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FARM2MARKET: A Mobile Application for Direct Farmer-to-Consumer Access

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Abstract - The rapid growth of digital technologies has created new opportunities in the agricultural sector to improve connectivity between farmers and consumers. This paper presents FARM2MARKET, a mobile-based application designed to eliminate intermediaries and provide a direct marketplace for farmers to sell their products. The system is built using modern web technologies including React.js, Node.js, Express.js, and MongoDB. Real-time communication is enabled using Socket.IO. The platform includes secure OTP-based authentication and role- based access for farmers, buyers, and administrators. The system improves transparency, ensures fair pricing, and enhances accessibility for rural farmers. The results demonstrate improved efficiency and user engagement compared to traditional agricultural marketing systems.

INTRODUCTION:

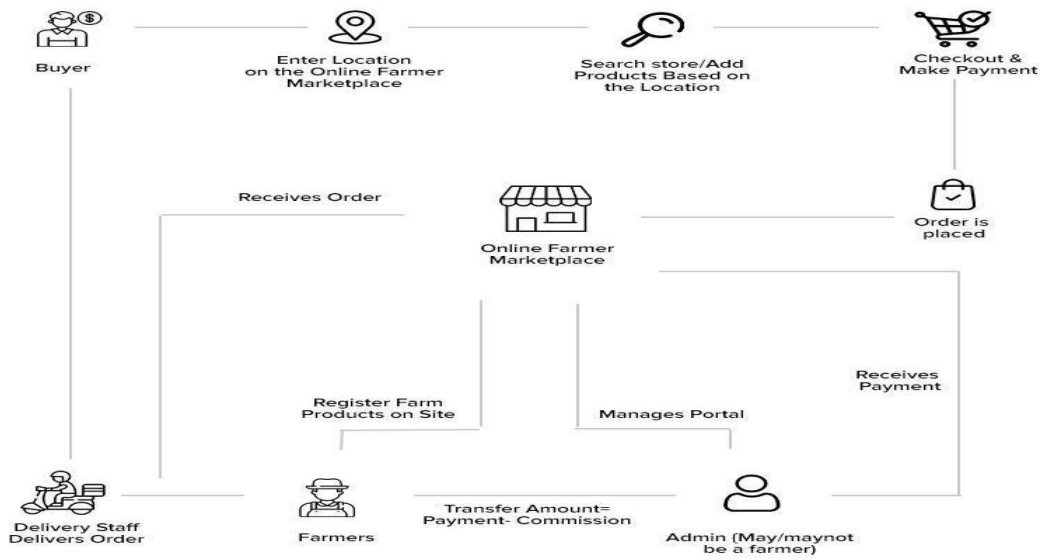
Agriculture plays a vital role in the economy, especially in developing countries like India. However, farmers often face challenges such as price exploitation, lack of direct market access, and dependency on middlemen.
These issues reduce farmers' profits and limit consumer access to fresh products. To overcome these challenges, digital platforms can be used to create a direct connection between farmers and consumers.

FARM2MARKET is developed as a mobile-based solution that enables farmers to sell their products directly to buyers without intermediaries. The system leverages modern web technologies and real-time
communication to provide an efficient, transparent, and user-friendly marketplace.

SYSTEM DESIGN:

The FARM2MARKET system follows a client-server architecture. The frontend is developed using React.js, providing a responsive and interactive user interface. The backend is implemented using Node.js and Express.js, which handle API requests, authentication, and business logic. MongoDB is used as the database to store user details, product information, and order data. The system integrates real-time communication using Socket.IO, allowing instant updates such as product availability, order status, and notifications. OTP-based authentication ensures secure login, while role-based access control manages permissions for farmers, buyers, and administrators.

