Blockchain applications as a mechanism to facilitate the export process in Algeria.

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Abstract:

This research paper aims to study the extent to which block chain applications contribute to facilitating the export process in Algeria, where we discussed the concept of block chain technology, the concept of export and the structure of export in Algeria. In it, we also studied the applications of the block chain that can contribute to facilitating the export process in Algeria.

Through this study, we concluded that the block chain technology can solve the various problems faced by the foreign trade sector in Algeria, by simplifying procedures and reducing customs costs. Providing transparency by enabling those involved in the process to monitor and track the container from start to finish. This allows exporters to implement their commitments in a timely manner without any delay, which leads to increasing and improving the competitiveness of Algerian exports.

Keywords: Foreign trade; exports; blockchain; smart contracts; Trade Logistics.

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1. INTRODUCTION

The global economy has recently tended to use digital technologies, as the world witnessed a rapid development in various aspects of life at the advent of the third millennium. The tendency of individuals and companies to use technology and the Internet increased to face the changes and challenges faced by the global economy, by integrating technologies such as artificial intelligence and cloud computing. the Internet of Things, and blockchain in various economic and social fields.

Among these economic sectors is the foreign trade sector, which the various economic actors in the world seek to digitize to overcome the various problems and obstacles known to global trade, especially in developing and underdeveloped countries, such as bureaucracy, lack of transparency in transactions, and poor coordination between the various bodies concerned with this. In addition to the slow completion of the procedures related to the export process, the large number of procedures and the interventions of the human factor in completing these procedures.

Blockchain technology first appeared in 2009 as an electronic payment system for the digital currency Bitcoin, an alternative to the old system. Due to its efficiency and distinctive characteristics such as transparency, decentralization and security. The application of blockchain technology has expanded in various economic halls. One of the most important of these sectors is the foreign trade sector, which various ports, banks and various economic institutions seek to implement the block chain in foreign trade. Since 2016, many institutions and banks have been experimenting with this technology in foreign trade, such as the experiment carried out by Barclays Bank with the Irish cooperative Ornua and the Seychelles Trading Company to finance the first trade transaction using blockchain technology, which was described as successful.

Blockchain technology facilitates the export and import process, reduces human intervention and the number of government offices and officials involved, and abolishes paper contracts in the process of managing foreign trade. In addition to facilitating the financing process, automating the shipping and transportation process, and tracking and verifying the

foreign trade process. This may help the developing country and its economic institutions to upgrade and enhance its exports, improve its competitiveness, and penetrate the fabric of global markets.

1.1Statement of the problem

The problem of the study lies in the following main question:

To what extent can blockchain technology contribute to facilitating and simplifying the export process in Algeria?

1.2Hypotheses

- Among the most important effects of applying blockchain technology in foreign trade operations is reducing costs through digitizing documents and increasing security and transparency between the concerned parties.
- The application of blockchain technology in international trade finance allows the completion of the process in a decentralized way away from banks and in a short time.
- The application of blockchain technology in foreign trade will allow trade facilitation of the export process and the promotion of Algerian exports due to the improvement of their competitiveness.

1.3 Significance of the study

The issue of export promotion is of great importance as it represents the most important trends that have emerged in the Algerian economy and which the state seeks to achieve. In addition to the ability of block chain technology to find solutions to the problems that the export process suffers from in its operational and financial aspects. For example, in 2017, Barclays Bank made a successful blockchain-based trade finance deal, in which the parties were able to execute a transaction within four hours, which usually takes up to 10 days. This shows the importance of this study on the one hand and on the other hand for what it imposes The current era of the necessity of adopting technology and trying to adapt to it.

1.4 Aims of the study

- Explanation of the nature of the blockchain technology, its mechanism of action and its advantage.
- Shedding light on the block chain technology and its various applications in customs procedures, logistical operations, and financing foreign trade.

- Highlighting the solutions offered by the block chain technology to the problems faced by foreign trade, which will contribute to the promotion of Algerian exports.

1.5 Research Methodology and Tools

To be familiar with all aspects of the study and to answer the problem posed, we relied on the descriptive and historical approach when defining the export process and the basics of block chain technology and its mechanism of action, in addition to the analytical approach in predicting the effects of block chain technology on the model of completing foreign trade transactions and on the trade finance process.

2. Export in Algeria

Many countries, especially developing ones, are seeking Obtaining hard currency in order to finance its imports, promote economic growth and reduce unemployment rates. Like these countries, export in Algeria is an important source of hard currency, an important resource for diversifying national income and financing the expenses of national projects, and a supporter of the trade balance.

