

A MINI PROJECT REPORT

A STUDY OF BLOCKCHAIN TECHNOLOGY IN FARMER'S PORTAL

A Mini Project report submitted in partial fulfillment of the requirements for the degree of Bachelor of Technology in Information Technology

by

| | |
|-----------------------|---------------------|
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MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

Autonomous Institution, UGC, Govt. of India

Accredited by NBA & NAAC with 'A' Grade

NIRF Indian Ranking, Accepted by MHRD, Govt. of India

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Maisammaguda, Dullapally(post), Secunderabad , TELANGANA

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DEPARTMENT OF INFORMATION TECHNOLOGY

CERTIFICATE

This is to certify that the Mini Project work entitled “**A STUDY OF BLOCKCHAIN TECHNOLOGY IN FARMER’S PORTAL**” is carried out by **G.Archana (20RH1A1262), K.Rashmika (20RH1A1276), K.Spandana (20RH1A1296), CH.Naga Manasa (20RH1A12B8)** in partial fulfillment for the award of degree of **BACHELOR OF TECHNOLOGY** in **Information Technology** to Malla Reddy Engineering College for Women, Maisammaguda, Secunderabad, during the academic year 2023-2024 is a record of bonafide piece of work, undertaken by the supervision of the undersigned.

Guide Signature

Head of the Department

EXTERNAL

MINI PROJECT COMPLETION CERTIFICATE

*This is to certify students undergone B.Tech M Project at **R TECHNO SOLUTIONS**, Hyderabad. The project entitled “A STUDY OF BLOCKCHAIN TECHNOLOGY IN FARMER’S PORTAL”*

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*Above Student record of the bonafide work undertaken by his/her towards partial fulfillment of the academic requirements for award **B.Tech** in IT from **MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**. He/she has completed the B.Tech Mini Project work from excellently.*



Managing Director
R TECHNO SOLUTIONS



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DECLARATION

We **'G.Archana (20RH1A1262), K.Rashmika (20RH1A1276), K.Spandana (20RH1A1296), CH.Naga Manasa (20RH1A12B8)'**, are students of **' Bachelor of Technology in Information Technology'**, session: **2023 – 2024**, Malla Reddy Engineering College for Women, Maisammaguda, Secunderabad, hereby declare that the work presented in this Project Work entitled **'A Study Of Blockchain Technology In Farmer's Portal'** is the outcome of our own bona fide work and is correct to the best of our knowledge and this work has been undertaken taking care of Engineering Ethics. It contains no material previously published or written by another person nor material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

Date:

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ACKNOWLEDGEMENT

We feel ourselves honoured and privileged to place our warm salutation to our college **Malla Reddy Engineering College for Women** and Department of **Information Technology** which gave us the opportunity to have expertise in engineering and profound technical knowledge.

We would like to deeply thank our Honourable Minister of Telangana State **Sri.Ch. Malla Reddy Garu**, founder chairman MRGI, the largest cluster of institutions in the state of Telangana for providing us with all the resources in the college to make our project success.

We wish to convey gratitude to our **Principal Dr. Y. Madhavee Latha**, for providing us with the environment and mean to enrich our skills and motivating us in our endeavor and helping us to realize our full potential.

We express our sincere gratitude to **Dr. Subba Reddy Borra, Professor and Head, Department** of Information Technology for inspiring us to take up a project on this subject and successfully guiding us towards its completion.

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We would like to thank our internal guide **Mrs.B.Prathyusha**, and all the Faculty members for their valuable guidance and encouragement towards the completion of our project work.

With regards and Gratitude

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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 transacted.

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1.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 information 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, communities, organizations and nations as well. In this era of digitization, 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.

- **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 merkle trees systematize transactions while enabling blockchain to be more competent.

2.SYSTEM ANALYSIS

2.1 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 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.

DISADVANTAGES OF EXISTING SYSTEM:

- Transaction depends on third party.
- Data stored in local servers it means data may be not secure.

2.2 PROPOSED SYSTEM:

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.

User: A user can be a buyer or a seller. The seller may be a farmer or a representative of him.

Device: The user can interact through the portal using a computer or a laptop. **Interface:** To access the portal, the user needs to register using a sign-up. The registered user logs in using the correct credentials. Once the user signs in successfully. The user will have access to the portal/interface. A user can view available items that are crops and seeds with their price.

ADVANTAGES OF PROPOSED SYSTEM:

- The buyer can buy a product and can search for any product according to the requirement. They can 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 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.

2.3 FEASIBILITY STUDY

The feasibility of the project is analyzed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. For feasibility analysis, some understanding of the major requirements for the system is essential.

Three key considerations involved in the feasibility analysis are,

- ☐ ECONOMICAL FEASIBILITY
- ☐ TECHNICAL FEASIBILITY
- ☐ SOCIAL FEASIBILITY

3.SYSTEM REQUIREMENT

The project involved analyzing the design of few applications so as to make the application more usersfriendly. To do so, it was really important to keep the navigations from one screen to the other well ordered and at the same time reducing the amount of typing the user needs to do. In order to make the application more accessible, the browser version had to be chosen so that it is compatible with most of the Browsers.

REQUIREMENT SPECIFICATION**3.1 Functional Requirements**

- ☐ Graphical User interface with the User.