System Flow Diagram



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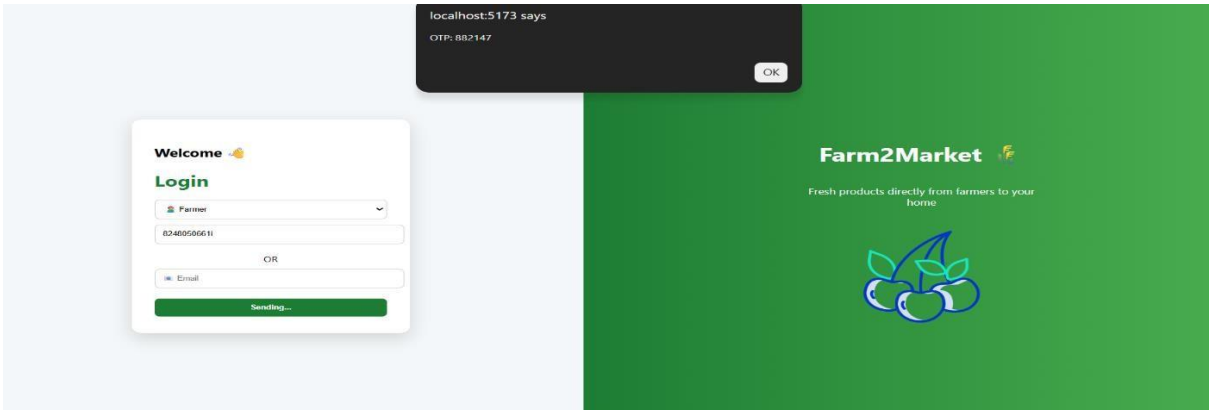
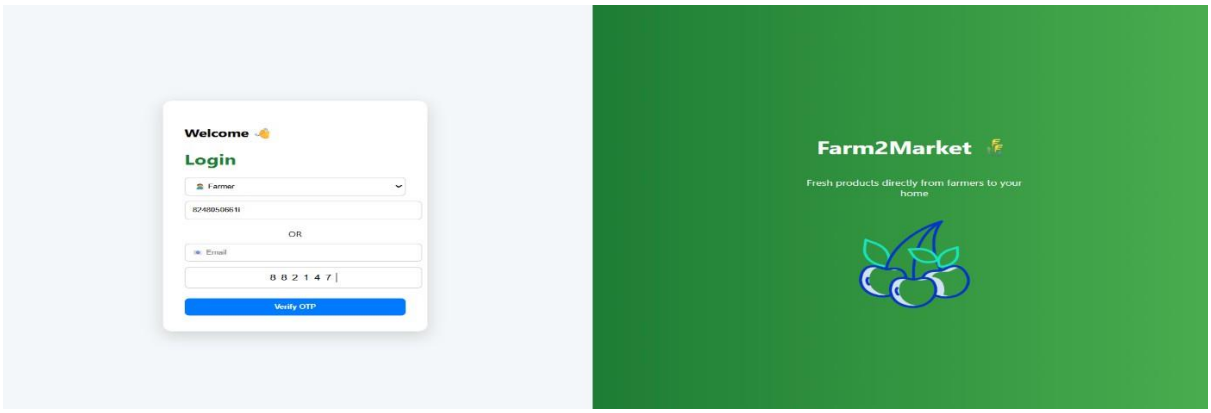
App Screenshots





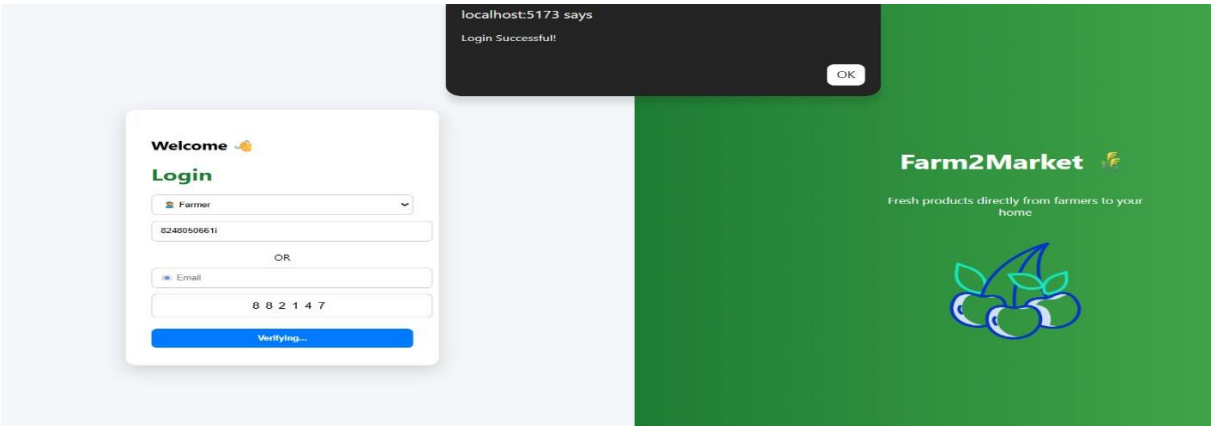


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Fig 1: FARMER LOGIN CREDENTIALS

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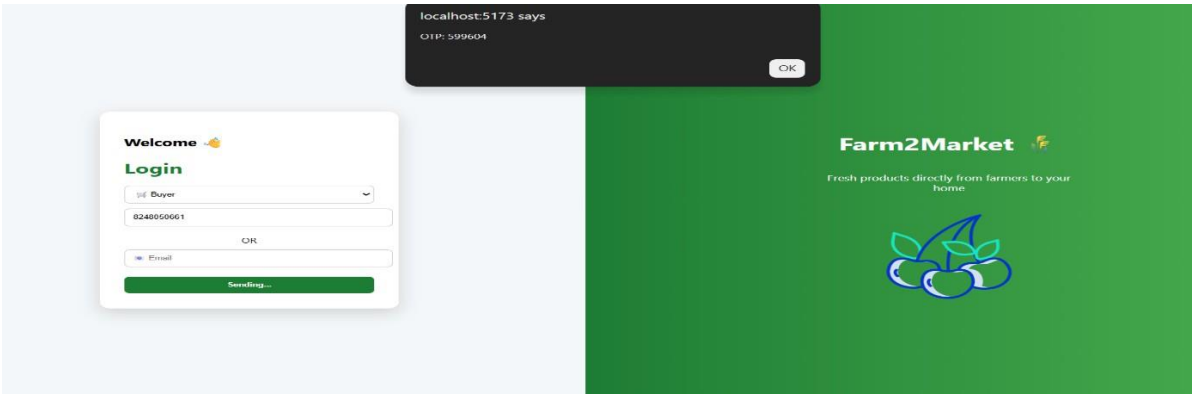