And export is the ability of the state and its companies to sell goods and services to other countries(نجلاء هراقمي، 2019، صفحة 380), which are carried out by residents and non-residents in the country (وئام بغياني، 2019، صفحة 11), according to laws and regulations that support export by exporting countries, and import by consuming countries (نجلاء هراقمي، 2019، صفحة 380), for example in Algeria The Algerian legislator approved a set of conditions for the practice of the export process, such as registration in the commercial registry according to the text of Article 04 of Law 04-08 related to the conditions for conducting commercial activities, and legal publicity in accordance with the text of Article 10 of Law 04-08 related to the conditions for conducting commercial activities, in addition to the export process being subject to control Exchange and for some special legal measures.(وئام بغياني، 2019، الصفحات 15-16)

Hydrocarbons are considered the most important commodity exported in Algeria for several decades, as they represent more than 90% of the value of Algerian exports. (نجلاء هراقمي، 2019، صفحة 380)The following figure represents the most important statistics of foreign trade in Algeria for the year 2020.

table (1): The structure of Algerian exports for the year 2020

Exports= 1+2+3	Algerian dinar	US dollar
1 Temporary exports of fuel	649606,96	5124,32
2 Final exports of fuel	2081145,10	16416,79
3Exports outside ofhydrocarbons	283926,46	2255,49

Source:(وزارة المالية، 2020)

Oil prices declined in the year 2020 due to the 19 mm Covid crisis, which caused a deficit in the trade balance estimated at 10.6 billion dollars. export process. To motivate companies and economic institutions to carry out the process of exporting their products in various global markets.

3. Blockchain technology

In the aftermath of the 2008 global financial crisis, the concept of blockchain technology appeared for the first time (بخاري لحلو، 2020، صفحة 09)in a paper published by an unidentified person named Satoshi Nakamoto entitled: "Bitcoin: A Peer-to-Peer Electronic Cash System." (فاطمة السبيعي، 2019، صفحة 04).Then the use of this technology quickly spread in various economic sectors due to its characteristics and advantages.

3.1 What is Blockchain Technology?

Blockchain is considered one of the most prominent technologies produced by the Fourth Industrial Revolution, and it is a shared record that stores information in a multiple way between the concerned parties without the need for a central authority to control the course of transactions, where each party owns the same copy that is automatically updated upon each addition. (عبد الرحيم وهيبة، 2018، صفحة 70) Unlike a centralized storage system, all authorized actors are allowed to validate the database and confirm all transactions by the participants, and once the block is complete, it becomes immutable. A confirmed transaction is a timestamp that provides the required information regarding when and how the transaction was completed (Ahmed Karam,Nikolay Goryaev,Olli-Pekka Hilmola,Sergey Tsiulin,Kristian Hegner Reinau, 2020). Some representatives or participants in the block chain may have the authority to add information, while others may only be allowed to view or monitor the information. Or access only the part of the process that relates to them. In international trade, for example, the block chain may include various institutions and agencies that are active in managing and managing the export and import process, such as the inspectors who

verify the shipment and compliance with shipping regulations, the importer's bank that prepares a letter of credit, the exporter's bank that provides financing, or the transport company that You, in turn, issue a shipping invoice(Christine McDaniel , Hanna C. Norberg, 2019, p. 05).

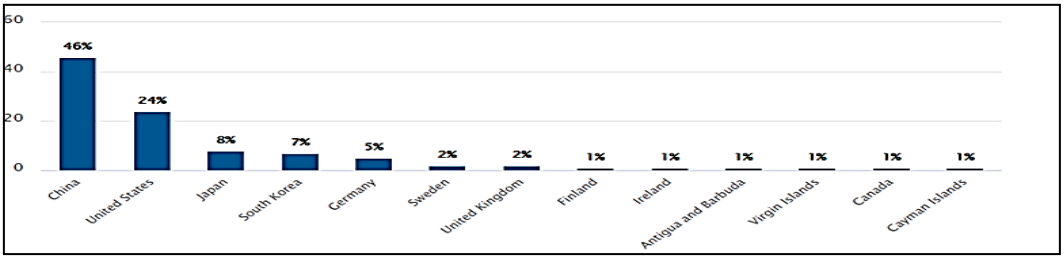
The importance and strength of the block chain technology lies in the decentralization and high transparency in the management of various economic transactions, and its ability to overcome and solve the various problems experienced by various economic and financial institutions. (الشاطر، 2019، صفحة 08). The data may be shared with a select group of users (with permission only) or with the public at large (without necessary permission). Blockchain also enables any company, large or small, to enter into a transaction with multiple parties, more quickly than previously achievable (Christine McDaniel , Hanna C. Norberg, 2019, p. 05).

