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Agri Analytics-Digital Agriculture

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Abstract: Agri Analytics is an android base application which, addresses multiple aspects of modern agriculture. Agri Analytics offers a comprehensive platform that provides farmers with access to a wide array of agriculture tools and equipment, bridging the gap between traditional farming methods and advanced practices. The platform also serves as an information hub for government schemes and initiatives, ensuring that farmers are aware of and can benefit from the latest programs designed to support their livelihoods. One of the project's key features of our system is based on soil nature, weather condition and water availability that suggests crop to farmers and also predict crop diseases if any. System will offer possibilities for renting or purchasing agricultural tools and equipment for more productive farming practices. This initiative is an example of a comprehensive modern agricultural method that can ultimately improve farmers' livelihoods and contribute to global food security in a constantly changing planet.The system will provide users with relevant information on government programs that are relevant to them. The system would provide farmers with all necessary solutions on a single platform.

Keywords: Machine learning, java, android, government programs, predict crop disease, decision tree algorithms, logistics regression.

I. INTRODUCTION

Agri analytics application is a platform where farmers can simply rent farming machinery in addition to buying and selling seeds, fertilizers, pesticides, and other farming supplies. We can monitor all of the tool and equipment details on the project's administrative side. This system's administrator is essential to its operation. Complete network access is granted to the project administrator. Customers can rent or purchase machinery through the agriculture system called Agri Analytics. It helps farmers with existing expertise to get newfound information. Relationships with suppliers and buyers are consequently established. The government will present new farmer-focused initiatives. Farmers will receive compensation if there is a production loss as a result of natural disasters. There will be a special interface for applying and viewing the schemes. A unique ID will be given to farmers and agents so they may enter into their accounts and gain secure access.

The development of this agricultural application used the capabilities of MySQL and Android to create a complete platform that tackles many facets of contemporary agriculture. Modern agricultural equipment's make farmers work more efficient and easy. Renting harvesters and other farming equipment is also beneficial to them. They also benefit from renting harvesters and other farming equipment. This includes certain organizations that have been established to assist farmers in need of such equipment; these organizations own the equipment and rent it to farmers upon request for a fee. Based on the weather, the administrator or owner of this program gives agricultural recommendations. The project is designed to address the common problems faced by farmers, especially those in rural areas, by providing easy access to necessary equipment and resources. The information on government schemes helps farmers take advantage of available subsidies and support programs, further enhancing their productivity and profit ability.

II. PROBLEM DEFINITION

For productive and efficient output, the agriculture sector significantly depends on machinery. For some jobs like planting, tilling, harvesting, and spraying, farmers frequently need specialized agricultural machinery. However, the cost of purchasing and maintaining these machines can be prohibitive for many farmers, particularly those with small to medium-sized farms. In certain areas, the lack of access to specialized and advanced machinery is another issue. Farmers in many developing nations do not have access to the newest agricultural gear and might be forced to use antiquated tools, which could have a detrimental effect on their production and productivity. Some farmers are not aware about which crop to take and which crop is suitable to that soil. sometimes crops are diseased by many diseases and farmers don't know which pesticides are used to grow.

III. OBJECTIVES

- To provide rental equipment to the farmers.
- To provide information of the government schemes to the farmer.
- To predict plant pest detection.
- To provide the suggestion of crops.

IV. SYSTEM ARCHITECTURE

Farmers provide their data during registration and farm data entry. The system validates the user credentials and stores the data. Farmers access weather information and government schemes through the system. When farmers enter soil data, the system uses the soil prediction model to recommend suitable crops. Farmers can check equipment availability and make reservations. The system keeps track of available equipment and inventory. It provides water availability information based on the farmer's location. The farmer can select crops based on recommendations.

