

Bridging the Market Gap: A Mobile App for Direct Farmer-to-Buyer Transactions

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ABSTRACT

Small and marginal farmers often face challenges in accessing direct markets, leading to dependency on intermediaries and reduced income. This paper presents a mobile-based solution designed to connect farmers directly with consumers and retailers, ensuring fair pricing and eliminating middlemen. The proposed application enables farmers to list their produce and manage transactions seamlessly. By integrating features such as real-time product listings, secure digital payments, and an intuitive interface, the platform empowers farmers with greater market control. The study follows a structured development approach, incorporating user feedback and usability testing to refine functionality. Preliminary trials indicate that the platform significantly enhances profitability, accelerates the sales process, and fosters a transparent agricultural trade ecosystem. This mobile application serves as a pivotal step toward a more sustainable and inclusive agricultural economy.

Keyword : - *Farmers, Direct Market Access, Mobile Application , Eliminating Middlemen in Agriculture , Digital Marketplace for Farmers , Fair Pricing in Agriculture .*

1. INTRODUCTION

Agriculture has long relied on traditional cultivation and trade methods, with farmers dependent on middlemen, often receiving lower prices. Early technological innovations like radio weather forecasts and SMS-based market updates helped farmers make better decisions. The introduction of digital payments streamlined transactions, while smartphones and mobile internet expanded trade opportunities. Today, mobile applications revolutionize agricultural commerce by empowering farmers with direct market access, better pricing control, and improved logistics. The proposed app offers a user-friendly platform for listing produce, negotiating prices, and managing sales, even for farmers with minimal tech experience. This shift enhances income opportunities, transparency, and real-time market insights, bridging rural producers with urban consumers. By eliminating intermediaries and ensuring secure transactions, the app fosters a fairer, more sustainable agricultural economy. This paper explores the development, challenges, and impact of such a solution, aiming to revolutionize agricultural trade globally.

2 . PROBLEM STATEMENT

Farmers face significant challenges in accessing markets, often relying on intermediaries who reduce their profit margins. Limited direct consumer interaction prevents them from securing fair prices for their produce, impacting their economic stability. The absence of an efficient marketplace leads to delayed payments, price exploitation, and restricted market reach. To address these issues, a mobile application is proposed to facilitate direct connections between farmers, consumers, and retailers. This platform will enable farmers to list their produce and manage transactions seamlessly, minimizing their dependence on middlemen. With a user-friendly interface, even farmers with minimal digital literacy can utilize its features effectively. The app will promote fair pricing, secure payments, and real-time market insights, fostering transparency and trust in agricultural trade. By integrating digital solutions into rural commerce, the project aims to enhance farmers' income, streamline transactions, and support sustainable agricultural development. This initiative aligns with the broader theme of Agriculture, FoodTech, and Rural Development, ensuring equitable market access for farmers.[SIH :2024][1637]

3 . LITERATURE REVIEW

The agricultural sector has undergone significant technological advancements over the past few decades, particularly in the domain of digital transformation and direct market access for farmers. This section reviews existing research, studies, and technological developments that have contributed to the evolution of online agricultural trade, the role of mobile applications in farming, and the impact of digital platforms on farmer income and market access.

3.1 Integration of Mobile Technology in Agricultural Extension Services

Mobile technology has transformed agricultural extension services by overcoming logistical barriers and enhancing farmer engagement, especially in remote areas. Tools like SMS, mobile apps, and internet portals provide real-time advice on weather, markets, and pest management. Successful initiatives, such as Kenya's M-Kilimo and India's e-Choupal, demonstrate cost-effective and broader reach. AI and IoT further enable precision farming, though challenges like network gaps and literacy remain. Governments and private sectors play a key role in fostering digital inclusion for sustainable agriculture.

3.2 Transforming Agriculture Through Direct Farmer-Buyer Platforms

This study proposes an innovative Farming Management System (FMS) that connects farmers directly with buyers via an e-commerce platform, ensuring fair prices and market transparency. Integrating precision agriculture, IoT, and data analytics, it enables efficient farm management with features like crop planning, real-time monitoring, and multilingual SMS support for inclusivity. Built with PHP, SQL, HTML, and JavaScript, FMS ensures scalability, security, and sustainability by reducing food waste and emissions while empowering small-scale farmers.

3.3 Mobile Phone-Enabled Agricultural Services for Smallholder Farmers in Kenya: A Pathway to Improved Access to Information

This study examines the impact of mobile phone-enabled services on smallholder farmers in Bungoma County, Kenya, where 98.1% own mobile phones, but only 60% use internet services for agriculture. Mobile tools like SMS, USSD, and apps enhance market access and decision-making, though challenges like high data costs and low digital literacy persist. It advocates for training programs and free Wi-Fi hubs at agricultural offices to bridge the digital divide. Findings show mobile technology significantly improves efficiency, reduces costs, and expands market opportunities, highlighting the need for policy support and community-driven solutions for sustainable farming.

3.4 Assessing User Readiness for Phone-Based Digital Extension Services Among Rwandan Banana Farmers

This study examines Rwandan banana farmers' readiness for phone-based digital extension services, revealing barriers like low digital literacy, limited smartphone use, and network constraints. While farmers show high motivation, only 44.6% demonstrate moderate readiness due to technology access issues. It advocates for capacity-building programs and blended digital-traditional approaches to ensure inclusivity. The ICT4BXW project highlights the need for user-centric design and policy support to integrate digital tools into existing agricultural practices, fostering sustainable rural transformation.

