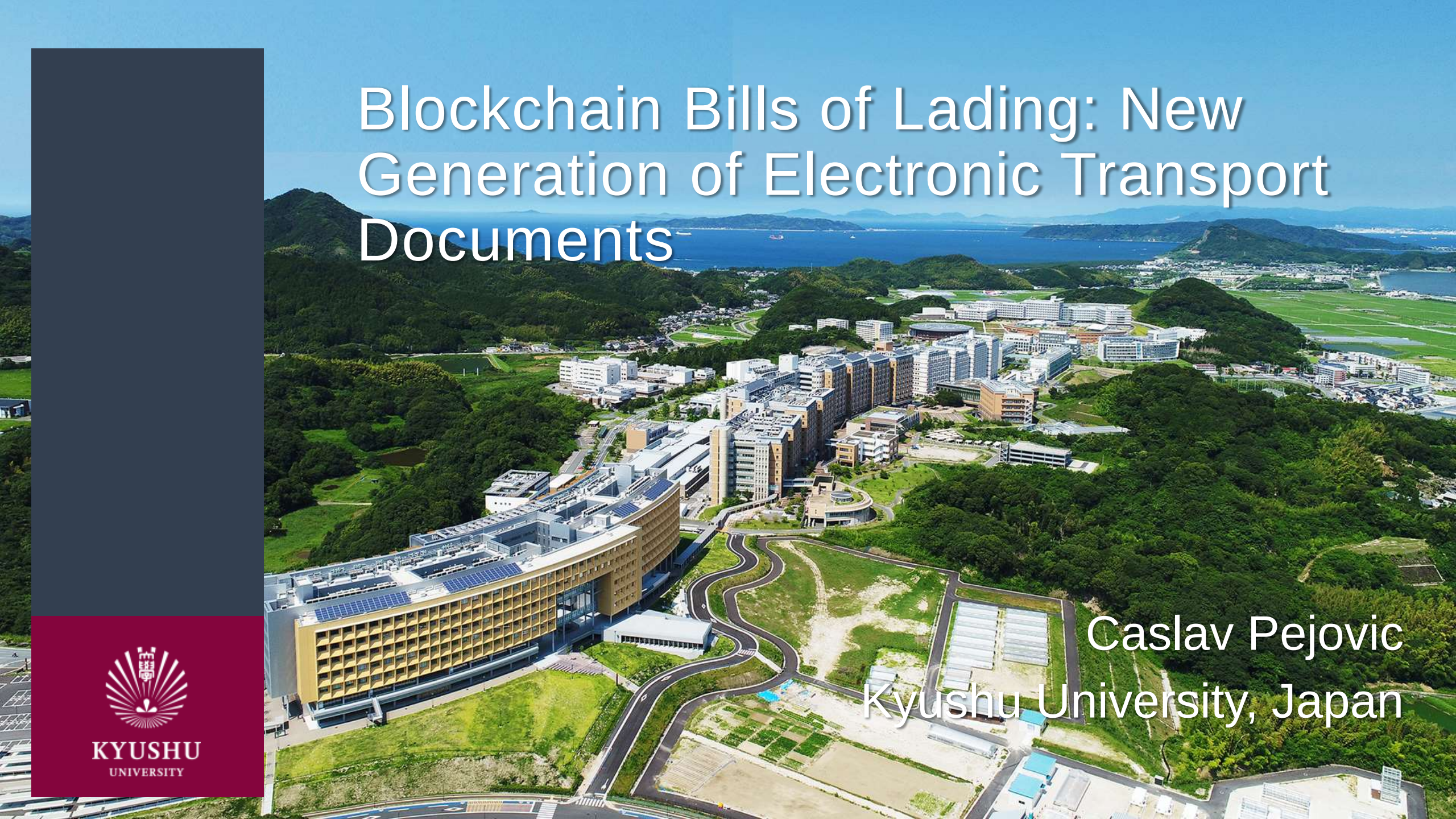
Blockchain Bills of Lading: New Generation of Electronic Transport Documents