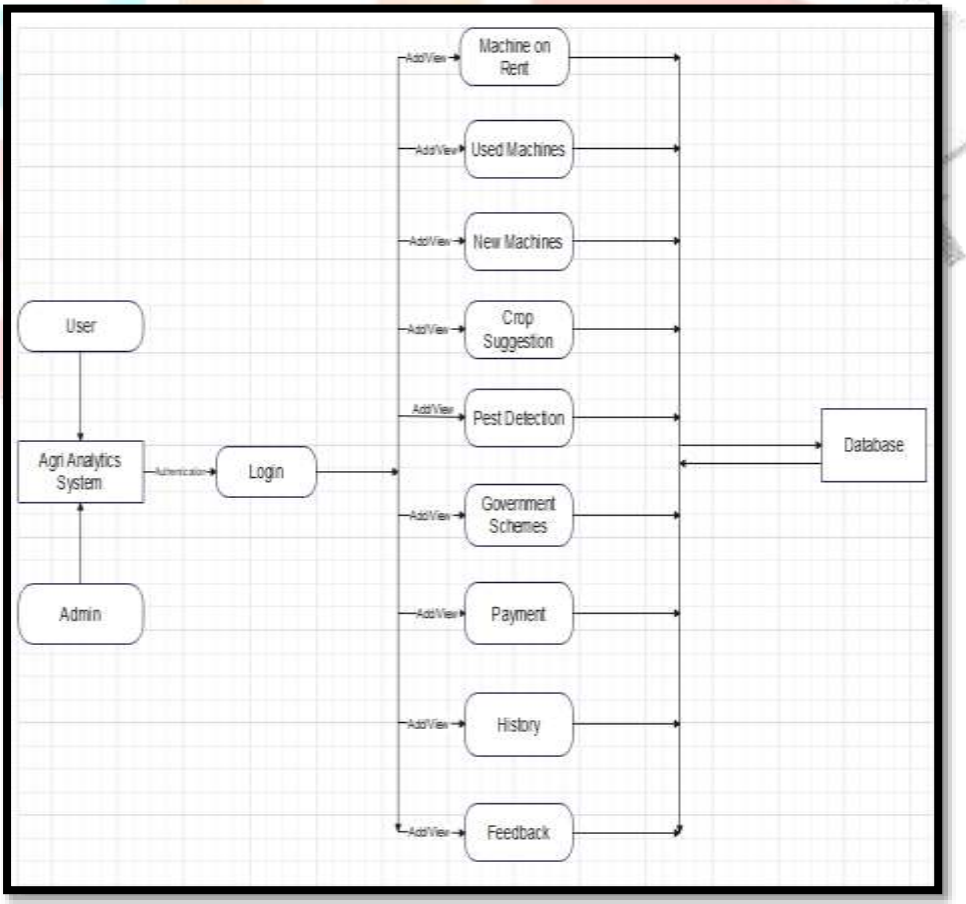


Fig 1. System Architecture

1) User Interface (UI):

Web based application serving as the primary interface for farmers. User-friendly design with intuitive navigation to access different features.

2) Authentication and User Management:

User registration and login functionality. Secure authentication methods for user accounts. Farmer profile management.

3) Equipment and Tools:

Listings of agricultural equipment, tools, fertilizers, and pesticides for sale or rent. User reviews and ratings for listed items. Inventory management for sellers.

4) Database Management:

Centralized database to store various data, including user profiles, equipment listings, soil data, weather forecasts, and government schemes. Relational database management system (e.g. PHP) to organize and query structured data. Geospatial database for storing soil and weather data.

5) Weather Information:

Real-time weather updates including temperature, humidity, rainfall, and wind conditions. Weather forecasts for the upcoming days/weeks to help farmers plan their activities. Utilizes GPS capabilities to determine the user's location for accurate weather, soil, and water information.

