A Theme Based Project Report on

AGRICONNECT

Submitted in partial fulfilment of the requirements of the degree

Bachelor of Engineering

Computer Science and Engineering

By

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING MATURI VENKATA SUBBA RAO ENGINEERING COLLEGE

(An Autonomous Institution, Sponsored by Matrusri Education Society - Estd. 1980) Affiliated to Osmania University & Recognized by AICTE Nadergul (PO), Balapur (M), Hyderabad, Telangana, India – 501510

Academic Year: 2024 - 2025

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CERTIFICATE

This is to certify that the Theme Based project work entitled "AGRICONNECT" is a bonafide work carried out by D.CHARAN(2451-23-733-316), k.NITHIN(2451-23-733-317), A.AKSHAYA RAO(2451-23-733-319) in partial fulfilment of the requirements for the award of degree of Bachelor of Engineering in Computer Science and Engineering from Maturi Venkata Subba Rao(MVSR) Engineering College, affiliated to OSMANIA UNIVERSITY, Hyderabad, during the Academic Year 2024-2025 under our guidance and supervision.

The results embodied in this report have not been submitted to any other university or institute for the award of any degree or diploma.

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External Examiner

DECLARATION

This is to certify that the work reported in the present Theme Based project entitled is a record of bonafide work done by us in the Department of Computer Science and Engineering, MVSR Engineering College, Osmania University. The reports are based on the work done entirely by us and not copied from any other source. The results embodied in this report have not been submitted to any other University or Institute for the award of any degree or diploma to the best of our knowledge and belief.

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Finally, we would like to take this opportunity to thank our family and friends for their support through the work. We sincerely acknowledge and thank all those who gave directly or indirectly their support in completion of this work.

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ABSTRACT

AgriConnect is an innovative digital platform designed to revolutionize the agriculture sector by fostering communication and collaboration among various stakeholders, including farmers, suppliers, buyers, experts, and service providers. It serves as a bridge to connect rural agricultural communities with modern technology, market opportunities, and essential agricultural services. The platform incorporates features like real-time weather updates, crop management advice, market pricing trends, and access to financial services. AgriConnect aims to empower farmers by improving productivity, increasing market access, and enhancing sustainability through data-driven insights and digital solutions. By leveraging mobile and internet technologies, AgriConnect not only facilitates the exchange of knowledge but also promotes the adoption of smart farming practices, contributing to overall agricultural development and rural economic growth. Through its user-centric approach, AgriConnect strives to transform agriculture into a more efficient, profitable, and sustainable industry.

CERTIFICATIONS







DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Vision

To impart technical education of the highest standards, producing competent and confident engineers with an ability to use computer science knowledge to solve societal problems.

Mission

- To make the learning process exciting, stimulating, and interesting.
- To impart adequate fundamental knowledge and soft skills to students.
- To expose students to advanced computer technologies to excel in engineering practices by bringing out the creativity in students.
- To develop economically feasible and socially acceptable software.

Program Educational Objectives (PEOs)

The Bachelor's program in Computer Science and Engineering is aimed at preparing graduates who will: -

- PEO-1: Achieve recognition through demonstration of technical competence for successful execution of software projects to meet customer business objectives.
- PEO-2: Practice life-long learning by pursuing professional certifications, higher education, or research in the emerging areas of information processing and intelligent systems at a global level.
- PEO-3: Contribute to society by understanding the impact of computing using a multidisciplinary and ethical approach.

Program Outcomes (POs)

- PO 1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization for the solution of complex engineering problems.
- PO 2: Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO 3: Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.

- PO 4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO 5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
- PO 6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO 7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and the need for sustainable development.
- PO 8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO 9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO 10: Communication: Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions
- PO 11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO 12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOS)

- PSO-1: Demonstrate competence to build effective solutions for computational real-world problems using software and hardware across multi-disciplinary domains.
- PSO-2: Adapt to current computing trends for meeting the industrial and societal needs through a holistic professional development leading to pioneering careers or entrepreneurship.

COURSE OBJECTIVES AND OUTCOMES

Course Title: Theme Based Project

Course Code: U21PW381CS

Course Objectives

- To enhance practical and professional skills.
- To familiarize tools and techniques of systematic literature survey and documentation.
- To expose the students to industry practices and teamwork.
- To encourage students to work with innovative and entrepreneurial ideas.

