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ELECTRONIC COMMERCE AND INTERNATIONAL TRANSPORT SERVICES

Report by the UNCTAD secretariat

This document introduces some of the crucial issues relating to the wider use of electronic means of communication in international trade and transport services. It covers the impact of e-commerce on both the organization of transport and the current paper-based legal framework of international trade transactions.

Part I highlights how e-commerce is already transforming relationships between transport service providers and users by making access to information more readily available to all. It also indicates that with information technologies increasingly being used in all forms of transportation services, the availability of such services is an important determinant of the growth of e-commerce. It identifies port systems as one of the potential areas for developing countries' service suppliers to take advantage of the opportunities offered by electronic commerce. Also it explains how e-commerce has stimulated competitiveness among service suppliers and strengthened the position of shippers in transport markets. Finally, it stresses the need for appropriate training and know-how transfer aimed not only at operators, but also at governmental authorities responsible for designing the necessary framework for private sector participation.

Part II, dealing with legal and documentary aspects, reviews the role of transport documents, particularly that of the negotiable bill of lading, in the functioning of international trade transactions. It highlights a number of legal issues and uncertainties arising from the application of the existing laws and transport conventions in an electronic environment, including the challenge of replacing the negotiable bill of lading by an electronic alternative. Attempts to facilitate the development of electronic transport documents are also reviewed, including both contractual and statutory approaches. It is suggested that while legislative solutions are needed, experience has shown that it could be many years before a complete legal framework is in place. In the meantime, contractual solutions need to be explored further.

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INTRODUCTION

The Plan of Action adopted at UNCTAD X in Bangkok requested UNCTAD to undertake work on the implications for developing countries of the economic, social and legal aspects of electronic commerce, in particular issues of concern in transport and other related service sectors (para. 157). At an open-ended informal consultation held by the President of the Trade and Development Board, member States agreed to convene an Expert Meeting on Electronic Commerce and International Transport Services: Best Practices for Enhancing the Competitiveness of Developing Countries.

This report has been prepared in order to facilitate the deliberations of the Expert Meeting. It consists of two parts. Part I reviews the economic and operational impact of electronic commerce on international transport services and Part II deals with legal and documentary issues.

Part I

THE ORGANIZATION OF TRANSPORT

1. Information technologies, and especially Internet-based systems, are increasingly being used employed in all forms of transportation services. At the same time, transportation and logistics services are becoming a critical element in the growth of electronic commerce for physically transportable goods. There is therefore a two-way relationship between e-commerce and transport. A number of issues arise from the developments in this interrelationship that have considerable implications for providers and users of transport services in developing countries in relation to e-commerce. These include the ability of transport service providers in those countries to participate and compete in the supply of transport services for e-commerce, the scope for transport service users to make use of e-commerce methods in purchasing transport services, the role of intermediaries, the functional relationships and balance of power between service providers and users, the scope for collaboration among service providers, and the evolving structures of ownership of transport service enterprises in global trade.

2. The Internet is a communications medium providing businesses with global reach. The physical tasks involved in delivering the traded goods remain unchanged: trucks, trains, ships or planes are still needed to move the product and cannot travel much faster than they already do. A reduction in delivery time has to come from the people behind the scenes who know how to handle problems when they occur and who, in concert with their carriers, develop sophisticated networks and management systems. Nothing replaces solid business relationships and true commitments between shipper and carrier. Shippers, using the Web as another way of leveraging carriers to provide more services at lower cost, might be greatly disappointed.[1]

3. Most companies recognize that the Internet will have a profound effect on supply-chain performance.[2] Many forward-thinking senior executives see this impending change as a clear opportunity to become more competitive as a result of having a broader reach, reduced assets and lower costs. A few forward-looking organizations have already begun to exploit the new technologies in order to increase their share of the market.

4. Experiences in developed countries indicate that the availability of appropriate transport and logistics services will be an important determinant of the growth of e-commerce in the years ahead. This will apply to developing countries as well.

5. This note outlines general trends as they apply to all modes of international transport, bearing in mind that there may be certain variations in the experiences of different modes.

A. The impact of e-commerce on transportation services

6. Electronic commerce is having a considerable impact on transport in several ways. The demand for transportation services will expand. New, sporadic, non-commercial buyers that are not as sophisticated as commercial shippers will lead carriers to introduce a whole new set of supply chains directed to on-line consumers with increased volumes, a variety of shipment origins and destinations, and a need for higher responsiveness as well. Consumer demands for next-day or even

[1] "Logistics and e-commerce", editorial by P. Bradley, Logistics Management and Distribution Report, June 2000.
[2] See "E-business marketplaces: a revolution in international trade", International Trade Forum, December 2000, p. 11.

same-day delivery mean that e-commerce providers, small and large, need to keep large amounts of product not only on hand, but also in distribution centres across the country. This will reverse the trend towards tighter, smaller inventories that has helped drive down costs for industrialized countries' businesses in recent years. Companies will have to review their distribution networks, and product delivery to consumers will need to be handled much more efficiently and cost-effectively than before. This, in turn, requires more infrastructure than has ever been offered before.

7. Along the supply chain are a multitude of activities ranging from ordering, invoicing, agency functions, warehousing, shipment, insurance, customs clearance, distribution and wholesaling to retailing. The performance of these activities involves many stakeholders, who have to exchange information and make payments amongst themselves. Taken as a whole, these activities constitute complex linkages between different enterprises and involve a variety of types of information to be exchanged. The availability of information on-line enables service providers and shippers to share real-time information and data. This creates scope for collaboration between them in planning the above-mentioned activities. Furthermore, the easy access to information gives shippers, including small ones, greater power in terms of determining their requirements and in negotiating with service providers. The capacity to handle information exchanges efficiently will be a determining factor for the survival of transportation and logistics service providers on the global scene.

