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The role of blockchain technology in facilitates international trade

دور تقنية البلوك تشين في تسهيل التجارة الدولية

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Abstract

Through this study, we aim to show how blockchain facilitates and improves the international trade mechanism, especially how this technology can improve trade finance and facilitate document management and logistics.

The findings of this study indicate that the application of blockchain in international trade would lead to: connecting all parties in a single and private network, enabling real-time tracking of documents and the electronic transfer of the required documents as well as eliminating the need for an intermediary; All this improves payment system procedures (reduces transaction fees and the delays in time settlement and delivery time), reduces the amount of physical documentation to manage and leads to faster, cheaper and secured logistics operations, as confirmed by TradeLens experience.

Keywords: Blockchain, Logistics, Letter of Credit, International Trade.

ملخص

نهدف من خلال هذه الدراسة الى إظهار كيف تساهم تقنية البلوك تشين في تسهيل وتحسين آلية التجارة الدولية، بالتحديد كيف يمكن لهذه التكنولوجيا تحسين تمويل التجارة وتسهيل إدارة المستندات والخدمات اللوجستية.

تشير النتائج إلى أن تطبيق البلوك تشين في التجارة الدولية من شأنه أن: يربط جميع الأطراف في شبكة واحدة وخاصة، وتمكين تتبع المستندات في الوقت الفعلي والتحويل الإلكتروني للمستندات المطلوبة، وكذا والقضاء على الحاجة الى وسطاء؛ كل هذا يحسن إجراءات نظام الدفع (يقلل رسوم المعاملات والتأخير في وقت التسوية)، ويقلل من حجم الوثائق ويؤدي ايضا إلى عمليات لوجستية أسرع وأقل تكلفة وآمنة، كما أكدته تجربة *TradeLens*.

الكلمات المفتاحية: البلوك تشين، الخدمات اللوجستية، خطاب الاعتماد، التجارة الدولية.

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1. INTRODUCTION

The international trade operations are a complex process because they involve many parties (intermediaries), multiplicity of documents required, and centralized system, and the dependence on manual process and documentation; having such a complex mechanism make the whole process expensive and prone to error and time-consuming. Recently, the world has witnessed rapid and successive technological developments, it must be noted that the extent and the tendency towards strengthening international trade relations with modern technologies would contribute to their development. Blockchain technology is considered one of the most prominent modern technologies and popular terms today, through its role in eliminating intermediary parties, as well as automating business processes.

The emergence of blockchain technology as a potential solution to the various challenges facing international trade and business can create a stimulus in the global market through more smooth and efficient processes in cross-border transactions and business consolidation, which is expected to lead to cost reduction and minimize settlement time, create a competitive advantage for organizations in global markets. This potential impact has pushed many companies and institutions to update their outdated technology.

Problem of the study:

Transactions in international trade can takes 90 to 120 days to complete, this is due to the complex mechanisms, strict regulations, the various parties involved in the implementation of the international sales contract and the reliance on the manual process and documentation in the execution of international contracts and the trading mechanism as well as the payment system. As a result, transaction-related costs are high, the time taken for goods to reach the end consumer from the manufacturer is long, in addition the massive use of the paper documents increases the risk of malicious behavior (double financing), and cause billions of Dollars of annual losses in income. Given the importance of international trade in the economies of countries, it is necessary to adopt techniques that facilitate and increase the efficiency of international trade operations. Perhaps the most prominent of these technologies is the "Blockchain" technology, which is one of the technic resulted from the industry 4.0, that has changed the concept of data management, and eliminated the role

of mediation in the financial services industry, and enhanced the security and transparency of transactions.

Question to address:

Following the above discussions, the question underlying this study is as follow:

What is the role of Blockchain in facilitating the international trade?

The following sub-questions are included:

- How does blockchain technology work?
- Can blockchain enhance the payment system in international trade?
- Can blockchain facilitate document management ?
- How blockchain can improve logistics operations?
- What are the challenges related to the implementation of blockchain in international trade?

