Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Farm2Market: Leveraging AI and Blockchain to Reinvent the Agricultural Supply Chain

Revanasiddappa Bandi

revanasiddappa@bnmit.in

BNM Institute of Technology

• **Aniketh G. V**

BNM Institute of Technology

Aravind K Vishwanath

BNM Institute of Technology

B S Sagarvir

BNM Institute of Technology

Research Article

Keywords: Blockchain, Agricultural Supply Chain, Smart Contracts, Artificial Intelligence, Price Prediction, QR Code Traceability, Ethereum, Mobile Application

Posted Date: July 14th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-10338733/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: The authors declare no competing interests.

Farm2Market: Leveraging AI and Blockchain to Reinvent the Agricultural Supply Chain

Abstract

Traditional agricultural supply chains face persistent challenges including data fragmentation, limited transparency, price volatility, and excessive dependence on intermediaries, resulting in reduced farmer profitability and lower consumer trust. This paper presents **Farm2Market**, a fully implemented blockchain and artificial intelligence (AI) integrated agricultural platform that enables secure, transparent, and intelligent supply chain management.

The proposed system integrates a mobile application supporting direct farmer–buyer interaction, product listing, order management, and real-time shipment tracking with Ethereum-based smart contracts that provide immutable transaction recording and escrow-based payment mechanisms. A QR-code-enabled traceability framework allows end-to-end provenance verification, while an AI-driven crop price prediction module forecasts market prices using historical agricultural data with approximately 82% prediction accuracy.

Experimental evaluation demonstrates low-latency blockchain operations, efficient QR-based traceability, secure financial transactions, and reliable predictive performance. The proposed framework improves transparency, pricing fairness, and supply chain efficiency while reducing dependency on intermediaries. The results indicate that Farm2Market provides a scalable and practical solution for modern agri-food ecosystems, particularly in resource-constrained agricultural markets.

Keywords: Blockchain, Agricultural Supply Chain, Smart Contracts, Artificial Intelligence, Price Prediction, QR Code Traceability, Ethereum, Mobile Application

1 Introduction

Agriculture remains one of the most important economic sectors worldwide and plays a critical role in ensuring food security and sustainable development. Despite significant technological advances, agricultural supply chains continue to experience numerous operational challenges, including fragmented data management, poor transparency, inefficient logistics, price volatility, and heavy dependence on intermediaries. These challenges reduce farmer profitability, increase operational costs, and limit consumer confidence regarding product authenticity and quality.

Traditional supply chain management systems are generally centralized and rely on multiple independent stakeholders for maintaining transaction records. Such architectures are susceptible to data manipulation, inconsistent record keeping, delayed information sharing, and limited traceability. Consequently, verifying the origin, transportation history, and authenticity of agricultural products becomes increasingly difficult.

Blockchain technology has emerged as a promising solution for addressing these limitations by providing decentralized, immutable, and transparent transaction records. Its distributed ledger architecture enables secure recording of supply chain events while reducing opportunities for fraud, counterfeiting, and unauthorized modification of data [1],[2]. Several studies have demonstrated the effectiveness of blockchain technology for improving agricultural traceability and enhancing stakeholder trust during global disruptions, including the COVID-19 pandemic [3],[4].

Although blockchain substantially improves transparency and provenance, existing blockchain-based agricultural systems frequently focus on individual functionalities such as traceability or digital marketplaces without providing a complete opera-tional ecosystem. Similarly, recent developments in artificial intelligence have shown promising results for agricultural decision support, particularly crop price forecasting, yield prediction, and demand estimation. Deep learning approaches such as Long Short-Term Memory (LSTM) networks have demonstrated high predictive capability for agricultural commodity prices [5–7]. However, these AI solutions typically operate independently and are rarely integrated with blockchain-enabled supply chain infrastructures.

Existing digital marketplaces improve direct farmer-to-consumer interaction but often lack secure payment mechanisms, immutable transaction histories, and reliable provenance verification. Furthermore, many blockchain-based solutions remain conceptual or prototype architectures without demonstrating practical deployment through fully functional mobile applications.

To overcome these limitations, this paper presents **Farm2Market**, a complete blockchain–AI integrated agricultural supply chain platform. Unlike previous approaches, Farm2Market combines:

- Ethereum-based smart contracts for secure escrow payments,
- QR-code-enabled product traceability,
- AI-based crop price prediction,
- Real-time mobile application services,
- Immutable blockchain transaction recording.

The proposed platform provides farmers and buyers with a unified ecosystem that supports secure product listing, intelligent pricing recommendations, transparent logistics monitoring, and trustworthy financial transactions.

The primary contributions of this work are summarized as follows:

1. Development of a blockchain-enabled agricultural marketplace utilizing factory-based escrow smart contracts for secure farmer–buyer transactions.
2. Design of a QR-code-based traceability framework providing immutable verification of product provenance throughout the supply chain.
3. Integration of an AI-driven crop price prediction model capable of forecasting market prices with approximately 82% prediction accuracy.
4. Development of a unified mobile application enabling real-time product listing, transaction monitoring, order management, and logistics tracking.
5. Experimental validation demonstrating low transaction latency, lightweight blockchain operations, efficient traceability, and reliable predictive performance.

