NUS Centre for Maritime Law Working Paper 23/04

NUS Law Working Paper 2023/017

IS ENABLING LEGISLATION SUFFICIENT TO PROMOTE THE UPTAKE OF ELECTRONIC PAPERLESS TRADING SYSTEMS?

Ilias Ioannou

Centre for Commercial Law Studies, Queen Mary, University of London

[Uploaded June 2023]

Is enabling legislation sufficient to promote the uptake of electronic paperless trading systems?

Ilias Ioannou[*]

ABSTRACT

Over the past three-and-a-half decades, the international trade community has made several attempts to create electronic paperless trading systems. These efforts revolve around a central theme: how can we create an electronic functional equivalent to paper bills of lading that is legally valid across jurisdictions? This paper adopts the view that different aspects of the so-called 'membership requirement' have constituted the main obstacles to the widespread adoption of electronic paperless trading systems. It concludes that legal recognition is insufficient to incentivise the broad implementation of such systems unless technological advancements are accompanied by appropriate governance mechanisms that promote trust and serve the varied interests of the stakeholders involved.

Keywords: Blockchain, container shipping, distributed ledger technology, electronic trade documents, electronic transferable records, paperless trade

[*] Visiting Researcher, Centre for Maritime Law, NUS; PhD student, Centre for Commercial Law Studies, Queen Mary, University of London. The author's doctoral research is generously funded by the London Interdisciplinary Social Science Doctoral Training Partnership (LISS DTP). The author would like to thank Professor Miriam Goldby, Professor Chris Reed, and Professor Stephen Girvin for their comments and suggestions on an earlier draft of this paper and the research support provided by the Centre for Maritime Law, NUS. The usual disclaimer applies.

1 Introduction

During the past decades, there have been various efforts from the international trade community to create an electronic equivalent to paper bills of lading (eBL).[1] At first, the technical task of creating an electronic functional equivalent to paper bills of lading was believed to be the key to enabling the uptake of electronic paperless trading systems.[2] The advent of blockchain and distributed ledger technology (DLT) has sparked the emergence of a new generation of eBL systems capable of achieving this task.[3] Notwithstanding these developments, devising an eBL system legally recognised across jurisdictions is more complicated.[4] Recent legislative initiatives, such as the UNCITRAL Model Law on Electronic Transferable Records (2017),[5] the Electronic Trade Documents Bill in the UK,[6] the amendment of the Electronic Transactions Act in Singapore,[7] and initiatives in other countries, aim to address this challenge.[8]

This paper argues that in addition to enabling legislation, the uptake of eBLs relies on governance mechanisms that will allow eBL systems to operate in a way that meets legal and commercial demands. This paper posits that different aspects of the so-called 'membership requirement' constitute the main obstacles to the widespread adoption of eBL paperless trading systems. It queries whether blockchain technology and legislative reform initiatives across multiple jurisdictions can help the industry overcome its scepticism towards digitalisation. It submits that the terms of use of each system which prescribes a membership requirement, is still a key factor influencing whether prospective users will adopt an eBL solution. The paper concludes that legal recognition is insufficient to promote the uptake of

---

1 AN Yiannopoulos, *Ocean Bills of Lading: Traditional Forms, Substitutes, and EDI Systems* (Kluwer Law International 1995) 23.

2 See below, text to n 25.

3 There are currently ten IGP&I-approved systems, seven of which are blockchain-based; see UK P&I Club, 'Circular Ref. 01/23:Electronic Paperless Trading', available at <https://www.ukpandi.com/news-and-resources/circulars/2023/circular-01-23-electronic-paperless-trading/> accessed 29 May 2023.

4 Mark L Shope, 'The Bill of Lading on the Blockchain: An Analysis of Its Compatibility with International Rules on Commercial Transactions' (2021) 22 Minn J L Sc &Tech 164.

5 UNCITRAL Model Law on Electronic Transferable Records (United Nations 2018) (MLETR).

6 See the Electronic Trade Documents HL Bill (UK, 2022-23) 57 (as introduced), available at <https://bills.parliament.uk/publications/47901/documents/2301> (ETD Bill), accessed 26 May 2023.

7 See the Singapore Electronic Transactions Act 2010 (2020 rev ed), available at <https://sso.agc.gov.sg/Act/ETA2010#pr16B-> accessed 26 May 2023.

8 An overview of the reform initiatives in the UK, the US, Singapore, Germany, Greece and China is provided below, text to n 45.

eBLs unless technological advancements are accompanied by suitable governance mechanisms that promote trust and serve the interests of the various stakeholders.

2 What has held back digitilisation? Scepticism regarding the 'membership requirement'

The ocean bill of lading is one of the oldest and most important trade documents in both common and civil law jurisdictions.[9] It is widely utilised by the international trade community in the cross-border sale and financing of goods and where transportation is by sea.[10] It is a paper document of title issued by or on behalf of a carrier to the person with whom it has entered a contract for transporting goods by sea.[11] As a document of title, it confers on its lawful holder certain legal rights, such as constructive possession of the goods and the entitlement to delivery of goods based on possession of a paper document.[12] As the carrier is required to deliver the goods covered by the bill of lading to the consignee upon the production and surrender of an original paper bill at the port of discharge,[13] significant demurrage and other costs can arise when the bill of lading is delayed, and cargo arrives at the port ahead of it.[14] The carrier may be subject to substantial claims from the lawful holder of the bill, which may encompass compensation for the 'goods' worth.[15]

[9] Georgios Zekos, 'The Contractual Role of Documents Issued Under the CMI Draft Instrument of Transportation Law' (2004) 35 JMLC 99, 103.

[10] Paul Todd, 'Electronic Bills of Lading, Blockchains and Smart Contracts' (2019) 27 Int'l J L & Info Tech 339, 341.