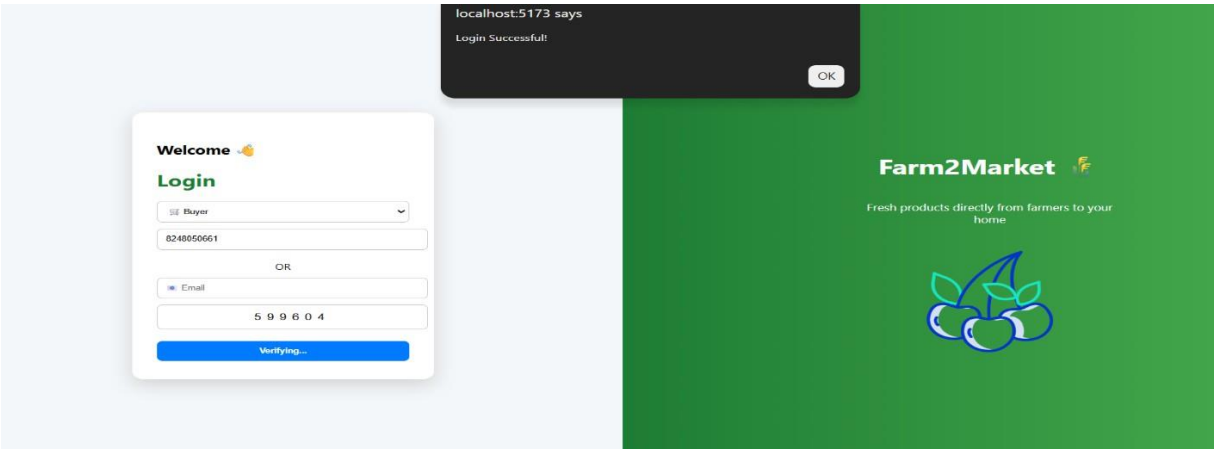

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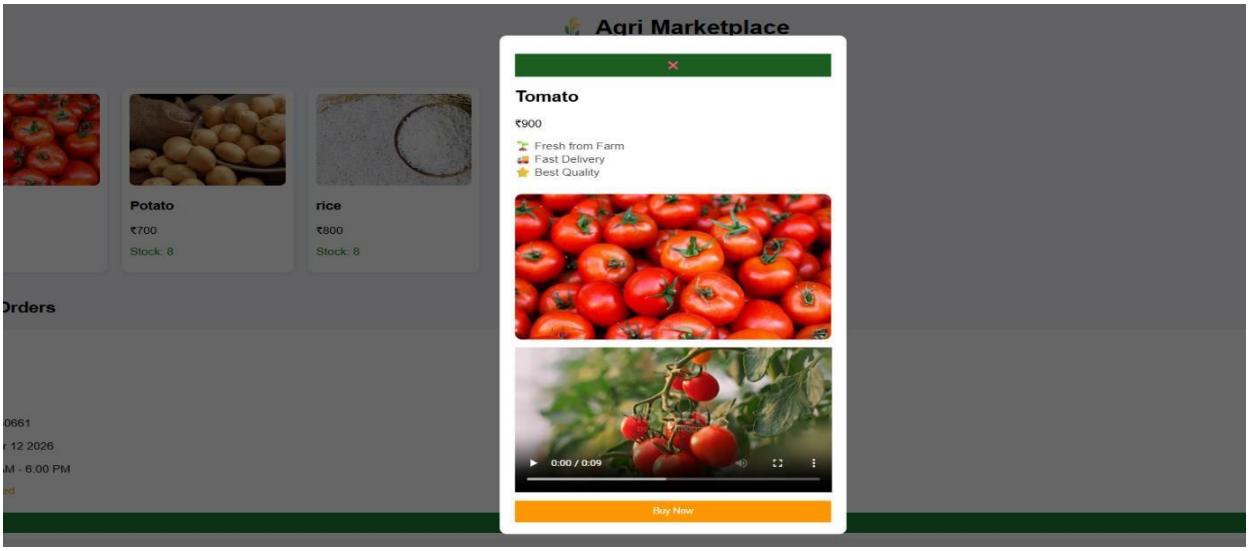

