

World Maritime University

The Maritime Commons: Digital Repository of the World Maritime University

World Maritime University Dissertations

Dissertations

8-22-2020

Preliminary study on cloud bill of lading issue

Yanchi Chen

Follow this and additional works at: https://commons.wmu.se/all_dissertations



Part of the [International Trade Law Commons](#), [Technology and Innovation Commons](#), and the [Transportation Commons](#)

Recommended Citation

Chen, Yanchi, "Preliminary study on cloud bill of lading issue" (2020). *World Maritime University Dissertations*. 1459.

https://commons.wmu.se/all_dissertations/1459

This Dissertation is brought to you courtesy of Maritime Commons. Open Access items may be downloaded for non-commercial, fair use academic purposes. No items may be hosted on another server or web site without express written permission from the World Maritime University. For more information, please contact library@wmu.se.



SHANGHAI MARITIME UNIVERSITY
WORLD MARITIME UNIVERSITY
Shanghai, China



PRELIMINARY STUDY ON CLOUD BILL OF LADING ISSUE

By

Chen Yanchi

China

A research paper submitted to the World Maritime University in partial
Fulfillment of the requirements for the award of the degree of

MASTER OF SCIENCE

INTERNATIONAL TRANSPORT AND LOGISTICS

2020

DECLARATION

I certify that all the material in this research paper that is not my own work has been identified and that no material is included for which a degree has previously been conferred on me.

The contents of this research paper reflect my own personal views and are not necessarily endorsed by the University.

(Signature):...Chen Yanchi...

(Date): ...2020.6.28.....

Supervised by

Professor Wang Xuefeng

Shanghai Maritime University

ACKNOWLEDGEMENT

I would like to express my gratitude to all those who helped me during the writing of this thesis.

My deepest gratitude goes first and foremost to Professor Wang Xuefeng, my supervisor, for his constant encouragement and guidance. He has walked me through all the stages of the writing of this thesis. Without his consistent and illuminating instruction, this thesis could not have reached its present form.

Second, I would like to express my heartfelt gratitude to Professor, who led me into the world of translation. I am also greatly indebted to the professors and teachers, who have instructed and helped me a lot in the past two years.

Last my thanks would go to my beloved family for their loving considerations and great confidence in me all through these years.

ABSTRACT

Title of research paper: **PRELIMINARY STUDY ON CLOUD BILL OF LADING
ISSUE**

Degree: **MSc**

With the rapid development of information technology, information technology is being applied in international trade and international shipping industry gradually. The traditional bill of lading can't meet the need of shipping, because the frequent international shipping needs more efficient method to optimizing the whole process. The traditional bills of lading usually undergoes complex process to deal with documents, the fraud risk threatens the use of traditional bills. The manipulation of Cloud Bill of Lading, as a replacement of traditional bills, is lack of legal obstacles and owns unavoidable practical risk, although its convenience is highly approved. This paper firstly analyses the advantages of cloud bills of lading, which compared with traditional bills of lading. According to the relevant principles of functional equivalence law, Cloud Bill of Lading is able to realize the core functions of traditional bills of lading, and the defects of cloud bills of lading is analysed and the application of cloud bills in practice is also discussed.

KEYWORDS: Cloud Bill of Lading, Application, Research

TABLE OF CONTENTS

DECLARATION.....	ii
ACKNOWLEDGEMENT.....	iii
ABSTRACT.....	iv
TABLE OF CONTENTS.....	v
LIST OF TABLES.....	vii
LIST OF FIGURES.....	viii
LIST OF ABBREVIATIONS.....	ix
1 Introduction.....	1
1.1 The Purpose and Significance of the Research.....	1
1.1.1 Research Purpose.....	1
1.1.2 Research Significance.....	2
1.2 Literature review.....	3
1.2.1 The Advantage of Cloud Bill of Lading.....	3
1.2.2 The Flowing of Cloud Bill of Lading.....	4
1.2.3 The relevant Laws of Cloud Bill of Lading.....	4
1.2.4 The Effectiveness of Cloud Bill of Lading.....	5
1.3 Research Contents and Methods.....	5
1.3.1 Research Contents.....	5
1.3.2 Research Methods.....	6
1.3.3 The Research Idea.....	7
2 The Related Theory of Application of Electronic Bill of Lading in Port Logistics.....	10
2.1 Cloud Bill of Lading and Its Application Advantages.....	10
2.1.1 Connotation of Cloud Bill of Lading.....	10
2.1.2 The Advantages of the Application of Cloud Bill.....	11
2.2 The Summary of Legislation Practice of Cloud Bill of Lading domestic and overseas....	16
2.2.1 Overview of Cloud B/L in International Law.....	16
2.2.2 Overviews of Cloud Bill of Lading Laws in Western Developed Countries.....	17
2.2.3 Overview of Domestic Cloud Bill of Lading Related Legal Documents.....	18
3 The Analysis of the "Cargo Receipt" Function of Cloud Bills of Lading.....	20
3.1 Analysis of "Goods Receipt" Function Legal Effect of Cloud Bill of Lading.....	21
3.2 Analysis of "Written Form" Effect of Cloud Bill of Lading.....	22
3.3 Analysis of Electronic Signature Effect of Cloud Bill of Lading.....	25
4 The Analysis of the "Document of Title" Function of Cloud Bills of Lading.....	28
4.1 Overview of Cloud Bill of Lading to Realize the Function of "Document of Title".....	29
4.2 Analysis on the "Certificate of Title" Function of Cloud Bill of Lading.....	30
4.3 Analysis of "Certificate of Title" Function of Cloud Bill of Lading.....	31

4.4 Conversion analysis between Cloud Bill of Lading and Traditional Bill of Lading.....	33
5 The Analysis of Key Technical and Legal Factors.....	35
5.1 Key Technical and Legal Factors of Cloud Bill of Lading.....	35
5.2 The Analysis of Key Factors of Cloud Bill of Lading.....	38
6 Conclusions and Prospects.....	39
6.1 Conclusions.....	39
6.2 Future Research Prospects.....	40
Reference.....	41

LIST OF TABLES

Table 1 Key Technical and Legal Factors of Cloud Bill of Lading.....错误! 未定义书签。

LIST OF FIGURES

Figure 1 The Research Flow Chart.....	9
Figure 2 The Advantages of the Application of Cloud Bill.....	错误! 未定义书签。
Figure 3 Certificate of Title Function of Cloud Bill of Lading.....	30
Figure 4 Key Technical and Legal Factors of Cloud Bill of Lading.....	错误! 未定义书签。

LIST OF ABBREVIATIONS

B/L	Bill of Lading
EDI	Electronic Data Interchange
INCOTERMS	Interpretation of Trade Terms
IMC	International Maritime Commission

1 Introduction

1.1 The Purpose and Significance of the Research

1.1.1 Research Purpose

The development of international maritime trade requires bill of lading, as one of important documents, to support the whole process of international trade, the bill of lading is necessary documents of traditional international trade to a certain stage. The first bill of lading, which was regard as modern bill, traced back to Sweden in Europe 1500 years ago. From the first emerge of bill of lading to the bill that has specific function in the legal sense, it experienced a long period of time. It was not until the Hamburg rules that the specific function and connotation of the bill of lading were identified. There were some disputes surrounding its contents, however, three basic functions of B/L are accepted by international community, (1) B/L is a document to prove the agreement on carriage of goods by sea between carriers and shippers; (2) B/L is a document to prove that shippers accept goods from carriers; (3) B/L is a document to prove of the confirmation of shippers on goods and which related to property rights certificates and all kinds of proof on the basis of the derived according to the material. Because of the three basic functions above, B/L owns great advantage and development space compared with other documents, and is widely used in the international trade maritime goods transportation. However, with the rapid development of global economic integration, the traditional B/L expose some shortcomings, such as slow speed of processing certificates of deposit, increasing expense of tolls and disposal cost, and the fraud risks in recent years, not only these

disadvantages all the above restrict the development of B/L severely, but also traditional B/L is unable to match the international trade and shipping business in rapid expansion. Governments all around the world optimizing the B/L gradually. The development of electronic information technology, Internet technology and the big data convert the traditional B/L to the Cloud B/L, and the Cloud B/L overcome the disadvantages of traditional B/L. By using EDI technology and the corresponding password to realizing the data recording and transferring, Cloud B/L is widely used in maritime transportation of international trade.