[11] Francis D Rose and FMB Reynolds, *Carver on Bills of Lading* (5th edn, Sweet & Maxwell 2021) [1-005].

[12] Časlav Pejović, *Transport Documents in Carriage of Goods by Sea: International Law and Practice* (Informa Law 2020) 221.

[13] Sir Richard Aikens et al, *Bills of Lading* (3rd edn, Informa Law from Routledge 2021) 153-154.

[14] Nicholas Gaskell, 'Bills of Landing in an Electronic Age' [2010] LMCLQ 260.

[15] *Motis Exports Ltd v Dampskibsselskabet AF 1912* [2000] 1 Lloyd's Rep 211 (CA); *Trafigura Beheer BV v Mediterranean Shipping Company SA (The MSC Amsterdam)* [2007] EWCA Civ 794, [2007] 2 Lloyd's Rep 622, 624; *Glencore International AG v MSC Mediterranean Shipping Co SA* [2017] EWCA Civ 365; *FIMBank Plc v KCH Shipping Co Ltd (The Giant Ace) (No 2)* [2022] EWHC 2400, [2023] 1 Lloyd's Rep 381.

The alternative to incurring these costs, notably by releasing the cargo against a letter of indemnity (LOI), can pose significant legal risks.[16] Delivery without presentation of the bill of lading regularly generates substantial litigation.[17]

The benefits of using eBLs to address the problems associated with paper bills of lading are well documented in the academic [18] and grey literature. [19] However, initiatives to dematerialise bills of lading throughout the last three and a half decades have largely failed.[20] Adoption rates remain low, and less than 1.2 per cent of all bills of lading are digital today.[21] According to an admittedly outdated survey report commissioned by the United Nations Conference on Trade and Development (UNCTAD) in 2003, the biggest obstacles to adoption included a need for more suitable infrastructure and market readiness, legal uncertainty, security concerns, high costs and confidentiality issues.[22]

The obstacles to eBL adoption can be viewed as different aspects of the 'membership requirement', that is, anyone who wants to use the eBL must join a closed system and a group of participating members.[23] This requirement is discordant with existing business practices

---

[16] See *Standard Chartered Bank v Dorchester LNG (2) Ltd (The Erin Schulte)* [2013] EWHC 808 (Comm), [2013] 2 Lloyd's Rep 338; *The Miracle Hope* [2020] EWHC 726 (Comm), [2021] Lloyd's Rep Plus 12; *The Nika* [2020] EWHC 254 (Comm), [2021] 1 Lloyd's Rep 109.

[17] See, for example, the three cases arising out of the collapse of the commodity trader Hin Leong Trading (HLT) and considered by the courts in Singapore: *ING Bank NV, Singapore Branch v The Demise Charterer of the Ship or Vessel 'Navig8 Ametrine'* [2022] SGHCR 5; [2022] Lloyd's Rep Plus 83; *Oversea-Chinese Banking Corporation Ltd v Owner and/or Demise Charterer of the Vessel 'STI Orchard'* [2022] SGHCR 6, [2023] 1 Lloyd's Rep 22; *Standard Chartered Bank (Singapore) Ltd v Maersk Tankers Singapore Pte Ltd* [2022] SGHC 242, [2023] Lloyd's Rep Plus 18.

[18] Miriam Goldby, 'Digitalisation of Shipping and Insurance Documents: Implications for Trade Finance' in Christopher Hare and Dora Neo (eds), *Trade Finance: Technology, Innovation and Documentary Credits* (OUP 2021) 199.

[19] According to the Digital Container Shipping Association (DCSA), if half of the industry were to adopt eBLs, this could result in annual savings of over US$4 billion: DCSA, Streamlining international trade by digitising end-to-end documentation, available at <https://dcsa.org/newsroom/resources/streamlining-international-trade/> accessed 26 May 2023.

[20] David Bury, 'Electronic Bills of Lading: A Never-Ending Story' (2016) 41 Tul Mar LJ 197, 198.

[21] DCSA, 'DCSA begins final phase of eBL platform interoperability proof of concept', 12 July 2022, available at <https://dcsa.org/newsroom/resources/dcsa-begins-final-phase-of-ebl-platform-interoperability-proof-of-concept/> accessed 26 May 2023.

[22] UNCTAD, The Use of Transport Documents in International Trade (2003) UNCTAD/SDTE/TLB/2003/3 paras [79]–[81], available at <https://unctad.org/system/files/official-document/sdtetlb20033_en.pdf> accessed 26 May 2023.

[23] Miriam Goldby, 'Electronic Bills of Lading and Central Registries: What Is Holding Back Progress?' (2008) 17 Inf & Commun Technol L 125, 132.

based on decentralised authority without the need for an intermediary to register and execute title transfers.[24]

First, the main technical challenge is finding a method for transferring the eBL that prevents the transferor from controlling it after the transfer occurs while granting exclusive control of the eBL to the transferee.[25] This requires an infrastructure where the eBL can be issued as data entered in an electronic registry system or as data linked with a unique transferable token instantiated within a socio-technical system.[26] The problem is that a supplier provides the underlying platform infrastructure, and the users of eBL systems accept terms set by the providers before being granted access to the platform. When a third party is introduced in the transaction, it may not be subject to the trader's jurisdiction.[27]

Second, the inability of users to trade with non-members,[28] especially in developing countries, has impeded the adoption of eBL systems.[29] This renders eBL systems dependent on network effects as they are only effective once they achieve many participants. The problem remains that until they achieve network effects, it is not cost-effective for prospective participants to join them.[30]

Third, to achieve network effects, a broad range of industry participants is required: merchants, ocean carriers, logistics providers, financers, insurers, and customs authorities. Onboarding all stakeholders is a formidable challenge.[31] As Paul Mallon from Bolero put it, the main challenges for adoption are 'commercial, not legal'.[32] All participants have distinct and sometimes conflicting interests they wish to protect. There are concerns regarding the

---

[24] Earlier, unsuccessful eBL systems, such as SEADOCS, used a bank as a central registry for the whole process; see Stephen Girvin, *Carriage of Goods by Sea* (3rd edn, OUP 2022) para 13.12. Current initiatives are more decentralised, but still, the system is provided by either a technology company or a carrier's web portal.

