IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

FUTURE OF AGRICULTURE SECTOR: BLOCKCHAIN TECHNOLOGY

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Abstract: Globalized delivery of manufacturing and agricultural production offer renewed attention to the health, efficiency, and validation of many vital criteria in the food and agricultural supply chain. That numbers of food safety and corruption hazards have generated an enormous need of an efficient traceability solutions which acts as an essential quality managements tools ensuring to enough product's safety within the agriculture supply chain. Block chain is the revolutionary technology, which provides the ground breaking result for commodity traceableness in agriculture and in food supply chains. Today's agricultural supplying chains are complicated ecosystems mixing several stakeholders making it difficult to validate several significant requirements mainly towards nation of first origin, crop growth phases, quality standards compliance, and yield monitoring. The paper proposes a strategy that levitates the block chain and conducts business operations effectively across the agricultural supply chain for tracking crop prices and traceability. The proposed framework solution discards the need for trusted centralized authority, intermediaries and offers records of the transactions, improving efficient science and safety with high integrity and reliability. All transactions are registered and then stored in block chain's unchangeable ledger with linkages to a decentralized network, thereby ensuring vary high degree of traceability and transparency in the supply chain ecosystem in a stable, reliable and in efficient manner.

Keywords: Blockchain, Supply, Traceability, Integrity, Transparency, stakeholders.

INTRODUCTION TO BLOCKCHAIN

The rise of Blockchain was such unforeseen that some enthusiasts asserted it as the biggest invention since in the Internet . The blockchain technology create a peer-to-peer form of electronic cash that did not require a financial institution as an intermediary and would be transferred directly between one party and another.

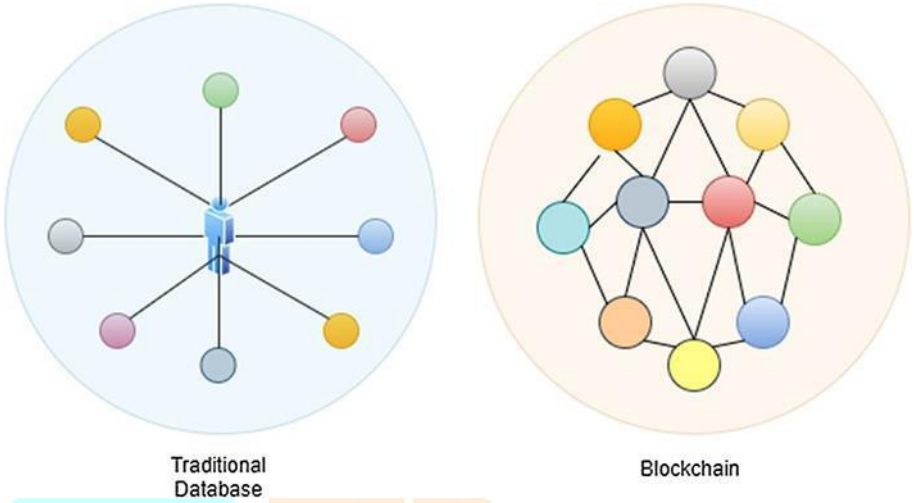

Fig1: Traditional vs Blockchain databases

Blocks: A block resembles a page in a record book . The first block is called the generic block. A block comprises a block header and block data where the block header consists of the history of the blockchain and miners perform hashing to validate the block, and block data keeps the record of recent transactions that are yet to enter the blocks.

A blockchain is a ledger in which agents take turns recording information on the process of generating, transacting and consuming a product or service. The ledger is collectively managed by all participating parties typically through a peer-to-peer network. A new record must be verified by the network before adding it to the blockchain. Any alteration to the recorded data should follow consensus decision making protocol, meaning the majority of the parties involved should agree. In addition, an alteration to one record will lead to the alteration of all its subsequent records. It is, therefore, almost impossible to change in data recorded in a blockchain in practice. Blockchain is viewed as “an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way”. Blockchain is a transformative ICT that have the potential to revolutionized how data is used for agriculture. Blockchain creates a faster, more efficient way for businesses to transmit, receive, and track orders using secure data. It is the foundation of cryptocurrency trading and is moving into regulated industries such as banking and auctions.

To ensure product safety, handling the growth of farming products and effective management of logistics - chain in agricultural supply chain is censorious. That cover about food safety and the risk of contamination has renewed the prominence of tracing power across the supply chain Moreover, farming goods exchanged across multiple nations require accurate tracking and compliance with nation-specific regulations Tracing of goods in the agricultural field requires to gather, communicate and maintain critical data by specifically identifying the source, multiple data exchanges in the logistic network. High-spirited nature of data in the agricultural / food supply chain where products are manufactured, processed and sent through multiple

intermediaries allows tracking and tracing difficult. Contamination of products and its public health consequences highlight traceability as the required policy instrument for tracking food quality and safety. The present traceability practice in the supply chain of agriculture is mainly affected by data fragmentation and centralized controls that are susceptible to both information modification and management. In case of contamination that identifies the source and isolates the product quickly from the supply chain. Today's supply chain is becoming really complex