1.1.2 Research Significance

Computer science and internet technology is growing rapid currently, computer information technology is gradually coming into use in international transportation. Cloud B/L are largely replaced by traditional B/L in paper sheet, by using interconnect technology to make storage and exchange of data, thus realizing the title transfer. The trend plays more and more important role in international maritime transportation, and its impact has widely expanded, the entire international trade industry would be deeply influenced. Traditional B/L is the basis of international trade, together with other documents has formed a series of international laws and practices, which is highly approved by various countries in the world. However, the application of Cloud B/L would arise conflicts in process of international transportation and international trade. Cloud B/L is widely applied currently, but a heated debate arise among various countries, whether Cloud B/L will replace traditional B/L by function and legal effect. Scholars have different opinions to Cloud B/L, and definition of Cloud B/L are not completely confirmed. The research on in-depth study of the Cloud B/L, especially on the related theoretical basis and practical operation, would enrich the study of the comparison with traditional B/L, the study would enhance the profound understanding Cloud B/L, and this paper holds

persistent idea of the integration of the prospective sides and practical sides it's considered that Cloud B/L should combined with the progress of technology and continuous improvement of relevant laws, the advantages of Cloud B/L compared with the traditional bill of lading will become more and more obvious, and the Cloud Bill of Lading will replace the traditional bill of lading in the international ocean widely promoted and used eventually.

1.2 Literature review

According to the current research and analysis domestic and overseas, most research on Cloud B/L concentrate in the promotion and development, and scholars hold their own opinions and no agreement on academic view reached, research overseas mainly focus on the study of the legislation, business model and the circulation of Cloud B/L, which forming a large number of research theories, the relative mature part of the research theoretical results as follows.

1.2.1 The Advantage of Cloud Bill of Lading

A large number of scholars make research on Cloud B/L, Zhang min stresses the effectiveness of Cloud B/L, which is higher than paper B/L. Cloud B/L can further simplify procedures, improve circulation speed and reduce error rate.

Yang Liangyi's research focus on Cloud B/L is an effective solution to release goods without B/L, which the paper B/L is unable to realize. The traditional B/L requires the carrier only to deliver the consignment goods to the document holder, under the situation that goods arrive without paper B/L, release the goods without document would cast disadvantageous impact on supplier, Cloud B/L is able to solve the above problems perfectly.

1.2.2 The Flowing of Cloud Bill of Lading

The study on the ACL (Atlantic Container Lines) of DFR (data Freight Receipt) electronic B/L firstly introduces the concept of secret key for goods picking-up, secret key for goods picking-up is applied in the process of electronic B/L, the electronic B/L is important document to protect the rights and interests of the shipper, but secret key was eliminated gradually, because the secret key are used only by carriers and shippers in most situation, but there is no impartial third party or regulatory authority responsible for it(Cornfors, 2002).

The transfer process of electronic B/L would combine electronic B/L EDI technology and traditional B/L, compared with the traditional B/L, electronic B/L owns different operating process to deal, the novel model of flow would leads to different flow method(Dr. Hu Lijun, 2011).

1.2.3 The relevant Laws of Cloud Bill of Lading

Some scholar analyze the defects of electronic B/L in international law, by analyzing judicial case in the past, summarizing the internal defects identified legal rules of judicial decision, because of lack of lag caused by the force of law, the termination of the electronic B/L happens occasionally(Koji, Takahashi, 2005).

Electronic B/L and its relevant legal issues are also a theme to study in depth, identification of relevant rights, related rights of jurisdiction, evidence effect, ultimate responsibility, the law about Electronic B/L is not perfect and needs improving. Some suggestions about improving law that relevant to Electronic B/L is put forward(Zhan Yun, 2011).

1.2.4 The Effectiveness of Cloud Bill of Lading

The security of the electronic B/L is placed in the important position, which is emphasized in Journal *blind number and digital signature* for the first time, blind number and digital signature model are mainly for improving the security of the electronic B/L by involving third party trust and bank payment application, in order to avoid security threats(Anastasia Pagnoni, Andrea Visconti, 2008).

Other scholars pay more attention to the shortcomings of traditional paper B/L. Traditional paper B/L is disadvantageous in time-effectiveness, if the goods delivery is wrong, electronic B/L may not effectiveness any more(Leung, 2009).

The study of the document rights of electronic B/L is focused on password protection mechanism, password protection makes electronic B/L as effective as traditional B/L, and electronic B/L work in flowing process as traditional B/L, which makes electronic B/L own property rights as traditional B/L(Ma Qian, 2012).

1.3 Research Contents and Methods

1.3.1 Research Contents

This paper mainly studies the current international shipping and Cloud B/L, international shipping is growing rapidly, but traditional B/L is relatively low efficient, moreover, the high cost of document processing costs, and more and more traditional bill of lading fraud risk, along with the development of international trade of traditional bill of lading already can't adapt to the requirement of times, Cloud B/L is more practical in process shipping, the needs for Cloud B/L is growing and computer information technology is gradually coming into use in international transportation. By using EDI technology and the corresponding password to realizing the data recording and transferring, shipping efficiency growing largely, the cost is

also reduced greatly by using Cloud B/L, its security is undoubtedly effectively. the relevant laws and regulations are also formulated by international organizations and nation, this paper takes the function of the Cloud B/L completely into consideration, for the realization of the function of the traditional bill of lading the necessity and feasibility of application in the process of practice, and the problems of the Cloud B/L is also put forward.

1.3.2 Research Methods

The research efficiency and the quality and level of the research can be greatly improved by using various scientific research methods, for in-depth researching the Cloud B/L and its flowing process and relevant laws, this paper mainly take literature research and descriptive research into use.

(1) Literature research

Literature research takes all the literatures as reference, then processing these literatures by collecting, identifying and sorting. Literature research accounts nothing about time and space, its advantage is to access to domestic and foreign research state-of-the-art by Internet, to transcend the limitations of the past and the present researches, Literature research makes study more convenient for researchers to get the latest view of other scholars efficiently, and B/L research materials from experts all over the world is easy to summarize.

(2) Descriptive research

Descriptive research is a research method for making comparison between different objects by describing and explaining existing phenomena, laws and theories through its own understanding and verification. Descriptive research is not only an

explanation of other scholars' arguments and ideas, but also a descriptive for known theories. Descriptive research is essential in scientific research to describes phenomena and reveal abuses, or introduces experience in a targeted way. Most investigations of revealing involve descriptive research, because it can introduce many examples for our actual research and provides new ideas for further prospects.

1.3.3 The Research Idea

The research route of this paper as follows:

- (1) finding problems
- (2) analyzing problems
- (3) solving problems

The contents are as follows:

- (1) The first chapter: the introduction

The introduction describes the research background, research significance, research state-of-the-art domestic and overseas, research ideas and methods;

- (2) The second chapter: the theory of electronic B/L

The theory of electronic B/L mainly describes the concept of electronic B/L, port logistics application etc.. This part mainly emphasizes the disadvantages of the traditional B/L, thus analyzing the advantages of electronic B/L compared with the traditional B/L.

- (3) The second chapter: The Analysis of the "Cargo Receipt" Function of Cloud B/L.

The Analysis of the "Cargo Receipt" Function mainly studies the "Written Form" Effect and Electronic Signature Effect, it first introduced the "goods receipt" function of the traditional B/L, the function difficulties by B/L in practice application, the corresponding solution is also put forward.

(4) The fourth chapter: The analysis of the "document of title" function of cloud B/L.

The analysis of the "document of title" function of Cloud B/L mainly studies the Function "Document of Title" and Function "Certificate of Title", this chapter firstly introduced the realization of function of "property right certificate" of traditional B/L, the function "property right certificate" existing difficulties, then the corresponding solutions for functions above is also put forward.

(5)The fifth chapter: Conclusion and prospect.

The fifth chapter summarizes the research results and points out the deficiencies, and the prospect of the research is also put forward.

