

**Title:** Switching From Paper To Electronic Bills Of Lading: Fundamental Sociological Structure, Distributed Ledger Technology And Legal Difficulties

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**INTRODUCTION:**

Bills of lading are usually issued in a paper format. During the last twenty years platforms have been set up to facilitate an electronic format of a bill of lading in order to prevent fraud, to reduce costs and to increase transparency and potentially real-time transfer of rights. But such attempts have not proved to be successful in terms of making the use of electronic bills of lading widely spread.

The premise of this paper is that the constituent components of the sociological structure under which the norms that constitute bills of lading (i.e. the constituent characteristics of receipt for goods, evidence for the carriage contract, document of title and transferability) that have become widely applied and effective in the paper format of bills of lading, equally apply to bills of lading in an electronic format. Current platforms supporting electronic bills of lading are based on the idea of a centralised ledger (a single authorised server that transfers the title and the transferable rights) monopolising the service by one company, which is inconsistent with the sociological structure of paper bills of lading that is based on decentralised authority; namely; norms (particularly transferability of rights) constituting bills of lading are executed by many players (i.e. carriers) and maintained by various players (i.e. carriers and traders).

**AIM:**

Platforms that aim to facilitate an electronic format of bills of lading should be based upon the fundamental sociological structure of bills of lading in order to be widely adopted by traders and carriers. This paper aims therefore to establish the constituent components of the sociological structure under which the characteristics of a bill of lading exist and thrive. It is proposed that Distributed Ledger Technology (DLT) is the most suitable technology for the sociological structure of bills of lading. The suitable kind of DLT is evaluated in light of both how the characteristics of bills of lading are effective in society as sociological norms and the current legal difficulties under some influential national laws.

**MATERIALS AND METHODS:**

A doctrinal study was conducted to analyse both the primary and secondary sources in law in order to provide a review of the history of bills of lading. A qualitative study was conducted using secondary sources (based on primary sources and empirical studies) as to the social norms. Both

the doctrinal and qualitative studies led to a model for the sociological structure of bills of lading as well as to the most suitable technology for such a sociological structure in light of legal difficulties.

## **RESULTS:**

The main lesson from history is that the paper format enables the exclusive possession of bills of lading without the need of a third party's interference to transfer such an exclusive possession.

A theoretical model of the constituent components of the sociological structure of bills of lading is proposed in order to encapsulate the fundamental components of the nature of bills of lading. The model can be utilized, as the fundamental basics in the life of bills of lading, by platforms such as Bolero and R3 that aim to develop a technology to facilitate electronic bills of lading.

The Distributed Ledger Technology (DLT) is the most suitable technology to reflect the sociological nature of bills of lading. However, the conflict of the transparency in DLT with the laws of privacy and intellectual property rights presents a challenge to the idea of unchangeable ledgers in DLT. Also the legitimacy of the authenticity of identities is challenging under some national laws. Having a permissioned DLT adds a legal complexity as to who is liable of the fault in the service. Legal solutions are suggested to solve such problems.

## **CONCLUSIONS:**

In the first part, this paper reviews the history of bills of lading. It infers lessons to help the success of future platforms for electronic bills of lading. The lessons are: (1) bills of lading are means of proof and authenticity; (2) the form of bills of lading must be capable of being exclusively possessed and moveable; (3) the characteristics of bills of lading are effectively sociological norms that are enforced through informal distributed powers under the sociological structure of norms; (4) an international platform facilitating the use of bills of lading must deal with the core elements, the basic functions, of each characteristic on the basis of rule based but it should be flexible as to the scope of each characteristic giving way to the parties intention and the applicable national law; (5) apart from the lack of having the platform with sound structure to facilitate electronic bills of lading, there are current social strains affecting the use of electronic bills of lading.

The second part provides a model clarifying the constituent components of the sociological structure under which sociological norms exist and thrive, with emphasis on the norms (characteristics) constituting bills of lading. The model contains the following constituent components: (1) the formation of a group for cooperation; (2) game theory in explaining how members of a group interact; (3) the McAdam formula of norms and (4) the structural conditions of a group under which an informal power maintains norms.

Based on the first and second part, the third part evaluates the type of technology that can fulfil the constituent components of the sociological structure of the norms that constitute a bill of lading. Applying the structural conditions of a group that generates effective norms (i.e. reciprocal informal powers, network of gossip, transparency and noticeability of who defects the norm), it is postulated that a distributed ledger technology (DLT), as opposed to a centralised ledger technology, is the only way to provide the right platform to facilitate electronic bills of lading. A hybrid (permissioned and permissionless) platform based on DLT is the most suitable. So, members (miners) who are able to issue bills of lading and to check the authenticity of transactions in the platform should only be available to carriers who have been permitted to join as carriers. But for the function of transferring (sending and receiving) the bill of lading, the platform should be open to public so any trader to whom the bill is transferred should be able to transfer it to any other trader in the world. This part also deals with the current legal difficulties encountering DLT for electronic bills of lading and how they may shape the kind of DLT for electronic bills of lading.

**KEYWORDS:**

Bills of lading, Distributed Ledger Technology, social norms, intellectual property, liability.

**BIOGRAPHY:**

Dr Mohd Hwaidi is a senior lecturer in law at Nottingham Trent University and the Deputy Director of the Centre for Business and Insolvency Law. He is the module leader of International Sale of Goods (LLM Master Level). He has completed his PhD in Law from Nottingham Trent University. Dr Hwaidi has a track record of publications in the law of Documentary Credits. He has various research papers on the nature and role of Transnational Commercial Law (Law of Merchants, Trade Usage and self-regulatory rules such as the UCP); Methodology of Empirical Study in Commercial Law; Functional Comparative Law between national laws.