2 Related Work

2.1 Blockchain-Based Agricultural Traceability

Blockchain technology has received considerable attention for improving transparency, trust, and traceability throughout agricultural supply chains. Alonso *et al.* proposed an intelligent Edge-IoT framework that combines sensor data acquisition with blockchain technologies to improve food traceability and minimize information asymmetry among supply chain participants [8].

Cao *et al.* introduced the BE-AC framework, which utilizes Ethereum smart contracts and cryptographic digital signatures to provide anti-counterfeiting capabilities across pharmaceutical supply chains [4]. Mezquita *et al.* proposed an interoperability model integrating blockchain with the InterPlanetary File System (IPFS) to improve scalability while maintaining secure decentralized storage [9].

Sugandh *et al.* developed a blockchain-based framework for agricultural food authentication that enables tracking, tracing, and risk assessment throughout food supply chains [10]. Recent survey studies have further highlighted blockchain's potential for improving transparency, security, sustainability, and trust within modern agricultural ecosystems [11–14].

Although these studies successfully demonstrate blockchain-enabled traceability, most primarily emphasize provenance verification without incorporating intelligent pricing systems or comprehensive user-centric applications.

2.2 Digital Agricultural Marketplaces

Digital agricultural marketplaces seek to reduce intermediary dependence by facilitating direct interaction between farmers and buyers. Jayashree *et al.* proposed an online agricultural marketplace supporting product listing and electronic payment facilities, although advanced transparency mechanisms were not incorporated [15].

Anitha and Praveen developed a MERN-stack agricultural marketplace supporting real-time communication and location-aware searches but highlighted challenges associated with rural internet connectivity and digital literacy [16].

Additional marketplace solutions proposed by Behera *et al.*, Mande *et al.*, Nugroho *et al.*, and Ronad *et al.* introduced mobile commerce platforms, chatbot integration, weather forecasting, and online negotiation mechanisms [17–20].

Although these systems improve accessibility and reduce intermediary involvement, they generally lack blockchain-supported transaction integrity, tamper-proof traceability, and intelligent pricing support.

2.3 Blockchain Marketplaces and Smart Contracts

Recent research has explored decentralized blockchain marketplaces employing smart contracts for agricultural commerce. Dwivedi *et al.* proposed a blockchain-enabled farm-to-fork marketplace that combines escrow-based payments with QR-code provenance verification to improve trust among participants [21].

Sedek *et al.* introduced the Smart Agro E-Marketplace (SAEM) architecture using cloud computing for digital agricultural transformation [22]. Similarly, Swami *et al.* proposed the Vriksha marketplace supporting direct agricultural sales through digital platforms [23].

Despite these advances, many blockchain marketplace solutions remain conceptual or provide limited mobile integration and lack AI-enabled market intelligence.

2.4 Artificial Intelligence for Price Prediction

Machine learning and deep learning techniques have increasingly been adopted for agricultural price forecasting. LSTM neural networks effectively capture nonlinear temporal dependencies in crop price data and have consistently outperformed traditional statistical models [5].

Hybrid ARIMA–LSTM models further improve prediction accuracy by combining statistical forecasting with deep learning [6]. Sagheer and Kotb compared several machine learning algorithms and demonstrated the superior performance of neural network models for agricultural time-series prediction [24]. Multivariate deep learning approaches incorporating seasonal and contextual variables have also achieved improved forecasting performance [7, 25].

However, these predictive systems generally operate as standalone analytical tools without integration into blockchain-enabled agricultural marketplaces.

2.5 Research Gap

Although existing studies have independently demonstrated the benefits of blockchain technology, digital marketplaces, and artificial intelligence, very few provide an integrated platform that combines all three technologies within a single operational system.

Current solutions typically focus on isolated capabilities such as traceability, secure transactions, or price prediction, while overlooking real-time mobile interaction, intelligent pricing support, QR-code logistics, and practical deployment considerations.

To address these limitations, this work presents Farm2Market, a fully implemented blockchain–AI agricultural supply chain platform that unifies mobile accessibility, Ethereum smart contracts, QR-code-based provenance tracking, and AI-driven price prediction within a single scalable ecosystem.

3 Proposed System

3.1 System Overview

The proposed Farm2Market platform is designed as a multi-layered architecture that integrates blockchain technology, artificial intelligence, QR-code traceability, and a mobile application into a unified agricultural supply chain ecosystem.

The architecture consists of four logical layers:

1. User Interaction Layer
2. Application Service Layer
3. Blockchain Traceability Layer
4. Data Intelligence Layer

These layers communicate through secure RESTful APIs while maintaining modular design and independent functional responsibilities.

Figure 1 illustrates the overall architecture of the proposed system.

The User Interaction Layer provides mobile interfaces for farmers and buyers. Farmers can register agricultural products, receive AI-generated price recommendations, manage orders, and monitor shipment status. Buyers can browse available products, verify provenance information, place purchase orders, and complete secure blockchain-enabled transactions.

