



Agripro - An integrated agricultural assistance system for Indian farmers

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Abstract— India is an agrarian country. Therefore its information-intensive agriculture sector requires mobile-enabled information services. It can bridge the gap between research and knowledge distribution among Indian farmers. This paper proposes one such application to help Indian farmers get acquainted with the latest technological trends in agriculture and increase their market connectivity. In this study, we created a prototype application that provided services like agricultural assistance and information based on various geological and economic factors to the farmers. This integrated platform is mobile enabled helped to achieve maximum connections with even less privileged farmers. Official government documents were more easily accessible. Our method increased productivity for farmers by providing every possible information, assistance, and guidance required on a single platform.

Keywords— Indian agriculture, Mobile app development, latest trends in Indian agriculture.

I. INTRODUCTION

Agriculture also described as the fundamental stone of the Indian market, is an integrated system of age-old and now-modern methods for managing the cultivation and harvesting of vegetables and other raw materials used in both food and industrial products. It is a complex undertaking that involves both technical and practical methods to maintain ecological balance, preserve human resources, and provide a sustainable food production system. There exists a disparity between the population engaged in agriculture and the contribution of the sector to the Gross Domestic Product of the country. In India, agriculture contributes to approximately 16% of the country's GDP and employs nearly half from the working class. However, the average production in India is relatively low in comparison to other countries. Recent improvements in the agriculture sector worldwide have made it easier for farmers

to be updated with real-time information about market prices, the latest production methods, etc. Yet despite efforts taken by the government, the average Indian farmer seems to be unaware of this information. Therefore we propose such an application that will integrate all the information and the government schemes and will also make it easier for farmers to apply for the latest schemes available. This has the potential to enhance not just the condition of agriculture in India but in addition the livelihoods and working conditions of farmers.

II. BACKGROUND

A. Obstacles encountered by farmers in India:

- One of the significant difficulties faced by Indian farmers is the lack of access to modern technologies and innovations. Small and marginal farmers, who constitute the majority of Indian farmers, lack the resources to purchase advanced machinery, fertilizers, and other inputs. As a result, they remain dependent on traditional methods of cultivation, which limits their productivity and yield.
- The Indian farmer's reliance on monsoon rains is another significant challenge. Erratic rainfall, droughts, and floods are common occurrences in India, leading to crop failures and food shortages. This issue is compounded by the lack of proper irrigation facilities, as many farmers do not have access to modern irrigation systems or rely on inefficient water management systems.
- Another critical challenge faced by Indian farmers is the fragmentation of land holdings. The majority of Indian farmers hold small and fragmented land holdings, which leads to low productivity and higher

production costs. The lack of economies of scale makes it challenging for small farmers to access credit and other financial services, which limits their ability to invest in their farms and grow their businesses.

- The high cost of inputs, such as seeds, fertilizers, pesticides, and other farming supplies, is another significant challenge faced by Indian farmers. The cost of inputs is often exorbitant, making it challenging for small farmers to purchase these supplies. This results in a lack of access to modern technology and innovative farming practices, limiting the farmers' ability to grow and succeed.
- In addition to these challenges, Indian farmers also face market-related issues, such as low prices for their crops and limited access to markets. Farmers often have to sell their produce at low prices to middlemen, who then sell them to traders and retailers at a higher price. This limits the farmers' profits and contributes to their financial instability.

B. Scope for technology in Indian agriculture:

- Firstly, technology has the potential to improve farmers' access to information. Farmers need to have access to accurate and timely information to make informed decisions about their crops and livestock. Advances in mobile technology and internet connectivity have made it possible for farmers to access information on weather patterns, market prices, and farming practices. For example, farmers can use weather apps to get real-time information about weather patterns and adjust their farming practices accordingly.
- Secondly, technology can help farmers improve their farming practices. Farmers can use precision agriculture technology to optimize the use of fertilizers, pesticides, and water. Precision agriculture involves using sensors and other technologies to measure soil moisture, temperature, and other variables. This information can be used to adjust the application of inputs and ensure that crops receive the right amount of nutrients and water. This approach can cut down input expenses, increase yields, and improve the quality of crops.
- Thirdly, technology can help farmers access new markets. The Internet has opened up new opportunities for farmers to sell their products directly to consumers through online marketplaces. This approach eliminates intermediaries and enables farmers to earn higher prices for their products. Social media platforms can also be used to promote products and build brand awareness.
- Fourthly, technology can help farmers improve their livestock management practices. Advances in animal health monitoring systems can help farmers detect health problems early and take corrective action. This approach can reduce the need for antibiotics and other medications, which can lead to healthier animals and higher profits. Livestock farmers can also use technology to optimize the use of feed and reduce feed costs.
- Finally, technology can help farmers access financial services. Many farmers in developing countries lack