[25] Mohd Hwaidi and Graham Ferris, 'Switching from Paper to Electronic Bills of Lading: Part 2' (2020) 25 JIML 377; William Vaudry and Sarah Green, 'Electronic Trade Documents: The Law Commission's Provisional Proposals, the MLETR, and the Concept of Possession' [2021] JBL 625, 641.

[26] Cf Law Commission, *Digital Assets* (Law Com CP No 256, 2022) [10.33].

[27] Miriam Goldby, *Electronic Documents in Maritime Trade: Law and Practice* (2nd edn, OUP 2019) [11.06].

[28] The terms 'user' and 'member' are used interchangeably.

[29] Goldby (n 27) [11.06].

[30] Pejović (n 12) 221.

[31] Jake Fava, 'Chip Off the Old Block: Acknowledging the Obstacles to Widespread Adoption of Blockchain Bills of Lading' (2022) 2 LSE Law Review 181, 211.

[32] Paul Mallon, 'Bolero: International experiences with the dematerialisation of negotiable transport documents', UNCITRAL Webinar, 14 April 2021, 7, available at <https://uncitral.un.org/en/webinar-dematerialization-negotiable-transport-documents> accessed 26 May 2023.

confidentiality and security of members' transaction-related information.[33] Moreover, the possibility of losing information due to system malfunctions is a reported obstacle to adoption.[34] The insurance cost remains expensive,[35] and platform providers tend to limit their liability cover.[36]

Finally, legal obstacles to eBL adoption derive from the lack of harmonised legal recognition of eBLs across jurisdictions. Current eBL systems rely on private rulebooks intended to replicate the tripartite function of the bill of lading contractually.[37] For example, the CargoX rulebook provides the following:

> The Smart B/L has the same status and attributes as a paper bill of lading. All Users undertake not to deny these effects. For that reason […] the Originating User together with each and every Subsequent User may sue and/or be sued in precisely the same manner as if the Smart B/L were a paper bill of lading […][38]

Contractual frameworks increase transaction costs and the complexity of transacting while remaining untested in court.[39] Rights obtained from using eBLs depend on whether national laws giving legal effect to the provisions of the rulebook recognise these provisions as having the desired result. Specifically, legal uncertainty persists as platform members have only personal claims against other members who transact over the platform as platform rulebooks only bind the signatories of the rulebook, who have agreed on those terms.[40] In contrast, the law is harmonised for paper bills of lading, which derive from the lex mercatoria. Thus, they

---

33 Goldby (n 27) para 11.06.

34 Yiannopoulos (n 1) 23-24.

35 Girvin (n 24) para 13.15.

36 For example, CargoX limits its liability to €3m: see CargoX Ltd Special Terms and Conditions version 1.0, clause 14.1, available at <https://cargox.digital/terms-and-conditions> accessed 26 May 2023.

37 IGP&I-approved rulebooks include the Bolero rulebook (1999), Databridge Services and Users Agreement (1/2021), e-Title™'s Electronic Title User Agreement v 1.2, edoxOnline's eBL Terms and Conditions (5/2018), CargoX Special Terms and Conditions (2/2020), WAVE Application and Network Bylaws (12/2019), TradeLens eBL Rulebook and Service Description (10/2022), IQAX eBL Service Terms and Conditions (2/2022), Secro Customer and User Agreement (10/2022) and e-bill (9/2022), and TradeGo User Agreement (12/2022).

38 CargoX Terms (n 36), clause 8.1.

39 Ling Zhu and Xuan Pan, 'A Conceptual Analysis of the Electronic Bill of Lading' [2021] JBL 336, 342.

40 Most rulebooks rely on English law, and the mechanism of attornment enables the transfer of constructive possession of the goods. This mitigates the *erga omnes* problem as the transferee of the eBL can rely on possessory remedies against anyone who deprives him of possession of the goods, whether party to the Rulebook or not. The problem is, however, that not all legal systems recognise attornment or have a similar concept.

can easily transfer property rights in the goods with *erga omnes* effect in cross-border transactions.

In June-July 2022, twenty years after the UNCTAD survey, another survey commissioned by the firm BRC on behalf of FIT Alliance[41] asked 278 participants from banks, freight forwarders, carriers, shippers, agents, consignees and others across 66 countries about the factors hindering eBL adoption.[42] The survey confirmed that adoption challenges remain largely the same. The top hurdles, cited by 73 per cent of participants, can be grouped as technology, platform or interoperability concerns. There is also a perceived vendor lock-in risk: eBLs cannot currently be transferred between different platforms, and multi-homing (signing up to multiple platforms) necessitates significant investment, including getting the legal department to read through and approve each platform's rulebook.[43] Insufficient adoption and lack of readiness by other stakeholders were cited by 63 per cent of respondents. Over half of the survey participants (55 per cent) cited legal challenges.[44]

Nonetheless, two recent developments are arguably able to overcome the obstacles discussed above: legislative reform to support the uptake of eBLs; and the use of blockchain instead of a centralised registry as an underlying technology for the eBL system. I assess below whether these advancements can address the challenges that have hindered the widespread adoption of eBLs in the past.

---

41 The FIT Alliance was formed in February 2022 with five founding members: BIMCO, DCSA, FIATA, ICC and SWIFT. Its primary aim is to promote the adoption of shipping standards and eBLs across all segments of the shipping industry; Thomas Bagge, 'The Future International Trade Alliance explained' (2022), available at <https://dcsa.org/newsroom/resources/the-future-international-trade-alliance-explained-thomas-bagge/> accessed 16 May 2023.

