**Blockchain management tracking system at Gezairi Shipping Company**

**Presented by**

**Mustafa Mohammed Mustafa Alsayes**

**Abstract:**

This study aimed to identify the blockchain management tracking system, The descriptive method was used to explain the blockchain management tracking system, its concept, types and forms, and to clarify its mechanism of action, and the inductive approach in tracking the reality of block chain technology to determine the extent of its success and use in Al- Gezairi Shipping Company. The study reached the most important results:

1. The study found that all documents of shipping containers were converted and placed on the block chain, which enables the tracking of containers, and in understanding where each particular container is located in a record without consensus of others.
2. The study showed that the supply management system relies on the blockchain technology to follow up its activity in marine logistics services and track goods from the moment they are produced until they reach the final consumer.

From the results of the current study, the study recommends the following:

1. Creating a blockchain management tracking system for the continuity of businesses in a rapidly changing business environment.
2. Implementation of a blockchain tracking management system for supply chain management in carriers to create a more transparent and reliable system.

**Keywords: Blockchain - Tracking System – Al- Gezairi Shipping Company.**

**Introduction:**

The wide spread of technology and communications, especially the Internet, has enabled the global business community to develop the commercial sector, as this technology has provided many advantages such as providing all goods on electronic platforms, and in providing detailed information about the offered goods and products, so the business environment has become a competitive environment from Before the owners of companies to reach the satisfaction of their customers and their satisfaction by tracking their feedback.

The concept of block chain technology appeared in 2008. The block chain is the transaction records of the block. Each block contains an encrypted token containing the history of the previous block's transactions, and a group of multiple blocks linked together in the block chain is called a "Blockchain". So using blockchain technology can allow consumers and businesses to track transactions from start to finish, without the need to consult a central authority tasked with maintaining the transaction or encrypting the data. It thus provides transparency into what happens in transactions and makes them more secure.

Block chain technology accelerates the export and import of goods, processing and tracking many different information for containers and their shipments, invoice prices, production dates, etc., and the adoption of electronic copies of documents and bills of lading, and this in turn reduces complications and reduces shipping costs and paperwork, in addition to increasing security rates Transparency and protection against counterfeit goods and price gouging (Pinto, & Ferreira, 2018).

**Research Problem**

The problem of the study is through finding a tracking system for managing the block chain, as it is a process that prevents cases of fraud, fraud, corruption and errors in the database, and the possibility of producing such a database is shared and reliable in the logistics sector, the transport sector in companies is based on the use of paper documents and records The physical processing of various transactions, which leads to fraud and loss of records, which leads to delays, the tracking system of the block chain can be a safe and transparent way to fix and control transactions in the company

**Research Question:**

From the research problem emerge the following questions:

1. What is the impact of the block chain management tracking system on Al GezairiShipping Company?
2. What are the problems facing the block chain management tracking system and ways to address them in Al- GezairiShipping Company?
3. What is the reality of using the block chain management tracking system and what are the challenges facing Al- Gezairi Shipping Company?

**Research Importance:**

The importance of the study shows from the importance of the system followed in tracking block chain management in companies because of its great importance and benefit to the company and limit errors, and the importance of tracking increases the accuracy of information related to the shipping process, and the importance of the block chain management tracking system is that it increases From the accuracy and safety of shipping information and the risks related to the tracking process in the block chain leads to operational efficiency.

**Research Objectives:**

Research objectives derive from research problems, these objectives include the follow:

1. Identify the importance of using the block chain management tracking system in companies, explaining its mechanism of work, and stating its advantages and disadvantages in its application.
2. Identify the problems facing the implementation of the blockchain management tracking system in the transportation sector.
3. Identify the potential challenges of adopting a blockchain management tracking system for the transportation sector.

**Study procedures**

The descriptive method was used to explain the block chain management tracking system, its concept, types and forms, and to clarify its mechanism of action, and the inductive approach in tracking the reality of block chain technology to determine the extent of its success and use in Al- Gezairi Shipping Company.

**previous studies**

Siham & Dovi (2020) study titled **Technology Blockchain Using Services Commercial The Developing**.

