BLOCKCHAIN TECHNOLOGY IN AGRICULTURE PRODUCT SUPPLY CHAIN

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***Abstract*— - Blockchain may be a methodology within which a authentication of a transaction is unbroken by betokens that of a crypto-currency. The record is maintained transversally, linking many computers during a peer to look network. Agreement, transactions, and therefore the documentation of them outline the economic system of a rustic. They set boundaries and supply security to the assets. Considering the options of blockchain like changelessness and maintaining the footage of group action details, this paper highlights the usage of blockchain technology with farmer's portal that keep the footage of mercantilism and shopping for data of crops. The planned answer uses the python as a programming language in integration with the blockchain system that may benefit the farmers or vendors and people by conserving the contract of trade Associate interface for the farmers is designed employing a python programing language additionally with blockchain technology, that is employed to store the information associated with vendor, buyer, mercantilism associated shopping for an item and total price transacted.**

Keywords*— *Block chain, Information and communication technology (ICT), Immutability, Farmer's portal, multilingual translation

I. INTRODUCTION

Blockchain an open, disseminated and redistributed ledger that evidences transactions involving 2 parties aptly during a falsifiable and stable means .Within the on top given definition, open suggests that the blockchain is approachable to 1 and every one, disseminated implies that there's no single party management and redistributed suggest that there's no central third party out there, capable suggests that it's quick and additional scalable tan standard technologies, falsifiable implies that everybody will check the validity of data.The government of India has conjointly taken several initiatives for an equivalent. Using blockchain technology within the field will built out their redistributed computation and data sharing platform. A reliable information audio system will be created that may contribute for the event within the agriculture sector. Since blockchain works sort of a public ledger, therefore it will be used to confirm many alternative aspects for which helps in providing security like: Protocols for commitment : make sure that each valid dealings from the shoppers' square measure committed and enclosed within the blockchain among a finite time.

• Consensus : Make sure that the native copies square measure consistent and updated.
• Security : The info must be tamper – proof. Note that the consumer could act maliciously or will be compromised.
• Privacy and Authenticity : The info or transactions belongs to varied clients; privacy and credibility got to be ensured.

Public key encoding is that the root of. blockchain wallets and dealings, cryptography hash functions endow with the attribute of changelessness and ouzel trees order transactions. The most objective of this study is to record the secure transactions between a vendor and a emptor that ensures a contract between the 2. The availability and accessibility of data square measure the crucial points in taking the optimum call at right time. The data in net is primarily maintained in English. An oversized variety of individuals are underprivileged from the good thing about net because of technical and West Germanic language illiteracy. An overwhelming range of individuals from the Indian farmer community are unable to read/write even their own maternal language. So, they're unable to access needed info on the farming life cycle via the net. As a result, suicide rate has been inflated apace among the Indian farming community.

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 objective 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.

II. LITERATURE SURVEY

Paper 1: Krishi-Bharat i: Associate in Nursing interface for Indian farmer. World Health Organization sleep in digital pockets. The illiterate individuals are unable to require the benefits of the ICT revolution. The essential agriculture data is extremely helpful to a farmer for taking effective call therefore we incline to develop Associate in Nursing painting interface.

Paper 2: Krishi Ville—Android based mostly solution particle for Indian agriculture. Information and Communication Technology (ICT) in agriculture is a rising field specializing in the sweetening of agricultural and rural development in Asian nation. It involves innovative applications exploitation ICT within the rural domain. The

advancement of ICT is often used for providing correct andtimely relevant data and services to the farmers, thereby facilitating Surroundings for remunerative agriculture. This paper describes a mobile based mostly application for farmers which might facilitate them in their farming activities. We have a tendency to propose a golem based mostly mobile application - Krishi Ville which might look out of the updates of the various agricultural commodities, forecast updates, agricultural news updates. The appliance has been designed taking Indian farming in thought.

Paper 3: Blockchain based mostly place of origin for agricultural products: A distributed platform with duplicated and shared bookkeeping. The place of origin system of farming product is vital for making certain food safety. The stakeholder's area unit various and physically spread. As a result, the assembly procedure remains not clear, and trust is difficult to create. Blockchain technology can be applied to the place of origin of an agricultural product, rather than just the production process itself.

