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Research Article

REPLACING TRADITIONAL AND HANDWRITTEN BILLS OF LADING BY ELECTRONIC BILLS OF LADING

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ABSTRACT

Bill of lading serves three primary functions: 1) goods' receipt; 2) proof to the carriage contract; and 3) an indicator of the goods' ownership. Since long ago, bills of lading have been issued and given to the senders in the form of a paper and occasionally in several copies. However, this document has a lot of problems, including delay in the goods' on-time delivery, robbery, bereave, forgery and so forth. In line with this and with the advent of internet, the scientists of law and economy as well as the merchants started thinking about a solution for replacing the electronic bills of lading for the handwritten and traditional versions. These efforts resulted in the holding of a session in Rotterdam and enactment of a convention bearing the same name. Considering the transferring of the goods' bills of lading and sales' receipt for numerous number of times before the delivery of the goods in the destination, problems may arise and the present article tries finding a solution for overcoming them in such a way that the operators can issue electronic history documents and the owners of the electronic bills of lading can carry their goods with peace of the mind before reaching the destination without bills of lading and goods being exposed to any risks; The important properties of the electronic bills of lading as well as protection of the bill of lading by the block chain have been explained in this article in an applied manner.

Keywords: bill of lading, electronic, bolero, CMI, electronic bill of lading.

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INTRODUCTION

Bill of lading is a deed wherein the perfect specifications of the goods are inserted and it is endorsed by the carrier or a representative of him and/or another person on his behalf and it is given to the sender so that he or the goods' owner or his representative can receive the goods in the destination after showing it to the carrier. Bills of lading are of three types; they are issued either to the name of a consignee or to the order of the carrier or to a third person. Based on the load-carrying customs, bills of lading are of various kinds with the most well-known of them being 1) ocean bill of lading; 2) non-negotiable sea waybill; 3) charter party bill of lading; 4) trough B/L; 5) negotiable FIATA Combined Transport Bill of Lading (FBL); 6) air waybill; 7) CMR; 8) railway bill of lading; and 9) postal receipt and bill of lading. The traditional bills of lading are most often faced with problems like delay in the delivery of the freight to the buyer or his representative, freight's retardation in the destination, paper use, loss of the bill of lading and forgery of bill of lading as well as some other routine problems. This made the officials start thinking about a solution for preventing or minimizing such problems and challenges. In Rotterdam and in 2008, a convention was agreed for reducing these problems; it was decided in the convention that computer devices and internet should be used for issuing electronic bills of lading instead of the traditional bills of ladings in marine transportation. But, this replacement encountered practical problems. Considering its problems, the use of internet in transportation is envisioned as a less faulty substitute in contrast to the traditional bills of lading; internet can be used for removing the shortfalls and disadvantages and help the merchants have their goods delivered in the destination in a timely manner. It is stated in the article one's paragraph 18 of the aforesaid convention[1] that "the shipment electronic history means the information exchanged in one or several messages sent through an electronic telecommunication means by the transportation operator based on a shipment contract in the form of attached data or in any other form such as the information that is exchanged at the time of the carriage's electronic history issuance or after that in a logical manner along with the related documents that altogether form a part of the overall bill of lading. So, the bill of lading: 1) confirms the receiving of the goods based on a shipment contract by the carriage enforcer or operator and 2) confirms or includes the shipment contract". The present article deals with the way the electronic bill of lading works as well as with its substitution for the traditional bills of lading and how to prevent others' misuse of them and also the various types of the electronic bills of lading.

ELECTRONIC BILL OF LADING AND ITS FUNCTION

As it was mentioned in the introduction, bill of lading is a deed wherein the perfect specifications of the goods are inserted and it is endorsed by the carrier or a representative of him and/or another person on his behalf and it is given to the sender so that he or the goods' owner or his representative can receive the goods in the destination after showing it to the carrier. Bills of ladings are of three types: they are issued either to the name of a consignee or to the order of a carrier and/or a certain person. As for the issuance of bills of ladings to the name of a person, no dispute has occurred amongst the officials and researchers; however, the shipper sometimes needs not to mention the receiver's name and agrees with the ship's captain or the transportation operator to issue the bill of lading to the order of the carrier. In this case, the goods can be received and owned by he who shows the bill of lading (Najafi 2009). Although electronic bills of lading (BLs) cannot be physically received, it has been concluded based on certain methods outlined in CMI and Bolero Regulations that this document can be issued to be received and kept. In defining the exchangeable carriage document, Rotterdam Convention points in paragraph 15 of article 1[2]

