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Farm E-Market: A Web-Based Agricultural Commerce System for Farmers and Consumers

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ABSTRACT

Indian farmers have long faced restricted access to open markets and freedom in choosing buyers for their agricultural produce. In most states, farm sales are mandated through government-controlled mandis, where intermediaries dominate transactions and significantly reduce farmers' earnings. Research shows that these middlemen often absorb a substantial portion of the profits sometimes as much as 70% leaving the actual cultivators with minimal returns despite their heavy investments in seeds, fertilizers, and labor.

The Farm E-Market a Web Based Agricultural Commerce System offers a web-based solution that connects farmers directly with retailers and consumers, removing the need for intermediaries. Through this platform, farmers can list their products with detailed information, set their own prices, and sell directly to buyers. Customers and retailers can view available produce, compare options, and make purchases efficiently and transparently.

Keywords: E-Agriculture, Online Marketplace, AngularJS, PHP, SQL, Rural Commerce, Farm Produce Management.

INTRODUCTION

Agriculture remains the backbone of the Indian economy, yet the majority of farmers are unable to fetch fair prices for their produce due to lack of direct market access. Traditional selling methods involve multiple intermediaries, reducing the farmer's profit. The digital age offers opportunities for transformation in the way agricultural products traded.

The Farm E-Market provides a platform for farmers to register, manage inventory, post produce for sale, and communicate with consumers. Consumers benefit from traceability, quality assurance, and competitive pricing. Developed using AngularJS for the frontend, PHP for backend processing, and SQL for data management, the system ensures a seamless user experience for both farmers and buyers.



Fig: 1. User Interface diagram

In today's digital era, most commercial activities including buying and selling of goods are shifting to online platforms for better accessibility, transparency, and efficiency. Agriculture, being one of the foundational sectors of the economy, is also undergoing a digital transformation. Traditionally, farmers have relied on physical markets and intermediaries to sell their produce, which often leads to reduced profits and lack of transparency in pricing. To overcome these limitations and bridge the gap between producers and consumers, we are introducing a Web-Based Agricultural Commerce System (Farm e-Market) where farmers can directly list and sell their agricultural products to buyers.

This online marketplace is developed using modern web technologies such as HTML and CSS for the frontend interface, and PHP with SQL Server for the backend and database management. The project is designed to simplify and digitalize the entire agricultural trade process, making it user-friendly for both farmers and buyers. The main objective of this system is to empower farmers with direct market access, minimize dependency on middlemen, and ensure fair pricing through a transparent and reliable platform.

The admin panel of the system consists of various modules that help manage and monitor the platform effectively. Admins can approve farmer registrations, manage product categories, view transaction logs, and resolve any disputes between buyers and sellers. They also oversee the logistics, pricing regulations, and seasonal updates related to agricultural trade.

The user interface is divided for both farmers and buyers.

- Farmers can register on the platform, add product listings (with prices, quantities, and harvest dates), and manage their orders.
- Buyers can browse available products, place orders, track deliveries, and make payments securely through the system.

Additionally, the system offers features such as order history, payment records, shipment tracking, feedback/reviews, and real-time notifications for both sellers and buyers.

METHODOLOGY

The development of the Farm E-Market system follows a structured approach with clearly defined technologies and components to ensure a robust and scalable application.

- 1. Technology Stack:
 - Frontend: AngularJS for dynamic interfaces.
 - Backend: PHP for server-side scripting.
 - Database: MySQL/SQL Server for data management.
 - Styling: HTML5 and CSS3 for responsive design.
- 2. SYSTEM ARCHITECTURE

The architecture includes three main modules: Admin, Farmer, and Consumer. Each module communicates with the backend via RESTful APIs. Realtime updates and synchronization are handled through AJAX calls and notification APIs.





3. INTEGRATION:

Real-time data synchronization between users and admin dashboards. o Notifications integrated via third-party APIs for SMS, email, and app alerts.

4. DEVELOPMENT APPROACH

An Agile development methodology was used, incorporating iterative sprints and continuous feedback. Regular prototype testing and user interviews ensured that the platform evolved in line with user needs.



Fig: 3. Work flow diagram

5. PROJECT PURPOSE

The **purpose of the Farm E-Market project** is to create a digital platform that empowers farmers by directly connecting them with consumers, thereby eliminating the dependency on middlemen. In traditional agricultural systems, farmers often face challenges like unfair pricing, limited market access, and delayed payments due to the involvement of multiple intermediaries. This web-based system is designed to address these issues by offering a transparent and efficient marketplace where farmers can list their products, manage orders, and track shipping details.

