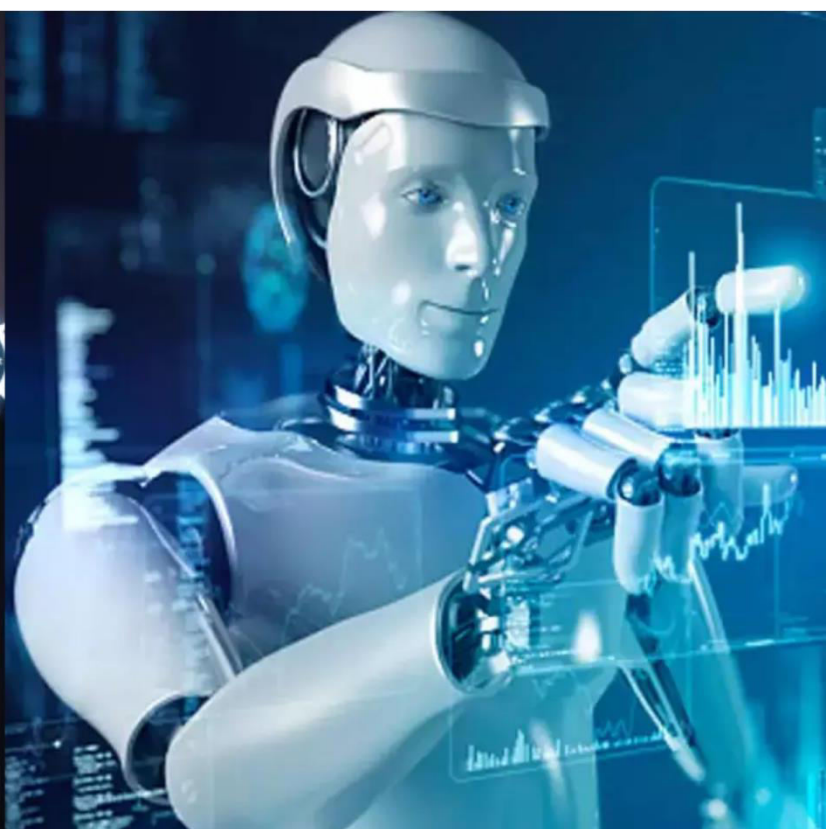




International Journal of Innovative Research in Science Engineering and Technology (IJIRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)



Impact Factor: 9.935

Volume 15, Issue 10, October 2026

AgriConnect: AI – Based Farmer to Buyer Platform

Maari Nivetha, Keertika Mayuri, N.Nazmunisha

U.G. Student, Department of Computer Engineering, K.L.N. College of Engineering, Pottapalayam, Tamil Nadu, India

U.G. Student, Department of Computer Engineering, K.L.N. College of Engineering, Pottapalayam, Tamil Nadu, India

Assistant Professor, Department of Computer Engineering, K.L.N. College of Engineering, Pottapalayam,
Tamil Nadu, India

ABSTRACT: Agricultural supply chains require careful evaluation of crop quality ,market demand and logistics to ensure profitable and fair trade for farmers. In this paper, the technique presented is for an automated , decentralized marketplace that directly connects farmers to buyers. The system detects crop quality using the MobileNetV2 deep learning architecture and calculates optimal buyer-farmer matching using a strict 60km geospatial radius filter. Additionally, the platform integrates predictive analytics to forecast future market prices. The resultant system eliminates traditional middlemen, providing an interactive dashboard for secure , data-driven agricultural trade. To achieve this, the proposed AgriConnect architecture utilizes a streamlined interface ensuring a seamless experience for rural stakeholders. The quality assessment module evaluates harvest images to assign AI-Driven confidence scores, establishing trust between transacting parties without manual inspection. Furthermore ,Scikit-learn algorithms analyze historical commodity data to generate accurate price forecasts ,shielding farmers from volatile market fluctuations . Active inventory ledgers and commercial transactions are securely managed within a MongoDB database

Experimental results validate the system's efficiency in accurately classifying agricultural grades, precisely mapping geodesic routes via the Geopy library and predicting pricing trends with minimal computational overhead. Ultimately ,this integrated approach fosters a sustainable ,transparent ,and highly optimized agricultural ecosystem.

