



## FARMER'S PORTAL: A STUDY OF BLOCK CHAIN TECHNOLOGY

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### ABSTRACT:

Block chain is a technique that uses a cryptocurrency to maintain a record of a transaction's confirmation. The record is kept across several computers connected by a peer-to-peer network. The economic system of a nation is defined by contracts, transactions, and the records of those activities. They define limits and provide the assets security. This study emphasises the use of block chain technology with farmer's site that maintains the footage of selling and purchasing information of crops, taking into account the characteristics of block chain such as immutability and keeping the footage of transaction data. Python is a programming language that is integrated with the block chain system in the suggested solution, which would help farmers, vendors, and individuals by maintaining the contract of trade. Block chain technology and the Python programming language are used to create an interface for farmers that stores data on the seller, the buyer, the selling and purchasing of an item, as well as the overall value of the transaction.

**Keywords:** Block chain, Digitization, Crypto-currency, Immutability, Public-ledger, ICT, Farmer's Portal.

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### [1] INTRODUCTION

Block chain is an accessible, decentralised, and open ledger that may competently record transactions involving two parties in a verifiable and stable manner (Iansiti, Lakhani 2017). In the definition above, "open" refers to the block chain being accessible to all, "disseminated" refers to having no single party in control, "decentralised" refers to having no central third party available, "capable" refers to being faster and more scalable than conventional technologies, "confirmable" refers to everyone being able to verify the accuracy of the information, and "stable" refers to the data being almost immutable, or almost impossible to change or tamper. They confirm and certify the individuals' identities and the timeline of events. They serve as the foundation for all decisions and interactions among people, groups, organisations, and nations.

The block chain is the answer to changing how these types of data are handled and governed in this digital age while also making them extremely secure.

A farmer's portal has always benefited farmers in the age of information and communication technology by making information accessible and convenient for them [1]. The Indian government has also launched many efforts in this regard. These websites include Krishijagran.com, farmer.gov.in, agricoop.nic.in, and agriwatch.com, among others. In addition to these, there are other E-commerce websites, such as fert.nic.in and enam.gov.in. The industries currently utilising block chain technology are depicted in Fig. 1. By utilising block chain technology, a decentralised platform for computation and information sharing can be made available, allowing multiple authoritative domains that do not trust one another to cooperate, coordinate, and work together in a rational decision-making process. Since block chain functions like a public ledger, it may be used to guarantee a variety of various things, including [3]:

- Commitment Protocols: Ensure that each legitimate client transaction is committed and added to the block chain within a set amount of 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.

One of the most important components of how block chain technology works is cryptography [4]. The foundation of block chain wallets and transactions is public key encryption, hash functions in cryptography give them the property of immutability, and merle trees organise transactions while making block chain more effective.

Numerous projects have been worked on in the block chain industry to ensure the aforementioned factors. The gateway that is being offered is an improvement over them. For farmers, maintaining a safe platform where they may transact electronically with clients might be helpful. This study's primary goal is to document safe transactions between buyers and sellers that support a binding contract between them. This might aid farmers in obtaining a fair price for their product. The solution also makes it possible to record the entire trading transaction in one location.

Information accessibility and availability are key factors in making the best decision at the appropriate moment. Modern ICT advancements enable the retrieval of virtually any information from the worldwide repository (internet). The majority of the material on the internet is kept in English. As a result, a sizable population is denied the advantages of the internet owing to technical and English language illiteracy. In a growing nation like India, where roughly 76% of the population is illiterate in English 1, this situation is exceedingly problematic. In addition, many English-literate people struggle to discover the information they need in the vast internet database because they don't know it well enough. Indian farmers are among the folks that lack a lot of technical and English language proficiency.

As a result, they are unable to acquire the necessary information from the internet on the farming life cycle, seed selection, pesticides, market pricing, etc. As a result, they are unable to make the best choices at various points in the farming life cycle, which have a significant influence on the farmer's income. The prevalence of suicide among the Indian rural population has therefore quickly grown. The findings state that those sad instances were primarily brought on by their aggravation at not being able to pay their obligations. Situations of this nature have a significant influence on the agriculture industry. As a result, the younger generation is no longer focused on the farming industry, which poses a threat to India's immediate future. Our early research shows that in order for farmers to make the best decisions, they need knowledge at the appropriate time in the farming life cycle [1]. Farmers are unable to access this information online due to their lack of technological and English literacy. Recently, certain websites that accept UTF-8 encoding<sup>3</sup> have made it possible for people to use the internet in languages other than English. Examples include Wikipedia and the Indian Railway website. However, it has been noted that information is not very helpful to those who lack basic internet and online surfing skills [2]. Additionally, attempts of this nature are useless to the uneducated. Many members of the Indian farming population are

