SIDDAGANGA INSTITUTE OF TECHNOLOGY TUMAKURU
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
Major Project Presentation
on
REVOLUTIONIZING AGRICULTURAL DYNAMICS

BATCH NO: B15

Presented By

Chinmay Shankar S. S. (1SI20CS027)

Dhanaraj C. N. (1SI20CS032)

Dhimanth C (1SI20CS033)

Nishanth H. K. (1SI20CS066)

Under the Guidance of

Dr. K. Bhargavi

Associate Professor

Department of CSE

AGENDA

- Introduction
- Problem Statement
- Objective
- Literature Survey
- High Level Design
- Low Level Design
- Implementation
- Results
- Conclusion

INTRODUCTION

- By fostering inclusive communities and equitable partnerships, the initiative ensures that all stakeholders, including legitimate intermediaries, play integral roles in a vibrant ecosystem where justice and cooperation thrive.

- Through the use of blockchain technology, the project paves the way for decentralized markets, eliminating exploitative intermediaries and ensuring fair prices that reflect the true value of farmers' contributions.

- The project aims to empower farmers by leveraging blockchain technology to grant them unprecedented control over fair prices, revolutionizing transparency in the agricultural supply chain.

- It orchestrates a transformative journey across the agricultural sector, reshaping the industry's landscape and fostering a culture of openness and integrity.

PROBLEM STATEMENT

In the agricultural landscape, the absence of transparency and equity in transactions prevails, undermining the livelihoods of farmers and buyers. Inadequate market information hinders farmers' decision-making and reduces profitability, while centralized marketplaces suffer from inefficiencies and middlemen. A decentralized agricultural marketplace solution is urgently required to empower farmers with equitable pricing, broader market access, and transparent transaction mechanisms, revolutionizing the agricultural sector and fostering fairness in all transactions.

OBJECTIVE

- Empowering farmers with equitable prices.
- Ensuring transparency across agricultural transactions.
- Empower farmers with broad market access.
- Accommodate legitimate intermediaries.

LITERATURE SURVEY

1] Title: "Enhancing Supply Chain Traceability with Blockchain Technology: A Study on Dairy, Agriculture, and Seafood Supply Chains" (2023)

Authors: A. Subramanian, B. Selvaraj, R. Sivakumar, R. Tabassum and S. Rajaram.

3rd International Conference on Pervasive Computing and Social Networking (ICPCSN), Salem, India, 2023, pp. 967-971, doi: 10.1109/ICPCSN58827.2023.00165.

2] Title: "Agricultural Supply Chain Management System Using Blockchain" (2023)

Authors: V. M, S. R. Hegde, S. K, A. S. Prasad and E. A. Madappa.

International Conference on Recent Trends in Electronics and Communication (ICRTEC), Mysore, India, 2023, pp. 1-4, doi: 10.1109/ICRTEC56977.2023.10111914.

3] Title: "An Interpretation of the Challenges and Solutions for Agriculture-based Supply Chain Management using Blockchain and IoT" (2023)

Authors: M. Surya and S. Manohar.

7th International Conference on Computing Methodologies and Communication (ICCMC), Erode, India, 2023, pp. 1199-1205, doi: 10.1109/ICCMC56507.2023.10083747.

4] Title: "AI-Enabled Blockchain for Supply Chain in Agriculture" (2022)

Author: A. Singh Bist et al.

IEEE Creative Communication and Innovative Technology (ICCIT), Tangerang, Indonesia, 2022, pp. 1-5, doi: 10.1109/ICCIT55355.2022.10118743.

5] Title: "Automatic Generation of Ethereum-Based Smart Contracts for Agri-Food Traceability System" (2022)

Authors: L. Marchesi, K. Mannaro, M. Marchesi and R. Tonelli.

in IEEE Access, vol. 10, pp. 50363-50383, 2022, doi: 10.1109/ACCESS.2022.3171045.

6] Title: "Blockchain Based Farm-to-Fork Supply Chain Tracking" (2021)

Authors: K. Land and A. Siraj.