Hypothesis:

Blockchain has been defined as a **decentralized system** that enables the involved parties to independently build a network and store the required information. The entire database is built and encrypted with the help of complex algorithms that aim to simplify and secure data and information integrity. This technology is therefore a source to indemnify the complex process that the companies today have to keep-up with to be in the business. Given the **concept of trust** preserved by the blockchain in transaction, the technology is progressively integrated into international trade and global supply chains (Wright & De Filippi, 2015). Blockchain technology can impact business models by authenticating traded goods via **disintermediation** and by lowering transaction costs (Nowiński & Kozma, 2017). The blockchain can facilitate the traceability of traded goods, which helps reduce logistics costs and safeguard operations from start to finish. And it can help to protect the security and privacy of user data (Zyskind, Nathan , & Pentland, Decentralizing Privacy: Using Blockchain to Protect Personal Data, 2015). In addition, it makes transfer payments more quickly and cheaply due to facilitating access to information for all parties involved. the contribution of the blockchain on the digitalization is key to facilitate the certifications and customs clearance procedures; as well as to address the challenges of cross-border

data exchanges between parties involved. So, from above we can summarize the hypothesis of study as follow:

Fig.1. Research hypothesis

Source: Author' elaboration

H1: The blockchain enhance the payment system in international trade

H2: The blockchain technology facilitates the document management.

H3: The blockchain can improve the logistics

Significance of the study:

This research we attempt to evaluate the importance and the role of blockchain in international trade and its potential benefit in overcome the challenges and on improving the various fields of international trade, such as trade finance, logistics and document management…. Therefore, The topic of this study is rational and can contribute in clarifying the role that blockchain technology can play in facilitating international trade. The findings of this study will help companies to understand how to achieve international trade efficiency by implementing blockchain technology; it also help companies to understand the requirements that must be met before the implementation of blockchain in international trade. The findings of this research would be complement to the results of the previous studies. Furthermore, this study could be a starting point for more in-depth studies in this field as well as research about the use of blockchain in multiple business environments and in creating a competitive advantage.

Data and Method:

In this study, we use a qualitative and analytical approach to analyze and highlight the potential benefit and role of implementing blockchain technology in international trade; this is by using secondary and reliable data and information from online journals and articles, WTO websites,

economist commentaries, and websites of the companies as well as public and previous research or literature studies about blockchain in international trade. We used qualitative and analytical approach, which is appropriate to describe how blockchain technology work, and to analyze the anticipated and the achieved results of implementing this technology in international trade based on the experience of some institutions and companies.

2. LITERATURE REVIEW

Blockchain technology is one of the numerous emerging technologies, launched in 2008, the last few years have shown that blockchain as a technology may be applicable to a large variety of industries and sectors, each with their own specificities (Ganne E. , 2018). The World Trade Organization (WTO) considers blockchain's impacts on global trade as revolutionary, due to its potential ability to break down the various trade barriers (Ganne E. , 2018). furthermore, the massively adoption of the blockchain internationally and the decision made by WTO to implement the technology in the capital market, will make revolutionary changes in entire trading industry, as well as global supply chain (Tripoli & Schmidhuber, 2020). There are many studies that investigated the importance of this technology in trade process.

The main impact of blockchain based solutions on international trade would be to contribute to trade facilitation by providing a trusted and secure infrastructure for documentation exchanges, ensuring relative equality between the stakeholders, and automating some processes, resulting in overall cost reductions (Copigneaux, 2020).

The blockchain technologies have the potential to **cut trade costs considerably**, this is essentially due to the increased transparency as well as blockchain's ability to automate processes such as financial intermediation and coordination of businesses and other aspects (Alexandre, 2018). The digital ledger does not require a trusted third party (McDaniel & Norberg, 2019) ; thus, traders with limited knowledge of each other can conduct business cheaply without intermediary.

The use of computer applications enables the participants in blockchain network to trace transactions easily (Ganne E. , 2018). Therefore, the technology eliminates or significantly **reduce the chances of tampering** with the goods or even the business documents. The blockchain is a type of database system that records information through a special fault-

tolerant mechanism called a consensus mechanism that increases the difficulty of being changed or hacked (Belle, 2017).The blockchain technology has massive importance due to its characteristics of making the digital assets unalterable and keeping them transparent with cryptographic hashing technology and decentralised mechanism (Zheng Z. , Xie, Dai, Chen, & Wang, 2018). Blockchain is considered a revolutionary technology in international trade process, as it **reduces risk and minimises fraud** by increasing transparency and scalability of transactions (Holotiuk & Moormann, 2018). Furthermore, blockchain is highly popular among users for being secure because of its digital signature feature and a decentralised system that is not controlled by the regulatory authority like central banks or governments, thus making the transactions smoother and safer (Zyskind, Nathan, & Pentland, 2015) .

