Electronic Bills of Lading: Legal Obstacles and Solutions

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Traditionally, in the commercial field, the necessary commercial transactions have been based on the use of paper for the conclusion of contracts such as the bill of lading. However, in the past decade, the extensive growth of technology has led to the emergence of new commercial structures, such as distant contracts. This new form of contract constitutes an impetus for improving the volume of commerce and has the effect of dematerialising the traditional paper-based transaction. However, presently, this is not feasible enough as the conventional legal institutions that control commercial transactions, are not fully attuned to the challenges of the technological society and its transactions.

The new dematerialized form of bill of lading should, theoretically, execute the same functions as the conventional paper one. However, this is not achieved effectively. Besides, the method of its performance is entirely dissimilar to the performance of its traditional equivalent. This is due to the fact that the electronic bill of lading is not merely a bill of lading, containing the necessary information as its traditional equivalent, which is transferred through electronic means. The new substitute of the paper bill of lading constitutes more than a mere transfer from one computer to another. The electronic bill of lading includes ‘data that is inserted in a computer and transmitted electronically using electronic messages, therefore, the electronic bill of lading is consisted of the series of electronic messages sent and received among a carrier, shipper and consignee. Consequently, the electronic bill of lading cannot be issued in sets as the traditional bill of lading and moreover, it cannot be signed in the same sense as the paper bill of lading.’

Despite the fact that the performance of an electronic bill of lading differs from that of paper bill of lading, the former should perform the most of the functions of the latter. The electronic bill of lading can successfully execute ‘the functions of receipt for the goods shipped’ and evidence of the contract of carriage as such information included in these contracts can be transferred without any obstacles, through the use of electronic messages as long as there is sufficient security. However, there is a difficulty in the performance of the most significant function of the paper bill of lading, that is the function as a document of title, which enables the title to the goods to pass on while they are still afloat. Moreover, other legal barriers exist as well and these include the requirements for ‘writing’, ‘document’, ‘original’, ‘signature’ and the evidential value of an electronic bill of lading in courts.

Legal Obstacles

‘Negotiability’ and Electronic Bills of Lading

Traditionally, negotiability has been associated with the physical possession of the bill of lading. The physical possession of it has been described as:

3 For an analysis of this function see: J.C.T. Chuah, ibid, pp.185-192 and J.F. Wilson, ibid, pp.132-135.
4 C. Pejovic, supra n.1.
5 For an analysis of this function see: J.C.T. Chuah, supra n.2, pp.192-200 and J.F. Wilson, supra n.2, pp.135-146.
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“the cornerstone to transmissibility of rights and compelling delivery by the carrier of the named goods.”

Therefore, transmissibility of rights under an electronic bill of lading is difficult as long as “the rights “exist” in cyberspace only”. The fact that the electronic bill of lading itself cannot be presented at delivery of the goods, nor is able of being endorsed to any subsequent holder as the original bill of lading, constitutes a major legal obstacle to the legal recognition of electronic bills of lading as ‘negotiable’ documents. Relating to electronic bills of lading, it is the possession of the private key under the EDI system that gives rights to its holder.

However, George F. Chandler proposes that:

“the substance of a negotiable instrument is not its signature or its original nature, but the process that inspires confidence in the piece of paper.”

Furthermore, Chandler believes that it is the information that is contained in the paper that is of great importance and not the paper itself. He goes on and compares the paper bill of lading with paper money and concludes that none of them has value on its own. Though, their value, he recommends that subsists provided that there is confidence that it will be exchanged for the material promised. Hence, as long as the electronic bill of lading through the use of EDI provides confidence to all the parties concerned then, the problem of negotiability will be overcome. Finally, Chandler delightfully comments on that issue that:

“the only limitation to EDI is a mental one. For those who can not bring themselves to abandon impressive looking pieces of paper for computer video screens or printouts, no argument can be put forward to justify negotiable transactions using EDI. For those who need or believe in EDI, they will come to realize that we put our faith not in the piece of paper, but in the process and that any process can be duplicated electronically. Thus, it is not a question of if it can be done, but when.”