3.2 The spread of blockchain technology

Blockchain technology was initially associated with virtual currencies as a new payment system alternative to the old system, but it was soon applied in various fields, such as financial services, education and medical record keeping. Blockchain technology is also being tested and implemented in various applications and industries such as insurance, reinsurance, capital markets, digital identity management, information management, payments, contracts (smart contracts), supply chains, etc (www.i-scoop.eu, 2018).

The application of block chain has also spread in many institutions and countries of the world, as it spread from America to various European and Asian countries, especially in the health crisis caused by Covid 19, as many countries, especially China, have been able to apply block chain technology in various economic fields to overcome the repercussions of the pandemic. Based on a survey of 100 global companies that filed for blockchain patents in the year 2020. China accounted for 46% of global patent applications, and other leading countries were the United States (24%), Japan (8%), and Korea South (7%) as shown in the following figure. (finances online reviewe for business, 2021)

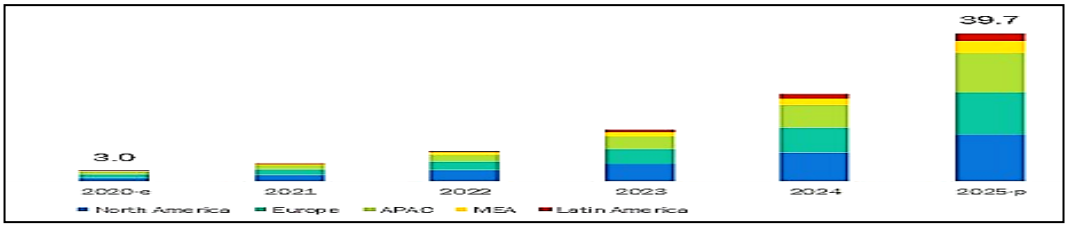
Figure (02): Blockchain patent applications by countries for the year 2020.



Source:(finances online reviewe for business, 2021)

It is expected during the period 2020-2025. The global blockchain market size is expected to grow from $3.0 billion in 2020 to $39.7 billion by 2025 (as shown in Figure No.), at a compound annual growth rate of 67.3%. Supply chain management combined with blockchain technology to push the blockchain market to grow and expand, especially in the global trend to digitization and the use of various technologies (www.marketsand markets.com, 2020).

Figure (03): The evolution of the blockchain market size by regions during the period 2020-2025.



Source:(www.marketsand markets.com, 2020)

Through the above figure, we note that the size of the blockchain market will grow significantly in North America, Europe and Asia, due to its possession of the capital and infrastructure necessary to apply blockchain technology in various fields, in addition to its possession of multinational companies active in the field of technology and various modern technologies that It was produced by the fourth industrial revolution such as Huawei (Huawei) in China and Microsoft (Microsoft) and IBM (IBM) in the United States of America.

3.3Characteristics of Blockchain Technology

Blockchain technology is used in various economic sectors, due to its characteristics, which are:

3.3.1 Safety

Hackers and network hackers face great difficulty in tampering with the chain of blocks, due to the nature and way of working of the block chain technology. It distributes it to the various computers connected to the network, which are called nodes, in addition to the process of updating and verification that the nodes do when adding a transaction to the chain, and This is done by solving various mathematical equations and algorithms in order to link the new blocks to the previous block chain, which is linked when the majority of nodes agree on the validity of the data (ساسي، 2019، صفحة 149). The correctness of the information stored on a chain is ensured by an encryption mechanism. This allows the validation of the information in the block chain. It prevents fraud and vandalism in the chain. In practice, after adding six blocks to each other, changing the information stored on the block becomes highly unlikely(Thorborg, 2017, p. 05).

3.3.2 Decentralization

When saving and verifying information and transactions in the block chain, there is no reliance on a central body or an intermediary party for that, but rather collectively between all parties participating in the network, and this is what makes it decentralized (الشاطر، 2019، صفحة 133). In the case of a public and open block chain, it will become The network is decentralized and the parties will be able to connect individually and do not need an intermediary. Moreover, different blockchain networks can interact with each other all over the world, providing different opportunities to work together in a unique way(Thorborg, 2017, p. 05).

3.3.3 Efficiency

Blockchain technology facilitates the completion and conduct of various operations, by completing them in the fastest time, accuracy and high efficiency, while reducing procedures and documents compared to the current systems, which require several procedures and require the intervention of the human factor to carry out the audit process (بخاري لحلو، 2020، صفحة 07). In 2017, Barclays made its first blockchain-based trade finance transaction for $100,000 in agricultural products from Irish cooperative Ornua to Seychelles Trading Company. The deal was executed within four hours which usually takes up to 10 days to complete(Christine McDaniel , Hanna C. Norberg, 2019, p. 09).