8. The on-line offer of transportation services, developed by Internet-based transportation and logistics service providers, will enable a shipper to enter an order into its enterprise resource planning (ERP) system, with the order automatically going through the service provider's transportation management system to the carrier. The system will determine and approve the price, acknowledge the order, send messages for collecting the shipment, notify the carrier and consignees, accept and pay the carrier's charges—all automatically. By accessing a single website, the shipper will obtain a customized view of all shipments in transit, identify shipment status, read exceptions reports, arrange for pick-ups and update its purchasing department on the true landed cost of freight movements around the world.

9. Transportation exchanges offer another option for Internet-based transaction capabilities. These exchanges tend to intensify competition between carriers in the supply of transportation services. In this connection, even though carriers of all sizes would, in theory, have access to the worldwide cargo transport demand posted on the Internet, the competition may drive out small carriers, with limited services, from the industry. Also, e-commerce methods enhance the ability of large carriers to manage and control the entire transportation chain, thus leading to increased capacity to perform all activities along that chain, including inland transportation. This may in turn encourage higher degrees of concentration in an industry that is already characterized by large integrators or carriers operating in large consortia or global alliances. In the long run, these changes may favour the domination of freight markets by large integrators and other large individual carriers "protected" from competition via vertical integration or mergers.

10. The ability of transport exchanges to provide opportunities for direct contact between carriers and shippers creates scope for greater partnership between them. This tends to lead to a further reduction of the already diminishing role of certain forms of transport monopolies, such as liner conferences in maritime transport, in influencing the pricing of services. For example, in maritime transport, there is increasing reliance on confidential price negotiations and contracts between shippers and individual lines. In some major trades, individual contracts already account for the majority of liner shipments.

11. E-commerce also reduces the role of the traditional freight forwarders and other intermediaries. However, some of the intermediaries have adopted new business models (e.g. value-added logistics services), thus ensuring continued demand for their services. The Internet provides the intermediaries with improved access to shippers and carriers, and this enhances their capacity to provide integrated door-to-door services. Also, using intermediaries such as forwarders appears to be attractive. This is due to their experience and specialized knowledge of a wide range of matters regarding transportation, warehousing, packing, formalities related to letters of credit, Customs, import licences, etc. While an individual shipper may search the matter-related information on the Internet, the range of services that a forwarder can offer creates a value-added service which shippers are prepared to continue to purchase.

B. Transport and logistics services as facilitators of e-commerce

12. While e-commerce has had a powerful influence on transportation services, the growth of e-commerce itself is becoming increasingly dependent on the ability of transport and logistics services to deliver the goods ordered through the Internet in a timely manner.

13. Some observers have suggested that existing transportation and logistics services do not fully satisfy the requirements of e-commerce and that the problem may increase as the volume of e-commerce expands. While the demand for transport generated by e-commerce has been growing at great speed, there has not been a corresponding growth in the supply of transport and logistics support services. This state of affairs has been attributed to a number of factors, including the ones described below:

- The order fulfilment and logistics requirements for handling e-commerce are quite different from those of traditional trade serving industrial supply chains. Traditional trade is characterized by the movement of large shipments. The shipments are assembled in transport unit loads (container, box, pallet, etc.) which can be tracked or traced. Also, industrial supply chains tend to involve few large buyers and a limited number of suppliers; the resulting transport demand is therefore fairly predictable. By contrast, in e-commerce, particularly in business-to-consumer trade, buyers tend to generate small and numerous shipments, with widely spread origins and destinations. The corresponding transport demand is quite unpredictable because it arises from orders placed by large numbers of buyers. The major challenge is to manage the whole fulfilment system in a way that meets customer expectations while controlling inventory and transportation costs.

- Pure on-line retailers tend to lack the necessary logistics infrastructure and experience for handling e-commerce. They still need to restructure their internal processes, hierarchies and communications around the demands of a digital environment. This implies the introduction of new forms of resource sharing with their new partners and the putting in place of arrangements whereby sales information is shared instantaneously with wholesalers, shippers, manufacturers, designers, and even suppliers of raw material.

- Traditional warehouses and other logistics facilities are not suited for e-commerce retail goods. E-commerce distribution networks now tend to consist of many small distribution centres around the country — or a fulfilment or shipping contractor with access to a network of distribution centres all over a continent. A limited amount of products are being stored in these centres, which are being refrequently replenished.

14. The industry has responded to these problems in various ways. Some companies have attempted to adapt their existing logistics services to fit both on-line transactions and regular transactions. Others have attempted to develop new tools and applications specifically designed to serve their new needs emerging from e-commerce. Yet others have decided to concentrate on their core business by discontinuing the distribution of their production and outsourcing it to third-party logistics service providers.

15. Overall, the capacity of the transportation and logistics services to handle e-commerce can be described as a new area that is experiencing new developments, both organizational and technological. There are several options for fulfilling orders, and an option that fits the requirements of one shipper may not necessarily meet the demands of another. The effectiveness of the different options depends on a variety of factors, for example the type of product and whether the order is for domestic or international delivery. Therefore, the ideal system of order fulfilment to be used involves strategic choices that may change over time and vary between industries.

C. Issues for developing countries

(i) Developing countries' service suppliers

16. The involvement of transport and logistics enterprises in developing countries as users of e-commerce methods is considered to be quite small. While this statement reflects the general situation of developing countries, a number of these countries are, of course, in the forefront of information and communication technology (ICT) and e-commerce developments. These are mainly Asian countries, such as China, Malaysia, the Republic of Korea, Singapore and Taiwan Province of China, which also happen to be important global players in the transport and logistics markets.[3] The generally limited involvement is attributed to a number of factors, including the following:

- Developing countries generate limited volumes of general cargo trade and their participation in e-commerce is low. Insufficient national or regional e-commerce traffic limits the demand for e-commerce-oriented transportation and logistics services.