However, some legal provisions to establish that the electronic bill of lading, as long as it is the electronic equivalent of the paper bill of lading, is a ‘negotiable’ document under which rights to the goods can be transmitted to the consignees, might be accommodating in the attempts to legally recognize this new form of bills of lading.

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7 M. Ash, ibid.

8 The private key is known only by its owner in contradiction to the public key which is known to the world at large. For more details see: How PGP works (online) http://www.pgpi.org/doc/pgpintro/ [27th August 2003].


11 G. Chandler, ibid.


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The Requirement of ‘Writing’

The requirement of ‘writing’ is either express or implied by national laws in various jurisdictions. The rationale behind this requirement was expressed by the UNCITRAL in the Vienna Report\(^1\) as being the following:

“To provide that a document would be legible by all; to provide that a document would remain unaltered over time; to allow for the reproduction of a document so that each party would hold a copy of the same data; to allow for the authentication of data by means of signature; and to provide that a document would be in a form acceptable to public authorities and courts.”

This is extremely important in relation to international trade transactions and in particular with the bills of lading which constitute a document of title therefore, enabling the holder of it to claim delivery of the goods it represents. So, it is necessary that the electronic bill of lading is recognized as being equivalent to ‘writing’.

The **UNCITRAL Model Law on Electronic Commerce** deals with this issue by providing in Article 6 that:

“Where the law requires information to be in writing, that requirement is met by a data message if the information contained therein is accessible so as to be usable for subsequent reference.”

By the word ‘accessible’ is meant that the information must be capable of being read and reproduced. This is easily achievable in the case of a traditional writing message such as a bill of lading and can also be obtainable in the case of data message, such as the electronic bill of lading, provided that the essential software necessary to render the data message readable exists. Therefore, as long as the information contained in the electronic bill of lading is ‘accessible’ then this requirement is satisfied. However, as long as the **UNCITRAL Model Law** does not have the force of law, this Article does not provide a permanent solution to this problem.

The **Hague-Visby Rules** do not explicitly require the bills of lading to be in ‘writing’. Despite this fact, under Article III the Rules suggest that the bill of lading should be issued to the shipper and therefore this implies that the requirement for ‘writing’ is assumed\(^14\).

The **Hamburg Rules** provide that “writing includes, inter alia, telegram and telex”\(^15\) therefore leaving it open for a wider interpretation of the word ‘writing’ so as to include data messages and consequently, electronic bills of lading. However, these Rules do not have widespread application and as a result they cannot constitute an impetus for the evolution of electronic bills of lading.

The European Community has tried to facilitate the electronic commerce by making the necessary provisions for the dematerialisation of paper-based documentation. In **Electronic Commerce Directive** it provides that\(^16\):

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\(^14\) E. Muthow, ‘The Impact of EDI on Bills of Lading, A global Perspective on the Dynamics Involved (part 1)’ (online) [14th November 2002].
\(^16\) O.J. 2000 L 178/1, Article 9(1).
“Member States shall ensure that their legislation allows contracts to be concluded by electronic means. Member States shall in particular ensure that the legal requirements applicable to the contractual process neither create obstacles for the use of electronic contracts nor result in such contracts being deprived of legal effectiveness and validity on account of their having been made by electronic means”.

This provision has been implemented in the UK by the **Electronic Communications Act 2000** therefore constituting the springboard for overcoming this legal requirement and enabling the electronic bill of lading to operate without any such difficulty.

However, the English jurisdiction in the **Interpretation Act 1978** under **Schedule 1** defines ‘writing’ as “typing, printing, lithography, photography and other modes of representing words in visible form”. It is not clear enough whether this provision enables or inhibits the desirable evolution concerning the commercial transactions. This is due to the fact that the opinions of various academics are divergent. Others believe that this definition can be widely construed so as to include electronic bills of lading through the use of EDI and others support that the electronic message, such as an electronic bill of lading, is not in a visible form of itself so it does not come under this provision.

