



MARKETPLACE FOR FARMERS

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Abstract : This project aims to develop a digital marketplace where farmers can sell their produce directly to consumers, retailers, and wholesalers, eliminating middlemen and ensuring fair pricing. The platform will be built using Flutter for the mobile app and Firebase as the backend for real-time data storage, authentication, and order management. Key features include farmer registration, product listings, location-based search, secure payments, order tracking, and live chat between buyers and sellers. The integration of Google Maps API will help buyers find nearby farmers, while payment gateways like Razorpay or Stripe will enable secure transactions. An admin dashboard will provide insights into user activity, sales, and market trends. Future enhancements may include AI-based price recommendations, blockchain for supply chain transparency, and logistics support. This marketplace will empower farmers, improve accessibility to fresh produce, and create a more efficient agricultural supply chain.

Keywords - Agricultural marketing, E-commerce platform, Direct-to-consumer sales, Digital agriculture, Farmer empowerment, Marketplace design, Machine learning, Supply chain, Price transparency, Rural development, Trust, User interface, Mobile application.

1. INTRODUCTION

Agriculture is an important sector of the world economy, but farmers sometimes have trouble selling their produce at reasonable prices because many intermediaries are involved. The old supply chain makes farmers have low margins, costs more for customers, and there are inefficiencies in the delivery process. To tackle these problems, a digital marketplace for farmers can act as a direct conduit between producers and buyers, bringing about improved price transparency, greater access to markets, and enhanced efficiency.

This project sets out to design a mobile and web-based platform where farmers may list and offer their produce, dairy items, and other agricultural products directly to consumers, wholesalers, and retailers. Developed through Flutter for the mobile application and Firebase as the backend, the platform will give real-time management of orders, secure payment gateways, live chat, and location based search for products.

By combining Google Maps API for local search and payment gateways for smooth transactions, the platform will ensure agricultural commerce becomes more accessible and lucrative. An admin panel will manage transactions, user activity, and market trends. AI-based price suggestions, blockchain-powered supply chain tracking, and logistics integration are potential future additions. This marketplace aims to empower farmers, reduce supply chain inefficiencies, and ensure fresh produce reaches consumers at competitive prices, thereby contributing to an agricultural ecosystem that is more lucrative and sustainable.

1.1 Population and Sample

The population for this study includes farmers, consumers, and intermediaries engaged in agricultural value chains in rural and semi-urban areas of India. The study is targeted at users who have used or are likely to use digital agricultural marketplaces. A purposive sampling approach was adopted in selecting 100 participants with 50 farmers, 30 consumers, and 20 platform administrators or intermediaries. Such farmers were selected for their exposure to digital platforms, availability of mobile internet, and engagement in agriculture trade.

1.2 Data and Sources of Data

- This research relies on both primary and secondary data sources.
- Primary data was gathered through structured questionnaires and interviews conducted with the sampled stakeholders. The survey collected responses on platform usability, pricing satisfaction, logistical challenges, and transaction trustworthiness.
- Secondary data was collected from reports of the government, scholarly papers, and platform usage reports from available agricultural marketplace startups and government eNAM portals. Other data about the prices of produce, transportation prices, and quantities of crops were collected from the Ministry of Agriculture and Farmers Welfare.

1.3 Theoretical framework

The theoretical foundation of this study is based on the **Technology Acceptance Model (TAM)** and **Transaction Cost Economics (TCE)**.

- TAM is used to assess user behavior towards the adoption of digital marketplaces by analyzing perceived usefulness and ease of use.

- TCE evaluates the efficiency of market structures with or without intermediaries, examining how transaction costs (such as information search, negotiation, and enforcement) vary across traditional and electronic systems.

Additionally, pricing mechanisms are analyzed through the lens of market efficiency theory, contrasting traditional auction or mandis-based pricing with real-time, user-driven digital pricing models. The framework aims to identify how platform design impacts resource allocation, trust, and revenue realization for farmers.

II RESEARCH METHODOLOGY

The methodology section outline the plan and method that how the study is conducted. This includes Universe of the study, sample of the study, Data and Sources of Data, study's variables and analytical framework. The details are as follows;

2.1 Implementing E-Commerce Mobile and Web Application for Agricultural Products: e-Farmers' Hut.

The authors developed a dual-platform application (Android app and web interface) that shares a common database. The system includes features for profile creation (for both consumers and farmers), product listing, ordering, and electronic payments. A complete system architecture was implemented and tested, focusing on direct producer-to-consumer engagement and bypassing intermediaries.

