International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 07 Issue: 07 | July - 2023 SJIF Rating: 8.176 ISSN: 2582-3930

A STUDY ON AGRONOMIST LABS TO HELP FARMERS TO INCREASE CROP YIELDS

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ABSTRACT

The Agronomist Lab mobile application is a solution designed to facilitate communication between farmers and labs, with the goal of enhancing crop yields. This mobile application integrates multiple modules, including the admin, labs, lab employees, and farmers, the exchange of vital information and expertise for optimized farming practices. Farmers often face challenges in obtaining accurate and timely guidance from experts in labs regarding fertilizer application, pest management, and other factors affecting crop yields.

The Agronomist Lab mobile application represents a transformative solution for enhancing communication between farmers and labs, aiming to increase crop yields. By integrating admin, labs, lab employees, and farmers within the application, it creates a collaborative ecosystem that fosters effective farmer-lab communication. This application, driven by technology and expert insights, empowers farmers to adopt best practices, optimize their farming methods, and ultimately achieve higher crop yields and profitability.

Keywords: Labs, Farmers, Admin, Employee, Tests, Results

INTRODUCTION

The Agronomist Lab mobile application is a pioneering solution designed to improve communication between farmers and labs, with the primary objective of increasing crop yields. By integrating multiple modules including admin, labs, lab employees, and farmers, this mobile application facilitates seamless and efficient communication, enabling farmers to benefit from expert guidance and insights from lab professionals. Farmers often face challenges in accessing timely and accurate information from labs regarding fertilizer application, pest management, and other critical factors that impact crop yields [7]. The Agronomist Lab mobile application addresses these challenges by providing a platform for effective communication and collaboration between farmers and labs. No one knows exactly how much food is lost on farms due to diseases and pests, whether measured in thousands of tons, or billions of dollars [1]. The plant clinics were created as a service to share information with farmers [2].

The admin module serves as the central control unit of the Agronomist Lab application. Admins oversee user accounts, ensuring adherence to industry standards and regulations, while providing support to both farmers and lab employees. Their role is essential in maintaining the integrity of the communication process and facilitating smooth coordination between the different modules. Labs, equipped with advanced facilities and expertise, play a pivotal role within the application. Through the mobile application, labs act as the interface for farmers to communicate their farming challenges, seek guidance, and share relevant data. Leveraging their knowledge and analytical capabilities, labs provide valuable insights and recommendations to farmers, customized to suit their specific crop requirements and growing conditions. Lab employees, utilizing the mobile application, play a vital role in facilitating effective communication between farmers and labs. They receive queries and requests from farmers, analyze the provided information, and offer expert advice and recommendations. By inputting the recommendations into the application, lab employees ensure timely and accurate responses to farmers' inquiries. This streamlined communication loop helps farmers make informed decisions and adopt best practices to improve crop yields.

Farmers, as the primary users of the Agronomist Lab application, engage with the mobile interface to seek guidance and share vital information with labs. Through the application, farmers can submit queries, provide data related to their crops, and share photographs or samples for analysis. In return, they receive personalized recommendations and solutions from labs, addressing their specific challenges and enabling them to optimize fertilizer application, pest control, and other agricultural practices to maximize crop yields. The Agronomist Lab mobile application harnesses technology to bridge the communication gap between farmers and labs, fostering

collaborative decision-making and knowledge sharing. By facilitating timely and accurate exchange of information, the application empowers farmers to implement effective strategies for crop management, leading to increased productivity and improved crop quality.

The Agronomist Lab mobile application revolutionizes the way farmers communicate with labs, with the ultimate aim of increasing crop yields. By integrating admin, labs, lab employees, and farmers within the application, it creates a collaborative ecosystem that promotes effective farmer-lab communication. This application, driven by advanced technology and expert insights, empowers farmers to make informed decisions, optimize their farming practices, and ultimately achieve higher crop yields and profitability.