Course Outcomes

- Demonstrate the ability to synthesize and apply the knowledge and skills acquired in the academic program to the real world problems.
- Evaluate different solutions based on economic and technical feasibility
- Effectively plan a project and confidently perform all aspects of project management.

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AGRICONNECT

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CHAPTER - 1

INTRODUCTION

AgriConnect is a forward-thinking platform dedicated to transforming the agricultural landscape by harnessing the power of technology, innovation, and collaboration. In today's rapidly evolving world, agriculture faces significant challenges, including climate change, resource scarcity, and fluctuating market demands. AgriConnect addresses these issues by creating a digital ecosystem that empowers farmers, enhances supply chain efficiency, and fosters sustainable agricultural practices.

At its core, AgriConnect connects farmers with essential resources such as inputs, advisory services, and real-time market insights. By integrating advanced technologies like IoT, artificial intelligence, and data analytics, the platform provides farmers with actionable insights to improve crop productivity, reduce resource wastage, and increase profitability. With mobile and web-based solutions, AgriConnect ensures that even the smallest farmer in remote areas can access vital information and services.

1.1 Problem statement

Agriculture, the backbone of many economies, faces critical challenges that hinder its growth and sustainability.

1.2 Existing systems

Farmers primarily relied on traditional marketplaces or middlemen to sell their produce, which involved physically transporting goods to local or regional markets. This process presented several challenges. Traditional methods often resulted in reduced profits for farmers due to intermediaries taking a significant share. Additionally, market access could be inconsistent, with farmers facing price fluctuations and limited bargaining power. For those in remote or underserved areas, reaching these markets was further complicated by inadequate transportation infrastructure and logistical barriers. Moreover, the lack of direct communication between farmers and consumers often led to inefficiencies and reduced transparency in transactions.

1.3 Proposed System

The proposed eCommerce Platform for Farmers aims to transform agricultural commerce by addressing the limitations of traditional marketplace systems. This innovative platform leverages modern technology to connect farmers directly with consumers, eliminating the need for intermediaries. Farmers can list and manage their products online, ensuring better profit margins and transparency in transactions. With its user-friendly design and accessibility, the platform allows users to operate it from anywhere with an internet connection, removing geographical constraints. Integrated tools for real-time updates, secure payment gateways, and direct communication between farmers and buyers ensure convenience, efficiency, and trust, making it a game-changer for the agricultural sector.

1.4 Scope

The scope of the AgriConnect project encompasses a comprehensive approach to addressing key challenges in the agricultural sector while fostering innovation, efficiency, and sustainability. The project aims to create a digital ecosystem that connects farmers, stakeholders, and markets, empowering them to thrive in a dynamic and competitive environment.

CHAPTER - 2

SYSTEM ARCHITECTURE SPECIFICATION

2.1 Software Requirements

Frontend : React JS , Tailwind CssBackend : Express.js, Node js

• Database: MongoDB

• IDE Used: Visual Studio Code

2.1.1 Functional Requirements

Order Management

- 1. Create Order: Users can create a new order for one or more products.
- 2. Create Single-Item Order: Users can place an order for a single product.
- 3. Update Order Status: Admins can modify the status of an order (e.g., Pending, Shipped, Delivered).
- 4. Remove Order: Users or admins can delete an existing order.
- 5. Retrieve Farmer Orders: Farmers can view orders assigned to them.
- 6. Mark Order as Delivered: Farmers can update the status of an order to "Delivered."
- 7. Get User Orders: Users can view all their placed orders.

Product Management

- 1. Create Product: Admins can add new products to the catalog.
- 2. Delete Product: Admins can remove existing products.
- 3. View All Products: Users can browse all available products.
- 4. View Single Product: Users can view detailed information about a specific product.
- 5. Get Admin's Products: Admins can manage products they have added.
- 6. Update Product: Admins can modify the details of a specific product.