[1] Paragraph 18 of article one in Rotterdam Convention

[2] Paragraph 15 of article one in Rotterdam Convention

to the issuance of BLs to the order of carriers; however, when the electronic history of the exchangeable carriage receipt is defined in paragraph 19 of this same article, no reference has been made to the issuance of such a type of document to the order of the carrier. Article 57 of Rotterdam Convention[3] is another notable provision in this regard for it asserts that "transportation in case of the issuance of the transferable document or exchangeable electronic carriage history; 1) in case of the issuance of the exchangeable carriage document, the holder can transfer the rights inserted in the document through deed conveyance to another person: A) if the document has been issued to the order of a person, the holder can correctly endorse it in favor of another person or deliver it without the mentioning of the consignee and also without signing it; B) if a document issued to the name of a carrier is not signed or if the two documents have been issued to the name of a certain person by the first holder; 2) in case that the exchangeable electronic carriage document is issued, the holder can transfer the rights inserted therein through an electronic carriage deed according to the methods outlined in paragraph 1-article 9 whether it is issued to the name or the order of a certain person". When the document is issued to the order of the carrier, the sender or the carriage operator sends the electronic bill of lading to the receiver. The inserted email might be possibly not that of the receiver so the bill of lading is delivered to the address of a person who does not have a certain identity. The thing registered in BOLERO's registration source is the address of a person who has sent the email; if the email is hacked by the fraudulent persons and the email and the user's password are compromised, it would be difficult to justify that the hacker does not own the bill of lading because the original owner does not have the ability to prove the ownership of the electronic address via making an unreal email without his or her exact specifications. This is possibly why Rotterdam convention does not have anything to say about the electronic BL to the order of carrier. Electronic BL is not lost and it does not reach the destination late so that it can consequently cause extra costs; unlike the traditional BLs, it cannot be easily faked but it is not impossible. These dangers have been minimized through the use of modern technologies; the e-BLs can be readily tracked. One of the problems of the e-BLs is the determination of the governing laws and qualified courts for the contingent discrepancies between the involved parties. In order to resolve this problem, use should be made of risk management methods, including security instruments or risk transfer means as well as enactment of expressive and explicit regulations regarding the courts' qualification and/or specifying the governing rules. The electronic data exchange has become a common method in the business world. Electronic exchange is the phrase usually used for identifying the business information systems and exchanges in a computer-to-computer manner without the involvement of the individuals. Electronic data exchange allows the companies expand automatic message delivery systems and use them in lieu of the paper-based deeds; such a use of data exchange method is needless of paper deeds and it is programmed based on the paper-free operation that brings about cost-effectiveness in the document generation and transfer in the course of business administration measures. In order to replace the e-BLs and build trust therein, they should have three properties of the paper-based BLs: 1) legal properties of the paper-based and traditional BLs should be actualized through e-BLs and this depends on the idea that which country's laws govern the contract (Dubovec 2006, p. 438); 2) the specifications of the goods, receiver, carriage contract, time and delivery port and all the other things required in the paper-based BLs should be mentioned in the e-BLs and this BL should be subsequently considered as the receipt for receiving the goods and the reason for the endorsement of the carriage contract. This has been confirmed by UNCITRAL task force regarding the exchange of the electronic data (UNCITRAL 1995, p. 5). 3) Electronic BL should be capable of agency and accepted as the goods' ownership deed. It is simple to change the paper-based BL to e-BL that must contain the carriage information; however, changing the appearance of the paper-based business deeds to a series of messages and signs would be accompanied by numerous problems. E-BLs should remain unexampled in the transferring process. However, considering the fact that e-BLs can be easily copied, their exclusiveness cannot be guaranteed in the transferring process and this causes the emergence of certain challenges in the transferring of the E-BLs. In case that the e-BLs are transferred through email, the email user can prepare another copy of the bill of lading with its originality not being detectable. The groups and organizations have performed activities for safeguarding the exclusiveness of the e-BLs with their results having been several e-BL transferring systems. Endorsement of the electronic bills of ladings is quite different from that of the paper-based BLs because it is done through encryption and digital signature and by a third person's intervention (Malek Mohammadi 2012, p. 21). Now, for better familiarity, the forthcoming parts present a detailed explication of the functioning of electronic bills of lading that are going to be replaced for the traditional BLs in not so distant future. The rapid fluctuations in the specific prices of the general and special goods have caused these BLs to be preferred for the carriage to the other BLs especially in the view of the idea that the existence of a transferable BL is necessary in regard of the goods with unfixed prices like oil due to its ability for goods' resales along the transportation course. That is because the BL can be transferred to another before the goods reach the port and the goods are rarely delivered to a final receiver and they are sold on the path though the transferring of the BL. Considering the fact that the banks issue goods' warrants, a real repayment and security has been predicted for the banks to be able to minimize the contingent risks and losses (Reed and Walden 2014, p. 72). You may just say that the traditional paper-based BLs are not currently performing well and it is necessary to devise methods facilitating the speeding of the document processing. It is not surprising that the INTERTANKOs were one of the sea DOCs initiators and offered one of the solutions (Ibid). However, many of the existent problems will be resolved or severely reduced in case of changing to e-BLs. Institutions like E. Title and Sea DOCs and L. Bolero were established and they are presently issuing electronic BLs under certain conditions[4].

Security in Electronic Bills of Lading (E-BLs)

Besides being time-consuming and costly and influencing the environment adversely, transaction through paper-based BL encourages this industry to faking the documents and exhibiting other forgery behaviors. Iran's law of electronic business was approved on 7th of January, 2004, with 81 articles and 7 notes and it was later on subjected to many amendments. In 1978, Hamburg regulations were passed by UNCITRAL and new regulations were enforced for bills of lading. These regulations meant the substitution of the BLs' convention and Hague-Visby rules[5]. Therefore, it can be reasoned that the legislator has made these regulations in consistency with the convention's perspectives. During 1990s, the need for certain regulations parallel to the accordance with the electronic communications was felt. It was in the beginning of 2000 that it led to the so-called "legislation's pattern rules". It was also put into practical use in Iran in 2004 in respect to the rapid and considerable technological and electronic progresses in governmental and private centers. While the electronic signature law creates a framework for the use of electronic algorithms through offering the minimum requirements, the electronic business regulations deal in a more accurate approach with some of the legal reasoning for law enactment in the backstage of which one can try figuring out the legislators' legal perspectives regarding the e-BLs. The method selected for ensuring that whether the law is reflective of a barrier or not was created based on a principle of function's shared value that was first proposed by UNCITRAL in its efforts for promoting identical regulations of the electronic communications in the electronic business model law in

[3] Article 57 of Rotterdam Convention

[4] https://www.ukpandi.com/fileadmin/uploads/uk-pi/Documents/2017/Legal_Briefing_e_bill_of_Lading_WEB.pdf (accessed in Dec. 2017)