The Application Service Layer implements business logic, authentication, authorization, product management, order processing, and communication between the blockchain network and AI prediction services.

The Blockchain Layer records every transaction using Ethereum smart contracts. Its immutable ledger guarantees transparency, prevents unauthorized modification of transaction history, and enables trustworthy financial settlement.

Finally, the Data Intelligence Layer analyzes historical agricultural market data using deep learning models to generate crop price predictions that support farmer decision making.

3.2 System Components

The proposed system integrates four major components that operate together to provide secure agricultural commerce.

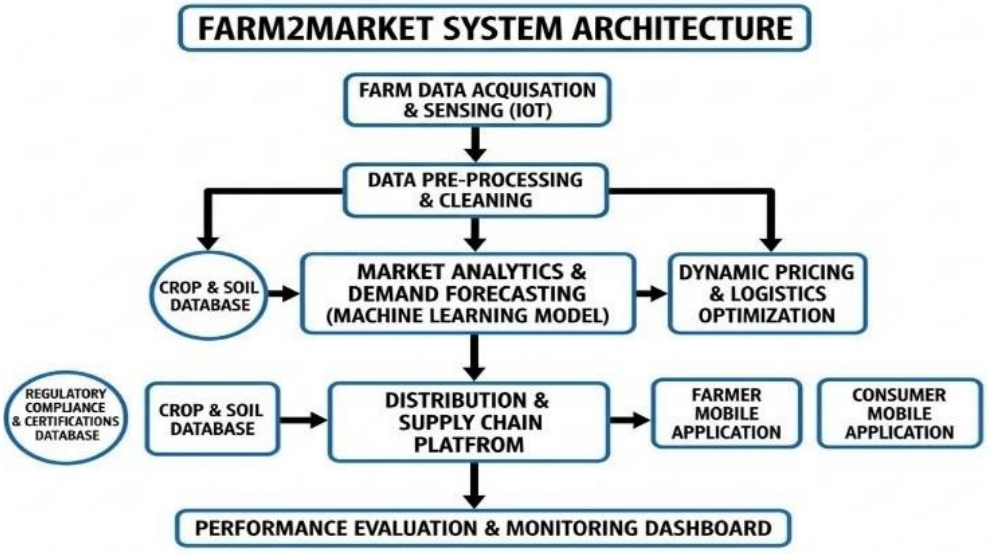


Fig. 1: Overall architecture of the proposed Farm2Market system.

3.2.1 Mobile Application

The mobile application serves as the primary interface between stakeholders. Farmers register products, monitor transactions, generate shipment QR codes, and receive predicted market prices.

Buyers browse products, search for crops, verify shipment provenance, and perform secure blockchain payments.

3.2.2 Blockchain Module

Ethereum smart contracts provide immutable transaction recording and trust-minimized payment processing.

Every product registration, order confirmation, shipment update, and payment is stored on the blockchain to ensure transparency and prevent tampering.

A factory-pattern architecture creates independent escrow contracts for every transaction, thereby improving modularity and reducing interference between multiple agreements.

3.2.3 QR-Code Traceability

Each shipment receives a unique QR code linked to its blockchain record.

Scanning the QR code retrieves product origin, ownership history, transportation updates, timestamps, and transaction integrity information.

This mechanism enables transparent provenance verification throughout the entire agricultural supply chain.