42 DCSA, 'Survey: FIT Alliance reveals strong interest in eBL, pinpoints obstacles to address' (2023), available at <https://dcsa.org/newsroom/resources/survey-fit-alliance-reveals-strong-interest-in-ebl-pinpoints-obstacles-to-address/> accessed 16 May 2023.

43 For an overview of some of the standardisation initiatives aimed at addressing this problem, see Stephen Girvin and Elson Ong, 'Electronic Bills of Lading, Blockchain, and Distributed Ledger Technology (DLT)' in Stephen Girvin and Vibe Ulfbeck (eds), *Maritime Organisation, Management and Liability: A Legal Analysis of New Challenges in the Maritime Industry* (Hart Publishing 2021) 217.

44 DCSA Survey (n 42).

3 Is legal recognition sufficient to address scepticism regarding the membership requirement?

The purpose of enabling legislation is to put eBLs on the same legal footing as paper bills of lading. Various national reform initiatives have been launched across jurisdictions. In the US, eBLs have been acknowledged by an amendment to the Uniform Commercial Code (UCC).[45] The 2003 amendment introduced several changes to §7 of the UCC recognising electronic documents of title, such as eBLs.[46] The person who has control of an eBL can be considered the holder of that document.[47]

In 2021, the Singapore Electronic Transactions Act 2010 was amended to recognise eBLs and other electronic transferable records.[48] Under the amended Act, bills of lading can take electronic form if the electronic record contains the information required to be contained in the paper bill,[49] and a reliable method is used to ensure the authenticity, integrity and its capacity to be subject to control.[50]

In Germany, eBLs were introduced by the Act on the Reform of Maritime Trade Law of 2013, which inserted art 516 of the German Commercial Code (HGB).[51] However, the German legislator has not yet specified the technical details concerning issuing, presenting, and returning electronic documents under art 516(3).[52] The situation is similar in Greece, where the new Code of Private Maritime Law, adopted in February 2023, states that if both the carrier and shipper consent to it, a bill of lading can be issued in a dematerialised form as an

[45] See UCC, §§1-201(16) and 1-201(b)(21)(C) (as amended).

[46] See, for example, UCC, §7-501(b), regarding the rules on the form of negotiation and the requirements of due negotiation applicable to 'negotiable electronic documents of title.'

[47] Control is defined in §7-106(b) of the UCC.

[48] See the Singapore Electronic Transactions Act 2010 (2020 rev ed), s 16(A) and s 16(B), available at <https://sso.agc.gov.sg/Act/ETA2010#pr16B-> accessed 27 May 2023.

[49] Ibid, s 16(H)(a).

[50] Ibid, s 16(H)(b).

[51] HGB, s 516(2).

[52] HBG, s 516(3) reads: 'The Federal Ministry of Justice and Consumer Protection is hereby empowered to determine by regulation, issued in agreement with the Federal Ministry of the Interior and not requiring the consent of the Federal Council, the details of issuing, presenting, returning and transmitting an electronic bill of lading, as well as the particulars of the process of posting retroactive entries to an electronic bill of lading.'

electronic document.[53] A joint ministerial decision by the Digital Governance and Shipping and Insular Policy ministers will determine the technical requirements for issuing, presenting, and utilising a valid eBL.[54]

In the UK, the Electronic Trade Documents Bill suggests that eBLs should be amenable to physical possession if they meet specific criteria. This means they can be subject to legal concepts based on possession, such as bailment or possessory securities, and thus transfer property rights.[55] The first reading of this bill in the House of Commons occurred on 23 March 2023 and is under consideration by the second reading committee.[56] In China, a proposed amendment in the Chinese Maritime Code of 1992 introduces the concept of 'electronic transport document', which covers eBLs, but is still in draft form.[57]

A detailed comparative analysis of these reform initiatives is outside the scope of this paper. However, to be workable, eBLs need to be recognised with some degree of uniformity across jurisdictions. The Rotterdam Rules,[58] which recognise 'electronic transport documents', has failed to gain traction and law reform initiatives at the national level should aim to align with the MLETR.[59]

With harmonised legislation, the need for a contractual framework replicating the absence of legal recognition of eBLs becomes partially redundant. It could remove the need for commonly agreed rules describing the rights and obligations of parties to a transaction involving eBLs, as eBLs will be recognised by general law. To the extent that legislative reform

---

[53] Law 5020/2023, OJ of the Hellenic Republic 29/15 February 2023, art 125, available at <https://www.hellenicparliament.gr/Nomothetiko-Ergo/Anazitisi-Nomothetikou-Ergou?law_id=6f852d2f-70b6-48cd-8532-af9a018109df> accessed 16 June 2023 (in Greek).

[54] Ibid, art 288(3).

[55] See Miriam Goldby and Weishi Yang, 'Solving the Possession Problem: An Examination of the Law Commission's Proposal on Electronic Trade Documents' [2021] LMCLQ 605, 620.

[56] See <https://bills.parliament.uk/bills/3344> accessed 29 May 2023.

[57] CMI Questionnaire, National Legislation for Electronic Bills of Lading, Reply from China MLA, available at <https://comitemaritime.org/work/rules-for-electronic-billing-of-lading-copy/> accessed 22 May 2023. See also James Zhengliang Hu and Lijun Liz Zhao, 'The Modernisation of the Chinese Maritime Code: The Revision of the Hybrid Regime Governing Carriage of Goods by Sea' in Shengnan Jia and Lijun Liz Zhao (eds), *Commercial and Maritime Law in China and Europe* (Informa Law from Routledge 2023) 40, 52.

