A Study Of Blockchain Technology In Farmer's Portal

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ABSTRACT

Blockchain is a method in which a confirmation of a transaction is kept by means of a crypto-currency. The record is maintained transversely, linking several computers in a peer to peer network. Contracts, transactions, and the records of them define the economic system of a country. They set boundaries and provide security to the assets. Considering the features of blockchain such as immutability and maintaining the footage of transaction details, this paper highlights the usage of blockchain technology with farmer's portal that keep the footage of selling and buying information of crops. The proposed solution uses the python as a programming language in integration with the blockchain system that will benefit the farmers or vendors and individuals by preserving the contract of trade. An interface for the farmers is designed using a python programming language in addition with blockchain technology, which is used to store the information related to seller, buyer, selling and buying an item and total value transacted.

INTRODUCTION

Blockchain [1] an open, disseminated and decentralized ledger that evidences transactions involving two parties capably in a confirmable and stable way (Iansiti, Lakhani 2017). In the above given definition, open means the blockchain is accessible to one and all, disseminated means that there is no single party control and decentralized means there is no central third party available, capable means it is fast and more scalable than the conventional technologies, confirmable means that everyone can check the validity of the informat ion and stable means that the data is nearly immutable that is it is nearly impossible to change or tamper the data or information. They verify and validate the identities and chronological events. They guide every action, transactions that have taken place among individuals, communit ies, organizations and nations as well. In this era of digitizat ion, the way maintained and regulated these type of data must be changed, it must be highly secure and the blockchain is the solution to this.

In the era of information and communication technology, a farmer's portal has always been helpful for farmers in many ways, providing ease of use and convenience of information to the farmers [1]. The Government of India has also taken many initiat ives for the same. Few examples of such portals are Krishijagran.com, farmer.gov.in, agricoop.nic.in and agriwatch.com etc. Apart from these some E-commerce websites are also available; fert.nic.in and enam.gov.in etc.

PROPOSED SYSTEM CONFIGURATION

Farmers, as well as agriculture, are the foundation of life. Numerous work has been done towards the enhancement of agriculture by developing technologies that support directly and indirectly to agriculture. A range of research shows that with the various enhancements in the field of ICT, the farmers are unable to take its advantage and fail to get the proper sale value for their crops. Gosh et al. [5] has designed an interface that benefited the farmers by providing the informat ion related to the advancement of agriculture techniques; farmers can interact with the system by means of text and speech as an input. The approach was the first rate in terms of providing the interface to the farmers.

Manav et al. [6] proposed an android based mobile application that would take care of updating the farmers regarding agricultural products, weather forecasts, and agricultural news. However, the system was good in providing the instant update to the farmer but the version was only in the English language, which was the limitation of the system. Jason [7] has discussed various technical approaches made in agriculture, mostly in the field of food and supply chain management. The

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incorporation of blockchain technology in agriculture has improved the efficiency of the agriculture supply chain by reducing the need for verification of data. However, the technology proposed benefited only the producers in terms of maintaining the accuracy of data for supply. Jing Hua et al. [8] has used blockchain technology and proposed an agricultural tracing system that is decentralized, maintained collectively and provides trust and reliability in case of supply chain management. The system proposed is beneficial for producers in terms of safeguarding the data of production and supply that is immutable.

The Proposed Farmer's portal is a single gateway through which the e-commerce activity of crops can be performed. The users' experience of the portal can be tailored according to the individual need. It is a single access point i.e., everything is in a single place, the only thing needed is single login to approved users. The security of the blockchain is maintained in the way that the transactions are bundled together to form a block that has a unique ID [10]. The data in it is made tamperproof by using a cryptographic hash function and adding a digital fingerprint to the block. Each block has its hash value and the hash value of the previous block which makes it the chain of blocks, then proof of work is also added as a constraint in the hash value to make it a cumbersome process for the user to mine a block in the chain. The blockchain implements hash functions. If someone tries to alter the data in the b lockchain, he has to do the following things, first has to calculate all the hash values once again, second, he has to do the corresponding proof of work and third he has to take the influence on at least 51 percent of the nodes in the network. And these three things are nearly impossible to be done simultaneously. The larger the network, the more temper resistance it will be.

The retrieval of a particular t ransaction of interest in future from the storage is one of the most important characteristics as this functionality will help the user to have the chronological ledger of everything done in the past. In our system, a simple generic blockchain is implemented which keeps the record of a transaction for an act ive session only because it is stored in a local system but when a deployable blockchain will be used and the storage may be on a cloud it can retrieve any data from the

generic block to the last block which has been added to the blockchain. This ultimate ledger of the transaction will be transparent to every node in the network and it can also help us in tracking and tracing any information or data related to the items in the portal.