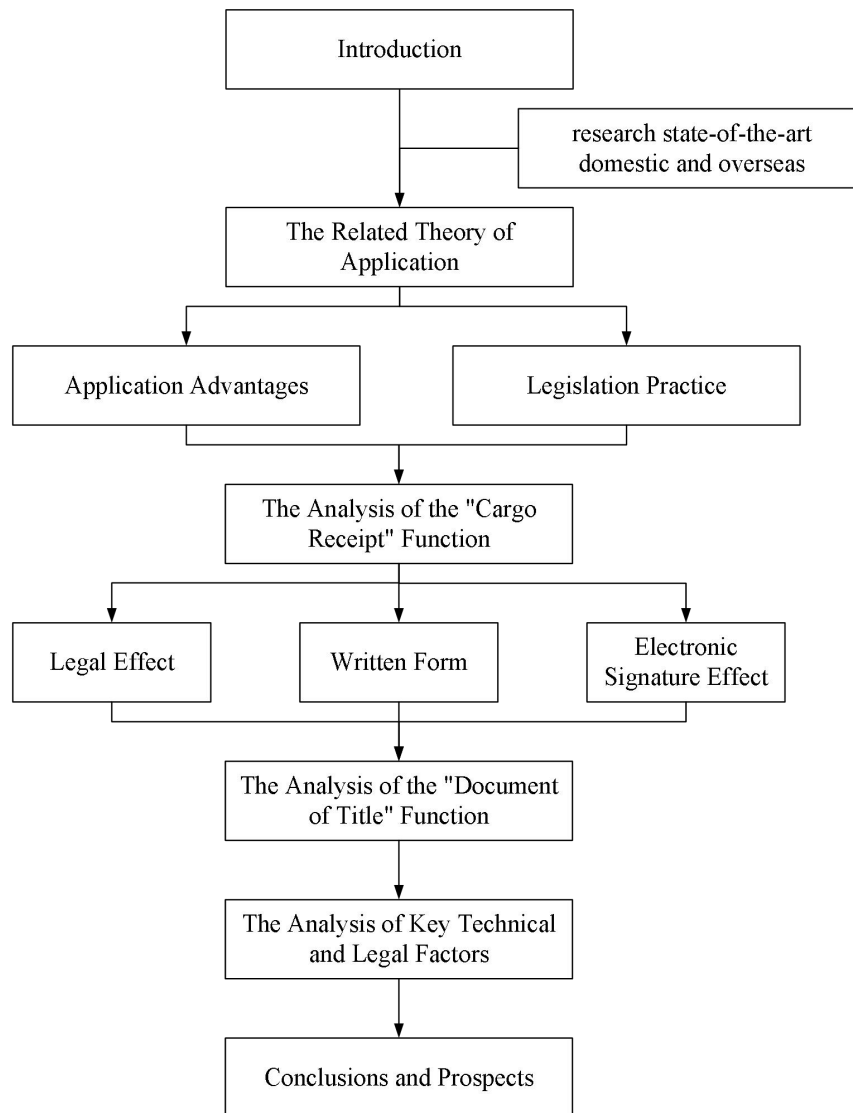


Fig.1 The Research Flow Chart

2 The Related Theory of Application of Electronic Bill of Lading in Port Logistics

B/L(Bill of lading) under traditional definition is a document that the carrier in international trade ocean shipping accepted the shipper's contract of sea transport or goods, the carrier to reach the destination of freight to deliver the goods. Under the situation of rapid development of modern information technology, Electronic B/L is a combination EDI technology and traditional B/L, which is gradually used in international trade, especially in transnational shipping on a large scale.

2.1 Cloud Bill of Lading and Its Application Advantages

2.1.1 Connotation of Cloud Bill of Lading

Cloud B/L has been widely used domestic and overseas, its advantages is obvious, but the legislation situation from the western countries and legal basis of international law is not complete, taking consideration of the researches of scholars domestic and overseas, the application of Cloud B/L can't match the legislation situation, the legal system of international law about Cloud B/L is not perfect, for the definition of Cloud B/L, experts all over the world has not yet formed unified the consensus of opinion. By analyzing the plans bolero, thus electronic B/L, as the origin region of sea freight, scholars form western countries thought Cloud B/L share identical functions with traditional B/L, but Cloud B/L and traditional B/L have nothing relation in material, Cloud B/L don't take any paper-based material, by manipulating information technology and on the basis of Internet technology, Cloud B/L record sea freight information in the form of electronic records instead of a written paper material, electronic records involves two aspects: (1) bolero B/L text contains the information of the bill of lading, (2) Cloud B/L contains all the trade

information of international trade.

Cloud B/L in the international law mainly manifested in the International Rules for the Interpretation of Trade Terms(INCOTERMS) and Rotterdam rules, its contents involves two important aspects: "electronic communication" and "electronic transport records technology", these concepts preliminary illustrates the important function of the electronic B/L, but in-depth definition of electronic B/L is not explicitly defined. Domestic experts make all kinds of research about Cloud B/L, but there is no unified understanding of the academic, the core content of Cloud B/L from two aspects, (1) Cloud B/L realize the function of transferring information by means of information technology; (2) Cloud B/L contains function of traditional B/L more or less.

The study of Cloud B/L combines the results of researches domestic and overseas, Cloud B/L contains two core elements: (1) Cloud B/L realize the function of transferring information on the basis of data privacy by means of information technology; (2) Cloud B/L would replace traditional B/L in the function and content, on the basis of description of goods, transport of goods, goods receiving, the records of the carrier and the shipper about and other important content of electronic records, forming a series of Cloud B/L. Thus Cloud B/L is regarded as a proof to evident that the contract of carriage of goods by sea and the goods have been taken over by the carrier, and the carrier guarantees to deliver the goods.

2.1.2 The Advantages of the Application of Cloud Bill

The bill of lading is mainly the traditional paper bill of lading under traditional shipping mode of international trade, the B/L circulated by international air mail, which has great limitations and defects in actual business. These defects are as

follows:

(1) the traditional B/L flowing process inefficient, which also causes the waste of resources. Statistics from the International Maritime Organization shows that the cost of managing traditional paper documents in international trade accounts for about 7%, involving the cargo container, international trade costs about 450 billion US dollars. The number of cargos for transporting goods in international trade every year is more than 290 million, all kinds of paper documents about a cargo sum up to 25 copies. Such large number of paperwork caused a great waste of resources, the requirements for management is relatively high. For company involves international trade, a large number of relevant documents of the preservation and management of resources occupies too much resources, both sides of international trade need a large number of documents, which improving the cost of document transferring and management.

(2) The traditional circulation speed of B/L can't keep up with the development of ocean transportation to some extent. With the rapid development of international freight ship technology after World War II, the shipping of Marine ships is more efficient, however, the circulation speed of traditional bill of lading has not been improved on a large scale, it may leads to the embarrassing situation that Marine goods have reached the destination port, but the B/L has not yet arrived. It brings unnecessary trouble to the carrier, especially in the case of short-distance cargo transport, the B/L arrives the destination later than the goods, which brings difficulties to the delivery of goods.

(3) The traditional B/L may be abused for fraud profit, B/L is regarded as a proof to extraction of goods, B/L itself is a valuable document, however, a safety system of B/L operation mechanism is not completely formed, traditional B/L is formed in material paper, its circulation mode is relatively inefficient, which may cause illegal

fraud.

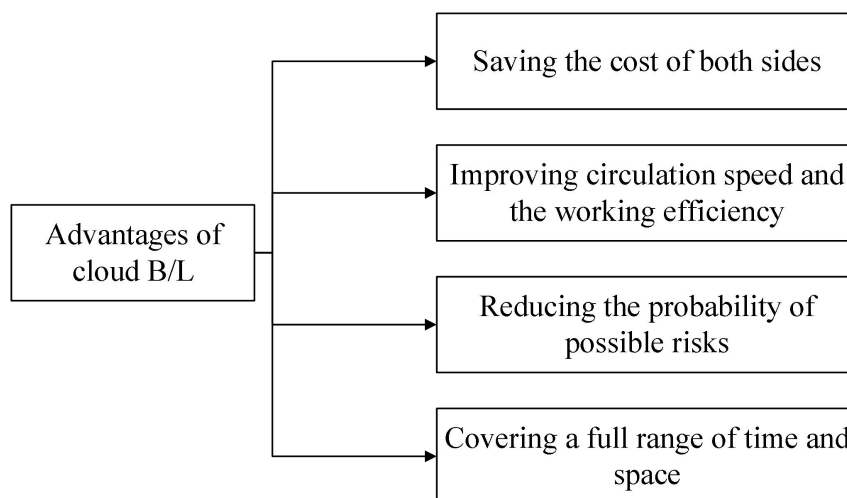


Fig. 2 The Advantages of the Application of Cloud Bill

Cloud B/L are widely used in the international trading, are able to avoid all kinds of defects of traditional B/L effectively, Cloud B/L can effectively save the cost, improve work efficiency, enhance the level of security, the transportation ability and level of international trade would be improved greatly, in particular, the advantage of the Cloud B/L is mainly manifested in the following aspects:

(1) Cloud B/L saves the cost of both sides of international trade.