[5] Protocol of 1968; The Hauge-Visby Rules

1996[6]. So, it is sufficient to say that the principle is a more precise glance at the document's primary properties and secondary functions followed by the evaluation of the idea that if an electronic equivalent can supply such secondary functions or is it necessary to investigate the idea as to whether there is a need for making legal reforms in line with the obtainment of these secondary functions (UNCITRAL 1996). Although it has to be accepted that the current regulations do not alone offer an appropriate legal framework for the use of e-BLs and, if such e-BLs are used in Iran, they have to be created based on a set of regulations the technical details of which have been arranged in respect to the paper-based BLs. The challenges we are faced with when using e-BLs pertain to the international cooperation tendencies for achieving certain results through the issuance of e-BLs worldwide. Due to the same reason, the vast use of e-BLs and any reformations made in the national laws till now are possibly just a blow in the dark. The researchers of the UN's international business and development conference(UNCITRAL, 1995) published a report in 2003 stating that one of the substantial barriers with which the potential users had been confronted during offering their electronic bills in their operations is that "the framework was and is not yet sufficiently clear; some of the challenges that were repeatedly showing up regarding the functions of e-BL law seem to be related to the secondary deeds that influenced the legal conditions of the contracts to a large extent. Possession of the deeds might be indicative of the idea that the holder is a party to a given contract and has the right to enforce it. But, as it is observed, the ownership becomes somehow complicated when the documents are faulty because their authenticity is scarcely verifiable. Therefore, there is a need for a legal framework guiding embedding these essential properties within a legal electronic media. Moreover, since the business customs and traditions are considered as law resources in Iran and in most of the countries around the globe, the regulations inserted in the e-business should be in commercial alignment with the newly emerging experiences and let the technological innovations come about. Special innovations and inventions should be brought about for the creation of a legal infrastructure for e-BLs and the required measures should be taken based on multilateral agreements connecting all the users. However, such an approach is not completely independent of the governmental laws because this issue is still related to the determination of matters pertinent to transportation contracts minus the matters pertaining to the use of electronic options that are to be subsequently agreed by the countries through these standards. The use of such nonfinancial standards is not a new subject. The same way that the international chamber of commerce (ICC) has made use of certain standards, universal customs and identical methods have been created for the credits. Such solutions are extensively supported by some of the interpreters who point out that the internet works without any border considerations hence such more suitable standards that serve making of business arrangements on the internet are amongst the states' rules(Goldby, 2011)[7]. Although there are various sets of such standards, we are herein concentrated on two solutions: CMI and Bolero regulations. Amongst the substantial groups of electronic options available for bills of lading, there are three companies that are distinct and notable: electronic record registration system (Bolero), Sea DOCs System and E-Title system. International P&IIG group confirmed Bolero and Sea DOCs systems in 2010 and E-title TM system in 2015. In this article, we will be more concentrated on Bolero system. UNCITRAL has made a lot of efforts for creating an identical legal framework for using e-BLs with the grounds being consequently set for the creation of e-BLs for companies like Bolero, Sea DOCs and E. Title. All of them have been concentrated on two primary principles laid on the foundation of prospective electronic documents' arrangement and their use, i.e. the principle of functional equivalence and technological impartiality. However, in the beginning, attentions should be paid in all of these efforts to the electronic data exchange and private and public keys' encryption. Electronic data exchange, digital signature and private and public keys' encryption and electronic information transferring are not new topics; they are electronic means for information transferring and they have resulted in an 80-percent reduction in the use of paper-based documents till 1980s. The most famous systems have made use of EDI and SWIFT technologies applied for international business in the banking industry in line with the credit transferring in the entire banks around the globe[8]. Unlike documents, EDI information is not processed by the human beings rather it is carried out by computers. However, some similar considerations and issues arise when using EDI[9]. Exactly like human beings, computers speak in a common language and rely on this identical language for establishing communication. Therefore, the information exchanged between the computers should be also in a common format. Due to the same reason, several standard formats have been created. The two formats that are most commonly applied are EDIFACT and ANSI X12[10]. As it has been demonstrated, EDI has been substituted for post, fax and email and it enables fast data processing through direct delivery of the data to the receiver. Although email is an electronic tool for data-based communication establishment, it is still in need of humans' interaction and processing but it also causes the emergence of many security problems in the first place[11]. This shortfall reminds us of one of the most outstanding characteristics of EDI: the ability of ensuring the confidentiality of the information between the parties via offering a safe platform for transaction with the encryption of the information exchanged between the sender and receiver so it is at risk of forgery and violation to a lesser degree for the information cannot be seen by other persons. Every sender who needs to send something to a receiver uses a message coded by the general key encryption method. The private key that is confidentially kept by the receiver is the only key that can decode the message coded by the related general key and there can be only one private key-holder. Considering such a requirement, the private key cannot be generated based on the general key. Thus, it is only the holder of the private key that knows it. This causes the users to more safely exchange the coded messages because the sender is authorized through a previously verified digital signature; so, since his private key is unique, it can be easily found out that which message is correct and which is not. Of course, this process is ignored and facilitated by a trusted third person (for example Bolero International Ltd.).

Rotterdam Regulations (RR 2008)

RR is indicative of the last UNCITRAL convention on the goods carriage and the latest efforts for offering an identical and up-to-date legal framework for the use of E-BLs and e-Business, in general[12]. Some of the regulations thereof have been authenticated as being reflective of notable progresses in the region; these progresses are the continuations of the ones made by Hague-Visby regulations and Hamburg Regulations. Article 47 of the regulations related to the delivery contrarily arranged the "negotiable transportation document". This convention does not use the letters B/L but features readily detectable properties of a negotiable transportation deed that generally means the documents issued by a carrier so: a) the evidence of the goods' or services' reception should have been agreed by the parties within a transportation contract and b) the evidence should

[6] Ot.prp.nr. 108 (2000-2001), p. 78

[7] http://www2.warwick.ac.uk/fac/soc/law/elj/jilt/2000_3/diedrich - Diedrich, A Law of the Internet? Attempts to Regulate Electronic Commerce, 2002 Journal of Information Law and Technology and Polanski, A New Approach to Regulating Internet Commerce, 2002 Electronic Communication Law Review, p. 165.

[8] SWIFT stands for Society for Worldwide Inter-bank Financial Telecommunications and was established to facilitate the transmission of bank-to-bank financial transaction messages. More than a million messages per day are transmitted on SWIFT's global telecommunication network, including letters of credit and bank guarantees. SWIFT is also one of the companies behind the development of Bolero.

[9] EDI is abbreviated form of electronic data interchange.

[10] It is business data exchange under a given standard agreed by the parties from a computer to another without the operators' intervention. The most credible method of electronic data exchange is EDI.