3.2 Software Requirements

For developing the application the following are the Software Requirements

1.Python

2.Django

Operating Systems supported

Windows 10 64 bit OS

Technologies and Languages used to Develop

Python

Debugger and Emulator

Any Browser (Particularly Chrome)

3.3 Hardware Requirements

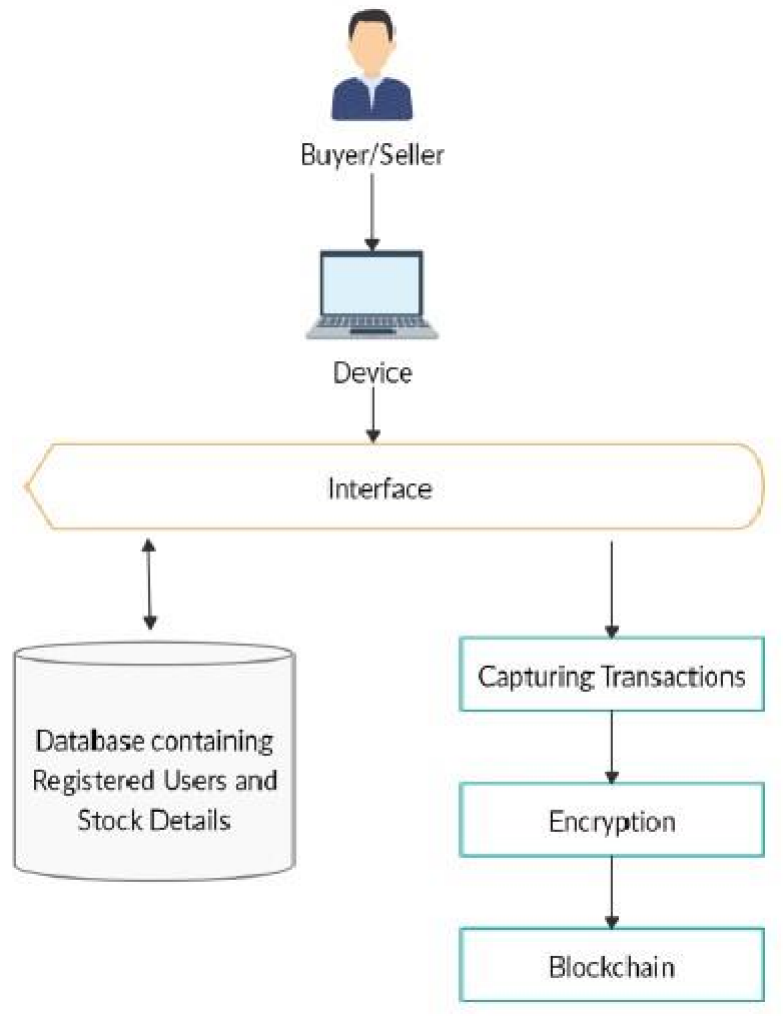
Processor: Intel i3

RAM: 8 GB

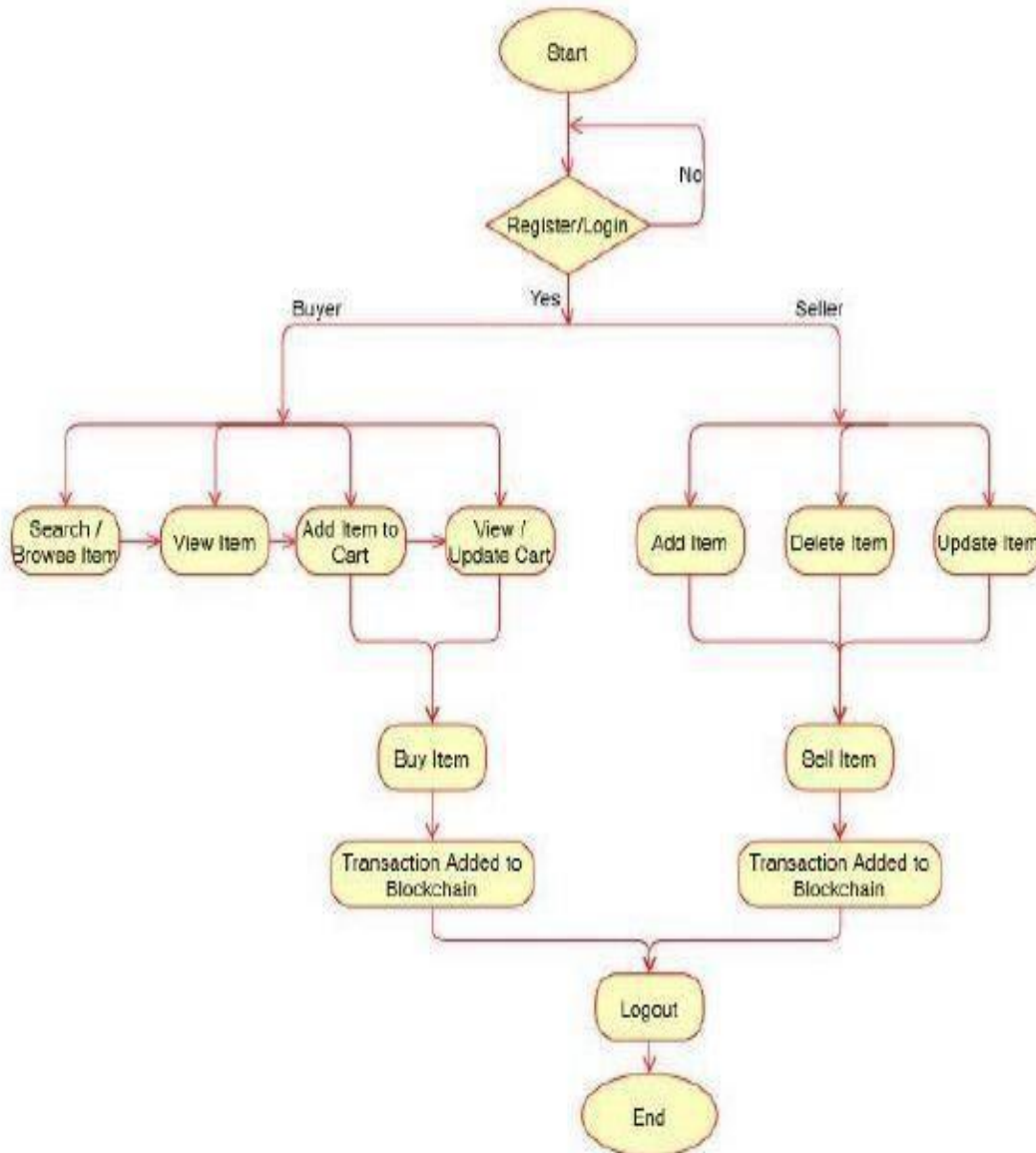
Space on Hard Disk: minimum 1 TB

4.SYSTEM DESIGN

4.1 SYSTEMARCHITECTURE:



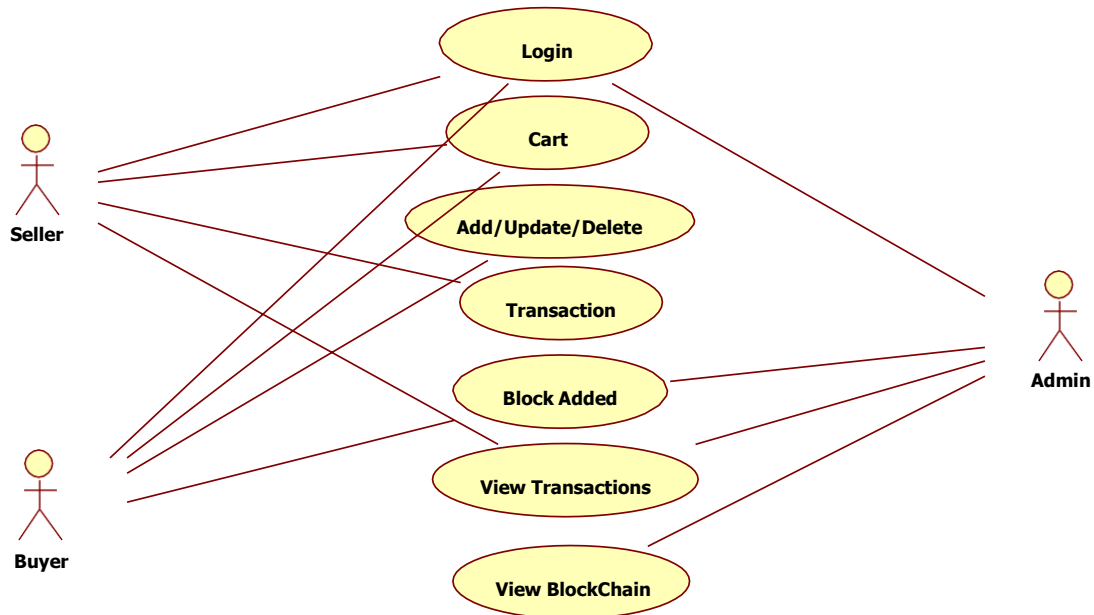
4.2 DATA FLOW DIAGRAM:



5.UML DIAGRAMS

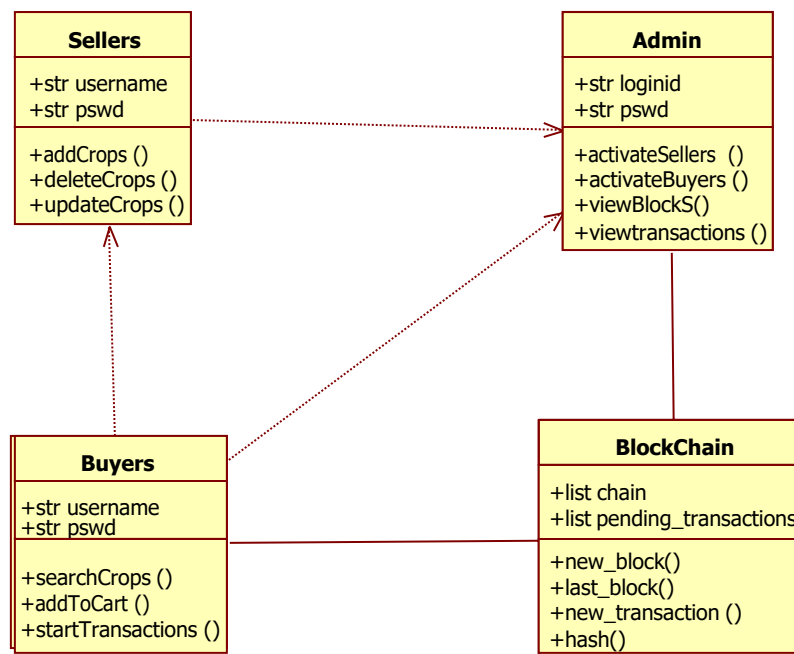
5.1 USE CASE DIAGRAM:

A use case diagram in the Unified Modeling Language (UML) is a type of behavioral diagram defined by and created from a Use-case analysis. Its purpose is to present a graphical overview of the functionality provided by a system in terms of actors, their goals (represented as use cases), and any dependencies between those use cases. The main purpose of a use case diagram is to show what system functions are performed for which actor. Roles of the actors in the system can be depicted.