Cloud B/L and traditional B/L have obvious difference, all procedures of Cloud B/L are undertaken through the electronic data, which no paper material necessary for the procedure. According to the United Nations conference on trade and development related statistical data, when all kinds of traditional B/L and related documents in the traditional international trade are completely changed to the electronic data, it would bring a direct benefit from more than \$100 billion, if all sides of international trade use EDI, not only the artificial mistake would be reduced the processing cost and the paper document corresponding to the human resources investment costs would be

greatly reduced. By preliminary estimation, when Cloud B/L is used by comprehensive promotion in international trade, the management cost of paper document would be reduced more than 45%, at the same time the paper document related to the management costs would reduce by 40%, Cloud B/L can greatly reduce the cost of manpower and material resources of the international trade, which improving the efficiency of international trade.

(2) Cloud B/L improves circulation speed and the working efficiency of international trade.

All business processes in traditional international trade clearly require "documents compliance" and "all documents match". However, the international trade process is complex, international trade contract, commodity inspection and customs declaration, shipment, insurance, tendering, negotiation, and the settlement of exchange links, all this process must pass through a series of apartment, such as government commodity inspection, customs, taxation, finance and banking, insurance, etc. Cloud B/L would integrate information, electronic, data, completely, moreover, Cloud B/L change the original work flow and work mode, which improving the efficiency of international trade level. The circulation speed of traditional bill of lading has not been improved on a large scale, it may lead to the embarrassing situation that Marine goods have reached the destination port, but the B/L has not yet arrived. It brings unnecessary trouble to the carrier, especially in the case of short-distance cargo transport, the B/L arrives the destination later than the goods, which brings difficulties to the delivery of goods. Cloud B/L can simplify the procedure and avoid possible loss of shipper.

(3) Cloud B/L reduces the probability of possible risks and improves the security and controllability of international trade.

Cloud B/L is undertaken by informatization of cloud, all the data stored in the relevant real-time memory system, the system avoid various reasons lead to loss by theft problem, which may happen when using Cloud B/L. All data in the Cloud B/L are under encryption processing, therefore improving its security and preventing stealing collar, the high confidentiality of B/L reducing the frauds that happens in paper B/L. The carrier can verify the specific content of the consignment goods in paper B/L in real time, so as to avoid the shipper to modify the B/L secretly and carry out fraud on the carrier and insurance institution. The shipper can also monitor the carrier through it to avoid the disappearance of the consignment goods. The bank side can only determine the transfer of control of goods after the consignee completes the relevant payment work through Cloud B/L system during the process of goods delivery. Shippers deliver goods to the payer accurately by instructions.

(4) Cloud B/L covers a full range of time and space.

Compared with the traditional international trade, e-commerce has various advantages and characteristics such as rapid communication, strong expansibility, high security and strong concentration, which determines that the circulation of Cloud B/L of different degree and level. Cloud B/L can under circulation 7days/24 hours, Cloud B/L is not limited to the situation of transportation and logistics, Cloud B/L can be communicated and circulated in real time when network connection working normally, generally, Cloud B/L has achieved all-weather, global circulation. From the perspective of the trend of international trade and the development of information technology, Cloud B/L would continue to be used in international trade with overwhelming advantages over traditional bill of lading.

2.2 The Summary of Legislation Practice of Cloud Bill of Lading domestic and overseas

2.2.1 Overview of Cloud B/L in International Law

Laws and regulations related to Cloud B/L in various international laws in the world mainly include the following legal documents currently:

(1) The IMC (International Maritime Commission) in 1990 on the "Rules for Electronic Bills of Landing", the rule is based on mutual recognition and the applicable trade, but it has the general legal mandatory, IMC Rules attempt to identify the situation of Cloud B/L for the first time all over the world, which has important guiding significance to the legislation subsequent international law about Cloud B/L, the requirements of IMC Rules has made positive and effective exploration and attempt for the specific data message, the efficiency of specific problems and endorsement.

(2) United Nations commission on international trade in 1996 passed the "UNCITRAL Model law on Electronic Commerce", the law is similar to "Rules for Electronic Bills of Landing", the rule does not have the general legal mandatory, the manipulation is just according to the provisions of the both trade sides, many countries make international practice and the basic principles to comply, the relevant data, signature and legal effect of B/L in this document solve the long-standing problem of "goods release without documents" effectively and further promote the authenticity and uniqueness of the Cloud B/L.

(3) "Rotterdam rules" is passed by United Nations international trade commission in 2008, "Rotterdam rules" is also called the United Nations the whole or part of the contract of carriage of goods by sea international convention, "Rotterdam rules"

introduces the electronic bill of lading and the electronic transport records clearly, the rule put forward electronic records and solve the problem of electronic bill of lading, the function of electronic information and the traditional paper-based information equivalent principle is also clearly identified for the first time, the "exclusive control" in this rule means to effectively solve the problem of the cloud of the bill of lading liquidity, providing a legal basis for the circulation function of Cloud B/L.

2.2.2 Overviews of Cloud Bill of Lading Laws in Western Developed Countries

The legal research on Cloud B/L began in western countries decades ago, Australia is the first country to definite the legal effect and status in the maritime law system, because the country has a long history of maritime transport. The reversed maritime law system is a perfect example for other countries. Cloud B/L is clearly supported to undertake in process of maritime transport by *Marine Documents Act 1996* for the first time, and authorizing the same legal effectiveness between Cloud B/L and traditional B/L. On the basis of *Marine Documents Act 1996*, *Carriage of Goods by Sea Act 1998* expanded the scope of application of electronic Documents of maritime trade, Australia had taken Cloud B/L as a legal permitted document and widely used currently. As a traditional maritime trade country, the Great Britain had taken Cloud B/L into consideration in international trade, law applicable to the use of a telex or other information technology in maritime trade, but Act 1998 doesn't expand the functions of Cloud B/L. The use of laws of Cloud B/L in United States is relatively backward than Australia and the UK, in order to apply the rapid development of e-commerce, Cloud B/L and B/L in pa per shares the same legal effectiveness in the revised Uniform Commercial Code. The Uniform Electronic Transactions Act has further clarified the legal effect of Electronic documents and established the principle of functional equivalence between Electronic documents and traditional paper documents.

2.2.3 Overview of Domestic Cloud Bill of Lading Related Legal Documents

China hasn't a system cloud providers of B/L in large scale, so a lot of domestic large state-owned enterprises such as China mining, ICBC, COSCO etc. has gradually started to use foreign professional institutions of Cloud B/L, because of the extensive use of foreign bill of lading system, inevitably restricted local laws and regulations. China's current professional laws and regulations in the field of Cloud Bill of Lading are not perfect, the only rules involved is *Electronic Signature Law*, which makes certain requirements and provisions for electronic B/L. *Maritime Law* is enacted in 1992, most of its contents is about B/L of paper material, the Ministry of Transport enacted the *Sea of International Container Transportation of Electronic Data Interchange (EDI) Message Instead of Paper Documents Management Rules* in 1997, the rule first mentioned the exchange of electronic B/L and B/L of paper material. Both rules share the identical legal effect, the National People's Congress *Electronic Signature Law* in 2004, which identify the legitimate legal effect for the first time, but there is no specific usage and working flow exposed. The lack of systematic legal support for the Cloud B/L make management and supervision of various systems unsatisfactory.

Generally speaking, with the promotion and use of Cloud B/L worldwide, the application, management and supervision of electronic B/L are gradually matching their legal systems, especially in developed countries, the trend also promotes the wider application. Cloud B/L is also applied in China, compared with the developed countries, there is still a large space to make improvement of legislation. As a important international trade and shipping participant, China government should take the current situation of the development of international maritime of developed countries as a reference to improve legislative experience and legislation system, and lay the solid foundation for the rapid development in China.

3 The Analysis of the "Cargo Receipt" Function of Cloud Bills of Lading

The traditional paper B/L exists in the international ocean shipping for a long time, paper B/L is the key of the transfer documents for the goods, traditional European B/L is a receipt, the concept of Bill of Lading (B/L) is widely used and accepted, B/L indicates the consignment goods has been received by the carrier and load the transport ships.

The shipper transfers the goods to the carrier in the process of actual operation, after the receipt of the goods, the carrier should provide the costs of carriage of goods list and documents, also it is called issue of the bill of lading, the type of goods, goods model, quantity, quality and packaging should be clarified, if the carrier contract of carriage of the goods with the sales contract signed or inconsistencies, B/L details should be introduced.

B/L is the most critical materials and documents for shippers, which suggests that the carrier has confirmed receiving the relevant transport of the goods, quality, quantity, condition of goods is verified with the actual conditions, shippers should deliver the goods according the B/L in the actual transport process, if shippers have no proof that the actual cargo carrier and the difference in their record, shippers need according to the bill of lading for delivery of the goods, the shipper may bring a claim against the carrier according to the B/L. The traditional B/L is what a carrier for the carriage of goods to confirm the document, the traditional bill of lading receipt function is actually represent legal effect from the carrier's signature on the B/L.