Another major area where the blockchain technology can has significant impact is in **the trade finance**. Today, cross-border transactions are time-consuming, lengthy, and expensive (Ganeriwalla, Casey, Shrikrishn , Bender, & Gstettner, 2018). Blockchain makes these international payments system faster by providing a robust cross-border common infrastructure and minimizes costs by eliminating expensive intermediaries; these improvements will be the most significant impact of blockchain technology and become apparent when considering the high inefficiency of global trade and the current payment system (Holotiuk, Pisani, & Moormann, 2017). The World Economic Forum predicts that the blockchain technology is expected to create new trade worth more than $3 trillion within the year 2030 (Derindag, Yarygina, & Tsarev, 2020) ; this prove the huge impact a blockchain technology can have on international trade.

3. RESULTS AND DISCUSSION

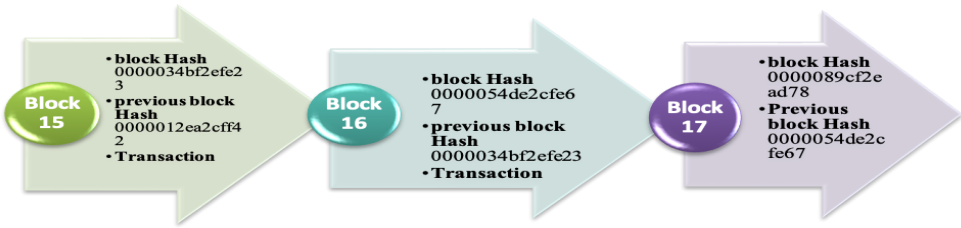
3.1. How Blockchain technology works:

The most popular definition of the Blockchain, is the one developed by Don and Alex Tapscott “The blockchain is an incorruptible digital ledger of economic transaction that can be programmed to record no just financial transactions but virtually everything of value” (Bahga & Madisetti, 2016). The blockchain technology provides an electronic record-keeping and transaction-processing system, which lets all parties track documentation through a secure network and requires no third-party verification (Kelly, 2016). This technology, which originally came from the Bitcoin digital

currency, does not require manual processing, nor authentication through intermediaries, which makes transactions faster, more reliable, and easier to audit. The two parties of the transaction can transfer the shipping, insurance and other original documents that have been stamped in an encrypted through the blockchain (Kelly, 2016). Blockchain technology is based on the following principles (Leloup, 2017):

- Decentralization and disintermediation: no central authority controls the blockchain
- Consensus: the fact that transactions are accepted or rejected is the result of consensus at the blockchain level and the result is not the decision of a central institution
- Immutability: it is impossible to modify or delete information in the system
- Trust and transparency: data, operations are shared

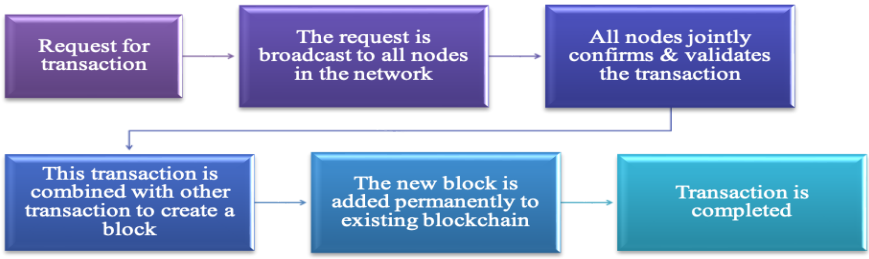
Fig.2. The sequence of the blocks in the blockchain



Source: author' elaboration

The blockchain is an inter-network of all the blocks each block is unit of data. (Genius blog, 2017). The Blockchain consists of linear sequence of blocks, which are added to chain with the regular intervals (Bahga & Madisetti, 2016). The information in the blocks depends on the Blockchain network, but the timestamp, transaction, and hash are existed in all the Blockchain variants ; each block contains its own cryptographic hash as well as the hash of the previous block. All hash's information is generated automatically, the sequence of linked hashes creates a secure, independent chain ;it means that it is not possible to change any information in the hash. In this case, each next block reinforces the verification of the previous block (Caramés & Lamas, 2018).

Figure 3: The Life Cycle of a transaction in a Blockchain



Source: (Genius blog, 2017) https://kindsonthegenius.com/blog/blockchain-technology-explained-part-2-distributed-database/

-Transaction: first the transaction is requested by users, two parties exchange data, such as customer details, money, contract or any other asset.

-Verification: since the database is a distributed database, all nodes in the network going to get the transaction request; the transaction is verified instantly. Then, all the nodes must determine if the transactions are valid.