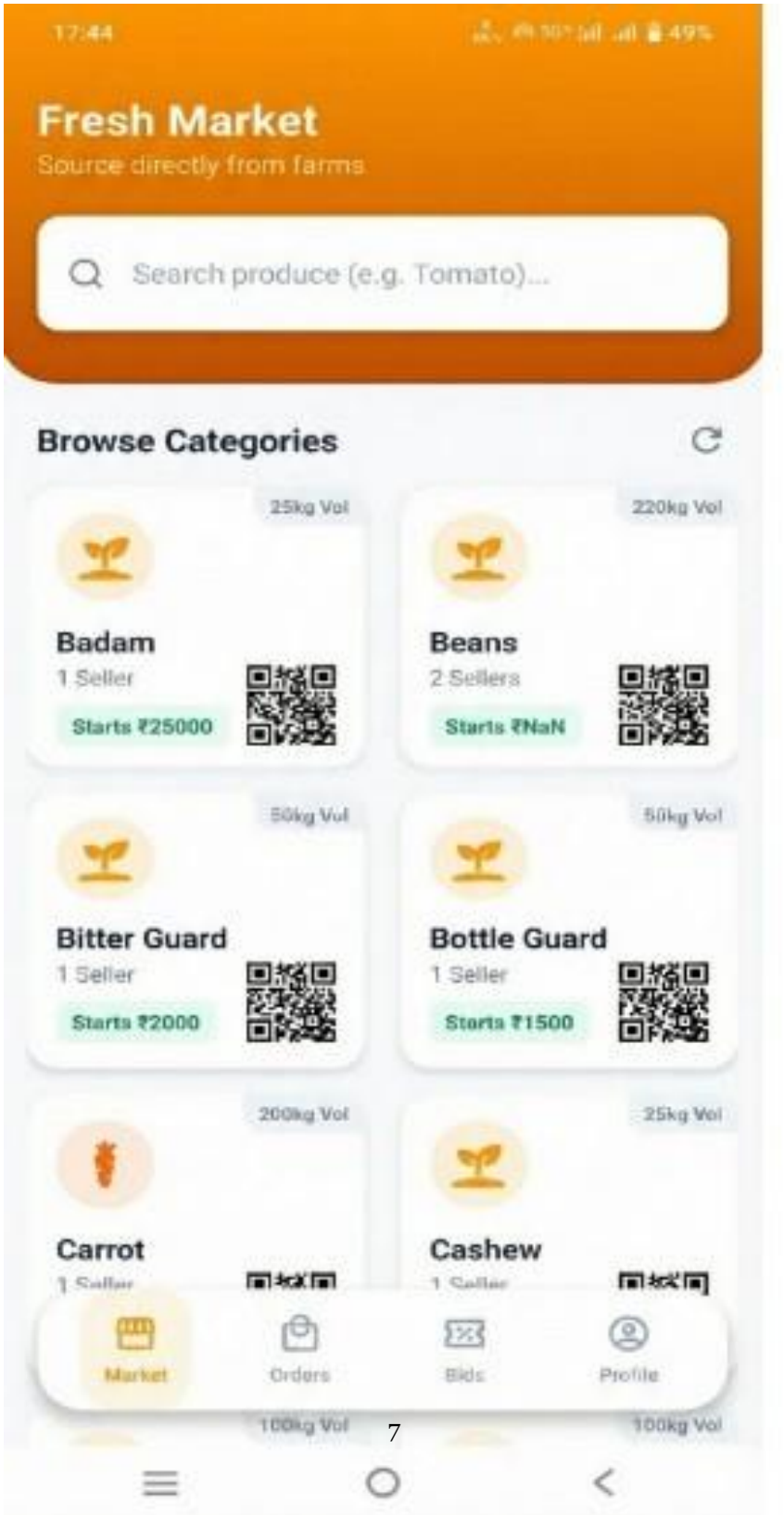


Fig. 2: Blockchain representation generated for each agricultural produce.



Fig. 3: QR-code generated for shipment verification.

3.2.4 Artificial Intelligence Module

Historical agricultural datasets consisting of crop type, quantity, geographical location, seasonal information, and historical market prices are processed using Long Short-Term Memory (LSTM)-based forecasting techniques.

The predicted market price is presented directly within the mobile application, allowing farmers to make informed pricing decisions before listing their products.

3.3 Traceability Workflow

The operational workflow consists of the following stages:

1. Farmer Registration
2. Product Listing
3. AI Price Prediction
4. Smart Contract Creation
5. Buyer Purchase Request
6. Escrow Payment
7. QR Code Generation

8. Shipment Tracking
9. Buyer Verification
10. Payment Release

Each stage produces immutable blockchain records that can be verified by any authorized stakeholder.

4 System Implementation

Farm2Market was implemented as a fully functional prototype integrating a Flutter mobile application, Ethereum blockchain infrastructure, QR-code generation, and an AI price prediction engine.

The mobile application communicates with backend services through RESTful APIs, while blockchain interactions are performed using Solidity smart contracts deployed through the Hardhat development environment.

The AI prediction engine operates independently and returns predicted crop prices to the mobile application before product publication.

4.1 Mobile Application

The application provides separate interfaces for farmers and buyers.

Major functionalities include

- User authentication
- Product registration
- AI price recommendation
- Marketplace browsing
- Order management
- QR-code generation
- Shipment verification
- Blockchain payment tracking

4.2 Blockchain Implementation

Smart contracts were implemented using Solidity.

A factory-pattern architecture dynamically creates one escrow contract for each transaction.

The escrow contract follows a finite-state machine consisting of

$$Created \rightarrow Active \rightarrow Delivered \rightarrow \{Completed,\ Rejected,\ Refunded,\ Cancelled\}$$

This architecture guarantees secure payment processing while preventing contract interference.

4.3 Escrow Algorithm

Algorithm 1 Escrow Contract Creation and Lifecycle

Require: Farmer, Buyer, TotalPrice, Deadline
Ensure: Secure escrow transaction

if Farmer is invalid OR TotalPrice ≤ 0 **then**
    Reject transaction
end if
Create FarmerEscrow Contract
Store contract address
Wait for buyer deposit
if Buyer deposits payment **then**
    Lock funds
end if
if Farmer delivers product **then**
    Update state to Delivered
end if
if Buyer confirms delivery **then**
    Transfer funds to farmer
    Update state to Completed
else
    Execute refund or penalty logic
end if
if Delivery deadline expires **then**
    Execute timeout resolution
end if

4.4 Experimental Setup

The blockchain network was deployed using Hardhat on a local Ethereum development network.

The AI module was trained using historical agricultural price datasets, while the mobile application was evaluated using Android devices under realistic usage scenarios.

System performance was evaluated using transaction latency, gas consumption, QR-code retrieval time, and AI prediction accuracy.