IEEE International Conference on Big Data (Big Data), Orlando, FL, USA, 2021, pp. 3416-3425, doi: 10.1109/BigData52589.2021.9671969.

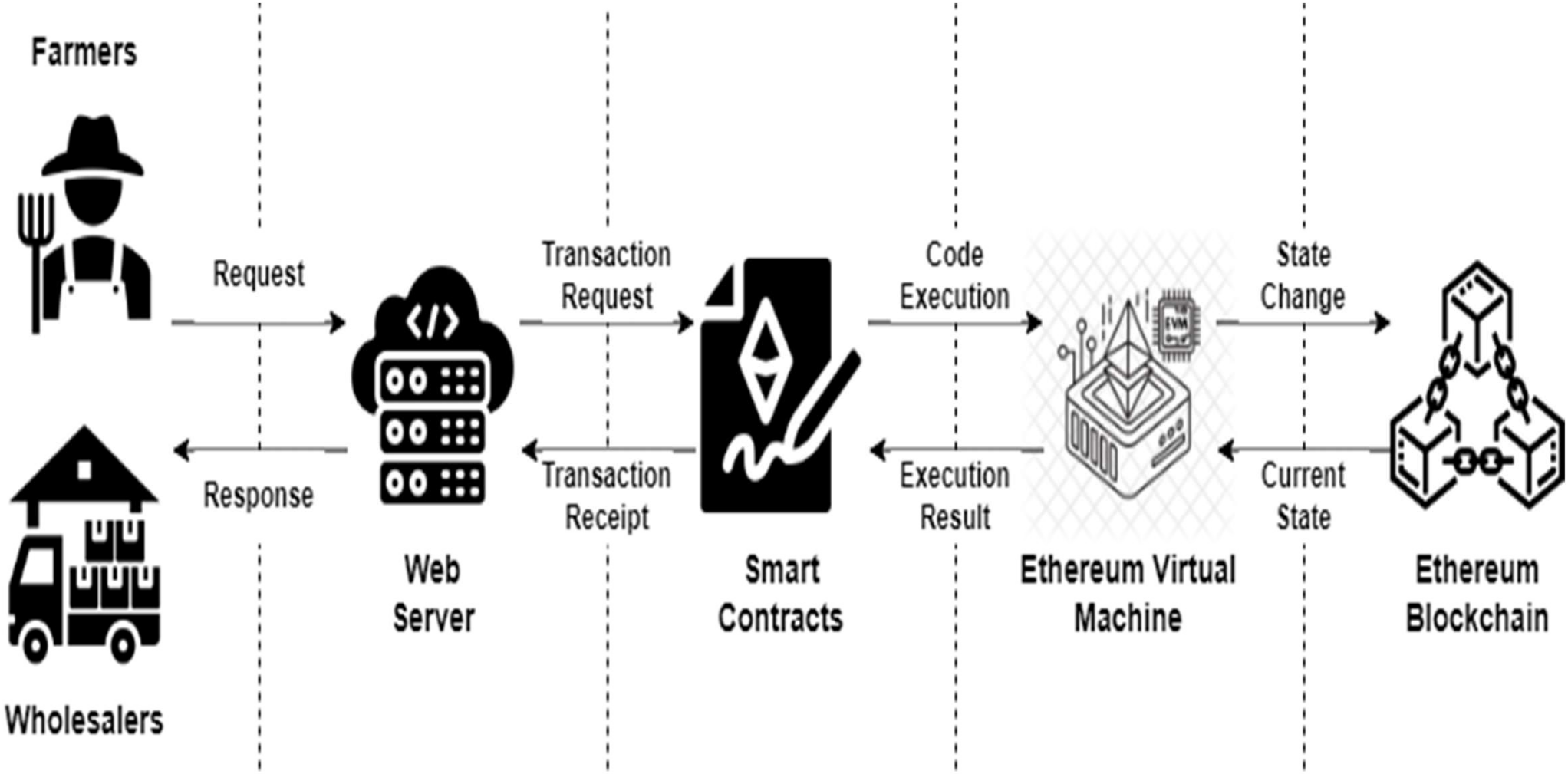
7] Title: "Design of a Blockchain-based Decentralized Architecture for Sustainable Agriculture: Research-in-Progress" (2021)

Authors: G. K. Akella, S. Wibowo, S. Grandhi and S. Mubarak.