Review Management

- 1. Submit Review: Users can leave a review for purchased products.
- 2. Get Product Reviews: Users can view all reviews for a specific product.
- 3. Delete Review: Users can remove their own reviews. User Management
- 4. Register: New users can create an account.
- 5. Login: Registered users can log in to the platform.
- 6. Logout: Authenticated users can log out of their accounts.
- 7. View Profile: Users can view their profile information.
- 8. Admin Access: Admins can access and manage admin-related functionalities.

Cart Management

- 1. Add to Cart: Users can add products to their cart.
- 2. Remove from Cart: Users can remove specific products from their cart.
- 3. Clear Cart: Users can empty their entire cart.
- 4. View Cart: Users can see all products in their cart.

2.1.2 Non-Functional requirements

Performance

- The application will ensure real-time responses to user actions, such as viewing products, adding items to the cart, or placing orders.
- The application will generate comprehensive weekly and monthly reports, such as sales and order summaries, within a reasonable processing time.

Security

- The application will enforce robust security measures, including encryption for data storage and transmission, to ensure user data privacy.
- Authentication and authorization mechanisms will be implemented to restrict access to sensitive operations based on user roles.

Usability

- The application will feature an intuitive, user-friendly interface, allowing seamless navigation across pages for users of all skill levels.
- Clear and consistent instructions, error messages, and feedback will be provided to assist users in completing tasks without confusion.

2.2 Hardware Requirements

• RAM: 8.00GB

Processor: 11th Gen Intel ® Core™ i5-11320H @ 3.20GHz 2.50GHz

• Storage: 458GB

CHAPTER - 3

SYSTEM ARCHITECTURE

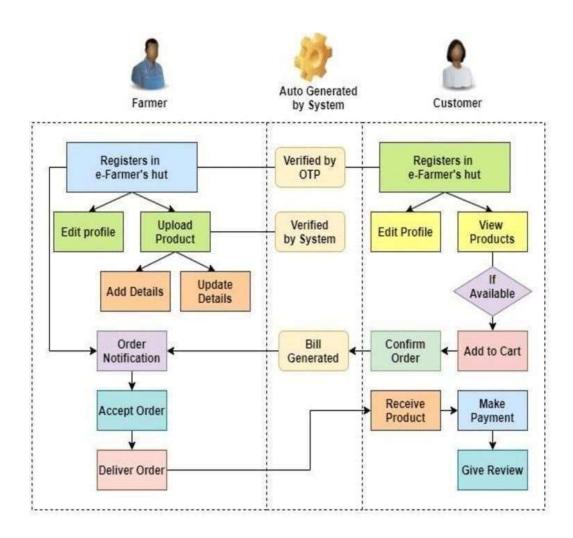


Fig 3.1 SystemArchitecture Diaagram

3. System Design

The objective of the system design phase is to establish a comprehensive architecture and detailed components for the eCommerce Platform for Farmers. This phase involves defining the overall system architecture, which includes a client-server model and database schema. The design process also involves creating intuitive UI/UX wireframes for the frontend to ensure a user-friendly interface. Additionally, API specifications for backend services are outlined to establish efficient communication between the frontend and backend. All design aspects are documented in a detailed system design document, serving as a blueprint for the implementation phase.

3.1 Methodology

The methodology for the eCommerce Platform for Farmers project follows a structured approach to ensure the development of a robust, efficient, and user-centric platform. The process is broken down into the following stages:

Implementation

The implementation phase focuses on building the system components as per the design specifications.

1. Frontend Development

- The React environment is set up to develop dynamic and responsive user interfaces.
- UI components are designed and implemented based on the wireframes, ensuring a seamless and user-friendly experience.
- Tailwind CSS is integrated to enhance the visual appeal and responsiveness of the platform.

2. Backend Development

- The backend is developed using Node.js and Express.js to handle server-side functionalities.
- RESTful APIs are created to facilitate efficient data exchange between the client and server

3. Database Design

- MongoDB is used to design schemas for managing user data, product details, orders, and reviews efficiently.
- Cloudinary is integrated for secure storage and retrieval of product images.

4. Integration and Deployment

- Authentication and authorization mechanisms are implemented using JSON Web Tokens (JWT).
- Secure payment gateway APIs are integrated to handle transactions.
- The system is tested for scalability and performance, ensuring a seamless experience for users.