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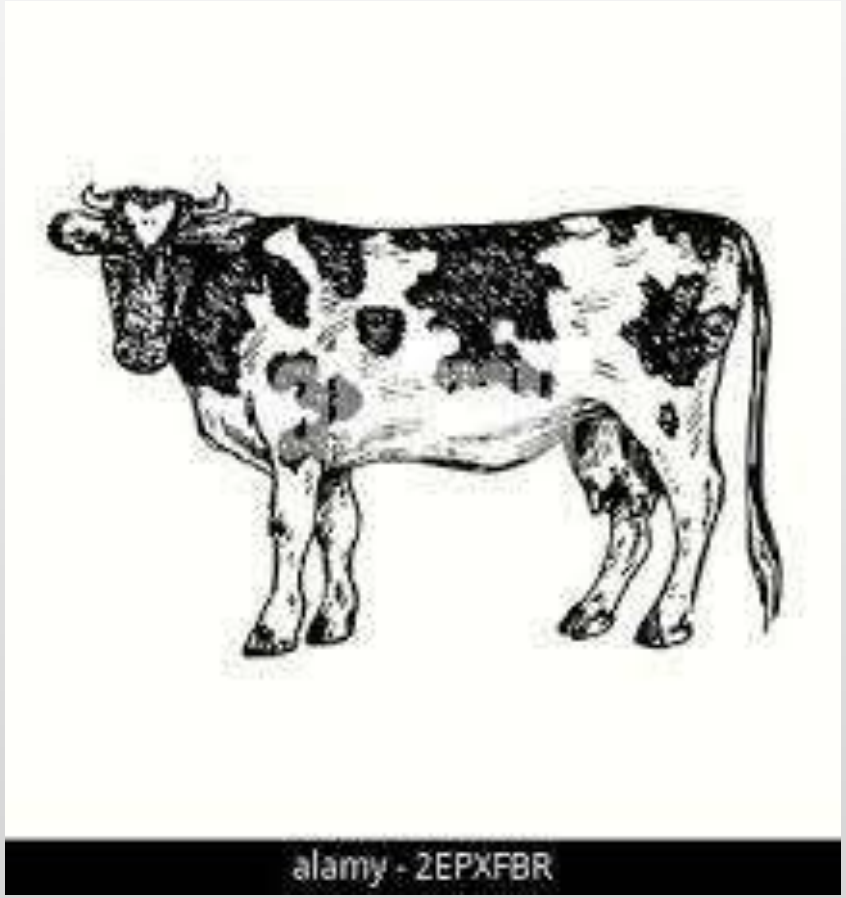
Legal Validity of Writings

"*A legal promise could easily be written down with black ink on a white cow and still be legally valid. The main reason why we do not use such a method is, of course, that it is the most inconvenient to have one's promissory notes feeding on green pastures*"

(Kurt Gronfors)



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Development of Electronic Documents

Development of electronic documents can be divided into three stages with the following approximate dates:

1. 1980 – 2000: first steps of e-commerce - the Electronic Data Interchange (EDI)
2. 2000-2010: introducing the registry model (Bolero launched in 1999)
3. 2010 - : start of blockchain (2008 – Satoshi Nakamoto)

Each period involved technology developments followed by legal reactions

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The First Stage: EDI

- Electronic Data Interchange (EDI) > the exchange of digital information where the data is structured in such a way that it can be automatically understood by the software of the recipient system
- Legal framework based on paper documents > process of adjustment to e-commerce
- UNCITRAL Model Law on Electronic Commerce, 1996:
    - Functional Equivalence Approach
    - Technological neutrality
    - Article 17 addresses transport documents

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Legal Recognition of Electronic Messages

- Revisions of civil procedure rules on evidence and requirements of writing and signatures
- The computer-generated records do not represent **reliable evidence** because they can be easily altered
- After revision of the civil procedure rules, such records are admissible**, if the integrity** of the records is demonstrated
- Legislation on **electronic signatures** in many countries based on the UNCITRAL Model Law on Electronic Signatures, 2001
- Focus on **replicating** the concept of the **original** document

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Starting Point for Replicating Paper B/L

- The main objective is to replicate functions of B/L
    1. Receipt
    2. Evidence of Contract
    3. Document of Title
- Paper B/L is capable of playing these functions **not because it is on paper,** but because of what **it represents and is capable of doing**

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Replicating the Functions of B/L

- Electronic transport documents do not have to perform the functions of paper B/L in **exactly the same way**; they should be able to achieve **the same effects**
- No problems in case of the functions of **receipt and evidence of contracts**
- *Challenging issue*: how to replicate the function of the **document of title?**
- Electronic trade documents being intangible cannot be possessed and function in the same way as paper documents ("possession problem")

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How to Clone an Electronic ‘Document of Title’?

