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BLOCKCHAIN TECHNOLOGY AND FINAL CHALLENGE FOR PAPERLESS FOREIGN TRADE

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ABSTRACT

Recent developments in the field of electronic documents have given signs that the use of paper will completely eliminated after a period of time in all business processes. As a result of the developments in information systems, the use of electronic documents has become widespread and even become mandatory in some areas. Foreign trade financing is one of the areas where electronic documents are useful. But use of electronic documents has not yet become widespread in this area. The continuation of paper-based processes shows that this area needs radical and comprehensive changes such as infrastructure, legal compliance, innovative products and investments. Foreign trade requires the creation of common platforms that bring together all parties involved in the transaction so that paper documents can be completely removed. In this case, legal integration from one country to another is required in many areas from electronic signature to foreign trade. The emergence of blockchain technology, which has the ability to provide document integrity without the need for a third party to act as a trusted third party, has created a new hope for this integration. This study approached to the electronic documents in foreign trade and finance in the perspective of blockchain technology.

Keywords: Blockchain, Electronic Document, Electronic Signature, Digital Signature

ÖZET

Özet

Elektronik belgeler alanındaki son gelişmeler bir süre sonra kâğıt kullanımının tüm iş süreçlerinde tamamen ortadan kalkacağına dair işaretler vermektedir. Bilgi sistemlerindeki gelişmelerin bir neticesi olarak, elektronik belgelerin kullanımı yaygınlaşmakta ve hatta bazı alanlarda zorunlu hale gelmektedir. Dış ticaret finansmanı alanı da elektronik belgelerin faydalı olduğu alanlardan biridir. Fakat elektronik belge kullanımı bu alanda henüz yaygınlaşamamıştır. Kâğıt tabanlı süreçlerin devam etmesi, bu alanın altyapı, yasal uyum, yenilikçi ürünler ve yatırımlar gibi radikal ve kapsamlı değişikliklere ihtiyaç duyduğunu göstermektedir. Dış ticaret alanında kâğıt belgelerin tamamen ortadan kaldırılabilmesi için tüm tarafları bir araya getiren ortak platformlara ihtiyaç vardır. Bu durumda ise elektronik imzadan dış ticarete kadar pek çok alanda ülkeler arası hukuksal entegrasyona ihtiyaç duyulmaktadır. Güvenilir bir üçüncü tarafa ihtiyaç duymadan belge bütünlüğünü sağlama yeteneğine sahip olan blockchain teknolojisinin ortaya çıkması, bu entegrasyon için yeni bir umut yaratmıştır. Bu çalışma, dış ticaret ve finans alanındaki elektronik belgelere blockchain teknolojisi perspektifinden yaklaşmıştır.

Anahtar Kelimeler: Kayıt Zinciri, Elektronik Belge, Elektronik İmza, Dijital İmza

1. Introduction

The emergence of blockchain technology, which is regarded as the second Internet revolution, will bring about the end of many paradigms dominating business life. By means of blockchain technology document integrity can be provided without the need for an intermediary to act as the third trusted party. It is expected that smart documents that can authenticate themselves, have an tamper proof structure and can be issued on a decentralized network will cause radical changes especially in logistics and foreign trade processes. Additionally, Smart Contracts are not only documents can authenticate themselves but can execute all transaction which were programmed thereon. Until today, there was a need for centralized systems that brought the parties together so that the processes in the paper environment could be transferred to the electronic environment. This situation was especially difficult to solve as it required integration between parties in foreign trade. But blockchain technology will be able to pave the way for significant changes with the potential to remove the intermediaries and has a considerable potential in terms of ensuring full integration among the parties that has not been achieved so far. It would be able to get rid of both paper documents and complex business processes. This important because it will decrease a great deal of cost and waste of time. Blockchain is a peer to peer technology which allows to create electronic ledger kept at the same time in the computers which is called the node on the open network, behaving both as client and server. Each record in this ledger is called a block since it consists of consecutive encrypted records. There is no need for a central authority to perform this cryptography. Therefore, the invention of this technology can be called as second internet revolution. Encrypted data structures called blocks are kept in duplicate copies on computers located on a dispersed network. In this study, it was tried to approach to the Integrated Single Foreign Trade Document which was proposed in the former Studies in the blockchain perspective (Civelek & Seçkin, 2017) (Civelek & Sözer, 2003) (Civelek, Uca, & Çemberci, 2015) (Civelek, Çemberci, Uca, Çelebi, & Özalp, 2017).