I. RESEARCH METHODOLOGY

The process used for this system Classic Life Cycle as this is simple. The Classic Life Cycle is also called as system development lifecycle (SDLC). It is defined The growth of an information system is through various identifiable stages. These stages are grouped together referred as SDLC. Methodology may be defined as systematic knowledge the best way of setting to work. In the development and progress of the methodology has played very important role. The structure of its stages which we used in our project is as follows:

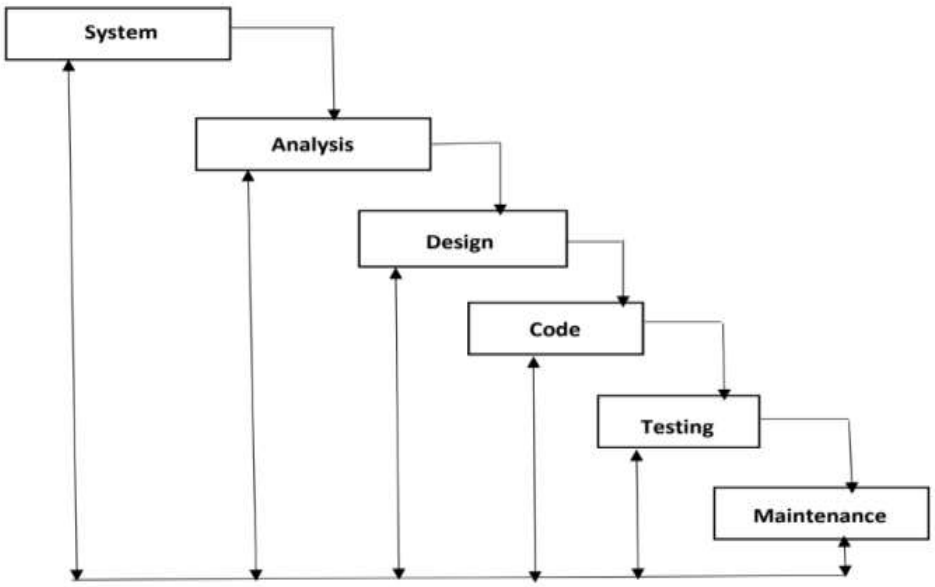


Fig 2. Methodology

3.1 System

Our Agri Analytics system for farmer project, we choose appropriate technologies and tools for developing the Agri Analytics system for farmer project. We considered Android technology, simulation software, and database system which are necessary to build Agri Analytics system for farmer project. We ensured that the selected technologies are scalable, user-friendly, and compatible across devices.

3.2 Analysis

The analysis stage is the foundation of the Agri Analytics system for farmer project. It involves whole study of agricultural requirements, technical constraints, user expectations, and learning objectives.
During this stage, the project team conducts in-depth research to ensure a clear understanding of what the Agri Analytics system for farmer needs accomplish.

3.3 Design

The design phase of a Agri Analytics system for farmer project is a critical phase in which the project team designs the structure, functionality, and user experience of the Agri Analytics system for farmer. During the design phase, the project team envisions his Agri Analytics system for farmer user interface. This includes designing the platform's layout navigation, and visual elements. Special attention has been paid to ease of use, intuitive design, and seamless navigation to ensure an engaging user experience. In design phase the main aim to focus on creating a positive user experience.

3.4 Code

The code phase of a Agri Analytics system for farmer project involves the actual implementation of the design and development of the software components that make up the Agri Analytics system for farmer platform. It involves Fronted and backend development, Database Integration, User authentication and authorization, integration of multimedia content, error handling and testing, security implementation, performance optimization, deployment preparation.

3.5 Testing

The testing stage of a Agri Analytics system for farmer project is a critical phase where the functionality, performance, and user experience of the platform are thoroughly evaluated.

3.6 Maintenance

The maintenance stage of a Agri Analytics system for farmer project is a crucial phase where the platform is deployed, monitored, and improved to ensure ongoing functionality, security, and user satisfaction.

