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Novel Automatic Food Trading System Using Blockchain

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Abstract: ***The blockchain functions as a decentralized and collectively maintained ledger that allows anyone to contribute. It provides a secure and readily accessible source of information concerning farms, inventories, and contracts in the agricultural sector, where acquiring such data can sometimes be costly. By tracing the origin of food, blockchain technology supports the establishment of trustworthy food supply chains and fosters trust between producers and consumers. Its reliable data storage capabilities enable the implementation of data-driven solutions to enhance farming practices. Furthermore, when combined with smart contracts, blockchain technology facilitates prompt payments by linking them to recorded data changes within the blockchain.***

Keywords: Block chain, smart agriculture, data base, data driven.

I. INTRODUCTION

To make the agriculture industry more open and responsible, new methods and innovations are needed as part of current agricultural growth and reform. Blockchain technology is one of the new instruments. Blockchain offers a decentralised data structure to store and retrieve data exchanged with several untrusted parties, in contrast to traditional centralised and monopolistic agriculture management systems. When contamination occurs, quickly identifying the origin and removing the contaminated products from the supply chain becomes challenging. Nowadays, the supply chain has become highly complex, involving various stakeholders at different stages. To ensure effective and successful management, these stakeholders need to collaborate in diverse ways.

II. RELATED WORK

1) Novel Automatic Food Trading System Using Consortium Blockchain

Authors: D. Mao, Z. Hao, F. Wang

The social stability and sustainable economic development are significantly influenced by the trade of agricultural and food products. Nevertheless, the existing agricultural product transactions face numerous technological challenges. One notable issue is the difficulty in enhancing transaction efficiency and ensuring market stability.

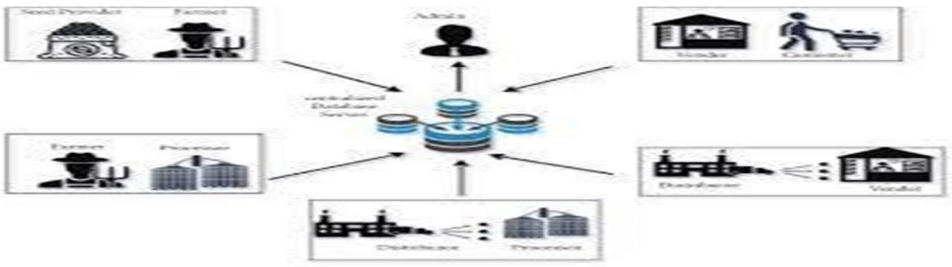
2) Food traceability from _eld to plate

Authors: L. U. Opara and F. Mazaud

The human food supply chain has come under heightened public scrutiny due to various concerns. Consumers are increasingly worried about food safety, animal welfare, and the environmental and ecological impacts of food production and agro processing. Factors such as the expanding global reach of the food supply chain and the emergence of new safety risks, including diseases like the human form of BSE and incidents of illness and death caused by contaminated fresh and processed foods, have further intensified these apprehensions.

III. METHODOLOGY

A. Proposed Architecture



B. Proposed System

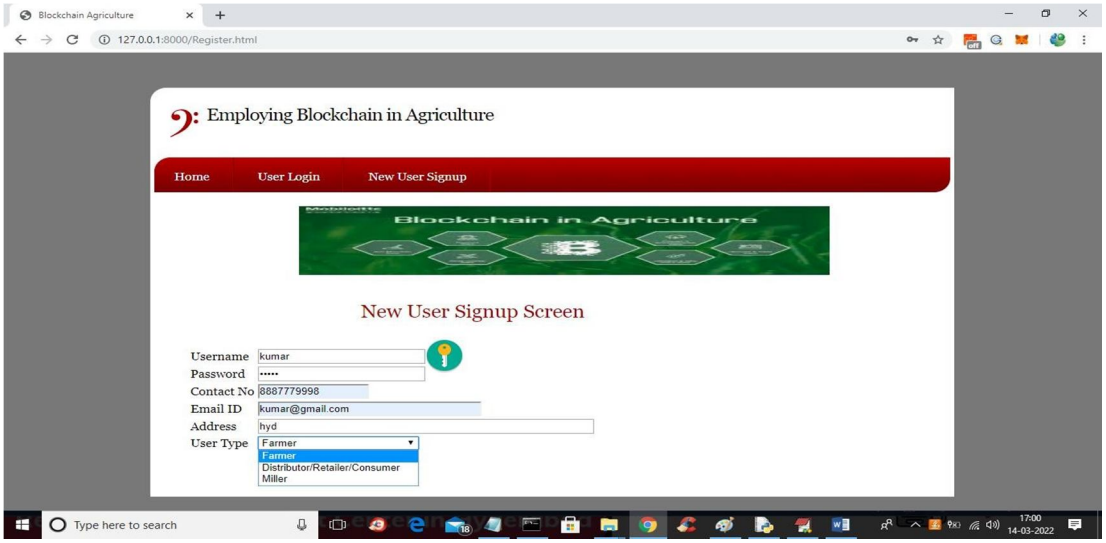
A distributed database known as a blockchain is used to store all interconnected transactions. In this database system, every transaction is denoted as a "block," serving as a foundational entity. When a transaction undergoes a change in its state, a new block is created and linked to the previous one in a linear and sequential fashion, forming a blockchain. To maintain uniformity across the network, the newly generated block is duplicated and shared among all nodes. As a result, each participant in the transaction possesses a copy of the blockchain on their respective devices. This enables every participant to independently verify a specific transaction, eliminating the need for centralized and trustworthy third-party confirmation.