-Validation: before the transaction is entered, all nodes have to confirm and verify it and the blocks must be first validated (make sure on its authenticity) to be added to the blockchain. One of the most validations accepted forms is proof of work (PoW). It takes some time, but it has to be done to ensure the integrity and consistency of the system.

-Block is Created: **(**This process is called **Mining)**: when all nodes have reached a consensus that the transaction is legitimate and can be accepted, then a block can be created. A number of confirmed transactions is combined and recorded together as a block (a block is a combination of two or more individual transactions) (Genius blog, 2017)

-Block is recorded (Chain): the block is added by each node on the chain, this new block in recorded permanently to the chain; which is distributed all along the network.

-Transaction is Completed: since the transaction is marked as completed the chain will be secured against any try of manipulation. For instance, “if a malicious miner tries to submit an altered block to

the chain, the other nodes detect these changes and reject the block from the chain" (Mediacloud).

To sum up, when a transaction occurs, it is recorded as a "block". This transaction shows the movement of an asset that can be tangible (product) or intangible (idea). The data block can record information about the identity, the quantity and condition such as the temperature of a food shipment. then, each block is connected to the next and previous block through cryptographic hashing (Hash), as each block carries its own information, the cryptographic hash of the previous block, and its own cryptographic hash. These blocks form a chain of data when the asset moves from one place to another (or changes the ownership). The blocks confirm the exact time and sequence of transactions, and blocks are securely linked to each other to prevent the risk of being changed any existing block or inserted an inexistent block between two blocks into the chain.

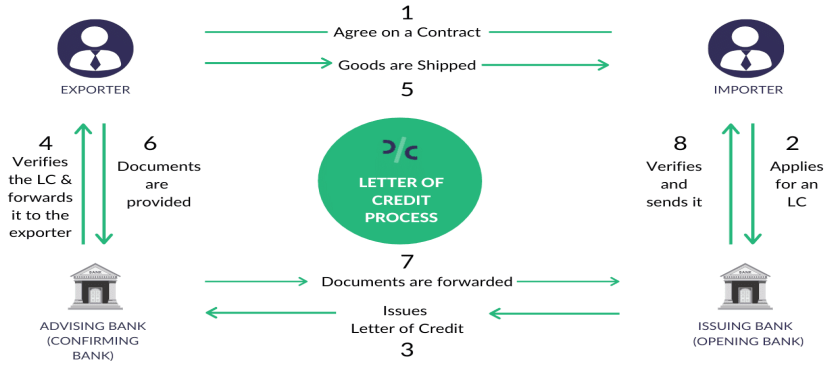
3.2. Blockchain for payment system in international trade

The exporters wish to receive their dues directly after shipping the merchandise, and the importers prefers to pay after receipt the goods and checked its integrity. To achieve the preferences and satisfy both parties the trade finance provides the credit payment guarantee, and insurance to facilitate the transactions; this leads to the intervention of many intermediaries. In addition, each step requires verification, for example, when the goods are transferred from the manufacturer to the warehouse, when the container is loaded onto the ship, when the container is unloaded from the ship at the port and when the goods are transported from the port to the final consumer. This complicated legal framework and mechanism are bounded by risks and is time-consuming, and it causes delays in delivery times as well as incurs high costs.

In international trade, the Letter of Credit is one of the most secured and widely used method of payment (The global volume of letters of credit is worth roughly $2.8 trillion). The letters of Credits are separated contracts issued by a bank (Importer's bank) at request of the buyer (the importers) and in favor of the seller (the exporter). They represent a commitment by the issuing bank to pay the beneficiary only if the terms and conditions, usually the delivery of specific documents, required by the L/C are met and

done within the stipulated period, called validity date (U.S. Department of Commerce, 2008).

Fig.4. letter of credit procedures



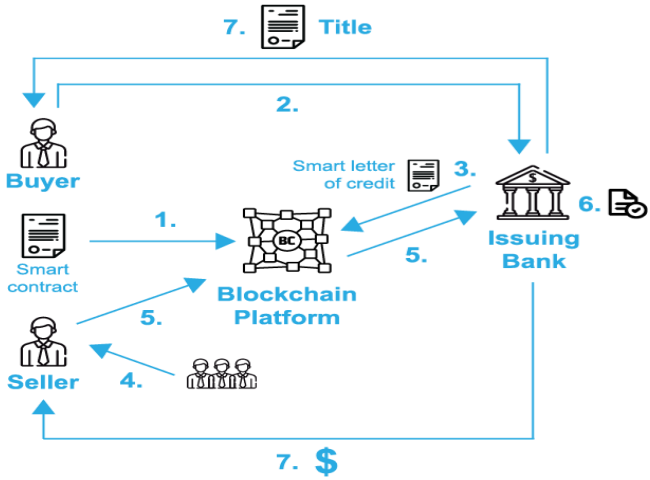
Sources: (Parekh, 2022) https://www.dripcapital.com/resources/blog/letter-of-credit-lc