IV. RESULTS AND DISCUSSION

4.1 Register page

Fig 3. Register Page

4.2 Login page

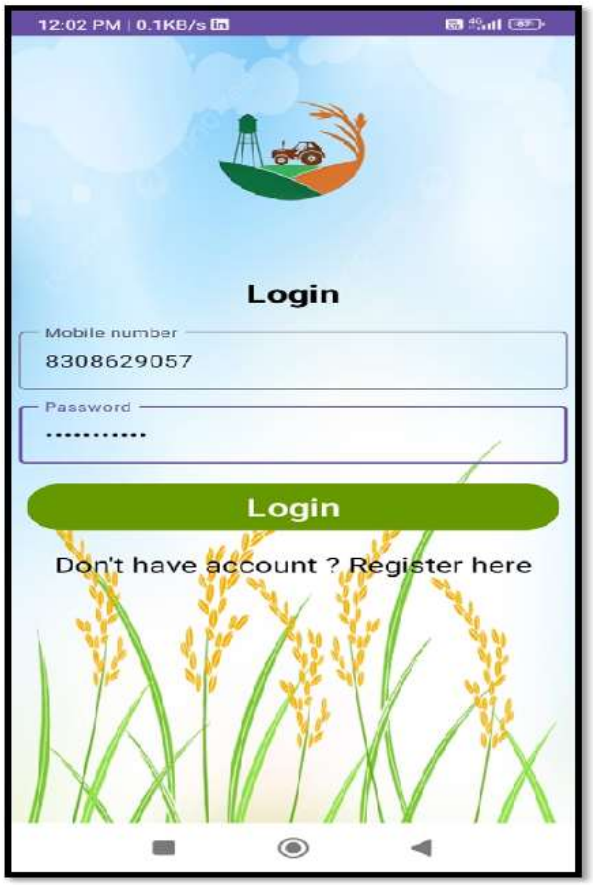


Fig 4. Login Page

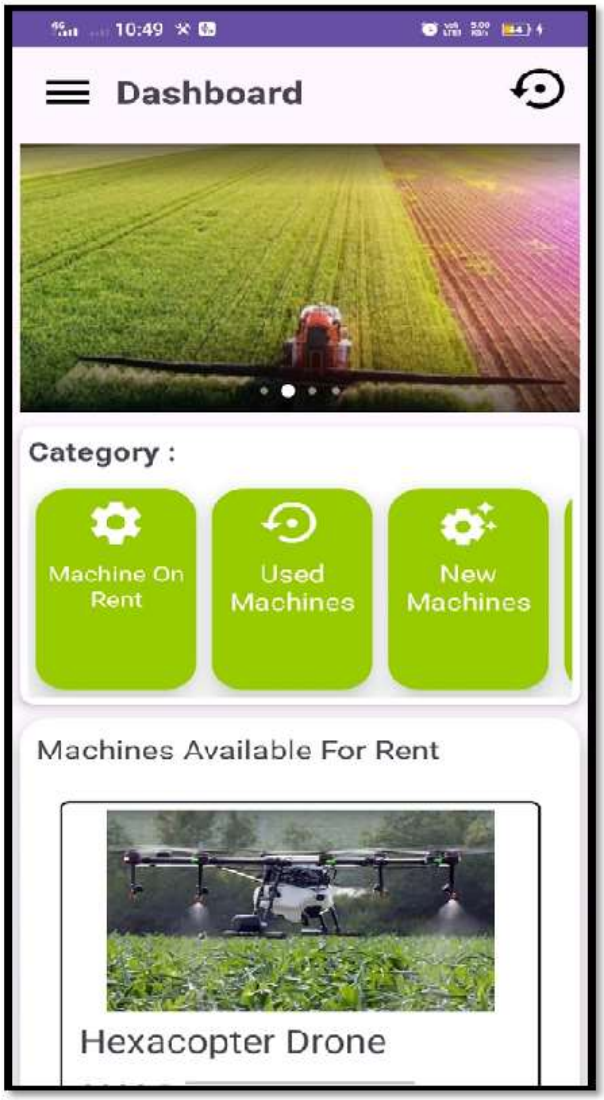
- **Register Page**

User will first go to register page. In register page user will have to enter Full name, Mobile number, Password. Then click on the green button of register to complete the registration process. If you are already registered, then you will get the message as your are already registered and you will be redirected to the dashboard of the agri analytics system.

