Farmer's Smart Assistant System

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Abstract— **In India, most of the population depends on the agriculture sector. Farmer is the backbone of the Indian economy. Today the people involved in agriculture are of the lower class and face a lot of trouble in their day-to-day lives due to extreme poverty. Lack of awareness of modern technology and techniques leads to Farm poverty. The purpose of this project is to help farmers to solve their problems in an instant of time. Smallholder farmers who are well educated, in most agricultural products are faced with a wide array of problems, including access to sufficient information, services, etc. The system consists of smartphone applications. The paper proposes the utilization of information mining to give suggestions to ranchers on crops, crop data, and distinguishing proof of suitable manure. The smartphone is used very commonly by everyone who is educated or non-educated. This application can provide different languages, which are Hindi and English this language is commonly used and is easy to use on the system. Through this application, we can guarantee farmers get better information about farming most advantageously.**

Keywords— **Pesticides Information, Farmers Connecting, Indian economy, modern technology and techniques.**

I. INTRODUCTION

India's agriculture industry is very important. Approximately 58% of our people make their living from agriculture. Farmers still have to deal with a number of difficulties. A few of the more significant issues are connected to marketing agriculture. Horticultural crops in India cover 264.57 lakh hectares and yield roughly 3199.69 lakh M.T.

For the majority of Indians, agriculture is their primary industry. About 60–70% of Indians make their living exclusively from the agricultural sector. Accessing and managing information is the most challenging challenge for farmers due to the volume of data and the complexity of precision farming procedures. Numerous sources, including newspapers, printed media, audio and mobile devices, TV, the internet, visual aids, and more, provide access to data related to farming, such as crop life cycle details, seeds, crop selection, weather, pesticides, fertilizer, and so forth. However, the structures and formats of this data vary. Therefore, it is very difficult for farmers to obtain accurate information and to be aware of a wide range of information that has been disseminated from many sources. Occasionally, multiple manual steps are essential to handing out data for translating data from one format to another format

In today's world of rapid change, mobile applications have become increasingly important. The purpose of the mobile apps was to assist businesses. The application was presented with the intention of assisting the farming community by developing the agriculture sector. With the advent of smart agriculture systems and digital India, the industry is racing to release cutting-edge mobile applications. Farmers are trapped since they don't know where to find the weather report, thus they frequently struggle to obtain it. With more than 135 crore people living in India, a large number of individuals will use the app. These give farmers the services that they require.

A significant contributor to the nation's development is farming. Many people all across the world can find work thanks to it. Agriculture technology is evolving daily. Farmers cannot benefit from the government's current collection of data on crop productivity and rainfall. Farmers can only benefit from the data collection and analysis in terms of relational trends. Additionally, there is software available to educate farmers about technology. However, because they cannot provide farmers with precise answers to their questions, the majority of these technologies are not practical. Some farmers are located in isolated parts of the nation; they lack knowledge about new developments in technology and farming methods, as well as adequate information on crops, soil characteristics, seeds, fertilizers, and cutting-edge equipment. Insufficient access to agricultural expertise and up-to-date farming techniques results in low yield of crops and livestock.

Here, we have 4 modules in our projects: -

Pesticides information - Pesticides are indispensable in agricultural production. They have been used by farmers to control weeds and insects, and their remarkable increases in agricultural products have been reported. The group of substances known as pesticides pertains to substances used as insecticides, fungicides, herbicides, rodenticides, molluscicides, and nematicides, it is generally accepted that pesticides play an important role in agricultural development because they can reduce the losses of agricultural products and improve the affordable yield and quality of food.

Farmers connecting - This module has a community forum where farmers can ask questions, share information, and get advice from other users and farmers. This can help users build relationships and networks that can be beneficial for their farming or gardening activities.

Suggestion on crops - To recommend optimum crops to be cultivated by farmers based on several parameters and help them make an informed decision before cultivation.

The major parameters considered here are:
1. Crop name.
2. Sowing Time (Month).
3. Region.
4. Temperature - Minimum & Maximum.
5. Rainfall - Minimum & Maximum.
6. pH value of the Soil.
7. Soil Type.