[58] The United Nations Convention on Contracts for the International Carriage of Goods Wholly or Partly by Sea (Rotterdam Rules) has been adopted by five States (Benin, Cameroon, Congo, Spain, and Togo). Pursuant to art 94.1, twenty states need to ratify the Convention for it to enter into force.

[59] 'Ministerial Declaration: G7 Digital and Technology Ministers' meeting (28 April 2021) 5-6, available at <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/981567/G7_Digital_and_Technology_Ministerial_Declaration.pdf> accessed 27 May 2023.

initiatives could achieve the transfer of property rights, the significance of rulebooks as a body of residual rules that create privity among the stakeholders to support the enforceability of its provisions is lessened. Therefore, harmonised legal recognition of eBLs can address the 'legal uncertainty' challenge for their adoption and, thus, progressively diminish legal transaction costs.

Even though it reduces legal uncertainty, enabling legislation does not necessarily address the 'membership requirement' because the terms and conditions for using eBL systems are inescapable. The users of the eBL still need to join an approved eBL system and accept its terms of use. Therefore, the technical and commercial challenges discussed above persist.[60] Upon admission, members must follow the system's policies, including the rulebook terms, market rules, and internal protocols. The issues of the reliability of the system and the allocation of risks and liabilities still need to be addressed. Participants' distinct and sometimes conflicting interests need to be balanced, and confidentiality issues regarding the use of data must be resolved. For this reason, this paper submits that enabling legislation is insufficient to incentivise the uptake of eBLs. The following section explores whether technology provides a solution.

4 A reality check on the transformational potential of blockchain

Blockchain is envisioned as a possible response to the barriers associated with paper bills or 'first-generation' eBLs.[61] Due to blockchain's decentralised feature, blockchain bills of lading can replicate the practical and legal features of paper bills of lading.[62] In their idealised form, blockchain-based eBLs would enable 'peer-to-peer transaction[s] without the need for a third-party agent administering a central registrar to validate the authenticity of the transaction.'[63] Enthusiasts suggest that decentralisation is the key differentiation between registry-based eBL systems, where the centralised system provides proof of ownership and

[60] See above, text to n 33.

[61] Koji Takahashi, 'Blockchain Technology and Electronic Bills of Lading' (2016) 22 JIML 202; Naomi Chetrit et al, 'Not Just for Illicit Trade in Contraband Anymore: Using Blockchain to Solve a Millennial-Long Problem with Bills of Lading' (2018) 22 Virg J L & Tech 59.

[62] Christian Albrecht, 'Blockchain Bills of Lading: The End of History? Overcoming Paper-Based Transport Documents in Sea Carriage Through New Technologies' (2019) 43 Tulane Maritime LJ 251.

[63] Mohd Hwaidi and Graham Ferris, 'Switching from paper to electronic bills of lading: Part 1' (2019) 25 JIML 297, 299.

blockchain-based systems: the third-party provider of the system is replaced by the blockchain, which contains who owns the tokenised eBL at any given juncture.[64]

Takahashi suggests that blockchain can address the membership requirement. Citing the 2003 UNCTAD survey,[65] the author recognises the membership requirement as the biggest obstacle to eBL adoption and argues:

> Unlike the existing systems based on the central registry model, blockchain technology has made the guarantee of uniqueness possible in a decentralised system. Transactions take place peer-to-peer on an open platform *where no prior subscription to membership is required.*[66]

Similarly, Bury suggests:

> Whereas past efforts to dematerialise paper bills of lading typically required some form of a trusted third-party central registry to track ownership, blockchain technology negates this requirement by creating 'digital property' whose ownership is recorded on 'decentralised ledgers.'[67]

This paper takes a realistic view of the transformational potential of blockchain for eBLs. It is essential to ascertain which challenges blockchain can and cannot address. Academic commentators have different and sometimes abstract perceptions of blockchain technology when they assess its impact on eBLs. Therefore, this paper considers the blockchain impact on eBLs based on the actual deployment of the technology in the industry.[68] Seven of ten eBL systems approved by the IGP&I utilise blockchain technology.[69] According to the providers of such systems, blockchain enables the creation of eBLs in the form of non-fungible tokens, which are transferable directly between users.[70] Some providers supply on-premises

---

[64] Jake Michael Herd, '"Blocks of Lading": Distributed Ledger Technology and the Disruption of Sea Carriage Regulation' (2018) 18 QUTLR 306, 309.

[65] Text to n 22.

[66] Takahashi (n 61) 205 (emphasis added).

[67] Bury (n 20) 235.

[68] Deepesh Patel and Emmanuelle Ganne, *Blockchain and DLT in Trade: A Reality Check* (World Trade Organization 2019) 36.

[69] These include edoxOnline, WAVE, CargoX, TradeLens, IQAX eBL, Secro and TradeGo eBL; see UKP&I (n 3).

[70] CargoX.io, 'The CargoX Platform uses ERC-721 type tokens to exchange the title of electronic bills of lading directly between users', available at <https://cargox.io/blog/legality-electronic-bill-lading/> accessed 27 May 2023.

solutions, which may even allow data to be hosted locally on the customers' servers and mirrors the confidential status of the paper bills.[71] Indeed, blockchain can offer a system based on the token model, where the eBL and title to the goods are represented in the token itself instead of in a centralised registry.[72]

Nonetheless, taking a closer look at those systems, it is possible to identify two common features in all seven blockchain-based eBL systems currently in use. First, they revolve around a common modular architecture comprising a platform provider and platform members.[73] The provider offers the eBL as-a-service or subscription offering.[74] Second, they all require platform members – users of the eBL service – to subscribe to a rulebook and accept the terms of use that govern each eBL's operation.[75] This is because a technology service provider is still required to provide users with an interface with an underlying blockchain.[76] It follows that those eBL systems in commercial use do not eliminate the membership requirement because they do not do away with the requirement that users need to be members of the same eBL system to transact. Therefore, this paper postulates that the terms of use of each system which prescribe what the membership requirement entails, i.e., what are the rights, obligations and liabilities of the users-members, are still a key factor influencing whether prospective users will adopt an eBL solution.