Other enactments in the UK, however, place electronic message in the same category with ‘writing’. Examples of them are the **Copyright, Designs and Patents Act 1988** which in **section 178** provides that:

“writing includes any form of notation or code, whether by hand or otherwise and regardless of the method by which, or medium in or on which, it is recorded, and ‘written’ shall be construed accordingly”.

Moreover, **The Merger (Prenotification) Regulations 1990** in **Regulations 5, 7(1), 8 and 9** provides that ‘writing’ includes “facsimile or other form of electronic transmission”.

All these various enactments in the UK jurisdiction demonstrate that there is no clear law as to what ‘writing’ means. Therefore, the provisions of these Acts mostly confuse all those concerned with the statutory interpretation of this simple word rather than clarifying its meaning. Consequently, law reform seems to be necessary in this area of law so as to provide a clear and indisputable definition of ‘writing’, which should encompass the electronic messages, as the law has to grow in accordance with the technological developments and the modern requirements of business society. Some recommendations have been made by the Working Party of the Society for Computers and Law in its first report to Government in January 1997. It was suggested that the **Schedule 1** of the **Interpretation Act 1978** should include the following definition of ‘writing’:

“writing is a representation of words, symbols and numbers which is now called ‘text’.”

By this definition a data message would be recognized as equivalent to ‘writing’ therefore, the use of electronic bills of lading should not be impeded by this legal requirement of ‘writing’.

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17 E. Muthow, supra n.14.
20 The word “text” means manual or digital according to the recommendations.
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The requirement for a ‘document’

Another legal barrier to the evolution of the electronic bill of lading is whether it can be regarded as a ‘document’. The word ‘document’ is defined as ‘an official or formal paper, form, book, etc giving information about something, or evidence or proof of something, or a record of something’. On condition that document is stick to paper only and not to documents made through electronic means, then, this will prevent the evolution of the electronic bill of lading. However, there have been some developments in law so as to recognise the electronic message as a ‘document’ and hence to overcome this problem.

Examples of such statutory provisions include section 160 of the Companies Act 1989, which states that a ‘document’ “includes information recorded in any form”. Therefore, digital technology used to record electronic message such as an EDI electronic bill of lading, could be easily covered by this provision. Moreover, further interpretations of the word ‘document’ can be found in The Finance Act 1993, section 40 which provides that a ‘document’ “includes a document of any kind whatsoever and, in particular, a record kept by means of a computer”. Once more, this encompasses the electronic messages. Further interpretations can be found in case law, for instance, in the case of Derby & Co Ltd & Ors v Weldon & Ors (No.9)22 which concerned discovery of documents and in which Vinelott J. held that a computer database is a ‘document’ given that the information contained in it is capable of being retrieved and converted into readable form.

Concerning the legislation that specifically refers to international commercial transactions, some steps have been taken, which assist to the legal recognition of the dematerialised documentation. Reference is made to the Carriage of Goods By Sea Act 199223, section 1(5) which provides that this Act shall apply:

“to cases where a telecommunication system or any other information technology is used for effecting transactions corresponding to:
(a) the issue of a document to which this Act applies;
(b) the indorsement, delivery or other transfer of such a document; or
(c) the doing of anything else in relation to such a document.”

This provision can apply therefore to an EDI format used for the performance of an electronic bill of lading as this Act by its wording seems to be flexible enough to give legal validity to the technological developments that affect the performance of international commercial contracts.

The judicial approach to this issue is similar to the view of the legislators who attempt to harmonise the relationship of law and technological development. This is clearly identifiable in the words of Walton, J. in the case of Grant v. Southwestern & County Properties Ltd24 in which he held that:

“the mere interposition of necessity of an instrument for deciphering the information cannot make any difference in principle.”