III. PROBLEM ANALYSIS

A. Existing System

In the existing system 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 (Information and Communication Technologies), the farmers are unable to take its advantage and fail to get the proper sale value for their crops. An interface that benefited the farmers by providing the information related to the advancement of agriculture techniques. Various technical approaches made in agriculture, mostly in the field of food and supply chain management. The incorporation of block chain 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.

B. Proposed System

The Proposed Farmer's portal is a single entrance through which the e-commerce activity of crops can be performed. The users' experience of the portal can be converted 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.

ADVANTAGES OF PROPOSED SYSTEM:

• The buyer can purchase a product and can search for any product according to the requirement. They can also add the product in cart.

• The seller can add a new item, update the existing items, allot and update the price of the item.

• Purchasing an item is considered as a transaction and connected to the blockchain accordingly with the unique digital signature and timestamp so that any user cannot deny the activity done by them.

Capturing Transaction, Encryption and 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 [9]. It makes the portal more secure at the data as it is immutable, transparent and accessible to all. 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 transaction 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 active 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 port.

IV. SYSTEM ARCHITECTURE

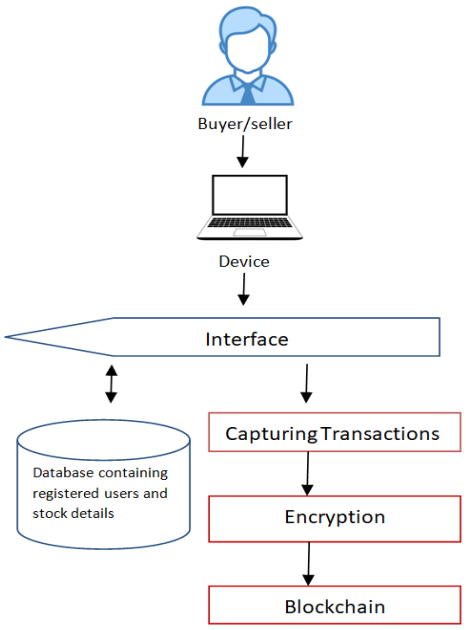

Fig. 4.1 System Architecture diagram

Description:

• **User**: A user can be a buyer or a seller. The seller may be a farmer or are presentative or assistant of him.

• **Device**: The user can communicate through the portal using a computer or a laptop.

• **Interface:** Permission to enter the portal, the user needs to register using a sign-up. The registered user's logins using the correct credentials. Once the user signs in successfully. The user will have access to the portal/interface. A user can see available items that are crops and seeds with their price.

ADVANTAGES

• Blockchain for business uses a shared and permanent record book that is ready to only be obtain by members with permission.

• Network members management what knowledge every organization or member could even see and what actions every will take.

• on such a lot of side matters of trust, blockchain delivers even different business benefits, beside the value savings from accrued speed, efficiency, and automation.

• By greatly decreasing work and errors, blockchain considerably decreases overhead and dealings prices, and decreases or eliminate the third parties or middlemen to confirm transactions.

V. IMPLEMENTATION

Sellers: The registration process begins with the seller user. During registration, the user is required to provide a valid email address and mobile number for future communication purposes. After completing the registration, the admin has the authority to activate the sellers. Once the adminactivates a seller, they can log into the system.

Once logged in, the seller has several functionalities available. They can add new items, update existing items, and manage the pricing of their products. These features aim to expand their market reach and eliminate the need for intermediaries.

Buyers: buyer user also goes through a registration process. Similarly, they are required to provide a valid email address and mobile number during registration. Once registered, buyers can browse and search for products based on their requirements. They have the abilityto add products to their cart and remove items if necessary. After finalizing the desired products in their cart and verifying the contents, buyers can proceed to check the purchase.

Admin: The admin can log in using their credentials. Oncelogged in, they have the authority to activate both sellers and buyers. Only the activated users can access our applications. The admin user has the ability to view all transactions performed by buyer users. In the admin interface, they can also access block chain transactions along with their previous block details and hash values.