From the figure we can see that the letter of credit procedure involved several parties four parties are directly involved while the other parties (such as customs authorities, insurance companies, the shipping companies….) are indirectly participate in the process; according to a study made by the Boston Consulting Group, more than 20 entities participate in one financing procedure, which involves a large number of documents and takes a long time and entails to huge costs (Ramachandran, Porter, Kort, Hanspal, & Garg , 2017). In addition, this process is fraught with risks such as the risk of fraud risk, human risks, the country risk, risk regarding shipment, etc. all of this making this process inefficient, slow, too much paper based and costly.

The Process regarding the Letter of Credit could be facilitated and simplified (more efficient) through the Blockchain using Smart Contracts. using this technology, the process can be presented as follows: **First,** the importer creates a Letter of Credit application for the importer bank to review and stores it on the Blockchain. **Then,** the importer bank receives notification to review the Letter of Credit and can approve or reject it based on the data provided. **Once** checked and approved, access is then provided to the exporter bank automatically for approval. If it approved, the exporter

is able to view the Letter of Credit requirements and is prompted to view through the application. **Secondly**, the exporter completes the shipment, adds invoice and export application data and attaches a photo image of any other required documents. **Once** validated, these documents are stored on the Blockchain. **Then,** these documents are viewed by the exporter bank, which approves or rejects the application. **Third,** importer bank reviews the data and images against the letter of document requirements, marking any discrepancies for review by the importer. When approved, the Letter of Credit goes straight to completed status or is sent to the importer for settlement. **Finally,** if required due to a discrepancy, the importer can review the export documents and approve or reject them." (Lotto Persio , 2016)

Fig.5.: Letter of Credit Process based on Blockchain



Source: (Collet, 2018) and from https://www.gtreview.com/news/asia/banks-blockchain-innovation-letters-of-credit/

The seven steps of the Letter of Credit under the blockchain technology is as follow (Collet, 2018):

1. The seller and buyer enter into a contract of sale (smart contract) on a platform using the

Blockchain's technology.

2. The buyer creates a Smart Letter of Credit to the issuing bank.
3. The bank will review the smart Letter of Credit, issue and confirm it on the Blockchain.
4. The different parties involved in the transaction (Shipping Companies, Customs, Port authorities, insurance companies...) will

issue the different documents required, such as the Bill of Lading, insurance documents, the certificates of quality and quantity, certificates of origins, etc.

5. The seller present those documents to the bank electronically (using the Blockchain).
6. The checking is done automatically in order to confirm the compliance of the documents with the Letter of Credit's conditions and highlight any discrepancies.
7. If everything is compliant and correct, the bank will sign off everything. Thus, the title to the assets is automatically transferred to the buyer and payment is made simultaneously to the seller (Lotto Persio , 2016).

Using Blockchain technology to execute Letter of Credit, could make a significant improvement of the procedures; since it can help streamline the manual processing of import/export documentation as the documents can be retrieved directly from the immutable ledger. The application enables exporters, importers and their respective banks to share information on a private distributed ledger. The trade deal can then be executed automatically through a series of digital Smart Contracts. By real-time tracking of documents digitally and electronic transfer of the bill of lading and other required documents and connecting all parties in a single and private network allows instant updates and eliminates the long lead-time communication among the different participants in a letter of credit operations the processing speed could be increased by 90% from 7 days to 24 hours. The higher visibility (the transparency and consensus characteristics of the blockchain technology) enables the parties involved in the transaction to visualize the data and to monitor the process in real-time, this helps identify root causes of issues, as well as to conceive the next actions to be performed. Since access to the documents is controlled by certificate-based authentication, this helps protect participating parties against the risk of documentary fraud; in addition, the immutability of the data in this technology enables a safe transfer of and offer a solution to the endorsement problem in trade finance. It also helps speed up reporting and decision making and this leads to more efficient operations in terms of the time needed to send and verify relevant documents, thus shortening cash cycles. From the foregoing we can say that the blockchain have the potential

to make the payment methods in international trade more efficient, trusted and easier for all parties involved in transaction.