3.2 Class Diagrams

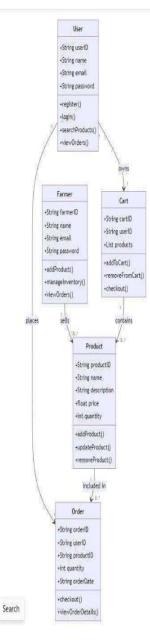
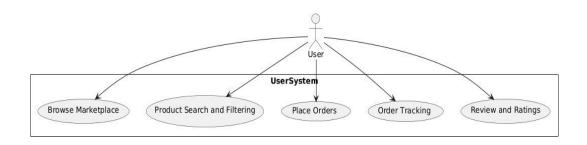


Fig 3.2 Class Diagram

3.3 Use Case Diagrams



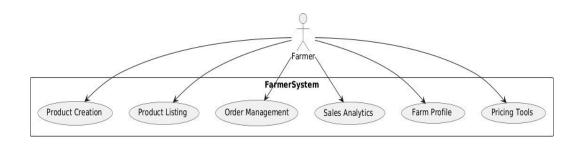


Fig 3.3 Use case Diagrams

3.4 Sequence Diagrams

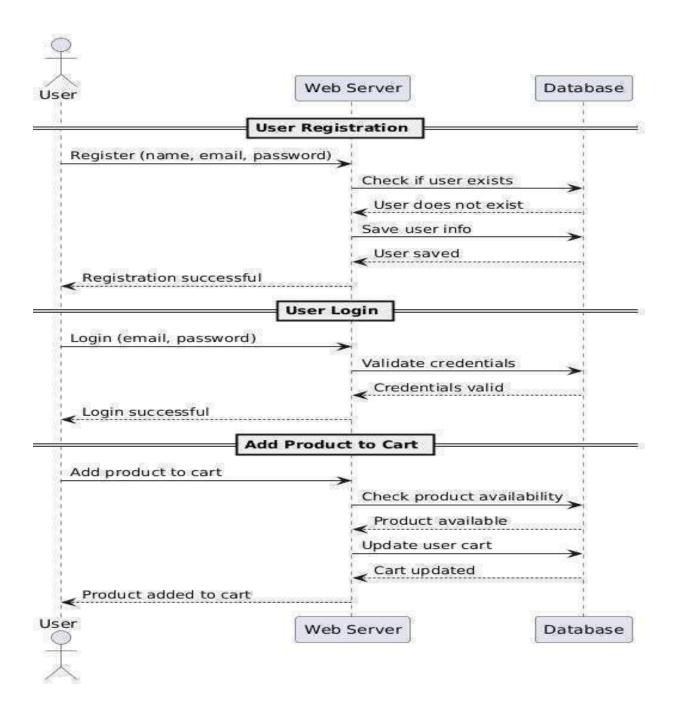


Fig 3.4 Sequence Diagram

CHAPTER-4

4. Implementation

4.1 Environmental Setup

Installing an editor: Visual Studio

 Download the Visual Studio by below mentioned link based on the operating system. https://code.visualstudio.com/download

Download and Install MongoDB:

2. Visit the MongoDB Community Server download page https://www.mongodb.com/try/download/community

Setting Up Node.js and npm

3. Download and Install Node.

https://nodejs.org/en+

Verify the installation by running 'node -v' and 'npm -v' in a terminal or command

Prompt. Additional Setup

React Setup:

Once Node.js and npm are installed, you can set up the front-end using React by running the following command in your project folder:

npx create-react-app client

This will set up the front-end environment for building the user interface of the eCommerce platform.

Backend Dependencies:

For the back-end, you'll need to install the necessary dependencies like Express, MongoDB client, and other utilities. You can install them by running the following commands: npm install express mongoose dotenv bcryptjs jsonwebtoken.

These packages will help with server-side logic, database interaction, and authentication.

4.2 Implementation Details

The eCommerce platform for farmers involves building a fully integrated web application using the MERN stack (MongoDB, Express.js, React, Node.js). The steps include frontend and backend development, database management, and API integration.

Frontend Development

(REACTJS)

Initialize Project:

Set up the React project using create-react-app to initiate the frontend environment.

