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 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.

The sectors currently using blockchain are shown in Fig.1.Using blockchain technology in the field can make available decentralized computation and informat ion sharing platform that enables multiple authoritative domains, which do not trust each other, to cooperate, coordinate and collaborate in a rational decisionmaking process, a reliable informat ion recording s ystem can be made that can contribute for the development in the

agriculture sector. Since blockchain works like a publicledger, so it can be utilized to ensure many different aspects such as [3]:

● Protocols for Commitment: Ensure that every valid transaction from the clients are committed and included in the blockchain within a finite time.

● Consensus: Ensure that the local copies are consistent and updated.

● Security: The data needs to be tamper - proof. Note that the client may act maliciously or can be compromised.

● Privacy and Authenticity: The data or transactions belong to various clients; privacy and authenticity need to be ensured.

Cryptography is a foremost part of the functioning of blockchain technology [4]. Public key encryption is the root of blockchain wallets and transaction, cryptography hash functions endow with the trait of immutability and merle trees systematize transactions while enabling blockchain to be more competent.

Ensuring the above aspects numerous work has been carried out in the field of blockchain. The presented portal is a contribution over them. It can help to maintain a secure platform for farmers, where they can trade with the customers electronically. The main object ive of this study is to record the secure transactions between a seller and a buyer that ensures a contract between the two. This can help farmers to get a legitimate price for their commodity. The system also facilitates a single place to record the whole trade transaction.

The availability and accessibility of information are the crucial points in taking the optimal decision at right time. Nowadays, advancement of ICT make possible to retrieve almost any information from the global repository (internet). The information in internet is primarily maintained in English. So, a large number of people are deprived from the benefit of internet due to technical and English language illiteracy. This scenario is very bad in developing country like India where nearly 76 % are English illiterate 1 . Moreover, a large percentage of the English literate people are also unable to find their exact need form the large database of internet due to lack of proficient knowledge in English. Indian farmers belong to such type of people who are not much sound in both technical as well as in English.

LITERATURE SURVEY

1) Krishi-Bharat i: an interface for Indian farmer

AUTHORS: Ghosh, Soumalya, A. B. Garg, Sayan Sarcar, PSV S. Sridhar, Ojasvi Maleyvar, and Raveesh Kapoor

Rapid growth in the field of ICT helps in basic aspects of mankind like- agriculture,

education, healthcare etc. However, the moderate technical growth of ICT applications is confined to the community of a limited number of people, who live in digital pockets. The illiterate people like – farmer, shopkeeper etc. are unable to take the advantages of the ICT revolution. According to the UNESCO report, population of such people in the globe is 64% who are unable to use the technology either language or technical barrier. Moreover the percentage (76%) must be increased in the context of developing countries. The essential agriculture information is very useful to a farmer for taking effective decision thus we proposed to develop an iconic interface which is integrated with speech based interaction in Indian languages. The proposed interface is critically evaluated with the farmer from different states of India. The evaluation results proved the effectiveness of the proposed interface.

2) Krishi Ville—Android based solut ion for Indian agriculture

AUTHORS: Singhal, Manav, Kshit ij Verma, and Anupam Shukla

Information and Communication Technology (ICT) in agriculture is an emerging field focusing on the enhancement of agricultural and rural development in India. It involves innovative applications using ICT in the rural domain. The advancement of ICT can be utilized for providing accurate and timely relevant information and services to the farmers, thereby facilitating an environment for remunerative agriculture. This paper describes a mobile based application for farmers which would help them in their farming activities. We propose an android based mobile application - Krishi Ville which would take care of the updates of the different agricultural commodities, weather forecast updates, agricultural news updates. The application has been designed taking indian farming in consideration.

3) Blockchain based provenance for agricultural products:

A dist ributed platform with duplicated and shared bookkeeping

AUTHORS : Hua, Jing, Xiujuan Wang, Mengzhen Kang, Haoyu Wang, and Fei-

The provenance (tracing) system of agricultural products is important for ensuring food safety. However, the stakeholders (growers, farmers, sellers etc.) are numerous and physically dispersed, making it difficult to manage data and information with a centralized approach. As a result, the production procedure remains non-transparent and trust is hard to build. In this paper, we propose an agricultural provenance system based on techniques of blockchain, which is featured by decentralization, collective maintenance, consensus trust and reliable data, in order to solve the trust crisis in product supply chain. Recorded information includes the management operations (fertilizing, irrigation, etc.) with certain data structure. Applying blockchain techniques to the provenance of agricultural product not only widens the application domain of blockchain, but also supports building a reliable community among different stakeholders around agriculture production.