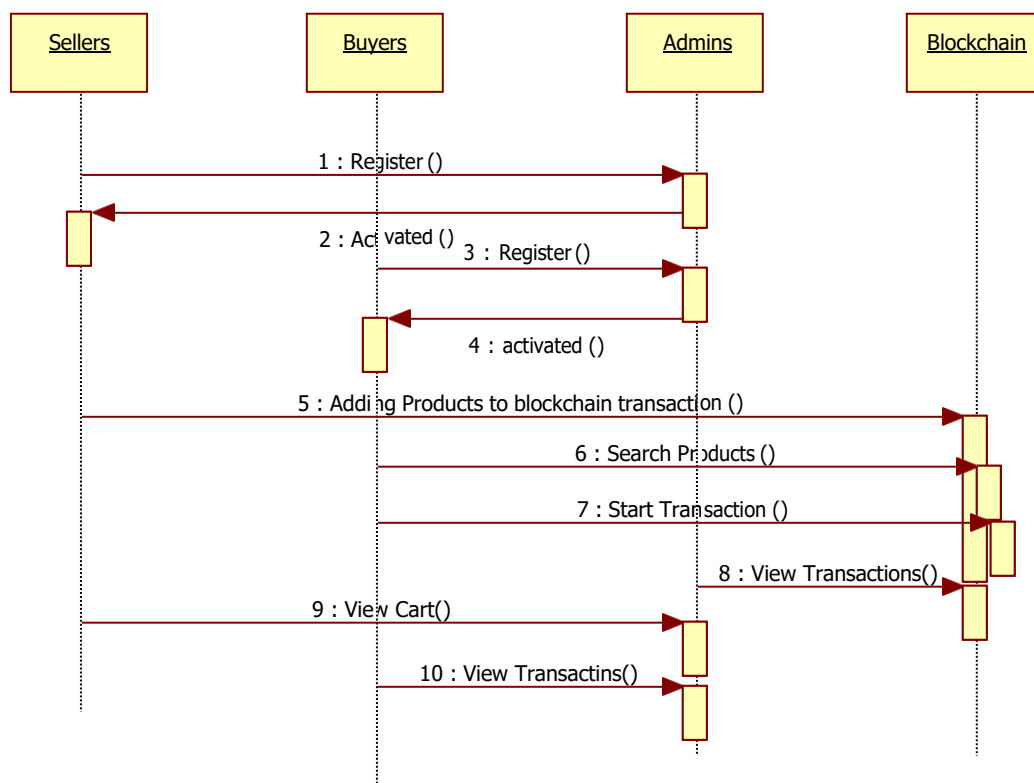
5.2 CLASS DIAGRAM:

In software engineering, a class diagram in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among the classes. It explains which class contains information.



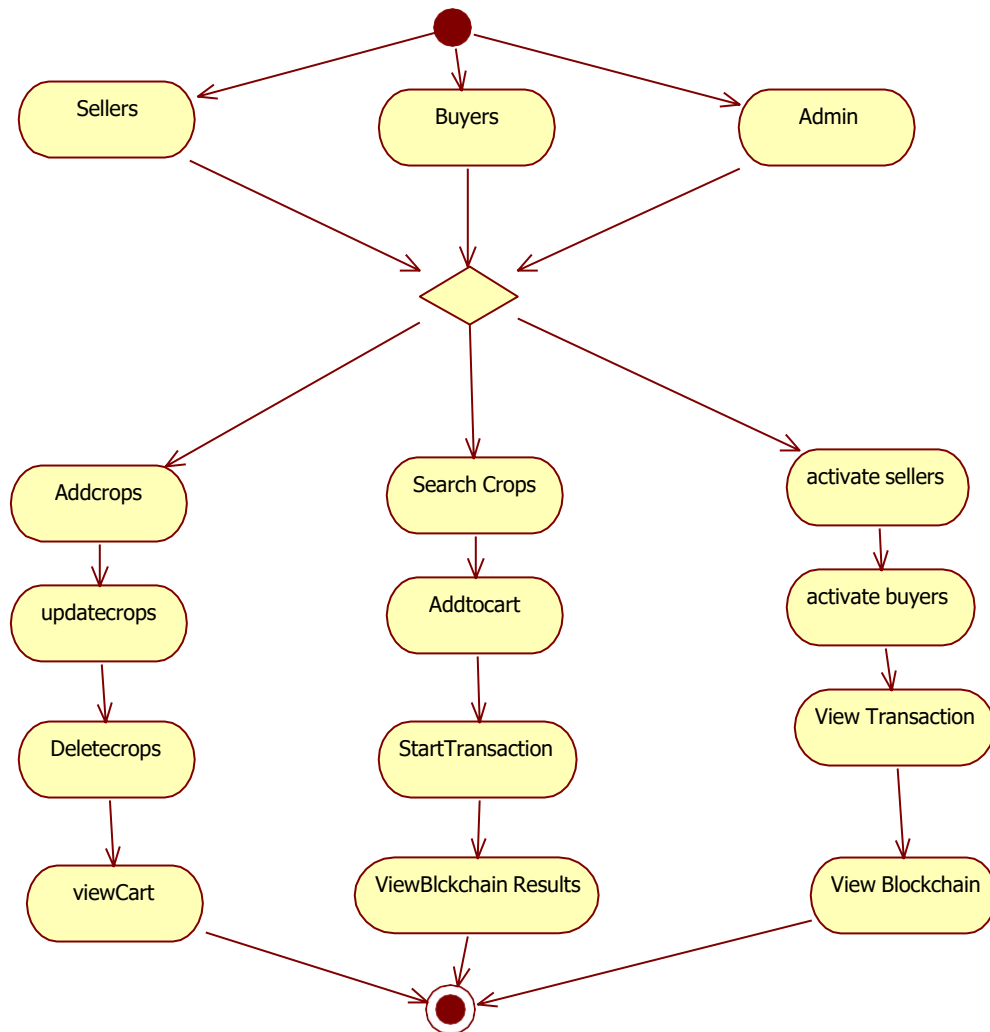
5.3 SEQUENCE DIAGRAM:

A sequence diagram in Unified Modeling Language (UML) is a kind of interaction diagram that shows how processes operate with one another and in what order. It is a construct of a MessageSequence Chart. Sequence diagrams are sometimes called event diagrams, event scenarios, and timing diagrams.