IEEE/ACIS 19th International Conference on Software Engineering Research, Management and Applications (SERA), Kanazawa, Japan, 2021, pp. 102-107, doi: 10.1109/SERA51205.2021.9509044.

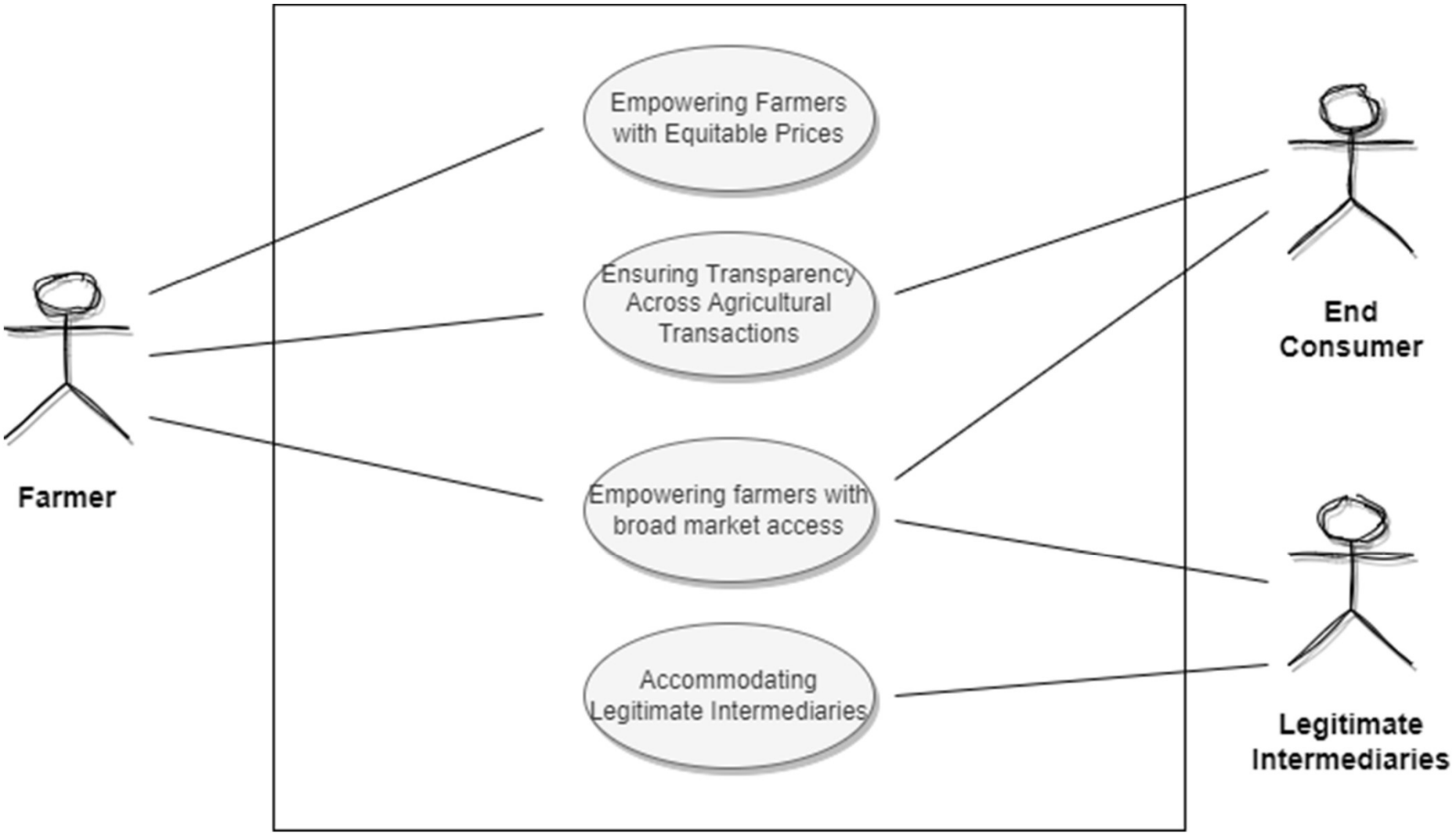