[11] Electronic data interchange (a standard for exchanging information between computer systems).

[12] United Nations Convention on Contracts for the International Carriage of Goods Wholly or Partly by Sea, 2008.

contain a transportation contract[13]. Rotterdam convention does not offer any regulations regarding bills of lading in written form; instead, it defines such concepts as "transportation document" and "electronic transportation record" both of which identically serve the same function[14]. Signatures have been taken into account in article 38 that stipulates that "transportation deed" should have been manually signed whereas the "transportation record" should have been electronically endorsed. In order to ensure the authenticity of the electronic signature, the endorser should show a permit regarding the carrier along with the electronic bill of lading. These regulations do not point to the status of the electronic signature in the national regulations. The principle of functional convergence has been mentioned in article 9 of the convention and it points to what is called "electronic transportation file". As a functional equivalence, the convention introduces the possession of a transferable deed and "unique control" over the electronic record. Concepts like "issuance" and "transfer" point to article 9a of Rotterdam convention. The first paragraph states that "issuance" of a negotiable electronic record should be in accordance with the procedures based on which it is concluded that the record is unique in terms of creating control so that no other effect or credibility can be brought about by it. The concept "transfer" refers to the transferring of the unique control inserted in the record. Rotterdam Convention presents contents in its article 7 in regard of the fair behavior of the electronic bill of lading and document of the bill of lading and states that "an electronic transferable record should not deprive a legal effect, credibility or enforcement power only based on their being inserted in the electronic form or not". However, the second paragraph determines an agreement for use of electronic communication. The success of this convention is completely dependent on the 47 important marine countries that have approved the convention[15].

ELECTRONIC BILL OF LADING TRANSFERRING SYSTEMS

The first project created for the transferring of e-BL was called Sea DOCs; however, since it was not so much successful, it did not last a long time and efforts were resumed for issuing electronic BLs. It was so until CMI, Bolero, Atsign and Mandit were proposed. The following parts briefly explain the quality of their functions.

- **Sea DOCs System**

In 1986, Sea DOCs was founded by Chase Manhattan Bank and INTERTANKO Company[16] for the transferring of the electronic bills of lading. This system used a central registration authority the founder of which was Chase Manhattan so that all the parties to a bill of lading could be connected. Efforts were made in this plan to operationalize all the rights related to bill of lading the same way it was possible through paper-based bills of lading so that the loading of large goods, especially oil and gas could be easily carried out. This system fell somewhere between the electronic system and paper-based system and it was not completely separate from the paper and traditional bills of lading because the bank established communication through telex with the holders and users of the bills of lading after receiving the original version in paper-based form (Chandler 1989). This system was discarded half the way to its use due to the practical problems and it failed for the following reasons: 1) the merchants were not willing to give their information to a central registration authority because the financial institutions and their rivals could gain access to their information in this way (Dubovec 2006, p. 450). The large companies did not trust Manhattan Bank as the registration authority because they thought that this bank does not consider impartiality in regard of their information (Kozolchyk 1992, p. 228). 2) It was difficult and costly for the registration authority to prove the risks and dangers to the merchants and also to provide proper insurance coverage for the liabilities stemming from the system's flaws and malfunctioning (Chandler 1989, P. 469). 3) The other banks could not cope with this issue that one of their rivals has precious information about the business transactions and they are deprived of such information (Dubovec 2006, p. 449).

- **Regulations of the Committee Maritime International (CMI)**

CMI is a nongovernmental organization working in the area of coordinating the legal frameworks in sea navigation. In 1990, the committee published regulations related to electronic bills within the framework of the comprehensive legal framework for the users of electronic money bills that could be used by the private parties in their transportation contracts. Both of the CMI regulations and Bolero project formed and predicted certain characteristics regarding the creation of a private set of regulations for rendering identical the use of electronic bills of ladings, especially in regard of their equal legal functions, to the paper-based accounts. CMI's regulations played a key role in developing the electronic transportation documents. Part of their success and popularity reasons pertained to their international approach for they were accessible by anyone without any subscription or cost; due to the same reason, more users were attracted. These regulations were voluntary meaning that the parties could decide to enforce the regulations in the transportation contract or not. Furthermore, they did not influence any national maxim or regulations. Article 6 of the aforesaid regulations expresses that "in case of using these regulations, the transportation contract's parties can arrange their contract based on any international convention or national laws and it is also accepted if their accounts are issued in papers or not"[17]. Article 11 of CMI regulations stipulates that "the carrier and the sender and all the parties can agree after the use of these methods on the national or local laws to govern the order or operation that needs transportation contract in written form through data transferred or confirmed electronically and shown in computerized data storage media in a human language on a screen or in printed form. In case of agreement with the enactment of these regulations, the parties do not have any right to require one another write a contract in contradiction to this article". After receiving the goods, the carrier should inform the sender about the goods' reception via sending a message to an electronic address announced by the sea navigator. The content of the message is substantially completed with the requirements of the bill of lading inserted in Hague-Visby regulations including the explanations about the shipment, time and date o reception and transportation authority and conditions. In case that the bill of lading is transferred to a third person, the private encryption code should be transferred to him for further use. These regulations authenticate the information sent within the context of such a message and consider it as possessing a force similar to that of the traditional bill of lading. Article 4 of CMI stipulates that "the e-BL should point to the transportation contract and expresses that the conditions and criteria should be part of the transportation contract and the carrier should also point to such conditions and contracts in the electronic bill of lading". Therefore, CMI regulations supply the services related to the transportation contract's confirmation. However, CMI regulations are somewhat imperfect regarding the documents' contents in respect to their subjects. This system has been created by encryption of the private codes. It is stated in EDI section how such a private key coding can be used as a substitute for taking physical possession of a paper-based document and how it allows the private key holder perform deed transferring through key transferring, of course, with some security concerns regarding the encryption of the general key. In summary, it can be stated that CMI regulations have the advantages of an open market that is needless of membership or extra costs' incurrence by the potential users. It is also interesting that CMI that played an important role in the development of the sea navigation law before is not currently playing any significant role in the international maritime regulations.