Literature survey

1. Nakamoto, S. (2008). *Bitcoin: A Peer-to-Peer Electronic Cash System*
This foundational paper introduced the concept of blockchain as a decentralized, peer-to-peer ledger system. It explains how transactions are validated through proof-of-work and recorded immutably. The use of this mechanism in agricultural trading platforms could enhance transparency and trust among farmers and buyers.

2. Tripoli, M., & Schmidhuber, J. (2018). *Emerging Opportunities for the Application of Blockchain in the Agri-food Industry*
This study from the FAO explores how blockchain can enhance traceability, reduce fraud, and streamline supply chains in agriculture. It supports the idea of using blockchain in a farmer's portal to track crop transactions and ensure fair trade.

3. Casino, F., Dasaklis, T. K., & Patsakis, C. (2019). *A systematic literature review of blockchain-based applications: Current status, classification and open issues*
This comprehensive review covers various blockchain applications across industries, including agriculture. It highlights the immutability, decentralization, and security features that make blockchain suitable for recording and verifying farming transactions.

4. Tian, F. (2016). *An agri-food supply chain traceability system for China based on RFID & blockchain technology*
Tian proposes a system integrating RFID and blockchain to ensure food safety and traceability in agricultural supply chains. The research demonstrates how transaction data related to crops

can be securely recorded and verified using blockchain.

5. Patil, A., & Dharwadkar, S. (2020). *Blockchain Technology in Agriculture: Enhancing Transparency and Reducing Corruption* This paper discusses blockchain's potential in creating transparent systems in agriculture, particularly in crop marketing and farmer-vendor transactions. It aligns closely with the objective of your abstract, where blockchain is used to preserve trade contracts and transaction histories

Results
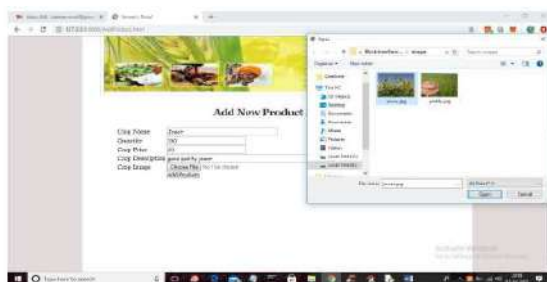
In above screen farmer can add crop details and upload crop image and then click on 'Add Products' link to get below output
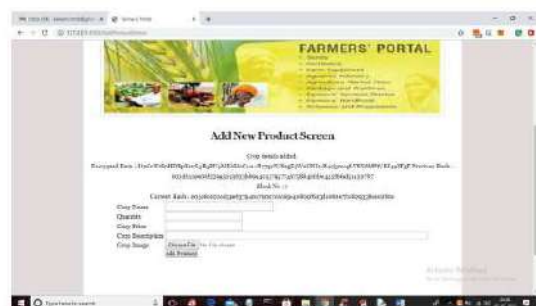
In above screen we can see crop details added and displaying Blockchain storage details and now click on 'Update Product Quantity' link to get below screen

In above screen all farmers can view order details and then contact consumer to complete order.

Similarly you can add any number of farmers, consumers and add new crop details

CONCLUSION AND FUTURE SCOPE

Blockchain Technology in the field of agriculture can bring a revolutionary enhancement in the area of maintaining farmers data securely, ensuring the quality of seed, monitoring of moisture content in the soil, data of crop yield and lastly demand and sale price of crops. In this work, a blockchain-based portal is proposed to deal with the issue of demand and sale price of crops which in result ensure crop security to farmers as well as to get fair price of the

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crop. For this, a portal is proposed on which a farmer can register and sell his crops, recording a transaction on a blockchain at a point when buyers commit to buy a farmer's crop. This transaction is capable of recording crop details, the price at which it is committed to buying and quantity of crop purchased. This immutable nature of blockchain technology will fortify farmers to get a legit imate price of crop and reduce the cost of operation for selling and buying crops when compared to traditional methods. Akin kind of portal can be implemented by the government and its confederate bureaus to ensureamelioration in the field of farming and commerce of crops which will improve the prominence of the nation's farmers.

This application can be more refined with increasing integration of blockchain in a spectrum of areas and constellating it into a single paramount portal for farmers. This can be done by putting farme r's crop details to the blockchain, buyer's data to the blockchain and adding more features and services to the single portal and bringing all possible facilities for farmers of the nation under sui generis awning. Information integrity and precision issues can be solved using open, protected and trusted systems presumptuous; the infrastructure dispensation and footage connections are protected and suitably provided. The blockchain technology did not promise the information reliability in the footage. Thus realizat ion in blockchain faces several boundaries that might require a vital authority or protected footage of confirmation.

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