illiterate, even in their own tongue. Therefore, it is clear that text-based interfaces are unable to offer the necessary information since they do not support the farmer's native language. According to the circumstances above, a different type of interaction strategy is needed (s). Plauché et al. suggested a speech-driven agricultural enquiry system for the Indian state of Tamil Nadu in light of this reality [3]. But this initiative is unable to solve the situation in all of India. Small-scale farmers in Gujarat, India, can use an interactive speech programme created by Patel et al. [4]. It does not, however, offer a facility to search for specific topic material. There, the user must respond to the questions in order, beginning with the most recent. The user cannot skip any of the questions. Furthermore, since the questions are answered by other users, there is no assurance that the response will be accurate. Additionally, this investigation is restricted to a certain region of India. Recent research has suggested using expert system-based text animation to diagnose the most prevalent ailments affecting Indian mangoes [5]. For a simpler comprehension of the illness symptoms, this work also employs a picture-based approach in conjunction with the text inquiry. It is a nice initiative for Indian farmers, however it is only applicable to one type of fruit. Another noteworthy project was GappaGoshti, a mobile-based multimedia social networking platform developed by Lobo et al. [6] for the exchange of information and advice. For the Indian common man, Ramamritham et al. [7] create a bilingual, multimedia-based online forum. However, compared to the internet, such forums and social networking sites only offer a small amount of information. Additionally, the content's quality could not be up to par, making it impossible for those who lack literacy to use it for any information. Samanta et al. [2] developed a multimodal interface for the average Indian to get beyond the barrier of illiteracy. The work's iconic component, however, has nothing to do with agriculture. The requirement for a systematic strategy to provide precise information about agricultural opportunities is also highlighted in other publications [8, 9,12,13,14,15,16,17,18]. Additionally, it's crucial to understand the farmers' motivations for obtaining the information in addition to simply delivering it to them [10]. All of the aforementioned findings encourage us to carry out in-depth study to create an interface for the Indian farmer community that will be more accessible, organised, and necessary for them regardless of language and technological skill. Here, we suggest an iconic interface combined with a text-to-speech (TTS) engine allowing the Indian farmer community to access agricultural data from the internet's worldwide library. In order to obtain urgent information without connecting to the internet, we also integrate a local repository with the interface.

## [2] LITERATURE SURVEY

Rapid development in the ICT sector benefits humankind's fundamental needs, such as agriculture, education, healthcare, etc. However, the community of a small number of individuals who reside in digital pockets is the only one benefiting from the sluggish technological progress of ICT applications. People who lack literacy, such as farmers and shopkeepers, are unable to benefit from the ICT revolution. The UNESCO research estimates that 64% of the world's population is unable to utilise technology due to a linguistic or technical barrier. In addition, the figure of 76% has to be raised in the case of emerging nations. A farmer can utilise the most important agricultural information to make informed decisions, thus we suggested creating an iconic interface with speech-based interaction in Indian languages. The planned interface is subjected to a rigorous evaluation by farmers from various Indian states. The evaluation's findings demonstrated how well the suggested interface worked.

Agriculture-related information and communication technology (ICT) is a new area that aims to advance rural and agricultural development in India. It entails cutting-edge ICT applications for rural areas. The development of ICT may be used to offer farmers fast, accurate, and relevant information and services, creating the conditions for profitable agriculture. In this paper, a mobile application for farmers is described that will support them in their farming endeavours. We suggest the Android-based smartphone application *Krishi Ville* to handle agricultural news updates, weather prediction updates, and updates for various agricultural commodities. The application was created with Indian agriculture in mind [19,20,21,22,23].

For the purpose of guaranteeing food safety, agricultural goods' provenance (tracing) systems are crucial. However, the stakeholders (growers, farmers, merchants, etc.) are many and geographically distributed, making centralized data management challenging. As a result, trust cannot easily be established and the

production process stays opaque. In order to address the trust issue in the supply chain for goods, we suggest in this study a block chain-based agricultural provenance system that is characterized by decentralization, collaborative maintenance, consensus trust, and trustworthy data. The management activities (such as fertilization, irrigation, etc.) with a certain data structure are included in the recorded information. Block chain technology's application area is expanded by using it to track the origin of agricultural products, and it also helps to create a trustworthy community among various agriculture production players[24,25,26,27,28,29].

Bitcoin revolutionised the field of digital currency and had a significant impact on several adjacent fields in addition to drawing a billion dollar economy. Additionally, this generated a lot of scientific curiosity. We roll up and organise the varied results and study directions in this survey. We begin by outlining the Bitcoin protocol and its fundamental components. From there, we review previous contributions and outcomes as we continue to explore the design space. We derive the essential principles and ideas that underlie the Bitcoin protocol and its uses in the process. As we demonstrate and debate, many important concepts have applications in many other areas, thus their influence extends well beyond Bitcoin.

To make the best decisions possible, farmers need information at every stage of the farming life cycle. Along with existing knowledge, real-time (dynamic) information such as market pricing and production levels are also necessary. Government entities provide some important information that farmers need and make it available in a variety of formats and locations. Despite the fact that farmers are the most significant stakeholders in agriculture, nothing has been done to give them access to the crucial information in real time. Farmers are having a lot of trouble since they can't make the best decisions for their farming operations due to a lack of knowledge. We have determined the official sources where the information is accessible and the information that farmers need at different phases of the farming cycle through field research. Next, we created a model of information flow that links different information sources with farmers' information requirements. Based on these discoveries, we are currently creating a mobile phone-based information system to provide farmers with the necessary information in real time.