[13] Article 48 of Rotterdam Convention.
[14] Article 54 of the second paragraph in Rotterdam Convention.
[15] Francesco Berlingieri: International Maritime Conventions (Volume 2): Navigation, Securities, Limitation of Liabilities and Jurisdiction, Information Law from Routledge (Abingdon 2015, p. 166).
[16] INTERTANKO: International Association of Independent Tankers Owners.
[17] Http://www.uncitral.org/uncitral/en/uncitral_texts/electronic_commerce/1996Model.html

- **Functioning Quality of CMI System**

Transportation operator and goods forwarder should have the regulations of CMI governing their transactions in case they intend to use the electronic bills of lading based on CMI's regulations based on which the shipment should be also delivered to the transportation operator. Following the reception of the freight, the transportation operator sends a message under the title of goods' reception to the sender's email. The message features the value of the paper-based BL following being received and includes the name of the goods' sender, place and date of reception and loading of the goods, transportation operator's carriage conditions and the private key of the sender. After the confirmation of the carrier's message by the sender, the transportation operator, as well, gains access to the private key and it is from this point of time on that the operator becomes the holder of the private key. The person having the private key can claim the possession of the goods and the transportation operator should deliver the goods to him. When the goods' holder intends to transfer the e-BL to another person, this third person should inform the transportation operator of intention for the transferring of the BL as soon as possible following which a shared private key is used for the identification and confirmation of the new holder; after confirming the message, the transportation operator sends all the information of the BL to the new key holder. Of course, the private key still belongs to the owner until the new holder accepts the message. Then, the exclusive right of the BL's control and transfer is delegated to the new holder and the transportation operator invalidates the current private key and defines a new private key for the third receiver's transferring of the BL hence the goods (CMI rules 1990). The substituted private key is replaced for the traditional BL and it can be similarly transferred. When the BL is of the traditional type, the holder possesses either one original BL or several original versions thereof but the holder of an e-BL only has a private and unique key and another private key has to be issued if it is transferred. In order to deliver goods in the destination port, the transportation operator informs the e-BL holder of the place and date of delivery and the holder has to introduce the receiver and send the required instructions for the delivery of the goods through private key to the transportation operator. The transportation operator delivers the goods based on the instructions and cancels the private key. Considering the fact that there is only one private key in every transferring stage as ruled in CMI regulations and also that the initial key is nullified following transferring and new key is issued to the new owner, the uniqueness of the electronic bill of lading is reserved in the transportation path; in this system, the transportation operator is the very private registration authority (Chandler 1989, p. 65). Amongst the most important essential differences between the transferring of the E-BLs and paper-based BLs is that the paper documents are transferred from merchants to merchants in traditional bills of lading and that they are not delivered to the transportation operator until the offloading time; but, in CMI system, the bills of lading are exchanged between the consecutive holders and they are simultaneously given to the transportation operators in which case each of them becomes the holder of a new BL (Todd 2006, p. 825). CMI system was not welcomed by the merchants and Sea DOCs could not resolve the uniqueness of the e-BLs based on the well-verified and favorable regulations like its previous predecessors. The reasons for such a failure have been explained beneath:

1) Most of the merchants were not willing to delegate the control of their business affairs to the transportation operators and disclose all their information to them; 2) in this system, the transportation operator had numerous responsibilities. For example, it had to issue and invalidate many keys at the time of the transferring and send new messages to the new owners and construct a new private key and invalidate the old key. Placement of all these duties on the shoulder of the transportation operators made them unable to perform their other tasks very well and/or caused them incur extra costs for getting their duties properly done such as by recruiting more human workforce and buying more administrative tools (Kelly 1996, p. 349); 3) in CMI regulations, there were no rules for transferring goods' ownership (Todd 2006, p. 825). Considering the inadequacy of security in the transferring of e-BLs through the use of CMI system, bankers also protested frequently thereto because the bills of lading were not encrypted by any code of, saying, e-series. That was because the electronization of the BL without security meant shared access to the information by the cyberspace users and banks (Chandler 1989, p. 477). Rule 8 of CMI speaks of a symmetrical key for securing the e-BLs and it does not present anything about the general key and asymmetrical encryption; symmetrical encryption does not provide sufficient security for the exchanging of the e-BLs (Dubovec 2006, p.452). The electronic business model law (MLEC) that was passed in 1996 as an unprecedented guideline stipulates that "national legislators have accepted a set of internationally agreed regulations and they should generally enact predictions for removing the legal barriers that might be existent and increasing in the entire various areas of e-business" (Electronic business model law 1996, p. 40). It is evident that EDI cannot spontaneously offer an equivalent model for paper-based documents with both of them being inherently but not legally usable. Therefore, MLEC enhanced some of the essential principles respected for the future development of the electronic business; such as the principles of non-discrimination, technological impartiality and performance homogenization[18]. Based on the analyses of the documents' required functions and determination of the idea as to how these functions can be investigated through electronic methods, three essential properties of being a document, investigation and being evidence of a carriage contract are evaluated[19]. The principle of nondiscrimination guarantees that a legal document should not be rejected only for its being in electronic form whereas the technological impartiality enacts the regulations that are impartial according to the used technology. In addition, the second part of MLEC that pertains to goods transportation by means of electronic business as ruled in the other legal texts, including the UN's convention about the contracts of international goods transportation by sea in part or in whole (Rotterdam Regulations) and might be the objectives of UNCITRAL's further works in future. The performance of a negotiable document introduces the subject of the BL's key function. In line with this, electronic BL has been authenticated in international business with physical storage of document being an essential aspect of this performance. Paper documents are unique in terms of their nature and an electronic equivalent can meet these unique requirements; and, the holder of goods ownership right and conventional rights accordingly enjoys guarantees practically beyond a paper-based BL against the carrier in technical terms. Seriously, the entire data messages can be unique even if they are copies of the older messages because they are sent at different times and dates. Every BL that is issued or transferred in electronic form is a record registered under the name of a person to whose address it is issued or transferred. This record of name's registration shows that a certain person is the possessor of the BL hence the unique possession right is satisfied. There are three primary models of registry system: governmental registrations that are administrated by the governmental organizations; private registrations that are registered by the right-issuers and central registrations that are administrated by a private group and they can be used only by the members thereof[20][21]. Therefore, the ground is set for electronic registration of the documents so that the goals and performance as well as the requirements related to the transferable documents can be met. The electronic business law aims at rendering usable the histories of the electronic transfers as equivalent to the performance of the documents and means of transfer. The most important of these requirements are technical guarantee and uniqueness. The relative concept of uniqueness causes technical challenges in the electronic environment because it causes the infeasibility of offering absolute non-amendable guarantees in technical terms as a result of which a given record that is to be an

