DOCKLAB

ESEP4FREIGHT webinar

Document management and blockchain technologies in an intermodal context

Wout Frijters

Portfolio Owner

Vasteland 100 3011 BP Rotterdam

contact@docklab.nl | +31 6 1600 7682

Outline

1. Docklab
2. Blockchain for business
3. Blockchain applications in logistics
4. Multimodal shipment documentation platform
5. Case study
6. Demonstration

DOCKLAB

DOCKLAB

- Founded in 2017 by Aljosja Beije and Janjoost Jullens
- Started as IT lab of Port of Rotterdam
- Transitioned from lab to incubator
- Some of our work:
  - Electronic bill of lading: amendments in Dutch civil code for acceptance of electronic documents
    - https://dutchblockchaincoalition.org/use-cases/electronic-bill-of-lading-ebl
  - Distro energy: AI driven p2p energy trading
    - www.distroenergy.com
  - Quayconnect: Fully digitalised customs declarations
    - www.quayconnect.io
  - Hydrotwin/FuelForward: Hydrogen and biofuel certification and trading
    - www.hydrotwin.nl
  - ILSA: Community-funding and –ownership of renewable energy assets
    - www.ilsa.tech

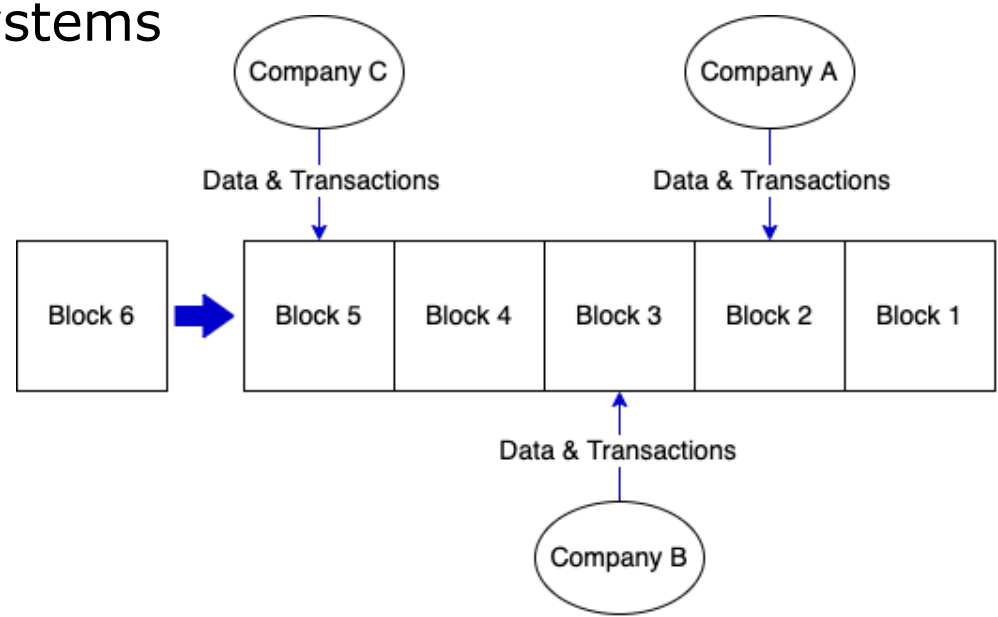
Blockchain for business

What is it?

- A decentralised, incentivized peer-to-peer network of computers that maintain a single, shared ledger, that is updated via blocks of transactions
- Transparant, immutable, timestamped, append-only logging of data and transactions, allowing for trustworthy and traceable recordkeeping

What is the value?

