iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 13 **Issue:** IV **Month of publication:** April 2025

DOI: https://doi.org/10.22214/ijraset.2025.68581

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 13 Issue IV Apr 2025- Available at www.ijraset.com

A Research on Bridging Farmers and Consumers with FarmKart: A Firebase-Powered Android App

Lilesh Lahre[1], Aastha Sahu[2], Aastha Tripathi[3]
[1, 2]*B.Tech Students,* [3]*Assistant Professor, Department of Computer Science Engineering, Government Engineering College Bilaspur C.G*

Abstract: ***This paper presents a review of FarmKart, a mobile application designed to create a direct link between farmers and consumers, thereby eliminating intermediaries, improving market access, and ensuring fair pricing. Developed using Kotlin for Android with Firebase and Firestore as backend technologies, the app offers a seamless digital marketplace for agricultural products. The platform not only empowers farmers by offering better visibility for their produce but also benefits consumers with fresh goods at fair prices. This review outlines the technological foundations, development methodology, features, and broader social and economic implications of such a solution, highlighting its potential in promoting sustainable agriculture, rural digitization, and food security.***

Keywords: Android App, Kotlin, Firebase, Firestore, E-Commerce, Agriculture, Farmer Empowerment, Smart Market, Rural Technology, Farm-to-Table.

I. INTRODUCTION

The agricultural sector forms the backbone of many developing economies. However, farmers often face challenges like market exploitation, lack of pricing transparency, and limited access to buyers. FarmKart is an Android-based application developed to tackle these issues by digitizing the agricultural supply chain and enabling direct trade between farmers and consumers.

This app utilizes modern technologies—Kotlin, Firebase Authentication, Cloud Firestore, and Firebase Storage—to ensure real-time, scalable, and secure services. The core idea is to streamline the distribution of farm produce and foster transparency and trust in agricultural commerce.

II. BACKGROUND AND MOTIVATION

Traditional agricultural markets are plagued with inefficiencies due to multiple intermediaries, leading to reduced profits for farmers and inflated prices for consumers. Various e-commerce platforms exist, but few cater specifically to the needs of rural farmers and their unique supply patterns. Advancements in mobile app development and cloud computing present new opportunities to bridge this gap. Kotlin has become the modern language of choice for Android app development due to its efficiency and safety features, while Firebase offers robust, real-time backend solutions that are ideal for data-heavy, user-centric apps.

III. OVERVIEW OF THE FOOTWEAR PROTOTYPE

The FarmKart app includes the following key components:

User Roles: Farmers (sellers) and Consumers (buyers) have distinct dashboards with relevant features.

Authentication System: Firebase Authentication is used for secure user registration and login.

Product Upload & Display: Farmers can upload crop details, images, and prices. Data is stored and retrieved from Firestore in real time.

Order Management: Consumers can browse, select, and place orders. Farmers receive order notifications instantly.

Chat Support: Optional Firebase-based messaging can be implemented for real-time communication.

Location Integration: Farmers can add location tags to help consumers find nearby sellers.

Rating & Feedback: Helps build credibility and improve service quality.

IV. LITERATURE REVIEW

The integration of technology into agricultural supply chains has gained considerable attention in recent years. Singh and Singla (2019) highlighted the inefficiencies in traditional agricultural markets and advocated for digital platforms to reduce middlemen influence and improve transparency [1]. Similarly, Kumar and Babu (2021) demonstrated that farmer-to-consumer marketplaces significantly increase farmer incomes and market reach, especially when powered by real-time cloud technologies like Firebase [2].

©IJRASET: All Rights are Reserved

Narayanan (2019) examined the role of Farmers' Producer Companies, noting their success in organizing farmers, but suggesting that mobile platforms could provide more scalable and user-friendly solutions [3]. The FAO (2022) emphasized the importance of accessible e-commerce tools in agriculture, recommending cloud-backed platforms with vernacular support for broader adoption [4]. Complementing this, the World Bank (2020) stressed the role of AI, offline capabilities, and blockchain in building resilient agri-supply systems, aligning closely with the vision of the Haat Bazaar app [5].

V. METHODOLOGY

A. *Technology Stack*

Frontend: Kotlin-based Android SDK
Backend: Firebase Cloud Firestore, Firebase Authentication, Firebase Storage

B. *Development Approach*

User-Centric Design: Conducted informal surveys with farmers and consumers to design UI/UX.
Agile Methodology: Iterative development with constant user testing.
Data Management: Firestore used to manage products, users, and transactions with optimized queries and indexing.

C. *Testing & Validation*

Tested app performance in both urban and rural network conditions.
Simulated order flows and product listing scenarios.
Conducted user acceptance testing (UAT) with selected farmers and early adopters.