2. Electronic Documents in Foreign Trade

Technological innovations in recent years have resulted in paper based documentation will be completely abandoned in all business processes, however the paper-based processes still prevail in foreign trade transactions due to complicated business processes. Electronic documents are the electronic records produced by a computer program which bear electronic signature confirmed by a certificate authority. They are consists of the statements, writings, figures and pictures which are integrated as electronic record. The greatest practical barrier to the promotion of electronic trade is the standardization of electronic documents (Civelek, Çemberci, Uca, Çelebi, & Özalp, 2017). The concerted approach in the Asia region enhances harmonization of systems and procedures, which is necessary for continuous paperless trade processes (Laryea, 2005).

In order to develop the international trade process, an e-Trade project was implemented by Korean government in 2003. In addition, to provide a single window for e-Trade, the uTradeHub was implemented in 2008. However, the evaluation of e-Trade performance was still controversial. The evaluation of e-Trade performance has both positive and negative results. Positive results were reported at the initial stage of e-Trade maturity, at the macro level, such as national, and at industrial levels. According to this view, e-Trade generally decreases transaction costs and increases productivity. However, recent literature has claimed some opposite results. Negative results were reported at the later stage of maturity as well as at the firm level. This means that the use of e-Trade is not continuously active when the benefits received do not match up with those expected. As result, both the use and net benefits of e-Trade show steady levels, but not steady enough to increase a firm’s capability. In addition,

empirical research has shown similar results, such as in the case of Korea, where the number of SMEs using e-Trade is low and not increasing (Kim & Lee, 2016). To enable increases in efficiency, a major opportunity is seen in the digitalization of these documents (Leyer & Hollmann, 2014). In China, internet-based, third-party internet service provider offering electronic bills of lading facilitate international supply chain processes. But for changing user attitudes towards electronic bills of lading, there is a need to build trust (Mei & Dinwoodie, 2005). Results regarding attitude of the users was dubious because electronic documents are conspicuously advantageous. Benefits such as cost reduction, shorter transaction time, elimination of archive problem and prevention of fraud are undeniable. Employees' negative attitude against electronic document system most probably arises from resistance to change and lack of system interoperability (Civelek, Uca, & Çemberci, 2015). Main participants of a foreign trade transaction are exporter, importer, carrier, insurance company, customs administration and bank. For full integration all of these parties need to come together (Civelek & Sözer, 2003). Electronic documents began to take the place of the paper documents that are being currently used in foreign trade. The benefits of using e-documents are classified as reduction of costs, reduction of processing time, elimination of application differences, increase of usability, reduction of the effect of the human factor, increase of the archive costs, recording of the economy, prevention of fraud, elimination of the complexity payment methods, reduction of the number of documents, facilitating the acquisition of commercial information, increase of trade volume, predictable costs and being no longer problem of language differences. The most important of these are the elimination of complexity payment methods and the reduction of the number of documents. Reduction of the number of documents required for completion of a foreign trade transaction cause simplification. The most important benefits of simplification are transaction time and cost decrease. Consequently this decrease exerts positive influence on economic growth (Civelek & Seçkin, 2017). Despite its plenty of benefits, the use of electronic substitutes of the documents used in foreign trade has major obstacles. Some of these obstacles are summarized as follows (Civelek, Uca, & Çemberci, 2015): There are great differences between the business processes conducted with paper documents and the business processes conducted with paperless documents. A large number of entities from different countries are involved in the business processes of foreign trade transactions and there are complex business processes. The international standards for paperless trade have not been fully determined. It is difficult to establish an international coordination among entities for a project to be invested in to set up a common system although it is necessary to use such a single common system among entities to secure integration. Since digital certificates have legal validity only in certain countries, this prevents reaching the critical number of users that is necessary for a satisfactory return on investment. Blockchain technology will make a better contribution to these difficulties.

3. Electronic Bill of Lading

The most important of the transport documents used in foreign trade is the bill of lading. The reason for this is that maritime transport has been done since the early ages and the legal ground of the bill of lading is based on very old times. "Bill of lading" is a contract of carriage of goods by sea; it is a formal receipt for the goods shipped and a document of title. Bill of lading is based on ancient customs and usages of merchants in trade known as Lex Mercatoria. Law relating to "Bill of lading" i.e. "Carriage of Goods by Sea Act 1992", "Hague Visby Rules", Similar Law, rules and Agreements are based on paper bill of lading, not electronic bill of lading. Since the first years of use of electronic documents, efforts are being made to develop electronic versions of documents used in foreign trade (Pagnoni & Visconti, 2010). These studies are usually focused on bill of lading because the bill of lading is most important

document in international and domestic trade. Bill of lading can be issued by carrier or the agent of the carrier or master. This document can be issued to the consignee, to the order of a party or to order and blank endorsed. It is a document indicating receipt of the goods and after on board statement indicating shipment of the goods. This document is also a contractual document between the shipper and carrier (Turan, 2010).