- Trustworthy common frame of reference for siloed systems
- Notarization layer for ownership, value, events
- Integration of the information and financial layer



Blockchain applications in logistics

- Secure digital transfer of Bill of Lading
  - Traditional BL transfer: paper-based, 5-10 days with courier express service
  - eBL transfer: tokenised, less than 24 hours
  - Built on open-source TradeTrust framework, developed by IMDA (Singapore)
- Certification of green hydrogen
  - Token as digital twin of hydrogen batch
  - Key events logged on chain, creating a digital twin of product journey
  - For each event: original document in digital vault, fingerprint logged with events on chain
  - Trustworthy, traceable audit trail for green certification and trading

DOCKLAB

Blockchain applications in logistics

- Multimodal shipment documentation platform (prototype, in collaboration UIRR)
  - One location to digitalise, collect, manage and share documents required for the execution of a shipment
  - Enables all stakeholders to collaborate on the document collection
  - For each attached document or document action:
    - Original document stored in Vault, allowing user to maintain control over document
    - User, action and document fingerprint notarized on chain, providing:
      - Proof of ownership
      - Proof of existence
      - Proof of integrity
- Digital customs declarations
  - Since Brexit, goods imported to UK have undergo full customs checks
  - Preparation, handover and checking of paper documents takes longer than actual shipment
  - Because of digitalisation and notarization of documents:
    - Documents can be handed-over and checked before and during shipment
    - Prevents border waiting times, improves operational efficiency

DOCKLAB

Multimodal Shipment Documentation Platform

Workflow, as demonstrated later

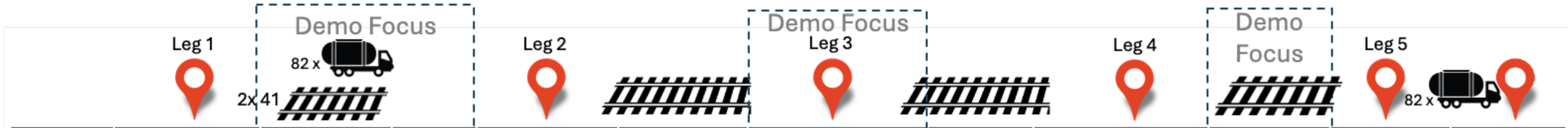
1. User creates and sets up shipment object, including
    a) General shipment information
    b) Container level information
    c) Involved document types on shipment level
    d) Involved documents types on container or carriage level
2. User uploads documentation
    a) On shipment level
    b) On container or carriage level
3. User creates roles for shipment stakeholders (e.g. Customs, CTO, etc)
    a) And assigns privileges for each role (read, confirm, create, or grant roles)
4. Other stakeholders are invited to view, add, and confirm/reject documents

DOCKLAB

Case study: Intercontinental rail transport

- From: Ludwigshafen, Germany
- To: Shanghai, China
- Via: Poland, Russia, Kazakhstan
- 1x pickup, 2x transshipment, 1x delivery
- Cargo: chemicals
- 82 tanker carriages
- Required documents
    - Shipment level
    - Carriage level
    - Translations
    - Amount: hundreds...

Case study

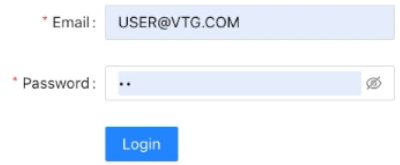


Physical	Pick-up			Main carriage		Transshipment 1		Transshipment 2			Delivery
Role	**Shipper**	**LSP**	**CTO**	**TO**	RU	TO / Customs	RU	TO	RU	TO	Consignee
Name	BASF AG	VTG	Hupac	Duisport	DB / Interrail	PKP Cargo / PL customs agent	UTLC	CN Customs Agent	CN Railway	Ishinu?	BASF CN
Location	Ludwigshafen (DE)			Duisburg (DE)		Malaszewice (PL)		Alashankou (CN)		Shanghai (CN)	Shanghai (CN)
Phase	Pre-carriage (L1)			Main carriage (L2)		Main carriage (L3)		Main carriage (L4)			On-carriage (L5)
Activity	Loading			Mode change		Transshipment		Transshipment		Unloading	Delivery
Product	Hexamoll										
Document originator	☑ Commercial invoice (per con.)		☑ CIM (DE-PL)								
	☑ Packing list (per con.)		☑ SMGS 82x			☐ SMGS 82x					
	☑ Export documents (MRN)	☑ Technical description of goods									
	☑ Certificates (non-DG)	☑ Inspection report tank certificate									
	☑ MSDS (EN + CN)										

ILU Type: Tank container ☐ Matching document example to be provided

LSP: Logistics Service Provider CTO: Combined Transport Operator RU: Railway Undertaking TO: Terminal Operator

Demonstration



DOCKLAB