
FARM EASY- Connecting Farmers, Consumers and Logistics for On-Demand Supply Of Tomatoes

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Abstract.

The tomato supply chain currently suffers from inefficiencies such as ineffective communication, unreliable deliveries, and fraud. Farm Easy, the proposed mobile app, simplifies processes by providing on-demand tomato supply across the state at affordable prices with the participation of farmers, consumers, and logistics providers. Consumers can register, order, track deliveries, and avail OTP verification for secure payments. A wallet system allows easy payment and refund, preventing fraud. Market price analysis provides real-time updates, allowing smart buying. Middlemen minimization ensures sustainable pricing and cost-effectiveness. Inventory management, delivery estimation, and quality control are enabled for farmers through a rating system. Logistics agents can register service areas, accept requests, and handle deliveries effectively. Real-time tracking increases transparency, and a dispute management system ensures fair conflict resolution. With direct farmer-consumer transactions, transparent pricing, and effective logistics, the app makes tomato distribution efficient, reliable, and cost-effective across the state.

Keywords. Supply Chain, Transparency, Real-time Tracking, On-Demand Supply, Wallet System, Market Price Analysis, Sustainable Pricing, OTP Security, Dispute Management.

1. INTRODUCTION

The supply chain of tomatoes experiences inefficiencies such as inefficient communication, undependable deliveries, and insecure transactions, which cause delays and deception. Farmers experience difficulties in satisfying demand precisely, and logistics agents encounter coordination difficulties. Farm Easy, a mobile application, brings farmers, consumers, and logistics agents together on a common platform. It provides secure transactions and effective order management. Customers register, enter location and payment information, order, and monitor deliveries with OTP-based security. A minimum balance wallet system ensures fraud prevention. Farmers post produce, control orders, and estimate delivery hours, while a rating system guarantees quality. Logistics agents receive delivery requests and arrange pickups. The app also has cancellation and dispute management for problem-solving.

2. RELATED WORK

Innovative digital technologies have revolutionized agriculture with enhanced market access, resource utilization, and price forecasting. Android applications link farmers directly to retailers, cutting out intermediaries and offering better prices. Equipment rental services enable farmers to obtain required equipment at lower costs. Sophisticated forecasting methods such as neural networks and machine learning enable accurate predictions of market trends, allowing informed decisions and sustainable agriculture. Online sales are enabled by smart farming applications, direct transactions are facilitated, and competitive pricing is facilitated, albeit with challenges of internet connectivity and digital literacy. Mobile applications for old farmers assist in activities, while web and GPS systems facilitate direct marketing, albeit with issues of language and payment channels. LSTM networks and ARMA models enhance the accuracy of tomato yield forecasting, allowing farmers to plan planting plans. The E-Mandi and E-Farmer platforms facilitate direct transactions, enhancing profitability but with the necessity for technology enhancements. Analysis of tomato price trends in India highlights the necessity for monitoring seasonal fluctuations to match production with demand. While hybrid forecasting models offer robust market forecasts, they require high-quality data and frequent updating. These

technological innovations enhance efficiency, transparency, and inclusive growth in agriculture, leading to a more competitive and sustainable market.

3. SYSTEM ARCHITECTURE

Farm Easy incorporates core modules to automate the tomato supply chain.

- User Registration: Consumers, farmers, and logistics agents register with required information to facilitate smooth transactions.
- Order Management & Payment: Consumers order and monitor orders, with secure transactions facilitated through OTP verification and secure payments.
- Backend Architecture: Developed using Java and Kotlin for frontend, Ktor for backend, and PostgreSQL for database management, to ensure efficiency and scalability.

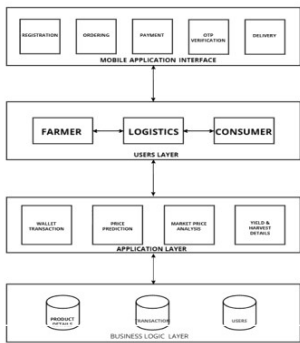


Figure 3.1 – System Architecture

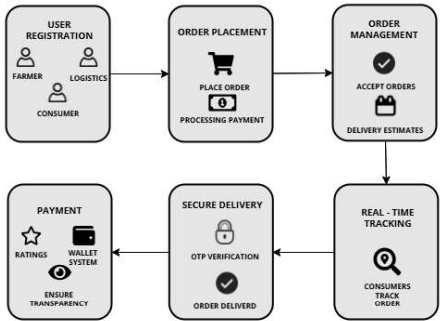


Figure 3.2 – System Flow Diagram

4. METHODOLOGY AND IMPLEMENTATION

Farm Easy follows a structured modular approach, ensuring effective communication and transaction management between stakeholders.

4.1 Farmer Dashboard

Farmers update stock levels in real time, making it easy to track inventory accurately. Real-time notifications for new orders allow for timely response, eliminating supply delays.

4.2 Logistics Dashboard

Delivery partners accept live orders and utilize Mapbox-integrated route optimization for optimized delivery. The flow is maintained in real-time, and secure OTP verification keeps the order process secure.

4.3 Consumer Dashboard

Consumers can preview stock availability, select preferred amounts, and view estimated delivery schedules before making the purchase. Order tracking capability exists for real-time tracking of the orders, as well as a built-in wallet system for ease of payment.

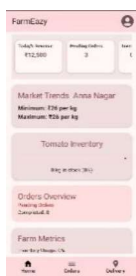


Figure 4.1.1- Farmer dashboard 1

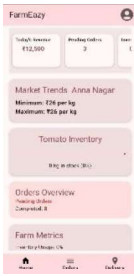


Figure 4.1.2- Farmer dashboard 2

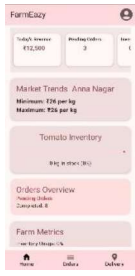


Figure 4.2.1- Logistics dashboard 1



Figure 4.1.1- Logistics dashboard 2



Figure 4.3.1- Consumer dashboard 1



Figure 4.3.2- Consumer dashboard 2

4.4 Wallet System and Price Prediction

A preload wallet system facilitates instant payments, obviating the delays in payment and fraud risks. The platform dynamically reprices based on historical data, market trends, and Uzhavar Santhai prices to offer equitable rates. For enhancing the accuracy of price prediction, ARIMA and LSTM models analyze past trends to predict future prices of tomatoes. The models are contrasted with traditional statistical methods to determine their effectiveness in detecting seasonal trends

5. CONCLUSION

The Farm Easy app effectively solves supply chain issues for tomatoes by creating an integrated, transparent, and secure platform for farmers, consumers, and delivery agents. It streamlines registration, order management, and OTP-based delivery confirmation while ensuring secure payments, real-time tracking, and fair dispute resolution. With an on-demand supply system, consumers can access real-time stock updates and place orders based on availability, reducing waste and improving efficiency. Farmers can adjust supply dynamically based on demand trends, ensuring better price control and resource utilization. The app promotes accountability through ratings and reviews, enhancing quality standards and consumer confidence. Farm Easy revolutionizes agricultural transactions by making the supply chain more profitable, transparent, and sustainable.

6. REFERENCES

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Biographies



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