[18]Http://www.uncitral.org/uncitral/en/uncitral_texts/electronic_commerce/1996Model.html

[19] The equal treatment of electronic writing is set forth in article 6, electronic signatures in article 7, and the requirement of original in article 8.

[20] The Korean KNET is an example of such a registry.

[21] The CMI Rules operates on a private registry, where the carrier has the role of managing the registry.

equivalent to that document or that means of transfer cannot be identified due to the absence of a tangible environment. In fact, the concept of uniqueness causes challenges, as well, regarding the transferable documents and deeds because it bars the offering of an absolute non-repeatable warrant deed. This is indicative of the idea that the information might be related to any electronically transferrable record at the time of issuance or at any time before and after that (such as in information confirmation). Especially, the metadata[22] generation does not necessarily happen after the production of a record rather it can also come about before that. It is possible in some of the electronical data transferring management systems that the collected information causes the generation of information containing electronically transferrable records but without the discrete record that is transferrable when performing record registration. The term "logic" refers to computer software not to human logic[23]. The definition of the "transferable document or means" is concentrated on the transferability key functions and confirmation of title for performance. In 1990, CMI regulations were enacted by the committee marine international. Unlike Sea DOCs system, these regulations are internationally available to the individuals who want to use them and render the transportation operators, goods' sender or goods' receiver needless of membership in a certain institutions; being able to receive the messages in electronic form and resending of them suffices them.

- **Bolero System**

In 1990s, EU started and financially sponsored a research with the goal of creating a comprehensive and mutual industrial solution for creating business equations in the border transactions. This resulted in the creation of a Bolero association that was rapidly authenticated amongst the banks, companies and supplies in the entire world. In the first stage, they inserted a central registry for all the documents related to the transactions like securities and finally bills of lading. Bolero's adequate interests drew the attentions of SWIFT and TT club that reached an agreement for a joint venture[24] in 1996. Nowadays, they offer an array of financial and technological expertise as well as a legal business framework for facilitating the digital solutions in the entire world[25]. It will be stated below how Bolero which is an electronic BL transferring contract uses BCMP when the contingent holder receives a sender's message to support the process of electronic BL delivery from the sender to the receiver or vice versa without the holders' being in need of direct interaction with the software and also without the need for all the parties' convergence in a unit platform. BTR is a shared user agreement for Boleros E-B/L users and it includes 18 rules that generally determine the duties and rights of the users and place the legal rule behind BTR and BCMP. These regulations guarantee that the users all work in adherence to a set of regulations; thus, the members are provided with legal assurance. Unlike CMI regulations that fall in the periphery of an open network wherein the users can use any platform or technology to send their required message, BR does not work with such an impartiality approach. The close relationship between BR and Bolero technology provides a strong guideline enforceable in the global level that meets the need for an individual inter-party mutual agreement because each rule covers a dimension[26]. Registration is the title that really separates Bolero's solution in comparison to the prior cases such as CMI regulations with its privilege being its superiority to the other programs while the message platform repeats document delivery or transfer from a party to another and always keeping the current record holder active so as to ensure its clarity and also for having only one document holder at a time. Additionally, registry is only updated by the current holder and it does not do anything else in transportation and this is one of the main weak points of CMI regulations[27]. If a person wants to transfer the electronic BL to any person outside the system, s/he will be immediately faced with a legal and technical barrier. The only solution is offered by Bolero in such a status that, instead of issuing a paper-based document, issues a private key for the old BL and the bill of lading is transferred to the new carrier. Now, answers should be found to several issues that whether everyone can take measures based on technology and not legal framework about them in adherence to the domestic laws and the principle of the contracts' freedom or not. Both Bolero and CMI regulations use the uniqueness of the electronic document through taking advantage of a shared agreement without a registry's sending of a title to the message's platform and without a registry's sending of a third person's title, such as in Bolero, or sending of a carrier's name such as in CMI regulations. Bolero clearly offers a solution that effectively repeats the performances of a BL's document; it removes the potential users and the businesses are limited through a practical member network. However, on the other hand, CMI can be accessed by anyone who intends to use it with the carrier playing an important role in the pursuit of the transactions and this causes the volume of works be unfavorably and remarkably increased in the transportation[28]. A sufficient infrastructure for use of electronic BL is amongst the largest hindrances that the potential users of e-BL should cope with it (UNCTAD 2003, para 79). Market infrastructure and the business partners are not still ready for taking advantage of this accomplishment. The legal frameworks are not sufficiently clear and adequate; the electronic equivalent is not sufficiently safe; the technology and/or change in the electronic environment is extremely costly; the confidentiality of the information is the businessmen's major concern; when a system membership is attained, the user might enter transactions with the non-member individuals that prevents the user's enjoyment of the investment (Goldby 2008, 2013). Thus, we may ask ourselves that is there any other technology that can solve these issues. Efforts have been made here to introduce this technology.