- The overall low level of e-commerce is itself, in turn, caused by a multitude of factors such as limited information and telecommunications infrastructure, high costs of Internet connectivity, limited use of electronic payment systems, limited skills base in building e-commerce (Internet service providers, application service providers, etc.), limited awareness of e-commerce potential and benefits, limited level of e-commerce and Internet culture, and limited volumes of goods to be traded via e-commerce.

17. Developing countries face both a challenge and opportunities in approaching e-commerce and the associated transportation/logistics services. Enterprises in developing countries are unlikely to offer services that can compete with those being provided by enterprises in developed countries. A key policy issue must be addressed: should these enterprises endeavour to develop in their countries transport and logistics services that are needed to handle e-commerce, or should they depend on global services being provided by enterprises in developed countries?

[3] P. Ailing and G. Klein, *Freight@Internet: The Impact of Internet Technologies in the Freight Transport Market*, Transport Techonology Publishing, 1998.

18. There are no reliable data on developing countries' enterprises providing Internet-based transport services on a significant scale. At the global level, there is clear evidence that most service providers are based in developed countries. In the short run, developing countries are expected to play a relatively minor role in e-commerce and in the provision of transport and logistics services for e-commerce, in view of the constraints outlined above. In addition, because of the limited volumes generated through e-commerce, there is no critical mass of shipments to support the growth of transport and logistics service providers.

19. However, these countries may still exploit opportunities in e-commerce-based transport/logistics services by selecting areas where they may have competitive advantage, in accordance with the available infrastructure and technological capacities. In particular, the application of e-commerce in ports could contribute to the efficiency of international trade and its development. Ports are of crucial importance to developing countries as they constitute a nodal point in the transport system linking often high-technology international transport with local transport services that use a limited technology base. With the growing use of information technologies (IT) in cargo booking, tracking, clearance and delivery by major shipping lines, as well as in Customs clearance, all ports are required to become efficient interfaces for shipping services in a world closely connected through logistics chains. Availability of common-user and robust e-commerce-based administrative and commercial services in these developing countries' ports would allow them to connect to the IT networks of administrations, shipping lines and other transport operators. Scalable systems with core functions are required in order to cater for the different needs of a wide range of ports and terminals serving developing countries' trade.[4] UNCTAD programmes such as the Advance Cargo Information System (ACIS) and the Automated System for Customs Data (ASYCUDA) provide major elements of such port community systems.

20. A number of Governments have realized that efficient transport interfaces can play a critical role in their countries' economic development. They have taken action not only to improve the quality of governmental services provided at interface points (i.e. regarding Customs, health and phytosanitary issues), but also to secure the provision of basic transport communications infrastructure through appropriate national liberalization policies. Coherent programmes for the transport and communications sectors could help in reaping the benefits of e-commerce.

21. The scope for developing countries' participation could take another form, for example in express and parcel delivery services, where a critical mass of a large consumer market is essential to support large service networks. In such services, developing countries' enterprises could enter into partnerships with global service providers in developed countries, for example through the provision of agency services. For instance, airlines, freight forwarders and other intermediaries have considered the creation of alliances as a means of offering services that can compete effectively with services offered by integrated carriers. It is therefore conceivable for freight forwarders in developing countries to cooperate, through joint ventures, with global air transport carriers as a strategy for participating in the transportation of goods in e-commerce.

22. There is also scope in business-to-business transactions of services for domestic markets. A variety of transport or related service providers, such as maritime ports, airports, trucking companies, rail services, shipping lines, freight forwarders, Customs services, container leasing companies and container terminals are prime candidates that can generate on-line transactions serving their own operations. Significant reductions in transaction costs and other benefits could be

[4] For a detailed discussion of the IT requirements of ports and terminals see UNCTAD, "Study on the use of information technology in small ports", UNCTAD/SDTE/TLB/1, Geneva, 2001.

achieved if such service providers were to make use of e-commerce and IT in their transactions with other businesses. These transactions could include invoicing, bills of lading, cargo information, cargo tracking and Customs clearance. Many of the major maritime companies, seaports, airports, terminals and so forth in developing countries now have access to IT. This provides the scope for engaging in e-commerce methods in their internal production systems as well as in business dealings with other enterprises. It also offers a great potential for focusing on the development of systems that can promote greater productivity and lower transaction costs in these service areas.

(ii) Shipper–carrier relations

23. The introduction ICT into transport markets has drastically changed the competitive relationships among service suppliers. These new competitive relationships have had major impacts on the position of shippers in transport markets. These developments are particularly important for developing countries, which are typically users of transport services. In the field of maritime transport services, previously existing market structures such as liner conferences have largely disappeared and new pricing mechanisms have been established. The move towards contract rates mentioned above[5] has weakened the competitive position of developing countries' traders. At the same time, however, shippers – irrespective of their size – are being given a unique source of information, one which provides supply chain visibility and the means to optimize transport/logistics requirements.

24. The use of the Internet has been at the origin of new developments whereby shippers can plan most of their transport procedures, if not all of them, on-line. Internet access is thus a basic prerequisite for developing countries' traders to improve their position in the market. This is being achieved through improved information flows and consequent market transparency, and also through the potential for consolidation based on common web portals for the purchase of transport services.

25. Table 1 provides a summary of the transaction capabilities of the websites of major shipping lines. While capabilities apparently differ considerably between carriers, basic information requirements are catered for by practically all sites. This is clearly a important step in levelling the playing field for developing countries' shippers. However, the transaction capabilities offered by a number of sites, which are likely to become standard features in the near future, are still not accessible to many traders. This is mainly due to the legal uncertainties surrounding web-based contracts and the use of non-paper documents.[6]

[5] See paragraph 10.
[6] See Part II below.