4. METHODOLOGY

This study is based on an extensive review of existing research papers and case studies on digital market access for farmers. The analysis focused on identifying the challenges farmers face in traditional markets and the potential of mobile technology in addressing these issues.

We conducted secondary research using existing studies on farmer market challenges. Based on this research, we designed a mobile app using React Native with Expo for the frontend and Node.js, Express.js, and MongoDB for the backend. The app was developed using a Full Stack approach. It includes essential features like product listing and secure transactions to connect farmers directly with buyers. Testing was done to ensure ease of use for farmers with minimal digital experience.

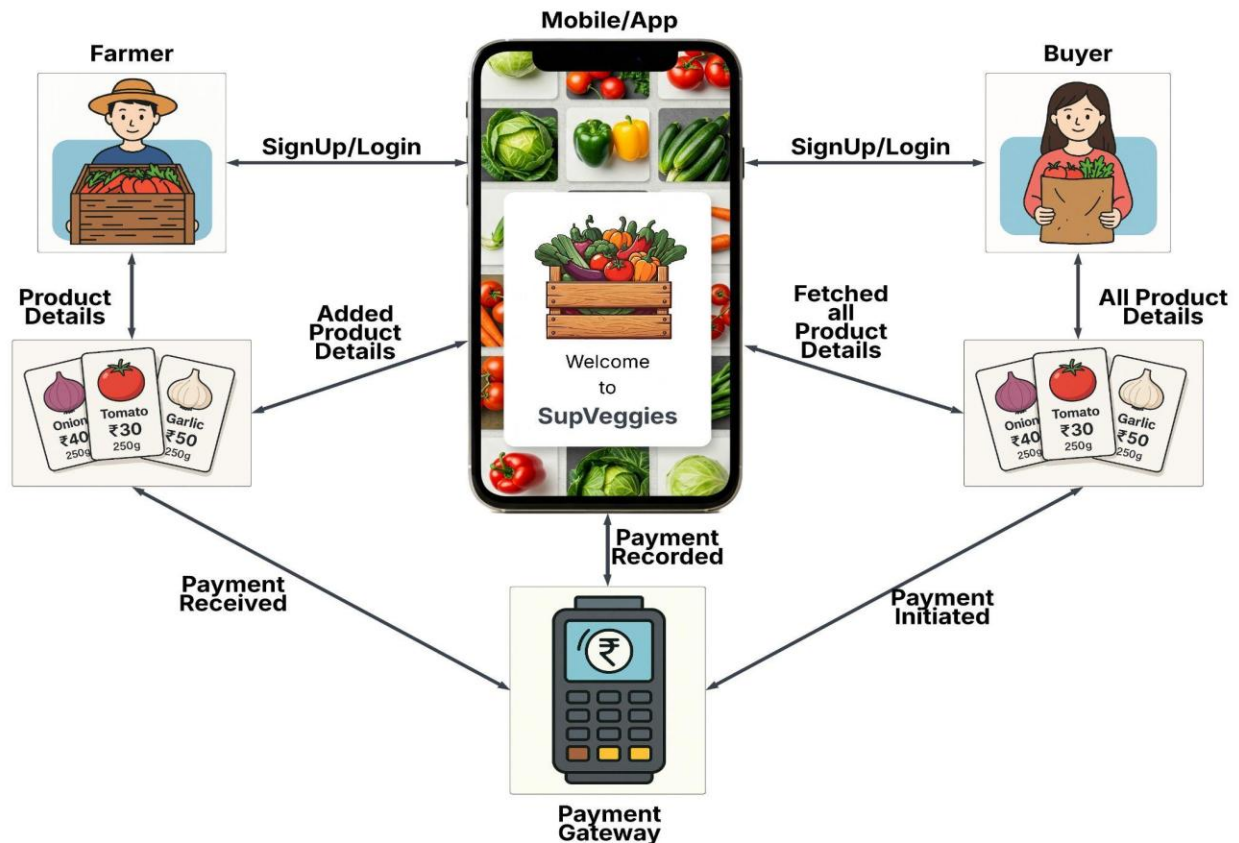


Fig 1 : System Architecture Diagram

While a mobile application can significantly enhance market access for farmers, several challenges and limitations must be addressed:

1. **Limited Digital Literacy:** Many farmers, especially in rural areas, lack the technical skills to navigate mobile applications effectively.
2. **Internet Connectivity Issues:** Poor network infrastructure in remote locations can hinder access to online platforms.
3. **Trust and Adoption Barriers:** Farmers may be reluctant to trust digital transactions or shift from traditional selling methods.

5. CONCLUSION

The development of a Direct Market Access Mobile App for Farmers presents a transformative solution to longstanding challenges in agricultural trade. By eliminating middlemen, the platform empowers farmers to sell their produce directly to consumers and retailers, ensuring fair pricing, increased profits, and greater market reach. Built using React Native with Expo for the frontend and MongoDB, Node.js, and Express.js for the backend, the app is designed to be user-friendly, scalable, and efficient. Multilingual support, secure transactions, and order tracking enhance usability and accessibility, particularly for farmers with limited digital literacy. This research highlights the potential of technology in revolutionizing agricultural markets, fostering economic growth, transparency, and sustainability. Future enhancements could integrate AI-driven price forecasting, blockchain for secure transactions, and IoT-based farm monitoring to further optimize the platform. Ultimately, this initiative represents a significant step towards digitizing agriculture and improving farmers' livelihoods.

6. REFERENCES

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