CreateComponents:

Develop UI components such as ProductList, ProductCard, ShoppingCart, OrderSummary, and UserProfile to display products, manage the cart, and allow users to view and update their profiles.

Set Up Routing:

Configure React Router for navigation between pages like Home, Product Details, Cart, Order, and Profile.

Integrate APIs:

Use Axios or Fetch API to communicate with the backend services for fetching product data, submitting orders, and managing the user's cart.

Styling:

Style components using Tailwind CSS for a responsive and modern design. Use utility-first classes to ensure a consistent layout and design across the application. Backend Development

(Node.js) nitialize Project:

Set up a new Node.js project and install necessary dependencies such as Express, Mongoose, and JWT for authentication. Define Routes:

Create route files for different functionalities, including:

Product-related routes (/create, /delete, /getAllProducts, /getProduct/:id)

User-related routes (/register, /login, /my-profile, /cart)

Order-related routes (/create-order, /get-order/:id, /update-order-status)

Create Services:

Implement service functions to handle interactions with MongoDB, including CRUD operations for products, orders, and user profiles.

Define Database Models:

Use Mongoose to define schemas and models for users, products, orders, and reviews. This ensures data consistency and allows for easy interaction with MongoDB.

Set Up Middleware:

Implement middleware for error handling, user authentication (using JWT), and logging.

Testing & Debugging:

Ensure that all routes and components are working correctly by writing unit tests and performing thorough debugging.