5 The need for governance

Contracts of carriage covered by paper bills of lading are regulated internationally through international conventions. The most widely adopted convention is the Hague Rules as amended by the Brussels Protocol 1968.[77] One of the main objectives of the Rules was to

---

71 Wave BL, 'Wave BL's on-premises solution' (Twitter, 10 February 2021) <https://mobile.twitter.com/wavebl/status/1359428895284596738> accessed 27 May 2023.

72 Elson Ong, 'Blockchain Bills of Lading and the UNCITRAL Model Law on Electronic Transferable Records' [2020] JBL 205.

73 For example, CargoX is provided by CargoX Ltd, Wave BL by OGY DOCs Inc, TradeGo eBL by TradeGo PTE Ltd and so on.

74 CargoX Terms (n 36), cl 2.1 'CargoX grants a license to Users to make use of its website and the Service in accordance with these ST&C's'; TradeLens eBL Rulebook and Service Description, clause 1.1 <www.ibm.com/support/customer/csol/terms?id=i126-8845&lc=en#detail-document> accessed 27 May 2023.

75 See all currently approved rulebooks, above, n 37.

76 CargoX Terms (n 36), cl 15.4.

77 International Convention for the Unification of Certain Rules of Law relating to Bills of Lading 1924 ('Hague Rules'), as amended by the Brussels Protocol 1968 ('Hague-Visby Rules' or the 'Rules').

answer 'whether the freedom of contract on the part of the shipowner with regard to carriage of goods by sea should be absolute or should be limited by legislation'.[78] The problem was that carriers were in a bargaining position to dictate terms to shippers. As noted by Mr James S McConechy,[79] speaking at the ILA Hague Conference 1921 preceding the adoption of the Hague Rules:

> […] when you have to deal with the conference liners, they, of course, quite in a business way, all combine to have certain bills of lading worded in a certain way, so that they may work in conference, and they cannot get out of it, and, with such clauses in the bills of lading as there are now, no cargo owner can make any bargain with the shipowner. *He has simply to ship his goods in accordance with the bills of lading which exist in the conference lines, or otherwise to have his cargo shut out or refused*.[80]

The Rules represent a compromise balancing the conflicting interests between shipowners and shippers[81] and impose limits on the freedom of contract concerning the carriage of goods by sea.[82] Certain inescapable obligations are imposed, providing the carrier exercises due diligence to make the ship seaworthy and properly manned, equipped and supplied.[83] As noted by Viscount Simonds in *The Muncaster Castle*:[84]

> The Hague Rules, as is well known, were the result of the Conferences on Maritime Law held at Brussels in 1922 and 1923. Their aim was broadly to standardise within certain limits the rights of every holder of a bill of lading against the shipowner,

---

78 Comité Maritime International, 'The Travaux Préparatoires of the International Convention for the Unification of Certain Rules of Law Relating to Bills of Lading of 25 August 1924, The Hague Rules, and of the Protocols of 23 February 1968 and 21 December 1979, The Hague-Visby Rules' (hereinafter, *Travaux Préparatoires*) 24, available at <https://comitemaritime.org/wp-content/uploads/2018/05/Travaux-Preparatoires-of-the-Hague-Rules-and-of-the-Hague-Visby-Rules.pdf> accessed 27 May 2023.

79 Secretary of the Bill of Lading Committee of the Manchester Chamber of Commerce. See Michael F Sturley, 'The History of COGSA and the Hague Rules' (1991) 22 JMLC 1, 20.

80 *Travaux Préparatoires*, n 78, 89 (emphasis added).

81 This compromise reflected the balance of power between the parties: see *Linea Naviera Paramaconi SA v Abnormal Load Ltd* [2001] 1 Lloyd's Rep 763, [19] (Tomlinson J), quoting Bingham LJ in *Compania Portorafti Commerciale SA v Ultramar Panama Inc (The Captain Gregos)* [1990] 1 Lloyd's Rep 310 (CA), 312. See also *Effort Shipping Co Ltd v Linden Management SA (The Giannis NK)* [1998] AC 605 (HL), 621.

82 The Hague-Visby Rules apply mandatorily if the provisions of Art X are satisfied. However, significant jurisdictions, such as the US, have not ratified the Visby Protocol, which means that the unamended Hague Rules apply if the bill of lading is issued in a port located within the US or where carriage is inbound to the US: see the Carriage of Goods by Sea Act 1936, ch 229, 49 Stat 1207 (as amended), s 13; see now 46 USC §30701.

83 *Travaux Préparatoires* (n 78), 24. This is enshrined in art III of the Hague-Visby Rules.

84 *Riverstone Meat Co Pty Ltd v Lancashire Shipping Co Ltd (The Muncaster Castle)* [1961] AC 807 (HL), 836.

prescribing an irreducible minimum for the responsibilities and liabilities to be undertaken by the latter.

The primary question with eBLs is whether international regulations, such as the Hague Rules or the Hague-Visby Rules, apply to eBLs. Goldby argues that if the Rules are interpreted literally as applying solely to paper bills of lading, eBLs provide a way for carriers to escape regulation which would otherwise apply mandatorily were a paper bill of lading issued.[85] This could have the unintended consequence of incentivising shippers to insist on paper bills, creating a hurdle to digital transformation.[86] If, on the other hand, the Rules are interpreted 'purposively'[87] to include eBLs, this hurdle is eliminated as eBLs would be captured by the Rules.[88] As the applicability of the Rules to eBLs is a matter of interpretation,[89] this issue can indeed be solved at the national level by enacting enabling legislation or through purposive interpretation by courts applying the Rules.