II. LITERATURE REVIEW

Sunidhi Sharma et al. addressed the current Android applications [1] for farmers in their article, including how they should be built and what features will actually assist farmers in boosting their yields and understanding of farming. The paper explored what adjustments should be made in existing applications to make them more accessible to a wider audience as well as the advantages of the Android operating system. Shankar M.patil, Monika Jadhav, and Vishakha Jagtap [2] proposed a system using Android and MySQL. In this paper authors explain various modules in their system such as weather forecasting, market rate, and government schemes and how they are beneficial to farmers. Sushanth M, Roopesh Gowda S, Sharath M Holla, Prajwal S, Dr. S. Prabhanjan, and Mrs. Sumana C [3] describe how smartphone applications are utilized for agricultural marketing. The authors developed a system that benefits farmers by digitizing the rise and fall of agricultural products on a daily basis and they can contact warehouse owners, distributors, and the closest local market hub.ManishaBhende, Mohini S. Avatade, Suvarna Patil, Pooja Mishra, Pooja Prasad, and ShubhamShewalkar explained an application [4] that will provide the feature where farmers will receive accurate information about various programmes and where all government notices pertaining to agriculture will be updated. ManishaBhende et al. developed an application using Android and Firebase. Heru Nugroho, RobbiHendriyanto and KautsarTisamawi [5] built the application using the Software Development Life Cycle (SDLC) prototype technique, which featured Java and XML programming languages as well as MySQL. This software provides information about agricultural products while also making it easier for farmers to market their products and conduct direct transactions with customers. Modern farming practices are completed significantly faster with Android applications, resulting in improved earnings for farmers. By giving information on market prices, the modern farming method using an Android app seeks to promote transparency in the agriculture produce marketplace, supporting group procurement of inputs, and facilitating group selling of goods. Farmers will find it easier to use if the functions are bundled and in their own language.

Forming Assistant is an online initiative that will assist farmers in generating significant revenue using computer and mobile technologies. Farmer's access to greater information about farming and the state of the market is improved through communication through consideration. According to the data, cell phones help farmers conserve time and energy.

The Android app agri-com informs farmers about different crops and other agricultural items. Agri-Com is an innovative mobile application for Android that gives farmers access to agriculture data to aid in decision-making.

One of the significant histories that provide the vitally necessary information, such as food, Energy, And fibre is agriculture. Market updates for diverse products are a challenge for Indian farmers. The creation of a mobile application that aids in management and increases agriculture profits is the major goal of the product.

Data mining provides access to agriculture information and the determination of appropriate fertilizers. Similar to how Android users may utilize the system online, Farmers can. Single-crop and hybrid-crop recommendations are made using a data mining technique.

III. PROBLEM STATEMENT

- Agriculture Occupies an important position in the Indian Economy. Indian farmers today are facing the problem of low income due to the lack of information about government schemes, fertilizers, farming equipment, etc.

- Due to their remote locations and lack of access to knowledge regarding soil qualities, seeds, recently used tools, etc., a portion of smallholders and marginalized farmers are rather ignorant.

- The main causes of low agricultural output are average farm size, inadequate infrastructure, low application of best farming practices and farm technologies, overfertilization that reduces soil fertility, and ongoing pesticide use.

- Bringing a product from the farmer to the consumer is known as agricultural marketing. It involves tasks including locating customers for the items, haggling over costs, shipping the merchandise, and obtaining product evaluations.
- The natural process of soil erosion occurs when water or wind transports soil particles from one location to another. Farmers face severe issues when this occurs on a large basis.

IV. METHODOLOGY

We conducted a number of surveys on the agriculture industry before to beginning to design for this project. The foundation of our project is primarily online. A few comparable projects that we looked into appeared to also be present online. We just cannot begin by evaluating a service on the Internet. As a result, we first hear from RTMNU UNIVERSITY students, and then we visit the villages to hear from farmers. The majority of Indian blogs and certain agricultural products are currently sold on websites centred around agriculture. However, in addition to one and a half farming consultants, our project will be able to respond to real-

time queries and answers online. More crucially, advisers for agriculture can be hired by farmers. Using our websites, you can quickly get in touch with UPAZILA agriculture officials in your area if you're looking for a farmer. We so understand that the primary goal of our mission is to develop Indians. Therefore, it will take a lot of effort for them to trust online services.

Some signification challenges that need to be considered in this task will be talked about in this segment.

- Collection of agricultural data
- It is very difficult to make a money deal with a consultant.
- Storing information is very difficult.
- Saving time.
- Quickly respond to the farmer and doctor.

The project consists of three modules: Pesticide information, Farmers connecting, And suggestions on crops.

Pesticides information – In the production of agricultural products, pesticides are essential. Farmers have used them to control weeds and insects, and it has been noted that they have LED to notable gains in agriculture. Output It is widely acknowledged that pesticides play a signification role in the development of agriculture because they can lower crop losses and increase food yields and quality at an affordable price.

Farmer connecting - In the farmer connecting module, the user must click an image of the crop or any upload it to the community module so that the plant experts may offer their advice. The farmer community module interface is comparable to social media applications like Instagram and Facebook.

Suggestion on crops – To recommend optimum crops to be cultivated by farmers based on several parameters and help them make an informed decision before cultivation.