2.2 Blockchain for Agriculture Supply Chain Transparency.

A conceptual framework is offered whereby blockchain is applied to trace the movement of agricultural commodities through the supply chain. The platform uses smart contracts for the enforcement of transactions and the generation of tamper-proof records. Although the paper is mostly theoretical in nature, using past research as well as present blockchain platforms in modeling supply chain situations.

2.3 Empowering Agriculture: A Revolutionary Direct-to-Consumer E-commerce Platform.

The system architecture includes features like secure authentication using JWT, dynamic product search, real-time order tracking, seller profiles, rating systems, and payment integration via Stripe. The backend is implemented in Node.js, and frontend in React, ensuring responsive interfaces and data protection.

2.4 AGROCONNECT: Direct Farm-to-Consumer Marketplace.

The platform is modular, comprising admin, farmer, and customer modules. Farmers can register, upload products, manage inventory; buyers can browse, add to cart, and complete transactions. The architecture supports data retrieval and analytics for trend observation.

2.5 Agriculture E-Marketplace Performance and Consumers' Trust in Its Utilization

The study utilized a "quantitative descriptive approach" with an associative model and a "survey method". Questionnaires were administered through Google Forms using purposive sampling. The Technology Acceptance Model (TAM) formed the basis of the analysis. Tested variables were website features, content, convenience, and trust (independent variables) against utilization intention (dependent).

2.6 A Study on Farmers' Marketing Strategies and Problems During COVID-19 Lockdown

A "descriptive research" chart was followed. Primary data were collected from 150 farmers through questionnaires from five mandals. Data were analyzed through "percentage analysis and Garrett ranking" techniques.

2.7 Online Sales: A Direct Marketing Opportunity for Rural Farms?

Using "logit regression models", the study analyzes how various farm characteristics influence online marketplace adoption. Key factors included internet use, farm size, value-added products, and regional characteristics.

2.8 Website Creation for Farmers Online Selling Portal•

The methodology includes:

- "Market research" to understand farmer and consumer needs.
- "Platform development" using web technologies.
- "Product listing and categorization", along with secure "payment gateway integration".
- "Customer support and quality assurance", "Logistics coordination", "marketing", and "training" for users.

2.9 Agricultural E-Marketplace and Consumer Trust

○ Quantitative descriptive research" using a "survey method". variables: Website features (X1), content (X2), convenience (X3), and trust (X4) vs. Utilization intention (Y). "Data analysis tools -test, F-test, regression, and coefficient of determination (R²).

2.10 Implementing E-Commerce for Agricultural Products

- Developed using a common database backend for both mobile and web platforms.
- Core features include: registration, product management, order placement, delivery tracking, and integrated payment systems.
- Use case testing was conducted through real-life test scenarios to validate each module (e.g., farmer registration, ordering, payments).

2.11 Development of Portal for Farmers to Sell Products at Better Rate.

- The system includes:
- Registration and profile creation for farmers
- Algorithm to match farmers with high-demand customers
- Direct communication and transaction capabilities
- Comparative evaluation with traditional systems via case studies and screenshots.

2.12 A Study on Agricultural Marketing in India.

- "Type:" Using primary data for descriptive research
- "Sampling:" Random convenient sampling
- "Sample Size:" 106 respondents (mostly from Tirupur district, Tamil Nadu)

- o “Data Collection:” Online questionnaire with 17 questions covering demographics, preferences, and satisfaction regarding agricultural products
- o “Analysis Tool:” Percentage analysis of consumer responses on satisfaction and preferences

2.13 Marketplace for Farmers to Sell Their Products With Higher Rates and Ease

The System was designed with the following key features:

- o “Farmer onboarding” using Aadhaar-based registration
- o “Machine learning models” (Decision Tree, Linear Regression) for:
 - o Crop recommendations
 - o Optimal selling time
 - o Personalized suggestions to consumers
- o “Multi-layer grading system” to assess product quality, packaging, punctuality, and logistics
- o “Logistics integration”: Uber Pool-style shared delivery model to optimize transport costs
- o “Secure transactions” with a transparent digital payment system
- o “Technology Stack:”
 - o An Android app for buyers and farmers
 - o ML algorithms for predictions
 - o Backend systems for logistics and grading

2.14 Direct Market Access for Farmers

Literature Review: Reviewed existing direct-sell models and barriers such as digital illiteracy and market opacity.