[1]. At various stage multiple stakeholder are present. All these Stakeholder need to collaborate with each other in various direction for efficient and effective management. To deal with food scares and accidents, the food industry becoming more customer-oriented and need quicker response time. Good traceability mechanisms help reduce the manufacture and sale of dangerous or low quality goods, mitigating the risk for false ads, liability and recalls. Reducing the impacts of food safety

[2]. Improving food safety, and providing a means to verify food quality attribute are driving the development of traceability initiatives in agri-food system

[3]. The United Nation Food and Agriculture Organization (FAO) and the International Telecommunications Union (ITU) are continuing to work together to facilitate the use of innovation Information and communication technologies (ICTs) in agriculture

[4]. The importance of traceability has significantly increased with the globalization of the food industries. Therefore, the need for a reliable identification and tracking system is necessary to ensure the quality and safety of food which reaches the consumer

[5]. Block chain for Supply Chain is a natural fusion of two technologies, built for mutual or common ledge transactions. A supply chain often reflects a distribution of products through industries, and is also cross-border. Food provenance is one pf FSC’s most difficult issue. This issue companies are facing today.

A global supply chain network with asymmetric food regulation and multiple operating procedure between various countries makes end-to-end food tracking incidental to the food industry. Distributed ledger/Block chain is very important technology that can significantly impact the supply chain management. This paper shows the possibility of block chain technology using supply chain for both perishable product and manufacturing. In food supply chain firms are rapidly adopting block chain system. Example for retailers such as Carrefour indicates that block chain can be used to provide access to rich and details information about food product, which is used to reduce the uncertainty about quality and ingredient. Food safety has been an enormous concern in china over the last few years. As conventional agri-food logistic practices can no longer satisfy consumer demands, developing a traceability framework for agri-food supply is becoming increasingly urgent.

PROPOSED SYSTEM

Existing Method:

There is no computerized system in place to trace the cost of agriculture. Agricultural products cannot be obtained by the farmer.72 percent of the population in India is dependent on the farming industry. Farmers get enormous quantities of crop manufacturing, but they have not got the correct price because they can survive the present circumstances. So they are suicide and nothing is done by the government. So we are

attempting to fix this issue in the suggested scheme by tracing the cost of the agricultural product from farmer to client.

Disadvantages:

- High complexity.
- Low Computation.

Proposed System:

In proposed system we are using a Block chain helps which helps in maintaining the integrity and transparency of the whole process right from inception of crop details. Blockchain helps in managing and tracing the crop information transparent distribution.

ADVANTAGES

- Customer can get appropriate price of the product.
- Farmer can get the FRP price for his product or crop.
- Government can trace the price of the crop and control the corruption between brokers.

METHODOLOGY AND ALGORITHMS:

Block chain is a distributed database containing all networked transactions. Each part of this database is a "block" As transaction state shifts, a block with a connection to the previous block is added to the block chain in a linear and sequential order. Then the new block is replicated over the network, so that each node has the same block chain. Each participant in this transaction has a copy of a block chain on it. Therefore, any participant can validate a particular transaction. This approach removed the need for the centralized, trusted confirmation of transactions by third parties .Block chain technology has a wide variety of uses, and tremendous innovation potential. Therefore, business leaders will use this technology to explore the range of opportunities open to their company and their industry.

Algorithm:

As we know hash is not "encryption", we cannot decrypt it back to the original text. Hash is a cryptographic one-way feature, and it is a fixed size for any source text size so This makes it convenient to compare "hashed" versions of texts when necessary, as opposed to decrypting the text to get the original version. SHA-256 is one of the SHA-1 (collectively referred to as SHA-2) successor hash functions, and is one of the strongest hash functions available. SHA-256 is not any more difficult to code than SHA-1, and has not been in any way compromised yet. The 256-bit key makes AES an excellent partner-function. It is specified in the standard 'FIPS 180-4' of the NIST (National Institute of Standards and Technology). Message Digest: The Java Message Digest class represents a cryptographic hash function that is capable of computing a digest message from binary data. After receiving any encrypted data, you cannot see from the data itself if it was altered during transport. A digest message will help to ease this issue. To detect if the encrypted data has been changed in transportation, the transmitter will measure a digest message from the data and send it along with the data.