- The concept of **transferability** has been linked to **paper** documents; only something **tangible** can be **physically transferred** from one party to another
- Electronic transport documents require a new **intangible concept of ‘document’** that enables the transfer of rights **without relying on physical possession** of a piece of paper
- Attempts aimed at developing **methods for cloning transferability** of rights in goods electronically

CLONE

Possession > Right of Control

- Right of control includes the right to **dispose** of the goods and the right to **give instructions** to the carrier
- Documents of title rely **on possession** as a reliable way to exercise and transfer the right of control
- The rights represented by a document of title are **embodied** in such a document and derive from the lawful **possession** of the document *(“Das Recht aus dem Papier folgt dem Recht am Papier“)*
- Traditionally, possession can only exist between persons and objects which are **tangible**

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Concept of Exclusive Control

- In an electronic environment the concept of **possession** is replaced by **‘exclusive control’** as a **functional equivalent** of possession
- Transferring control requires **identification of the person** to whom the electronic document was issued or transferred
- Right of control is focused on the use of a **reliable method** to identify the **person in control** of the electronic transferrable record

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CMI Uniform Rules on Electronic Bills of Lading, 1990

- The CMI Rules apply only to the **electronic transfer of a bill of lading** and are mostly concerned with B/L as a document of title
- The CMI Rules create a mechanism that can be used **to replace** a paper bill of lading with its **electronic equivalent** by replicating the functions of the paper bill of lading in an electronic environment
- The system is based on the use of a **private key** which represents an imitation of possession of a document giving its holder the **right of control**
- The private key is **not transferable,** in contrast to the possession
- **The carrier** is given the central role in the transfer of rights acting as an unofficial registry of the private key, always changing it in order to protect the holder's interests

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Registry Model: The Second Stage

- **Trusted third party**: The registry model relies upon a **trusted third party** who can securely identify the person entitled to take delivery
- Transfer of the control over an electronic record identifies the **person in control**
- **Central registry** based on a **closed system**; **public-and-private key** authentication > imitates the function of document of title
- Based on the contractual arrangement: the parties agree to recognize electronic documents as legally equivalent to paper documents
- BOLERO and essDOCS as examples of the registry model
    - **Obstacles**: expensive; closed system – the rights are enforceable only against other system users; lack of legal recognition

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Token-Based Model as Alternative

- The token model is distinguished from the registry model in that it **identifies the holder** of an electronic record **through the record itself**
- Token model may rely on technological and security safeguards, **without a third party's assistance,** to ensure that the **electronic record is unique;** this is similar to how an original bill of lading is transferred
- In contrast to the registry model, the token **grants its holder possession/ control** of the record, including the rights deriving from such possession
- Token-based systems can be operated **merely by the transfer of tokens** among participants **without an intermediary**
- **Token model was not implemented in practice** because there was no technology that could support its use (blockchain may change this!)

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Blockchain B/L: The Third Stage

- Blockchain BL is a **new generation** of electronic transport documents relying on the **token model** that identifies the holder of an electronic record through the record itself
- Blockchain has made it possible to transfer rights online **without the intervention of a third party;** tokens are transferred **among the participants** > blockchain is based on **a peer-to-peer (P2P) network**
- The holder **can possess/control blockchain BL**, and through the digital identity, **exclude others** from accessing the blockchain BL
- In this way, the holder can have the **right of control** in a similar way as in the case of a paper BL

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Blockchain Technology

- Blockchain is an **electronic logbook** in which a certain amount of **transaction history is collected as a block**
- The database contains a continuous and complete **record of transactions**, and **each block is chained to the next block using a cryptographic signature called hashing**
- For a **new transaction to be added** to the blockchain, a participant on the network must **solve a complex mathematical problem** known as proof-of-work (POW)
- **Public key cryptography** plays an important role where **public key and private key work together** for the completion of a transaction
- The **digital signature** enables the users to approve the changes in the data they have access to by using the private key

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Main Features of Blockchain Technology

1. Decentralized System: A peer-to-peer (P2P) network where **no single party has control**

2. Pseudonymity: Transactions are conducted through a publicly available address or key, whose **identity is not known or recorded on the blockchain;** aimed at ensuring the confidentiality of transactions

3. Immutability: Cryptography technology is designed to create **secure and immutable records** by making it virtually **impossible to tamper with transaction data** in the blockchain blocks. Immutability is attributed to the mechanism of **hashing** that protects and chronologically connects the blocks

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Blockchain B/L as a Document of Title

- Blockchain B/L **cannot be physically possessed**
- Blockchain technology allows the **tokenization of physical assets** which can be used to create blockchain B/L acting as an asset
- Private keys enable the user to have **exclusive right to execute transactions**; only the holder of the private key **can initiate the transfer of rights** in the goods
- Blockchain B/L can achieve the **endorsement** function because the token is in the form of a **chain of digital signatures** whose order is established and **cannot be reversed**

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Public or Private system

- A blockchain may be **public (“permissionless”) or private (“permissioned”).**
- Private blockchains can provide a greater level of **confidentiality**
- The **private system is similar to the registry model** and may replace it in the future
- The public system has the potential to **replicate paper bills of lading**

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Blockchain BL As a New Generation?

