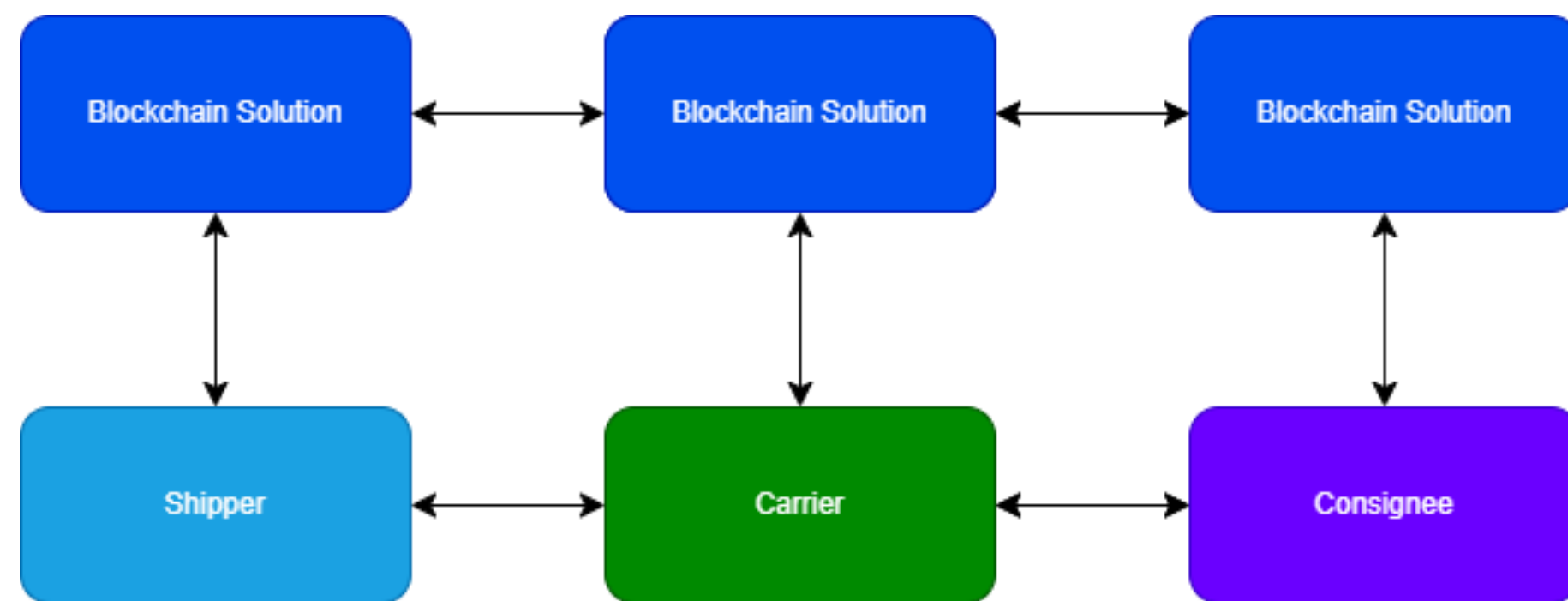
DCSA standards are developed in close conjunction with the member carriers who work with DCSA to ensure widespread adoption.

Interoperability DCSA Members



Our goal is not only for it to be possible to validate other blockchain platform's documents through our blockchain solution, but also be able to interchange trade documents between existing blockchain solutions (CargoX, WaveBL, etc).

We will integrate this solution with other platform NEXUS Webtrans, as a repository for BL's.



Interoperability Other Solutions

The screenshot shows the webTRANS interface with a booking process flow at the top: Create booking (26/06/2023), Booking accepted (26/06/2023), Container inserted (26/06/2023), Create BL (26/06/2023), and BL accepted. Below the flow is a table of shipments:

Shipment	NrPackage	Description	GrossWeight	Measurements
Shipment 1	1	Meds	23100	2120
Shipment 2	2	Meds	46200	4240
Shipment 3	1	Filmes Fotograficos	32280	1420
Shipment 4	1	ORGANIC CRUDE PALM OIL	30,000	139

Below the shipment table is a detailed view of the Bill of Lading (BL) for RENA 201674 3, including shipper and consignee information, and a summary table of goods:

BL No.	Reference No.
RENA 201674 3	

GENERAL AGENTS: NAIP S.A. MATOSINHOS - PORTUGAL

Solution



Total Funding Amount
\$390.1M

Funding Rounds
9

Investors
25

Monthly Visits
15,946

Monthly Visits Growth
19.85%

Clients



Solution

wave BL

Total Funding Amount
\$41.1M

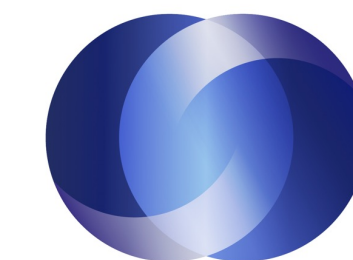
Funding Rounds
5

Investors
16

Monthly Visits
11,571

Monthly Visits Growth
-8.77%

Clients



Surecomp

SWOT Analysis



- Crowdfunded project started in 2018.
- Built over the Ethereum blockchain.
- For smart contracts and to serve as a payment method for logistics services, the company created the ERC-20 token CXO.
- Relies on the security and decentralization provided by open blockchains and smart contracts.
- Document ownership can be transferred using Ethereum's public token ownership transfer capabilities.
- Users can always audit the trail of title transfers and other transactions via blockchain explorers.



- Project started in 2015.
- Built over various blockchains.
- Has no token.
- Wave BL does not have the capabilities to take over ownership of any documents.
- User managed control of data and access.
- Uses blockchain to ensure there's an original copy of the document.
- The receiver gets the document and a token used to validate the document against the blockchain.



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**Thank
you!**