VI. RESULTS AND EVALUATION

1) Usability: Test users found the app intuitive and appreciated features like real-time price updates and location tagging.
2) Performance: Firestore's real-time database ensured seamless syncing across devices. The app showed high responsiveness, even on low-spec Android phones.
3) Impact: Potential increase in direct sales and fewer reliance on local middlemen. Consumers noted better produce quality and fairer prices.
4) Limitations: Dependence on internet connectivity in some rural areas. Limited adoption by non-tech-savvy farmers (potential to improve with vernacular support and digital literacy programs).

VII. APPLICATIONS AND IMPLICATIONS

Rural Empowerment: By giving farmers market visibility, the app democratizes access to trade.
Urban Benefits: Consumers can access fresh, traceable produce.
Supply Chain Transparency: Supports traceability and quality assurance.
Policy Integration: Potential for integration with government subsidies, farm credit schemes, or MSP programs.

VIII. FUTURE DIRECTIONS

To further enhance the impact and usability of the FarmKart app, several future enhancements are proposed. Implementing multi-language support would significantly increase adoption across diverse linguistic regions, ensuring that farmers and consumers from various backgrounds can comfortably interact with the platform. Integrating AI-based price forecasting using machine learning algorithms could assist farmers in determining optimal pricing based on historical data and current market trends. Additionally, logistics integration through tie-ups with local delivery services or cooperatives can streamline the order fulfillment process, making it easier for farmers to reach customers efficiently. Developing an offline mode with cache-based product uploads and data synchronization would allow users in areas with limited internet connectivity to continue using the app without disruption. Finally, incorporating a blockchain ledger can provide transparent, tamper-proof records of transactions, which would foster greater trust among users and ensure accountability within the marketplace.

IX. CONCLUSION

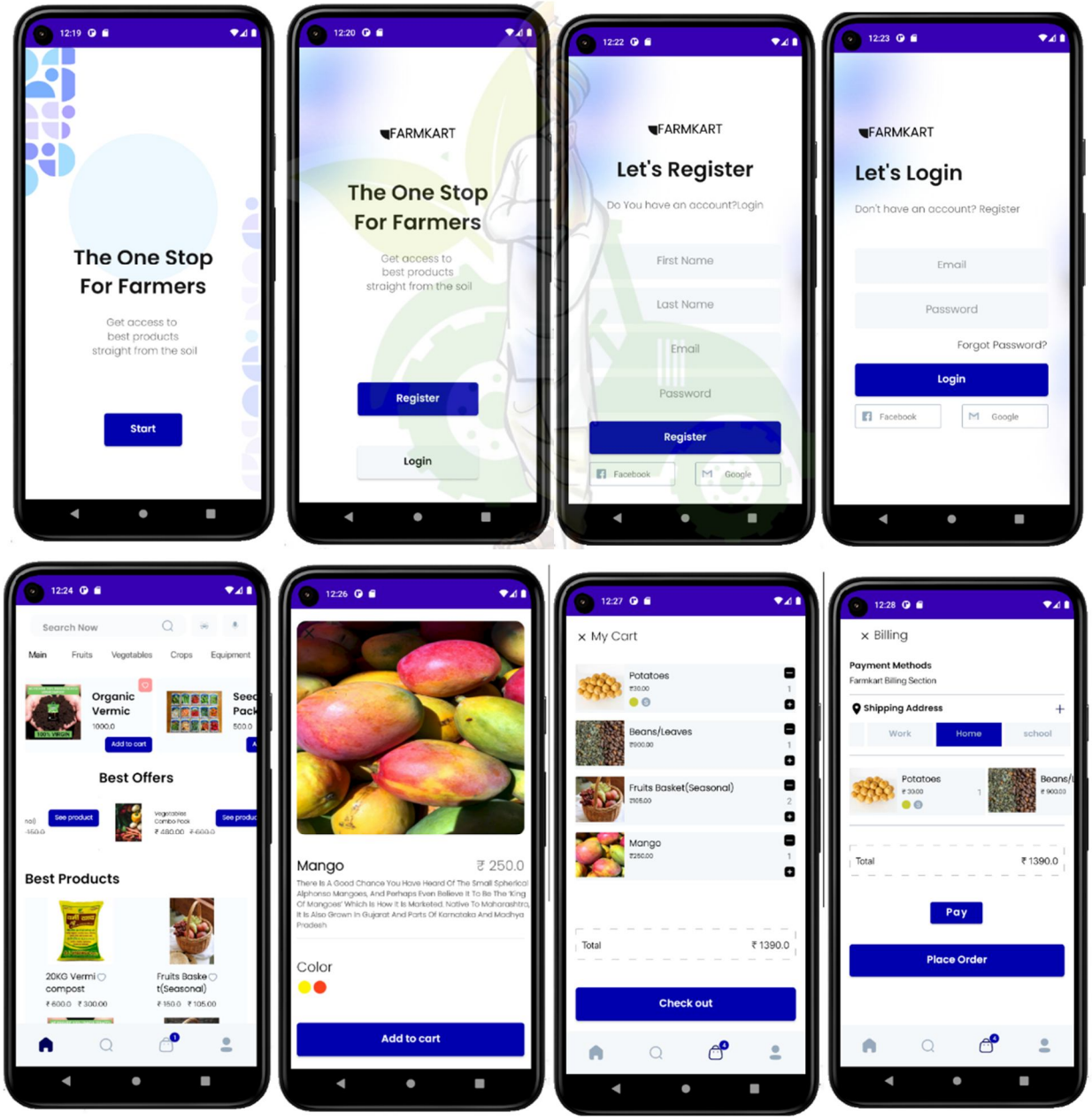
FarmKart demonstrates how modern mobile and cloud technologies can be leveraged to address long-standing inefficiencies in the agricultural marketplace. By facilitating direct interaction between farmers and consumers, this app not only enhances economic outcomes for both parties but also paves the way for a more transparent, inclusive, and tech-enabled agricultural economy.

