ISSN No. 0976-5697

VOLUME 12 SPECIAL ISSUE 2, JUNE 2021

International Journal of Advanced Research in Computer Science

RESEARCH PAPER

Available Online at www.ijarcs.info

BLOCK CHAIN TECHNOLOGY USING FOOD SUPPLY CHAIN MANAGEMENT

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Abstract—Agriculture is the primary source of livelihood for about 58 percent of India population. Food supply chain its very complicated by fragmented inbound and outbound networks[9]. It consists of multiple agents or intermediaries inthe marketing channel to realize a profit and successfully pass on the losses to the producer[3]. Food producers are facing multiple obstacles, from seasonal changes to the broken supply chain also their occupation is very laborious and demanding[3]. Most of the losses produced here are due to missing formation, miscommunication and lack of trust between the different intermediaries[3]. Especially the Indian food supply chain is highly dividable.main it helps formers to sell their products with a valuable profit so people will never loose their trust on agriculture .so that it helps whole world to get their foods and whatever they need they can buy. Former is happy then he feeds whole world. This all is possible only because of using block chain technology.The proposed system uses blockchain technology which facilitates the transfer of data or useful information and transparent manner pertaining to food supply management. This system ensures trust and brings transparency across various stakeholders.

Keywords- Blockchain, Supply Chain Management, Smart Contract

I. INTRODUCTION

The food supply Chain Management is a group of agents and sub agents it carried out for transforming foo material into a final step, maximizing customer value and achieving a maintainable competitive advantage [1]. Block chain is a database system that maintains and records data in a way that allow multiple organization and individual to confidently share data in real time. The whole supply chain is divided into several stages. The demand for top quality products and interest of end consumers in the provenance of data is increasing rapidly[1]. Agriculture development is predicated by improvement in farm production so it leads to better utilization of food inputs, proper marketing and also efficient food management. But currently food supply chain management facing many problems in terms of centralized network, lack of trust, less quality product and lack of communication[8]. By Introducing blockchain in agriculture field so that supply chain will overcome the problem that it is facing today. Blockchain is well prefer system that plays aimportant role in currectingof supply chain with its foodmaterials inproperties like decentralization, transparency and immutability[1*J*.And mainly it build new revenue models around security, privacy and control.

II. LITERATURE SURVEY

Today, Food supply System facing many obstacles. Paper [4] explains how blockchain technology is helpful for SCM to transfer the information in secured way[3]. The proposed paper get good impression on using food supply chain management. It analyses different wayswhich blockchain technology can be incorporated in the food supply chain, is depend able transaction mechanism.This paper presents a full blockchain based traceability that enables to build blocks for hoe food will transfer that continuously integrate with IoT devices from producers to consumer. The implementation part we introduced Producer-Consumer

Network a theoretical end to end food traceability section . The objective is to create distributed ledger that is accessible by all users in the network that in turn brings transparency[4].This paper provides a survey to study both techniques and applications of blockchain technology used in the agricultural sector. the technical elements, including data management, cryptography methods, and consistent mechanisms given in detail. Then the existing agricultural blockchain applications are categorized and reviewed to demonstrate the use of the blockchain[5].

III. METHODOLOGY

Our proposed system guarantees traceability in an agricultural supply chain system. In our proposed model, we track each and every step involved right from purchasing of seeds by the farmer till the delivery of food to the customer. In this journey, we have considered various stake holders like farmers(producers), food manufactures (if needed) food quality Inspectors, packing agents, transporters, dealers, food suppliers and consumers. All these stake holders are the various nodes of blockchain.