### [3] SYSTEM ARCHITECTURE

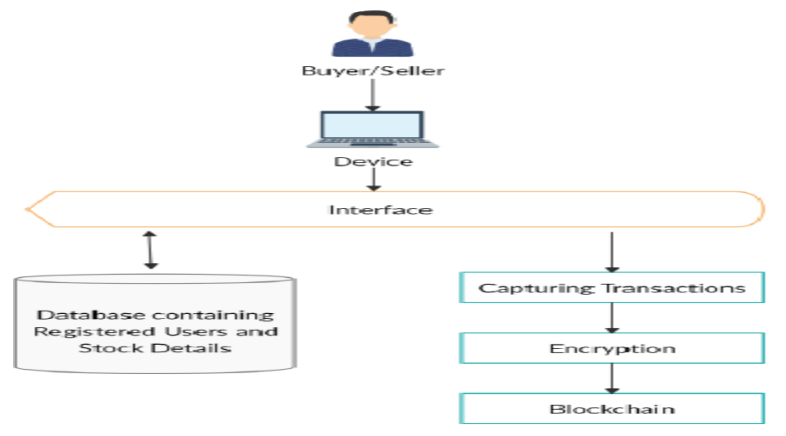


Fig. 1 Block Diagram of Proposed Work

### [4] IMPLEMENTATION

#### 4.1 MODULES DESCRIPTION

i) **Sellers:** The first can be registered by the seller user. He needed a working user email and cell phone upon registration for more conversations. Admin can activate the Sellers once the user registers. Sellers can log into our system when admin has activated them. The seller can allocate and change the price of the

item, add a new item, and edit the current products. In addition to extending the market, it will cut out the middlemen.

**ii) Buyers:** The first can be registered by the seller user. He needed a working user email and cell phone upon registration for more conversations. Admin can activate the Sellers once the user registers. Sellers can log into our system when admin has activated them. The consumer has the option to purchase a product and may search for any goods based on their needs. They can put the item in their cart and remove crop from it. The consumer may check out after deciding the item to purchase and confirming their cart.

**iii) Admin:** With his login information, Admin may log in. He may activate the vendors and buyers after he logs in. Only our applications allow the enabled user to log in. The admin user has access to every transaction made by the buyer user. You may examine all block chain transactions, together with the previous block's information and hash values, in the admin frame.

**iv) Block chain:**

Each time a new item is introduced or a purchase is made, it is regarded as a transaction and uploaded to the block chain in accordance with the proper date and unique digital signature, preventing any other user from disputing the activity. Everyone on the network can see every single one of these transactions. The block chain uses data encryption, time stamping, and consensus to enable peer-to-peer transactions based on distributed node networks. Since the data is unchangeable, visible, and available to everyone, it increases the security of the portal.

## 4.2 Screenshots

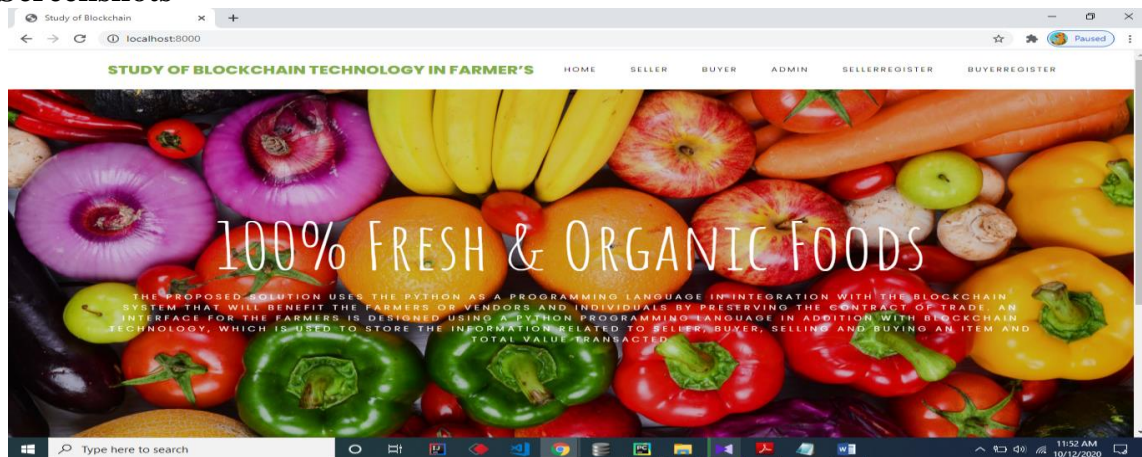


Fig. 2 Homepage

Home Page contains some menus like Home, Seller, Buyer, Seller register, Buyer register.