3.4 Types of Blockchain Networks

There are three types of block chain networks:

3.4.1Public blockchain

It is an open network that allows anyone to enter, verify, see and approve the transactions that take place within it, with the ability to conduct various transactions without any condition, an example of this type is the Bitcoin blockchain network. There are also public blockchain networks that require the identity card to perform the process of verifying operations and transactions and adding the block, while allowing everyone to access the data(08 صفحة ،2020 ،الضحوي).

3.4.2 Private blockchain

It is a network that gives the personality of (the founder-founders) a central control over the access to it, according to the terms and instructions agreed upon by the founder, while maintaining all the mechanisms and rules on which the general block chain technology is based, and this is what made the private block chain characterized by simplicity and speed in completing transactions. And a higher degree of security and privacy (132-131 الصفحات ،2019 ،الشاطر).

3.4.3 Alliance networks

It is a network supervised by a select group of leaders, and it works according to principles very close to the rules of private networks, except for the number of units that control the management of the network, and this is what makes it suitable for the application and implementation of collective institutional work, for example is the R30 alliance (الشاطر، 2019، صفحة 132).

From the above, the most important differences between the three types of blockchain networks can be summarized in the following table (01):

Table (02): The differences between the three types of networks for the blockchain

	Public networks	Private Networks	Union Networks
Users	decentralized management without a license secret identity May be a harmful source	one institution Entry Permit known reliable	several institutions Entry Permit known reliable

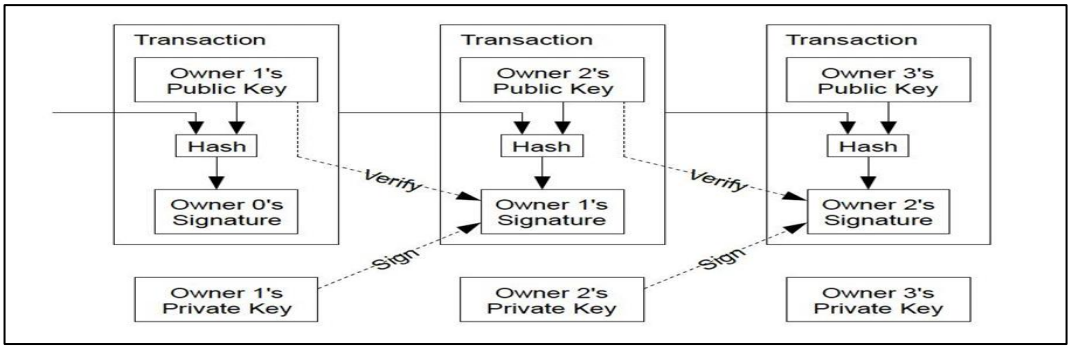
Collective consensus and confirmation mechanism	High energy consumption	Lighter consumption	Lighter consumption
Transaction confirmation time	Long 10m	Short 100 milliseconds	Short 100 milliseconds
Most prominent benefits	Decentralization and no need for any intermediary part to complete the process	Transparency, security, reduced transaction costs and time, and reduced data redundancy	Transparency, security, reduced transaction costs and time, and reduced data redundancy

Source:(فاطمة السبيعي, 2019, p. 06)

3.5 How does blockchain technology work?

The block chain system is based on a data network distributed on all the devices organizing the network without being subject to a central administration that monopolizes data management and storage (قرمية، 2020، صفحة 51). Rather, it is stored on all the devices that make up the network, called nodes, which are supervised by participants or prospectors (MINER), where they verify the information carried by the new block, in addition to verifying its timestamp and date of creation and linking it to the previous block chain after adding the timestamp and digital signature of the new blocks, which is done by consensus and consensus algorithms. This allows distinguishing and defining the new block and its chain from other blocks and chains (الضحوي، 2020، الصفحات 04-07). As shown in Figure (02):

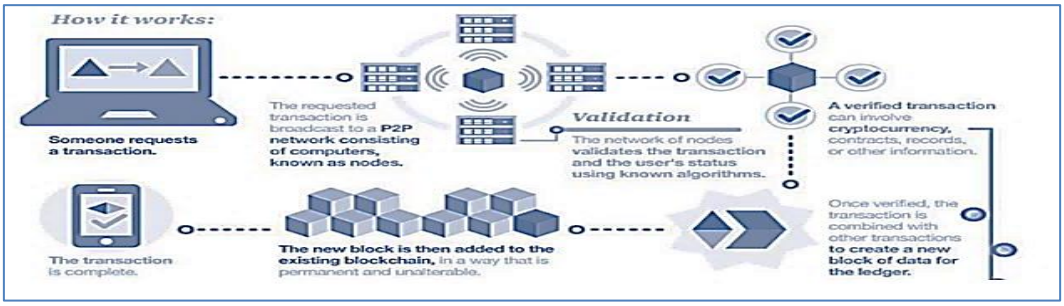
Figure 04: Block cipher in the blockchain