- Replicating the document of title ***function***, not its ***tangibility***
  i. Entitles the holder to claim the goods from the carrier
  ii. Entitles the holder to dispose of the goods in transit
- Intangible alternative
  - **Creates** possession/control and transfers the record
  - **Excludes others** from possessing/controlling and transferring the record

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Transfer of Possession/Control

- Possession/control of a token=possession of the goods:
  - Possession/control of a token in a blockchain network enables the transfer of blockchain B/L, corresponding to/resembling the transfer of a paper B/L
  - Digital signature, one-way hashing, private key: to prevent B/L from being tampered
  - Transfer of a token in the form of a chain of digital signatures
- Compatibility with the notion of “control” for its capability of being “possessed”

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Reconsideration of the Concept of ‘Control’

- Limited definition of ‘control’
  - **Control has not been legally defined** except being a functional equivalent of possession, which varies depending on jurisdictions
- Functional equivalence to possession: ‘control’
  - **Registry:** a trusted third party controlling the record & identifying the person in control
  - **Token**: a technological system ensuring the uniqueness of the record
  - **Blockchain**: enables replication of the endorsement

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BBL As a New Generation?

How BBL Works & Systems in Use

BBL	Type	Features
SA edoxOnline (2019)	Web-based/private blockchain platform (integrated API)	- cost: no information - platform: edoxOnline platform
Wave network (2020)	Private blockchain web-based platform	- cost: no information - WAVE BL Platform
CargoX (2020)	Public and neutral blockchain based on Ethereum network;	- Priced below $15 per BBL - A web-based CargoX Platform dApp - Trade information hidden from public view (public blockchain?)
TradeLens eBL (2021)	Permissioned blockchain & neutral Hyperledger Fabric network (integrated open APIs)	- Priced $25 per BBL - TradeLens platform (closed)

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The Issues Related to Liability

- Who should bear the risk (errors, malfunctions, system abuse)?
- International Group of P&I Clubs covers liabilities arising in respect of the carriage under edoxOnline, WAVE, CargoX, TradeLens eBL, and IQAX eBL
- P&I Club cover is **limited**: "... cover is available for P&I liabilities arising under any Electronic bills of lading to the extent these liabilities **would also have arisen under paper bills of lading**. "

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Legal Framework: The Rotterdam Rules, 2008

- Introduction of the concept "**exclusive control**" as a functional equivalent to "**possession**"
  - Article 8(b): "… the issuance, *exclusive control*, or transfer of an ETR has the same effect as the issuance, *possession*, or transfer of a transport document."
  - Article 1(21): an ETR must be "subject to exclusive control from its creation until it ceases to have any effect"

  ➔Only one person is entitled to have control over the goods

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UNCITRAL Model Law on Electronic Transferable Records, 2017 (MLETR)

1. **Principle of technological neutrality**:

   'Technological neutrality' enables the use of electronic transferable records **regardless of their underlying technology**. The rationale is that technology is developing rapidly

   2. Principle of Functional Equivalence:

   Functional equivalence means **replicating the functions performed by paper documents in electronic form**

3. **Exclusive Control**:

   Exclusive control is focused on the use of a reliable method **to identify the person in control** of the electronic transferable record. Based on the principle of functional equivalence, the person in control of an electronic transferable record is in **the same position as the lawful holder of a paper bill of lading**

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Uniqueness and Singularity

A document of title must be not only **‘original’** but also **‘unique’;** its holder must be the only party entitled to the goods it represents

Unique means that there must be **only one document that gives rights to the goods**, distinguishable from any copies made

Uniqueness may not be suitable for electronic records, which by nature are **intangible** and easy to duplicate

MLETR uses the term **singularity** that requires **reliable identification** of the electronic transferable records

Reliability is the key instrument for eliminating the risk of having multiple claims on the same goods

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Potential Impact of MLETR

- MLETR provides guidance to legislators and to businesses as to how to address the problems regarding **transferring rights** and **replicating negotiability** in e-commerce
- Transfer of electronic records should **retain the legal effects of negotiability**, even though electronic transfer will inevitably result in different practices
- This will be determined by the revision of a substantive national legislation dealing with the effect of negotiability