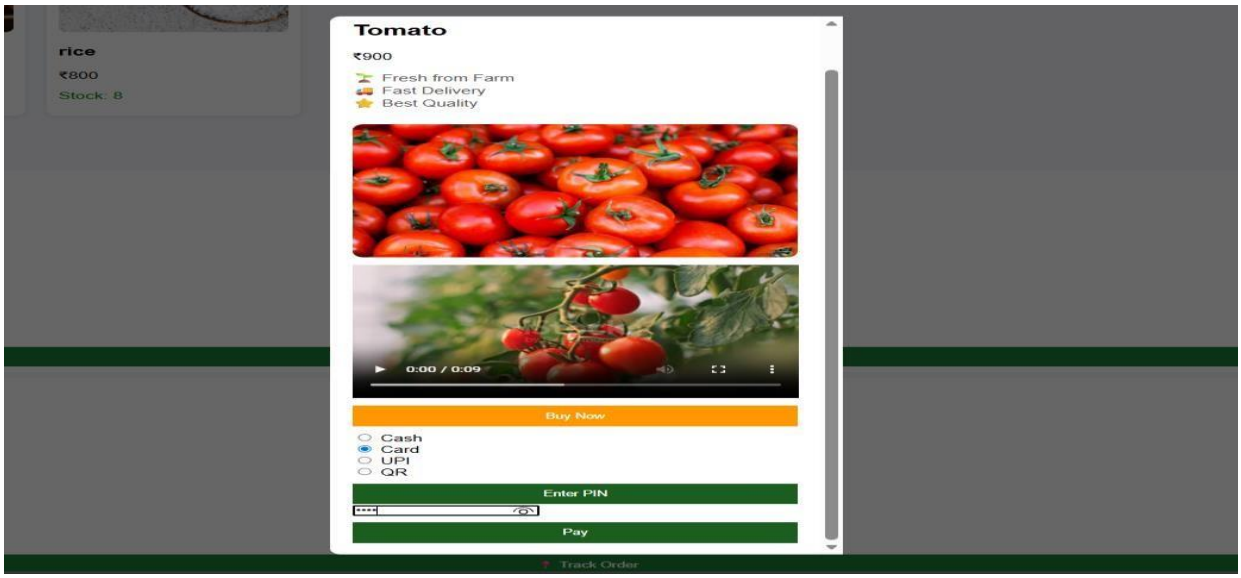

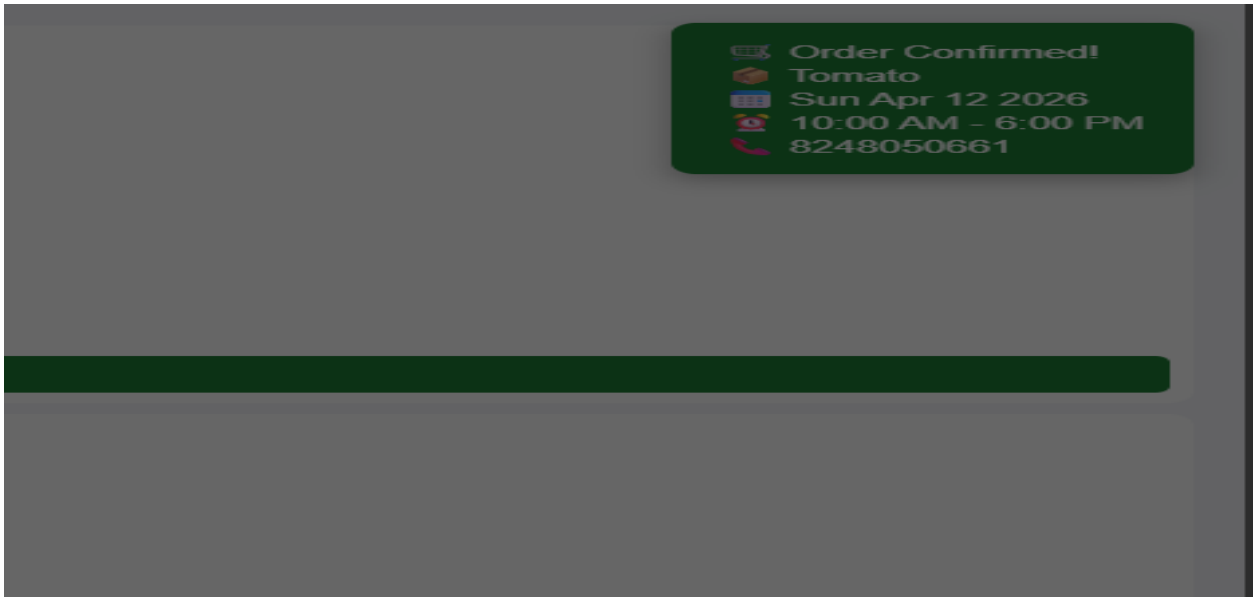