4) Bitcoin and beyond: A technical survey on decentralized digital currencies

AUTHORS : **Tschorsch, Florian, and Björn Scheuermann**

Besides attracting a billion dollar economy, Bitcoin revolutionized the field of digital currencies and influenced many adjacent areas. This also induced significant scientific interest. In this survey, we unroll and structure the manyfold results and research directions. We start by introducing the Bitcoin protocol and its building blocks. From there we continue to explore the design space by discussing existing contributions and results. In the process, we deduce the fundamental structures and insights at the core of the Bitcoin protocol and its applications. As we show and discuss, many key ideas are likewise applicable in various other fields, so that their impact reaches far beyond Bitcoin itself.

5) Towards using ICT to enhance flow of information to aid farmer sustainability in Sri Lanka

AUTHORS: **L. N. De Silva, J. S. Goonetillake, G. N. Wikramanayake, and A.**

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Farmers need information at all stages of the farming life cycle to make optimal decisions. The required information includes not only prior knowledge but also real time (dynamic) information such as market prices and current production levels. Some valuable information needed by the farmers is produced by government organizations and is available in different locations in different formats. Although farmer is the most important stakeholder in agriculture, there has not been much effort to provide the essential information to farmers on a real time basis. This lack of information is creating many difficulties for farmers as they are not being able to make the correct decisions relating to their farming activities. Through field studies we have identified information required by farmers at various stages of the farming cycle and official sources where this information is available. Next we developed an information flow model that connects various information sources to farmers' information needs. Based on these findings we are now developing a mobile phone based information system to deliver the required information to farmers in real time.

IMPLEMENTATION:

MODULES:

- **Sellers**
- **Buyers**
- **Admins**
- **Blockchain**

MODULES DESCRIPTION:

Sellers:

The Seller User can register the first. While registering he required a valid user email and mobile for further communications. Once the user register then admin can activate the Sellers. Once admin activated the Seller then he/She can login into our system. The seller can add a new item, update the existing items, allot and update the price of the item. It will increase the market reach and will also eliminate the middleman.

Buyers:

The Seller User can register the first. While registering he required a valid user email and mobile for further communications. Once the user register then admin can activate the Sellers. Once admin activated the Seller then he/She can login into our system. The buyer can buy a product and can search for any product according to the requirement. They can add the product in cart and delete crop from the cart. After finalizing the product to buy and verifying the cart user can check out.

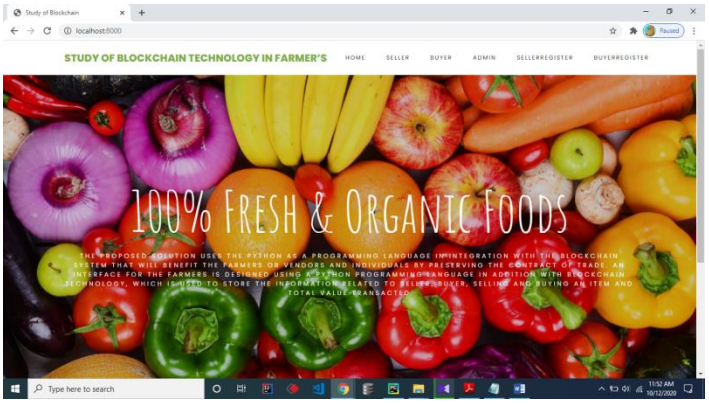
Admin:

Admin can login with his credentials. Once he login he can activate the sellers and buyers. The activated user only login in our applications. The admin user can view the all transaction which is done by buyer user. In the admin frame can view all block chain transaction with its previous block details and hash values.

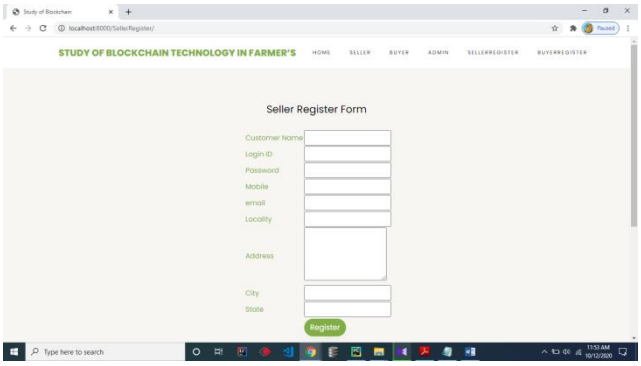
Blockchain:

Every activity related to introducing a new item and purchasing an item is considered as a transaction and is added to the blockchain accordingly with the correct unique digital signature and timestamp so that any user cannot deny the activity done by them. All these transactions are visible to everyone in the network. The blockchain is a peer to peer transaction based on distributed node systems by means of data encryption, time stamping and consensus. It makes the portal more secure at the data as it is immutable, transparent and accessible to all.