access to formal banking services. Mobile banking and digital payment platforms can help farmers access credit and other financial services. This can enable farmers to invest in their farms and improve their productivity and profitability.

III. OBJECTIVES

- To identify the information and services that are relevant to Indian farmers
- To design and develop an Android application that provides access to this information and services
- To evaluate the usability and effectiveness of the Android application

IV. EXPECTED OUTCOMES

- Identification of the information and services that are relevant to Indian farmers
- Development of an Android application that provides access to the identified information and services
- Evaluation of the usability and effectiveness of the Android application
- Insights into the factors that affect the adoption of technology by Indian farmers
- Recommendations for the development and deployment of similar applications for farmers in other countries

V. TECHNOLOGIES REQUIRED

1) Android Studio: It is Google's open-source Android mobile operating system. The fact that Android is open-source has further inspired a sizable community of developers to use the open-source code. This creates the foundation for collaborative projects. During the 3rd quarter of 2012, Android has a 75% global market share for smartphones, with 500 million devices activated overall and 1.3 million activations each day.

2) MySQL: SQL is short for SQL, or Structured Query Language, and is used to access and modify databases. The language SQL is open source. The American National Standards Institute has standardized SQL. You can use SQL to run queries through a large data collection, build databases, insert data, edit information, and erase databases including their contents.

3)Java: Object-oriented programming is what Java is all about. It's a language that works on any platform. Any Android application's front end can be designed using Java and a SQL database that has been set up.

VI. LITERATURE REVIEW

1)SURVEY OF ANDROID APPS FOR THE AGRICULTURE SECTOR:

This essay investigates the effects of agricultural services Android apps on farmers' farming practices.

2)Farmer Assistant Android App:

The paper suggests using information mining to provide ideas to ranchers for crops, crop statistics, and differentiating evidence of appropriate manure.

3)KisanVikas – Android Based ICT Solution in Indian Agriculture to Assist Farmers:

This study suggests the smartphone application KisanVikas (Farmer Development), which uses ICT to promote e-governance by continuously disseminating information about agriculture, including weather forecasts, crop prices, news, government helplines, and an inventory database manager.

4)Android Application for Farmers :

This paper proposes an Android application for the Farmers who use smartphones can obtain real-time updates about the prices of fruits and vegetables in every market in India with this Android app, enabling them to sell their goods at fair prices. this application will have a feature where all government notices about agriculture will be incorporated, allowing farmers to properly learn about various programs. Including a tool that provides weather data will also assist farmers make plans for the next two to three days.

5)MahaFarm – An Android-Based Solution for Remunerative Agriculture:

This paper describes a smartphone application for farmers that would be of enormous use to them in their farming endeavors. They suggest creating the "MahaFarm" mobile application for Android, which would offer updates on weather, daily market prices, and news and loan information. Maharashtra has been taken into account in the development of the application.

6)Integrated Android Application for Effective Farming: This paper proposes A mobile application that informs farmers about the tasks that need to be completed for farming and their extensive details. It is an integrated farming application that includes data on market prices, seasonal crops, weather forecasts, and a forum for consultation. The primary goal of the app is to offer solutions for agriculture, which will be beneficial to farmers.

7)Agriculture Decision Support System As Android Application:

This decision-support system is utilized in agriculture to advise farmers on which crop to choose for cultivation mapping using several ground factors. As inputs use soil type, soil PH, average weather, water use, and temperature range.