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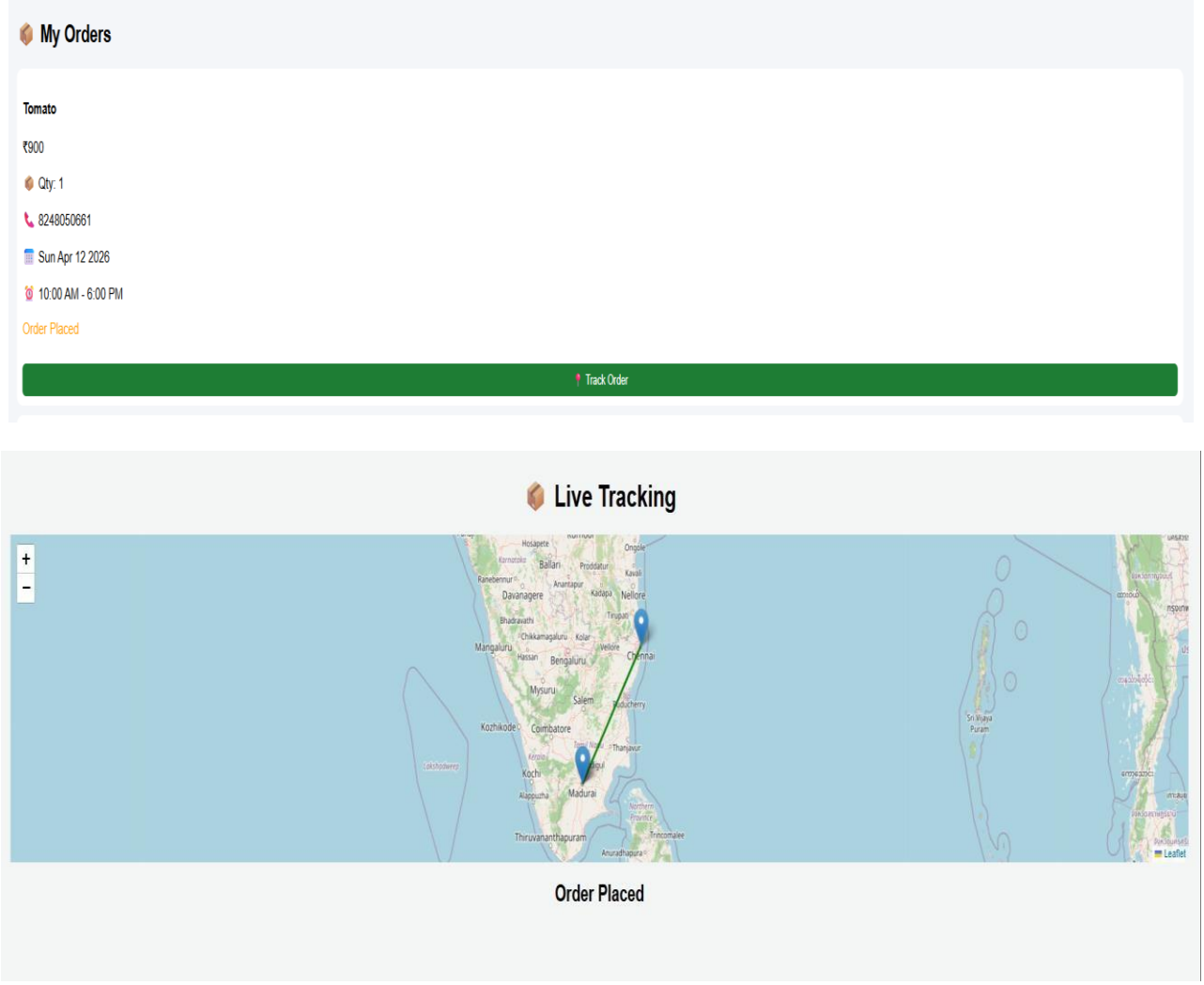
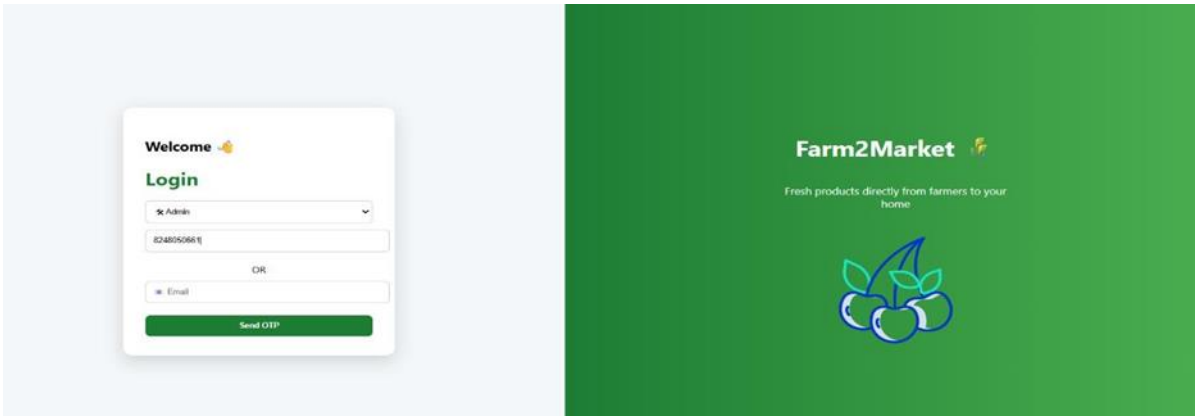