Source:(الشاطر، 2019، صفحة 131)

From the above, the mechanism of block chain technology can be summarized in the following figure (05):

Figure (05): mechanism of blockchain technology



Source:(Thorborg, 2017, p. 04)

When Person A sends money to Person B via the block chain, in the first stage the transaction is encrypted and a block with its own timestamp and signature is created. The contract validates the transaction by solving complex mathematical equations and algorithms, then the validity of the transaction is validated by the network participants according to the algorithms and consensus mechanism on which the block chain is based, so that the new block is added to the previous block chain, and the money reaches the account of Person B to be Then pick it up.

4. Blockchain applications to facilitate the export process

Algeria seeks to improve and promote its exports outside hydrocarbons, and for this reason it has updated legislation related to foreign trade. It has developed commercial registration systems. Various measures have also been taken to support exporters and various economic institutions to penetrate the various global markets, such as reducing customs clearance deadlines and costs, providing financial support and covering part of the expenses of international transportation and expenses of participating in various exhibitions, expenses of establishing a brand and protecting products destined for export abroad(وئام بغياني، 2019، صفحة 24).

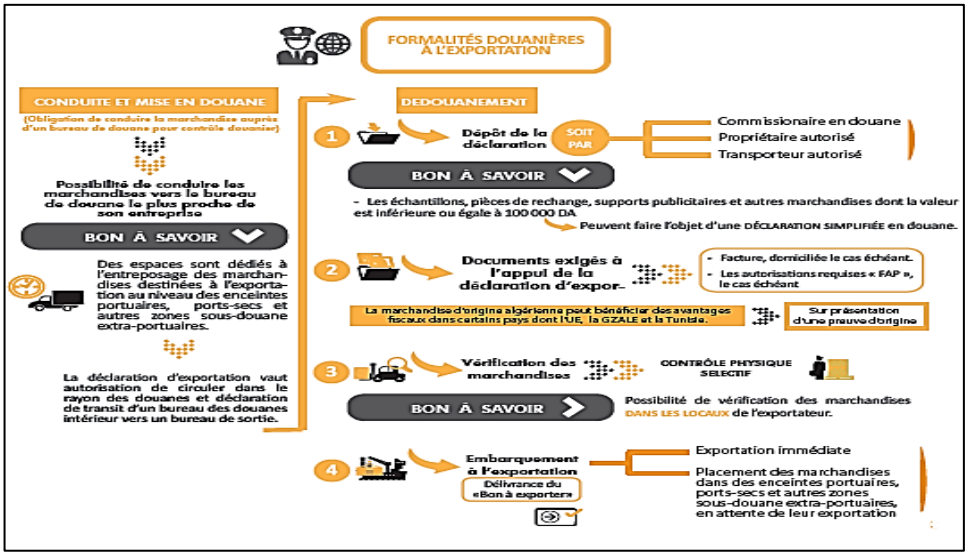
However, foreign trade still suffers from several obstacles, such as bureaucracy, lack of transparency in transactions, and poor coordination between the various bodies concerned with this. In addition to the slow completion of the procedures related to the export process, the large number of procedures and the interventions of the human factor in completing these procedures, and this requires intensifying efforts to solve these problems, as a trend to digitize the import and export processes and procedures and the adoption of various techniques for the conduct of foreign trade operations.

To improve competitive opportunities for Algerian merchandise exports. It is among the prominent and pioneering technologies in facilitating trade finance, improving customs procedures and regulating shipping. And the ability to overcome the aforementioned problems and obstacles is the block chain.

4.1Blockchain applications to facilitate customs procedures

The customs process includes all the rules and regulations related to the movement of goods across national borders and is therefore an integral part of any successful international business transaction. The customs process includes many separate steps that an exporter or importer must clarify to have their goods ready for import or export(Christine McDaniel , Hanna C. Norberg, 2019, p. 10). For example, the customs declaration must be deposited by the agent with the customs, the authorized owner, or the authorized carrier, bringing several documents such as the invoice subject to localization and various required licenses and special administrative procedures, then the goods are subject to selective physical control by customs agents with It is mandatory to bring the goods to the customs offices in order to complete the customs control, after which an export permit is received, so that the goods are shipped and exported or placed in port areas, a dry port, or in any other area under customs control pending their export. The following figure summarizes the customs steps mentioned above that the Algerian exporter takes when exporting his goods(Ministry of Finance, 2021, p. 06).