The legal validity of electronic documents is based on the electronic signature they bear. The legal validity of the electronic signature is based on the electronic signature laws of the countries. The legal basis of Bill of lading is based on Lex Mercatoria, International Law, Rules and agreements. The lack of an integrated system that brings together all the parties involved in a foreign trade transaction is one of the obstacles to the widespread adoption of electronic bill of lading. However, in the future it is inevitable to use an electronic bill of lading on an integrated system that includes banks and all commercial parties. As a matter of fact, since the beginning of 2018, work has been accelerated on blockchain-based electronic bill of lading. Especially, IBM and Maersk have announced a new joint venture in order to develop blockchain technology solutions for maritime shipping. They try to integrate all supply chain processes into one platform by using blockchain technology.

4. Blockchain Technology and Foreign Trade Transactions

In order for electronic documents to be regarded as documents in a legal sense, they need electronic signature bearers in a manner accepted by the laws of the country. Electronic signature is a code attached to a document and shows the authenticity and authorization of the sender. Electronic documents have serious cost advantage. But it would be extremely optimistic to expect that the all foreign trade transaction carried into electronic environment. It is also a problem that there are separate electronic signature laws in every country in the world. Because there is a problem that the electronic signature created in accordance with the laws of any country is not recognized by another country. In the light of the above, the introduction of an international new, simple but secure system may meet this requirement through blockchain and by its mathematical algorithms and high authentication. Additionally, secure but simple payment methods that complex payment methods may also be developed on Blockchain. This must be done in order to spread the use of electronic documents worldwide.

Thus it may be possible to use this methods and documents instead of traditional methods and documents, besides, a single electronic document of multiple purposed may be developed as well. That is to say, one document will be used for multiple purposes, i.e.as a Bill of Lading, İnvoice, Certificate of Origin, Analysis Certificate, Packing List etc. This will be done through Blockchain and Smart contract. One smart contract as a single document will serve as multipurpose document. Finally, it may be possible to use one secure and electronic record instead of issuing a large number of foreign trade documents, it is necessary to use such secure electronic documents to facilitate the trade. All parties may access to one document and update with necessary information on their part. This updated document or record may be used in any payment method such as collection or letter of credit etc. It will lead to the disappearance of paper based documents. Thanks to the integration of the blockchain and smart contracts for payment methods and documents, the dominance of any one of the parties will cease to exist. For example, when goods are processed on e-Documents in smart contract form, which are withdrawn from customs, transfer between bank accounts will take place without any manual intervention, if bank accounts are not available, the smart contract e-Document will not allow the goods to be cleared through the customs. If the buyer causes the non-payable goods to wait at customs, the problem will be tried to be solved by the terms of the smart contract. If this is

done in an improper manner, the parties will be able to move out of the system. In this trust based system, the rate of applying to the courts due to fraud in foreign trade transactions will also decrease. In order for a foreign trade transaction to take place, although each country has different legislation, an average of 40 different documents is issued by 28 different institutions. All foreign trade documents can be combined into a single universal foreign trade document which can be delivered to all institutions at the same time as it is relevant to the nature of the transaction. In this case, all foreign trade transactions can be carried out with one document. This kind of document is suitable for the philosophy of blockchain.

The existing foreign trade payment methods and documents have to be simplified and adapted to the electronic medium so that foreign trade can be done through commercial electronic documents. It is unnecessary to adapt all the processes followed in paper base environment in to the electronic environment. It may be hybrid. It would be appropriate to use simpler transaction standards, even if possible, in a single standard of electronic environment that will take the place of all the classic payment methods and documents. To overcome these obstacles, paperless trade investments should be directed to multiple solutions covering all institutions involved in foreign trade transactions. In this way, the business processes that need to be mastered for many years in the paper environment will become feasible without expertise. At the end of this, it is clear that there will be very significant decrease in the operational costs of the companies. Despite the availability of alternative methods for letter of credits, these methods do not reach sufficient efficiency because they do not cover all parties in the trade and they still try to use the electronic equivalents of classical documents (Özkan, Bayram, Karakaya, & Karakaya, 2014). However, it is unnecessary to produce documents more than one. Because a document, which is designed as a smart contract on blockchain on the internet and can be accessed by all commercial parties from all over the world, the functions of such document can be increased as desired. A single foreign trade document may fulfill the functions of all documents issued separately. All parties involved in this transaction must be able to combine on a single system in order to be able to execute a foreign trade transaction through a single document from the beginning to the end. In the classic paradigm, in order to finalize the foreign trade transaction using a single electronic document, a single online platform is required for all parties to become members. But in blockchain technology non-member parties can be involved in the processes. In the classic paradigm, International co-operation is necessary to create such a platform. The key to Blockchain technology arises at this point. It is expected that this technology, which promises a decentralized structure and does not require an intermediary party, will cause important developments in electronic foreign trade documents. Therefore, there is no need closed, member-only systems for using blockchain based documents (Takahashi, 2016).