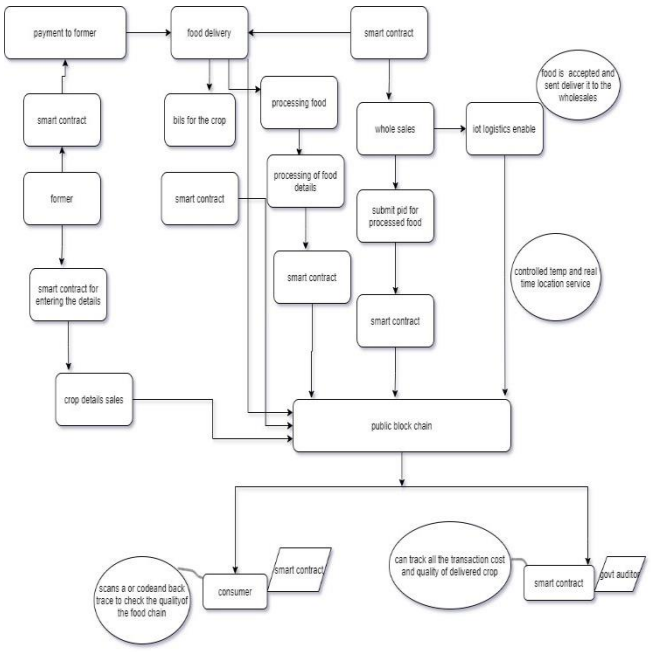

Figure 1 : Flow chart of Proposed System

Our proposed model follows the below sequence of steps and the flow chart is indicated in Figure 1.

1. The farmer(producer) uploads the seed quality and seed purchase details before he starts farming. These details are tracked with a unique farmer identity,fid, that is assigned to each farmer.
2. Once the crop is ready to harvest, the quality inspector will grade the quality of the crop and updates the block chain.
3. Later, the crop is harvested and yield is packed. The packing unit will provide an unique package identifier, pid , which is mapped to step 1 and 2.
4. The packed units are then transported to various dealers. The transporter will key-in the details of packets received and delivered.
5. On receiving the packets the supplier will accept the packet and update the availability status.
6. Now the consumer, can look at the details of products right from seed quality, harvest date,crop grade and supplier's availability and then place an order for purchase.

In our proposed model we have built a smart contract, thatincorporates all the above steps. Thus, eliminating the need of intermediaries and monitors the food quality guaranteeing high integrity, reliability, and security.

IV Block chain based traceability in food supply chain

Here the Blockchain technology transform food to entireindustry, some tech prospectors says by increasing efficiency, transparency and collaboration throughout the food system. Consumers could be able to trace the source of their products in seconds. Shippers could see if a truck is full before they schedule a delivery. As blockchain gets closer to its marketplace debut in the food system, it's important to scrutinize just how the technology will actually work. Blockchain was initiative developer as part of the cryptocurrency Bitcoin and smartcontract,The farmer(producer) uploads the seed quality and seed purchase details before he starts farming. These details are tracked with a unique farmer identity, fid, that is assigned to each farmer.
[2]. Resource consumption leads to increased production costs,the food will transfer from producer to consumers in between we have many process carryout by block chain technology.On receiving the packets the supplier will accept the packet and update the availability status. Now the consumer, can look at the details of products right from seed quality, harvest date, crop grade and supplier's availability and then place an order for purchase.A company that uses supply chain management can achieve efficiency of its operations since only those value adding actions are encouraged. This ensures that the organization's processes flow smoothly and output keeps inline with the needs of the company[6].

.V RESULTS

We have implemented the food supply traceability system using blockchain technology. We have implemented itEthereum blockchain using Remix IDE. The smart contracts were deployed in Ganache, which is a test blockchain network.Our proposed model helps the consumer and farmer to track each and every step involved right from purchasing of seeds by the farmer till the delivery of food to the customer. The Sample traction is provided in Figure 2.

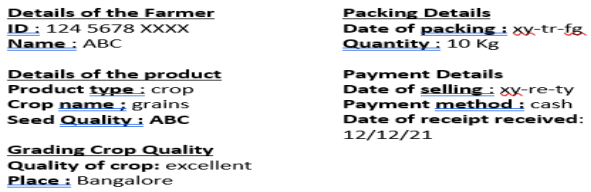

Figure 2: Transaction Details

VI.CONCLUSION

Blockchainis a powerful tool in brining traceability of products and guarantees transparency and immutability between various stake holders. In India, most of the farmers are uneducated and they have limited knowledge about markets, pricing, and quality control. In this paper, we made an effort to resolve the existing problems of the Indian agricultural supply chain system by implementing blockchain[4]. Our proposed model helps the consumer and framer to track each and every step involved right from purchasing of seeds by the farmer till the delivery of food to the customer. This enables the farmer to be aware of pricing and supports them to recover from losses.In future, we would like to extend our idea by collaborating with AI Techniques, that helps the farmers to predict the pricing before farming.

VII. REFERENCES

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