Table 1
Ocean carriers' website transaction capabilities

Carrier	Container/ cargo tracking	Voyage/ schedule locator	Rate/ tariff quote	Booking	Bill of lading	Customs reports
Maersk	✔	✔	✔	✔	✔	
Evergreen	✔	✔	✔	✔	✔	
P&O Nedlloyd	✔	✔				
MSC						
APL	✔	✔	✔	✔	✔	✔
COSCO	✔	✔	✔			
Zim	✔	✔				
NYK	✔	✔			✔	✔
CMA-CGM			✔			
HMM	✔	✔		✔	✔	
Yang Ming	✔	✔	✔		✔	
OOCL	✔	✔	✔	✔	✔	
Hapag-Lloyd		✔		✔		
K-Line	✔	✔	✔	✔		
MOL	✔	✔	✔	✔	✔	
Hanjin	✔	✔		✔	✔	

Source: D. Wise and J. Brennan, "E-commerce: taking stock", *Containerisation International*, November 2000.

26. Another issue that will impact on the position of shippers is the ease of accessibility of information and transaction sites. Contrary to the present situation, some shippers, particularly small and medium-sized enterprises, might have a preference for single, open interfaces to conduct business with different carriers. Such open solutions are being provided by third-party market places but could also be installed by carriers themselves. A carrier-based single interface could help to increase market transparency and reduce transaction costs particularly when it comes to logistics transactions that go beyond point-to-point transport operations. Such advantages would, however, have to be weighed against the risk of restrictive business practices potentially inherent in such solutions.

(iii) Training

27. There is a need for many new skill sets and capabilities to run and operate e-market places in developing countries. Universities and other academic institutions in developing countries could play an essential role by offering appropriate training not only to operators to ensure their competitiveness in the international market place, but also to governmental authorities called upon to provide the necessary framework for private sector participation.

28. Know-how transfer is also required in order to ensure wider participation by the private sector in ICT-based transport operations and create the necessary conditions for a sustainable transport development process. This transfer can be promoted not only from developed countries to

developing countries, but also through cooperation between developing countries exchanging know-how and experience.

29. Various ways of ensuring an effective know-how transfer can be envisaged, including participation in diploma courses abroad, locally organized specialized short-term training or on-the-job training. Another approach would aim at building a training capacity in a developing country in international transport and logistics issues. This training capacity would have a regional coverage. A possible strategy is to establish such a capacity gradually, by assisting in developing requisite training/pedagogical material and by providing assistance in course delivery in a developing country on a regional basis jointly with local professional associations (freight forwarders, exporters etc.) and/or academic institutions. The country and its institutions would therefore not only be provided with training for their nationals to cope with modern transport and logistics issues, but also be prepared to provide training and thus contribute to the sustainability of transport sector development.

Part II

LEGAL AND DOCUMENTARY ASPECTS

A. Transport documents and international trade

30. Transport forms an integral part of international trade. The relations between the parties involved in these transactions are governed by various contracts and documents, including contracts for sale, carriage, insurance, and payment/finance. The transport document which makes it possible to exchange goods and payments between sellers and buyers located in distant parts of the world and to trade goods in transit is the negotiable bill of lading.

31. Through the custom of merchants the bill of lading has become recognized as a document of title, representing goods, and is considered the fulcrum of international trade. The attributes of the bill of lading which give rise to this are the following: First, the bill of lading is a receipt issued by the carrier for the goods received from the shipper for carriage. The buyer therefore knows that they are in the physical possession of the carrier, who must in due course deliver them to the consignee. Second, it evidences the contract of carriage between the carrier and the cargo owner and sets out its terms and conditions. Thus, if the goods are lost or damaged during the voyage, the holder of the bill of lading can lodge a claim against the carrier under it. Third, it is a document of title in the sense that it can be endorsed from one party to another, thereby transferring property in the goods if that is the intention of the parties. The bill of lading has therefore come to represent the goods that give the holder the right to claim delivery and the right of control.

32. The function of the bill of lading as a document of title means that possession of the document constitutes a constructive or symbolic possession of the goods. Transfer of constructive possession of the goods and rights in the goods can thus be effected by transfer (or delivery and endorsement) of the bill of lading. Mainly because of this, a bill of lading is traditionally said to be a "negotiable" document. The ability to perform this function makes the bill of lading a unique and key instrument in international trade. It allows the goods to be traded during carriage because the constructive possession of the goods can be transferred from the seller to the buyer and to any subsequent buyers by transfer of the bill of lading. This key feature of the bill of lading also enables banks to obtain security in the goods, for payments under letter of credit or other collection arrangements, by taking a pledge on the bill of lading. Thereby, a buyer can finance or pay the purchase price through a letter of credit or documentary collection arrangement. Bills of lading are thus valuable and necessary instruments in international trade and finance.

33. It is this third attribute of the bill of lading which has made it such a useful tool in international trade, but which has also traditionally been the element which has caused the most difficulty. Problems arise from the fact that modern transport technology has resulted in accelerated arrival of the goods at the destination port, but not in accelerated arrival of the shipping documents.[7] Thus, to enable delivery of the goods, original bills of lading have to be couriered around the world, with the cost and safety implications to which that gives rise. Failing the availability of the original

[7] See A.N. Yiannopoulos, "General Report", in A.N. Yiannopoulos (ed.), "*Ocean Bills of Lading: Traditional Forms, Substitutes and EDI Systems*", The Hague International Academy of Comparative Law (Kluwer Law International, The Hague, 1995), paragraphs 3-54, p. 17.

bill of lading at the port of discharge, "letters of indemnity" are normally given for the value of the cargo, with further cost implications. This practice strongly undermines the value of bills of lading as negotiable documents of title and the whole bill of lading system. Another serious problem is that "paper bills of lading constitute a considerable source of maritime fraud. An entire bill of lading may be counterfeited, the signature may be forged, the quantity of the goods may be altered, and the consignor may fraudulently sell the same goods two of three times to different buyers."[8]