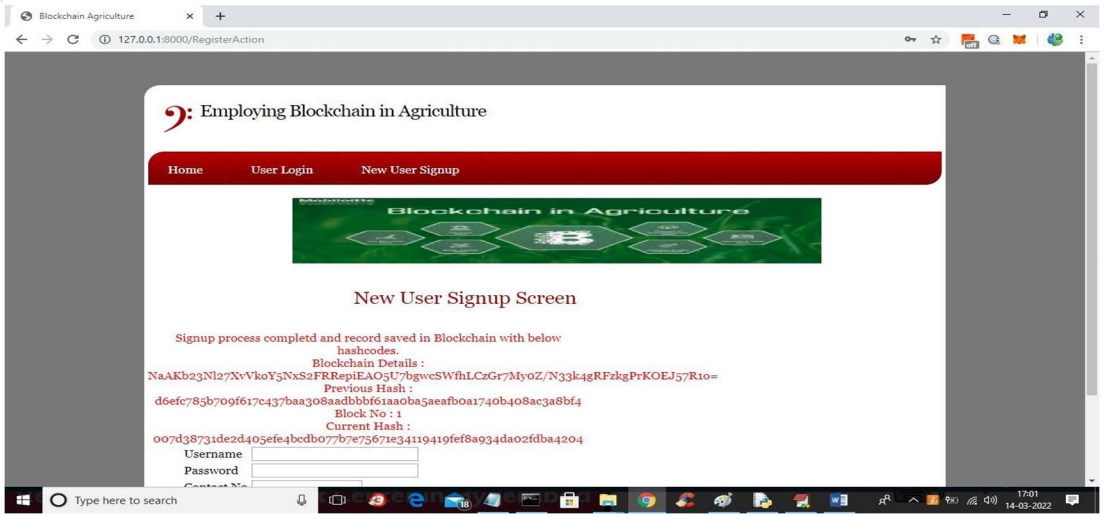
There are three distinct phases, and each phase interacts with the others to play an important part.

1) *Farmer:* The initial block in the blockchain, labelled "Farmer," stores comprehensive information about the farmer. This block includes all the relevant details about the farmer and the crop they cultivate. By uploading this information, any user can conveniently purchase the crop.
2) *Miller:* Miller has a login register that may save information on agricultural prices that are set by the government and certain organisations. As blockchain is immutable we cannot edit the details of farmer's information so miller can just use the hash code of crop and his own data.
3) *Consumer:* As in real life consumer doesn't know the actual price of the crop but whereas in this the consumer can know the quality and also the exact price of the crop through farmers directly. The last product must be acquired by the consumer.
4) *Advantages:* High accuracy and high efficiency.

