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A Web-Based Farmer-Buyer Partnership System for Direct Agricultural Market Connectivity

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Abstract: Agriculture plays a vital role in the Indian economy and provides livelihood opportunities for a large rural population. However, farmers often face difficulties in finding suitable buyers, accessing market information, communicating product availability, and managing agricultural sales. Traditional agricultural marketing systems may involve multiple intermediaries, resulting in limited direct interaction between farmers and buyers. To address these challenges, this paper proposes a Farmer–Buyer Partnership System, a web-based platform that provides a digital connection between farmers and buyers. The proposed system enables farmers to register, create profiles, list agricultural products, specify available quantities and expected prices, and manage buyer requests. Buyers can register, search and view available agricultural products, access relevant farmer and product information, and submit partnership requests. An administrator manages users, products, and partnership activities through a centralized system. The proposed application is developed using HTML, CSS, and JavaScript for the frontend, Python Flask for the backend, and MySQL for database management. The system follows a structured approach to improve product visibility, communication, request tracking, and information accessibility. The proposed platform provides a foundation for direct farmer–buyer interaction and can be extended in the future with online payments, real-time market prices, logistics management, notifications, and intelligent farmer–buyer matching.

Keywords: Farmer–Buyer Partnership, Digital Agriculture, Agricultural Marketplace, Flask, MySQL, E-Commerce, Market Connectivity.

I. INTRODUCTION

Agriculture is one of the most important sectors of the Indian economy and provides livelihood opportunities to a significant portion of the rural population. Farmers play a major role in producing food and agricultural commodities required by consumers, retailers, processors, and other businesses. However, selling agricultural products through traditional marketing channels can be challenging for farmers because they may have limited access to suitable buyers, market information, and direct communication channels.

In many traditional agricultural markets, farmers depend on intermediaries to sell their products. The involvement of multiple intermediaries can make the supply chain more complex and can limit direct interaction between farmers and buyers. Farmers may also experience difficulties in identifying buyers who require particular products, quantities, or locations. On the other hand, buyers may find it difficult to identify farmers and available agricultural products that match their requirements.

The growth of information and communication technologies provides an opportunity to address these challenges through digital platforms. A web-based agricultural marketplace can provide a centralized environment where farmers can list their products and buyers can search for available products according to their requirements. Such a platform can improve the accessibility of product information and facilitate communication between the two stakeholders.

This research proposes a Farmer–Buyer Partnership System, a web-based application designed to establish a structured digital connection between farmers and buyers. Farmers can register on the platform, create their profiles, add agricultural products, specify available quantities and expected prices, and manage requests received from buyers. Buyers can register, search for agricultural products, view product and farmer information, and submit partnership requests.

The proposed system uses HTML, CSS, and JavaScript for the frontend, Python Flask for backend development, and MySQL for database management. The system provides separate functionalities for farmers, buyers, and administrators. The administrator can manage users, products, and partnership requests.

The main objective of the proposed system is to provide a simple and structured digital platform for farmer–buyer interaction. By centralizing product and user information, the system can support product discovery, communication, and partnership-request management. The proposed system can also serve as a foundation for future integration of online payments, logistics management, real-time market prices, notifications, and intelligent farmer–buyer matching.

II. LITERATURE REVIEW

Several studies have examined the use of digital technologies in agricultural marketing and the relationship between farmers and buyers. These studies show that access to information and suitable markets can play an important role in agricultural marketing.

Goyal [1] studied the use of information technology to provide farmers with better access to market information in central India. The study examined Internet-based information services and alternative marketing channels. The findings showed the importance of providing farmers with information that can help them make better marketing decisions.

The National Agriculture Market (e-NAM) is another important development in digital agricultural marketing in India. It provides an electronic platform for connecting agricultural markets and aims to improve transparency and price discovery. The e-NAM model shows how information technology can be used to connect different participants in agricultural markets.

Research on farmer-buyer relationships has also examined the factors that influence the interaction between agricultural producers and buyers. Price, marketing costs, convenience, and the relationship between the farmer and buyer can affect the way agricultural products are marketed. These studies indicate that improving communication and access to buyers can be useful for farmers.

Although existing agricultural platforms provide several market-related services, there is still a need for simple systems that focus specifically on connecting individual farmers with potential buyers. Small farmers may need an easy-to-use platform where they can add their products and provide information about quantity, price, and location without going through complicated processes.

