A SURVEY ON BLOCKCHIAN DIRECT DELIVERY OF AGRICULTURAL PRODUCTS FROM FARMER TO CONSUMER AND NON-PROFIT ORGANIZATIONS

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DOI : https://www.doi.org/10.56726/IRJMETS53089

ABSTRACT

The entire blockchain-based supply chain restoration for food and agriculture (agri-food). It utilizes smart contracts and the fundamental elements of blockchain technology, both of which are utilized on blockchain networks. This paper describes how blockchain technology works, how it could be used, how it might affect the state of the current SCM Registry systems, and what legal experts do. Blockchain's widespread adoption is detrimental to government agencies and businesses that are thought to be reliable enough to manage transactions. Therefore, to guarantee distribution methods, confidence, and traceability in the Agri-Food supply chain, a robust system is required. Under the suggested arrangement, every transaction is recorded on the blockchain, which uploads the information to the Interplanetary File Storage System (IPFS). Identifying how blockchain technology might transform the supply chain and logistics sector is the primary goal. The common problems in these fields were taken into the account, and the primary characteristics of blockchain technology that can address these problems were noted. We learned about the potential drawbacks and advantages of blockchain-based applications through the poll. This thesis can enable many firms to collaborate with companies developing blockchain-based solutions, given the existing state of the supply chain and logistics sector.

Keywords: Agricultural Product, Block Chain, Supply Management, NGO, Farmer Etc.

I.   INTRODUCTION

In a real-time environment, managing the food supply chain is an extremely laborious and time-consuming procedure. The blockchain for food supply chain management improves security by storing data safely. As per the smart contract system, it also permits modifications to the whole blockchain. Compared to a blockchain-based food supply chain system, blockchain hash functions provide superior solutions for signature protection. Building control and configuration in particular, secrecy, integrity, availability, and management is the goal of the blockchain networking system. The purpose of this system is to help farmers to sell agricultural products in convenient way and easy to use application for consumers Who are willing to buy it on daily basis.

By using data science technique, we can be able to do. To make farmer consumer relation far better with good estimation value of product as well as fresh direct delivery of product up to certain distance. An open-source platforms, this research suggested creating specialized blockchains. To control food safety and quality, traceability is essential. A crucial component of modern supply chain management is tracking goods and procedures via intricate networks of supply chains.

In block-chain is very difficult to alter a record once it has been added to the chain. Generally speaking, "block-chain technology" refers to the open, trustworthy, publicly viewable ledger that enables safe ownership transfers of valuable units using proof of work and public key encryption. The technology is not centrally controlled by a bank, corporation, or government because it maintains the network through decentralized consensus. Blockchain networking systems are used to create control, configuration, and management. Hierarchical computing facilities are provided by a highly virtualized computing infrastructure known as the distributed computing framework. This study focuses on the applicability of Block chain technology in agriculture-food transaction by Identifying potential Block chain use cases.

This paper consists of the objective of the proposed system, previous research work and architecture of the proposed system which illustrate how to design and developed a system for food supply chain management

using block chain framework. The implementation of custom block chain provides data distribution in peer-to-peer network data security in parallel manner.

Objectives

- To create a custom block-chain supply chain management system for agri-food. By utilizing blockchain technology, the entire process of the agricultural supply chain, from the farmer to the consumer, can be transparent and traceable.

- To create a new mining strategy, smart contract, and hash generation for the suggested block-chain. Implementing a direct delivery system can potentially eliminate intermediaries, reducing overall costs and increasing the profits for both farmers and consumers.

- With the integration of blockchain, the processes involved in the delivery and processing of agricultural products can be streamlined and automated.

II.   RELATED WORK

As per [1] an entire blockchain-based farming and food (Agri-Food) inventory network arrangement It takes utilization of the primary qualities of blockchain and brilliant agreements, and it's undeniably finished on the Ethereum blockchain network. In spite of the fact that blockchain guarantees the unchanging nature of information and records in the organization, it actually misses the mark regarding tackling a few central questions in store network the executives, the reliability of the gatherings in question, exchanging method responsibility, and item discernibility. Thus, a reliable framework that ensures discernibility, trust, and conveyance components in the Agri-Food store network is required.