- **Login Page**

After authentication, user's profile will get created. Then user can login to the system by entering the correct mobile number and password. If you enter incorrect mobile number and password you will get message to enter the valid details, after that user have to click on the green button of login to enter the dashboard of the agri analytics system.

4.3 Home Page **4.4 Payment Page**



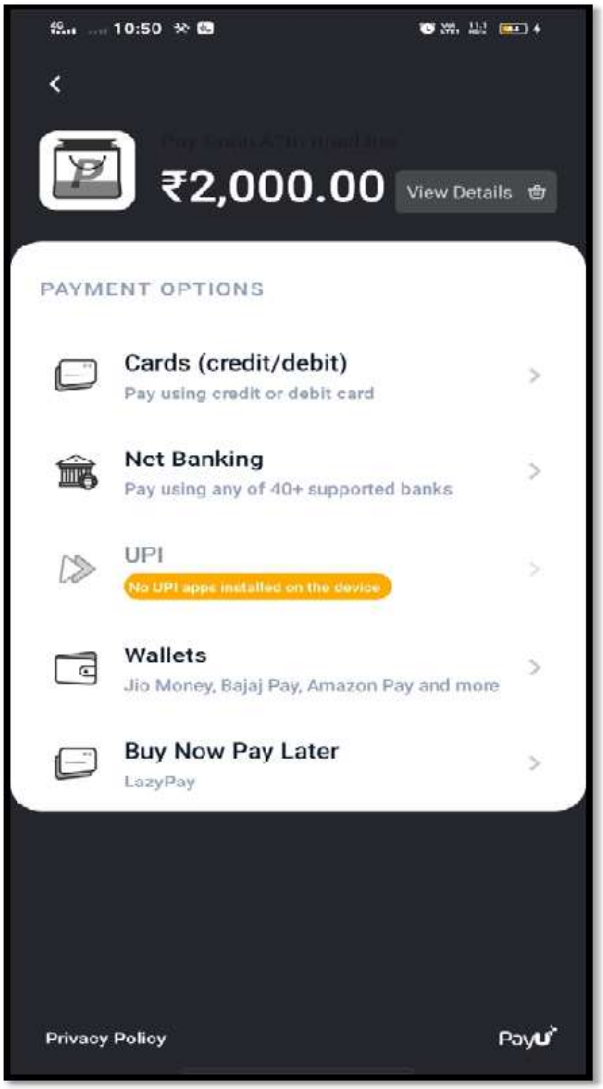


Fig 5. Home Page Fig 6. Payment Page

- **Home Page**

After the successful login, user will get the message of login successfully and enter to the home page and they can able to see the modules like rental machine, used machine, new machine, crop suggestion, pest detection and government schemes. In the section of machine on rent user will get different rental equipment which includes information about the equipment. User can call and SMS directly to owner of machines by this module and also user can do the payment from the same module.

- **Payment Page**

In the section of machine on rent user will get the option of payment on the same module using this payment option user can able to do the payment of rental machine by credit/debit cards, Net Banking, UPI, Wallets, Buy Now Pay Later. User can choose any one method to complete their payment.

V. CONCLUSION

The system is designed to be user-friendly, efficient, and secure. This Agricultural Machinery Rental System offers a various features such as equipment listing, equipment booking, payment processing, and order management. This system eliminates the need for physical visits to rental shops, and provides a wider range of equipment options. In this we discuss different issues regarding farmers also we provide solution for that. These issues are related with equipment, which crop to take better growth in their soil. This system provides different government schemes which are applicable to farmers. Also our system able to suggest crop based on water supply and weather condition and pest detection through image analysis. Thus Agri-Analytics is a useful and innovative solution that can help farmers and service providers in the agricultural sector. This android-based Agricultural Rental System has the potential to improve the efficiency of agricultural machinery rental and contribute to the growth of the industry.

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