IV. RESULTS

A. Output Screens




Blockchain Agriculture
127.0.0.1:8000/RegisterAction
Employing Blockchain in Agriculture
Home
User Login
New User Signup
Blockchain in Agriculture
New User Signup Screen
Signup process completd and record saved in Blockchain with below hashcodes.
Blockchain Details :
NaAKb23Nl27XvVkoY5NxS2FRRepiEAO5U7bgweSWfhLCzGr7MyoZ/N33k4gRFzkgPrKOEJ57R1o=
Previous Hash :
d6efc785b709f617c437baa308aadbbbf61aa0ba5aeafb0a1740b408ac3a8bf4
Block No : 1
Current Hash :
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Username
Password
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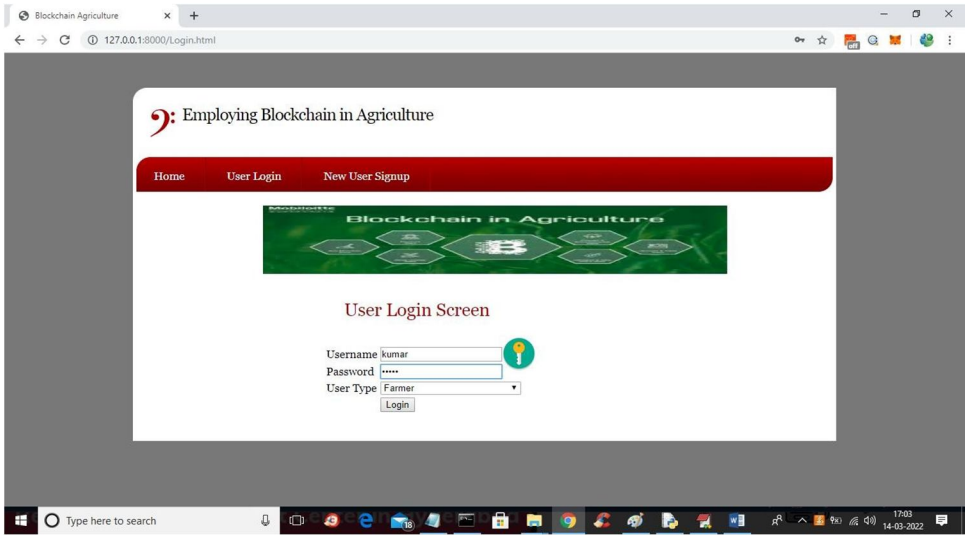
Blockchain Agriculture
127.0.0.1:8000/Login.html
Employing Blockchain in Agriculture
Home
User Login
New User Signup
Blockchain in Agriculture
User Login Screen
Username kumar
Password
User Type Farmer
Login
Type here to search


Blockchain Agriculture
127.0.0.1:8000/UserLogin
Employing Blockchain in Agriculture
Upload Crop Details
Fertilizers/Pesticide Info
View Orders
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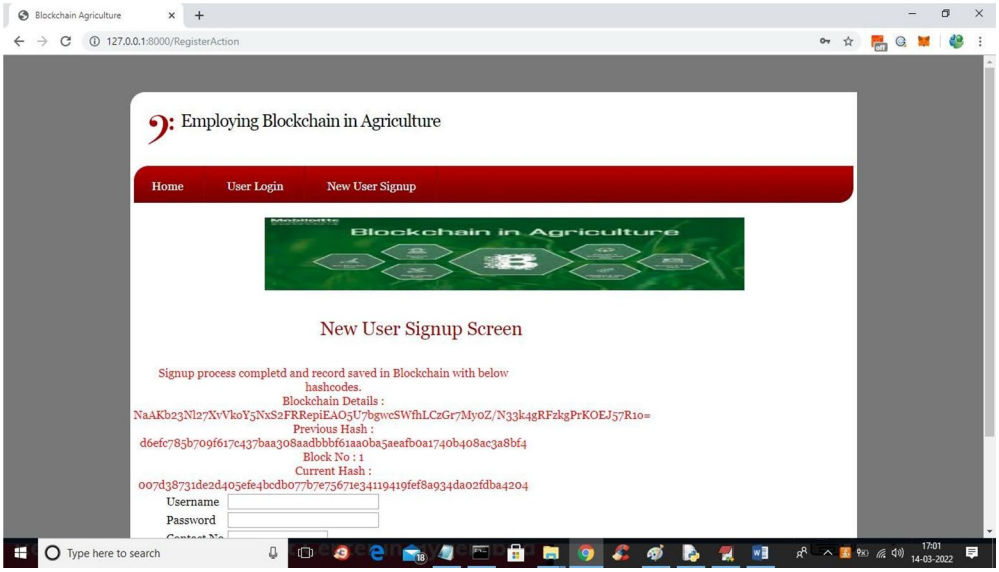

V. CONCLUSION

Within this article, we have presented an extensive framework and approach for effectively managing, supervising, and executing commercial operations within the agricultural supply chain. Our methodology eliminates the need for intermediaries and the traditional central processing point typically involved in tracing crop prices. Through the utilization of entity-relationship diagrams, sequence diagrams, architectural design, interfaces, and execution algorithms, we have furnished comprehensive details and system components. We have effectively showcased the tracking capability of our technology for crop prices throughout the entire supply chain. The components and knowledge shared are highly adaptable and applicable across various agricultural supply chain contexts, as they are specifically designed to enable decentralized traceability and ensure reliability for any crop.