As per [2] Edgence (EDGe + Knowledge) is proposed to act as a blockchain-empowered edge-registering stage to brilliantly oversee enormous decentralized applications (dApps) in IoT usecases1. To stretch out the scope of blockchain to IoT-based dApps, Edgence embraces ace hub innovation to interface with a shut blockchain-based framework to this present reality. An expert hub contains a full hub of the blockchain and an insurance and is sent on an edge haze of versatile edge figuring, which is helpful for the expert hub to utilize assets of the edge cloud to run IoT dApps.

As per [3] presents HCloud, a believed JointCloud stage for IoT frameworks utilizing server less figuring model. HCloud permits an IoT server to be carried out with various servers less capabilities on various mists in light of a timetable strategy. The strategy is indicated by the client and incorporates the expected functionalities, execution assets, dormancy, cost, etc. HCloud gathers the situation with each cloud and dispatches waiter less capabilities to the most appropriate cloud in view of the timetable arrangement. By utilizing the blockchain innovation, we implement that our framework can neither phony the cloud status nor wrongly dispatches the objective capabilities. As per [4] present the idea of a decentralized gasified help trade stage where the arrangement suppliers can powerfully offer and solicitation administrations in an independent shared style. Cost and choice to trade administrations are set during activity time in view of gasification strategies as per business objectives. The proposed idea depends on blockchain innovation to give a tokenized economy where the IoT arrangement suppliers can execute gasification methods utilizing shrewd agreements to expand benefits during administration offering and mentioning.

As per [5] a signal based secure collaboration framework with savvy home IoT wellbeing gadgets to help older individuals or individuals with exceptional necessities. The structure utilizes a decentralized blockchain agreement for putting away the savvy home IoT wellbeing information and client characters. The system uses off-chain answer for putting away crude sight and sound IoT tactile payload and motion information. Various approved home inhabitants can interface with the IoT-based savvy home observing sensors, do client and IoT wellbeing tangible media enrollment, and move value-based values by means of secure tokens, as well as crude IoT wellbeing information payload through motion.

Brilliant Agreements [6] likewise called crypto contract, it is a PC program utilized for moving/controlling the property or computerized flows in unambiguous gatherings. It doesn't just decide the agreements however may likewise carry out that arrangement/understanding. These shrewd agreements are put away on block-chain and BC is an optimal innovation to store these agreements because of the uncertainty and security. At the point when an exchange is thought of, the savvy contract figures out where the exchange ought to be

moved/returned or since the exchange really occurred. Presently CSIRRO group has proposed another way to deal with incorporate BlockOn IOT with [7]. In its underlying undertaking, he utilizes shrewd home innovation to comprehend how IOT can be hindered. Block wheels are particularly used to give access control framework to Shrewd Gadgets Exchanges situated on Brilliant Home. Presenting BC innovation in IOT, this search again gives some extra security highlights; nonetheless, every standard BC innovation should have an idea that does exclude the idea of thorough calculations.

As indicated by Huehuangenet. Al [8] they offer a blockchain and a MedRec-based approach by empowering encryption and quality-based verification to empower secure sharing of medical services information. As indicated by VipulGoyalet. Al [9] grows new cryptosystems to share encoded information appropriately, which we call key-approach trait-based encryption (KPABE). In our cryptosystem, Cyphertext is marked with a bunch of properties and controls that it associates with private key access designs that a client can decode the encryption. We show the utility of our item to share review log data and broadcast encryption. Our creation upholds private key suppliers, which buy into ordered recognizable proof-based encryption (HIBE).

As per SarmadullahKhanet [10] implanted power exchanges in blockchain depend on their characterized attributes through the mark of numerous producers. These marks have been confirmed and clients are happy with the elements that open no data that meet those highlights. People in general and confidential key makers have been made for these clients and utilizing this key guarantees that the help cycle is approved by clients.

As per Khalil Ur Rehman[11], The combination of Blockchain technology with the Internet of Things makes tracking the Supply Chain of Agricultural products easy. Blockchain technology in agriculture is recognized as a ledger of all financial transactions and information required and shared by the farmers for customers at all levels. This provides a better platform for crop management records; global health and environmental problems exist in agricultural production.Blockchain technology based on the Internet of Things (IoT), like cameras and sensors, records immediate change and auto updates each step of crop production from seed type, seed sowing, chemical type/quantity applied till harvesting Studies observed that developing countries still rely on traditional farming practices, which need more step-by-step data records from sowing to selling agricultural product.[12]The conventional agricultural food supply systems have are numerous actors in the supply chain, and communication between them is inconvenient, resulting in a lengthy supply chain cycle. Then, because of the many participants with their dispersion across several networks, information exchange is inadequate, with no data trust. Finally, the agricultural food supply chain is a centralized system with authority concentrated in the hands of the central management, and data can be easily manipulated.