LITERATURE REVIEW

Jeffery Bentley et al [1]

Between 2000 and 2009, nine plant clinics in three agro-ecological areas of Bolivia (Andes, lowlands and valleys) served about 800 communities in an area roughly 300 × 100km. Over 6000 farmers consulted these clinics with 9000 queries. Many found the advice so useful that they visited the clinics repeatedly. A survey of 238 clinic users found that most adopted the clinics' recommendations. Fruit and vegetable growers who followed the clinic recommendations tended to spend less on pesticides. As for certain crops like potato, citrus and peach palm, a modest increase in pesticides helped improve the quality and quantity of the harvest.

Zahid Hassan et al [2]

Plant clinics are a novel channel of providing low-cost and regular plant health services to farmers in developing countries. Limited research has been conducted on the assessment of plant clinics in Pakistan. The plant clinics are playing an effective role in agricultural development through the dissemination of technical guidance to the farmers. This study was conducted in the Punjab province of Pakistan to assess the impact of plant clinics on the income of farmers. A total of 353 randomly selected farmers were interviewed from the two districts of Punjab province, Gujranwala and Multan through a face-to-face interview technique. Collected data were analyzed through the Statistical Package for Social Sciences (SPSS). Along with the descriptive analysis, the

Ordinal Logistics Regression (OLR) model was applied to estimate the impact of plant clinics on the income of the farmers.

Steven R. Belmain et al [3]

Many people have problems with pest rodents. Rats damage our crops and possessions and spread dangerous diseases to people and livestock. While this can be a difficult problem to tackle, experience has shown that with the right knowledge and tools it is possible to sustainably reduce pest rodent populations. A number of research and extension institutions have recently been collaborating with farming communities in Asia and Africa to develop effective rodent management strategies. Here you can read about how communities in Bangladesh have managed to dramatically reduce rat populations, and see the difference it has made.

Jean Claude N. Majuga et al [4]

Although plant clinics are considered an important mechanism in the service delivery to farmers, not much is known about their functioning in the daily reality of plant doctors and farmer-clients. This article reports on an exploratory study describing the functioning of eight plant clinics in Rwanda. Personal and organizational commitment, publicity, and proactive communication with farmers and local leaders are key factors explaining higher attendance of some clinics. Farmer attendance is under-reported by 40–50%. Data management needs improvement to make clinic records reliable tools for decision-makers. This type of assessment can help improve operations and realise the plant clinics' potential.

Jeffery W. Bentley et al [5]

Smallholder farmers need information on plant diseases. Ten plant health clinics (Postas para Plantas) evolved in Bolivia after 2000 and are still operating due to the efforts of three local institutions. The plant clinics receive any problem, on any crop, and give written and verbal recommendations, immediately if possible. Many clinics are held at weekly farm fairs, where villagers from many surrounding communities can seek help. The clinic staff write fact sheets for farmers on common problems.

METHODOLOGY

The application uses Asp.Net for the admin as web application and lab employees, farmers use android mobile application due to its usability and convenience.

By following this methodology, the Agronomist Lab mobile application can be developed and deployed successfully, facilitating effective communication between farmers and labs, and ultimately assisting farmers in optimizing their farming practices to increase crop yields

1. **Requirement Collection:**
    i. Identifying key features and functionalities required in the Agronomist Lab mobile application, considering the roles of admins, labs, lab employees, and farmers.
2. **System Design**
    i. Designing the overall system architecture, considering the integration of the admin, labs, lab employees, and farmers as modules.
    ii. Determining the technical requirements, such as programming languages, frameworks, and databases, for mobile app development and web-based admin control.
3. **Database Design:**
    i. Designing and develop a robust database schema to store user data, farming data, testing records, and recommendations.
    ii. Establish relationships between different entities, ensuring efficient data management and retrieval.
4. **Development**:
    i. Developing the mobile application for farmers, providing features such as user registration, login, profile creation, and data submission.
    ii. Building the web-based admin control panel, enabling admins to manage user accounts, oversee testing processes, and provide support.