KEYWORDS: Artificial Intelligence, MobileNetV2, Geospatial Routing, Agricultural Supply Chain, Price Forecasting.

I. INTRODUCTION

In modern agricultural environments , farmers are required to navigate large volumes of market data including volumes of market data including volatile pricing, logistical barriers, and quality assessment standards. Traditional agricultural systems rely heavily on manual inspection of crops and word-of-mouth market pricing, which can be time-consuming and prone to human error. To address this, the Agri Connect platform utilizes an intelligent decision support system that can analyze harvest images for specific 6 vegetables cucumber,tomato ,capsicum,bitter guard ,okra,potato and also provide accurate market recommendations, and ensure transparency in decision-making .

This system could enhance agricultural profitability by providing automated analysis, faster decision-making, and improved accuracy in market assessment . The proposed architecture integrates a Streamlit frontend, a FastAPI backend , machine learning models for market prediction and a MongoDB database for secure persistence.

II. LITERATURE SURVEY

The concept of automated fruit and vegetable recognition using MobileNetV2 was first introduced by Khalid et al.[1]. The method was inspired by the need for lightweight image classification without heavy computational overhead. The performance of advanced machine learning models in capturing volatile agricultural pricing patterns was evaluated by Manogna et al. [2] , who used deep learning techniques to significantly outperform traditional statistical methods . this technique uses an approach which combines historical commodity trends with predictive analytics and hence produced very good results. In [3] , the authors integrate spatial geographic data and machine

learning to enable precision logistics within the agricultural sector. Digital decision support systems are combined with the techniques of bypassing traditional middlemen in [4], which is highly beneficial for increasing farmer profitability. A trust-aware decentralized agricultural marketplace using persistent data storage to verify identities is presented in [5].

The work in this paper is divided in three stages .1) Crop Quality Assessment 2)Market Forecasting 3)Geospatial Routing. Crop quality assessment is done by applying PyTorch - based MobileNetV2 deep learning models on uploaded harvest images and extracting visual features. Thereafter ,predictive analysis is applied to forecast expected buyer demand and future price trajectories using scikit-learn algorithms . then ,geodesic distance calculation is performed to map farmer to buyer coordinates using geopy library . finally ,a strict spatial filter is applied to filter out any agricultural listings that can exceed a 60 - kilometer radius. After optimal matching,the commercial transaction is accomplished by updating the active inventory ledger in a MongoDB database.

III. METHODOLOGY

The MobileNetV2 architecture and geospatial routing techniques are used for the AgriConnect platform to combine automated crop quality assessment with localized logistics. The system is based on a multi-stage evaluation procedure. First ,it extracts visual features from harvest images using pytorch to determine a quality grade and AI confidence score. Next ,for buyer queries, it calculates precise geodesic distances using the geopy library and priorities optimal matches within a strict 60 kilometer radius. This procedure is coupled with scikit -learn algorithms to forecast market prices. Finally ,the algorithm automatically deducts purchased stock and updates the MongoDB database without manual user interaction to maintain an accurate inventory ledger.

IV. EXPERIMENTAL RESULTS

Figures shows the results of fair price prediction and demand detection ,geospatial buyer recommendation of nearby farmer by filtering distance less than 60km, crop quality assessment 2 (a) original input image uploaded by farmer and it gives output as by analyzing quality and it gives quality grade and confidence score .(b) it gives output of original input image of another vegetable bitter guard and it analyzes using deep learning model and gives output. (c) another crop image to quality grade.