Gap Analysis:

Paper Title	Year	Distributed DB Environment	Supply-Chain Management	Scalability	NGO	Block-chain	Reliability and Transparency	Traceability	Security	SCM + NGO
Blockchain-enabled smart agriculture: Enhancing data-driven decision making and ensuring food security	2023	✓		✓		✓	✓	✓	✓	
A blockchain-enabled security framework for smart agriculture	2023	✓		✓		✓	✓	✓	✓	
Blockchain technology in the supply chain: An integrated theoretical perspective of organizational adoption	2022	✓	✓	✓		✓	✓	✓		

	Year									
A Systematic Review on Supply Chain Risk Management.	2022		✓							
Blockchain in Service of NGOs and Charities	2022	✓		✓	✓	✓	✓	✓	✓	
Blockchain for sustainable e-agriculture	2021	✓		✓		✓	✓		✓	
"Blockchain-based agri-food supply chain: A complete solution."	2020	✓	✓	✓		✓		✓		
A blockchain-enabled edge-computing platform for intelligent IoT-based dApps	2020	✓		✓		✓	✓	✓		
HCloud: A trusted Joint Cloud serverless platform for IoT systems with blockchain	2020	✓		✓		✓	✓		✓	
Service exchange platform on blockchain for IoT business agility	2020	✓	✓			✓		✓		
Proposed System	2024	✓	✓	✓	✓	✓	✓	✓	✓	✓

III. EXPERIMENTAL METHOD/PROCEDURE/DESIGN

The proposed system implements a system that would aid in the selling and buying of agricultural products with good cost estimation and safety aspects in mind, as well as good quality processed food for the needy, using the necessary hardware and software to benefit farmers, consumers, government employees, and non-governmental organ.

The system contains the following modules:

Supply (Farmer)- A farmer is the first entity in the agri-food supply chain, the first one to invoke a smart contract for trading .

User's Group (Consumer): The maintains warehouse by(processing, storing & managing)supply of goods from producers & certification of various product standards & authentication regarding quality.

NGO: NGO- To purchase consumer-products and to collect leftover food from different places.

The Blockchain is the distributed ledger used to represent the current state of delegated access rights in the system. Permissions to interact with the Blockchain are handled by the Root Authority and the Attribute Authorities. Make transaction, Block Generation and blockchain validation, Consensus Algorithm validation and block chain recovery and Results Generation. This system highlights the implementation of e-transaction system using blockchain for such a proposal from a practical point view in both development/deployment and usage contexts. Concluding this work is a potential roadmap for blockchain technology to be able to support complex applications. In the system carried out transaction system for online user, where end user easily access the system and make the transaction without using any third party validation. The system can't be generating any high-level hardware configuration requirement, it possible to make vote using traditional configuration. The system is able to perform the transaction without any hardware device with drastic security manner.

In this data is processed in multiple servers so the transactions are processed in sequencing P2P distributed network. This illuminates the quality-of-service issue and time limits.

This is a middleware system in which the processing environment in which the load will be balanced using threads. The request generated will be parallels saved on all nodes in a Blockchain manner. We use the Hash generation algorithm, and the Hash will be generated for the given string. Before executing any transaction, we use peer to peer verification to validate the data. If any chain is invalid, then it will recover or update the current server blockchain. This will validate till all nodes are verified and commit the query. Mining algorithm is used for checking the hash generated for the query till the valid hash is generated.
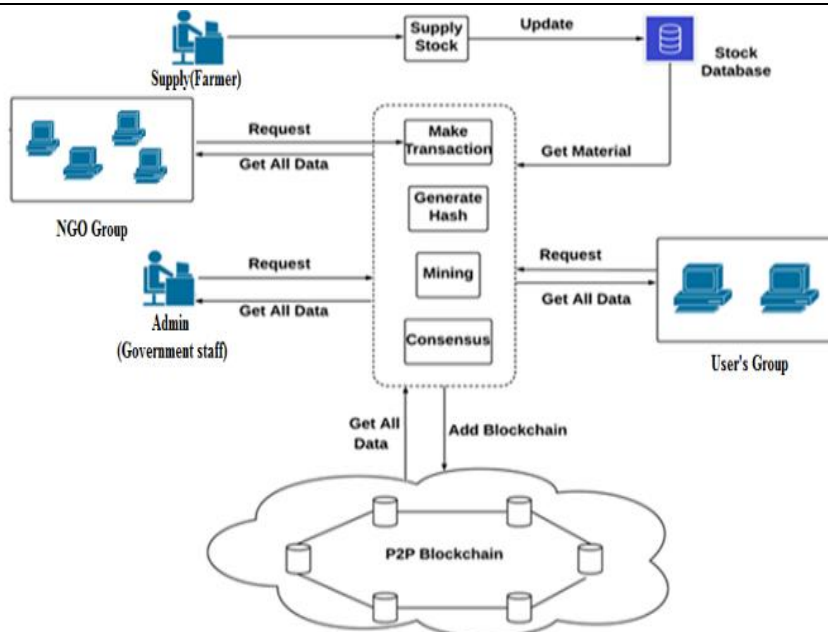
Figure 1: Architecture of System