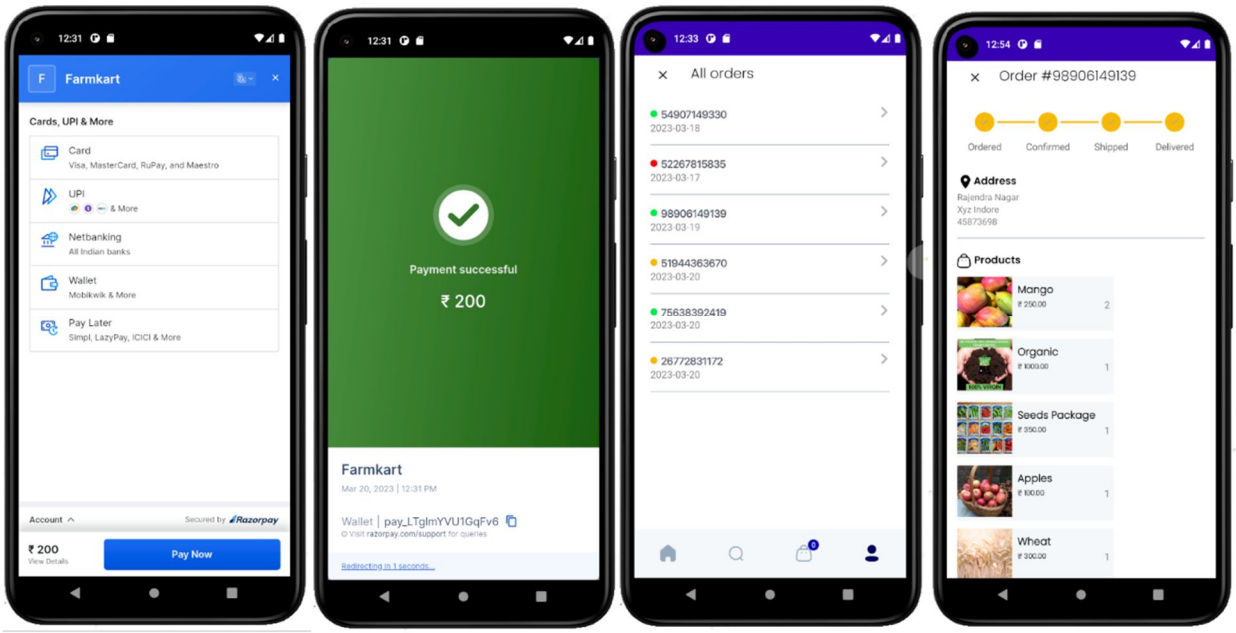
©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