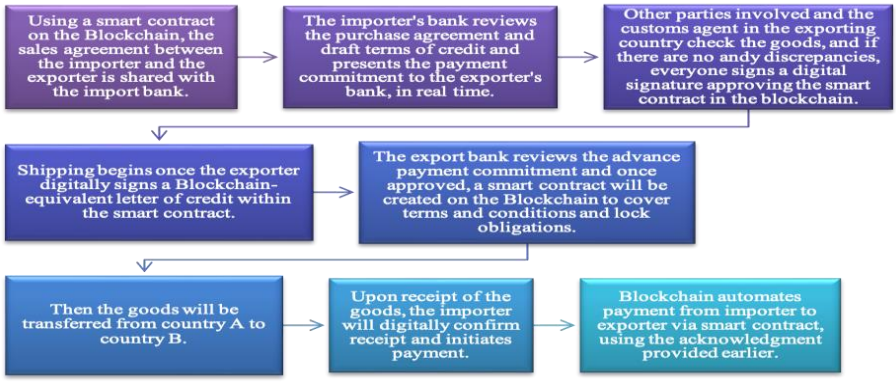
Here are some examples of companies that have experimented with blockchain technology in trade finance process. In 2017, Barclays described its first trade transaction using blockchain as a success, as the parties of the transaction were able to execute a deal that normally take between seven to ten days in less than four hours. The letter of credit reportedly guaranteed the export of $100,000 worth of agricultural products (cheese and butter) from Irish cooperative Ornua to the Seychelles Trading Company (Kelly, 2016). In July 2018, European banks launched a trade finance blockchain platform with at least nine major financial institutions (Zhao, 2018). The initial focus appears to be on small and medium-sized businesses trading within Europe, and the next phase reportedly will aim for buy-in from additional banks and from their customers in Europe and further afield. In September 2018, the Hong Kong Monetary Authority similarly announced plans to launch a trade finance blockchain platform. Twenty-one banks are participating in the platform, including large institutions such as HSBC and Standard Chartered. Using blockchain in letter of credit, HSBC was able to reduce the timeline of such a transaction (letter of credit) from about 5-10 days to 24 hours. "Removing paper from the exchange increases the velocity of trade. More trade can be conducted in the same amount of time," said Ajay Sharma, Regional Head of Global Trade and Receivables Finance for Asia-Pacific at HSBC (Ledger Insights, 2019). The Hong Kong Monetary Authority is also reportedly working with its counterpart in Singapore to develop a blockchain-based trade finance network to settle cross-border transactions (Zhao, 2018). The HSBC and Bank of America Merrill Lynch venture and fintech firm R3 said separately that they had found ways to simplify trade finance processes with blockchain (Kelly, 2016).

3.3. Blockchain for international trading mechanism

Blockchain technology has many advantages to make international trade mechanism smarter and seamless, this technology is a strategic tool in the hands of companies to increase their activity in global trade, as it works to reduce barriers and difficulties to trade. The real-time verification of documents: financial documents accessible via the blockchain can be

verified and accepted in real time, reducing the time for preparing the delivery of the goods (Deloitte). In addition, decentralizing the contract execution (the contract clauses are recorded in the blockchain) reduces the time needed for monitoring the delivery process (Deloitte). Using the blockchain, the mechanism of international trade is as follows:

Figure 6: Transaction mechanism based on blockchain technology



Source: (Deloitte)
https://www2.deloitte.com/content/dam/Deloitte/global/Documents/grid/trade-finance-placemat.pdf

Using the blockchain in international trade mechanism leads to the simplification of the transaction mechanism. Over time, the blockchain is more accepted across the world as it will reduce the complexity of trade process such as letters of credit and logistics operations. The use of blockchain in logistic leads to rapid and secured operations, for example, the determination of the content of the lots and their recipient after the arriving of the ship at the port of destination takes a few days; but in the case of using blockchain the recipient and content information will be accessible right when the ship arrives. This is confirmed by the experience of the Maersk which established in partnership with IBM a blockchain-based platform called "TradeLens" for logistics operations, in December 2018; this platform solution has been used by more than 60 members within the network. During the 12-month trial, Maersk and IBM worked with dozens of ecosystem partners to identify opportunities to prevent delays caused by documentation errors, information delays, and other impediments. One example demonstrated how TradeLens can reduce the transit time of a shipment of packaging materials to a production line in the United States by