Figure (06): Algerian customs procedures when exporting goods

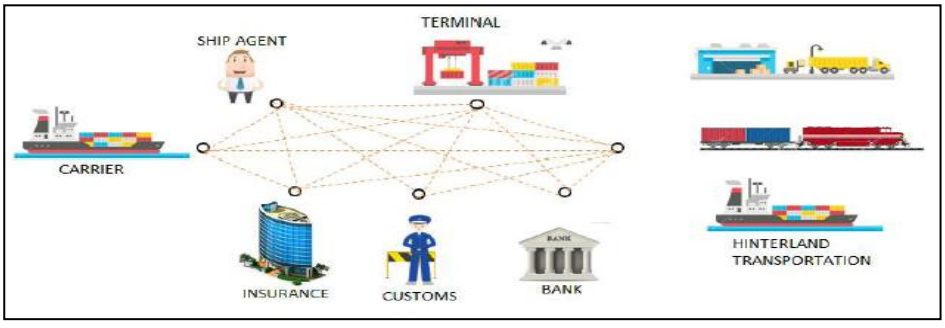


Source:(Ministry of Finance, 2021, p. 06)

But companies often have difficulty navigating the customs process due to its complexity. Procedures in both industrialized and developing countries and Algeria like these are notorious for their shortcomings, which usually result from onerous compliance requirements and costly delays, as a shipping container can spend a significant amount of time waiting for signatures, financing or loading. These delays present real costs to exporters, as these costs represent a huge loss of resources that could have been spent elsewhere in a more productive manner. The World Bank notes that greater corruption is associated with the increased complexity of customs procedures and increased discretion granted to customs officials, with both features prevalent in developing country ports, with the World Customs Organization estimating revenue loss from customs-related corruption at least $2 billion(Christine McDaniel , Hanna C. Norberg, 2019, pp. 12-13).

Therefore, and to improve and promote Algerian exports, we must overcome these obstacles, by adopting various techniques to improve the competitiveness of Algerian exports, such as blockchain technology that will facilitate the implementation of information exchange between the parties involved in the process. This can be achieved by storing the information of the goods on the block chain. Instead of exchanging paper documents between different bodies, the parties involved in the process are given permission to access the block, creating a unique, shared piece of information that can be accessed in real time and with lower transaction costs. This further speeds up the process by including the currently external parties in the process (banks and insurance companies) (Thorborg, 2017, p. 09). As shownin the following figure.

Figure (07): Information exchange between the parties involved in the export process using blockchain technology



Source: (Thorborg, 2017, p. 09)

Incorporating blockchain technology into the customs process allows

to reduce corruption by simplifying procedures and reducing the number of government offices and officials involved in each transaction. Blockchain will allow all parties involved in the export process to monitor and track the container from start to finish, meaning that shipping history will be completely transparent and immutable. For example, after a customs agent checks and verifies the contents of a container, the agent can scan this information and immediately upload it to the blockchain with a private digital fingerprint, allowing all other users to see the transaction. This ensures instant auditability and reduces the time-consuming and research costs of correspondence obtaining the appropriate papers long after they have been filed (or lost).

Although there is no estimate of the economic effects of integrating the blockchain into customs procedures, but if we compare its effects with the effects that will accompany the full implementation of the trade facilitation measures described in the Trade Facilitation Agreement of the World Trade Organization due to the similarity of its effects with the effects of the blockchain. Trade costs may fall by 17.4 percent for lower middle income countries such as Algeria(Christine McDaniel , Hanna C. Norberg, 2019, p. 14).

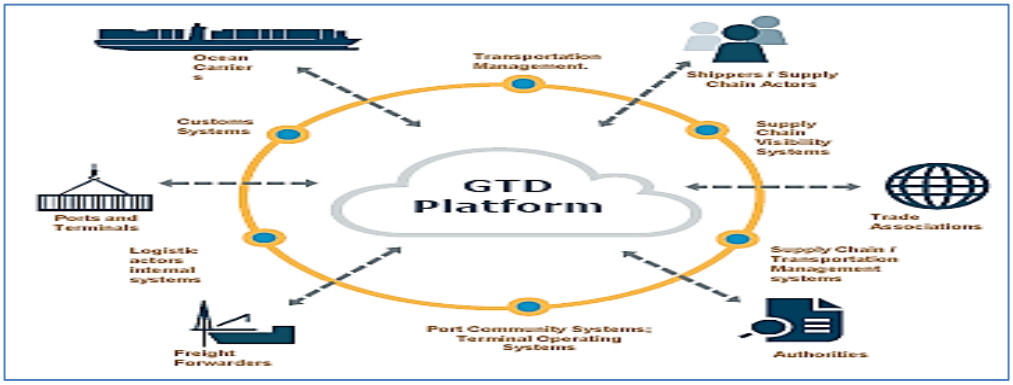
4.2 Blockchain applications to facilitate the shipping and transportation process.