Upon receiving the encrypted data and digesting the message, you can recalculate the digest message from the data and check if the measured digest message matches the digest received with the data. If the two digests correspond

Implementation:

In this project there is four modules

1. Farmer
2. Dealer
3. Sub-dealer
4. Customer

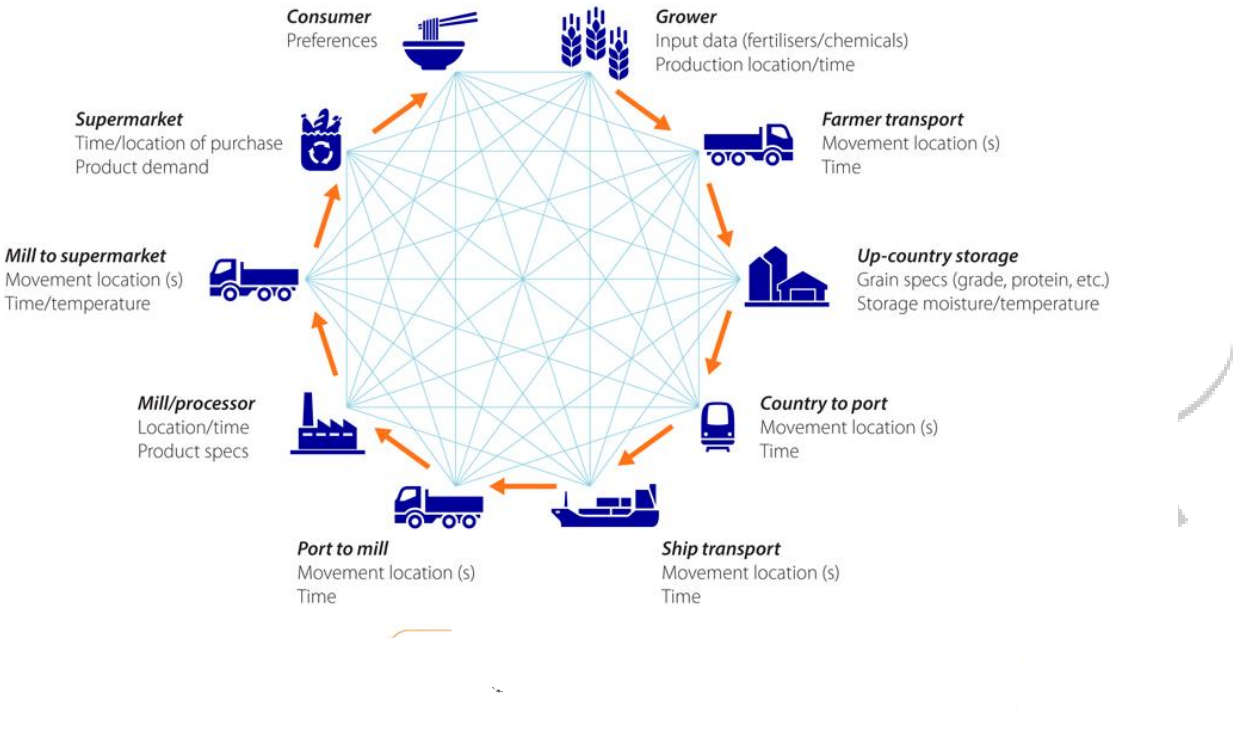

Fig2: Working process of blockchain in farming

Farmer:

Farmer is first block of the block chain which contain the farmer details like name, address, mobile no, crop name, crop selling price(FR). All details are added into smart contract and smart contract generate the hash code using sha256 algorithm. Then block chain mine the block and added to block chain network.

Dealer:

Dealer contain the login registration which can hold the crop price details which are fix by the government and particular organization. the block chain is immutable so no one can change the crop price and farmer's details. So dealer is contain his own data and previous hash code of the farmer.

Sub-Dealer:

Sub-dealer can buy product from the dealer which is fix price and the price is determine by the government. And sub dealer cannot increase the price of the product. Because block chain contains immutable so each and every time data change block can generate different hash code.

Customer:

Customer is last entity of the block chain which are purchase the product. He does not know the exact price of the product so we can give authenticate permission to check the price of the product from farmer to customer. so customer can get the all chain details and price details.

Performance analasis:

This project helps to farmer to get more profit without interference of middleman when buying and selling of the products. And also the customers can buy the products directly from the farmer. So, both the customer and farmer get benefits with this.

Conclusion:

This paper proposes a novel EHRs sharing scheme enabled by mobile cloud computing and blockchain. We identify critical challenges of current EHRs sharing systems and propose efficient solutions to address these issues through a real prototype implementation. In this work, our focus is on designing a trustworthy access control mechanism based on a single smart contract to manage user access for ensuring efficient and secure EHRs sharing. To investigate the performance of the proposed approach, we deploy an Ethereum blockchain on the Amazon cloud, where medical entities can interact with the EHRs sharing system via a developed mobile Android application. We also integrate the peer-to-peer IPFS storage system with blockchain to achieve a decentralized data storage and data sharing. The implementation results show that our framework can allow medical users to share medical data over mobile cloud environments in a reliable and quick manner, in comparison to conventional schemes. In particular, our access control can identify and prevent effectively unauthorized access to the e-health system, aiming for achieving a desired level of patient privacy and network security. We also provide security analysis and extensive evaluations on various technical aspects of the proposed system, showing advantages of our proposal over existing solutions. Based on the merits of our model, we believe that our blockchain enabled solution is a step towards efficient management of e-health records on mobile clouds, which is promising in many healthcare applications.

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