40 percent, avoiding thousands of dollars in cost. Through better visibility and more efficient means of communicating, some supply chain participants estimate they could reduce the steps taken to answer basic operational questions such as "where is my container" from 10 steps and five people to, with TradeLens, one step and one person (IBM Newsroom, 2018). Westergaard-Kabelmann points out that the average time associated with documentation has been significantly reduced due to a streamlined exchange system with a "secure and consistent digital work flow" between all partners via a blockchain-based supply chain system. Bridget van Kralingen, senior vice president, IBM Global Industries, Solutions and Blockchain said that "Our work with Maersk and other enterprises in the shipping ecosystem has shown that blockchain can be used to form a strong, connected network in which all members gain by sharing important data and that together we can transform a vital part of how global trade is conducted." (IBM Newsroom, 2018)

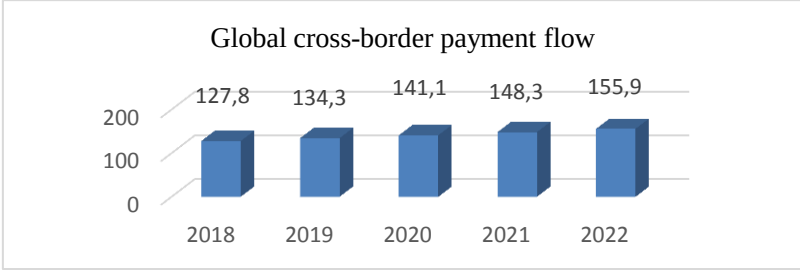
Documentation and administration are estimated to be one-fifth of the $1.8 trillion spent annually to move goods across borders. In addition to showing the location of containers in transit, blockchain can show the status of customs documents, bills of lading and other documentation. It can improve workflow, cut processing costs and enhance visibility by integrating shipping processes and partners. (Agility Group, 2018) "Blockchain technology is going to make shipping cheaper, safer and more reliable. As early adopters, companies like Agility can help Maersk and IBM understand the needs of shippers and develop standards that will make trade more efficient," said Essa Al-Saleh, CEO of Agility Global Integrated Logistics (Agility Group, 2018) According to the 2019 Sustainability Report, the analysis of business trends for Maersk's terminal in India showed that simplified transaction processes through the system TradeLens reduced total operating costs ; for example, the exporters and importers in Mumbai reduced their costs by about 15% of total costs than before (Maersk, 2019). The use of distributed ledger technology (DLT) for port operations in Mexico may help to deal with growth. In Mexico, imports have risen by 5.9 % in the first six months of 2019. That's up on the 2018 growth of 3.4 % (Ledger Insights, 2019).

Customs and border authorities can use the technology to improve the information available for risk analysis, leading to increased safety and

security as well as greater efficiency in border inspection clearance. "For Agility, it's important to be involved early in blockchain and to work with forward-thinking companies like Maersk and IBM," Al-Saleh said. "Together, we have a lot to learn and share in order to bring the benefits of this technology to shippers and consumers as quickly as possible." (Agility Group, 2018)

The graph below (Figure 7) shows that cross-border transaction flow jumped from $127.8 trillion to $155.9 trillion; this significant growth is the result of the simplification of payment processes after the digitization (the adoption of blockchain technology) and to the transition from the traditional method to the digital method in various cross-border transactions steps.

Fig.7. the development of global cross-border payment flow



Source: (India Business & Trade, 2022)
https://www.tpci.in/indiabusinesstrade/blogs/blockchain-technology-role-in-global-trade/

4. CHALLENGES OF IMPLEMENTING BLOCKCHAIN ON INTERNATIONAL TRADE

Despite the different advantages and benefits associated with the blockchain as well as the opportunity provided by this technology for the international trade; several challenges are faced it's application in the business operations namely:

-The data immutability and decentralized that characterizes the blockchain technology makes making mistake a serious challenge for applying this technology in international trade, since it is difficult to correct wrongly entered data in the traditional way; as to fixe an error in a single transaction, all transactions that follow in the chain must be corrected; the more transactions that must be handled the more time must be devoted to do so. In reality, according to a 2018 survey conducted by North Carolina State University, only 15% of respondents (including those in senior supply chain

and procurement management roles) believe their current structures can deliver safe, trustworthy results.

-The data quality: selecting people whom be responsible to the data is another challenge facing the blockchain implementation, since it is important to select the right people to be responsible to the data to avoid data leaks and financial losses.