The Architecture of the proposed work is described as shown in the figure:
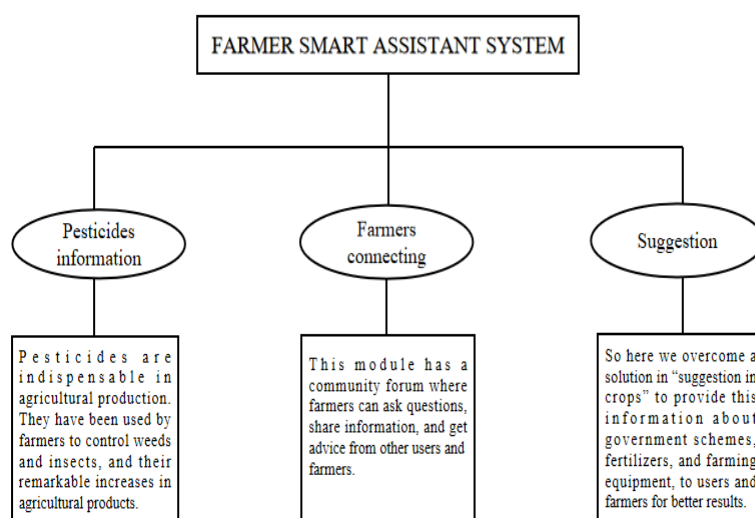
1. *BENEFITS*

- The app provides farmers with instant access to crucial information on crops, fertilizers, government schemes, and farming equipment, addressing the knowledge gap.

- Offering information in Hindi and English caters to a broader audience, ensuring that both educated and non-educated farmers can use the application effectively.

- The system suggests using information mining for crop advice, statistics, and identifying appropriate manure, aiding farmers in optimizing irrigation and fertilization practices.

- The farmer community module fosters collaboration, enabling farmers to share experiences, ask questions, and receive guidance, creating a supportive network.

- Providing personalized suggestions on irrigation and fertilization practices enhances crop yields while reducing costs, contributing to increased efficiency in agriculture.

- The app contributes to the digitalization of the agricultural sector, reducing reliance on outdated manual methods and increasing transparency between farmers and clients.

2. Drawback

- Farmers with limited access to smartphones or those unfamiliar with technology may face challenges in adopting the application, limiting its reach.

- In rural areas, where many farmers reside, issues such as poor internet connectivity could hinder the app's effectiveness and accessibility.

- The success of the system relies on the accuracy of the data it provides. Incorrect information may lead to suboptimal farming practices and outcomes.

- Farmers need adequate training to use the application effectively. Lack of awareness or training programs may hinder its widespread adoption.

3. Future Scope

- The future scope of this project, which uses machine learning algorithms and IoT applications to predict the time required to complete the perfect mixing of concrete mixture, is vast. Here are some potential future developments and applications:

- Expansion to other construction processes: This project can be expanded to optimize other construction processes, such as material transportation, equipment scheduling, and resource allocation. By applying the same principles of machine learning and IoT integration, you can improve the efficiency and accuracy of these processes.

- Integration with Building Information Modeling (BIM): This project can be integrated with Building Information Modeling (BIM) systems to provide real-time data and insights into the construction process. This can help improve collaboration and decision-making among project stakeholders.

- Development of predictive maintenance algorithms: This project can be extended to develop predictive maintenance algorithms for construction equipment. By analyzing data from IoT sensors, machine learning algorithms can predict maintenance needs and prevent costly breakdowns.

- Enhancement of safety protocols: This project can be used to enhance on-site safety by identifying potential risks and hazardous conditions. Machine learning algorithms can analyze data from IoT sensors to provide real-time alerts and enable timely interventions.

- Reduction of environmental impact: This project can help reduce the environmental impact of construction by optimizing resource allocation and reducing waste. Machine learning algorithms can analyze data from IoT sensors to provide insights into material usage, energy consumption, and waste generation.

V. EXPECTED OUTCOMES

This website is intended to help current or prospective farmers who are having problems find answers. In summary, our primary goals are to maximize farmer profits and minimize costs whenever feasible. Additionally, this is done to keep our farmers informed about any news and new or current farming-related things that may be beneficial to them. This will enable them to make better decisions for themselves. Therefore, researchers will create a novel way to close this gap between farmers and modern technology as well as government aid to promote agricultural growth. This mobile application will provide the required process and framework to inform farmers about new and varied agricultural information and assist them in our nation.

VI. CONCLUSION

The system can address the main issues that farmers face. The system's interface is straightforward since farmers can readily obtain important data about the weather, market prices, government initiatives, and their crops. Within the quickly growing digital world, mobile applications have emerged and become very significant. Mobile apps are introduced to support the farming community and further the agricultural sector. India is a nation primarily reliant on agriculture. Many innovative technologies have been created specifically for agriculture. To increase farmers' output, the Indian government also offers additional facilities. Due to unjust management, farmers are not able to access any vital farming plans or information. The majority of the farmers do not know about the uses of new technologies in agriculture. Thus, in order to bridge this gap between farmers and new technology as well as government aid to improve agricultural growth researchers will develop a novel solution. This mobile app will define the necessary procedure and model to make farmers aware of new diverse knowledge about agriculture and also help them to improve agriculture in our nation.

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