Shipping and transportation is an important element in foreign trade. More than one means of transportation is used. To transport goods and merchandise from the source to the importer's warehouses, the method and method of transport is critical to ensuring the efficiency of trade and shipping, and increasing the competitiveness and cost-effectiveness of exports. At the right time and price (IBM GLOBAL ENTERPRENEUR, 2018, p. 08), but the transport and shipping process is still in many ways Of the countries, including Algeria, depends to a large extent on paper documents. Customs rules that require multiple transfers of information, delaying the shipment of the container and making it wait at different signatures, causes a huge loss to the exporter that could have been spent elsewhere in a more productive manner(Christine McDaniel , Hanna C. Norberg, 2019, p. 10).

Blockchain technology can contribute to reducing challenges faced by the transportation and shipping industry, such as delays in delivery, loss of documents, and unknown source of products. In addition to its ability to facilitate the tracking of orders, receipts, invoices, payments and any other official document, in addition to sharing information about The production

and delivery process between exporters and importers and with various agencies(Hala Nasr abouzid, 2020, p. 01), by fully automating the process through the use of Internet of Things devices (IoT), installing them on containers and linking them to the block chain. This allows information to be recorded automatically on the block chain without any user interaction. Moreover, sensors installed in the container can monitor the condition of the goods and provide information to various agencies (Thorborg, 2017, p. 10). This allows most essential services to be ordered in a small amount of time. (IBM GLOBAL ENTERPRENEUR, 2018)as shown and summarized in Figure (08).

Figure (08): Organizing the transportation and shipping process using the blockchain



Source: (Godbole, 2017, p. 11)

This is what gives an addition to our ports, and gives an added value to the way the export and import process goes by reducing the various administrative costs while providing documents in a timely manner, which gives facilities and incentives to various institutions to carry out the export process and focus on improving their products to penetrate global markets instead of thinking about the administrative obstacles that discourage various Economic operators to carry out the export process, which allows to promote the Algerian export and enhance its competitiveness abroad.

4.3Application of Blockchain in Trade Finance

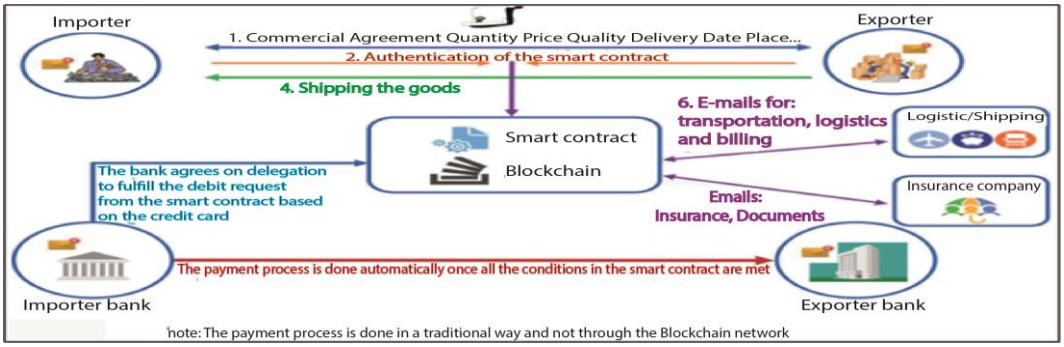
Importers prefer to pay upon receipt of goods in order to check their physical integrity upon arrival. Exporters prefer to be paid as soon as the goods are shipped. For this reason, banks provide various formulas for financing trade and facilitating the transaction on terms that satisfy all parties, such as issuing documentary credits, letter of credit and insurance

of goods. The World Trade Organization estimates that 80 percent of world trade depends on trade financing or credit insurance(Christine McDaniel , Hanna C. Norberg, 2019, p. 07). as the trade finance market itself exceeds $10 trillion annually(Hala Nasr abouzid, 2020, p. 11).