This means that the fact that the use of a medium such as a printer is necessary in order to make out the information does not prevent the electronic message from being a document25.

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23 This Act has replaced the Bills of Lading Act 1855.
24 [1975] Ch. 185.
25 D. Faber, op cit n.18.

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As a result, an electronic bill of lading can be able of being regarded as a ‘document’ and therefore it can be legally valid.

However, as far as the requirement of ‘document’ and the evolution of electronic bills of lading are concerned, an obstacle still exists. This is due to the fact that, even though various legislations and case law are apt to recognising an electronic message as a ‘document’, there is no clear and absolute reference to it in any statute. The law, once more, seems to be outmoded and not responding to the growth of technology, which consequently creates new business needs and demands such as the use of electronic bills of lading through EDI in order to facilitate the international trade transactions.

The requirement for a ‘signature’

‘Signature’ is required in most jurisdictions as far as international commercial contracts are concerned. That is due to the fact that a traditional ‘signature’ performs two very important functions. Firstly, it represents the intention of the party signing a document to be legally bound by its contents and, secondly, it authenticates the document.

‘Signature’ is also extremely important as far as bills of lading are concerned. The master of the ship that carries the goods, acting on behalf of the carrier, acknowledges that the goods have been loaded in good condition and order by signing the bill of lading. However, as the bill of lading is a ‘negotiable’ document, it is occasionally transferred to a third party who then becomes the holder of it and who is also required to sign the bill of lading. This should also be followed in cases of electronic bill of lading. However, a manual signature cannot be affixed on an electronic message as the electronic bill of lading. Therefore, various attempts have been made to provide an electronic equivalent of ‘signature’, which will be legally acceptable and which will be able to carry out both of the functions that a traditional ‘signature’ performs. The Hamburg Rules in Article 14(3) provided that: “the signature on the bill of lading may be in handwriting, printed in facsimile, perforated, stamped, in symbols, or made by any other mechanical or electronic means...”. This provision is wide enough to include an electronic signature that is carried out by electronic means. However, as these Rules do not apply widely, there is a need for an international harmonization of the law on this issue in order for the electronic bills of lading to succeed.

The UNCITRAL has worked twice and has provided two Model Laws that provide standards for the worldwide legal recognition of electronic signatures. The UNCITRAL Model Law on Electronic Commerce by adopting the minimalist approach deals with the issue of signature in Article 7 which provides that:

“Where the law requires a signature of a person, that requirement is met in relation to a data message if:

(a) a method is used to identify that person and to indicate that person's approval of the information contained in the data message; and


27 Professor, Dr. Indira Carr said that: “The definition of electronic signature is open ended and does not promote any specific technology. The electronic signature could be a digital signature, a digitised image of a handwritten signature or based on biometrics such as a fingerprint or iris scan”. See: Professor, Dr. I. Carr, ‘UNCITRAL and Electronic Signatures: A Light Touch at Harmonisation’, 2003, Hertfordshire Law Journal, vol.1, no.1, p. 20.


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(b) that method is as reliable as was appropriate for the purpose for which the data message was generated or communicated, in the light of all the circumstances, including any relevant agreement.”

By this Article the **UNCITRAL** provides for an electronic signature, which enjoys the same functions as the traditional handwritten ‘signature’.

The **UNCITRAL** becomes even more specific in its work concerning solely the electronic signatures. In **Article 2** it defines the electronic signature as:

“data in electronic form in, affixed to or logically associated with, a data message, which may be used to identify the signatory in relation to the data message and to indicate the signatory’s approval of the information contained in the data message”.

This definition of the electronic signature provides functions equivalent to those of the traditional ‘signature’.

Moreover, the **UNCITRAL** in **Article 6** provides the necessary elements in order to comply with the requirement for a signature. In particular, in **Article 6(3)** it deals with the requirement of reliability of an electronic signature that is essential for it to be legally recognised and for the electronic bill of lading to succeed. It is obvious therefore that if both **UNCITRAL Model Laws** were adopted by all the nations, this legal obstacle would be overcome.