Fig 2: BUYER LOGIN CREDENTIALS



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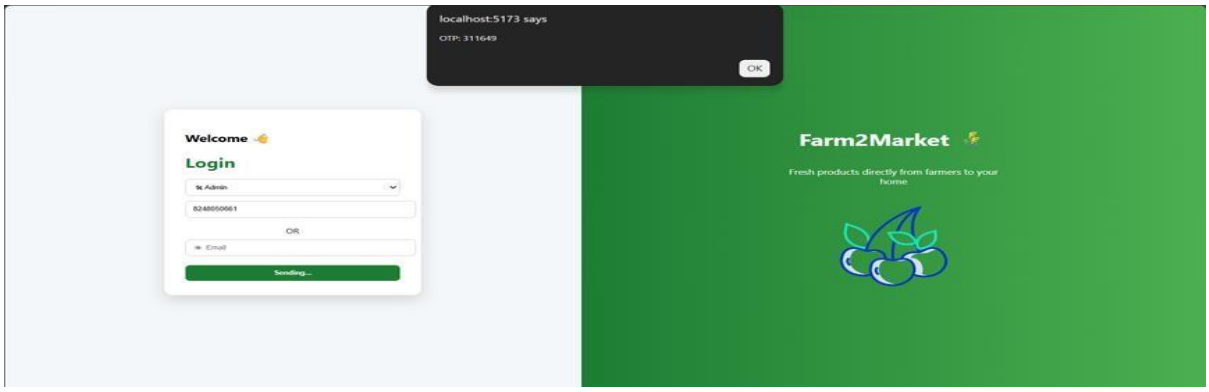