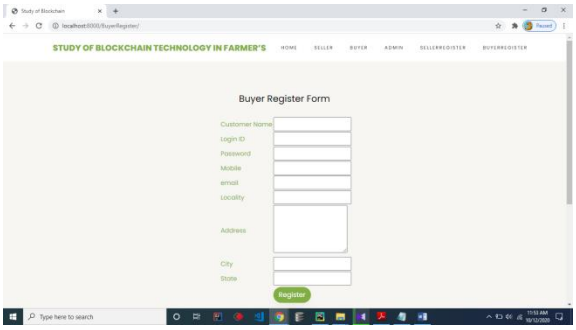
Home page:



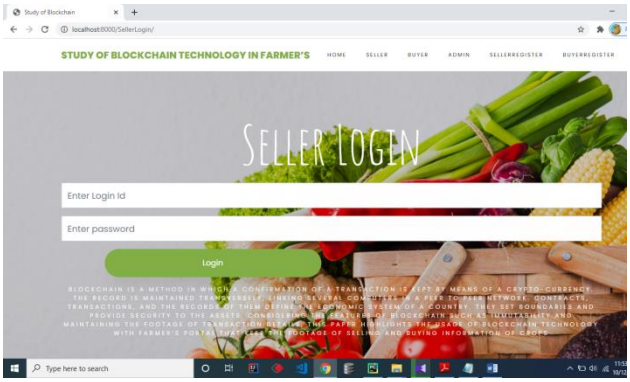
Seller Registraion:



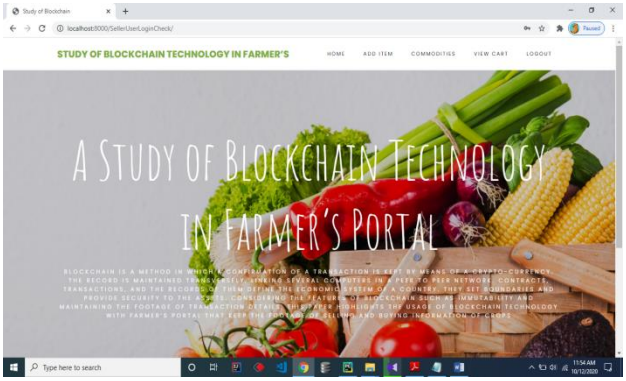
Buyer Registration:



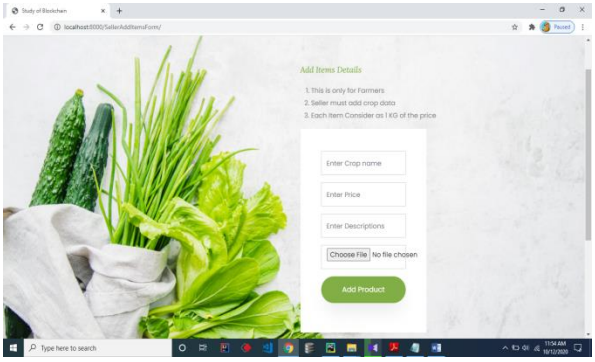
Seller Login:



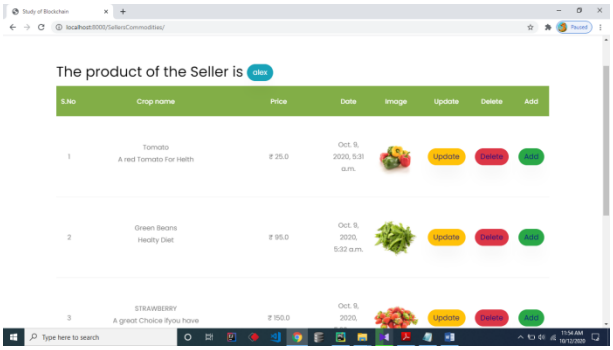
Seller Home:



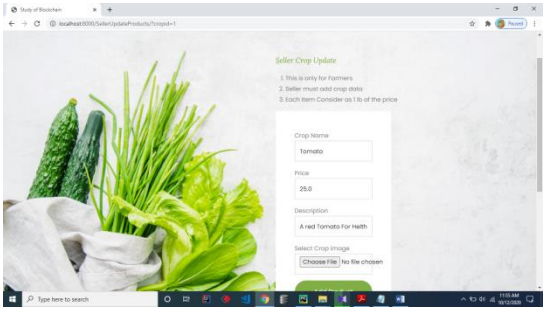
Seller Adding crops Details



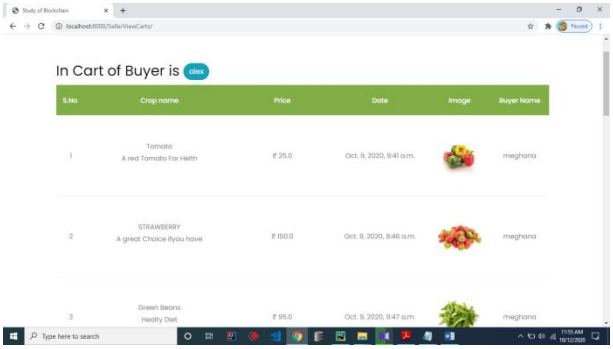
Seller Commodities:



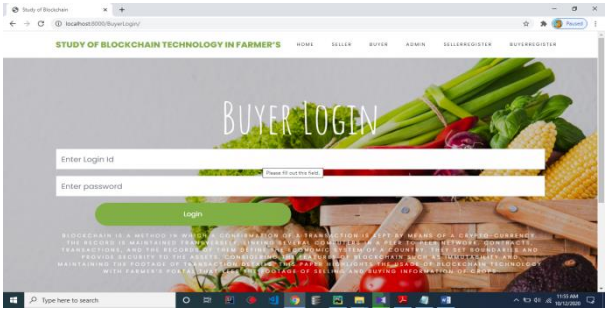
Updaing Crops:



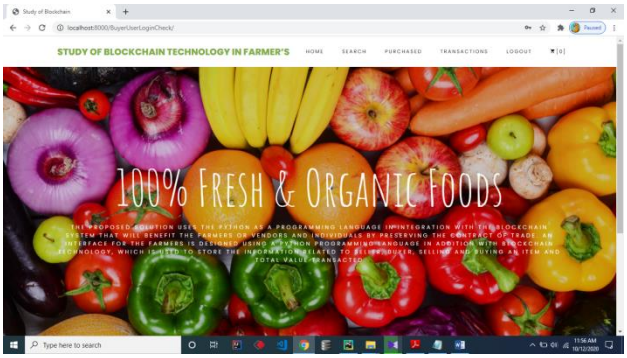
User View In Cart



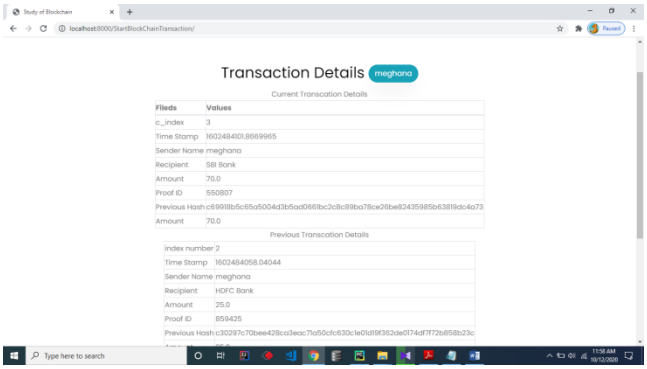
Buyer Login:



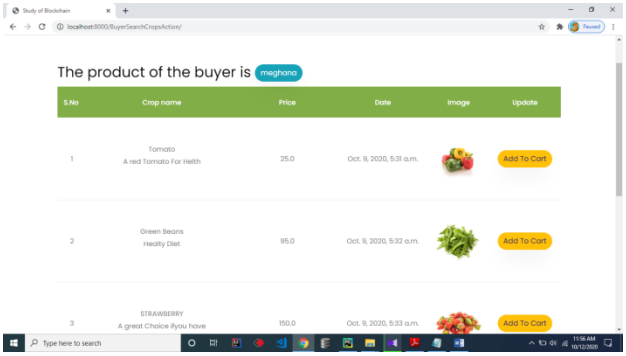
Buyer Home:



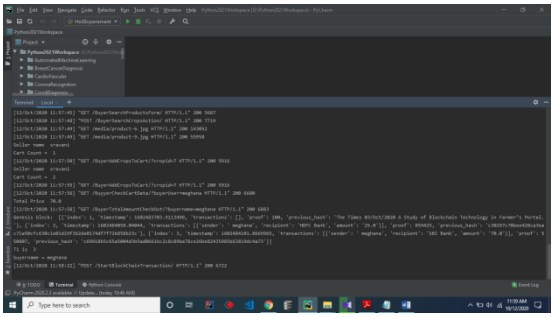
Search Results:



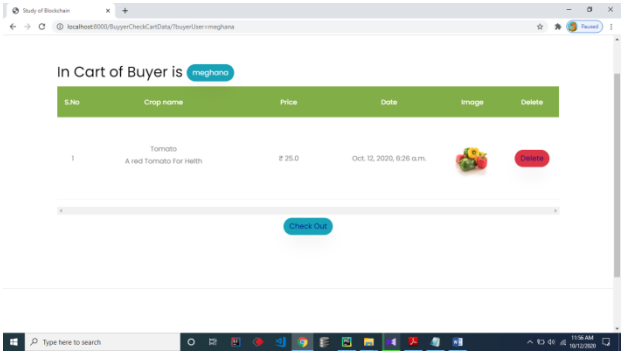
Blockchain Transaction:



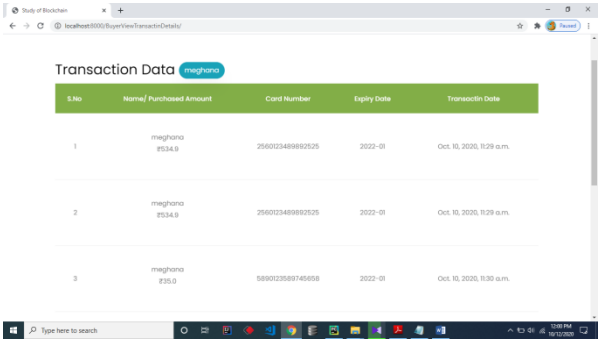
Buyer Cart View:



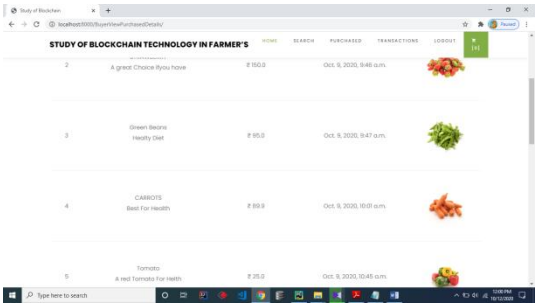
Buyer View Transaction



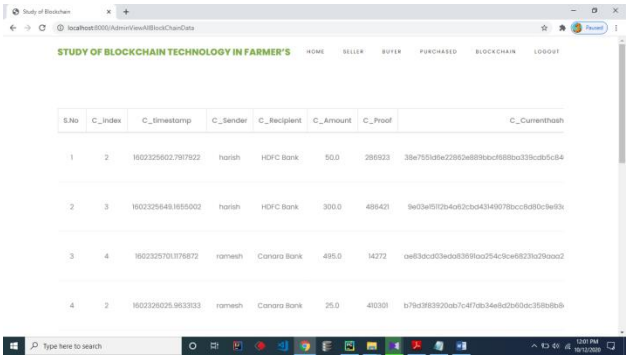
Block chain :



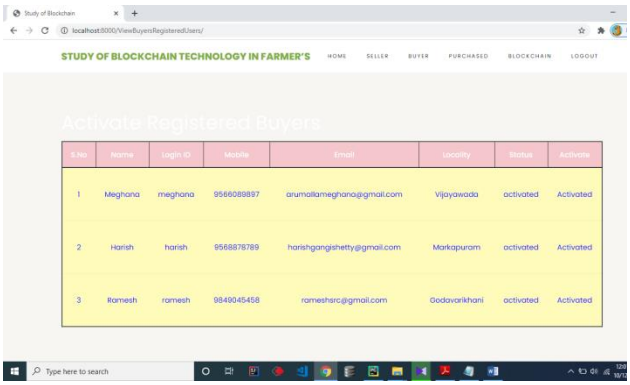
Purchased Crops



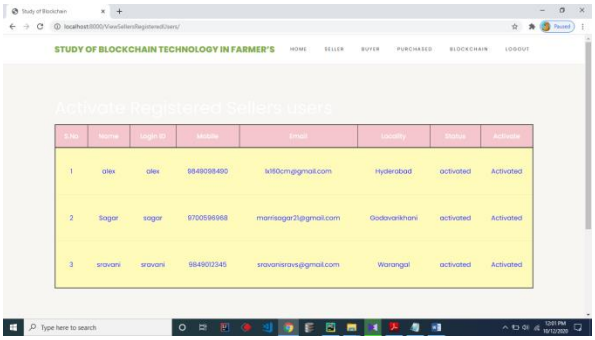
Admin View Blockchain Transaction:



Admin Activate Buyers



Activating Sellers:



CONCLUSION

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 s ale 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 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.

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