Block chain: Every action related to adding a new item or making a purchase is considered a transaction and is recorded in the block chain. Each transaction is assigned a unique digital signature and timestamp, ensuring that no user can deny their involvement in the activity. All transactions within the block chain are visible to everyone in the network. The block chain operates on a peer-to-peer system with distributed nodes, employing data encryption, time stamping and consensus mechanism. This makes the portal more secure as data stored in the block chain is immutable, transparent, and accessible to all.

VI. RESULTS

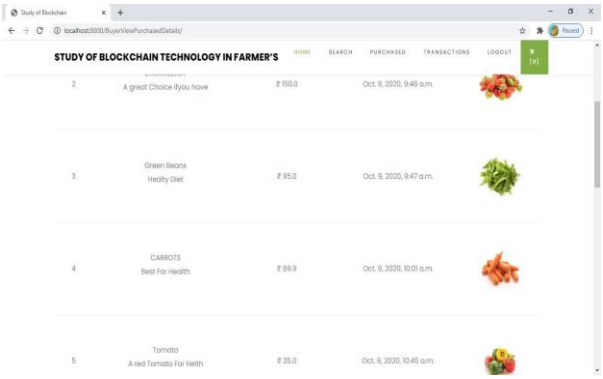

Fig Purchased Crops

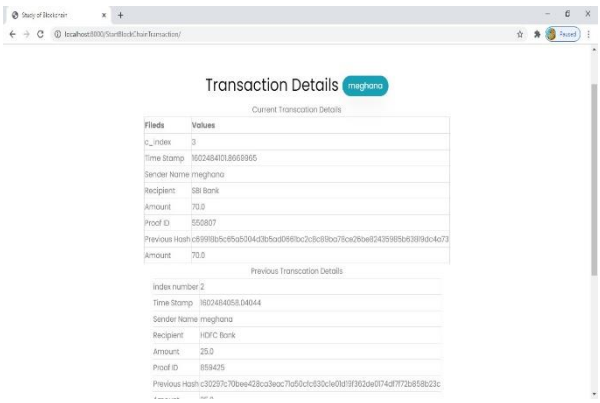

Fig Block chain

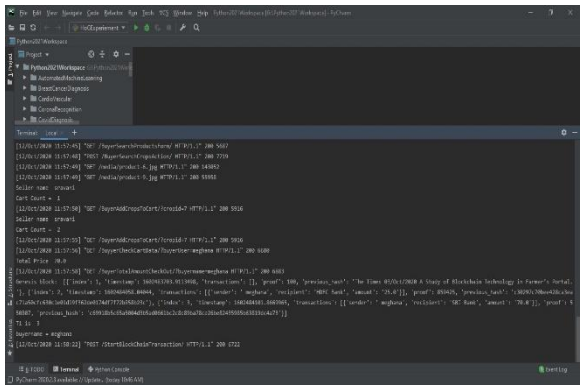

Fig Blockchain Transaction

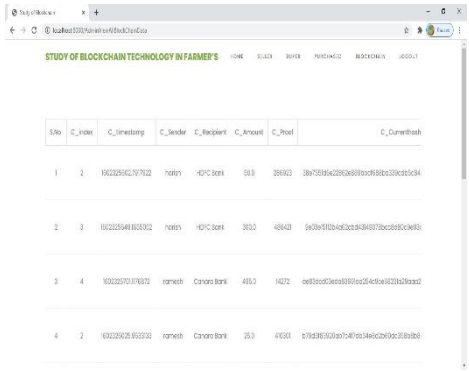

Fig Admin View Blockchain Transaction

VII. CONCLUSION

Block chain 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 block chain-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 block chain 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 block chain technology will fortify farmers to get a legitimate price of crop and reduce the cost of operation for selling and buying crops when compared to traditional methods. . A portal is planned on that a farmer can register and sell his crops, recording a dealing on a blockchain. This dealing is capable of recording crop details, the price at that it's committed to purchasing and amount of crop purchased.

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