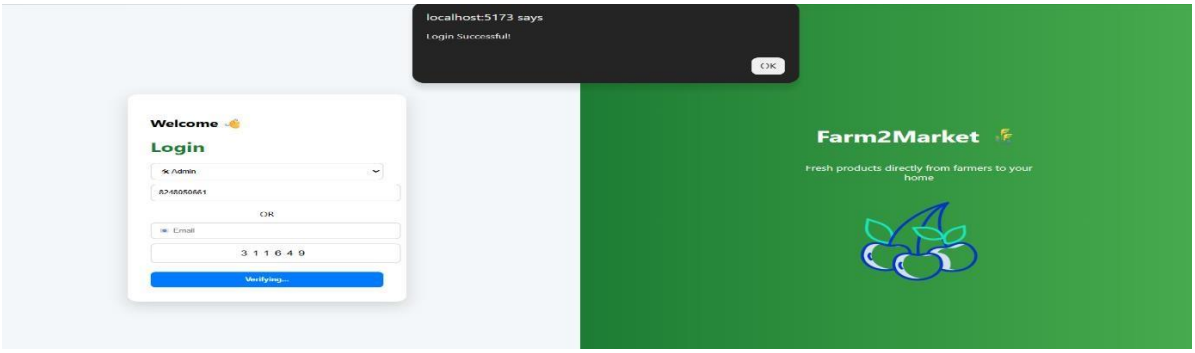

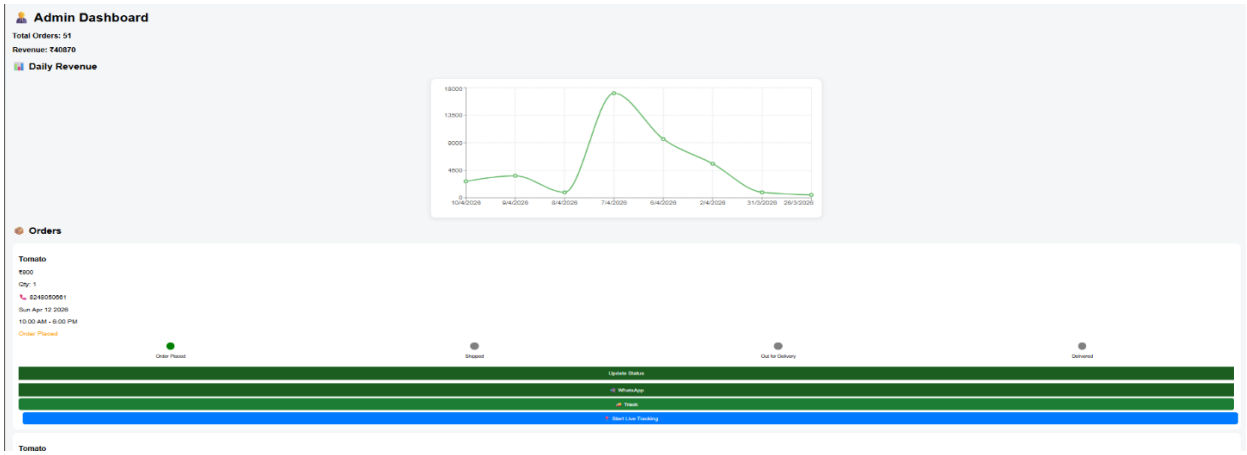

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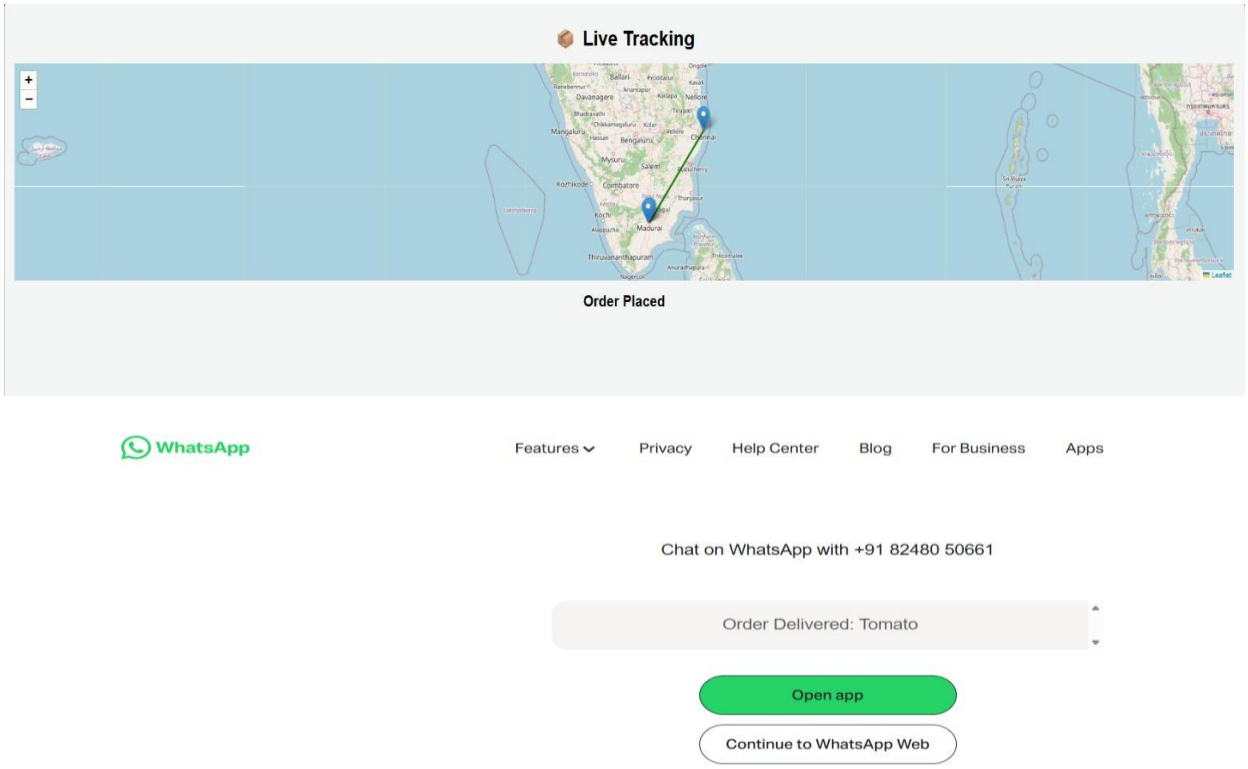

Fig 3: ADMIN LOGIN CREDENTIALS

Architecture:

The architecture of the FARM2MARKET system consists of three main layers:

1. Presentation Layer (Frontend)
    - Developed using React.js
    - Provides user interface for farmers and buyers
2. Application Layer (Backend)
    - Built using Node.js and Express.js
    - Handles API requests and server logic
3. Data Layer (Database)
    - Uses MongoDB
    - Stores users, products, and orders

Additionally, Socket.IO enables real-time bidirectional communication between the client and server. This architecture ensures scalability, flexibility, and efficient data handling.

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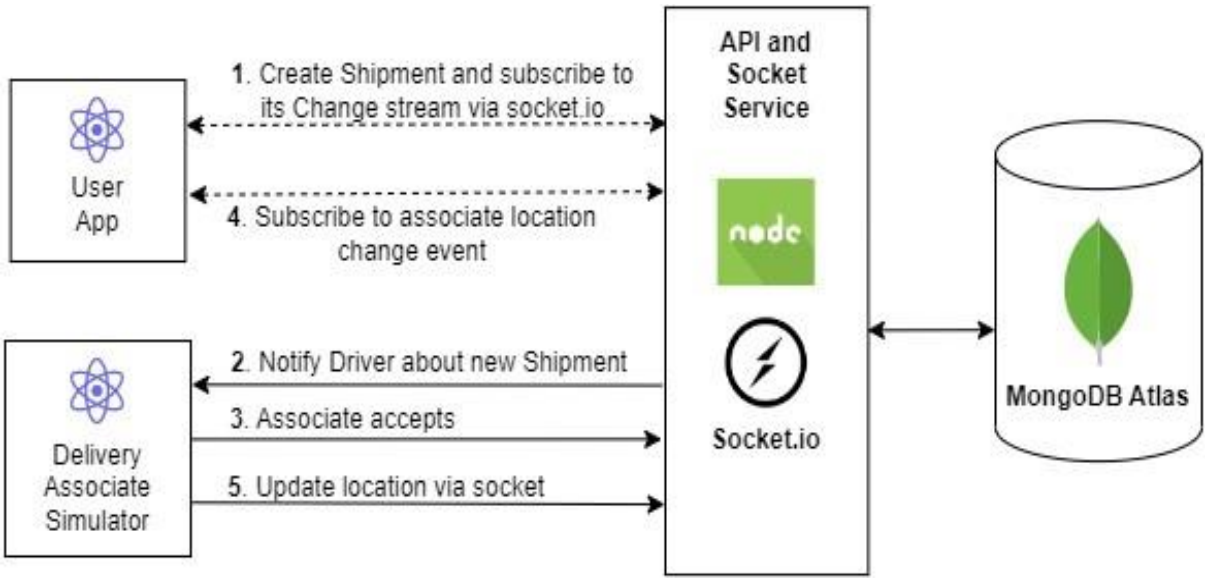