- **Note**: MLETR was drafted before the use of blockchain became widespread

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Prospect of MLETR

- The success of the MLETR will depend on the level of its acceptance
- MLETR has been ratified by only seven jurisdictions (Abu Dhabi Global Market, Bahrain, Belize Kiribati, Paraguay and Singapore)
- Important developments in the US and the UK

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The US Law

Under Sect.7 of the revised UCC electronic transport documents are legally enforceable

The definition of document of title makes reference to ‘electronic document of title’:

Section 7-106 - Control of electronic document of title

(a) A person has control of an electronic document of title if a system employed for evidencing the transfer of interests in the electronic document reliably establishes that person as the person to which the electronic document was issued or transferred.

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The Law Commission Report

Electronic transport documents **are not recognized as documents of title** by merchant customs nor by the COGSA 1992

Electronic documents cannot be possessed under current law and have the same functionality as paper documents (cannot be delivered or held) > the easiest way is to **amend the existing legislation**

"While there were powerful arguments for extending possessory rights to intangibles, it was more appropriate for such **a reform to come from the Parliament**, **after consideration by the Law Commission**" (*Your Response v Datateam Business Media Ltd.* [2015] QB 41)

The Law Commission published the Electronic Trade Documents Report and the Electronic Trade Documents Bill ("Bill") on 16th March 2022

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Main Points of the Report

Sect.1 uses the term "**paper trade document**" covering several documents, such as bill of exchange, promissory note, bill of lading, warehouse receipt, and marine policy – "closed list" (Documents dependent on possession for their operation: Is this a new category of document under English law? How different from transferable documents?)

The Law Commission proposes that electronic documents **are capable of possession** in the same way as paper documents; **exclusive control** is treated as an **element of possession**

The objective is to expand the concept of possession to cover electronic documents

"Possession" is defined in Section 3 of the Bill (in the sense of **exclusive control** element of possession)

Under English law the **physical possession** of a document is the basis of the right to claim the performance of the obligation recorded in the document

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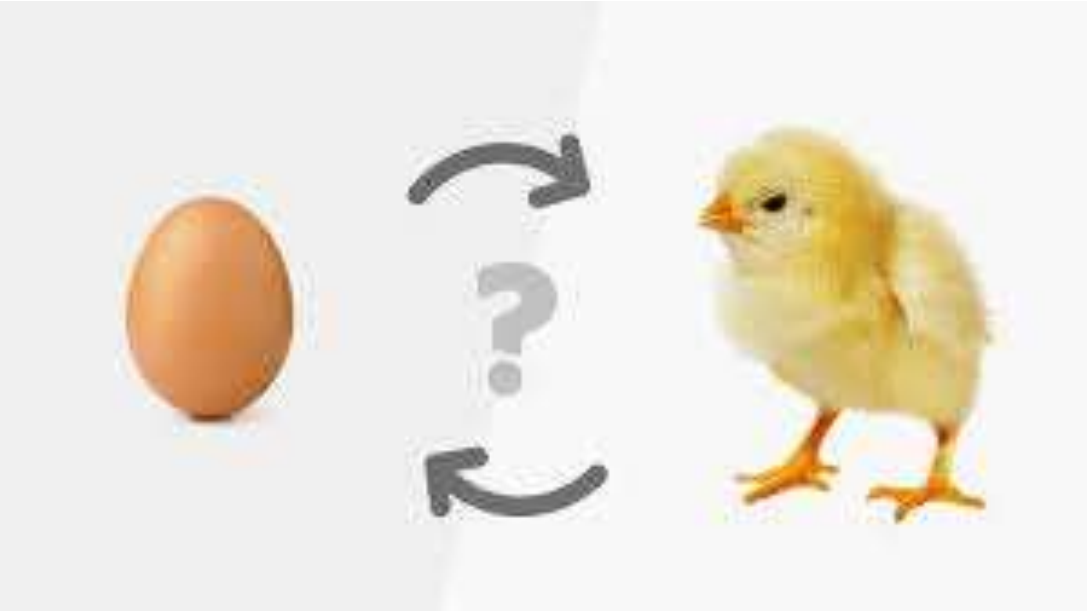
Chicken or Egg?

- Legislation is typically not adopted until the **demand** from the industry becomes strong enough; this implies that business practices develop **ahead** of law reforms
- But…the **law should change first**, where businesses are reluctant to undertake electronic transactions due to a lack of legal certainty
- The transition from paper documents to their electronic equivalents will most likely be gradual
- The final legal outcome might be a new international convention




Thank you
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