By using the Farm E-Market platform, farmers can showcase their produce to a wider audience beyond their local markets, improving their chances of better sales and income. Consumers, on the other hand, benefit from accessing fresh, quality products at reasonable prices, along with clear information about the product source and quality. The system also simplifies processes such as product booking, shipping updates, and feedback, making the entire agricultural transaction cycle smoother and more efficient.

Ultimately, the project aims to support the agricultural community by promoting digital inclusion, enhancing economic sustainability, and fostering direct farmer-consumer relationships, all while ensuring fair trade practices and improved livelihoods for farmers.

6. ABOUT THE PROJECT

The Farm E-Market is a web-based agricultural commerce system designed to digitally connect farmers with consumers, retailers, and wholesalers. The platform allows farmers to list their agricultural products, manage their inventory, and directly sell to buyers without the involvement of middlemen. It serves as a transparent, user-friendly, and cost-effective solution to modernize the agricultural marketing process.

The system consists of two main modules: User Module and Admin Module. The User Module enables farmers and buyers to register, browse available products, book orders, view product details, and track shipping statuses. The Admin Module oversees user

Management, product verification, and report generation.



Fig: 4. Activity diagram

Built using AngularJS for dynamic front-end interfaces, PHP for backend processing, and MySQL/SQL Server for database management, the system offers a responsive and reliable environment for online transactions. The design follows modern web standards with HTML5 and CSS3 for a consistent user experience across devices.

The Farm E-Market system ultimately aims to promote fair trade, increase market access for rural farmers, reduce post-harvest losses, and contribute to a more efficient and equitable agricultural supply chain.

FEATURES

- Easy farmer and consumer registration
- Product listing with image, description, and pricing
- Real-time order notifications
- Inventory management for farmers
- Order tracking for consumers
- Admin tools for monitoring, advertisements, and reporting

User Features

- Add, edit, or deactivate farmer and consumer user accounts.
- Approve user registrations and assign roles dynamically.
- Monitor user activity and handle complaints or queries.
- View and manage complete user profile details.

Product Features

- Approve and verify newly added farm products.
- Edit or remove product details like price, quantity, or description.
- Categorize and organize products for easy browsing.
- Track product listings and inventory levels from users.

Reports & Monitoring

- Generate reports on product sales, bookings, and user activity.
- Monitor top-selling products and seasonal trends.
- View shipping and order history for analysis.

EXISTING SYSTEM CHALLENGES

Traditional agricultural trade systems are plagued by inefficiencies including manual pricing, unreliable transport, and lack of real-time inventory tracking. Farmers often earn less due to dependence on middlemen.

Traditional agricultural trade systems suffer from multiple inefficiencies such as manual pricing processes, unreliable and uncoordinated transportation, lack of transparency, and the absence of real-time inventory and order tracking. These issues often result in reduced profits for farmers, limited market access, post-harvest losses, and overdependence on middlemen who control pricing and distribution.

The Farm E-Market system addresses these challenges by introducing a digital, centralized platform that enables direct interaction between farmers and consumers. Key enhancements include:

- Automated Pricing and Product Listing: Farmers can set and adjust prices digitally, reducing delays and manipulation.
- Real-Time Inventory Management: Farmers can track product availability and manage stock efficiently.
- Transparent Order and Shipping Tracking: Buyers and sellers can view order status, shipping progress, and delivery updates in real-time.
- Direct-to-Consumer Sales Model: Eliminates middlemen, ensuring fair prices for farmers and competitive rates for buyers.
- Integrated Reporting Tools: Provides insights into sales trends, demand forecasting, and operational efficiency.

By integrating modern web technologies and a farmer-friendly user interface, the enhanced system modernizes the agricultural supply chain, increases farmer income, and ensures timely access to fresh produce for consumers.

PROPOSED SYSTEM ADVANTAGES

- Direct-to-consumer model
- Transparent pricing and reduced exploitation
- Improved logistics tracking
- Real-time data access
- Scalable platform for future expansion
- System is providing platform such as android app wherein farmer can sell his crop products at different layer of marketing chain (market, merchant or end user) with multiple option.
- This platform will help farmers to find out nearest markets, its current stock details and its demand for particular product within less time & with less effort.
- This analysis will thereby help to determine which market will be more profitable for his crop/product.
- Farmers can use this facility and can learn how it is possible and how they can use e-farming to sell their products. This application will act
 as unique and secure way to perform agro-marketing.
- The system allows farmers to sell their stock directly as a direct supplier throughout the country without any middlemen so that, farmer earns optimum rates for his stock and also the customer gets it at lowered costs.
- This will also eliminate the food grains mafia that stores these products in own warehouses in order to increase demand and thus rates of the products, so that it can later be sold at higher profits.