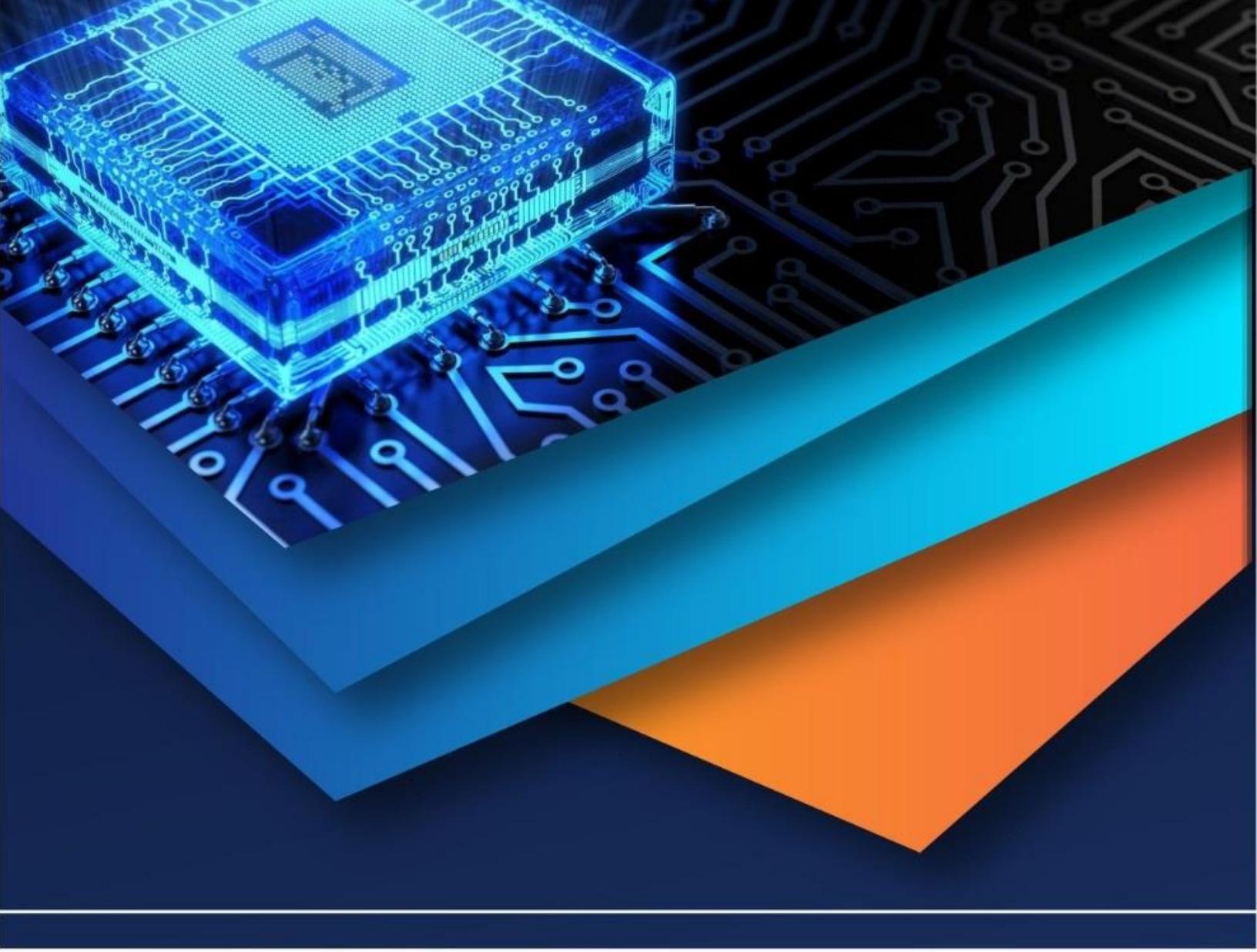
REFERENCES

[1] Singh, S., & Singla, S. (2019). E-commerce in Agriculture: A Study on Scope and Challenges. Int. Journal of Agricultural Economics & Rural Development, 7(2), 45–52.
[2] Kumar, R., & Babu, S. C. (2021). Digital Platforms and Agricultural Supply Chains: A Case Study of Farmer-to-Consumer Marketplaces. Journal of Agribusiness and Rural Development, 58(3), 112–130.
[3] Narayanan, S. (2019). Farmers' Producer Companies in India: A Review of Performance and Potential. Economic & Political Weekly, 54(20), 34–41.
[4] FAO. (2022). E-commerce in Agriculture: Opportunities and Challenges. Food and Agriculture Organization of the United Nations.
[5] World Bank. (2020). Transforming Agri-Food Supply Chains through Digital Innovation.

OUTPUT




Farmkart
Cards, UPI & More
Card
Visa, MasterCard, RuPay, and Maestro
UPI
Netbanking
All Indian banks
Wallet
Mobikwik & More
Pay Later
Simpl, LazyPay, ICICI & More
Account
Secured by Razorpay
₹ 200
Pay Now
Payment successful
₹ 200
Farmkart
Wallet | pay_LTglmYVU1GqFv6
All orders
54907149330
2023-03-18
52267815835
2023-03-17
98906149139
2023-03-19
51944363670
2023-03-20
75638392419
2023-03-20
26772831172
2023-03-20
Order #98906149139
Ordered
Confirmed
Shipped
Delivered
Address
Rajendra Nagar
Xyz Indore
45873698
Products
Mango
Organic
Seeds Package
Apples
Wheat



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)