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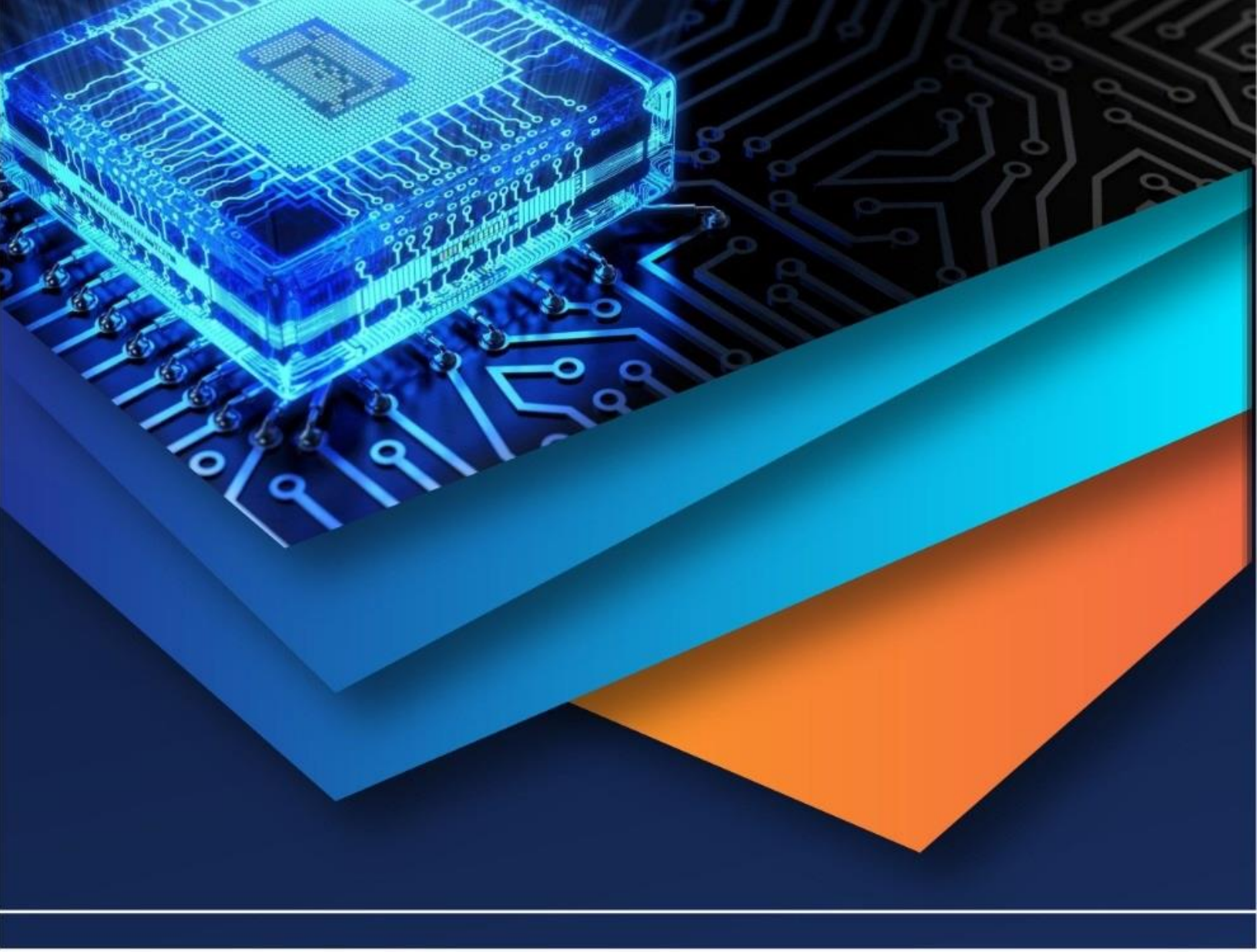

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