4.5 Gas Consumption

Table 1 summarizes the average gas consumption of major blockchain operations.

The obtained measurements indicate that routine blockchain operations require less than 50,000 gas, while contract deployment incurs a higher one-time cost. These results demonstrate that the proposed system remains practical for small-scale agricultural transactions.

Table 1: Average gas consumption of escrow operations.

Operation	Average Gas Used
Accept Agreement	44,488
Deposit Funds	24,734
Create Escrow	1,655,038
Factory Deployment	2,815,237

4.6 Implementation Screens

The mobile application supports end-to-end interaction between farmers and buyers. Major screens include registration, authentication, AI price prediction, marketplace browsing, QR-code generation, blockchain transaction monitoring, and shipment verification.

The implementation screenshots will be presented together with the experimental evaluation in the following section.

5 Experimental Results and Performance Evaluation

The Farm2Market platform was experimentally evaluated to assess the effectiveness of its blockchain infrastructure, artificial intelligence prediction model, QR-code traceability mechanism, and mobile application. The evaluation focused on four primary performance metrics:

1. AI price prediction accuracy,
2. Blockchain transaction performance,
3. QR-code traceability efficiency,
4. Mobile application responsiveness.

The experiments were conducted using the fully implemented prototype deployed on a local Ethereum blockchain through the Hardhat development environment. The mobile application was executed on Android devices, while the AI module was evaluated using historical agricultural market datasets.

5.1 AI Price Prediction Performance

The AI module forecasts agricultural commodity prices using historical market data including crop type, seasonal trends, geographical location, and previous market prices.

Figure 4 presents the prediction interface integrated within the Farm2Market mobile application.

The implemented forecasting model achieved approximately **82% prediction accuracy** on the evaluation dataset.

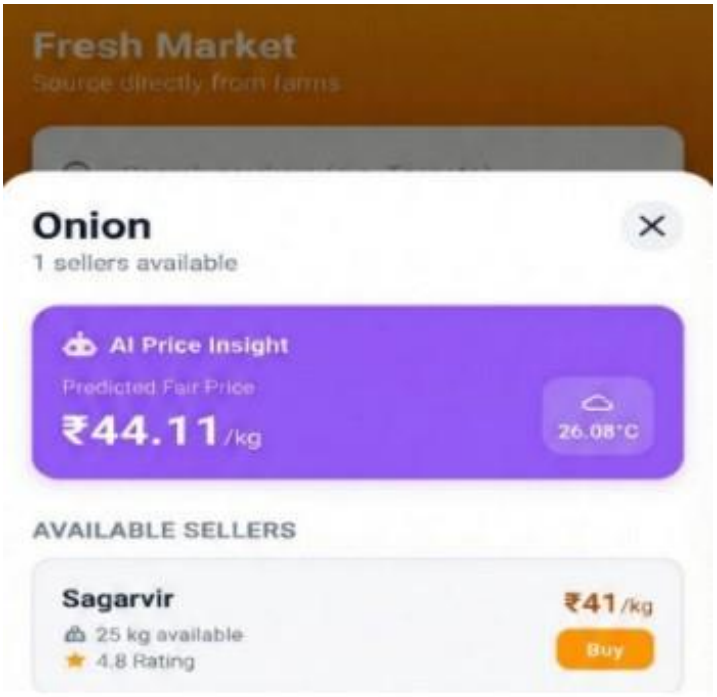


Fig. 4: AI price prediction interface integrated into the Farm2Market mobile application.

The generated price recommendations assist farmers in selecting competitive selling prices before publishing products on the marketplace, thereby reducing pricing uncertainty and improving decision making.

5.2 Blockchain Performance

The Ethereum smart contracts were deployed using the Hardhat development framework.

Multiple unit tests were executed to validate the correctness of the escrow workflow, contract deployment, payment settlement, timeout handling, and refund mechanisms.

Figure 5 illustrates the deployment output together with gas consumption statistics.

The experimental results demonstrate that routine blockchain operations require less than 50,000 gas, while contract deployment incurs higher one-time costs due to bytecode size.

Under typical Ethereum gas prices (20 Gwei), runtime transaction costs remain well below one US cent, making the proposed solution economically feasible for small-scale farmers.