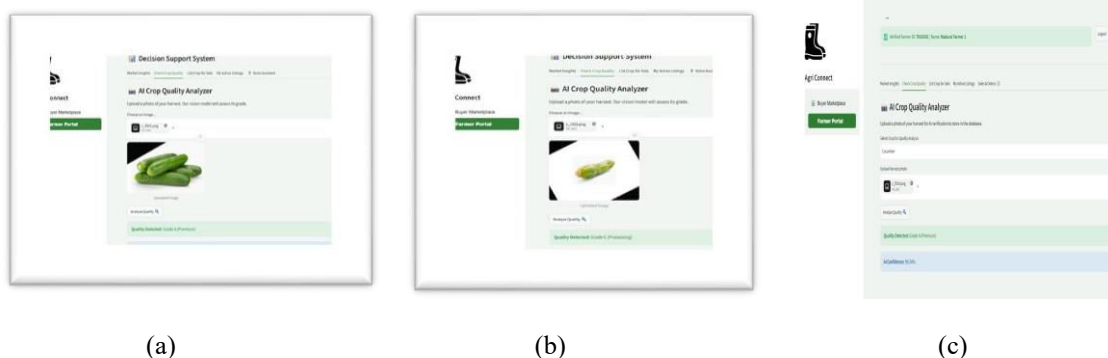


Fig.2. crop quality grading (a) Original input harvest image to be quality graded and quality is displayed below (b) bitter guard image is given to be quality grade (c) another vegetable cucumber image to quality grade

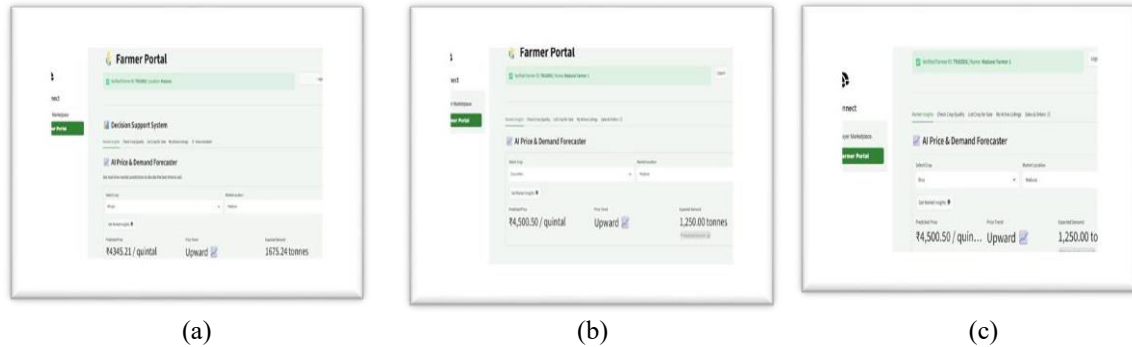


Fig. 3 AI fair price prediction and demand detection (a) selection of vegetable to see their market price and demand of that particular vegetable after analyzing market trends price is shown (b) selection of another vegetable to predict fair price and demand output is given about the fair price and demand (c) shows the demand and fair price of okra vegetable.