3.1 Analysis of "Goods Receipt" Function Legal Effect of Cloud Bill of Lading

In general, the function of the goods receipt is only a form of information transferring process, the process does not involve transfer of ownership of the goods, most scholars domestic and overseas agree that the replacement of traditional paper bills of lading bill of lading is a trend, which can be realized without any difficulty. Most developed countries have passed legislation to clarify the function of Cloud B/L, there is still no clear law system in China, according procedural law, electronic B/L process "Cargo Receipt" function.

By the research of analyzing the substantive law, the international legislation prefers to recognize electronic data legal proof. International legal system of B/L has already been a clear definition on cloud goods receipt function. *Hague Rules*, *Hague - Visby Rules* and other international legal system covers most of the world maritime country, these rules regard Cloud B/L as a preliminary evidence to build up the relationship between shippers and carriers. *Contract Law* and *Maritime Law* of China has no clear legal effect of electronic B/L, as a compensation for legal blank area, *Electronic Signature Law* article 4 clearly stipulated: the data message Cloud B/L can be obtained at any time, the legal proof effect of Cloud B/L isn't eliminated or excluded.

By analysis of procedural law research, China government has enacted "Judicial Interpretation of the Civil Procedure law", "Electronic Signature Law", these rules clearly put forward the legal effect of B/L, Cloud B/L should be of objective reality, legitimate, and of case relevant.

First of all, the objective facts would change with anyone's will, according to the definition of the objective facts above, the objective facts of Cloud B/L is undoubtedly, its record and store content is specific events that already occurred,

shippers and carriers goods transportation is also objective facts, and the fact before litigation cannot be changed.

Secondly, the formation process of Cloud B/L must be legal, the legitimacy takes the main body, mode and content involved in the formation of Cloud B/L within the legal framework as a reference, the business process and element formation process of Cloud B/L is also legal. The main making body of Cloud B/L is legal, thus the shippers for the goods, which is an independent legal person with full capacity for civil conduct, the relevant provisions of the relevant data obtained is through public fair negotiations for the shipper and the carrier, the procedure is confirmed by the form of electronic signature, so the process is also legal.

Finally, Cloud B/L have relevance with the object of legal effect. Only when it has relevance, Cloud B/L can be taken as admissible evidence. Cloud B/L is regarded as a proof of the agreement between shipper and carrier for the transport of goods, which indicates that the cargo transport event has actually occurred. Cloud B/L can reflect the specific relationship between shippers, carriers and the goods, and the relation of events is satisfied. In general, Cloud B/L should be able to serve as the proof material of goods receipt in the practical judicial application.

3.2 Analysis of "Written Form" Effect of Cloud Bill of Lading

In general, writing form refers to record the parties by means of written content of the agreement or the contract, the records in writing material is the key carrier, the carrier can be read and copy, and writing can be read and visual. In the era of traditional bill of lading, bill of lading must be in written form, paper material as the main form of B/L, which the specific content of the bill of lading is recorded. Cloud B/L have brought significant changes to the written form, based on EDI technology,

cloud B/L can be recorded under the specific standards and through the agreed format by computer and Internet, and Cloud B/L can be transmitted in form of electronic data record. all EDI data is unreadable during the process, but the electronic copy can be shown in computer display or be printed, Cloud B/L is not the origin traditional B/L in written form.

Traditional international law on maritime trade transportation has different legislation foundation and form, all the traditional international law focus on the written form of the bill of lading, a list of specific requirements is put forward in these rules, traditional bill of lading is an important in international trade and maritime transport written documents, in all the process of the international trade, B/L often involves in issued and endorsed, international law from all over the world need to be signed definitely by who is responsible. Based on the technology of the electronic data of the bill of lading, all the procedure can be replaced by electronic data to transfer, which replacing the traditional material carrier flow into circulation process. The circulation of legal status is the foundation of legal effect and Cloud B/L "written form" effectiveness, the important content to the international legislation should be taken into consideration.

For realization of function "written form" in Cloud B/L, there are mainly two approaches at present, (1) shipper and the carrier contract is a reasonable way to solve the problem when the law is not perfect; (2) promoting the cognizance of Cloud B/L in legal system through the improvement of international law and national law. The shipper and the carrier record the data by using EDI transmission protocol, the data information and data transmission and the traditional B/L is consistent in laws and regulations in written form. The shipper and the carrier negotiate and take communication protocol template pattern in the operation process, confirming Cloud

B/L is equivalent to writing, the negotiation between both sides determine the all data files in Cloud B/L, the B/L contains actual situation of specific goods, e.g. quality, quantity, condition, starting point, terminal of carriage of good, etc.. All these factors above is equal to the traditional B/L "written form", carrier and the shipper should use contract model to solve the problem electronic B/L in the international ocean shipping in the mutual communication protocol. The Cloud B/L have some drawbacks also has some limitations as follows:

(1) The contract does not break through the legal system of mandatory, it means that legal provisions for the restriction role of electronic commerce, it's difficult to solve the problem in the process of litigation.

(2) The terms of the contract only restrict the both sides of carriers and shippers, but there is no restrict for the third party, many stakeholders belong to contract of the third party, the contract of the so-called "written form" in the process of practice meets many restrictions and constraints.

The "written form" of Cloud B/L can be fundamentally determined by ways of legislation, international organizations are gradually improving and exploring the establishment of the "written form" of Cloud B/L. A relatively simple way to deal with it is to interpret the original legal system, the recording the transmitting of electronic data of international e-commerce should be involved in written form. From the perspective of practical judicial interpretation, the developed countries have adopted this method in practice. For example, the United States and Australia have extended the definition of "written form" to telegram, telex and other media, international conventions and international laws of some international organizations, such as the "United Nations Convention on the International Sale of Goods" and the "Model Law on International Commercial Arbitration", further extend the "written

form" to telegraph, telex, telephone, electronic data and other means of electronic messages.

Electronic data of "written form" needs independent formulate relevant laws and institutions, the traditional B/L and Cloud B/L should be identified separate "written form", no matter in terms of legislation and judicial practice are reasonable and beneficial. The United Nations commission on international trade law promulgated "E-commerce Demonstration Method", electronic data of written law to define the subsequent enacted "Communication Rules", on the basis of fully established a set of separate service in the electronic data of the legal system. When separately formulating and improving the legal system of e-commerce, the specific format, recording content, transmission mode and characters of the Cloud Bill of Lading must be strictly stipulated, which not only improves the accuracy and clarity of the "written form" of the Cloud Bill of Lading, but also further strengthens the standardization and security of the Cloud Bill of Lading.

3.3 Analysis of Electronic Signature Effect of Cloud Bill of Lading

Signature is indispensable and very important procedure in the traditional transaction of bill of lading. The carrier need to sign on the bill of lading confirm the basic condition of the transport of goods when goods enter the port of shipment, traditional B/L may undertake indorsement, the process needs all sides relevant to sign. Signature not only plays important role of the bill of lading circulation, but also has certain restraint effect, which prove the business is determined. There are two key points in the process of B/L decision, (1) if the B/L copy identical with the origin B/L, (2) if the B/L copy signature is signed by both sides of B/L.

Traditional B/L is identified through the handwriting signature, but signature is not

the only way to determine, the file authenticity determined by various symbols, quoted "Uniform Commercial Code" of the United States, international law "Hamburg rules" admit all kinds of signature that owns legal effect, including handwritten signature, stamp, symbol and electronic signature. Electronic B/L has a specific way to make signature to identify B/L, electronic B/L has a complete different method with traditional B/L, the signature of electronic B/L is not in written form, every signature has a specific password key in the database, password key match to identify electronic B/L. The identification procedure has adopt the agreement from clients, therefore the electronic B/L has the objective and significance of the traditional signature, what's more, electronic B/L has higher safety and reliability.

The electronic signature Cloud B/L is taken into effect through contract or legislation in operational level, the validity of electronic signature is actually judged by the acceptability of electronic signature, when both parties sign the contract, the validity of electronic signature is admitted. The vigorous development of international e-commerce lays on the basis of electronic signature. However, the validity of electronic signatures is just admitted by both sides of the contract, because the electronic signature is used only by carriers and shippers in most situation, but there is no impartial third party or regulatory authority responsible for it, in order to solve the problem, a new innovation is put forward in Bolero B/L, there is a requirement that all sides relevant to Bolero B/L needs to agree the Bolero B/L mechanism, the mechanism requires a signatory to Bolero's Rulebook at the same time, all participants in Bolero B/L must be subject to electronic signatures, so the participants is under restrict to electronic signatures in Bolero B/L.