4.3 Results



Fig 4.1 register page

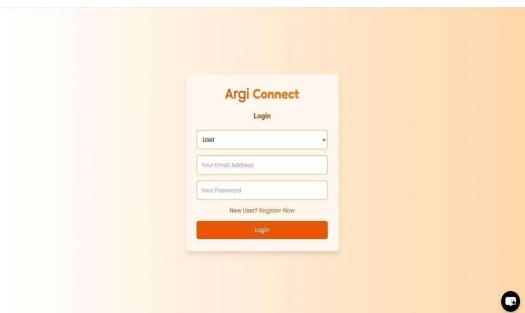


Fig 4.2 login page

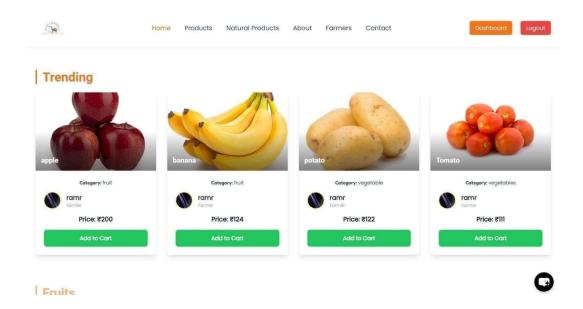


Fig 4.3 home page

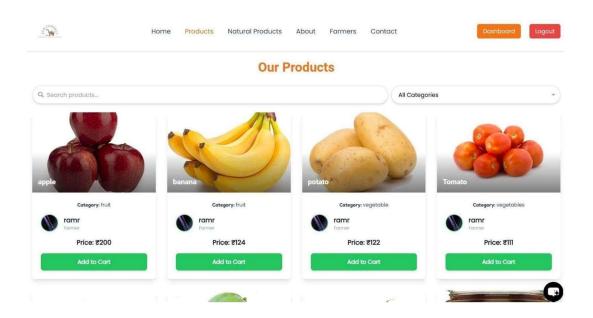


Fig 4.4 products page

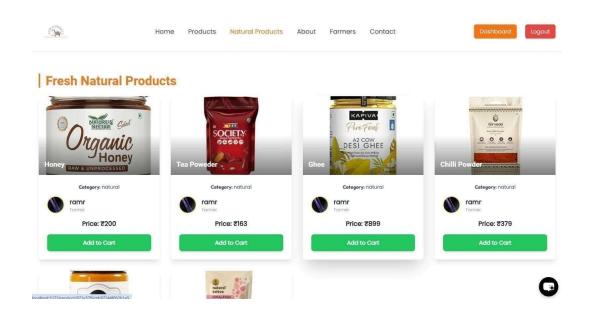


Fig 4.5Natural products

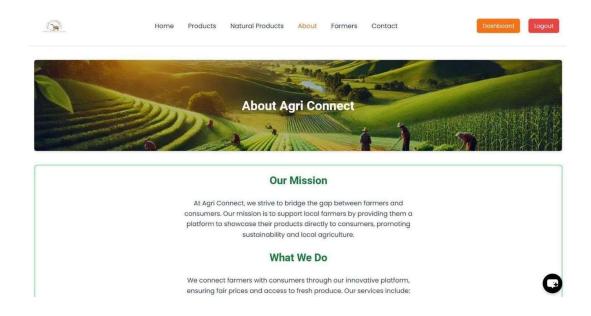


Fig 4.6 About page

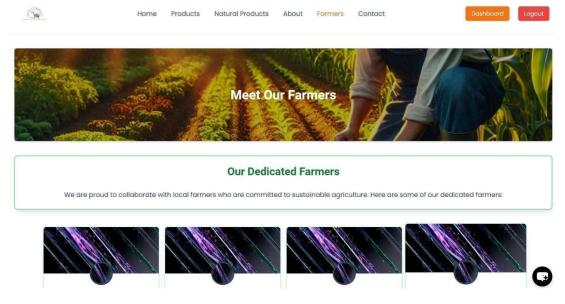


Fig 4.7 Farmers page

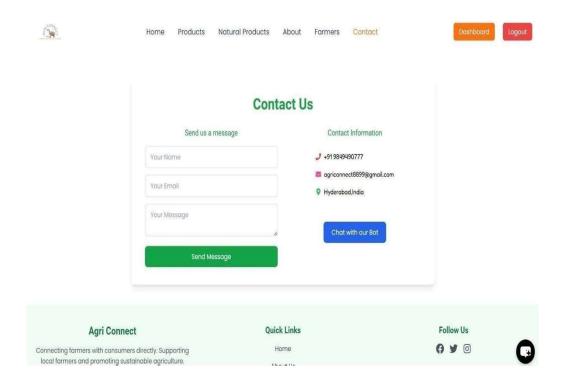


Fig 4.8 Contact page

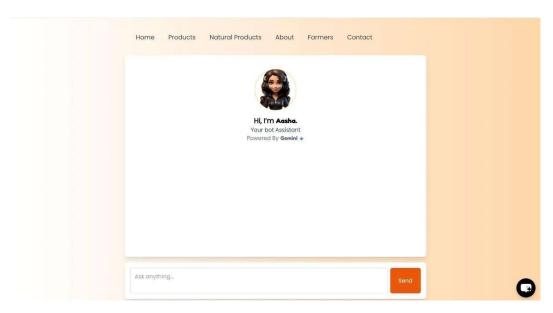


Fig 4.9Chat bot

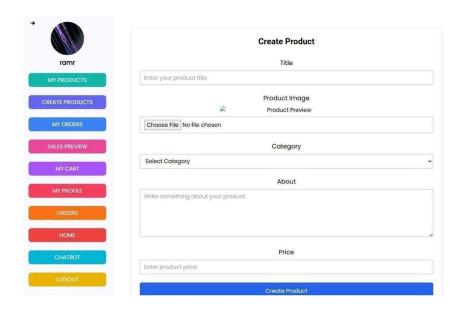


Fig 4.10

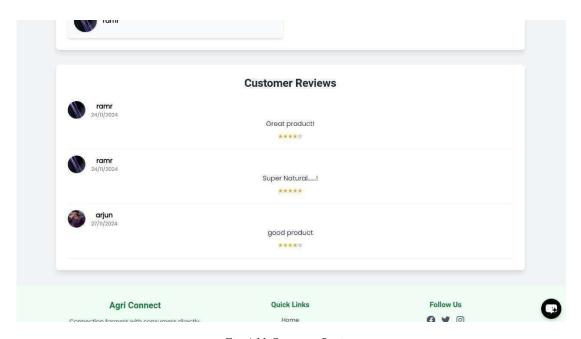


Fig 4.11 Customer Reviews



Fig 4.12Farmer profile

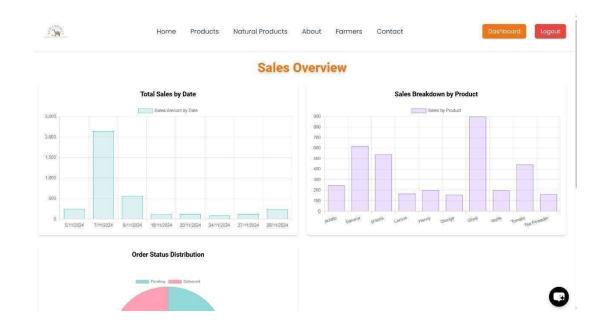


Fig 4.13 Sales overview

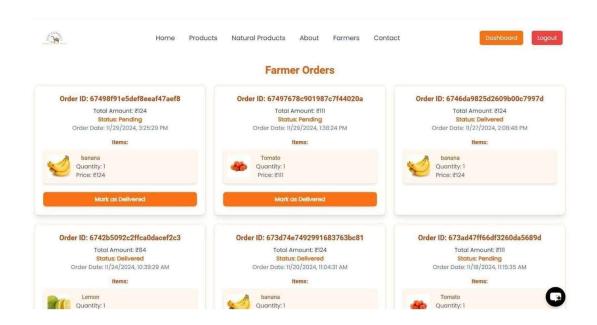


Fig 4.14 Farmers orders



Fig 4.15 MyProducts

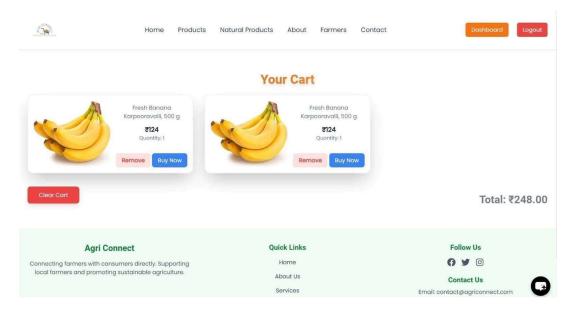


Fig 4.16 Users cart

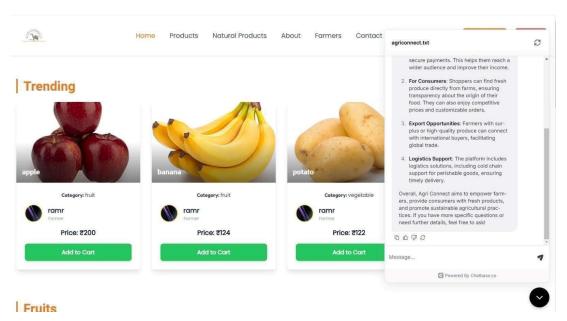


Fig 4.17Chat base

CHAPTER-5

CONCLUSION & FUTURE ENHANCEMENTS

Conclusion

AgriConnect successfully bridges the gap between farmers and consumers by creating a streamlined eCommerce platform tailored to the agricultural sector. Through its intuitive design and robust functionality, the platform empowers farmers to list, manage, and sell their products directly, eliminating the need for intermediaries. This fosters a fairer marketplace and ensures transparency in transactions.

Utilizing the MERN stack for scalability, MySQL for reliable data management, and Tailwind CSS for an aesthetically pleasing interface, AgriConnect delivers a seamless user experience for both farmers and consumers. By leveraging modern web technologies, the platform addresses critical issues like accessibility, convenience, and affordability in the agriculture domain.

In conclusion, AgriConnect stands as a significant step towards digital transformation in the agricultural ecosystem, promoting sustainability, efficiency, and economic empowerment for farmers.

Future Enhancements

In the future, AgriConnect can be enhanced by introducing mobile applications for better accessibility, multilingual support to cater to diverse users, and AI-driven insights for market trends and pricing strategies. Integration with logistics services and flexible payment options will improve the user experience, while features like crop advisory services and community engagement will empower farmers with knowledge and collaboration opportunities. Additionally, partnerships with government bodies and NGOs can provide access to subsidies and schemes, while promoting sustainability through incentives for eco-friendly farming practices. These upgrades will ensure AgriConnect continues to evolve as a comprehensive solution for the agricultural.

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- https://www.mongodb.com/docs/