Fig 4: Architecture of FARM2MARKET

Modules:

The system is divided into three main modules:

1. Farmer Module
   - Register and login using OTP
   - Add, update, and delete products
   - Manage inventory
   - View orders and sales
2. Buyer Module
   - Browse available products
   - Search and filter items
   - Place orders
   - Track order status
   - Communicate with farmers
3. Admin Module
   - Manage users (farmers & buyers)
   - Monitor transactions
   - Handle complaints and disputes
   - Ensure system security

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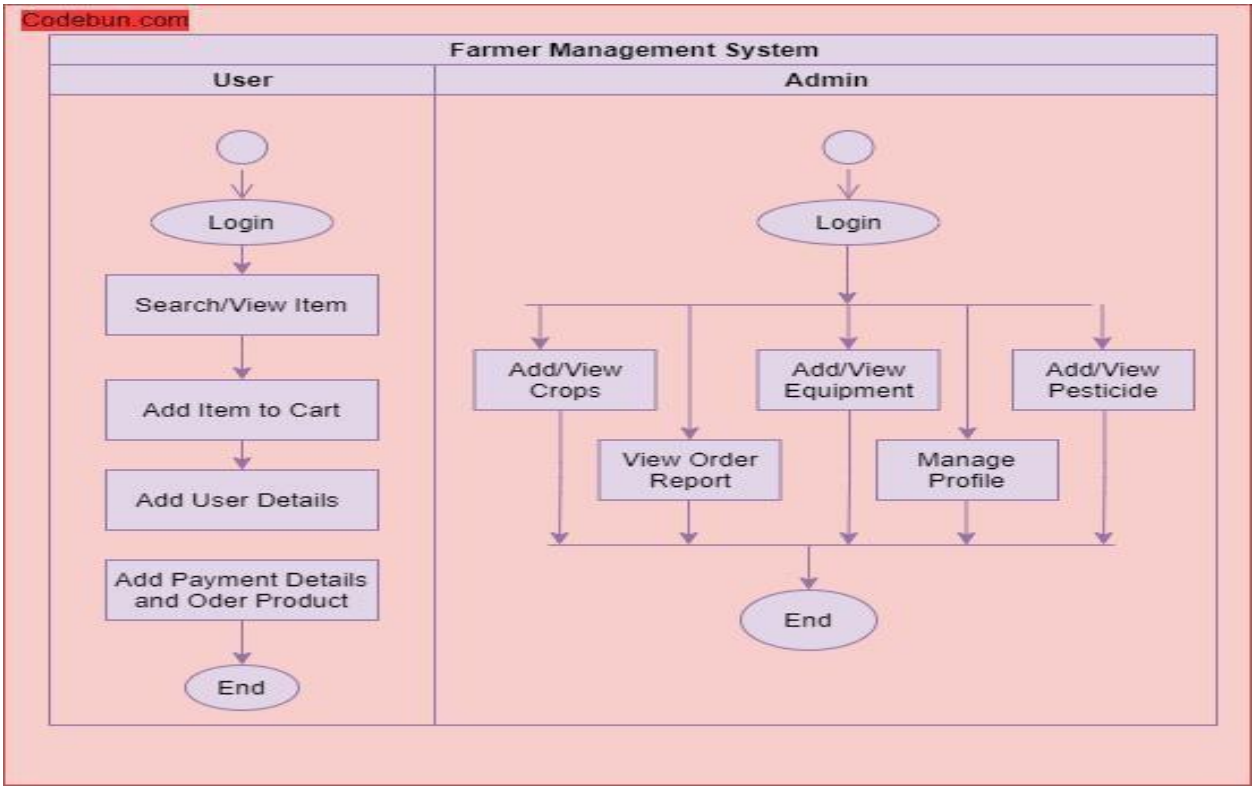

Fig 5 MODULE DIAGRAM

Results and Discussion:

The FARM2MARKET system was tested with multiple users to evaluate its performance and usability. The results show that the system successfully reduces dependency on intermediaries and provides direct access between farmers and consumers.

Key observations include:

- Faster product listing and updates due to real-time communication
- Improved user engagement through interactive interface
- Increased transparency in pricing
- Reduced delay in order processing

Compared to traditional systems, FARM2MARKET improves efficiency and ensures better profit margins for farmers.

CONCLUSION:

FARM2MARKET provides an effective digital solution for connecting farmers directly with consumers. By eliminating intermediaries, the system ensures fair pricing and improves transparency. The use of modern technologies and real-time communication enhances user experience and system performance.

The application contributes to the development of smart agriculture and digital marketplaces, making it easier for farmers to access a wider customer base.

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FUTURE WORK:

- Integration of AI-based price prediction
- Online payment gateway integration
- Multilingual support for rural users
- Expansion to larger geographic regions

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MongoDB Documentation – https://www.mongodb.com

Socket.IO Documentation – https://socket.io

IEEE Papers on Smart Agriculture and IoT-based systems