34. The difficulties associated with the present-day use of bills of lading has created a demand for non-negotiable sea waybills, which are now widely used in many major trades, such as the Baltic and North Atlantic trades. It is understood, however, that negotiable bills of lading are still used by many traders in developing countries even in transactions where a negotiable document is not required. While sea waybills serve as a receipt for the goods and evidence of the contract of carriage, they are not documents of title and do not have to be presented to the carrier at the port of discharge before the goods can be released. The consignee's right to demand delivery is subject only to identification of himself. The problems associated with the late arrival of the bill of lading do not arise. Indeed, the use of sea waybills means that the time and costs involved in processing and handling documents is much reduced and the risk of fraud is considerably diminished. As far as other modes of transport are concerned, the question of negotiability does not arise since non-negotiable transport documents, such as "consignment notes", are normally used.

B. Legal issues

35. As agreed at the UNCTAD Expert Meeting on Capacity-Building in the Area of Electronic Commerce: Legal and Regulatory Dimensions, the existing laws and regulations are generally applicable in an electronic environment. However, as they were mostly developed in the absence of electronic systems, they may create uncertainty as to their legal effect and would need to be adapted or supplemented in view of the new media currently in use.[9]

36. Legal issues identified by various studies[10] as creating legal barriers to the development of e-commerce are equally relevant to transport. A document issued by the UNCTAD secretariat reviewed many of the legal issues arising from paper-based rules and regulations such as the requirements for "writing", "signature" or "original", the evidential value of an electronic message, negotiability and documents of title, validity and formation of contract.[11] These issues have been dealt with by the UNCITRAL Model Law on Electronic Commerce, which is aimed at providing guidelines to national legislators for removing legal barriers to e-commerce.[12]

(i) Transport conventions

37. There are laws governing certain transactions such as transport which require a written and signed paper document for the validity of the transaction. Such obligations may also arise from international conventions applicable to international trade and transport.

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[8] Yiannopoulos, op. cit., p. 19. See also B. Kozolchyk, "Evolution and present state of the ocean bill of lading from a banking law perspective", 23 *Journal of Maritime Law and Commerce* 161 (1992), p. 216.

[9] See TD/B/COM.3/EM.8/3, 11 August 1999, paragraphs 3, 4 and 5.

[10] See the UN/ECE document "Legal aspects of Trade data interchange: Review of definitions of 'writing', 'signature' and 'document' employed in multilateral conventions and agreements relating to international trade", TRADE/WP.4/R.1096, July 1994. See also the UNCITRAL report "Legal value of computer records", A/CN.9/265, February 1985.

[11] See "Electronic commerce: Legal considerations", UNCTAD/SDTE/BFB/1, chapter II.

[12] For a detailed discussion of the Model Law, see document UNCTAD/SDTE/BFB/1.

38. Early international conventions applicable to transport proceed on the implicit assumption that the "documents" which are governed by the conventions, such as the bill of lading, air waybill or consignment note, must be in paper form. The Convention for the Unification of Certain Rules Relating to Bills of Lading 1924 (Hague Rules) and the Protocol of 1968 to amend this Convention (Hague/Visby Rules) apply only if a "bill of lading or similar document of title" has been issued. The requirement in these instruments that a bill of lading must be "issued" and "surrendered" and that certain information be "noted" on or "inserted" in a bill of lading presupposes the existence of a paper document.[13]

39. The United Nations Convention on the Carriage of Goods by Sea, 1978 (Hamburg Rules), on the other hand, applies to "contracts of carriage" as opposed to "bill of lading or similar document of title" and allows the use of electronic signatures (article 14). Most provisions of the Convention, however, relate to bills of lading, which are defined (article 7) in terms reflecting those of a traditional negotiable bill of lading. Furthermore, the Convention does not define the term "document," which appears in a number of its provisions.

40. The Convention on the Contract for the International Carriage of Goods by Road, 1956 (CMR) provides that the consignment note "shall be made out in three original copies signed by the sender and by the carrier… The first copy shall be handed to the sender, the second shall accompany the goods and the third shall be retained by the carrier" (article 1). The Warsaw Convention on air transport (1929) and the Hague Protocol of 1955 contain somewhat similar provisions.[14] The Convention covering International Carriage by Rail, 1980 (CIM) contains a formal requirement for the use of a traditional consignment note for concluding a contract under the Convention (article 11). While the Conventions on air and rail transport were revised in 1999,[15] permitting the use of electronic messages to replace the traditional transport documents, no revision of the CMR Convention is envisaged.

41. Failure to comply with the requirement for a transport document under these Conventions may have important consequences. In the case of conventions such as the Hague and Hague/Visby Rules, which apply to documents, it would render the Convention inapplicable by force of law with the loss of the right to rely on the benefits of the Convention, such as the limitation of liability and the evidentiary value of the document. In the case of conventions which apply to contracts such as the CMR and the Hamburg Rules, it would mean that while the Convention would apply to a transport contract, the absence of a prescribed transport document would render the relevant provisions on documentation inapplicable.

42. The UNCITRAL Working Group on E-Commerce, discussing its future work, noted that "in many jurisdictions treaty obligations had precedence over internal legislation. Where an international instrument posed obstacles to use of electronic means of communication, such obstacles could only be removed by another international instrument of the same hierarchical nature". The Group, therefore, agreed to recommend to the UNCITRAL Commission that it undertake work towards the preparation of an international convention to remove legal barriers that might result from international trade law instruments.[16]

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[13] See, for example, articles 3 (3) and (7) and 4 (5) of the Hague and Hague-Visby Rules.
[14] See articles 5 (1) and 6 (2).
[15] See the Montreal Convention (1999) on air carriage, article 4 (2), and CIM 1999 on rail carriage, article 6 (9).
[16] See the Report of the Working Group, at its 38th Session, A/CN.9/484, April 2001, paragraphs 81-86.