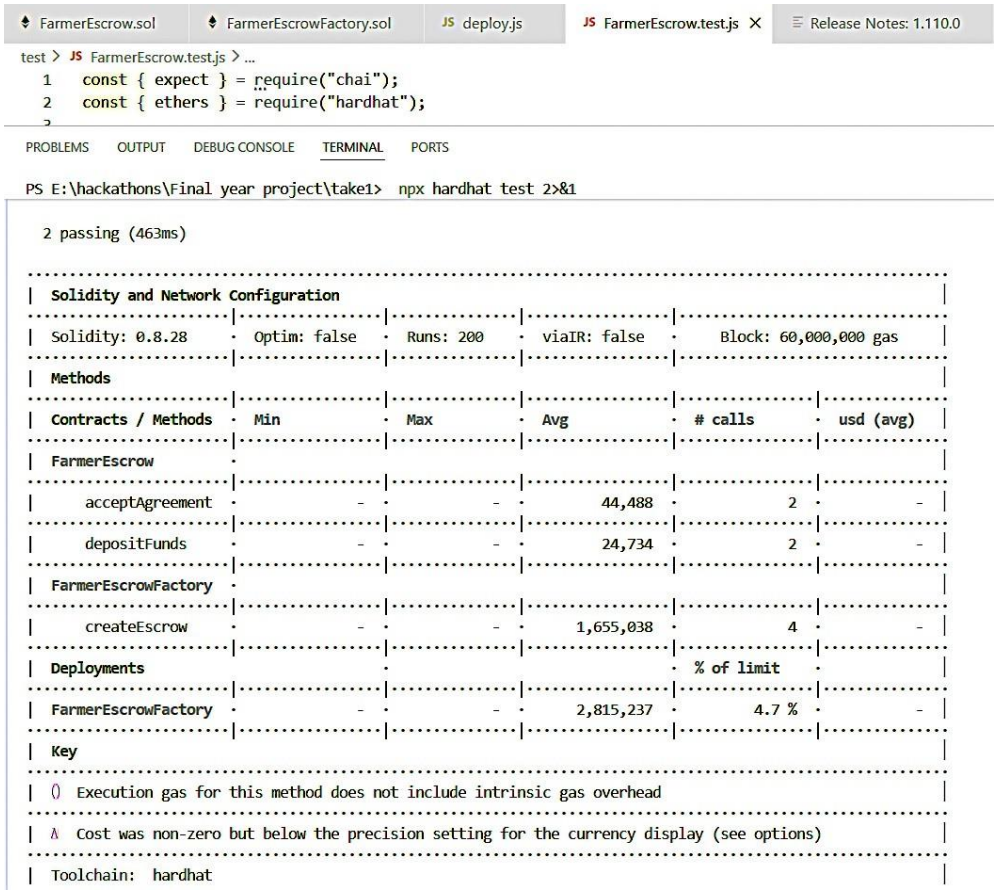


Fig. 5: Hardhat deployment output and gas consumption of the implemented smart contracts.

5.3 QR-Code Traceability Evaluation

Each registered agricultural product receives a unique QR code linked directly to its blockchain record.

During experimentation, QR-code scanning successfully retrieved immutable information including

- Product identity
- Farmer information
- Shipment history
- Ownership transfers
- Blockchain transaction hash
- Timestamp history

Retrieval occurred almost instantaneously within the mobile application, demonstrating the effectiveness of the proposed traceability mechanism.

5.4 Mobile Application Evaluation

The Farm2Market application was evaluated through complete end-to-end transaction workflows involving farmer registration, product listing, AI-assisted pricing, blockchain payment, QR-code verification, shipment tracking, and transaction completion.

Figure 6 presents representative application interfaces.

The application exhibited smooth navigation and low-latency responses during product registration, marketplace browsing, order creation, payment confirmation, and QR-code verification.

5.5 Overall Performance Analysis

The experimental evaluation confirms that the proposed Farm2Market platform successfully integrates blockchain technology, artificial intelligence, and mobile computing into a unified agricultural supply chain framework.

The major observations include:

- AI prediction accuracy of approximately 82%.
- Lightweight blockchain transactions.
- Secure escrow-based payments.
- Near real-time QR-code verification.
- Responsive mobile application performance.
- Complete transaction transparency through immutable blockchain records.

These results demonstrate the practicality of deploying Farm2Market in resource-constrained agricultural environments.

6 Discussion

The presented experimental results validate the feasibility of integrating blockchain technology with artificial intelligence for agricultural supply chain management.

Compared with conventional centralized agricultural marketplaces, the proposed platform provides significantly improved transparency by storing all transactions on an immutable blockchain ledger.

Unlike existing systems that separately address either product traceability or marketplace functionality, Farm2Market integrates

- blockchain-enabled escrow payments,
- QR-code provenance verification,
- AI-driven crop price prediction,
- real-time mobile interaction,
- secure transaction management.