MODULE 1 – ADMIN

Forms and Functional Features

- Add Product
 - O Add new product entries with full details like crop name, category, pricing, and image upload.
 - O Auto-generate Product IDs and allow category-based assignment.
- Manage Orders
 - View, confirm, or reject orders in real time.
 - Filter orders based on status (Pending, Approved, Delivered).
- Update Orders
 - O Modify order quantities, status, or customer details on request.
 - Send automated notifications to users post updates.
- Shipping Details
 - Assign delivery personnel and update dispatch/shipping details.
 - 0 Monitor delivery status and expected delivery timelines.
 - O Generate shipping reports and analyze logistic efficiency.

MODULE 2 - USER

Forms and Functional Features

- Book Product
 - O One-click booking system for available farm produce.
 - Auto-fill profile and shipping info for registered users.
- View Product Details
 - Detailed product information including description, price, quantity, and seller details.
 - Product images and seasonal availability.

• View Orders

- Track all previous and current bookings.
- View itemized order breakdown, cost, and delivery details.

View Shipping Status

- O Real-time status updates of product shipping (e.g., Dispatched, In Transit, and Delivered).
- 0 Notifications via SMS/email for order movements.

MODULE 3 – PRODUCT MODULE

Forms and Functional Features

- Product Listing Form
 - Farmers can upload multiple products using a simple form interface.
 - Add images, description, price, quantity, and category tags.

• Product Details View Page

- Display selected product with all available information and farmer profile.
- Show live status (In Stock, Sold Out).
- Filter/Search Products
 - Search by category, price range, crop type, or location.
 - O Smart filters based on trending or seasonal products.
- Product Review / Feedback Form
 - Allow users to rate products and write reviews post-delivery.
 - O Display average ratings and verified buyer comments for transparency.
- 7. Key Benefits of the Enhanced Farm E-Market System
- 1. Efficiency: Real-time product and shipping updates eliminate manual coordination, reducing delays and errors.
- 2. Transparency: Direct farmer-to-consumer transactions ensure fair pricing and traceability.
- 3. Scalability: Built on robust architecture to support expanding user and product base.
- 4. User Engagement: Interactive dashboards, alerts, and feedback systems keep both farmers and consumers actively involved.
- 5. Smart Management: Seamless handling of inventory, orders, and logistics from a single platform.

MODULE OVERVIEW

MODULE 1- ADMIN

- Add product
- Manage orders
- > update orders
- shipping details

MODULE 2- USER

- book product
- View product details
- view orders
- View shipping status

MODULE 3- PRODUCT MODULE

- Product listing
- Product details
- View page filter/search products
- Products review/ feedback

CONCLUSION

Farm E-Market is a robust, web-based solution that addresses key pain points in the agricultural trade ecosystem. It enhances farmer income, reduces dependency on intermediaries, and gives consumers access to fresh and affordable produce. The system's architecture and development framework ensure ease of use, scalability, and adaptability.

- A high end solution can be bought or rented as a standalone program or as an addition to an enterprise resource planning program.
- It is usually installed on the farmer's own web site and may integrate into the existing supply chain so that ordering; delivery can be automated to a large extent.
- Other solutions allow the user to register and create an online shop on a portal that hosts multiple shops at the same time.
- Its main purpose for this app is time saving and easy moving to farmers and users.

FUTURE SCOPE

- > The current system developed can be further enhanced to enable the farmer to connect to his device with SMS.
- The system's design can be optimized based on much precise requirement of the farmer and can developed on a large scale, which even reduce the cost of the device.
- > The advertisements related to agricultural equipment can also be published on the interface of the farmer.
- The system can be extended to provide a common platform for different kinds of farmers to interact and exchange information regarding farming.
- > The system will extended added multiple host of farmers and maintaining farmers hubs enhanced to connect sub dealers and retailers.
- The development of a custom-made application and its interface required a stringent examination, in order to verify the correct comprehension, analysis and exact implementation of thoughts of the client into the definite product.
- Some future work, could include the development and implementation of a mobile application designed towards geospatial data collection to update the Agri shop database, with a complete and customized interface

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