Algorithm on Agronomist Lab mobile application

Step 1: Start

Step 2: Login/Register

Step 3: Choose Role as Admin, Lab, Lab Employee, Farmer

Step 4: if Role == Admin (Web)

a. Manage user Accounts
b. Provide support and guidelines

Step 5: if Role==Lab (Mobile)

a. Receive Testing Requests from Farmers
b. Analyze Samples and conduct tests
c. Generate test results

Step 6: if Role == Lab Employee (Mobile)

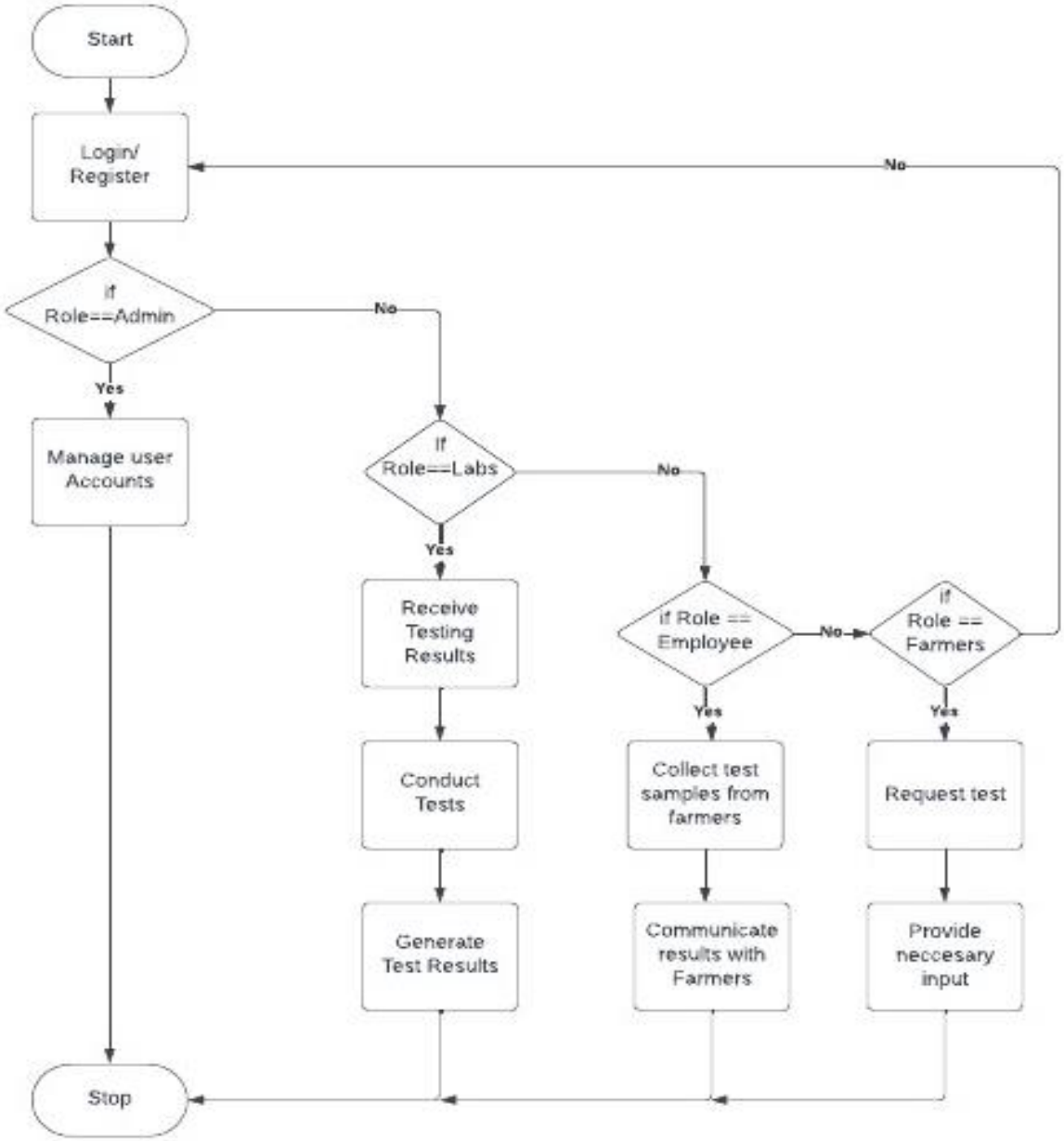
a. Collect samples from farmers
b. Communicate results with farmers

