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SMART CONTRACT: MAKE TRACEABILITY EASY

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Abstract: The complexity of a supply chain makes product safety or quality issues extremely difficult to track, especially for the basic agricultural food supply chains of people's daily diets. The existing agricultural food supply chains present several major problems, such as numerous participants, inconvenient communication caused by long supply chain cycles, data distrust between participants and the centralized system. The emergence of blockchain technology effectively solves the pain-point problem existing in the traceability system of agricultural food supply chains. This thesis proposes a framework based on the consortium and smart contracts to track and trace the workflow of agricultural food supply chains, implement traceability and share ability of supply chains, and breakdown the information is lands between enterprises as much as possible to eliminate the need for the central institutions and agencies and improve the integrity of the transaction records, reliability and security.

Keywords: Blockchain, smart contract, agricultural food supply chain, traceability, food safety.

I. INTRODUCTION

The convolution of a supply chain makes it extremely challenging to identify problems with product safety or quality, specifically for the core agricultural food supply networks that comprise the majority of people's daily diets. There are many peoples included in the agricultural product supply chains, which leads to challenging communication problems brought on by extended supply chain cycles. With the advancement of blockchain technology, one of the key problems with the traceability system of agricultural food supply chains has been effectively resolved. In order to establish tracking and sharing data of supply chain, deconstruct the data in lands, and track and trace the workflow of agricultural product supply chains, this thesis proposes a framework based on a smart contract.

II. RELATED WORK

Yorghos Voutos, [1] As a result of the Internet of Things, major advancements have been made in a wider range of technological and financial areas, resulting in a variety of sensory application areas to support testing on the quality of the air, water, and soil. Additionally, mobile devices show the ability to enhance agricultural machinery and provide intelligent infrastructure for remote control and remote control of water pumps, atomizers, and other agricultural machinery. However not yet the most popular in agriculture, these integrated systems are crucial for the current advancement of agricultural techniques. Computer science and information technology integration into conventional agricultural thought are examples of wise agricultural practises.

Taufik Hidaya,[2] Agricultural precision trends and potential technologies in farming are two kinds that make up the core elements of IoT-based agriculture. Recent developments in sensor technology aim to reduce sensor size or production costs. Agriculture has evolved technologically thanks to accuracy and micro precision in agricultural technologies. Smart agriculture uses a variety of sensors, including those for weather, soil, radiation, and climate. Additionally, these sensors are used to store data and control intelligent agricultural systems. The data can subsequently be utilized to monitor and manage agriculture or even to get new knowledge.

Chuntang Yu**,** [3] Food safety issues have become more prevalent in latest years of misuse of insecticides, artificial fertilizers, veterinary medicines, and other agricultural chemicals. The development of an agricultural product traceability system helps find the source of agricultural goods and successfully address issues with their quality and safety. In order to track the information in the supply chain, the majority of agricultural goods supply chain research projects currently in use build traceability systems using technologies as two-dimensional coding technology, the Iot, wireless sensor networks, etc.

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Mohamed Amine Ferrag [4] The structural components of IoT-based agriculture are split into two categories, such as agricultural precision trends and potential technology in agriculture. Recent advances in sensor technology aim to minimize both the cost of sensor production and sensor size. Precision and micro-precision in agricultural technology have helped traditional agriculture evolve technologically. Weather, soil, radiation, and climate sensors are all employed in smart agriculture. These sensors are also utilized to store data and regulate smart agriculture systems. The information can then be used to keep an eye on and manage agriculture or even to learn more.

III. METHODOLOGY

A. Block Chain

As we mentioned above, blockchain is a distributed ledger system that consists of one-by-one blocks with timestamps in the form of a decentralized database in the P2P network. As the underlying technology of Bitcoin, blockchain technology has gradually emerged into the public consciousness. Although this new concept has become a hot topic in recent years, in fact, some technologies it relies on, such as asymmetric encryption technology and P2P network protocol, have existed for a long time. However, blockchain is a good combination of encryption technology, consensus algorithm, timestamp technology and smart contracts, forming a distributed system where users can be anonymous and data can be trusted. It offers the advantages of decentralization, immutability, anti-tampering and traceability, etc. It is widely applied in the fields of medical treatment, education, credit and supply chain traceability

B. Flowchart of implementation

The flow of implementation starts with Seed seller who adds seeds into the database. Farmer login to the system using his Username and password created by themself and performs the functionalities such as view seeds, upload products, apply insurance, view suggestions and view all transaction made by distributor. Distributor is login using username and password and performs the functionalities such as view seeds, upload products and view all transaction made by retailer. Retailer is login using username and password and performs the functionalities such as view products, upload product and view all transaction made by customer. Customer is login using username and password and performs the functionalities such as view products, add products to cart and scan the QR code.