The blockchain is the largest distributed and open digital record, allows the transfer of the original ownership from one party to another at the real time without the need for any party. Blockchain technologies are developing many industries with better transparency, high security, and low transaction costs, especially in the commercial sector. This paper is presented through an analytical study of the blockchain and highlighting its advantages and multiple uses in commercial transactions and the most challenges facing the adoption technology in the sector. We concluded the extent of the great importance of the blockchain in facilitating and developing commercial operations through a mechanism of trust and cooperation between consumers and exploring the behavior of commercial dealers, which is stored in their data file within the chain. It also eliminates the central role of major companies in controlling and setting restrictions, and in developing and expanding trade.

Kanga., et al, (2020) study titled **Management and Monitoring of Blockchain Systems**.

Blockchain technology is based a decentralized model, in which pairs collaborate and build trust on a corporate or public network. Each peer organization can be represented by one or more nodes and this network of nodes is used to broadcast transactions and reach consensus for each transaction submitted. Secure data encryption and new transactions linked to previous ones make it nearly impossible to edit old records without having to edit subsequent ones. On the other hand, controlling more than half of the nodes in the network could allow blockchain data corruption. However, adding a layer of oversight of each blockchain node and the entire blockchain network could ensure truly decentralized and robust operations.

# Varada., et al, (2021) study titled Blockchain-Based Government Project Fund Tracking and Management System.

# Aross the globe, governments are testing blockchain in various administrative processes including public relations. Blockchain technology provides a secure platform and ensures data integrity. And its applications are resistant to breakdown and are secured using cryptography; hence, it can be used for government applications. Hyperledger fabric is one of the prominent open-source framework of blockchain which is used to develop a "permissioned" network system. When various project funds are issued by the government, often a large amount is unutilized for the actual project, due to corruption. It is necessary to leverage the hyperledger fabric for the formation of a network which allows efficient fund distribution systems resulting in a better society. In this paper, we explored adding permissioned support of hyperledger fabric to government fund distribution system.

# Montaser, et al., (2021) study title. Secured Tracking and Tracing System Based on Blockchain Technology.

# Tracking and tracing management is a system which require recording of product's related information associated with product movement, shipping, transition between location until the product reach its final destination. In this management, traceability is a critical element to be satisfied by the business processes. Tracking and tracing of product is important for many purposes from the time product start its order process, prepared, shipping, movement from one delivery stakeholder to other delivery stakeholder until the product reach its destination. This is where we found the effectiveness of technology that is called the blockchain that could increase the safety of all tracking management processes. The blockchain technology since it emerges has contributed to many wide ranges of applications from various fields where safety and trust are critical in the field business process. Through this research, we are willing to present the contribution which can be offered by blockchain that obviously can increase the safety such like other tracking technology such as the use of QR-code, RFID, man-to-man delivery and few others.

# Harsha, et.al, (2021). Blockchain and IoT based Vehicle Tracking System for Industry 4.0 Applications.

# Vehicle automation is one of the main applications of industry 4.0 especially for tourism companies who provide their vehicles to migrants for traveling purposes. It is difficult to maintain trust among the travel agency and the customers. Although there are many existing solutions in the research that addresses the trust issues, but most of the solutions are based on centralized architecture such as cloud computing where the data is prone to various security threats. Motivated by the aforementioned discussion, the authors have proposed a vehicle tracking system based on the integration of blockchain and IoT in this paper. The proposed system will increase the trust among the entities by providing them transparency in tracking details of the vehicle. As the trip details are immutable and decentralized in nature, so, blockchain is used to store the details. Also, the system will generate the trip summary that contains the route detail, the number of kilometers travelled and the total cost of the trip. Tools such as Ethereum, Remix IDE, Meta Mask, and Rinke By have been used to measure the performance of the system.

**Blockchain technology**

Blockchain technology has been used in the crypto exchange in digital currency (Sammali, et al, 2017), there is no agreement on the definition of block chain technology, and the block chain is defined as a distributed digital ledger that records transactions in an encrypted form in the form of blocks, and after the transactions are authorized between the participants who release It has nodes, you can see the transactions but you can't delete or change it (Pradhan, 2018).

Block chains are defined as impenetrable records consisting of distributed data that have the ability to manage an ever-increasing list of records called blocks containing a block on the timestamp with a link to a previous block you cannot modify these blocks (Shehab and Demirdash, 2018).