(ii) Bills of lading – electronic alternatives

43. As stated earlier, it is the document of title feature of the bill of lading that has caused most difficulty and is likely to continue to do so in relation to establishing its electronic alternative. Thus, the question in this context has been whether it is possible to achieve the functions of the traditional bills of lading in an electronic environment.

44. The first two attributes of the bill of lading, namely its function as a receipt and evidence of a contract, should not present specific legal problems. The legal issues arising in these context are common to other transport documents. Questions arise whether the law recognizes the validity of electronic signatures and authentication measures and whether electronic incorporation of the terms and conditions of the contract of carriage by reference is permitted by law. The value of a paper document as a receipt and evidence of a contract mainly depends on the authenticity and integrity of its signature. There is no doubt that electronic authentication mechanisms such as digital signatures can achieve greater authenticity because of the uniqueness of the algorithm method used. Digital signatures and encryption techniques are used to ensure the integrity, authenticity and confidentiality of electronic messages. The question, however, is the legal validity of such signatures.

45. The UNCITRAL Model Law on Electronic Commerce[17] has been used by a number of States in removing legal barriers, including requirements for "writing", "original" or "signatures", recognizing the evidentiary effect of data messages, and permitting incorporation by reference of the terms and condition of the contract.[18]

46. It is the unique characteristic of the bill of lading as – a document of title – that presents a challenge in the context of e-commerce. Under the existing national and international laws, legal rights are attached to the physical possession of the paper document. The possession of the traditional paper bill of lading represents constructive possession of the goods, and the right to delivery of the goods is based on the physical possession of an original document.

47. Thus, some commentators on the subject believe that under the existing legal regimes an electronic bill of lading is not a "negotiable document of title" and that it is "highly questionable whether the electronic bill can be used for the transfer of the title to the goods".[19] It has also been commented that: "In the present state of legislation, negotiability cannot be divorced from the physical possession of the original paper document".[20] Furthermore in "jurisdictions in which physical endorsement and delivery of a document of title are required for the transfer of the ownership of goods, paperless transactions would be without effect".[21] It has also been pointed out that "as a rule the creation of negotiable documents of title is a prerogative reserved solely for

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[17] The UNCITRAL Working Group on E-Commerce completed, in March 2001, the draft Model Law on Electronic Signatures, which is finalized by the UNCITRAL Commission in July in and is be made available to States wishing to enact legislation on the subject. See also the European Commission's Directive on Electronic Signatures 1999/93/EC of 13 December 1999.

[18] See articles 5– 9 of the Model Law.

[19] See W.H. Van Boom, "Certain legal aspects of electronic bills of lading", *European Transport Law*, vol. XXXII, no. 1, 1997, pp. 9-24, at p. 16.

[20] K. Bernauw, "Current developments concerning the form of bills of lading, Belgium", in Yiannopoulos, op. cit., p. 115.

[21] Yiannopoulos, op. cit., p. 38.

statutory law".[22] These comments highlight the need for legislative reform in order to achieve the title function of the bill of lading in an electronic environment.

48. In the meantime, contractual solutions to the problem could be achieved, it is believed, through the development of systems whereby rights in goods could be transferred by means of electronic messages. It is considered that by "using a registry system (either a central register or one party register), any negotiable document can be duplicated electronically".[23] The registry would therefore administer the process of transfer of rights in goods or negotiation on behalf of the parties on the basis of contractual provisions binding upon the users.

49. Thus, "in the paper world, the 'key' is the negotiable bill of lading which the carrier has issued. In the electronic world, the 'key' is dominion over the unique electronic message that the carrier has created".[24] The Uniform Electronic Transaction Act 1999 of the United States, which includes provisions on electronic equivalents of negotiable documents (Section 16), establishes the concept of "control" over an electronic record as a substitute for possession, endorsement or delivery of a negotiable document of title.

50. Part two of the UNCITRAL Model Law on Electronic Commerce, dealing with carriage of goods (articles 16 and 17), sets out general principles for transfer of rights and obligations through the use of electronic messages.[25] While provisions of part one of the Model Law, covering e-commerce in general, have been widely adopted by States, articles 16 and 17 have received very limited support. Thus, the report by the secretariat[26] proposed that the Working Group consider the desirability of developing a more detailed set of rules for the implementation of the general principles set forth in the Model Law. It was suggested that the work could focus on the issues relating to the functioning of electronic registry systems for transferring property and other rights by electronic means through the preparation of a set of rules to support such registries. The Working Group, however, considered that further study was needed to enable it to define in more precise terms the scope of future work in the area.[27] Thus, in the absence of a uniform legal framework, voluntary systems are being developed (discussed below, paras. 52-62) which replicate the functions of the traditional bills of lading and are supported by contractual rules binding on the parties.

C. Attempts to facilitate development of electronic transport documents

I. Contractual approaches

a. SeaDocs Registry

51. The first attempt to facilitate the bill of lading process took place in 1986 through the launching of the SeaDocs Registry by Chase Manhattan Bank and the International Association of Independent Tanker Owners (Intertanko). It was to act as a depository and central registry of the original paper bills of lading instead of their free circulation. Any endorsement of the bill of lading

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[22] Kozolchyk, op. cit., at p. 240.
[23] See J.F. Chandler, "Maritime electronic commerce update", paper delivered at the UNCITRAL/CLA Seminar, New York, February 2000, p. 22.
[24] See P. Mallon and A. Tomlinson, "Bolero: electronic 'bill of lading' and electronic contracts of sale", 1998, International Trade Law Quarterly, at p. 263.
[25] See paragrapha 63-64.
[26] A/CN.9/WG. IV/W, December 2000, paragraph 105.
[27] See the Report of the Working Group on Electronic Commerce, at its 38th Session, A/CN.9/484, paragraph 93.