The proposed Farmer-Buyer Partnership System focuses on this gap. It provides separate modules for farmers, buyers, and administrators. Farmers can list their agricultural products, buyers can search for products and send partnership requests, and farmers can manage those requests through the system.

The main research gap identified from the reviewed work is the need for a simple web-based system that combines farmer product listing, buyer search, direct partnership requests, and request-status tracking in one platform. The proposed system attempts to address this gap using a Flask and MySQL based web application.

III. METHODOLOGY

The proposed Farmer-Buyer Partnership System was developed to provide a simple platform for farmers and buyers to communicate and exchange product information. The main idea of the system is to help farmers find buyers for their products and help buyers find the products they need. The system has three main users: farmer, buyer, and administrator. Farmers can create an account, log in, add their agricultural products, and provide details such as product name, quantity, price, and location. Buyers can create an account, search for available products, view the details provided by farmers, and send a partnership request. The administrator is responsible for managing users, products, and requests. The frontend of the system is developed using HTML, CSS, and JavaScript. Python with the Flask framework is used for the backend. MySQL is used as the database to store user details, product information, and partnership requests. The development process starts with identifying the problems faced by farmers and buyers in the existing system. Based on these requirements, the database and application structure are designed. The main modules are then developed and connected with the database. Finally, the system is tested by checking important functions such as registration, login, product addition, product search, request submission, and request status updates.

The system is evaluated mainly through functional testing. Each major feature is tested to check whether it performs the expected operation. The testing results are used to identify errors and make necessary improvements to the application.

This approach helps in developing a simple and practical platform for improving communication between farmers and buyers. Further features such as online payment, delivery management, notifications, and real-time market prices can be added in future versions.

IV. RESULTS AND DISCUSSION

The developed Farmer-Buyer Partnership System was tested to check whether the main functions of the application work as expected. The testing focused on the activities performed by farmers, buyers, and the administrator.

A. Farmer Module

The farmer module allows farmers to create an account and log in to the system. After successful login, the farmer can create a profile and add agricultural products. Product information such as product name, available quantity, expected price, location, and description can be entered into the system.

The farmer can also view the requests received from buyers. Each request can be reviewed and its status can be updated based on the farmer's decision. This makes it easier for the farmer to keep track of interested buyers.

B. Buyer Module

The buyer module allows buyers to register and log in to the application. After logging in, buyers can search for agricultural products available on the platform. They can view information about the product and the farmer before sending a partnership request. After submitting a request, the buyer can check whether the request is pending, accepted, or rejected. This provides a simple way for the buyer to follow the progress of the request.

C. Administrator Module

The administrator module is used to manage the activities of the system. The administrator can view and manage farmer accounts, buyer accounts, product information, and partnership requests. This helps maintain the information stored in the application and provides better control over the system.

D. Functional Testing

The main functions of the system were checked during testing. The test cases include user registration, login, adding products, searching products, submitting partnership requests, and updating request status.

Test Case	Expected Result	Status
Farmer Registration	Farmer account should be created	Passed
Buyer Registration	Buyer account should be created	Passed
User Login	User should access the appropriate dashboard	Passed
Add Product	Product should be stored and displayed	Passed
Search Product	Matching products should be displayed	Passed
Send Partnership Request	Request should be recorded	Passed
Update Request Status	Status should be updated	Passed
Admin Management	Admin should manage system records	Passed

E. Discussion

The testing shows that the major functions of the proposed system can be performed through the web application. Farmers can publish their products, while buyers can search for products and communicate their interest through partnership requests. The system also provides a common place for managing the information exchanged between the two users. The proposed system is mainly focused on improving the digital interaction between farmers and buyers. It does not replace existing agricultural markets or guarantee a particular selling price. Instead, it provides a platform through which farmers and buyers can discover each other and manage their initial partnership requests.

The current version can be further improved by adding real-time market prices, online payments, delivery tracking, notifications, product verification, and mobile application support. These features can make the system more useful for practical agricultural transactions.

V. CONCLUSION

The Farmer–Buyer Partnership System was developed to provide a simple digital platform for connecting farmers and buyers. The system allows farmers to register, create their profiles, and list agricultural products with details such as quantity, price, location, and description. Buyers can search for available products, view farmer and product information, and send partnership requests.

The system also provides an administrator module for managing users, products, and partnership requests. The main functions of the application were tested, including registration, login, product listing, product search, request submission, and request-status updates. The testing showed that the developed modules perform their intended functions.