Step 7: if Role == Farmer

a. Request sample test with Labs
b. Provide necessary inputs to labs
c. Receive results from lab employee

Step 8: End

Flowchart on Agronomist Lab mobile application



Results and Discussion

Figure 1: Lab Information

Figure 1 depicts the lab's specifics and can include all of the lab's pertinent data. This page includes the ID, Lab Name, Address, City, Mobile Number, and Lab Location. The opportunity to view the lab's location is available to users and farmers.

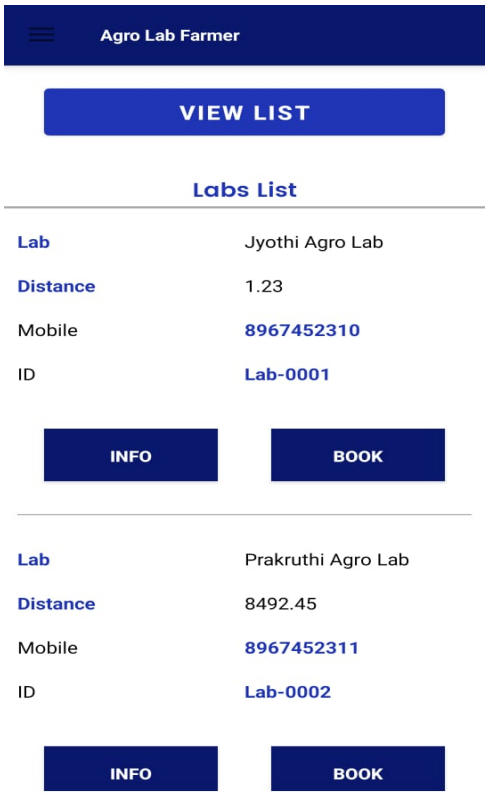


Figure 2: View List

Figure 2: Shows a list of laboratories; all laboratories are shown in this list. Labs can add their information and the location of their lab after registering for the online application with the appropriate information.

Figure 3: Test List

Represents the test list in Figure 3. Users have the ability to add the test here in accordance with the lab's specifications and also have the option to add the test to their shopping cart. They will then have the ability to place orders once they add or choose the exam.

CONCLUSION

The Agronomist Lab mobile application is a transformative solution designed to revolutionize the way farmers communicate with labs, ultimately aiming to increase crop yields. By integrating modules for admins, labs, lab employees, and farmers, this application facilitates seamless communication, knowledge sharing, and collaboration among all stakeholders involved. The application empowers farmers by providing them with a platform to communicate their farming challenges and seek guidance from expert lab professionals. Farmers can submit testing requests, share relevant data and samples, and receive personalized recommendations tailored to their specific crop requirements and growing conditions.

The Agronomist Lab application promotes collaboration, data-driven decision-making, and knowledge exchange between farmers and labs. By using technology and expertise, it empowers farmers to enhance their farming practices, leading to increased productivity, improved profitability, and sustainable agriculture. The Agronomist Lab mobile application is a game-changer in the agricultural industry, enabling farmers to communicate effectively with labs and harness their expertise to increase crop yields. The integration of admin, labs, lab employees, and farmers within the application creates a collaborative ecosystem that drives innovation, knowledge sharing, and sustainable farming practices. With this application, farmers can unlock their potential, optimize their farming methods, and ultimately achieve higher crop yields and success.

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