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Krishi-Mitra: Farming Assistance application for next Generation Farmers

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Abstract - *Mobile applications and services make our daily needs for information, communication, entertainment, and leisure more convenient. Mobile applications have ushered in a new age. In India, information and communication technology (ICT) in agriculture is a new area aimed at improving agricultural and rural production. It entails developing new ICT-based applications for rural areas. The innovation of ICT can be used to provide farmers with reliable and timely relevant information and services, promoting a remunerative agricultural climate. This paper describes a mobile-based application for farmers that will aid them in their farming activities as well as keep them informed about new government programs.*

Key Words: **Agriculture, android application, Mobile application, crop treatment, crop information**

1. INTRODUCTION

Agriculture is a vital part of India's economy, and it is currently one of the world's top two farm producers. This sector employs approximately 52 % of India's workforce and contributes roughly 18.1% of the country's GDP. For nearly two-thirds of India's employed community, agriculture is their only source of income. Agriculture accounts for 18 percent of India's GDP, according to economic data from the 2006-07 fiscal year. India's agriculture sector accounts for nearly 43% of the country's total land area.

Arguably, reviving India's agriculture is the country's most important agenda. Over the years we have observed that the young among the farming communities are hardly interested in agriculture. Lately, the government has started taking initiatives to publicize and develop people's interest in agriculture. The data regarding farming are available from many sources, but the information is either insufficient or far flung. The popularity and widespread user base of latest technology can be used as a motivating factor for the younger generation.

Luckily, internet and android devices combined can be the solution to publicize agriculture and make the information accessible to everyone because of its reach and widespread use by common people. The internet provides a gateway to a plethora of knowledge which was previously unavailable to an average individual. This power should be harnessed and utilised for the betterment of farming as an occupation, also increasing its popularity in the process.

Considering the extensive user base for android devices, creating a native application for android operating system would provide a great amount of compatibility for the devices also making the apps more resource efficient. Currently the information regarding the domain is available on many sites, thus making it hard and tiresome for the end user to access information which might lead to losing the interest by the users. The application will provide a singular platform to collectively represent the data to users in the language of their preference.

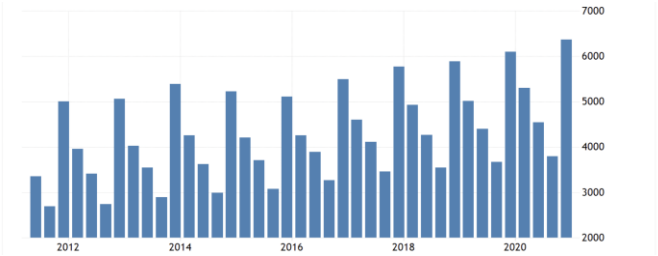


Fig: India's GDP growth from Agriculture from Jan 2012-21.

1.1 Literature Review

A. Overview of Mobile Android Agriculture Applications The writer shows an insight of agricultural-related mobile applications currently available on the Google Store for Android devices. Furthermore, a solution to the given problem is designed and presented in the form of Kissan Sevak, an Android application. The paper also addresses the nature of the applications discussed and what changes are needed to make them more accessible to a broader audience

B. *Android Application for Farmers*

The paper talks about a platform for farmers who use smartphones to get real-time updates on fruit and vegetable prices in every market in India, allowing them to sell their goods at the appropriate prices. It also provides Farming-related government notifications, so farmers will have accurate information about various schemes. They have also added weather API to their application.

C. Krishi Ville – Android based Solution for Indian Agriculture

The aim of this paper was to explain a mobile-based application for farmers that will aid them in their farming activities. Some of its main features include agricultural

commodity updates, weather forecast updates, and agricultural news updates. The application was created with the needs of Indian farmers in mind.

D. Survey of Android Applications for Agriculture Sector

This paper investigates how agricultural service Android apps have influenced farmers' farming activities.

They discovered that several apps are being used for various functions related to farming activities, such as cropping information, pesticides, fertilizer, seed, crop sale, irrigation information, crop output prediction, weather information, and information on best farming practices. Many of the apps were found to be static. Instead, they felt that dynamic software would be more convenient to use. It would also be easier to use if all of the above-mentioned features were bundled into a single app and available in the farmer's native language.

2. System Methodologies

A. Home Screen

The Home Screen is the primary page where the use will land when he opens the application. The application has a hassle-free process to get started with no registration or logging-ins thus making the whole process of using and getting started with the application a lot easier. This main page leads to the following features of the application.

1. Crop Production Methods
2. Crop Treatment Methods
3. Government Schemes
4. Fertilizer Calculator
5. Chatbot
6. Soil Health Card Authenticator
7. Weather Forecasting

B. Crop Production methods

The application will provide detailed information about crop production methods. These instructions are segregated crop wise, further the details are present in a stepwise manner in Hindi.