Advantages:

- Increased communication between producer-farmer and consumer -NGO

- Improved negotiating positions for the farmers

- Increases transparency in dealings.

- In blockchain-based agricultural product from farmer to consumer and NGO, supply chain tracking system is developed to maintain high transparency and traceability.

- The proposed system also protects data privacy across all parties along with sharing information in a trusted way.

- Real-time information reduces the chances of food waste globally.

Below is the sequence diagram of the proposed system, which consists of Supplier, User, DB Admin and NGO as the entities. They communicate with other for making the transactions which are stored using by generating the hash value, data mining and then update the blockchain for end-to-end security.
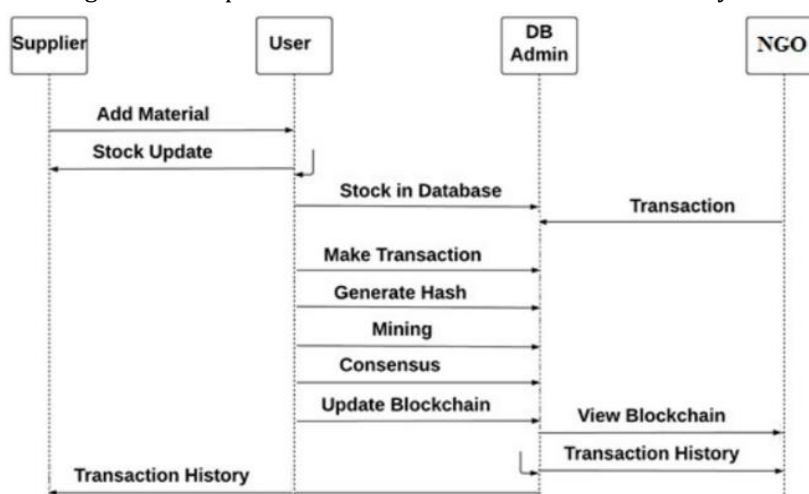

Figure 2: Sequence Daigram

IV.   CONCLUSION

We're establishing up an online system that uses blockchain technology to directly deliver agricultural products from farmer to consumer and to non-profit organizations. It facilitates safe and accurate cost estimation.

Blockchain technology will secure all data. The size of this industry and the demand for more reliable and efficient information management solutions have led to a number of study recommendations for incorporating blockchain technology into agri-food supply chain transactions.

In this paper, we have introduced a blockchain-based food supply chain system for the agriculture-food industry. The blockchain has gained several benefits to grow and move toward a decentralized, trustable environment. It has many advantages in comparison to traditional food supply chain management. This work included detailed information on the proposed framework in terms of traceability, trading, and delivery. It analysed the smart contracts' performance to ensure that our proposed framework is reliable and secure.

To date, blockchain-based systems still face challenges related to their practical implementation. In future, we plan to integrate refund and return mechanisms in Agri-Food products trading. Similarly, the system stores reviews from end consumers which can be biased or fake. In this regard, we plan to integrate fake review detection system that will facilitate the system in detecting the false reviews from the end consumers. Moreover, security analyses that will focus on attacks against system. Also, we wish to provide further discussions on various aspects of blockchain and explain in detail how current challenges in the proposed system can be resolved in future development of blockchain in agricultural systems. Potentially, our illustration could be further extended to be a much fuller case study, which could then be evaluated via a series of empirical tests.

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