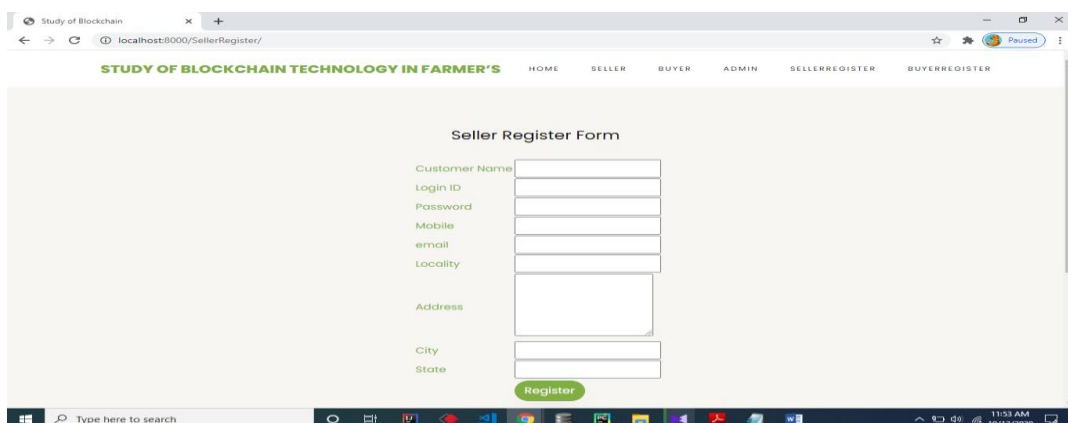


Fig. 3 Seller Registration

The Seller registration contains Seller registration form, it consists customer name, login id, password, email, etc.



**Fig. 4 Buyer Registration**

The Buyer registration contains the Buyer registration form, which consists of customer name, login id, password, email, etc.



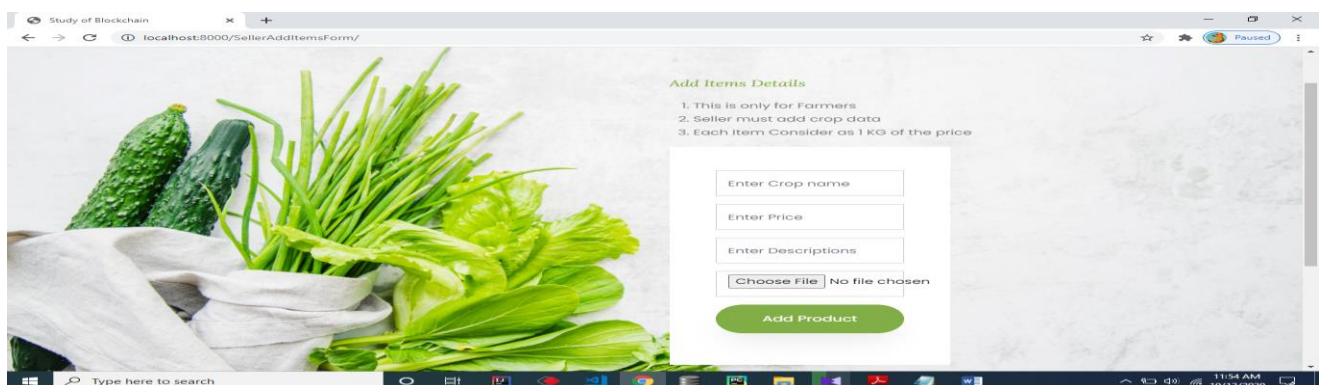
**Fig. 5 Seller Login**

The Seller login consists of Seller's login id and password.



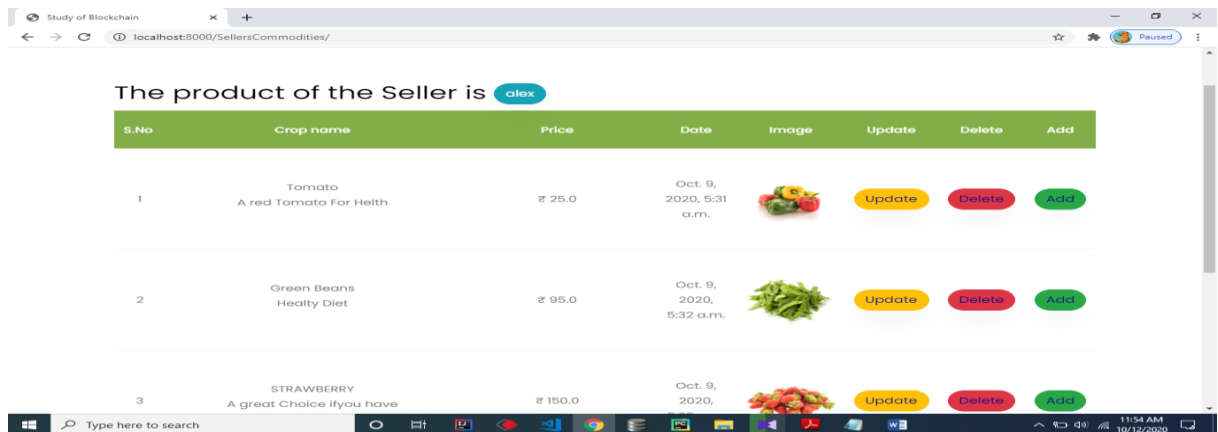
**Fig. 6 Seller Home**

The Seller Home consists of details of seller and it contains some menus like home, add item, commodities, view cart, logout.



**Fig. 7 Seller Adding crops Details**

In the above screen the seller adds the crop details and it consists of crop name, price.