It is not a long-term solution by using electronic signatures in the contract, the effect

of electronic signature should be supported by legal system, which is the basis from the ordinary electronic signature law system. The legal system contains not only the effect of electronic signature in common e-commerce, but also a specialized legislation of electronic signature or digital signature, these legislations doesn't include cloud B/L exactly, and there is no specific legislation for cloud B/L to support the effectiveness of electronic signature, but these legislations is regarded as a rules to put into practice in procedure of electronic signature. electronic signature technology is widely used in B/L, electronic signature and encryption provided by third party ensure the security in the actual process, for example, Bolero B/L divides password key into Private key and the Public key, each of B/L are need to use electronic signature Private key to make confirmation, the recipient can confirm its authenticity by Public key.

4 The Analysis of the "Document of Title" Function of Cloud Bills of Lading

The document of title is a kind of proof of ownership, which is called “Rights Security” at abroad, especially in Europe. The document of title is a kind of valid document that clearly defines the rights of commodities and goods in the process of contract or transaction, as well as a kind of important document indicating that the consignee own the title of transferred goods according to international conventions.

The "document of title" function of traditional B/L was first confirmed in a British case and preserved in commercial practice. "Bills of Lading", which was enacted in the Great Britain in 1855, defined that B/L transfer has the same legal effect as the actual goods transfer by law for the first time. “Maritime Cargo Transportation Act”, which was promulgated and implemented subsequently by British in 1992, improved the “document of title” function of traditional B/L. The main method to realize the transfer of “document of title” in practice is the bill of lading. The primary reason of the generation of traditional B/L is that the consignor can require the carrier to deliver goods registered according to B/L within specific time. Therefore, B/L reflects the right to delivery especially for the carrier, because B/L is the main basis for delivering, and no one could take goods without it. In actual business activities, the owners of B/L often transfer and sale goods in transit, in order to allocate resources more effectively and get capital and profits timely. According to international business practices, the transfer of traditional B/L represents the transfer of the title to the goods. At the same time, the carrier has responsibility for delivering goods to the holder of the bill of lading. B/L owner's title to the goods is fully secured according to the practice that title to goods is presumed and possessed reasonably.

4.1 Overview of Cloud Bill of Lading to Realize the Function of "Document of Title"

The nature of "document of title" of traditional B/L requires that the carrier has to confirm the B/L before the delivery of goods. With the rapid development of international freight ship technology, the speed of Marine ships is getting faster and faster. In the meanwhile, there is no significant improvement of the flow rate of traditional B/L, which will easily lead to the situation that the goods have reached the destination port without the B/L. In international trade, it is usual to pick up the goods with the copy of B/L and guarantee according to the tradition, which is called "shipment release without collection B/L ". Using Cloud B/L will easily solve the problem that "shipment release without collection B/L" actually undermines the rights of the actual owner of the B/L.

The "document of title" function of Cloud B/L has been gradually reflected, according to the legislative process of international law and the practice of international trade. At the same time, lots of international laws such as "CMI Rules of Electronic BL" specified that Cloud B/L also has the function to transfer the ownership of its consigned goods. The key of above rules is that there is a carrier whose job is to confirm and issue the Cloud B/L, register the transfer of the Cloud B/L unofficially, and provide code registration system for the Cloud B/L. During actual operation, the carrier should be notified in time while transferring the goods property rights, after that the carrier has to provide all information except password to the new owner of goods. In this case, the transfer procedure is completed. Through the above process, it can be clearly seen that the Cloud B/L has fully played the function of "document of title". Under this rule, the carrier should issue new Cloud B/L to the consignor after every transfer, and send new password to the assignee with confirm of the consignor.

In the laws and regulations of some countries, the requirements for the transfer of the ownership of goods are jointly determined by endorsement and transfer of document of title. The basic thought and idea of “endorsement and transfer of document of title” meets the publicity requirements of property transfer. Under such a legal framework, Cloud B/L will have the same “document of title” function with traditional B/L only by meeting the publicity requirements of property transfer as well. From both legal perspective and practice process perspective, the Cloud B/L will realize document of title by a public link in the transfer process.

4.2 Analysis on the "Certificate of Title" Function of Cloud Bill of Lading

In practice, the "document of title" function of Cloud B/L mainly includes B/L pledge function and B/L circulation function. At present, Cloud B/L has certain constraints in the realization of two above functions.

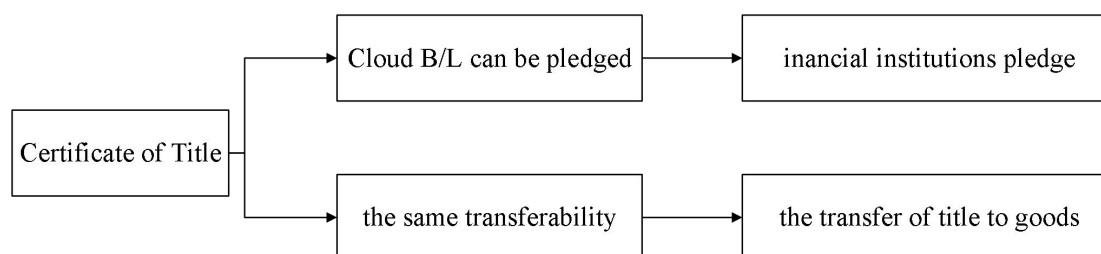


Fig. 3 Certificate of Title Function of Cloud Bill of Lading

Firstly, the paper analyzes whether the Cloud B/L can be pledged. Traditional B/L can be pledged for its written bills, because that pledged goods should be put in a written form during general pledge process. However, doubts remain in many quarters about such Cloud B/L pledges, since it is electronic data recording and flows based on EDI mode. Certainly, with the development of information technology, the pledge modes of financial institutions are improving constantly. In practice, there are

financial institutions pledge goods, which embodied by Cloud B/L, using passwords under the support of cargo carrier. There are still problems to face in concrete operation process, such as how to distinguish the pledge and transfer of Cloud B/L scientifically, make sure that the transfer of rights brought by pledges can legally effective against a third party, and ensure the pledge right transfer smoothly after pledges. On the other hand, the precondition that Cloud B/L can be pledged is that financial institutions can gain control of goods in transits. The so-called Cloud B/L doesn't make any sense when the goods are out of control.

Secondly, there are still difficulties in whether Cloud B/L has the same transferability with the traditional B/L. The mode of transfer by endorsement of traditional B/L makes it possible that goods move freely between different owners. Cloud B/L can not be endorsed since it is electronic data, not written bills, so that the endorsement function of traditional B/L is useless for Cloud B/L. On the other hand, from the analysis on people's traditional thinking and international practice, it is unreality that the transfer of electronic data of Cloud B/L could determine the transfer of title to goods. There is no visible material during the transfer of Cloud B/L but only electronic data, which is different from the transfer of traditional B/L. Therefore, it is doubtful whether Cloud B/L can have flowing function, in academic and theoretical circles at home and abroad. In specific business practice, the CMI Electronic B/L Rule has been issued internationally, which also mentions the liquidity mode and function of Cloud B/L. However, this rule is still not recognized and implemented in many countries and regions for it is not a mandatory legal document.

4.3 Analysis of "Certificate of Title" Function of Cloud Bill of Lading

The technical way to solve the problem of "Certificate of Title" Function of Cloud Bill of Lading can be described as "tag stamping" in the process of maritime

transport practice, a special tag is conducted to mark the pledge, which represent the B/L for goods is pledged. The tag can be easily distinguished from other goods, this process is clarified in the electronic bill of lading the IMC rules. By changing the password code, the tag conduction procedure can be realized.

When the carrier receives the goods from shipper, the cloud B/L and its password would sent to carrier in the same time, shipper should inform carrier about the cloud B/L message during the process of pledge. After the pledge carrier deliver the information with changing the old password to the latest password to the shipper, and the process of pledge is done.

When the carrier accepts the transportation of the goods, it will send the electronic password to the shipper together with the cloud bill of lading. The shipper needs to notify the carrier in time while carrying out the material charge. After receiving the shipper's transfer information, the carrier needs to notify the new owner of the goods provides all the previous information except the password. After the pledge unit receives the confirmation of the information, the carrier changes the original password to the new password and sends it to the pledge unit to form a pledge of the transported goods. Through the way of using electronic password, or secret key, cloud B/L holders can effectively dispose of the goods in transit, and financial institutions can improve their procedure by informatization methods, the procedure is kind of similar to traditional endorsement, the innovation would guarantee their security rights to the goods by holding secret keys.