Block chain, the Solution to the Protection of Electronic Bills of Lading

Block chain is an innovative and outstanding invention; it is born in the mind of an individual or a group of individuals known as Satoshi Nakamuto. However, since the time block chain was introduced, it became a huge creature and the main question by many of these individuals is that what is block chain? Block chain technology created a new type of internet backbone via providing the possibility of digital information distribution without copying. At first, bitcoin was designed for digital money. But, at present, the technology society is seeking to find other potential applications for this technology. Block chain is a non-destructible digital ledger of the economic transactions that can be used not only for recording the financial transactions but also nearly for registering any valuable asset. Imagine a spreadsheet that has been copied a thousand times in the computer network. Then, imagine that this network has been designed to be regularly updated. Now, you have an initial perception of block chain. The information kept in the block is shared as the database and it is in a constant matching process. This method of network use has vivid advantages. The block chain database is not saved in a place meaning that the files that are being stored are really general and easily confirmable. There is no centralized version of such information so that a hacker may be able to destroy it. It is by the data hosting by millions of computer at the same time that its data can be accessed by everyone on the internet.

[22] In fact, metadata are data defining other data.

[23] http://www.uncitral.org/pdf/english/texts/electcom/MLETR_ebook.pdf - UCITRAL Model Law on Electronic Transferable Records, paragraph 38.

[24] Bolero International Limited.

[25] http://www.bolero.net/home/company-overview/ (Last accessed in February 2018)

[26] Before this, it was custom for merchants to travel with their goods to the port of destination. Eventually this became less desirable as the merchant trade advanced and grew more complex, and the merchants stopped travelling with their cargo, instead consigning the goods to a buyer at the port of destination. It then became apparent that on would have kept such a registry – Alan Mitchelhill, Bills of Lading: Law and Practice, Second Edition, Springer, 21. Nov. 2013, page 1 and William Porter Bennett, The history and present position of the Bill of Lading as a document of title, Cambridge 1914, p. 6.

[27] Https://cdn2.hubspot.net/hubfs/326699/Gated%20Files/The%20Bolero%20Rulebook.pdf?submissionGuid=13c30427-1df3- 4f88-90a6-e8e10b17e91f – The Bolero Rule book (Easily accessible by typing a made-up name, email address and company name)

[28] United Nations Conference on Trade and Development.

Block chain's Persistence and Robustness

Block chain's technology is like internet's technology that features an internal solidarity. It is via storage of information blocks identically in the entire breadth of its network that 1) block chain cannot be controlled by a single control unit and 2) there is no single point of failure.

Block chain is really a revolutionary mechanism that responds to everyone in the highest level. Human and machine errors or even an exchange that has not been conducted based on the parties' satisfaction are all missing. More importantly, the most important area to which block chain contributes is the guaranteeing of the credibility of a transaction through its registration not only in a primary and centralized registry but also in a distribution system that are connected through a sage validation mechanism.

Decentralization Idea

Block chain is a non-centralized technology. Everything that occurs in block chain is a product of the network performance as a whole. This property is used frequently. It is by the creation of a new method for investigating the transactions that some aspects of the traditional business lose their necessity. For instance, the stock market transactions simultaneously occur in block chain or various kinds of audits like land registration can be rendered completely general. For the time being, decentralization is a reality. It is hoped to use the block chain technology that has been invented for ensuring the flexibility of the e-BLs in virtual network cooperation without the intermediaries and names' registration. Block chain is comprised of block and chain. This technology is indeed a chain of blocks. In general, block chain is a decentralized information registration system and a distributed report system. Any information can be registered in every block from crimes by an individual to the display of the accounts for the assets like bitcoin. In block chain, information is placed in blocks that are connected to one another in a chain form. It is also possible to maintain online P2P business on block chain without the interference by the intermediaries in the same way that every transaction is supplied with a digital signature in EDI that ensures the credibility of the transferor's identity. Since a bill of lading is not in more precise terms like a monetary value such as bitcoin, the technology should be applied somewhat differently. This issue enables the carrier in the bill of lading to show the e-BL in the form of a sign in the block chain as an indicator of the right to request the goods' delivery. Since technology causes changes in the record and/or necessitates the copying of the electronic records in the negotiation chain, no third person would exist for supervising the transactions and pursuing the individual that has to be the holder; the record transfers itself and the negotiation chain remains intact at the bottom. Even if the block chain technology reduces some of the issues related to the closed networks and titles-names' registration, there is still a need for supporting an enforceable legal system. Rotterdam convention was approved before the birth of block chain technology in 2008[29]. As it is observed, UNCITRAL works from the beginning to the end with Rotterdam Convention; the principle of the technology's impartiality is a guided principle. Although Rotterdam Convention does not point to Block chain Technology, it does not necessarily mean that it omits it from its functioning domain[30].

Asserted Results

Block chain technology allows the business in a P2P system to be carried out without the interference of the intermediaries and/or a central registry. There is no possibility of storing or copying the materials in block chain rather the private key is again allowed for taking a second intervention. The unique properties of the web-based indicators and the large number of the block chain's blocks cause a question to be raised with its answer being a lot beyond the scope of a single research. Keeping the abovementioned materials in mind, many of the legal issues have been discussed and investigated. Koiji Takashi, a Japanese Professor from the University of Doshisha, has performed extensive works in this regard. It is better to do deep research on his materials because he offers a unique discretion concerning this issue[31]. It has to be pointed out additionally that Bolero is currently working on the implementation of Block chain technology in his systems[32]. After the completion of CMI System, BIMCO[33] took measures in line with launching a system for developing electronic bills of lading. Although his project was left in the middle of the work even with the large costs that had been made, it was later on resumed by a consortium of transportation operators, merchants, banks and telecommunication companies. The system was designed in 1994 and its aerial phase reached exploitation stage in 1995. Afterwards in 1998, it was by the civil collaboration between SWIFT[34] and TTClub that a Ltd. Company was established for issuing e-BLs and it was used as the center of Bolero's operation (Low 2000, p. 178).