reflecting its negotiation would be carried out, by electronic means, through the Registry, acting as agent for the parties. The project was abandoned after less than a year. The reasons suggested failure included questions of costs, insurance, liability and confidentiality of information.

b. CMI Rules for Electronic Bills of Lading 1990

52. The CMI Rules aim at providing a contractual mechanism for replacing the traditional paper bill of lading with an electronic alternative by imitating the functions of the bill of lading in an electronic environment. The CMI Rules do not have the force of law and only apply whenever the parties so agree (Rule 1). The main feature of the CMI Rules is the creation of an electronic bill of lading by the carrier, who acts as a depository or central registry for negotiations. Any endorsement/negotiation of the bill of lading takes place through the use of a secret code or what is called a "private key".[28] The "private key" is unique to the holder and is non-transferable (Rule 8). Its possession is considered to place the holder in the same position as being in possession of a paper bill of lading. Thus, the holder of the private key is the only party that can claim delivery of the goods, nominate the consignee or substitute a nominated consignee for any other party, or transfer the right of control and transfer to another party.

53. From a strictly legal standpoint serious doubts have been expressed about whether the private key is the equivalent of the paper bill of lading.[29] The Rules further provide that electronic transfer "shall have the same effects as the transfer of such rights under a paper bill of lading" (Rule 7 (d)). The "difficulty with this provision is that mandatory rules of law cannot be discarded by mere agreement of the parties".[30]

54. The problems which may arise from the requirement, under certain national laws, that the contract of carriage be evidenced in writing are addressed by stipulating that an electronic recording or a computer print- out would satisfy that requirement. In agreeing to adopt the CMI Rules the parties are taken to have agreed not to raise the defence that the contract is not in writing (Rule 11). The legal effect and validity of such provisions, however, will depend on the applicable law.

55. The CMI Rules have not received a wide support from the industry. They have been criticized for placing excessive liability on the carrier (arising from his involvement in the process of negotiation of the bill of lading), for failure to address the allocation of liability for system breakdown and for the lack of a specific security system.[31]

c. Bolero

56. The Bolero system provides a mechanism for exchange of trade documentation, including transfer of rights from the holder of a bill of lading to a new holder replicating the functions of the traditional paper bill of lading in an electronic environment. It began operation in September 1999 and its services are available only to members on subscription. All Bolero members trade with each

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[28] A "Private key" is any technically appropriate form, such as a combination of numbers and/or letters, which the parties may agree for securing the authenticity and integrity of a transmission. See Rule 2 (f).

[29] See Kozolchyk, op. cit., p. 239.

[30] See Yiannopoulos, op. cit., p. 38.

[31] See Kozolchyk, op. cit., pp. 237-240. For more detailed information on the CMI Rules, see Electronic Commerce: Legal Considerations, UNCTAD/SDTE/BFB/1, paragraphs 38-46.

other under a legal framework embodied in the Rule Book, which is binding on them. It constitutes a multilateral contract between all the users of the Bolero system and is governed by English law.

57. The transfer of rights and title to the Bolero Bill of Lading (BBL) is achieved by a separate Title Registry run by Bolero. The BBL, which is created by the carrier through electronic messages, will state whether it is to be transferable (electronic equivalent of "to order" bill of lading) or not, and will inform the Registry who is to be the "Holder" of the BBL, i.e. the person who is to control it initially. The transfer of control takes place by the Holder giving the Registry an electronic instruction by use of its digital signature and the Registry acting upon such instruction by cancelling the control rights of the first Holder (the seller) and transferring it to the next Holder (the buyer). As this process does not involve any function traditionally recognized by the custom of merchants or by any of the legal regimes regulating the transfer of the paper bill of lading, the Rule Book achieves the same end by agreement and by use of the English law concepts of novation and attornment.

58. The system also enable users to "switch to paper" (Rule 3.7), for example in cases where the goods are sold to a party who is not a member of Bolero. In such a case, the BBL is placed in "end status" by the Title Registry and the carrier releases the paper bill of lading, including a statement to the effect that it originated as a BBL.

59. The risks associated with the use of electronic transport documents are at present difficult to assess. Under the Bolero system, the maximum liability of Bolero is limited to US$ 100,000 per incident. The members of the International Group of Protection and Indemnity (P&I) Clubs, while supportive of the aims of Bolero, have introduced into their Rules a Paperless Trading Endorsement which excludes from the normal P&I Cover liabilities arising as a result of electronic trading unless and to the extent that it can be shown that liability would have been incurred in any event had a paper document been used. To assist those members who wish to use Bolero, the International Group has arranged for a separate cover against such risks up to a limit of US$ 50 million for any one accident or occurrence.[32]

60. Bolero clearly offers advantages over paper trading in terms of speed and security. The risks and uncertainties may not be so significant as long as transactions are taking place between those who are members of Bolero and bound by its Rules. The situation may be different when interaction with third parties is required or when the cargo is sold to a party outside Bolero and the "switch to paper" procedure is followed.

d. @GlobalTrade Secure Payment and Trade Management System

61. The @GlobalTrade Secure Payment and Trade Management System was created by CCEWeb Corp., Canada. A pilot of the system is being run from April to August 2001 and will be followed by a commercial launch in the autumn of 2001.[33] The system aims at performing functions equivalent or similar to the functions of some key trade and transport documents, including letters of credit and bills of lading, by the use of electronic messages.