HIGH LEVEL DESIGN

- **System architecture**

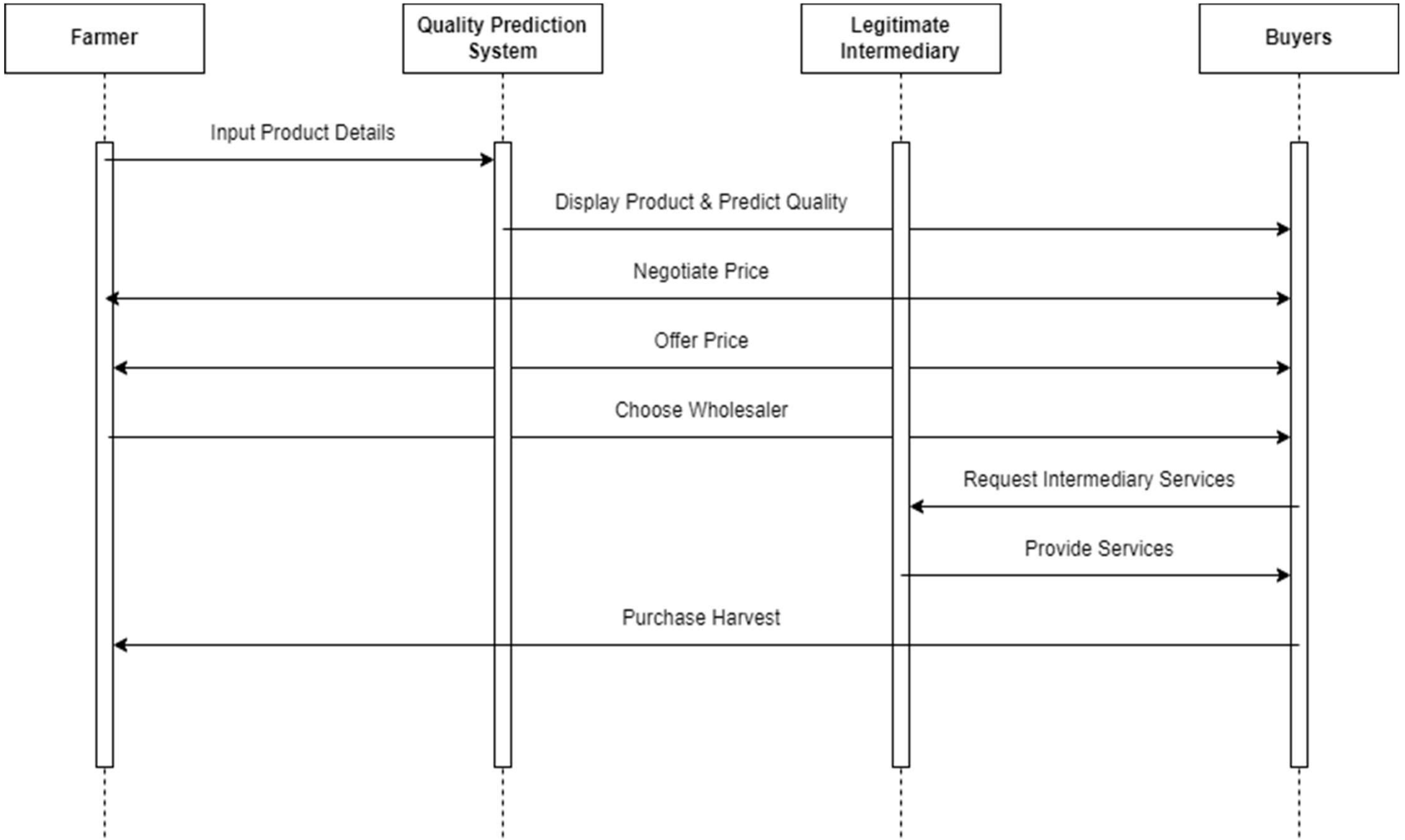


LOW LEVEL DESIGN

- **Use case diagram**



- **Sequence diagram**



IMPLEMENTATION

Tools and Technologies

Blockchain Technology:

- Ethereum Blockchain.
- Solidity programming language for smart contracts.

Web Development:

- Front-end: React.js
- Back-end: Node.js
- Interaction with Ethereum blockchain: Web3.js

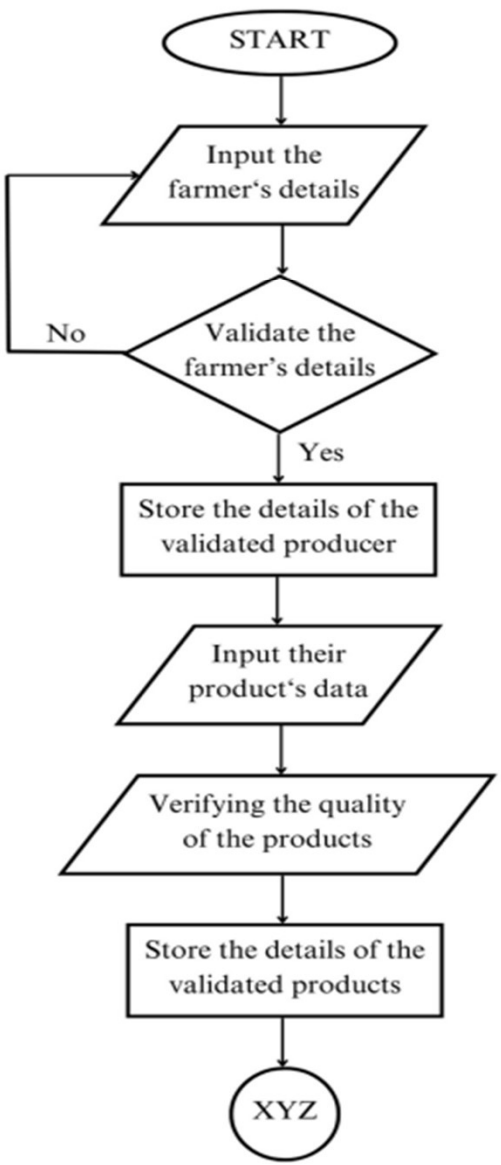
Data Management:

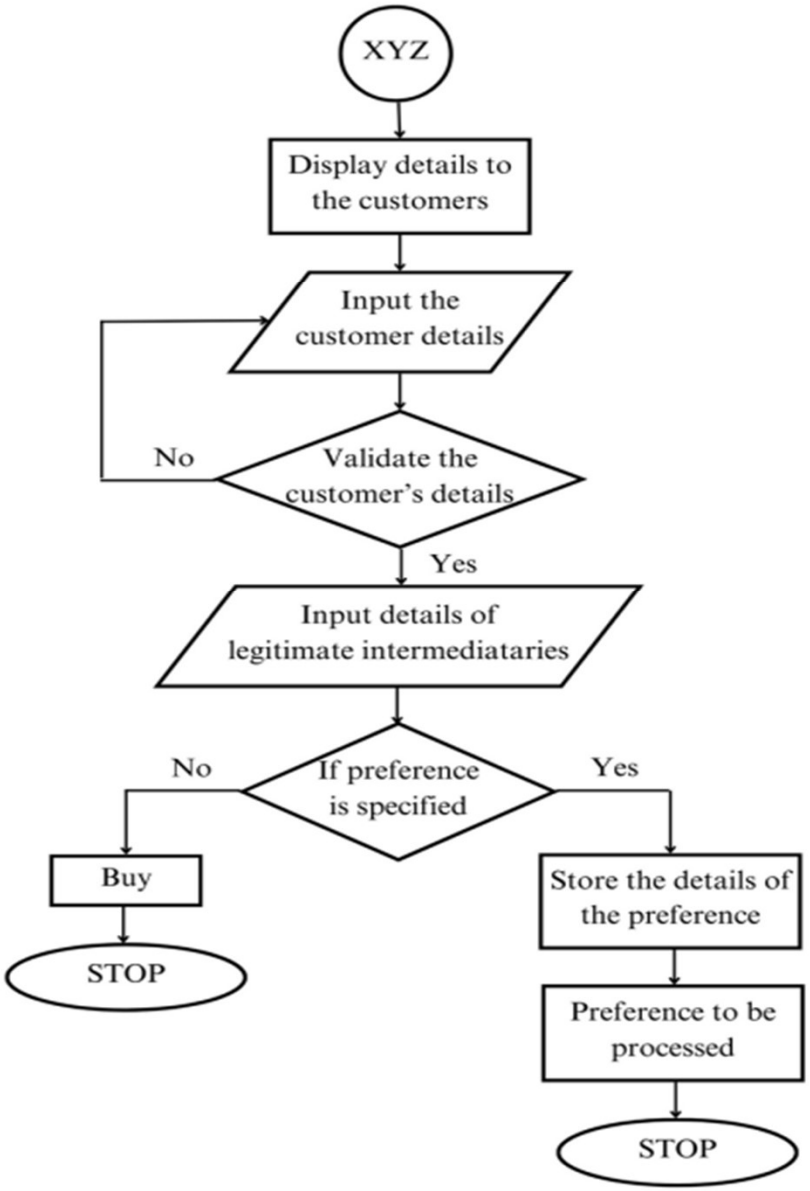
- IPFS (InterPlanetary File System) for data integrity. Relational databases for efficient storage and retrieval.

User Interface Design:

- CSS framework for a visually appealing and intuitive UI

- **Flow chart**


START
Input the farmer‘s details
Validate the farmer’s details
No
Yes
Store the details of the validated producer
Input their product‘s data
Verifying the quality of the products
Store the details of the validated products
XYZ


XYZ
Display details to the customers
Input the customer details
Validate the customer’s details
No
Yes
Input details of legitimate intermediataries
If preference is specified
No
Yes
Buy
STOP
Store the details of the preference
Preference to be processed
STOP

RESULTS

Equitable Compensation System:

Farmers empowered with control over pricing decisions. Decentralized marketplace ensuring fair prices . Eradication of exploitative intermediaries. Improved financial well-being for farmers.

Transparent Agricultural Transactions:

Utilization of blockchain for a clear and traceable ledger. Elimination of opacity in agricultural transactions. Increased transparency throughout the supply chain. Building trust and ensuring accountability in transactions.

Inclusive Stakeholder Empowerment:

Rejection of exclusionary practices. Empowerment of legitimate intermediaries. Expanded services, customer base, and revenue streams for intermediaries. Increased participation, fostering a collaborative and inclusive agricultural community.

Harvest hive for connection to registration page

CONCLUSION

This project serves as a beacon of innovation within the agricultural landscape, championing transparency and fairness as its core tenets. By integrating blockchain technology and smart contracts, it establishes a decentralized framework that fosters trust among stakeholders while ensuring efficient access to blockchain data through a user-friendly interface. Beyond its technological advancements, the project is driven by a deep commitment to empower farmers and cultivate resilient communities, promising a transformative impact on the agricultural sector.

At its core, this initiative aims to empower farmers with fair pricing, transparency in transactions, and expanded market access, all while integrating legitimate intermediaries. By fostering connections between stakeholders and prioritizing accessibility and confidence, it heralds a cultural shift in agriculture toward justice and openness. With a steadfast dedication to robust data management and farmer empowerment, this project represents a beacon of hope for building sustainable and equitable agricultural communities, paving the way for lasting positive change in the industry.

THANK YOU