**Importance of blockchain**

The importance of the block chain is that it achieves greater corporate values, solves problems, maintains records consistency, increases coordination among stakeholders, and increases information sharing, which speeds up operations and thus reduces the time required for the supply process (George. et., al, 2019), as the more difficult it becomes in Making modifications to the previous blocks, which in turn leads to a higher level of trust among users.

The block chain can reduce errors in the event of data entry and verification, and this data is immutable as fraud attempts are easily detected, which creates a kind of trust between users and develops relationships with suppliers and also works to track any error or problem that occurred within the chain Blockchain technology improves productivity by replacing traditional standard contracts with smart contracts (Mann, et. at., 2018).

**Benefits of a blockchain application**

There are many benefits and benefits of blockchain implementation:

* Blockchain technology relies on a highly secure encryption feature, which makes it difficult for anyone to change any information, to access any block, you must access all blocks (Min, 2018).
* Blockchain follows commodity sources, history and quality (Felin, Lakhani, 2018).
* There is no need a third party to complete or certify operations, but the process is visible to create trust between parties (Hackius, Petersoen, 2017).
* Blockchain technology, a great capacity to significantly enhance and facilitate supply chain operations (Blossey, et.al, 2019).

**Advantages of blockchain technology**

1. Record each transaction in the decentralized books of accounts.
2. Significantly reduces financial fraud.
3. Transparency and disclosure.
4. Efficiency.
5. Intangible technological benefits (clearly defined processes).
6. Undertaking complex operations.

**Blockchain System Elements**

* Mass: The Chain Building Unit is a set of processes and tasks to be performed or carried out.
* Information: means the sub-process within a single block.
* Hash: It is the distinctive DNA of the block chain, sometimes symbolized by "digital signature."
* Silently time: the time when any operation was performed within the chain.

**blockchain System**

The reliance of the block chain on recording and recording data serially, and this prevents any tampering with the original input, that encrypted data can be accessed and shared by anyone who has the access code, as transactions are compiled and updated at short intervals of time (Joanna, 2017).

**Types of Blockchain:**

First: a public network: It works on the type to provide an open platform for everyone to use this network, and there are no restrictions for any member of it, and it gives everyone the authority to deal and be informed of the transactions that take place any time.

Second: A private network: These networks are used within certain boundaries, such as settling financial transactions in institutions. The network is prepared to facilitate the sharing and exchange of private data and information between a certain group of members in the institution, as the encryption and control operations are subject to a specific party such as a specific individual or organization. Applications for this category include databases, in company.

Third: Alliance: This type is a combination of the private and the audible. This type of network is used by a group of joint institutions in one interest, and examples of this network are financial settlements that use Ripple and Eris (Antonopoulos, 2014).

**Blockchain Dimensions**

The blockchain is represented by several dimensions (decentralization, transparency, and traceability), and each of these dimensions can be described as follows:

**First: Decentralization:**

It is defined as a system in which no central or specific party controls the processing of data related to the joint work among many devices on the network (treiblmaier, 2018) and there is no single entity that can control the system within the chain, so anyone can Joining it, and that decentralization is an important feature of block chain technology, and it verifies that there are no errors in the information, and this in turn increases the validity of the information. The removal of collectively preserved records is not possible, and it can be said with confidence that thanks to decentralization and open systems, anyone can join them. (Crosby, et al., 2016).

**Second: Transparency:**

It works to provide readily available information to users and companies in the supply chain. Transparency has been known with an alias, where all blocks are able to see all transactions as they are more transparent (Jansson, Peterson, 2017).

Transparency in the block chain can improve transparency in the supply chain through the block chain that anyone can see, and it can be concluded that the block chain prevents the creation of barriers between the parties to the chain and this in turn allows easy access to information and leads to increased coordination between stakeholders in the participation of the information (Min, 2018).

**Third: Traceability:**

Blockchain can easily find any problem and trace events within the chain that occurred, whether intentionally or accidentally, and traceability is an increasingly urgent requirement and a basic characteristic in many supply chain industries (Costa, 2018).

**Conceptual Framework for the Blockchain-based Tracking Process**

With the evolution of global supply chains, researchers have described the major players in supply chains and their functions in the previous literature. Figure 1 illustrates a typical supply chain process presenting the flow of information, goods, and money (Min, 2018). For further insight into the interactions among supply chain participants, a simplified model explaining the functions of players with similar attributes is needed. Supply chain tracking formulates the backbone of the entire mechanism and represents the business logic behind each business process.