On the other hand, the realization of function "property certificate" of cloud B/L ensure the effective circulation of B/L, a roundabout way of operation is usually adopted in the practice currently, the roundabout way is called "registration system". Registration system is based on the mechanism, which all the Cloud B/L must be

registered by the third party, and the cloud B/L flowing is guaranteed by third party. The flow of cloud B/L is under control by signing a common contract or agreement from the support of third party. The most popular ruler is Bolero rules. Bolero rules is widely used in the international maritime trade, cloud B/L can be transferred to paper B/L under Bolero system, when the Bolero members transfer B/L to non-Bolero members, actual holder of Bolero sends issue instructions to registration center, cloud B/L can be transferred paper B/L.

The client must be a Bolero member, and the Bolero rules should be exactly implemented, the framework of Bolero rule is built on the basis of cloud registration center, the registration, tracking and management process need shipper to be the Bolero member, when there is B/L transfer, registration center should register the process, the latest information would be reversed under the guidance of the registration center, the whole process is emerged in the UK for the first time, it is known as "transfer mechanism", the mechanism's core idea is to establish the relationship between the shipper and the carrier and trusteeship relationship, when the shipper deliver the goods to third party, following the instruction, the trusteeship relationship is changing from carrier to the third party, and shipper no longer exists within trusteeship, it is quite different from the traditional relationship, because traditional B/L doesn't need the signature the third party, however, the carrier must make a commitment to the transferred third party under framework of Bolero rule, "Certificate of Title" Function of B/L can be realized.

4.4 Conversion analysis between Cloud Bill of Lading and Traditional Bill of Lading

In the rapid development of cloud B/L in the international trade, cloud B/L haven't completely replaced traditional B/L, considering the legislation and practice of B/L

in each country are different, cloud B/L and traditional B/L coexist simultaneously, the supervision over both B/L type needs to be strengthened, and the exchange between both B/L type is particularly important. Bolero rules is most widely used system, which protect the conversion of cloud B/L and paper B/L, cloud B/L can be transferred to paper B/L under Bolero system, when the Bolero members transfer B/L to non-Bolero members, actual holder of Bolero sends issue instructions to registration center, cloud B/L can be transferred paper B/L, the instruction would lead two consequences, (1) Bolero registration center put an end to B/L, and B/L wouldn't flow to the next step within internal circulation in Bolero system; (2) the carrier would make a new paper B/L on the basis of origin B/L, the new paper B/L should include origin content of Bolero B/L, and statement and all records, end date of B/L, start date of B/L, and other information necessary. There is a key point in Bolero system need to be mentioned, once cloud B/L has been transferred to paper B/L, it is impossible to change back. In general, it is only applicable to a single B/L, traditional paper B/L cannot be converted to cloud B/L under Bolero system. The complete legislative system for paper B/L and cloud B/L doesn't build up in each country all over the world, in order to improve the transformation process between paper B/L and cloud B/L, the International maritime Organization and countries around the world should improve and improve the relevant legal system as soon as possible.

5 The Analysis of Key Technical and Legal Factors

5.1 Key Technical and Legal Factors of Cloud Bill of Lading

The analysis above suggests the Cargo Receipt function and Document of Title function, and the key factors lays in the text, this chapter summarizes the key factors of technology, legal and a new evitable environment to make an investigation to estimate the power of each factor.

(1) Technical factors

Carrier, shipper, and the relevant third party would negotiate around bill of lading in endorsement stage, traditional B/L may make endorsement by negotiation of three sides, B/L signature should be determined by all sides, comparing the copy of B/L signature and original document to guarantee the signature of both documents, and the signature has adopt the agreement from clients

Cloud B/L can be recorded under the specific standards and through the agreed format by computer and Internet, and Cloud B/L can be transmitted in form of electronic data record, all EDI data is unreadable during the process.

All data in the Cloud B/L are under encryption processing, therefore improving its security and preventing stealing collar, the high confidentiality of B/L reducing the frauds that happens in paper B/L.

(2) Legal factors

Legislation basis lay the foundation the electronic signature, the electronic signature Cloud B/L is taken into effect through contract or legislation in operational level, the

validity of electronic signature is judged by the acceptability of electronic signature of both parties.

Evidentiary effect of cloud B/L mainly determined as follows:

(1) shipper and the carrier contract is a reasonable way to solve the problem when the law is not perfect; (2) promoting the cognizance of Cloud B/L in legal system through the improvement of international law and national law.

The validity of electronic signatures is just admitted by both sides of the contract, because the electronic signature is used only by carriers and shippers in most situation, but there is no impartial third party or regulatory authority responsible for it.

Document of title represent the validity of electronic B/L, electronic signature and encryption provided by third party ensure the security in the actual process, the validity of electronic signature is actually judged by the acceptability of electronic signature.

(3) Environment factors

Carrier's reputation is a key factor in the procedure of Cloud B/L, carrier responsible for the most work in the maritime transport, their reputation represent the realization in Cloud B/L without credit problems.

System risk is the operating risk of cloud B/L system, when the cloud B/L system in status of low stability, system risk would threaten its operation.

In order to investigate the degree of influence of various constraints on the use and

promotion of electronic bills of lading in China, a number of professionals and professors who are representative in the shipping industry, logistics industry and international trade industry are selected, a survey around key factors are push forward, the result is as follows:

Table 1 Key Technical and Legal Factors of Cloud Bill of Lading

Primary factors	Secondary factors	Scores
Technical Factors	transferability	12
	Unified technical standards	4
	Security	5
Legal Factors	legislation basis	15
	evidentiary effect	10
	legal effect of electronic signature	9
	Unclear responsibility among shipper and carrier	3
	document of title	6
Environment Factors	Carrier's reputation	5
	system risk	8

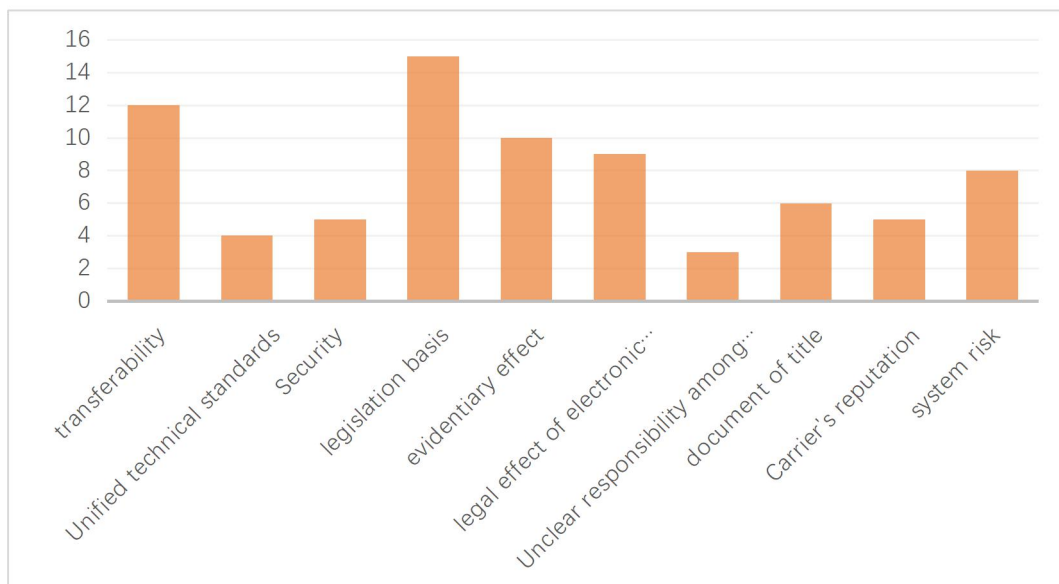


Fig. 4 Key Technical and Legal Factors of Cloud Bill of Lading

5.2 The Analysis of Key Factors of Cloud Bill of Lading

By the analysis of key factors of cloud bill of lading, the secondary factors of technical, legal and environment, transferability is most important factor in technical factor, legislation basis is most important factor in legal factors, the power of carrier's reputation and system risk factor is nearly the same. Cloud B/L has many advantages, compared with traditional B/L, transferability as technical factor suggests the Cloud B/L and traditional B/L are able to exchange to each other without technical difficulties, information technology, big data and block chain technology have improved the security of cloud B/L system. The disadvantage of cloud B/L is obvious, a more unified international basic legislation system has not yet established, the procedure of maritime transport and cloud B/L is largely determined by the specific rules, and there is no specific legislation for cloud B/L to support the effectiveness of electronic signature, that's why the legislation basis have largest power in the survey. The system risk exists all the time, and realization of cloud B/L depends on the stability of cloud B/L system, the developed countries have make a great progress in the building of cloud B/L system, "Document of Title" and "Cargo Receipt" function is relatively clear for cloud B/L practice, which make a good environment for cloud B/L application. Compared with traditional bills of lading, cloud bills of lading have more obvious advantages and broader development space.