In a European level, the European Union has made various attempts in order to assist to the legal recognition of electronic signatures so as to promote any activities related to e-commerce. The **Electronic Signatures Directive** is the legal instrument, which provides for a legal recognition of the electronic equivalent of a manual ‘signature’. This **Directive** recognises two types of signature: ‘electronic signature’ and ‘advanced electronic signature’ that is more secure than the former one.

However, the **Electronic Communications Act 2000** that implemented the **Electronic Signatures Directive** in the UK makes reference only to one type of signature and that is the ‘electronic signature’. The functionality of an ‘electronic signature’ as provided by the Act is similar to the traditional functions of ‘signature’ enabling therefore the legal recognition of them.

Despite the fact that the legislation has developed so as to offer the necessary provisions for the legal recognition of electronic equivalents of traditional ‘signature’, a harmonisation of laws constitutes still a necessity for the complete success on this issue.

In the UK, the Working Party of the Society for Computers and Law in its first report to Government in January 1997 suggested that a new definition of ‘signature’ should be provided in **Schedule 1** of the **Interpretation Act 1978** which should be as follows:

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29 **UNCITRAL Model Law on Electronic Signatures 2001.**
30 **OJ 2000 L. 13/12.**
31 The **Electronic Signatures Directive** as well as the **UNCITRAL Model Law on Electronic Signatures** follow the two-tier approach that is a mixture of the minimalist approach and the digital signature approach. For more details see: Dr. C. Moreno, op cit n.28.
32 See in particular section 7(1) and (2) of the **Electronic Communications Act 2000.**
33 Op cit n.19.

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“Any process performed on a writing or other thing to be signed by or under the authority of a person (the signatory) which (a) alters or adds to the information content of the writing or other thing to be signed and (b) identifies the signatory and evinces his adoption of the writing or other thing to be signed.”

Furthermore, there is one more obstacle that has to be overcome. This is related with the fact that uniqueness of a ‘signature’ is obligatory in order to authenticate the document. However, with ‘electronic signatures’ there is a ‘threat that computers can produce identical sets of symbols leading therefore to risks of fraud’ which as a consequence eliminate the confidence of those concerned. It is essential to defeat this obstacle in order to be able to adopt electronic bills of lading. Walden remarks that:

“If an electronic equivalent [to the traditional signature] satisfies the core requirement of uniqueness and intention to authenticate, it should be capable of being recognised by law.”

When this becomes legally and technically feasible then, the ‘electronic signatures’ will be legally effective.

The requirement for an ‘original’ document

This requirement is related with the requirements of ‘writing’ and ‘signature’ and is extremely important for a sound performance of international commercial transactions. In relation to negotiable documents and documents of title, this becomes an incredibly strict requirement that has to be complied with. With reference to the bills of lading, the holder of it will not be able to claim the title of the goods if the bill of lading is not the ‘original’ one. However, it is difficult to establish whether an electronic message such as an electronic bill of lading is ‘original’ or not.

The UNCITRAL Model Law on Electronic Commerce deals with this issue in Article 8(1), which provides that:

“Where the law requires information to be presented or retained in its original form, that requirement is met by a data message if:

(a) there exists a reliable assurance as to the integrity of the information from the time when it was first generated in its final form, as a data message or otherwise; and

(b) where it is required that information be presented, that information is capable of being displayed to the person to whom it is to be presented.”

Moreover, the UNCITRAL in Article 8(3)(a) provides that for a message to be ‘original’ it must remain complete and unaltered. In order to ensure the integrity of the message, security measures have to be applied, the most effective being digital signature through asymmetric cryptography techniques.