As a matter of fact, the current mechanism utilizes the pull system for the purpose of tracking. However, this method reduces transparency among supply chain participants. Data exchanges between multiple selfowned databases are often time consuming and expensive. A near real-time tracking system seems unavailable due to the business frictions that exist in each hand-off, while quick logistic status updates are difficult without manual queries and timely data updates. Prior research found that one third of business leaders would not trust the information they use to make decisions and large volumes of data sets were often required to identify useful underlying patterns from data-oriented activities in order to make efficient and effective business decisions (Acharya et al., 2018). Actually, from a managerial perspective, decision support along with the consecutive monitoring of process flow becomes difficult. For example, cash backlogs are created when inflexibility becomes an issue due to untimely delivery, which results in the inevitable loss of efficiency and potential profits.

**Are other industries using blockchain technology?**

A number of industries are already using a blockchain to assist them with the creation, management and record-keeping of data. Use cases include:

**Property** – to process property transactions and registers of ownership

**Health** – as a viable method of managing patient records

**Business** – as a means to manage supply chain information

**Legal** – to create, execute and maintain legal documentation and contracts

**Intellectual property** – to track intellectual property rights and registers of ownership

**Insurance** – to make applications and claims more efficient

**Finance** – to record financial transactions

**Cryptocurrency and NFTs** – cryptocurrencies use blockchain technology to keep a record of transactions of the particular currency and blockchain is used as an easy way to verify ownership of non-fungible tokens (NFTs)

**Can blockchain be applied in the shipping industry?**

The shipment of goods by sea requires the input and co-operation of a number of organizations and people (the shipper, ports, logistics, authorities, rail, carrier, and consignee to name a few), all of whom are usually in different locations around the world, facing the geographical and language barriers that come with this. In addition, it is well known that the shipping industry relies heavily on a paper-based system. Therefore, can blockchain technology really be applied to the shipping industry (Joanna, 2017).

Well, the short answer is ‘yes’ because it already is.

Since 2018, a number of parties in the container, bulk, oil, and gas industries have all separately been using this technology for the seamless and secure transfer of data between relevant parties. One example of this is the collaboration between IBM and Maersk called Trade Lens.

[Trade Lens](https://www.maersk.com/news/articles/2019/09/20/a-game-changer-for-global-trade) is a blockchain platform that allows for the digital processing of customs documentation between all parties involved at both import and export. The documents are visible to everyone, have guaranteed immutability, privacy and full auditability. The platform supports fast and secure end-to-end supply chain information in a single source, with trusted and cross-organisational workflows. The reported result is better risk assessment with fewer processes and barriers, which has led to lower administrative expenses. Further, the cost of moving physical paper across international borders has been removed completely.

There are innumerable other use cases for blockchain from cargo and logistical tracking to dispute resolution to demurrage claims to automated contracts to… well, many, many more.

**Result and Recommendations**

**First Result:**

The study reached the most important results:

1. The study showed that the use of the blockchain management system in Al- Gezairi Shipping Company from the point of view of the employees that the blockchain has benefits in increasing transparency, quality, accuracy of information, traceability, continuous monitoring and reducing fraud, in addition to using the usual and recognized electronic methods and eliminating any unauthorized manual effort essential.
2. The study found that all documents of shipping containers were converted and placed on the block chain, which enables the tracking of containers, and in understanding where each particular container is located in a record without consensus of others.
3. The study showed that the supply management system relies on the blockchain technology to follow up its activity in marine logistics services and track goods from the moment they are produced until they reach the final consumer.
4. The study showed that the company's tracking management contributed to improving the feasibility of cash flow for buyers and contributed to the exploitation of the resources and competencies in the company.

**Second: Recommendations**

From the results of the current study, the study recommends the following:

1. Creating a blockchain management tracking system for the continuity of businesses in a rapidly changing business environment.
2. Conducting training courses for workers in transport companies to deal with the technology of the block chain tracking system in proportion to their job duties to improve the efficiency of the management of the block chain system, which in turn contributes to improving the performance of the company.
3. Implementation of a blockchain tracking management system for supply chain management in carriers to create a more transparent and reliable system.
4. Preparing future research in the field of blockchain management tracking system for shipping companies.

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