However, existing regulations do not cover the terms and conditions offered to shippers and other stakeholders by platform providers offering the eBL service to customers. These terms and conditions, enshrined in platform 'rulebooks', are independent of the contract of carriage and, thus, not covered by liner carriage regulation. They are typical Software-as-a-Service (SaaS) or Blockchain-as-a-service (BaaS) contracts that allocate the relevant risks and liabilities for the use of an eBL system, provide for data confidentiality, set liability limitations, and of course, set a price for the use of the eBL service.[90] As such, platform rulebooks escape regulation; they are unregulated contracts based on freedom of contract.[91] Considering that

---

85 Miriam Goldby, 'The Impact of New Commercial Practices on Liner Contracts of Carriage: New Wine in Old Skins?' in Jason Chuah (ed), *Research Handbook on Maritime Law and Regulation* (Edward Elgar Publishing 2019) 231-232.

86 Ibid, 240.

87 For English law, see *AP Moller Maersk A/S trading as Maersk Line v Kyokuyo Ltd* [2018] EWCA Civ 778, [2018] 2 Lloyd's Rep 59, [70], where Flaux LJ gave effect to 'the clear intention' behind the Rules.

88 Goldby (n 85) 240.

89 Generally as to the approach to the interpretation of the Rules (and other international conventions), see *Alize 1954 v Allianz Elementar Versicherungs AG (The CMA CGM Libra)* [2020] UKSC 51, [2021] 2 Lloyd's Rep 613, [34]-[42].

90 Above, text to n 74.

91 In English Law, the Unfair Contract Terms Act 1977 does not apply as, according to s 27, where English law is applicable only by choice of the parties, such as in platform rulebooks, the core provisions of this Act do not apply. The situation might be different in civil law jurisdictions; however, most eBL systems include a choice of English law clause, and there is currently no IGP&I-approved rulebook governed by the substantive laws of a civil law country.

shipping companies may have an equity stake in eBL platforms,[92] this creates an additional layer of contracting between liner shipping companies and their customers. This relationship is unregulated and means that shipping lines through their eBL platforms are in a bargaining position to dictate terms on a 'take it or leave it basis' to shippers who are prospective members of the eBL platform for the use of the platform.

Moreover, it is no secret that some shipping lines are expanding vertically in the supply chain and transforming into multimodal logistics operators.[93] This threatens the commercial position and strategic interests of other intermediaries, such as freight forwarders[94] and non-vessel operating common carriers (NVOCCs),[95] and places them in direct competition with shipping lines in providing transportation and logistics solutions for shippers.[96] It is, therefore, no surprise that such intermediaries are reluctant to join eBL systems. Synergies between shipping lines and technology companies to provide eBL systems, such as TradeLens, have not been widely implemented due to the industry's scepticism about sharing the necessary information online and depending on a digital platform for transacting.[97]

This issue is already present in other consumer-facing digital platforms where providers can dictate terms to consumers.[98] However, as eBL rulebooks are business-to-business contracts, consumer protection regulation does not apply to eBL systems. Similarly, EU

---

92 Gaskell (n 14) 238.

93 James Baker, 'Maersk's aim to shake up supply chains has further to run: Liner giant says network must extend well beyond ocean core to improve supply chains' *Lloyd's List* (London, 15 February 2023); Kristoffer Grønbæk, 'Maersk to promote logistics leg with expansion of inventory space', (ShippingWatch, 27 February 2023), available at <https://shippingwatch.com/logistics/article15190695.ece?utm_campaign=ShippingWatch%20Newsletter&utm_content=2023-02-27&utm_medium=email&utm_source=shippingwatch_com> accessed 27 May 2023.

94 Freight forwarders are employed by shippers to book space and enter the contract of carriage as their agents. See, eg, Girvin (n 24) [1.39]; [3.40]-[3.43].

95 NVOCCs comprise the shippers in their relationships with ocean carriers but carriers in their relationship with the initial shipper; they function as 'single contractual carrier' for shippers seeking a 'door-to-door' service. See Andrew D Kehagiaras, 'Duty Call: Do NVOCCs Have a Duty to Exercise Due Diligence to Make a Ship Seaworthy' (2014) 27 U of San Francisco Maritime LJ 37, 38-39.

96 International Transport Forum (ITF), Performance of Maritime Logistics, International Transport Forum Policy Papers 106 (OECD Publishing 2022) 43.

97 Dag Holmstad, 'Maersk explains Tradelens shutdown: Central players won't share "necessary data"' (Shippingwatch, December 2022) available at <https://shippingwatch.com/carriers/Container/article14644675.ece?utm_campaign=ShippingWatch%20Newsletter&utm_content=2022-12-01&utm_medium=email&utm_source=shippingwatch_com> accessed 27 May 2023.

98 Christoph Busch et al, 'The Rise of the Platform Economy: A New Challenge for EU Consumer Law?' (2016) J of European Consumer and Market Law 3.

legislation of online intermediation services, such as the platform-to-business (P2B) regulation, would not apply to eBL systems as they do not involve a contractual relationship with consumers.[99] Moreover, the new Digital Markets Act (DMA) is unlikely to apply to digital services in the liner sector as neither liner carriers nor eBL providers currently fall within the definition of 'gatekeepers' under this Act.[100] Therefore, shippers are in a less advantageous position if they have to accept standardised terms and conditions for their participation in an eBL system.