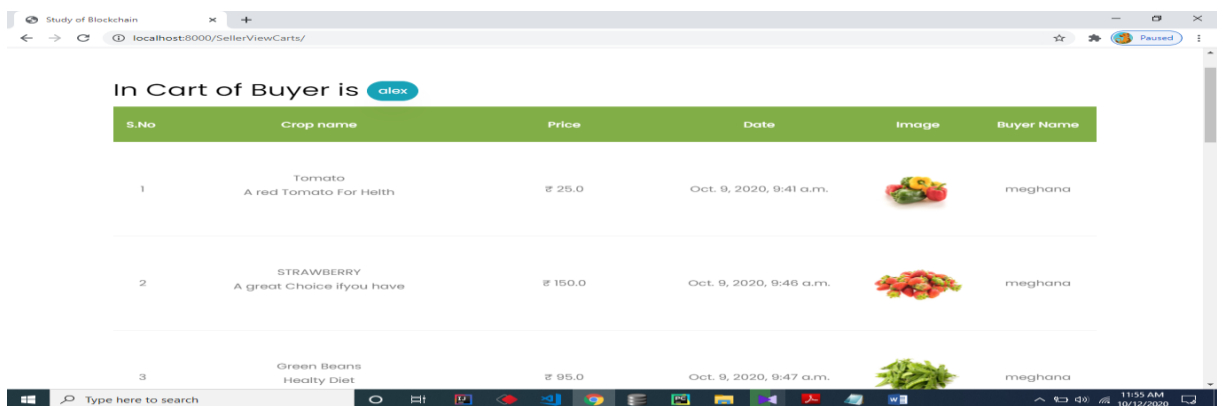
**Fig. 8 Seller Commodities**

The Seller Commodities contains the details of seller.



**Fig. 9 Updating Crops**

In the above screen the seller will update the crop details.



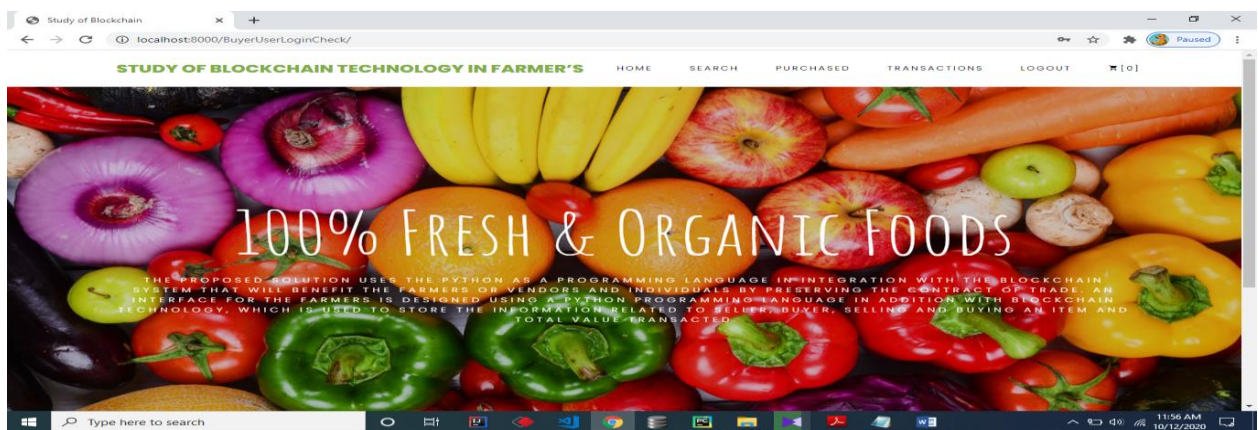
**Fig. 10 User View In Cart**

In the above screen it view the buyer's cart.



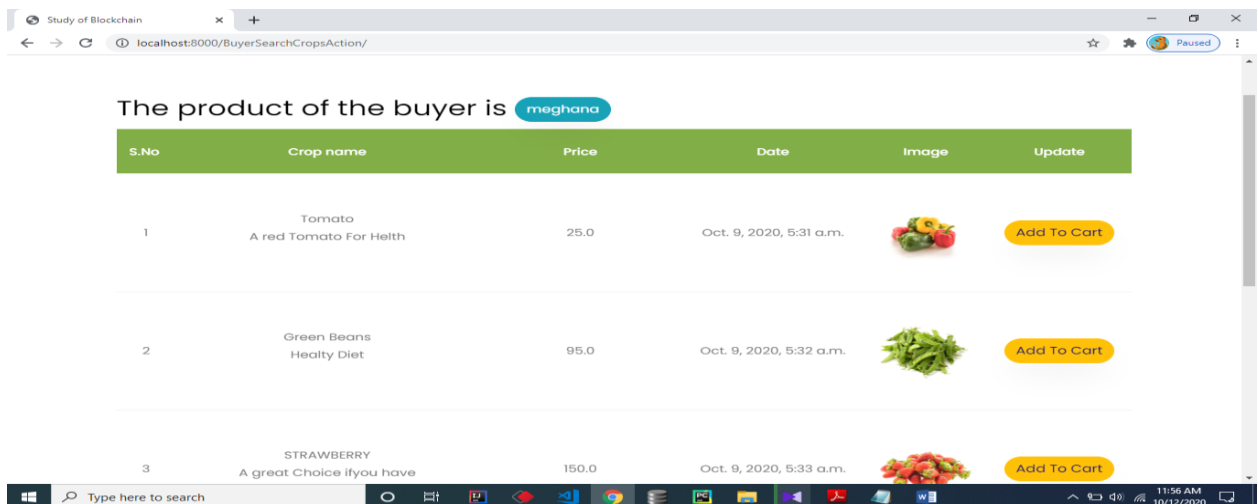
**Fig. 11 Buyer Login**

The Buyer login consists of Buyer's Login id and password.