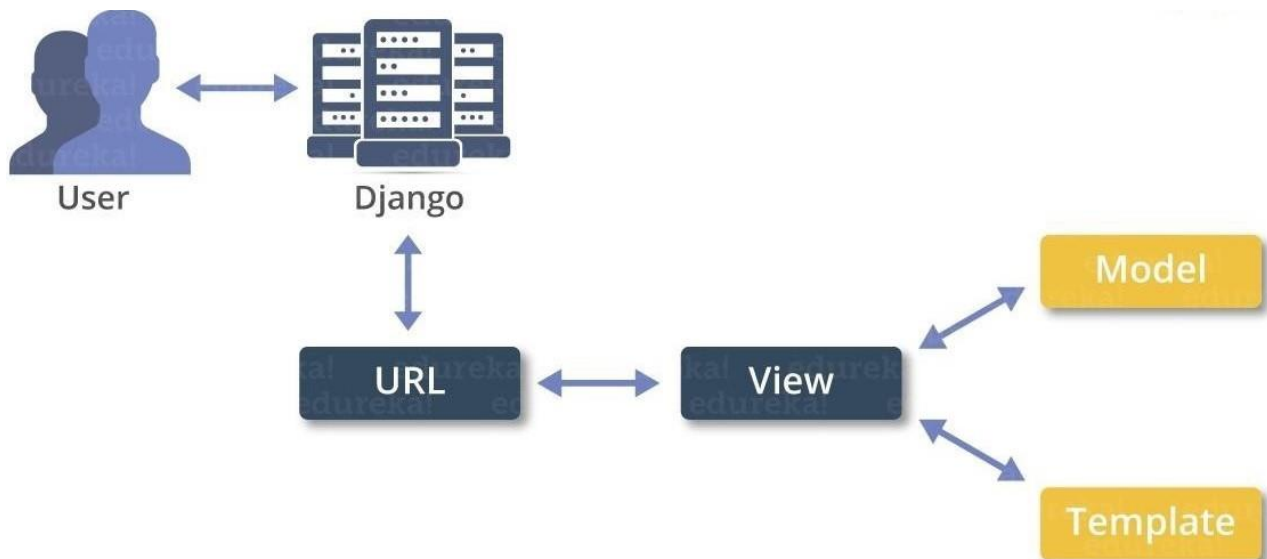
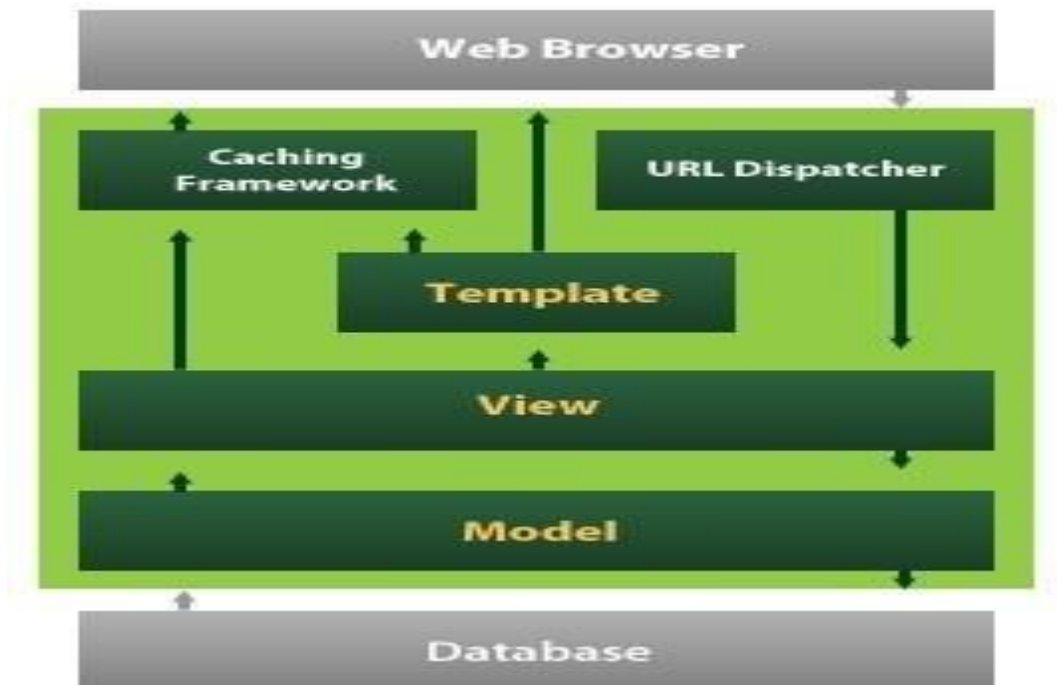


5.4 ACTIVITY DIAGRAM:

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. In the Unified Modeling Language, activity diagrams can be used to describe the business and operational step-by-step workflows of components in a system. An activity diagram shows the overall flow of control.



6.SYSTEM ENVIRONMENT



7.IMPLEMENTATION:

MODULES

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.

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.

8.SYSTEM TEST

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub assemblies, assemblies and/or a finished product. It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of test. Each test type addresses a specific testing requirement.

8.1 TYPES OF TESTS

Unit testing

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program inputs produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application. It is done after the completion of an individual unit before integration. This is a structural testing, that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at component level and test a specific business process, application, and/or system configuration. Unit tests ensure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.