It could be argued that competition between eBL systems would solve this problem. An open market could enable shippers and freight forwarders to negotiate with eBL providers and choose to use a system that offers its members terms that suit their needs. However, this depends on two premises: (i) the terms being up for negotiation, and they are not standardised contracts of adhesion, or (ii) that prospective members would only participate in an eBL system if they wish so. Nevertheless, these terms are part of a pre-existing multilateral contract, the platform rulebook, and thus are not individually negotiated when each shipper enters the system. Moreover, as discussed below, digitalisation is driven by shipping lines which are the leading actors in the container ship supply chain and may restrict the options of prospective members or even compel them to join an eBL system, 'or otherwise to have [their] cargo shut out or refused' to use the wording employed by Mr James S McConechy almost a century ago.[101]

Moreover, on 15 February 2023, shipping lines representing almost three-quarters of the industry in terms of carrying capacity made an 'eBL adoption declaration'[102] as part of their participation in the Digital Containers Shipping Association (DCSA).[103] Under the agreement,

---

[99] Regulation (EU) 2019/1150 of the European Parliament and of the Council of 20 June 2019 on promoting fairness and transparency for business users of online intermediation services [2019] OJ L186/57, arts 1(2) and (3).

[100] This is because these actors do not provide 'core platform services' as defined in Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act) [2022] OJ L265/1, art 2.

[101] Cf text to n 80.

[102] DCSA, 'Commitment to accelerating digitalisation of container trade – the electronic bill of lading,' 15 February 2023, available at <https://dcsa.org/wp-content/uploads/2023/02/100-percent-ebl-by-2030-commitment-statement.pdf> accessed 29 May 2023.

[103] As of 29 May 2023, the shipping lines above represented 73.6 per cent of the market share; Data regarding the carrying capacity of container carriers were retrieved from Alphaliner; see Alphaliner, 'Alphaliner top 100', available at <https://alphaliner.axsmarine.com/PublicTop100/> accessed 29 May 2023.

nine of the world's major ocean carriers have jointly committed to converting in their respective organisations 50 per cent of original bill of lading activities to digital within five years and 100 per cent by 2030.[104] It is submitted that this declaration could potentially evolve into a concerted practice that may entail the restriction of competition in the sense that it deprives business customers of product differentiation, namely, the option to choose if they wish to use a shipping line operating with an eBL or a paper bill of lading.[105] This could adversely affect the sentiment of prospective users who might be opposed to a situation where they are forced to use eBL systems on standard terms provided by liners.

Instead, this paper argues for the need for governance to encourage the industry's voluntary adoption of eBL systems. Private transnational laws and regulations derive their legitimacy and normative power from the equitable incorporation of the interests of all stakeholders whom the subsequent norm application will impact.[106] In cyberspace, legitimacy can be assessed by observing the conduct of those to whom the norm is directed.[107] The focus lies on the acceptability and recognition of such norms.[108] Therefore, the voluntary adoption of a system by the users to whom it is addressed can be viewed as evidence of the legitimacy of such a system. It is submitted that an important reason for the failure of eBL systems hitherto is a deficit in their legitimacy.[109] To that end, it is necessary to establish a governance mechanism to legitimise the terms of use of eBL systems in the eyes of the international trade community. The final section provides some preliminary thoughts on the role of non-governmental organisations and industry associations in shaping such a governance mechanism.

---

[104] Press release, 'DCSA's member carriers commit to a fully standardised, electronic bill of lading by 2030', 15 February 2023, available at <https://dcsa.org/newsroom/resources/dcsas-member-carriers-commit-to-a-fully-standardised-electronic-bill-of-lading-by-2030/> accessed 27 May 2023.

[105] The extent to which exemptions of competition law cover this declaration, such as the Consortia Block Exemption Regulation in the EU and the Digital Container Shipping Association Agreement in the US (Federal Maritime Commission Agreement No. 201288, 11 April 2019) is outside the scope of this paper.

[106] Andreas Maurer, 'Transnational Shipping Law: The Role of Private Legal Actors in International Shipping' in Miriam Goldby and Loukas Mistelis (eds), *The Role of Arbitration in Shipping Law* (OUP 2016) 229, 241.

[107] Chris Reed, 'Cyberspace Institutions, Community and Legitimate Authority' in Orkun Akseli and John Linarelli (eds), *The Future of Commercial Law: Ways Forward for Change and Reform* (Hart Publishing 2019) 133.

[108] Gralf-Peter Calliess and Peer Zumbansen, *Rough Consensus and Running Code: A Theory of Transnational Private Law* (Hart Publishing 2010) 249.

[109] Cf Reed (n 107) 129.

6 The way forward

The transition to eBLs relies on the economic benefits and legitimacy of eBLs and on the trustworthiness of the system provider.[110] The legalisation of eBLs does not necessarily legitimise their use. Good governance is required to promote trust and legitimacy of eBL systems. As a contract is the only source of governance in this setting, the terms and conditions underlying the use of eBL systems need regulation. Attention to stakeholder sentiment and prudent business structure and contractual design is required when setting up the terms of use of the eBL to reduce prospective participants' onboarding resistance. What is needed is a legal standard able to regulate the ability of shipping lines and eBL system providers to impose unfettered terms on system users. Adopting such a standard would promote trust and commonality of interest and thus enable the uptake of eBL systems.

Almost a century after the conclusion of the Hague Rules regulating contracts of carriage covered by a bill of lading, a new instrument is required to ensure that eBLs are covered by the existing conventions and that the terms of use of such eBL systems are balanced and fair. Adopting a role-dependent and risk-allocational legal standard would promote trust and legitimacy of eBL systems. It would help industry stakeholders such as banks, merchants, insurers, and logistic providers overcome their hesitation and voluntarily adopt such systems. Non-governmental organisations and industry associations, such as the Comité Maritime International (CMI) or the International Chamber of Commerce, which have historically supplied parties with international conventions, such as the Hague Rules, and standardised contract terms, such as the Uniform Customs and Practice for Documentary Credits (UCP 600), can balance the various vested interests and may be well-placed to contribute to the development of such a legal standard.

[110] Girvin and Ong (n 43) 220.