- **Bolero System's Operation**

Bolero was first tested in the first place in aerial bills of lading and it could successfully pass it. In this system, all the news is delivered through Bolero's messaging center. Bolero's message is formed of three elements of Bolero packet, business deed and digital signature. All of the information of the BL is electronically inserted in the business deed and put in the Bolero packet. The digital signature is appended to Bolero's packet through available ways. Appending of the signature is conducted by the goods' sender and through his private key. The message encrypted through digital signature is sent to the Bolero's operation center and it verifies the digital signature of the goods' sender by means of the sender's general key. In case that the signature matches with the registered signature sample, the Bolero's operation center isolates the sender's digital signature from the deed and signs it by the Bolero's private key and sends it back to the goods' sender. The sender of the goods is able to verify the authenticity of the message based on his general key. Bolero's operation center directly sends the business deed that has the information of the bill of lading to another institute which is called ownership registration. After acquiring the signature of the goods' sender, Bolero becomes the initial owner of the BL and the registration authority authenticates his ownership as the current holder. Bolero Operation Center is a channel through which the seller and buyer are electronically connected. Bolero's ownership registration center registers and keeps the names of BL holders and manages the rights and duties created regarding the bills of lading (Laryea 2001). If the holder of the BL intends to transfer its ownership, he must send a message to the Bolero's ownership registration authority and inform it about the transferring whereabouts. This message should be also sent to the third person who has become the new holder, as well, so that it can become clear whether he accepts or rejects the transferring. When the new holder accepts it, the name of the current owner is invalidated and the name of the new holder is registered instead with the general Bolero's key code being transferred to him. When the goods' ownership was completely transferred to the new holder, a commitment transformation would be created in the contract but, in case that the transferring occurs in the form of mortgaging the BL, no commitment transformation would occur (Bolero Rulebook 1998). This way, there

[29] Michael Sturley, Tomotaka Fujita and G van der Ziel The Rotterdam Rules: The UN Convention on Contracts for the International Carriage of Goods Wholly or Partly by Sea (Sweet & Maxwell London 2010) para 3.039 states that: 'it appears that the technology needed for a reliable token system is still not available in the market place'.

[30] Explanatory Note to the UNCITRAL Model Law on Electronic Transferable Records, Article-by-article commentary.

[31] Http://www.uncitral.org/pdf/english/congress/Papers_for_Programme/30-TAKAHASHIImplications_ of_the_Blockchain_Technology_and_UNCITRAL_works.pdf - Implications of the Block chain Technology for the UNCITRAL Works (last accessed 7, May 2018) https://www1.doshisha.ac.jp/~tradelaw/PublishedWorks/BlockchainTechnologyElectronicBL.pdf - Block chain technology and electronic bills of lading (last accessed 27. April 2018)

[32] Http://www.bolero.net/pass_the_panacea_the_trade_-finance_revolution_puzzle/ (last accessed 29.05.2018) http://www.bolero.net/the-unstoppable-tide-of-digitisation-in-trade-bolero-at-gtr-asia-in-singapore/ (last accessed 13.05.2018

[33] BIMCO: Baltic and International Maritime Council.

[34] SWIFT: Society for Worldwide Interbank Financial Telecommunication.

is always a holder for the BL and its uniqueness will be also guaranteed at any time.

- **Shortcomings of Bolero System**

Bolero system also has its own shortfalls because there is a need for a trusted and impartial registration system to shoulder the endorsement and transferring of the BL in an electronic form. Lack of attention and satisfaction in the banks for the previous systems is one of Bolero's failure reasons. Before the enactment of Rotterdam regulations and when this system was working, use was only made of paper-based BLs in Hague and Visby-Hague regulations which were only enforced for the paper documents and the countries, as well, formed their regulations in adherence to the aforesaid regulations and Bolero's BL was not included by these rules and regulations because no use was made of paper in creating and transferring these bills of lading (Dubovec 2006, pp. 452-453). Bolero System made some efforts for not accepting new members and lacked the transparency and clarity for accepting the new members. Bolero's registration system only is run for the members of this system and not all the merchants are able to access this system (Todd 2006, p. 819). On the other hand, this system creates limitations for its members because they are not capable of transferring the Bolero's BL within electronic format to the merchants who have not joined Bolero. And, if they intend to transfer to the non-member individuals, they should use paper equivalents. Bolero's framework of contract is very complicated. The user of such a system is faced with a huge volume of contracts with hundreds of regulations pages attached thereto. It is evident that such a complex contract framework needs comprehensive and vast regulations to become a standard. Another issue that comes about due to this large volume of regulations is the terminology of the words used in the contract with it being almost impossible for the users to get familiar with the related terms and this may discourage memberships in the aforesaid system (Gehrke 2001, p. 68).

CONCLUSION

Electronic bills of lading have not been ubiquitously expanding everywhere during the several past decades and can there be created new changes that bring about new evolutions? To find an answer to this question, we are to take a long journey and investigate the legal documents as well as the various electronic BLs and the existent legal frameworks and also technologies; we are to also evaluate if the novel block chain technology can be used for e-BLs under such systems. The followings highlight some of our primary findings so we try to reach a conclusion. Putting conservatism, doubt and general dubiousness in maritime industry aside, the present study's findings seemingly prove that the entire existent solutions suffer from various subjects that may dissuade the potential users from using electronic bills of lading. First of all, neither Bolero nor CMI regulations can guarantee the uniqueness of e-BLs without connection to a registry as a messaging platform. However, Bolero offers a clear solution that effectively reiterates the functions of a bill of lading and removes the potential users and limits the business to a dependent network of members. On the other hand, CMI is accessible by everyone but it gives a considerable role to the carrier in tracking the transactions. Block chain allows the trading of tags in a P2P system in a special sort of computer networks in such a way that all the computers or the member devises of this network share their work load and volume in the whole network. Computers or devises that form part of a P2P network are called peers. The computers inside a P2P network do not feature any preference to one another and they are all equal. The computers inside a P2P network apportion the resources without any need for a centralized management system and work without the intervention by the intermediaries and/or a central registry. It is not possible to store or copy the materials in block chain rather the private key is not authorized for the private users. The unique properties of the block chain-based indicators propose a large number of the legal questions. Based on such principles as technological impartiality and functional value sharing, the existent works would be sufficiently flexible to use block chain technology. However, there are several unexpected issues augmented by the technology. It is through the development of these effects that we may face them. It has to be also stated that UNCITRAL has made a lot of efforts in electronic business for arriving at the point we are currently in.

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