Integration testing

Integration tests are designed to test integrated software components to determine if they actually run as one program. Testing is event driven and is more concerned with the basic outcome of screens or fields. Integration tests demonstrate that although the components were individually satisfactory, as shown by successfully unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problems that arise from the combination of components.

Functional test

Functional tests provide systematic demonstrations that functions tested are available as specified by the business and technical requirements, system documentation, and user manuals.

Functional testing is centered on the following items:

Valid Input : identified classes of valid input must be accepted.

Invalid Input : identified classes of invalid input must be rejected.

Functions : identified functions must be exercised.

Output : identified classes of application outputs must be exercised.

Systems/Procedures : interfacing systems or procedures must be invoked.

Organization and preparation of functional tests is focused on requirements, key functions, or special test cases. In addition, systematic coverage pertaining to identify Business process flows; data fields, predefined processes, and successive processes must be considered for testing. Before functional testing is complete, additional tests are identified and the effective value of current tests is determined.

System Test

System testing ensures that the entire integrated software system meets requirements. It tests a configuration to ensure known and predictable results. An example of system testing is the configuration oriented system integration test. System testing is based on process descriptions and flows, emphasizing pre-driven process links and integration points.

White Box Testing

White Box Testing is a testing in which in which the software tester has knowledge of the inner workings, structure and language of the software, or at least its purpose.

It is purpose. It is used to test areas that cannot be reached from a black box level.

Black Box Testing

Black Box Testing is testing the software without any knowledge of the inner workings, structure or language of the module being tested. Black box tests, as most other kinds of tests, must be written from a definitive source document, such as specification or requirements document, such as specification or requirements document. It is a testing in which the software under test is treated, as a black box .you cannot “see” into it. The test provides inputs and responds to outputs without considering how the software works. **Unit Testing**

Unit testing is usually conducted as part of a combined code and unit test phase of the software lifecycle, although it is not uncommon for coding and unit testing to be conducted as two distinct phases.

Test strategy and approach

Field testing will be performed manually and functional tests will be written in detail.

Test objectives

- All field entries must work properly.
- Pages must be activated from the identified link.
- The entry screen, messages and responses must not be delayed.

Features to be tested

- Verify that the entries are of the correct format
- No duplicate entries should be allowed
- All links should take the user to the correct page.

Integration Testing

Software integration testing is the incremental integration testing of two or more integrated software components on a single platform to produce failures caused by interface defects.

The task of the integration test is to check that components or software applications, e.g. components in a software system or – one step up – software applications at the company level – interact without error.

Test Results: All the test cases mentioned above passed successfully. No defects encountered.

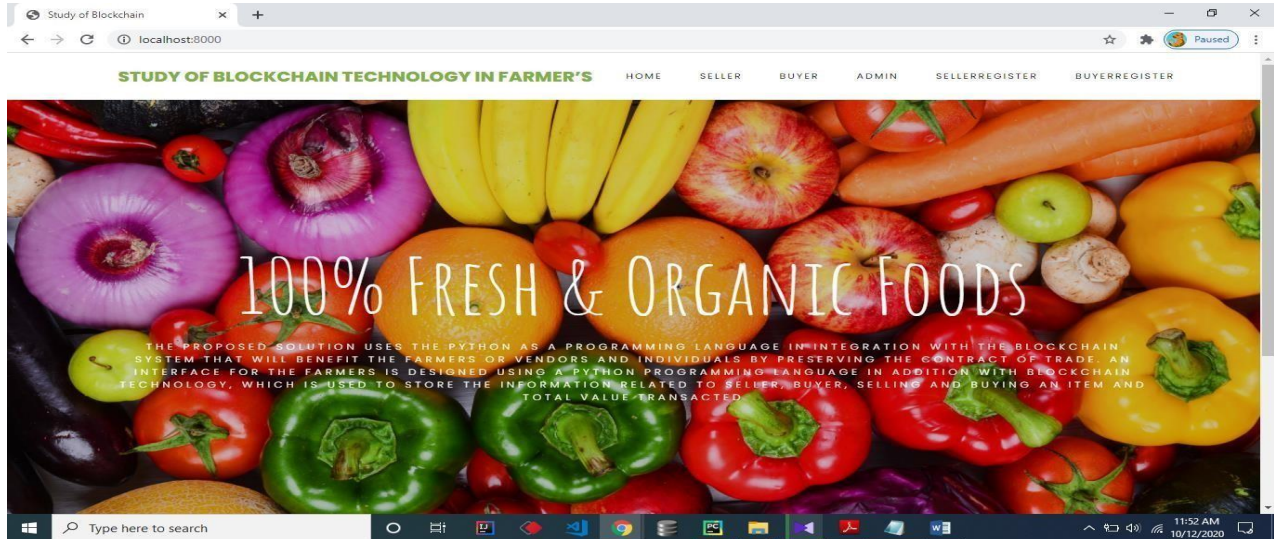
Acceptance Testing

User Acceptance Testing is a critical phase of any project and requires significant participation by the end user. It also ensures that the system meets the functional requirements.