**Fig. 12 Buyer Home**

The Buyer home consists of some menus like home, search , purchased , Transactions , Logout.



**Fig. 13 Search Results**

In the above screen it searches the results of buyer.



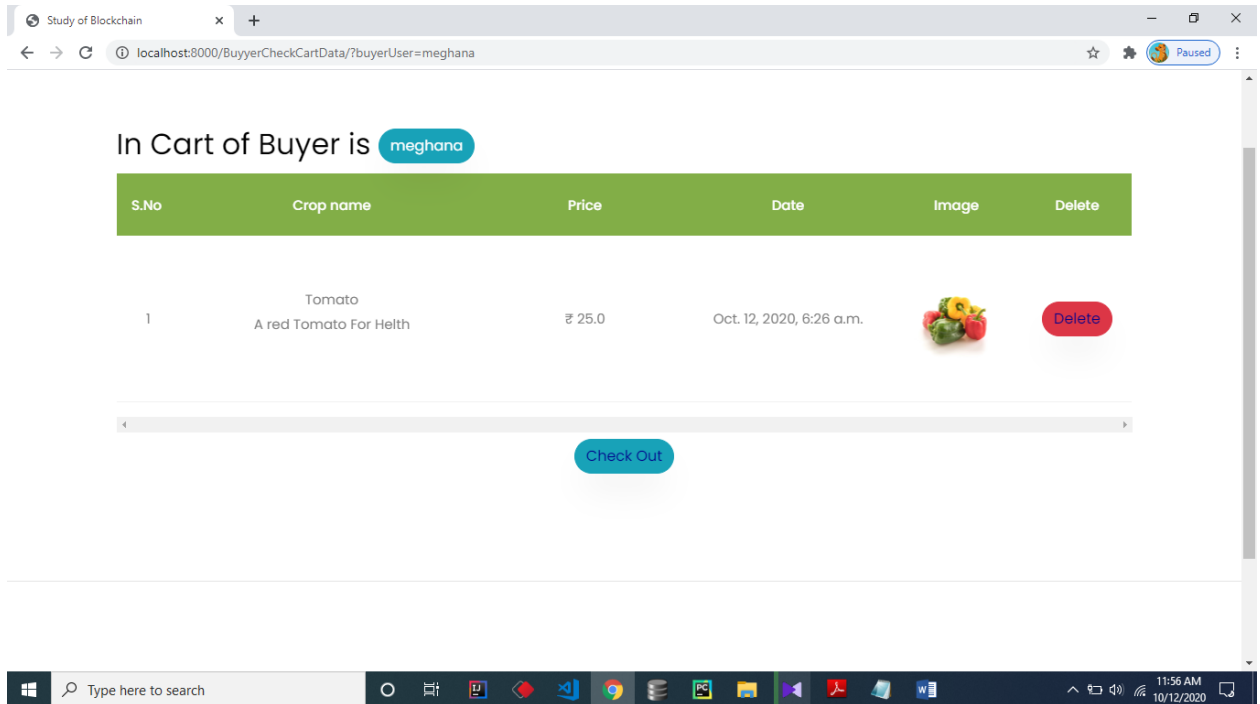


Fig. 14 Buyer Cart View

The Buyer cart view shows the items in the cart.

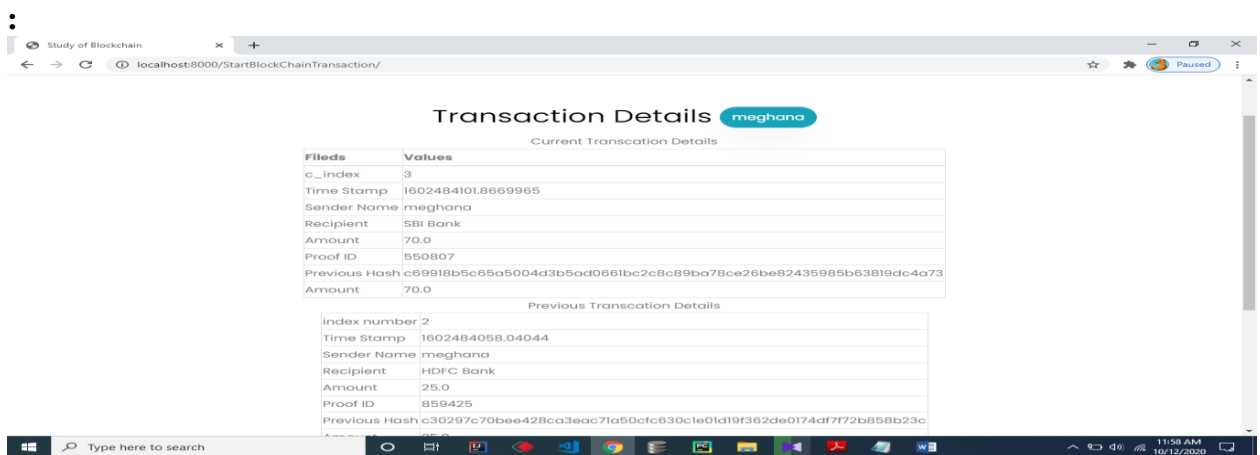


Fig. 15 Block chain

In Block chain it views the transaction details of buyer.