- o Platform Design:
 - o Core features:
 - o Real-time price and demand data
 - o Forecasting based on historical data
 - o Multilingual support for regional inclusivity
 - o Strategic partnerships with government and agri institutions
 - o -Backend: Cloud-based services with secure, scalable architecture
 - o Frontend: Simple, icon-based UI with voice command support for ease of use
 - o Security: End-to-end encryption and data privacy law compliance
- The authors created a dual-platform application (Android app and web interface) that has a shared database. The system has profile creation (for both consumers and farmers), product listing, ordering, and electronic payments. A full system architecture was implemented and tested, focusing on direct producer-to-consumer engagement and bypassing intermediaries

2.15 Farmers’ Markets: Consuming Local Rural Produce.

Farmers’ markets:

- o Enable “small-scale rural producers” to access “urban markets” more efficiently.
- o Support “short supply chains”, reducing “food miles” and promoting “seasonal, eco-friendly consumption”.
- o Foster “community building”, creating stronger “relationships between producers and consumers”.

The paper also notes “challenges”:

- Maintaining “product consistency” and “supply reliability”.
- Ensuring “affordability and equitable access” to both vendors and consumers.
- Competition from “online grocery services” and “larger food retailers” that provide similar convenience.

2.16 E-Commerce Application Based on Farming Products

The app was coded with Flutter on the frontend side to provide an interactive and responsive interface. There is no description of backend integration, but utmost importance was given to providing an effortless user experience for farmers as well as customers.

2.17 Building a Digital Bridge Between Sri Lankan Farmers and Retailers: Conceptual Mobile Application Prototype.

The paper focuses on the conceptual development of the “Agri Sri” mobile application. It outlines the planned features of the application, including an online marketplace, buying/selling/renting capabilities, a database, prediction and analysis tools, a call center, and update/notification functionalities. The application is intended to be developed for mobile Web, Android, and iOS platforms.

2.18 Electronic Commerce for Agricultural Transactions: Role of Intermediaries and Accurate Pricing.

The paper analyzes transaction costs to compare the efficiency of electronic commerce with and without intermediaries. It also contrasts pricing mechanisms used in agricultural markets with those used in Internet-based retail electronic commerce.

2.19 A Framework for Next Generation Agricultural Marketing System in Indian Context.

The article proposes a framework that incorporates Market Intelligence, Food Supply Chain management, and a One-Stop Mobile App. It also uses government initiatives such as DigiLocker, Aadhaar, and Jan Dhan Yojna.

2.20 Empire State of Food: Two-Sided Marketplace for Matching Local Farmers and Institutional Buyers

The assignment entailed research to determine pain areas of buyers and suppliers, and the creation of a platform to pair local sources’ orders for buyers, price and food miles optimized.

III. RESULTS AND DISCUSSION

3.1 Implementing E-Commerce Mobile and Web Application for Agricultural Products: e-Farmers’ Hut.

Testing of various components like user registration, login, product listing, and payment succeeded with high reliability. All test scenarios passed as expected. The results confirmed that the system provides a secure, efficient platform that can simplify the direct sale of agricultural goods. The app’s usability and backend integration were also validated, and future work aims to enhance accessibility for rural users by introducing a localized language version and minimizing app size. .

3.2 Blockchain for Agriculture Supply Chain Transparency.

While the paper is not based on quantitative implementation outcomes, it shows through theoretical modeling how blockchain can impose transparency, traceability, and trust. According to the authors, blockchain incorporation in agriculture has great potential, particularly where trust and logistics issues are key challenges.

3.3 Empowering Agriculture: A Revolutionary Direct-to-Consumer E-commerce Platform.

The platform was able to establish direct interaction between buyers and farmers, increase transparency, and supported scalability. Findings indicated enhanced user experience, enhanced trust through reviews and safe payments, and decreased intermediary dependence. User adoption, policy compliance, and platform tuning are the priorities for future work.

3.4 AGROCONNECT: Direct Farm-to-Consumer Marketplace.

Initial user testing indicated ease of use, increased farmer revenue, and better market reach. Features like multilingual support, notifications, and logistics integration improved usability. Planned enhancements include mobile apps, voice recognition, and real-time weather/crop price data.

3.5 Agriculture E-Marketplace Performance and Consumers' Trust in Its Utilization

- The “reliability test” (Cronbach’s alpha = 0.957) confirmed internal consistency.
- The “regression analysis” showed that “consumer trust and website convenience” had a statistically significant impact on utilization intention, while “features and content” had lesser effects.
- The model’s “ $R^2 = 0.609$ ”, suggesting that 60.9% of the variation in intention to use is explained by the tested variables.

3.6 A Study on Farmers' Marketing Strategies and Problems During COVID-19 Lockdown

- “Mobile agricultural marketing” was the most effective and widely used strategy (ranked 1st via Garrett method).
- Farmers also relied on “weekly markets”, “retailer sales”, and “roadside stands”.
- Major issues included lack of cold storage, transportation barriers, and spoilage of produce left in fields.
- The study highlighted the need for better infrastructure and market access during crisis

3.7 Online Sales: A Direct Marketing Opportunity for Rural Farms?

- Only “8%” of DTC farms had online marketplaces.
- Farms with online platforms had “four times higher average sales” than those without.
- “72% of sales” occurred within 400 miles or the same state.
- Farms with online marketplaces conducted “71% of DTC sales without leaving the farm”, showing operational efficiency.
- Use of online platforms correlated with higher value-added product sales and a broader market reach.