VII. METHODOLOGY

The following methodology will be used in the creation of the Android app for Indian farmers:

- Gathering needs: Farmers and agricultural specialists will be surveyed and interviewed to determine the application's needs. The specifications will call for elements like real-time weather updates, crop-related data, market prices, and government initiatives.

- Design: The requirements acquired in the first phase will serve as the basis for the design of the application.

The application will be made with an emphasis on user-friendliness and accessibility for farmers in outlying areas.

- Development: The newest technologies, including Java, Android Studio, Firebase, and Google Maps API, will be used to create the application. The application will be developed with a focus on being quick, dependable, and scalable.

Testing: Before being made available to the general public, the program will be checked for flaws and mistakes. A group of quality assurance specialists will conduct the testing.

- Deployment: Following testing and approval, the application will be made available for download and usage by farmers on the Google Play Store.

VIII. DESIGN AND IMPLEMENTATION



Fig. 1 The Landing Page of the application

1) The Landing page of the application presents the user with two options, either to sign up or log in, this helps to differentiate between a past user and a new one.



Fig 2. The signup page



Fig. 4 Agri guide page

2) Login and Registering: To sign up for the app, the user must provide their mobile number and a 4-digit numerical password. The user is then verified by sending an SMS to their own number and detecting its receipt. After complete verification, data is registered into MySQL central server.

4) The Agri Guide page as shown in the picture takes the input from the farmer such as Soil type and amount of land etc. and outputs the suitable crops to grow in the respective harvest season.



Fig. Language support

3) Language Support: The application will be available in 10 different languages including eight Indian regional languages and Hindi and English. When the application is launched, the user must select his favorite language.

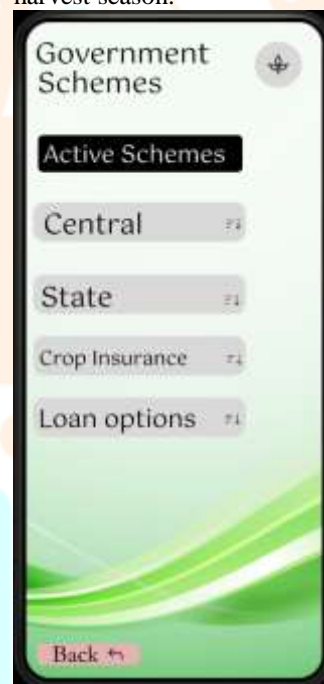


Fig 5. The Government Schemes page

5) Government schemes: The Government of India introduces various schemes that are helpful to farmers, but one criticism of this program's underwhelming performance is that it is unable to reach everyone and cannot provide accurate information, thus here we present extensive information and the processes of various programs.



Fig . 6. The Market overalls page

6)At the district level, agricultural commodities are traded at mandis (markets). Although the Mandi prices are dynamic, the government establishes support prices to stabilize the market. The farmer must enter the date, the crop name, and the Indian state to obtain these prices. The program sends HTTP requests to the Agmarket Portal servers using APIs made accessible by Open Government Data (OGD) - Platform India. From there, it receives data in XML format, which is then formatted and made available on the app in a human-readable way. The outcome table includes data on the market (district name), arrival quantity (in MT), origin, variety, grade, minimum price, highest price, and modal price (in Rs. / quintal).

IX.FUTURE SCOPE

The Android app for Indian farmers will offer a much-needed technology remedy for the difficulties experienced by Indian farmers. Farmers will be able to make informed decisions thanks to the application's real-time information on the weather, crops, market pricing, and government initiatives. Farmers will have the ability to contact agricultural specialists through the application to receive advice and direction. In general, the application will help farmers' quality of life and the growth of India's agriculture industry.

X.CONCLUSION

In summary, technology can potentially increase farmers' productivity and profitability by facilitating information access, enhancing farming techniques, opening up new markets, enhancing livestock management techniques, and facilitating financial services. Governments, development organizations, and the private sector should cooperate to guarantee that farmers have access to affordable and useful technology. This will make it more likely that farmers will be able to overcome their obstacles and advance agricultural sustainability.

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