5.Smart Conracts

Smart contracts are self-executing computer codes that automatically carry out functions once a triggering event has taken place. It is a linear contract that can include multiple parties (buyer, seller, banks, insurance companies, etc.) and that cannot be altered. For example, if a smart contract is written between a buyer and a seller to say that once goods have been cleared by customs, 20% of the funds will be released to the seller, a smart contract would automatically disburse payment once confirmation is entered into a distributed ledger that the customs office has cleared the goods. The confirmation of approval by customs is not a triggering event requiring action by a bank; the payment is automatically made once confirmation has been entered into the system. With a smart contract, legal stipulations are embedded in the computer code, which enables the automatic execution of functions defined by a legal contract. It also

provides protection against duplicate invoice financing, as the contract will not allow for an invoice that has already been financed to receive additional financing.

Banks will play an important role as advisors to their clients while developing smart contracts. The terms of a smart contract have to be worked out between the parties before the smart contract is developed, and banks will also have to perform compliance checks such as KYC procedures before embedding the legal contract in code. Today, legal and regulatory issues surrounding smart contracts are still unclear (many jurisdictions, and many companies exporting the use of smart contracts are still in the proof of concept stage. As the technology matures, standardization of smart contract terms is explored, and successful adoption of smart contracts grows, their use in trade finance could bring even more benefits to all stakeholders along the supply chain (EBA, 2016).

6.Some Initiatives and Studies on Trade Finance and Blockchain

We.Trade: we.trade Innovation DAC is a joint-venture company owned by 9 European banks, that develops and licenses the first blockchain trade platform for commercial clients and their banks available in the market. Through distributed ledger technology and smart contracts, the platform provides a secure, innovative environment for banks' commercial clients engaged in import/export transactions to trade in a user-friendly and efficient way (We.Trade, 2018).

Marco Polo Finance: Marco Polo is one of the fastest growing trade finance business networks. It is a joint undertaking with trade finance technology firm TradeIX, working with enterprise software firm R3 and a network of the world's leading financial institutions.
Launched in 2017, Marco Polo is focusing on a Trade Finance Platform built on an interoperable business network powered by open Application Programming Interfaces (APIs) and blockchain technology. Marco Polo provides mutual benefits for financial institutions and their corporate clients and elevates the delivery and management of trade finance solutions. Marco Polo's approach is unique — by working with leading financial institutions and harnessing collective expertise, together we have developed a Trade Finance Platform leveraging blockchain technology that raises standards for an interoperable business network. If you want to be part of Marco Polo, to grow your business, become more competitive and work in collaboration with other financial institutions and corporate clients (MarcoPolo, 2018).

7.Regulatory and Security Issues

With the use crypto-technologies still in its infancy, it is unsurprising that the regulatory frameworks surrounding their use remain unclear. Combine this with the fact that crypto-technologies themselves are a technological innovation that have only been possible for a few years, and there seems to be an uphill battle ahead to craft laws and regulations that will ensure a stable playing field for industry stakeholders looking to adopt crypto-technologies. Regulatory compliance is a key issue for banks, and as long as they are unsure of how regulators view the use of distributed ledgers in finance, they are unlikely to make it a backbone of how they provide products and services to their customers. While regulators in some countries such as Australia have signaled their openness to the use of crypto-technologies, what banks and corporates need are concrete rules to reduce the risk of regulatory action. Banks, fintechs, and corporates could engage with regulators to help educate them on how crypto-technologies work and how they can be used to benefit end users while maintaining the security and stability of payment systems.11 In addition to the need to clarify regulatory aspects that affect all industry stakeholders, banks will have to look at their own internal risk management policies and determine whether changes need to be made to accommodate the use crypto-technologies

(EBA, 2016).

8 Conclusion

All around the world, expectations have arisen that blockchain technology will cause radical changes in multilateral business processes, as document integrity can be obtained and processes without the need for an intermediary to act as the third trusted party. Particularly in the supply chain business process, it is expected that the blockchain technology will provide a significant cost reduction and eliminate time losses. For this reason, many institutions are intensifying their work on this issue. Especially in the field of foreign trade, studies are mostly focused on blockchain-based electronic bill of lading and similar documents and payment methods such as letter of credits etc. However, as mentioned in previous studies, in the case of foreign trade business processes carrying in electronic environment, there is no need for issuing separate documents for each transaction and the functions of all documents can be combined a single document (Civelek, Çemberci, Uca, Çelebi, & Özalp, 2017). In the same way, the multilateral decentralized structure of blockchain technology allows the integration of the functions of documents.

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