3.8 Website Creation for Farmers Online Selling Portal The

platform successfully empowers farmers to:

- Sell directly, bypassing intermediaries.
- Receive better prices.
- Serve a wider consumer base.
- Foster trust via reviews, secure payments, and seasonal product displays.

3.9 Agricultural E-Marketplace and Consumer Trust

- Trust (X4) and convenience (X3) were the most significant factors affecting utilization intention.
- Model $R^2 = 0.609$ indicates a moderately strong predictive ability.
- Website features and content showed less statistical impact.
- The authors emphasize improving trust mechanisms and usability for broader adoption.

3.10 Implementing E-Commerce for Agricultural Products

All system features passed testing with expected outcomes. The app demonstrated:

- Effectiveness of operations in trials conducted in both rural and urban areas.
- Seamless order processing and payment handling.
- Enhanced user satisfaction due to intuitive interface and real-time updates.

3.11 Development of Portal for Farmers to Sell Products at Better Rate.

- The portal allows better profit realization for farmers
- Farmers can monitor customer needs and demand trends
- Direct selling cuts out middlemen, improving income and decision-making.

3.12 A Study on Agricultural Marketing in India.

- “42.5%” of respondents were aged 15–20, suggesting a young, digitally engaged audience.
- Consumers expressed **dissatisfaction** with price fairness and transparency.
- Major issues identified:
 - Poor warehousing and storage facilities
 - Inadequate transportation access in rural areas
 - Lack of bargaining power and awareness among farmers
 - Manipulation by middlemen and incorrect weighing practices

- Recommendation: Farmers should sell directly to consumers to eliminate middlemen and improve profitability.

3.13 Marketplace for Farmers to Sell Their Products With Higher Rates and Ease

- “Proposed system” aims to significantly improve price realization for farmers and transparency for buyers.
- Farmers receive smart crop advice and real-time market analytics.
- Consumers benefit from quality-rated products and competitive pricing.
- Efficient transportation and grading system reduces post-harvest losses and builds trust.

The project was in the design and proposal phase; therefore, outcomes were discussed in terms of projected impact rather than measured implementation results.

3.14 Direct Market Access for Farmers Economic

Impact:

- Increases farmers’ income by reducing transaction costs and improving price transparency
- Supports rural economic resilience through job creation and market expansion
- Sustainability: Promotes environmentally conscious practices via platform recommendations and education
- Inclusivity: Enables farmers of diverse linguistic and digital literacy backgrounds to participate in the digital market ecosystem.

3.15 Farmers’ Markets: Consuming Local Rural Produce.

- The paper adopts a conceptual/literature-based analysis rather than conducting original empirical research.
- It synthesizes insights from previous studies, government reports, and market behavior trends to build a narrative.
- The methodology focuses on qualitative evaluation of the social, economic, and environmental benefits of farmers’ markets, supported by examples and anecdotal evidence.

3.16 E-Commerce Application Based on Farming Products

"AgroGrow" facilitated easier access to farming products for consumers and provided farmers with a broader market reach, enhancing sales and reducing the dependency on traditional marketplaces.

3.17 Building a Digital Bridge Between Sri Lankan Farmers and Retailers: Conceptual Mobile Application Prototype.

The anticipated impact of the "Agri Sri" application is to establish an ecosystem that promotes effective integration of precision agriculture, the Internet of Things, and big data for improving efficiency in the agricultural value chain. The platform plans to solve problems like absence of supply chain transparency, record maintenance challenges, and farmer difficulties as a result of intermediaries.

3.18 Electronic Commerce for Agricultural Transactions: Role of Intermediaries and Accurate Pricing.

The research concludes that trading of agriculture using intermediaries is more effective. The research also concludes that existing Internet-based commerce pricing is not efficient for electronic agricultural marketplaces and recommends the use of alternative pricing mechanisms.

3.19 A Framework for Next Generation Agricultural Marketing System in Indian Context.

The envisaged framework is aimed at assisting farmers in propelling the Agricultural Marketing System as a cooperative, to make it easy to utilize available resources, and to empower them to make informed choices

4.0 Empire State of Food: Two-Sided Marketplace for Matching Local Farmers and Institutional Buyers

The platform aims to demonstrate that, in contrast to traditional sourcing, purchasing directly from nearby farmers can save consumers money and cut down on food miles.

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