62. Under the @GlobalTrade system, an electronic sea waybill is created by the carrier and accepted by the seller as shipper. The waybill is a receipt and a contract of carriage, but not a document of title. It can nevertheless facilitate the concurrent exchange of control over goods and

[32] See the circular of 5 October 1999, issued by SKULD.
[33] See <http://www.cceweb.com/dmsystem.asp>

payment between seller and buyer. This effect is created by nominating the buyer as consignee in the waybill and including a statement in it that the shipper irrevocably renounces any right to nominate another party as consignee when a bank has accepted the waybill against an electronic letter of credit arrangement and confirmed the acceptance to the carrier.[34] After receiving the confirmation, the carrier will be under an obligation not to carry out any instruction from the shipper (seller) and only to deliver the goods to the nominated consignee (buyer).

II. Statutory approach

UNCITRAL Model Law on Electronic Commerce

63. Part two of the UNCITRAL Model Law on Electronic Commerce includes general provisions (articles 16 and 17) covering specific issues relating to transport of goods. They are to apply to carriage of goods by sea as well as by other modes of transport. Article 16 sets out the range of activities to which provisions of the chapter are to apply. It includes a non-exhaustive list of actions expected to be carried out in the context of carriage of goods, such as furnishing marks, number, quantity or condition of goods, claiming delivery, giving notice of loss of or damage to goods, transferring or negotiating rights in goods, and acquiring or transferring rights and obligations under the contract. Article 17 establishes the functional equivalent of a paper document in relation to actions listed in article 16 and transfer of rights and obligations through communication of data messages.

64. The Model Law attempts to establish the functional equivalent of transfer of rights and title in an electronic environment by requiring the use of a reliable method to ensure the uniqueness of the message to be relied on in delivering the goods. No indication, however, is provided as to the nature of the method to be used in achieving singularity or uniqueness in an electronic environment. Unlike part one of the Model Law, which has been used by many States in enacting legislation, articles 16 and 17 have not received much support from national legislators. The effectiveness of these provisions, however, may be questioned in overcoming legal requirements arising from mandatory international conventions in some jurisdictions. Thus, as stated earlier, it is proposed to undertake further work in this context within UNCITRAL (see para. 50).

[34] See "Watch out bolero – here's @globaltrade", *e-commerce*, vol. 1 issue 6, October/November 2000, p. 14.

THE WAY FORWARD

65. The review of the legal and documentary issues has demonstrated that international trade and transport would significantly benefit from the opportunities offered by electronic commerce. The time and expense incurred in processing numerous documents, the time spent in waiting for the arrival of the bill of lading at the port of discharge, and the costs and liabilities arising from delivery of goods without production of the original bill of lading or delivery against "letters of indemnity" are examples of some of the problems which can be avoided by transition to an electronic environment. This is particularly important in relation to developing countries that wish to get their raw materials and commodities to the global market on a "just in time" basis. It is observed, however, that trades where the negotiable bill of lading is an essential tool in the transportation process particularly involve the developing nations. Cargoes such as rice, sugar and coffee are regularly traded "afloat", in the same way as oil and its products. It is therefore essential that developing countries be involved in the development of electronic commerce, particularly in the maritime sector.

66. In addition to the general legal uncertainties arising from the use of electronic means of communications in international trade, the transport sector faces the particular challenge of replacing the negotiable bill of lading with an electronic alternative. Some national Governments have already enacted, or are in the process of preparing, legislation to remove general legal uncertainties arising from paper-based requirements. International efforts are continuing to establish the necessary rules and guidelines. The UNCITRAL Working Group has proposed the preparation of an international convention to remove legal obstacles arising from the requirements in the existing international conventions.[35] It is further proposed by UNCITRAL that the general provisions of articles 16 and 17 of the Model Law be expanded on and that further work be carried out towards establishing a more detailed set of rules which would facilitate electronic transfer of rights and title to goods through the use of electronic registries.

67. Thus, although legislative initiatives are under way, experience has shown that it could be many years before a complete legal framework is in place. In the meantime, contractual systems, supported by voluntary rules binding on the parties, have been, and are being, developed to carry out the functions of the traditional bills of lading. Such systems make use of a registry system, as in the case of Bolero, for transfer of rights and title to goods among the members; or alternatively the system of sea waybills is adapted to achieve the functions, as in the case of @GlobalTrade. As stated earlier, the wider user of non-negotiable sea waybills would greatly facilitate the transition to electronic commerce. Indeed, the feasibility of adapting waybill patterns to electronic commerce would need to be explored further.

68. The Expert Meeting may wish to address, amongst others, the following issues relating to the economic and operational impact of e-commerce on international transport services:

- The future role for national transport providers in e-commerce; the steps which Governments could take to promote their participation in this service; the feasibility of international partnerships;
- The capacity of developing country ports to link to the information systems of major international shipping lines; strategies to develop port community information systems;

[35] Any future convention dealing with transport of goods will also need to accommodate electronic commerce. See the CMI draft outline instrument on carriage of goods by sea, to be submitted for consideration by UNCITRAL: CMI Yearbook 2000, Singapore 1, Documents for the Conference, pp. 112-175.

- The effect of the use of e-commerce and ICT by transport service providers in developing countries on transaction costs;
- The main barriers for traders in arranging for transport services via the Internet; actions that Governments could take to help traders to enhance their competitiveness;
- Measures to be taken for know-how transfer to government officials, shippers and transport service providers.

With regard to legal and documentary aspects, the Experts may wish to consider, amongst others, the following issues:

- Legislative measures which national Governments and international organizations may need to adopt in order to promote the use of electronic means of communications in international transport;
- Contractual measures and documentary practices that trading parties can adopt to overcome/minimize legal obstacles arising from paper-based requirements;
- The extent to which the use of non-negotiable documents such as the sea waybill can facilitate maritime e-commerce;
- Contractual measures for the performance of the functions of the traditional paper bill of lading in an electronic environment, including registry-based systems and the sea waybill pattern;
- The feasibility of adapting the sea waybill to e-commerce requirements through the preparation of voluntary rules.