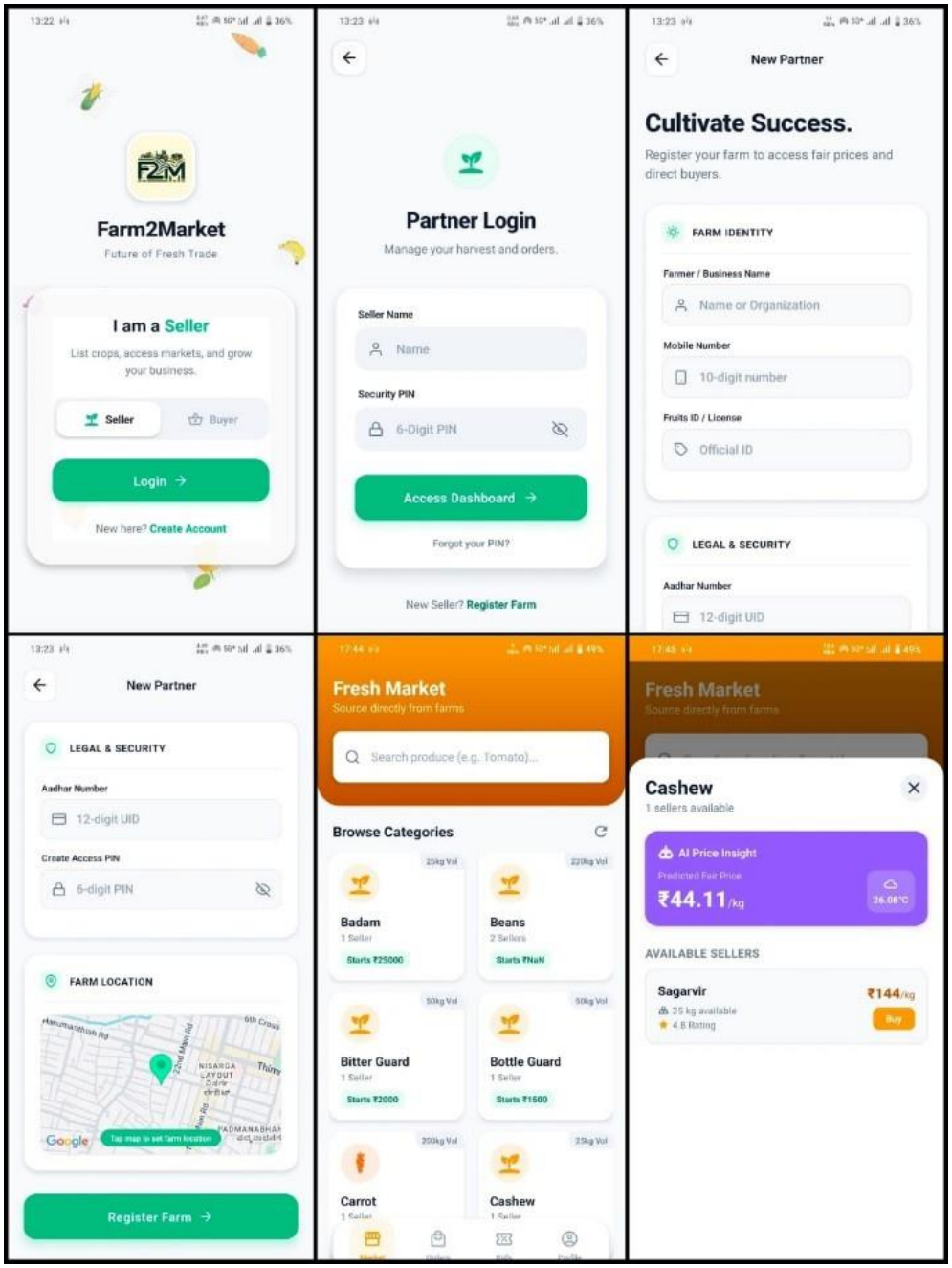


Fig. 6: Farm2Market mobile application demonstrating registration, marketplace, AI pricing, and buyer interaction.

The AI prediction model enables farmers to make informed pricing decisions, thereby reducing exposure to market volatility.

Similarly, QR-code traceability improves consumer confidence by allowing buyers to verify the complete lifecycle of agricultural products before purchase.

Although the proposed system demonstrates encouraging performance, several limitations remain.

The current blockchain deployment was evaluated using a local Ethereum network. Future evaluations should investigate deployment on public blockchain networks such as Ethereum Sepolia or Polygon.

Furthermore, larger agricultural datasets may improve AI prediction performance through transformer-based forecasting architectures and multimodal market analysis.

7 Conclusion

This paper presented Farm2Market, a fully implemented blockchain and artificial intelligence integrated agricultural supply chain platform designed to improve transparency, traceability, pricing fairness, and transaction security.

The proposed system combines

- Ethereum smart contracts,
- escrow-based payment mechanisms,
- QR-code product traceability,
- AI-assisted crop price prediction,
- mobile application services.

Experimental evaluation demonstrated

- approximately 82% AI prediction accuracy,
- efficient blockchain execution,
- secure payment processing,
- rapid QR-code verification,
- responsive mobile application performance.

These findings indicate that Farm2Market provides a practical and scalable solu-tion capable of reducing intermediary dependence while improving trust throughout agricultural supply chains.

Future work will investigate deployment on Layer-2 blockchain platforms, integration of transformer-based forecasting models, offline synchronization for low-connectivity rural regions, privacy-preserving blockchain techniques, and large-scale field trials involving agricultural cooperatives and smallholder farmers.