-The multiple parties included in the logistics (importer, exporter, bank, forwarder and port) rely on different tools, integrating a blockchain platform with all these different tools could be a real challenge.

-Scalability is probably one of the biggest challenges faced by blockchains which is due to the relatively few engineers whom versed in the technology, makes its implementation complex and expensive. Pete Harris, Co-Founder of Chain Business Insights pointed out "Technical issues relate to scalability and performance of underlying blockchain platforms, and ease of integration with existing systems and databases".

-The inadequate legal frameworks for blockchain is one of the leading challenges facing the application of this technology in real world for instance of a regulation case involving the blockchain, is case of Centra[1] which was involved in fraudulent initial coin offering (ICO) activities.

-knowledge gap is another challenge faced the blockchain application, there is a lack of understanding about how blockchain could improve the different business operations.

-The challenge related to technical issues, which include the difficulties associated with developing technological infrastructure.

- **Challenge related to the level of energy consumption,** the process of validating blocks can, for some blockchains, be computationally intensive and require a high level of energy (Ganne E. , 2018) which is in the contrast with sustainable development goals.

5. Conclusion

International trade mechanism is very complex since it involved many parties; the involvement of multiple parties creates communication challenges (lack of transparency) amongst stakeholders. In addition, the international trade transactions adopt a paper based, will be very costly

[1] Centra: is a cryptocurrency firm, advertise itself as a blockchain-based credit card and payment system, it aims to create a world connected to cryptocurrency.

(costing time and money), and are prone to error, losses, and fraud; all this make international trade process inefficient. Blockchain is the technology which is able to manage the international trade complexity and bring important changes to it's process. With decentralized and digitalization architecture of blockchain, this technology enables every member in the network to accede to the same data without relying on central authority, and it removes the need of an intermediary, and facilitates the transition from paper based into digitalized process (using smart contract). In this study we discussed and analyzed how the blockchain technology can improve the different aspects of international trade (payment system, document management and logistics), the research also tries to identify the challenges regarding the application of blockchain technology in international trade; this by referring to the academic literature and various online sources. The findings of this study show that: the implementation of blockchain technology in international trade would lead to: First, improvement of payment system procedures; the real-time tracking of documents digitally, the electronic transfer of the bill of lading and other required documents and connecting all parties in a single and private network all this allow instant updates and eliminates the long lead-time communication among the different participants in a letter of credit; thus processing speed could be increased by 90% from 7 days to 24 hours, this also reducing the transaction fees involved in such international monetary transactions. Second, facilitates document management; Blockchain provides an electronic record-keeping and transaction-processing system, which lets all parties share and track documentation through a secure network and allows the real time verification of the document without the need of the third-party intervention in the verification process, which facilitates the complicated legal framework, reduces the amount of physical documentation, reduces errors and shorten delivery, thus facilitates the customs clearance mechanism. Third, simplifying the transactions mechanism; the use of blockchain in logistic leads to rapid, cheaply and secured operations, as confirmed by the experience of TradeLens which reduced the transit time of a shipment of packaging materials to a production line in the United States by 40 percent, avoiding thousands of dollars in cost. Through better visibility and more efficient means of communicating, some supply chain participants estimate

that with TradeLens they could reduce the steps taken from 10 steps and five people to one step and one person.

Despite the huge advantages of blockchain technology, it also faces some challenges, some of them are related to data, others related to technical issues, including a lack of knowledge, the other challenges related to the legal framework, and a challenge related to the level of energy consumption. even with the existence of these challenges that hinder the application of the blockchain, but it is still the best solution to overcome the problems of international trade, and make international trade more efficient.

Recommendations

- Blockchain technology is efficient for dealing with many problems and crises. Therefore, we recommend the Algerian institutions, especially those active in logistics, to establish in partnership with a technology partner a platform based on this technology to improve operational efficiency and keep abreast of current developments. This is beneficial to them, the foreign trade sector, and the economy as a whole.
- Blockchain is an efficient tool to reach many of the sustainable development goals outlined in the agenda of the United Nations, thus this organization should encourage countries to provide programs and provide the necessary infrastructure for institutions to use this technology.
- Blockchain has several advantages and give many opportunities that will improve the companies' performance and the international trade; despite with the lack of knowledge, and other challenge related to the implementation of blockchain, it is still possible and the best solution to overcome the problems of international trade, and making international trade more efficient.

Finally, I recommend future researchers in this field to focus on: how blockchain can create a competitive advantage for logistics providers. How does blockchain prevent risk related to international trade? The role of blockchain in business auditing.

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