6 Conclusions and Prospects

6.1 Conclusions

Cloud Bill of Lading has experienced a very short period, its development is amazing. Cloud Bill of Lading has a huge impact on traditional shipping industry and paper bill of lading, and motivates scientific and modern development of international shipping industry. International organizations and the developed countries has been exploring the approach to optimizing the technology and legal system of cloud B/L, with the exposure of "IMC Electronic Bill of Lading Rules" and "Model Law on Electronic Commerce", Australia, the United States, Britain and other countries also gradually complete the building of cloud B/L, series of legal norms are put into practice and great process is made by business organizations, based on the endeavor of various organizations, Bolero solutions, SeaDocs solutions is finally built up. Series of legal norms are put into practice and great process is made by business organizations.

It has only been more than 20 years since Cloud Bill of Lading came into being, and the development rapidly, it has exerted great influence and impact on the shipping industry and the traditional bill of lading system, it has also brought new motivation to the traditional shipping industry and international trade. The international organizations endeavor for establishing and optimizing the system of the electronic Bill of Lading since the 1980 s, for example, the United Nations commission on international trade Law enacted by the "Model Law on Electronic Commerce" and other international uniform legislation on Electronic Bill of Lading have issued, government around the world are set based on the relevant laws and regulations. Electronic B/L have made huge progress in business practice, such as SeaDocs scheme and Bolero scheme. There is a lot of problem in practical operation, (1)

Technical problem: there are still technical difficulties to realize the exchange between Cloud B/L and paper B/L, and the potential risk and defects lays in the process of exchanging, the realization from electronic B/L equivalent to cloud B/L still have some technical problems. (2) Legal problem: a more unified international basic legislation system has not yet established, the procedure of maritime transport and cloud B/L is largely determined by the specific rules which applied by the destination country, the operating procedures need to be further standardized to support the laws and regulations of cloud B/L.

6.2 Future Research Prospects

With the further improvement of the electronic information technology, the laws and regulations is getting more complete, cloud bill of lading has a bright development prospect in maritime transport, as a developing country, China owns a powerful potential for international trade and is gradually being an great power in maritime transport market. Therefore, China should focus on the build the cloud B/L in the next decades, adjust the policy strategy actively, and increase the intensity of cloud technical research on cloud B/L. Big data technology and block chain, as the latest technology, should be paid more attention in improve security, reliability and rapidity. On the other hand, the legal environment for cloud B/L should be built up to meet the needs of rapid growing maritime transport, the measurement lays a stable foundation for compating with international legislation.

Reference

Xing Husong , Deng Yuanhui (2019). *Application research of block chain technology in the field of electronic bill of lading* [J]. Productivity research : 77-83.

Ma Lianliang (2018). *Problems and countermeasures of electronic bill of lading in international trade* [J]. Foreign economic and trade practice : 62-65.

Wang peirui (2016). *On the possibility of the promotion of electronic bill of lading in China* [J]. Law and economics : 101-103.

Li Wei (2016) . *Internet + shipping from the perspective of electronic bill of lading* [J]. China ocean shipping, : 66-68 + 11.

Shao Xiaohong (2015). *Analysis on the legal issues of electronic bill of lading circulation under Rotterdam rules* [J]. Legal system and society : 88-89.

Chen Fang(2013). *Research on the foundation of the construction of electronic bill of lading system* [J]. Ques : 176-179.

Li Zhenzhong(2011), *leng qiang. Advantages and problems of electronic bill of lading* [J]. Cooperative economy and technology : 86-87.

Wang Chao(2011). *Research on the development mode of electronic bill of lading in China* [J]. Business times : 53-54.

Cheng Jie(2009). *Function analysis of document of property right of electronic bill of lading* [J]. International business research, 30 (04) : 20-27.

Ma Qian(2007). *Legal problems faced by electronic bill of lading and its legislative proposals* [J]. Theoretical exploration : 154-157.

Xiang Zaisheng(2005). *Discussion on the negotiability of electronic bill of lading* [J]. Journal of wuhan university (humanities and sciences edition) : 53-57.

Zhang Min(2009). *Thoroughly understand bill of lading* [M]. China customs press

Deng Yaxin (2018). *On the function of document right of electronic bill of lading in international cargo transportation* [J]. Shopping mall modernization : 61-62.

Zhang Ziheng (2017). *Legal research on the function of document rights of electronic bills of lading under the paperless trend of cross-border e-commerce* [J]. *Legal system and society* : 94 + 105.

Wang Peirui (2016). *On the possibility of the promotion of electronic bill of lading in China* [J]. *Law and economics*: 101-103.

Guo Yu (2016), *Peking law University. Should promote the practice of electronic bill of lading and the construction of regulations* [N]. *International business daily* (A07).

Yu Xiaolan (2016). *Construction of cross-border e-commerce transportation legal system under the background of "One Belt And One Road"* [J]. *Academic exchange* : 88-94.

Zhao Jiaqi (2015). *Analysis on the legal conflict of electronic bill of lading* [J]. *Legal expo*,: 262.

Yu Xiaolu (2015). *Responsibility system of releasing goods without order under Rotterdam rules* [D]. *Huaqiao university*.

Shao Xiaohong (2015). *A brief analysis on the legal issues of electronic bill of lading circulation under Rotterdam rules* [J]. *Legal system and society* : 88-89.

Tao feng (2014). *Carrier's liability under electronic bill of lading* [D]. *Fudan university*.

Fu Huifang (2014). *Discussion on electronic bill of lading in international trade of enterprises* [J]. *Enterprise leader* : 61-62.

Chen Qiang (2013). *The future of electronic presentation of l/c* [J]. *China foreign exchange*,: 34-36.

Ji Zhen (2013). *Comparative study on electronic bill of lading circulation mode* [D]. *Shandong university*.

Chen fang (2013). *Research on the foundation of the construction of electronic bill of lading system* [J]. *Quest* : 176-179.

CAI Yuchen (2012). *Legal risk control of electronic bill of lading* [D]. *Shanghai jiao tong university*.

Yang Qiong (2012). *Preliminary study on legal issues of electronic bill of lading* [J]. *Modern*

business : 60-61.

Ying Yiran (2012). *Research on control of international maritime cargo* [D]. East China university of political science and law.

Li Zhenzhong, Leng Qiang(2011). *Advantages and problems of electronic bill of lading* [J]. Cooperative economy and technology : 86-87.

Wang chao (2011). *Research on the development mode of electronic bill of lading in China* [J]. Business times : 53-54.

Wang Mingyan (2009). *Brief analysis of several factors hindering the widespread application of electronic bill of lading* [J]. Foreign trade and economic practice : 67-68.

Cheng Jie (2009). *Function analysis of document of property right of electronic bill of lading* [J]. International business research,30 (04) : 20-27.

Zhao Liqin (2009). *Research on the legal issues of replacing traditional bills of lading with electronic bills of lading* [D]. China university of political science and law.

Tan Zhenhuan (2008). *Analysis on some legal issues of electronic bill of lading* [J]. Legal system and economy (second half): 35-37.

Chen Yan, Han Lihong (2007). *Thoughts on constructing multilateral legal mechanism of electronic bill of lading* [J]. Shopping mall modernization : 310-311.

Guo Yujun, Xiang Zaisheng (2005). *Research on conflict law of electronic bill of lading* [J]. Journal of politics and law : 85-91.

Xiang Zaisheng (2005). *Research on legal issues of electronic bill of lading* [D]. Wuhan university

Xiang Zaisheng, Wang Yuanxiang (2005). *Research on legal issues of electronic bill of lading* [J]. Law of The Times : 105-110.

Li Dehua (2004). *Several problems of electronic bill of lading* [J]. Journal of Suzhou institute of education : 54-56 + 129.

Yao Ying (2009). *Reflection on the major reform of carrier's obligation of "document release" in Rotterdam rules -- a game between transaction convenience and transaction*

security [J]. Contemporary law : 120-129.