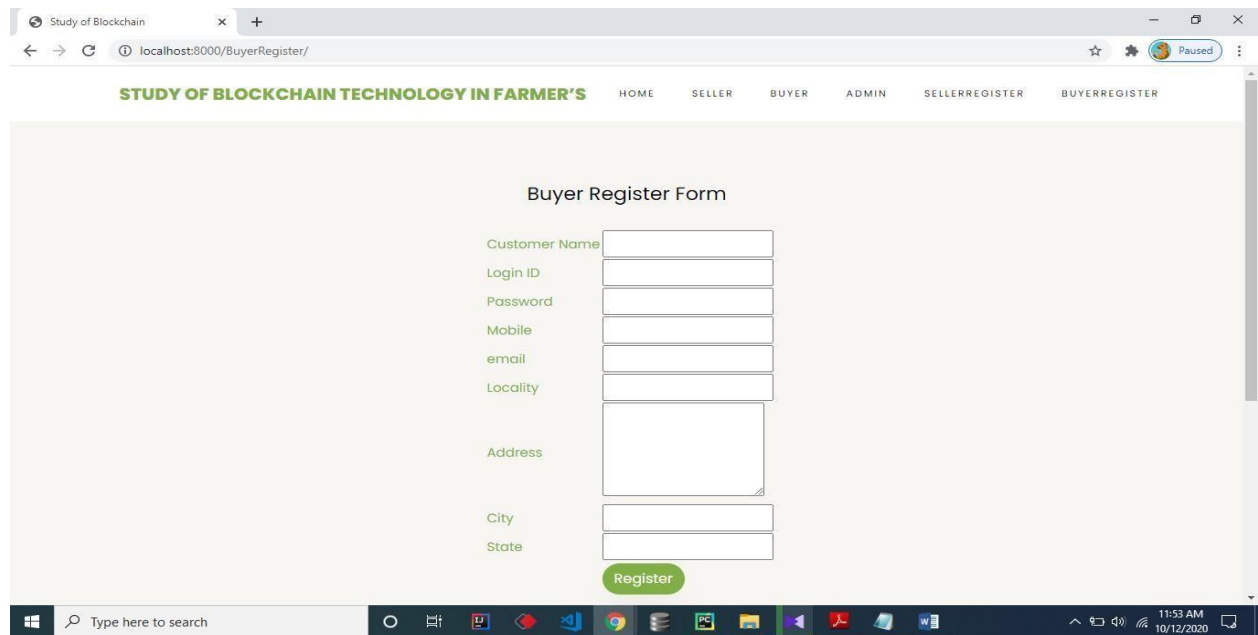
Test Results: All the test cases mentioned above passed successfully. No defects encountered.

9.OUTPUT SCREENS

Home page:



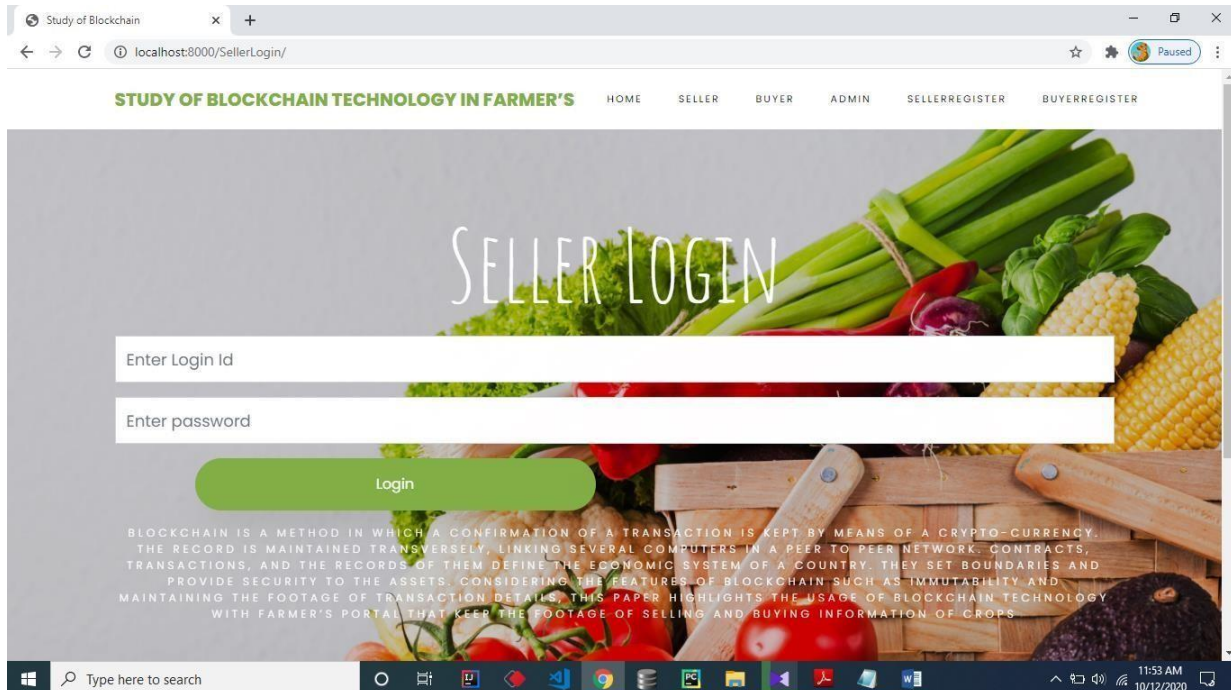
Seller Registration:

Buyer Registration:

The screenshot shows a web browser window with the address bar displaying "localhost:8000/BuyerRegister/". The page title is "STUDY OF BLOCKCHAIN TECHNOLOGY IN FARMER'S". The navigation menu includes "HOME", "SELLER", "BUYER", "ADMIN", "SELLERREGISTER", and "BUYERREGISTER". The main content area is titled "Buyer Register Form" and contains the following fields:

- Customer Name
- Login ID
- Password
- Mobile
- email
- Locality
- Address
- City
- State

A green "Register" button is located at the bottom right of the form. The Windows taskbar at the bottom shows the search bar and various application icons, with the system clock indicating 11:53 AM on 10/12/2020.