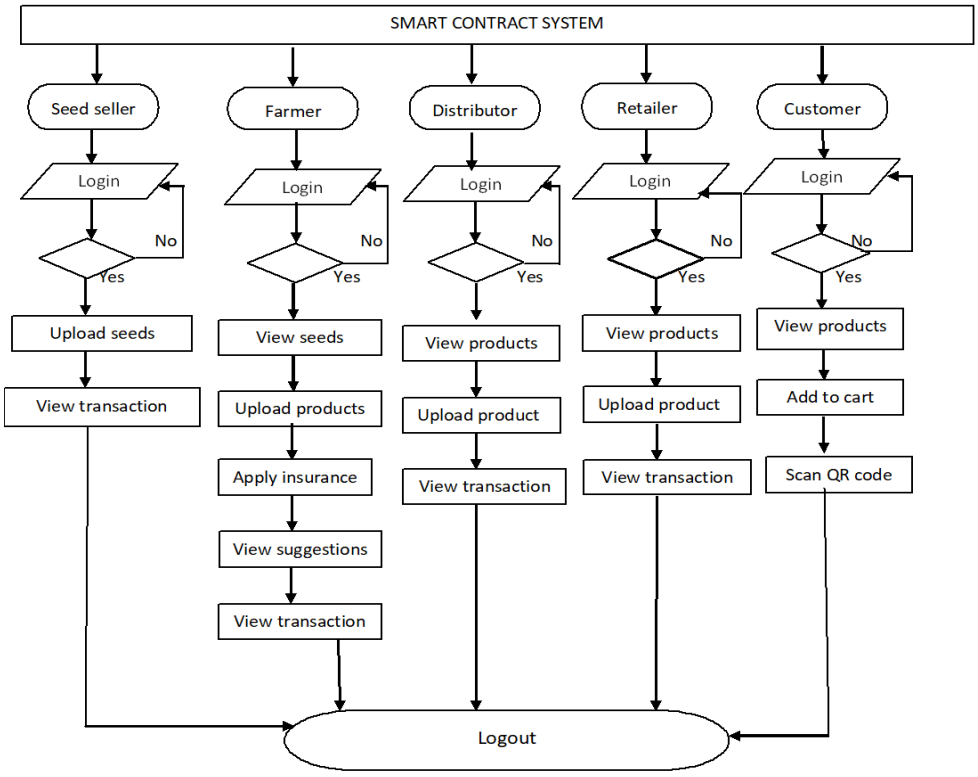

Fig: flow of implementation

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IV. IMPLEMENTATION

The Seed seller login through this page by using username and password or new seed seller can also register here by using required details and they can upload the seeds details for sale. The Farmer can login through this page by using username and password or new seed seller can also register here by using required details and they can upload the product details grown in their field for sale. The Distributor can login through this page by using username and password or new distributor can also register here by using required details, they can upload the product details of food product for sale and they can purchase food products from farmers. The Retailer can login through this page by using username and password or new retailer can also register here by using required details, they can upload the product details of food product for sale and they can purchase food products from distributors.
Customers can view the food products uploaded by Retailer and they can purchase that product.
Insurance companies are also had right to accept or decline the request from formers for insurance on their crops.

V. RESULT AND ANALYSIS

In Proposed system, we provide a blockchain-based framework and solution for tracking and transparency in the supply chain utilizing Ethereum smart contracts in the proposed system. In terms of the overall system design and architecture, we discuss and highlight important elements of our blockchain solution. These include critical interactions among the key participants, entity relations, and sequence diagrams. We introduce, put into practice, and evaluate smart contract algorithms that control and guarantee proper interactions between important players in the supply chain.

VI. CONCLUSION

We provide a system for tracing and supplying the food products without any intermediates it is very useful for all models such as Farmer, distributor, Retailer, Customer.Gets rid of middlemen, and enables the realisation of the decentralised model of supply chain for agricultural food, thereby satisfying demand for agricultural food traceability. In relation to issues with agricultural food safety, this paper discusses the significance of food safety traceability, reviews pertinent studies, and explains blockchain technology and shows a tracking and monitoring system with Smart Contracts implementation of the agricultural food trade; system Architecture creates and explains the connections between the actors in the agricultural food supply chain and their interactions between two things.

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