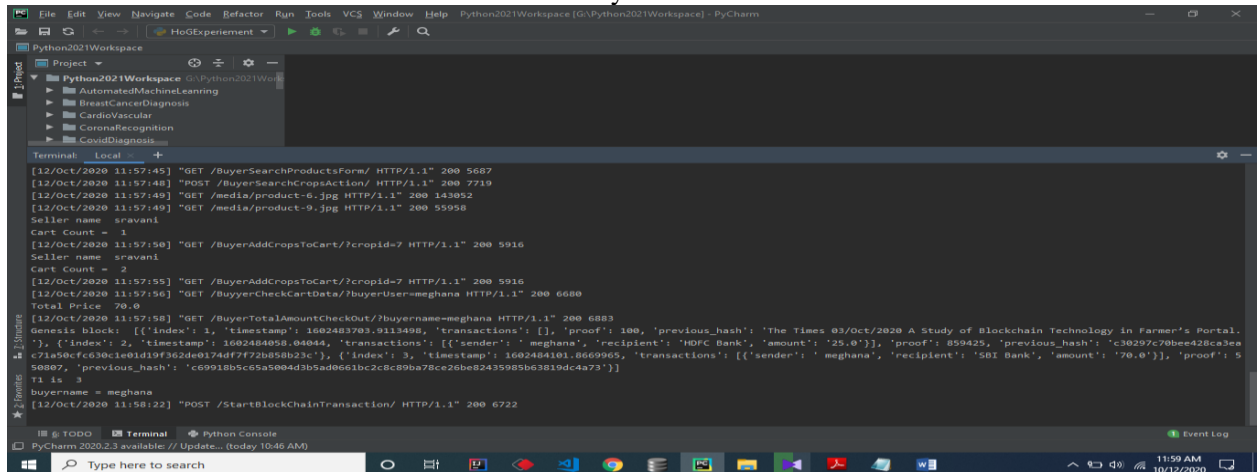


Fig. 16 Block chain Transaction

In the above screen it views the transaction details in Block chain.

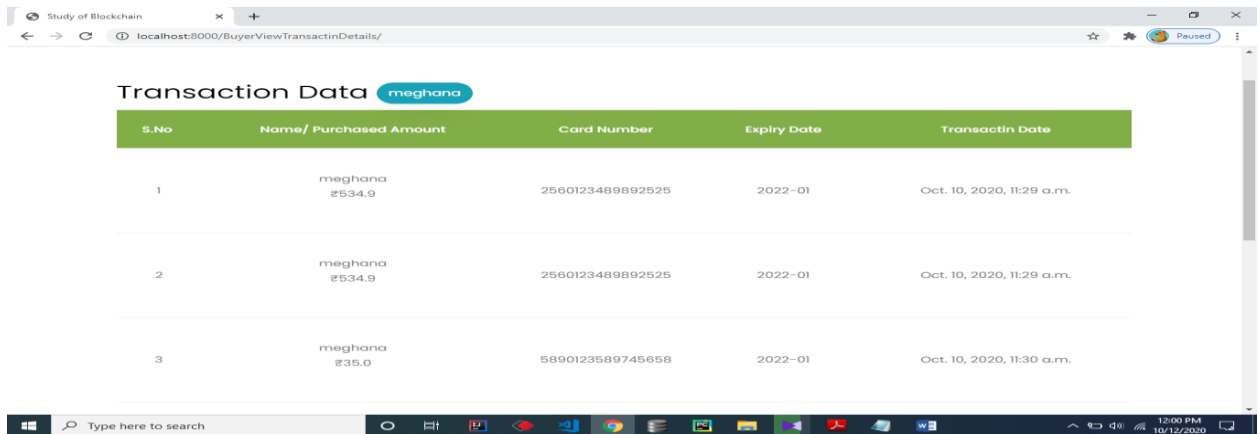


Fig. 17 Buyer View Transaction

In the above screen it views the transaction details of Buyer.

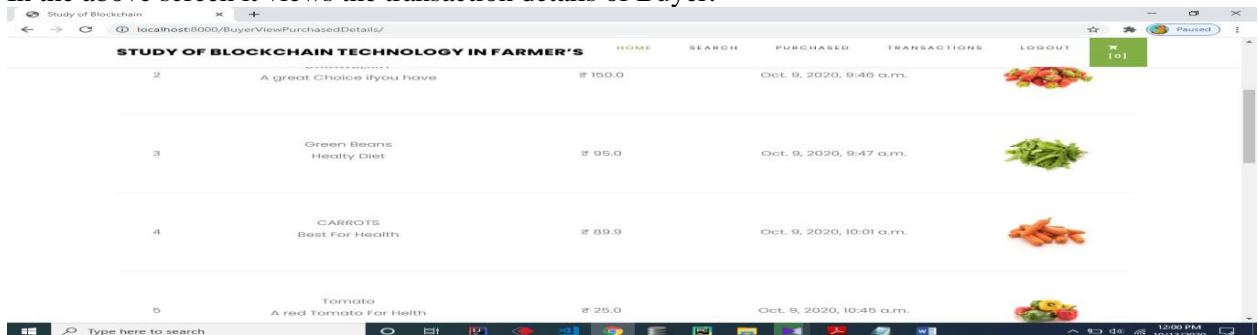


Fig. 18 Purchased Crops

In the above screen it views the details of purchased crops.