C. Crop Treatment method

The application lists some of the most commonly faced infections and parasite infestations, and information about the same and their appropriate, efficient and economical organic remedies.

D. Government Schemes

The Government of India will launch various programs that will benefit farmers, but due to the poor publicity performance of these programs, they are not being able to reach every individual and fail to provide accurate information, so we will provide detailed information and processes for each program.

E. Chatbot

It provides a 24/7 online text-based chat support which will provide information related to the topic, this chatbot can be overtaken by an operator if the chatbot is unable to answer questions regarding the topic. Apart from this, it has multiple language support which will help users with different language backgrounds to use the application with ease.

F. Fertilizer Calculator

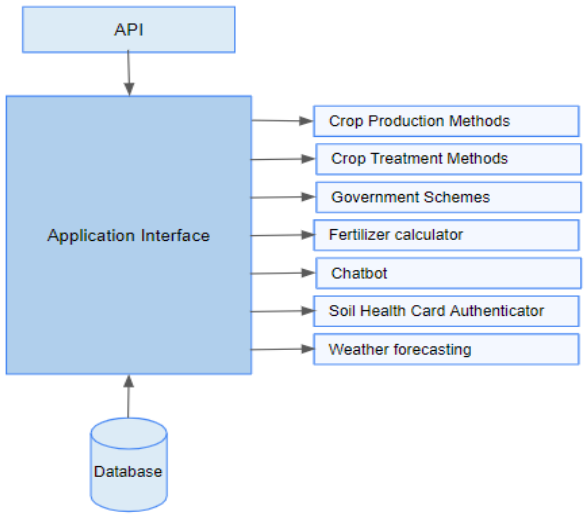
It has an inbuilt fertilizer calculator which provides the exact amount of fertilizer to be fed to the crops over a given area based on the required N-P-K values.

G. Soil Health card Authenticator

The application is connected with the database consisting of the locations of the soil and water testing laboratories from all over the country. Once the state and the district is specified the application will give out the locations of the nearest laboratories for testing purposes.

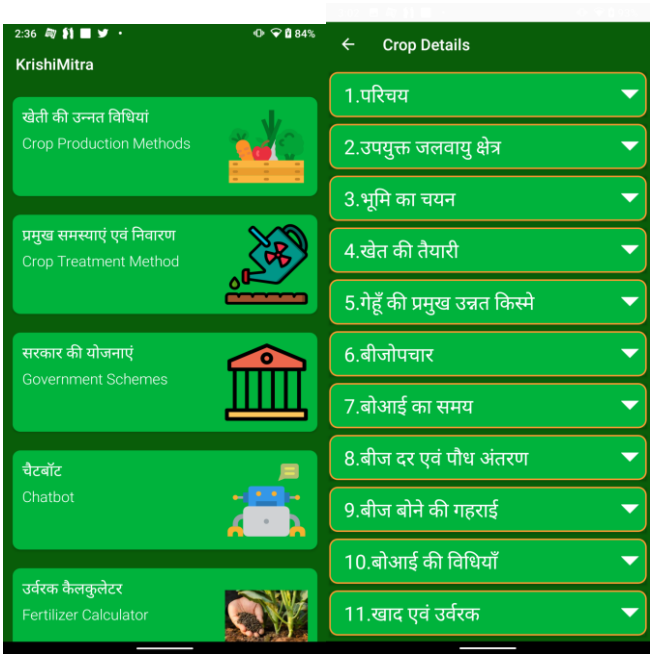
H. Weather Forecast

This weather service is an innovative idea that assists farmers in learning more about the weather in a specific area. The farmer can look up information such as humidity in any district on any given day, sunrise and sunset times, and strain.



3. System Testing

This application was tested on One Plus Nord (Android version 10.5) and the application was developed for android 5 and above versions. Some of the screen shots for the application are-



fig(a) fig(b)

The figure (a) shows the home page of the application where the user can select whichever feature he is interested in, and figure (b) shows the crop details page, which guides the famer right from preparing the soil to harvesting the crop.

4. CONCLUSION

The application Krishi Mitra would be a boon to the Indian farmers as it lays out all the information required throughout the process of crop production. The farmers will derive greater benefit when they can make better decisions about their soil quality and appropriate use of fertilizers, etc. Moreover, the application is user friendly as it is easy to navigate through it and the information is in Hindi, which makes it easier to understand for farmers. In case, they face difficulties, chatbot is available to solve their queries. Hence, the application will be helpful to all types of farmers and not just amateurs or farming enthusiasts.

5. Future Scope

Using a convolutional neural network we can add an image recognition system that will automatically detect the type of plant which is being sown and then will suggest different fertilizers, methods, equipment and medicines for a better and easier yield. This system can also be used for the identification of different plant diseases and insect infections and suggest pesticides and insecticides accordingly.

We can also include a combined market place where the farmers can get the required resources such as fertilizers, pesticides, insecticides and many other related types of equipment, specifically selected for their crops which they are cultivating.

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