Seller Login

The screenshot shows a web browser window with the address bar displaying "localhost:8000/SellerLogin/". The page title is "STUDY OF BLOCKCHAIN TECHNOLOGY IN FARMER'S". The navigation menu includes "HOME", "SELLER", "BUYER", "ADMIN", "SELLERREGISTER", and "BUYERREGISTER". The main content area features a background image of fresh vegetables and a wooden crate. The text "SELLER LOGIN" is prominently displayed. Below the title, there are two input fields:

- Enter Login Id
- Enter password

A green "Login" button is positioned below the input fields. At the bottom of the page, there is a paragraph of text explaining blockchain technology:

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 Windows taskbar at the bottom shows the search bar and various application icons, with the system clock indicating 11:53 AM on 10/12/2020.

Seller Adding crops Details

Add Items Details

1. This is only for Farmers
2. Seller must add crop data
3. Each Item Consider as 1 KG of the price

Enter Crop name

Enter Price

Enter Descriptions

Choose File No file chosen

Add Product

Seller Commodities:

The product of the Seller is **alex**

| S.No | Crop name | Price | Date | Image | Update | Delete | Add |
|------|--|---------|-------------------------|-------|---------------|---------------|------------|
| 1 | Tomato A red Tomato For Health | ₹ 25.0 | Oct. 9, 2020, 5:31 a.m. | | Update | Delete | Add |
| 2 | Green Beans Healty Diet | ₹ 95.0 | Oct. 9, 2020, 5:32 a.m. | | Update | Delete | Add |
| 3 | STRAWBERRY A great Choice if you have | ₹ 150.0 | Oct. 9, 2020, | | Update | Delete | Add |

Blockchain Transactions:

Transaction Details **meghana**

Current Transaction Details

| Fields | Values |
|---------------|--|
| c_index | 3 |
| Time Stamp | 1602484101.8669965 |
| Sender Name | meghana |
| Recipient | SBI Bank |
| Amount | 70.0 |
| Proof ID | 550807 |
| Previous Hash | c69918b5c65a5004d3b5ad0661bc2c8c89ba78ce26be82435985b63819dc4a73 |
| Amount | 70.0 |

Previous Transaction Details

| | |
|---------------|--|
| index number | 2 |
| Time Stamp | 1602484058.04044 |
| Sender Name | meghana |
| Recipient | HDFC Bank |
| Amount | 25.0 |
| Proof ID | 859425 |
| Previous Hash | c30297c70bee428ca3eac71a50cfc630cle01d19f362de0174df7f72b858b23c |

Blockchain :

```

[12/Oct/2020 11:57:45] "GET /BuyerSearchProductsForm/ HTTP/1.1" 200 5687
[12/Oct/2020 11:57:48] "POST /BuyerSearchCropsAction/ HTTP/1.1" 200 7719
[12/Oct/2020 11:57:49] "GET /media/product-6.jpg HTTP/1.1" 200 143052
[12/Oct/2020 11:57:49] "GET /media/product-9.jpg HTTP/1.1" 200 55958
Seller name sravani
Cart Count = 1
[12/Oct/2020 11:57:50] "GET /BuyerAddCropsToCart/?cropid=7 HTTP/1.1" 200 5916
Seller name sravani
Cart Count = 2
[12/Oct/2020 11:57:55] "GET /BuyerAddCropsToCart/?cropid=7 HTTP/1.1" 200 5916
[12/Oct/2020 11:57:56] "GET /BuyerCheckCartData/?buyerUser=meghana HTTP/1.1" 200 6680
Total Price 70.0
[12/Oct/2020 11:57:58] "GET /BuyerTotalAmountCheckOut/?buyername=meghana HTTP/1.1" 200 6883
Genesis block: [{"index": 1, "timestamp": 1602483703.9113498, "transactions": [], "proof": 100, "previous_hash": "The Times 03/Oct/2020 A Study of Blockchain Technology in Farmer's Portal."}, {"index": 2, "timestamp": 1602484058.04044, "transactions": [{"sender": "meghana", "recipient": "HDFC Bank", "amount": "25.0"}], "proof": 859425, "previous_hash": "c30297c70bee428ca3eac71a50cfc630cle01d19f362de0174df7f72b858b23c"}, {"index": 3, "timestamp": 1602484101.8669965, "transactions": [{"sender": "meghana", "recipient": "SBI Bank", "amount": "70.0"}], "proof": 550807, "previous_hash": "c69918b5c65a5004d3b5ad0661bc2c8c89ba78ce26be82435985b63819dc4a73"}]
T1 is 3
buyername = meghana
[12/Oct/2020 11:58:22] "POST /StartBlockChainTransaction/ HTTP/1.1" 200 6722
  
```


Admin View Blockchain Transaction:

| 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 | 38e7551d6e22862e889bbcf688ba339cdb5c84 |
| 2 | 3 | 1602325649.1655002 | harish | HDFC Bank | 300.0 | 486421 | 9e03e15112b4a62cbd43149078bcc8d80c9e93c |
| 3 | 4 | 1602325701.1176872 | ramesh | Canara Bank | 495.0 | 14272 | ae83dcd03eda83691aa254c9ce68231a29aaa2 |
| 4 | 2 | 1602326025.9633133 | ramesh | Canara Bank | 25.0 | 410301 | b79d3f83920ab7c4f7db34e8d2b60dc358b8b8 |

Admin Activate Buyers

| S.No | Name | Login ID | Mobile | Email | Locality | Status | Activate |
|------|---------|----------|------------|-----------------------------|---------------|-----------|-----------|
| 1 | Meghana | meghana | 9566089897 | 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 |

10.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 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 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 legitimate price of crop and reduce the cost of operation for selling and buying crops when compared to traditional methods.

11.FUTURE SCOPE

A kind of portal can be implemented by the government and its confederate bureaus to ensure amelioration 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 farmer'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 realization in blockchain faces several boundaries that might require a vital authority or protected footage of confirmation.

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