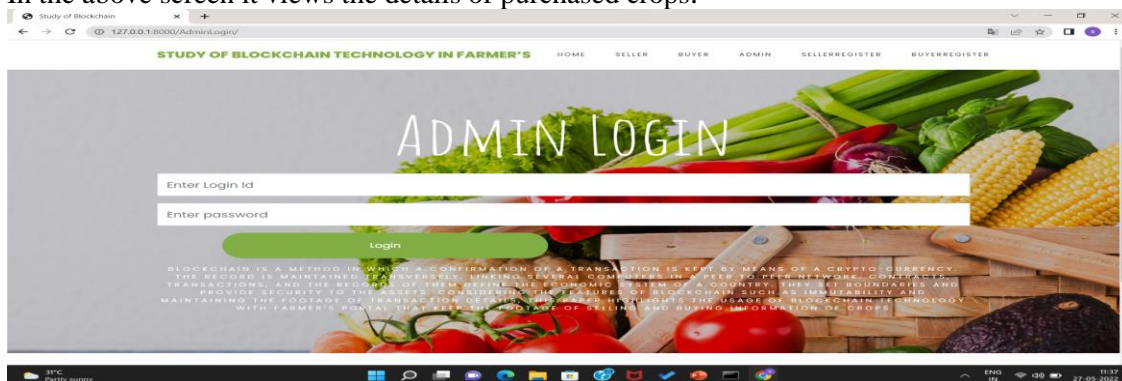


Fig. 19 Admin login

In the above screen the admin logs in by using login id and password.



Fig. 20 Admin home

The admin Home consists of home , seller , buyer , purchased , block chain , logout.

S.No	C_Index	C_timestamp	C_Sender	C_Recipient	C_Amount	C_Proof	C_Currenthash
1	2	1602325602.7917922	harish	HDFC Bank	50.0	286923	38e7551d6e22862e889bbcf688ba339cdbc5c84
2	3	1602325649.1655002	harish	HDFC Bank	300.0	486421	9e03e15112b4a62cbd43149078bcc8d80c9e93c
3	4	1602325701.1176872	ramesh	Canara Bank	495.0	14272	ae83dcd03eda83691aa254c9ce68231a29aac2
4	2	1602326025.9633133	ramesh	Canara Bank	25.0	410301	b79d3f83920ab7c4f7db34e8d2b60dc358b8b8

**Fig. 21 Admin View Block chain Transaction**

The above screen views the block chain transaction details of buyers.

S.No	Name	Login ID	Mobile	Email	Locality	Status	Activate
1	Meghana	meghana	9566088897	arumallameghana@gmail.com	Vijayawada	activated	Activated
2	Harish	harish	9568878789	harishgangishetty@gmail.com	Markapuram	activated	Activated
3	Ramesh	ramesh	9849045458	rameshsrc@gmail.com	Godavarikhani	activated	Activated

**Fig. 22 Admin Activate Buyers**

In the above screen admin activates the new buyers.

S.No	Name	Login ID	Mobile	Email	Locality	Status	Activate
1	alex	alex	9849098490	lx160cm@gmail.com	Hyderabad	activated	Activated
2	Sagar	sagar	9700596968	marrisagar21@gmail.com	Godavarikhani	activated	Activated
3	sravani	sravani	9849012345	sravanisravs@gmail.com	Warangal	activated	Activated

**Fig. 23 Activating Sellers**

In the above screen admin activates the new sellers.

**[5] CONCLUSION**

In the world of agriculture, block chain technology has the potential to bring about a dramatic improvement in the areas of securely keeping farmer data, guaranteeing the purity of seed, monitoring soil moisture content, data on crop production, and ultimately demand and sale price of crops. In this piece, a block chain-based portal is suggested to address the problem of agricultural demand and selling prices, which would ultimately assure crop security for farmers and a just price for the commodity.

For this, a portal is suggested where a farmer may list and sell his crops, recording a transaction on a block chain when buyers formally agree to purchase a farmer's product. This transaction has the ability to record crop information, the price at which it has made a purchase commitment, and the quantity of crop bought. When compared to conventional techniques, the irreversible nature of block chain technology will strengthen farmers' ability to obtain a fair crop price and lower operating costs for selling and buying crops. The government and its affiliated bureaus may develop some sort of portal to assure advancement in crop growing and trade, which would raise the status of the country's farmers. This application may be improved by incorporating block chain into a wider range of applications and consolidating it into a single, essential gateway for farmers. This can be accomplished by adding buyer data to the block chain, farmer crop specifics to the block chain, new features and services to the one portal, and uniting all relevant resources for the nation's farmers under one sui generis umbrella. With the right infrastructure in place and secure video connections, problems with information integrity and precision may be resolved utilising open, secure, and trustworthy technologies. The information veracity in the video was not guaranteed by block chain technology. Thus, block chain implementation faces a number of obstacles that may call for the assistance of a crucial authority or a secured record of validation.

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