References

[1] Tian, F.: An agri-food supply chain traceability system for china based on rfid and blockchain technology. In: Proceedings of the 13th International Conference

on Service Systems and Service Management (ICSSSM), pp. 1–6 (2016). IEEE

[2] Kamilaris, A., Fonts, A., Prenafeta-Boldú, F.X.: The rise of blockchain technology in agriculture and food supply chains. Trends in Food Science & Technology **91**, 640–652 (2019) https://doi.org/10.1016/j.tifs.2019.07.034

[3] Lin, J., Shen, Z., Zhang, A., Chai, Y.: Blockchain and iot-based food traceability for smart agriculture. Future Generation Computer Systems **110**, 657–666 (2020)

[4] Cao, Y., Guan, S., Wang, D., Wang, Z.: Be-ac: Reliable blockchain-based anti-counterfeiting traceability solution for the pharmaceutical industry. Cluster Computing **27**(6), 8119–8139 (2024)

[5] Xiong, T., Li, C., Bao, Y.: Agricultural product price forecasting based on lstm neural network model. Computers and Electronics in Agriculture **162**, 558–566 (2019)

[6] Li, Y., Wang, J., Zhao, X.: Hybrid arima-lstm model for agricultural commodity price forecasting. IEEE Access **8**, 143762–143775 (2020)

[7] Zhang, G., Liu, Y., Yang, X.: Deep learning-based agricultural market price prediction using multivariate time-series analysis. Applied Soft Computing **106**, 107305 (2021)

[8] Alonso, R.S., Sitton-Candanedo, I., Garcia, O., Prieto, J., Rodriguez-Gonzalez, S.: An intelligent edge-iot platform for monitoring livestock and crops in a dairy farming scenario. Ad Hoc Networks **98**, 102047 (2020)

[9] Mezquita, Y., Podgorelec, B., Gil-Gonzalez, A.B., Corchado, J.M.: Blockchain-based supply chain systems: Interoperability model in a pharmaceutical case study. Sensors **23**(4), 1962 (2023)

[10] Sugandh, U., Nigam, S., Khari, M., Misra, S.: An approach for risk traceability using blockchain technology for tracking, tracing, and authenticating food products. Information **14**(11), 613 (2023)

[11] Bekkouche, S., de-Magistris, T.: Digitalization in the european agri-food supply chain: A scoping review of traceability, transparency, and sustainability. Frontiers

in Blockchain (2025) https://doi.org/10.3389/fbloc.2025.1701872

[12] Pakseresht, A., Kaliji, S.A., Hakelius, K.: Blockchain technology characteristics essential for the agri-food sector: A systematic review. Food Control **165**, 110661 (2024) https://doi.org/10.1016/j.foodcont.2024.110661

[13] Xinyan, Z., Omain, S.Z.B., Khatib, S.F.A., Lei, J.: A systematic review of the application of blockchain technology in agricultural supply chain. International Journal of Academic Research in Economics and Management Sciences **13**(2) (2024)

[14] Sebti, M.R., McCarthy, U., Ktenioudaki, A., Russo, M., Merenda, M.: Traceability and anti-counterfeiting in agri-food supply chains: A review of rfid, iot, blockchain, and ai technologies. Sensors **26**, 1685 (2026) https://doi.org/10.3390/s26051685

[15] Jayashree, V., Dayanand, B., Nirmal, M., Raghul, V., Dhanush, M.: Website creation for a farmers' online selling portal. International Journal of Creative Research Thoughts **12**(4) (2024)

[16] Anitha, M., Praveen, B.: Farmer's e-market. International Research Journal of Modernization in Engineering, Technology and Science **6**(5), 3134 (2024)

[17] Behera, A., Singh, A., Singh, K., Gawade, S.D.: Mandi farm: Novel approach for farmers as an e-marketplace. International Journal of Current Microbiology and Applied Sciences, 3786–3793 (2020). Special Issue 11

[18] Mande, N., Sankhe, S., Talekar, N.U., Neman, V.V.: A portal for farmers to sell products at better rates. International Research Journal of Engineering and Technology **8**(4), 4125 (2021)

[19] Nugroho, Hendriyanto, R., Tisamawi, K.: Application for marketplace agricultural product. International Journal of Applied Information Technology **2**, 58–67 (2018)

[20] Ronad, A., Madgi, M.: Online platform for agricultural produce livestock marketing. International Journal of Recent Innovation Trends in Computing and Communication **9**, 12–18 (2021) https://doi.org/10.17762/ijritcc.v9i12.5494

[21] Dwivedi, R., Chaudhary, R., Dagade, S., Gaikar, C., Mate, P.: E-commerce for direct marketing of fresh food from farmers to bulk ordering buyers and local buyers. International Journal of Creative Research Thoughts **12**(4) (2024)

[22] Sedek, Osman, M., Omar, M., Wahab, M., Idrus, S.Z.S.: Smart agro e-marketplace architectural model based on cloud data platform. In: Journal of Physics: Conference Series, vol. 1874, p. 012022 (2021). https://doi.org/10.1088/1742-6596/1874/1/012022

[23] Swami, Sharma, M., Panwar, N., Panwar, N.: Marketplace for Farmers to Sell Their Products with Higher Rates and Ease (Vriksha). India (2022)

[24] Sagheer, A., Kotb, M.: Time series forecasting of agricultural prices using machine learning techniques. International Journal of Advanced Computer Science and Applications **10**(7), 281–290 (2019)

[25] Patel, H., Shah, D.: Machine learning-based crop price prediction in indian agricultural markets. Procedia Computer Science **200**, 1368–1377 (2022)