36 See op cit n.8.
Despite the fact that the requirement for an ‘original’ document is extremely significant, there is no legal instrument that deals with it in relation to electronic messages in general or electronic bills of lading in particular. Consequently, legal provisions must be enacted as far as this requirement is concerned. If this is fulfilled, except of the legal recognition of electronic bills of lading that will be achieved, this will also provide more confidence and trust to the e-traders for this new form of bills of lading.

Electronic bills of lading as evidence in court

Another legal issue, which arises with respect to electronic bills of lading, is whether they can be admissible as evidence in court as long as they constitute electronic data messages. This obstacle rises due to the fact that most jurisdictions when dealing with the admissibility of evidence, they assume that this evidence is based on paper documentation. Moreover, the Rule against Hearsay and the Best Evidence Rule in common law countries, are hindering the legal recognition and admissibility of computer evidence. Consequently, as it will be analysed below, the present legislation is not suitable to deal accurately with the admission of electronic data evidence.

The UNICITRAL Model Law on Electronic Commerce deals with the legal validity of data messages in Article 5 and with their admissibility and evidential value in Article 9. Accordingly, the former Article provides that “information shall not be denied legal effect, validity or enforce- ability solely on the grounds that it is in the form of a data message” and moreover the latter supplies that, in the legal proceedings the data message shall not be denied admissibility and evidential value solely because it is a data message. These Articles result in the legal recognition and admissibility of electronic evidence despite the Hearsay and the Best Evidence Rules.

In the English jurisdiction, the Civil Evidence Act 1968 provided in section 5 that information contained in a computer document can be admissible as evidence. However, there are some strict conditions that have to be fulfilled such as that the computer must have been ‘regularly used’ for the process of information. The Act does not provide a definition of ‘regular use’ creating therefore problems, for example, in cases where a computer was used only once to transmit information. Besides, the Rule against Hearsay has been abolished by the Civil Evidence Act 1995, section 1 of which provides that the hearsay evidence is admissible in civil proceedings, eliminating therefore the legal obstacles as to the legal recognition of electronic evidence.

Further obscurities are created in relation to authentication and the Best Evidence rule. The Civil Evidence Act 1995 by section 9(5) grants the courts with the ability to refuse the admissibility of a business record as a result of being unauthentic. Consequently, security measures such as digital signatures techniques and encryption engaged by BOLERO, have to be taken in order to guarantee authenticity of electronic messages and of their transmission.

In criminal proceedings, section 69(1) of the Police and Criminal Evidence Act 1984 states that:

37 For more information on both rules of evidence and on how they hinder general electronic commerce see: C. Nicoll, ‘Should Computers be Trusted? Hearsay and Authentication with Special Reference to Electronic Commerce’, 1999, JBL, July issue, pp.332-341.
40 An electronic bill of lading can be regarded as a business record as section 9(4) of the Civil Evidence Act 1995 defines the ‘record’ as “records in whatever form”.
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“In any proceedings, a statement in a document produced by a computer shall not be admissible as evidence of any fact stated therein unless it is shown:

(a) that there are no reasonable grounds for believing that the statement is inaccurate because of improper use of the computer;
(b) that at all material times the computer was operating properly, or if not, that any respect in which it was not operating properly or was out of operation was not such as to affect the production of the document or the accuracy of its contents...”

However, this provision has created various problems that have been addressed by the Law Commission\(^4\). For example, Law Commission in para 13.9 expressed the opinion that the recipient of a document produced by a computer, who wished to bring it in evidence, will not be in a position to convince the court that the computer was not working properly. It is the recipient’s opponent who will be in a better position to prove it. Based on these various arguments, the Law Commission concluded in para 13.23 that:

“We are satisfied that section 69 serves no useful purpose. We are not aware of any difficulties encountered in those jurisdictions that have no equivalent... We recommend the repeal of section 69 of PACE.”

Some global review therefore on the issue of legal admissibility of electronic messages as evidence in courts, is necessary for the development of electronic bills of lading in the commercial sphere.

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