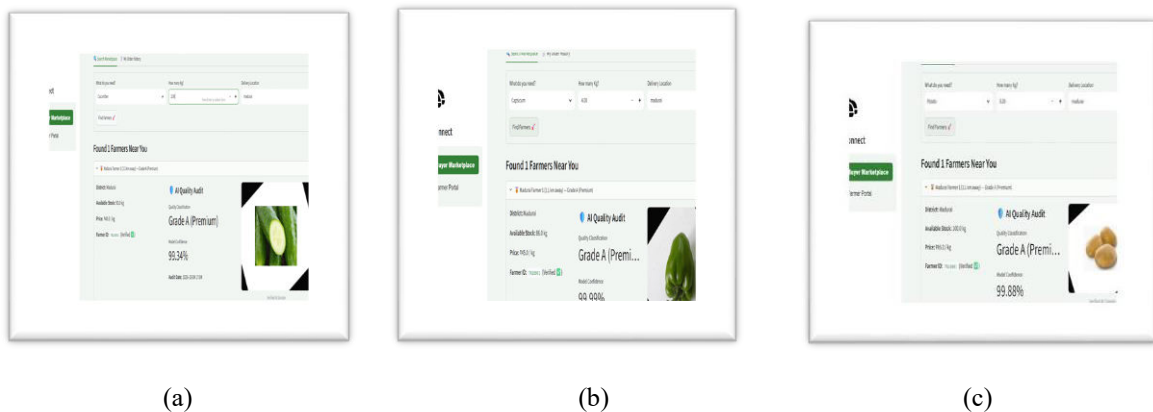


Fig. 4 geospatial routing (a) buyer selects an crop cucumber to purchase and after selecting the location and quantity required it is routed by algorithm and gives nearby farmers recommendation with the verified graded image (b) selects capsicum to find nearby farmer (c) selects another crop potato to see recommendation.

V. CONCLUSION

We have implemented an agricultural platform that successfully eliminates agricultural middlemen by integrating MobileNetV2 for crop quality assessment and geopy for strict 60km spatial routing. Furthermore, predictive price forecaster and demand for particular vegetable ensuring transparent, highly profitable agricultural trade.

REFERENCES

1. S. Khalid ,R.H.Ali ,and H.B. Khalid, "Fruit and Vegetable Recognition using MobileNetV2: An Image Classification Approach ",Engineering Proceedings, vol 87,no.108, 2025.
2. R.L .Manogna, V. Dharmaji , and S. Sarang , " Enhancing agricultural commodity price forecasting with deep learning", Scientific Reports, vol .15, no. 20903, 2025.
3. N. Ghosh , " Revolutionizing Agri-Tech : Synergistic Integration of Spatial Routing and Advanced Machine Learning", IEEE International Conference on Smart Agriculture ,pp. 112-118, 2025.
4. R. Sharma and K. Gupta , "Aided Decision Processes in Agricultural Logistics: Measuring Supply Chain Systems'Influence",IEEE Transactions on Systems ,vol. 55, no. 3,2025.
5. A. Venkat and M. Patel , " Trust – Aware Decentralized Agricultural Marketplaces using AI and Persistent Data Storage", Journal of Agricultural Informatics ,vol.12, no.4, 2026.
6. M. Sandler,A.Howard, M. Zhu, A . Zhmoginov , and L. Chen, "MobileNetV2:Inverted Residuals and Linear

- Bottlenecks”, in Proc. IEEE/CVF Conference on Computer Vision and Pattern Recognition, pp.4510-4520, 2018.
7. J. Smith and T. Lee, “ Implementation Of Scikit-Learn Regression Models for Agricultural Yield and Price Prediction”, International Journal of Machine Learning and Computing, vol.14, no.2, pp.134 - 142, 2024.
 8. A. Kumar and S. Singh, “Geospatial Mapping and Routing Optimization in Supply Chain Management using Python Geopy”, IEEE Transactions on Intelligent Transportation Systems, vol.23, no.6, pp. 5432-5440, 2022.
 9. P. Sharma, D. Kumar, and S. Verma, “Real-Time Web Applications for Smart Agriculture using Streamlit and FastAPI”, Journal of Web Engineering, vol.20, no.5, pp. 1101-1115, 2023.
 10. R. Desai and K. Joshi, “ A NoSQL Database Approach for Managing Agricultural Supply Chain Records using MongoDB”, International Journal of Computer Applications, vol.182, no. 45, pp. 21-27, 2021.
 11. L. Wang, Y. Chen, and H. Liu, “ Direct Farmer-to-Consumer E-Commerce Platforms: A Framework for AI-Driven Quality and Price Assessment”, Computers and Electronics in Agriculture, vol.205, 2023.
 12. K. Reddy and P. Rao, “AI-Based Decision Support System for Crop Quality Grading and Market Linkage”, IEEE Access, vol.11, pp. 34567-34578, 2024.



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 9940 572 462  6381 907 438  ijirset@gmail.com



www.ijirset.com

Scan to save the contact details