Documentary credit is one of the most important forms used in financing foreign trade in many countries of the world, including Algeria, but it depends on many documents and steps that include sending the same document back and forth for verification purposes in order to obtain the credit, in addition to the financing sector suffers from imbalances Others are financing difficulties for small businesses seeking to export or expand into new markets(Christine McDaniel , Hanna C. Norberg, 2019, p. 07). However, the introduction of blockchain technology into the foreign trade finance sector will provide several advantages to the exporter, importer, banks, and various agencies involved in the trade finance process, such as profiting time, saving resources, improving and increasing the efficiency of financing, and reducing a large part of the manual processing procedures and linking records, which can To be a catalyst and support for the expansion and promotion of the exports of companies participating in foreign trade.

Several financial institutions provided proof of concept or launched foreign trade finance platforms that support blockchain technology (لحلو، 2020، صفحة 37). In 2016, Bank of America, HSBC and the Infocomm Development Authority in Singapore developed a trade finance app, and in 2017, Barclays made a successful blockchain-based trade finance deal in which parties were able to execute a transaction within four hours which usually What takes up to 10 days. The blockchain application will allow exchange of data in real time, recording every action in the workflow in its own block, giving transparency to authorized participants while encrypting confidential data. (Christine McDaniel , Hanna C. Norberg, 2019, pp. 08-09). Where the exporter, the importer, banks and insurance companies will be linked to the smart contracts stored in the block chain, for example, if the smart contract is programmed between the exporter and the importer, on the following condition: If the goods are customs customs, part of the invoice value will be released, in this case the smart contract will Transfer money once it receives confirmation via the blockchain that the Customs Administration has customs customs for the goods(لحلو، 2020، صفحة 36). As shown in the molar figure:

Figure 09: Financing foreign trade through the blockchain



Source:(لحلو، 2020، صفحة 37)

5. CONCLUSION

Simplifying foreign trade procedures is one of the most important factors for promoting exports, motivating exporters to carry out the export process, and expanding their activities. According to the models and examples that we mentioned in the application of the block chain in foreign trade, I show us that this technology has the efficiency and characteristics that can solve the various problems that foreign trade suffers from in Algeria, such as bureaucracy and lack of transparency of transactions. In addition to its efficiency in simplifying customs procedures, facilitating the financing process and automating the shipping and transportation process. This may help and contribute to the promotion and growth of Algerian exports, enhance their competitiveness, and help exporters penetrate fabricated global markets, which contributes to promoting economic growth and achieving balance in the balance of payments.

5.1Research results

Through this research paper, we reached a set of results, which we present as follows:

- Hydrocarbons is one of the most important commodities that Algeria exports, as it represents more than 90% of the value of exports. For this reason, Algeria seeks to improve and promote its exports outside hydrocarbons. Therefore, it has reduced customs clearance deadlines and costs, and updated legislation related to foreign trade. Providing financial support and taking care of part Among the expenses are international transportation and the expenses of participating in various exhibitions, and commercial registration systems have been developed.

-Foreign trade in Algeria suffers from several problems that hinder companies and economic institutions from carrying out the export process and accessing various global markets, such as bureaucracy, nepotism, lack of transparency in transactions, and poor coordination between the various bodies concerned with this. In addition to the slow completion of the procedures related to the export process, the large number of procedures and the interventions of the human factor in completing these procedures.

- The application of the block chain in the management of customs procedures allows to simplify the procedures, reduce the number of government offices and officials involved in the process, and reduce customs costs. It provides transparency by enabling those involved in the process to monitor and track the container from start to finish. This allows exporters to implement their commitments in a timely manner without any delay, which leads to increasing and improving the competitiveness of Algerian exports.

-Shipping delays cause heavy losses to exporters, due to complicated procedures and many documents. Which makes the exporter lose part of his financial resources and time to complete the process of shipping his goods, instead of focusing on improving products, studying various markets and seizing opportunities.

-Incorporating blockchain technology into the shipping process allows automating the process using smart contracts and installing IoT devices and connecting them to the blockchain. This allows the regulators in the foreign trade process to track and verify the steps of the shipping process while obtaining the necessary information at the same moment. Which facilitates and simplifies the shipping process for the exporter, which makes him focus on studying the various markets and consumer needs, and motivates him to expand his activity.

5.2 Research proposals

Based on the results obtained, the following suggestions can be made:

-In order to boost exports and increase their volume, the state must fight bureaucracy and nepotism in the foreign trade sector by digitizing the sector.

-The development of Algerian ports is a craving for the development of the logistical side in Algeria, by seeking to create smart ports based on blockchain, smart contracts, and artificial intelligence. This allows expediting the closing of export and import operations in the fastest time.

-Adoption of blockchain technology in the form of an export platform that brings together all bodies and departments concerned with foreign trade, with the opening of accounts for each exporter that allows him to track and verify the steps of the shipment process while obtaining the necessary information at the same moment.

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