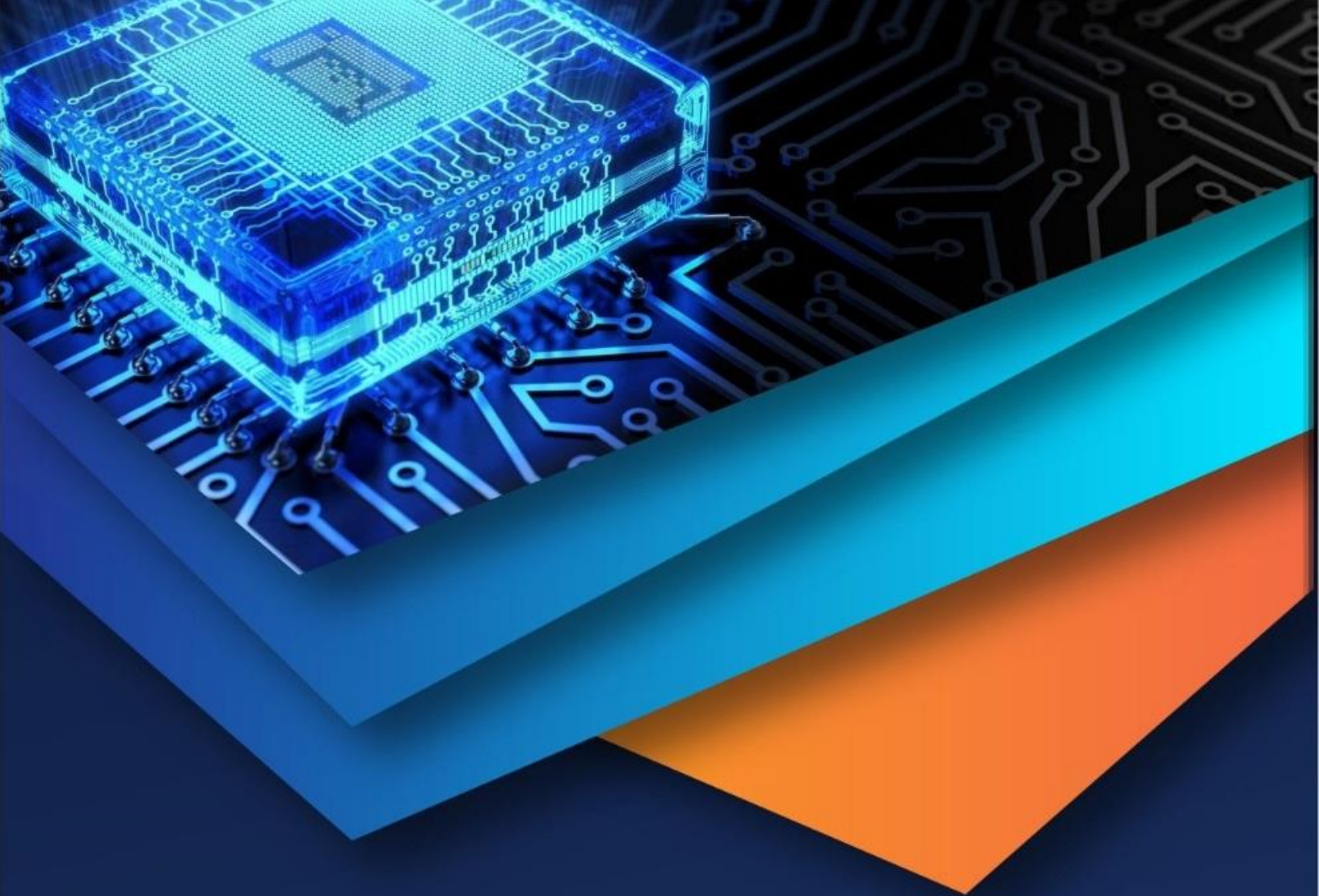
The proposed system can make the process of sharing agricultural product information and communicating between farmers and buyers more organized. However, the current system is a basic web-based prototype and does not include features such as online payment, delivery tracking, real-time market prices, or product-quality verification.

In the future, the system can be extended with these features along with mobile application support, notifications, location-based search, and intelligent farmer–buyer matching. These additions could make the platform more suitable for practical use and provide additional support for digital agricultural marketing.



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