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Intelligent Crop Recommendation System using Machine Learning

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Abstract:

Agriculture is a sector that significantly contributes to the growth of the economy in our nation. Civilization was born through the practice of agriculture. India is an agrarian nation, and crop productivity plays a significant role in the country's economy. Therefore, we can argue that agriculture may be the foundation of all business in our nation. In the planning of agriculture, choosing each crop is crucial. The choice of crops will be influenced by a number of factors, including government policies, market price, and production rate. To improve changes in our Indian economy, a lot of modifications in the agricultural sector are needed. By utilising machine learning approaches that can be quickly applied to the farming industry, we can improve agriculture. Along with all improvements in the tools and technologies employed. A large part of it is also played by reliable and valuable information about various topics. The goal of this project is to put the crop selection approach into practise so that it can assist in addressing a variety of farming and agricultural issues. As a result, the yield rate of crop production is maximised, which benefits our Indian economy

I. INTRODUCTION

The primary objective of agricultural planning is to maximise crop output rates while utilising a certain amount of available land resources. Numerous machine learning techniques can aid in increasing crop output rates. When there is a loss due to unfavourable conditions, crop selection might be used and reduce the losses. And under favourable circumstances, it can be employed to increase crop yield rates. By maximising yield rates, nations' economies are boosted. Some of the elements that affect crop output rate are in our control. They are crop selection and seed quality. Before sowing, we must examine the seed quality. As is common knowledge, high-quality seeds increase yield rates. Additionally, the choice of crops is influenced by both favourable and unfavourable environmental factors. Hybridization techniques can also help with this. Numerous

studies are conducted to enhance agricultural planning. Obtaining the highest crop production is the aim. The application of numerous classification techniques also helps to maximise agricultural output. Crop yield rates can be increased using machine learning techniques. To increase crop production, the crop selection technique is used. Crop production may be influenced by the region's natural features, such as riverbeds, hilly terrain, or deep places. such as cloud cover, temperature, rainfall, and humidity. The kind of soil can be peaty, saline, sandy, or clay. Copper, potassium, phosphate, nitrogen, manganese, iron, calcium, ph level, carbon, and various harvesting techniques can all be found in soil. For various crops, a variety of parameters are utilised to make various projections. Research studies can be used to examine these prediction models. There are two different categories for these forecasts. The first is a classic statistical approach, whereas the second uses machine learning methods. Single sample spaces can be predicted using traditional methods. Additionally, machine learning techniques aid in method prediction.

II. LITERATURE REVIEW

EXISTING SYSTEM

Therefore, all of the latest machine learning technologies and other new methods should be familiar to our farmers. These methods assist in maximising agricultural productivity. Numerous machine learning approaches are used in agriculture to increase crop yield rates. Crop production may be influenced by the region's natural features, such as riverbeds, hilly terrain, or deep places. such as cloud cover, temperature, rainfall, and humidity. The kind of soil can be peaty, saline, sandy, or clay. Copper, potassium, phosphate, nitrogen, manganese, iron, calcium, ph level, carbon, and various harvesting techniques can all be found in soil. For various crops, a variety of parameters are utilised to make various projections.

DISADVANTAGES

1. We need to reduce the issues that farmers in the agricultural industry are facing.
2. Farmers are unaware of how to use the Weak tool.
3. By using innovative approaches in agriculture, difficulties associated with low efficiency can be reduced. This application aids in yield prediction

IV. PROPOSED SYSTEM

Only the Naive Bayes and K-Nearest Neighbor methods have been taken into account. We can forecast which crops should be chosen for a given field and season using these two techniques. With this programme, we may do a single test by providing input for the crop name, season, and location. We can choose either the KNN or NB approach. You can choose the method and mine the results as soon as you provide the input. You can find out the yield rate of that crop from the findings. Furthermore, by studying the datasets, we may

perform multiple testing. You can choose an entire file at once to analyse and receive accurate results.

ADVANTAGES

- High Efficiency.
- reduction of problems can be done by implementing new techniques on agriculture
- This application helps them to predict the yield.
- this will help the farmers which crop to be selected for their land or the region

MODULES

- Service Provider
- View and Authorize Users
- Remote User

DESCRIPTION OF MODULES:

Service Provider

The Service Provider must enter a valid user name and password to log in to this module. After successfully logging in, the user can perform certain actions like Browse Agriculture Data Sets and Train & Test. View All Crop Yield and Production Prediction, View All Crop Recommendations, Download Predicted Data Sets, View All Remote Users, and View Crop Yield Prediction Per Acre Results. View Trained and Tested Accuracy in Bar Chart.

View and Authorize Users

The list of people who have registered can be seen by the administrator in this module. The admin can examine the user's information in this, including user name, email address, and address, and admin can also authorize users.

Remote User

There are n numbers of users present in this module. Before doing any operations, the user should register. Once a user registers, the database will record their information. After successfully registering, he must log in using an authorised user name and password. After successful login, the user can perform a number of actions, including "PREDICT CROP YIELD AND PRODUCTION, PREDICT CROP RECOMMENDATION, and VIEW YOUR PROFILE".

FEASIBILITY ANALYSIS

An important outcome of preliminary investigation is the determination that the system request is feasible. This is possible only if it is feasible within limited resource and time. The different feasibilities that have to be analyzed are

Operational Feasibility

Economic Feasibility

Technical Feasibility

Operational Feasibility

Operational Feasibility examines the potential of the system that will be created. Operationally, this approach relieves all of the administrator's stress and enables him to efficiently monitor the project's

development. Automation of this nature will undoubtedly save time and energy that were previously expended on manual labour. The study's findings support the system's operational viability.

Economic Feasibility

An evaluation of the financial basis for a computer-based project is known as economic feasibility or cost-benefit analysis. Since hardware was deployed from the start and for many purposes, the project's hardware cost is modest. Any number of employees connected to the LAN within that organization can utilize this tool at any time because the system is network-based. The organization's current resources will be used to create the virtual private network. The project is therefore financially viable.

Technical Feasibility

According to Roger S. Pressman, technical feasibility is the evaluation of an organization's technological resources. The company requires computers that are IBM compatible and have an Intranet and Internet connection as well as a graphical web browser. The system was made for a platform-neutral environment. The system was created using Java Server Pages, JavaScript, HTML, SQL Server, and WebLogic Server. A technical feasibility study has been completed. The system is technically viable to construct, and it can be done using the facility that already exists.

V. RESULTS

VI. CONCLUSION

This paper emphasized the shortcomings of existing systems and their usefulness in yield prediction. The proposed solution then introduces a workable yield forecast system to the farmers, connecting them via a mobile application. Users of the smartphone application can choose from a variety of features to help them choose a crop. The built-in prediction technology aids farmers in forecasting crop yields. The built-in recommender system enables the user to investigate potential crops and their yield in order to make more informed judgments. On the provided datasets from the states of Maharashtra and Karnataka, many machine learning algorithms, including Random Forest, ANN, SVM, MLR, and KNN, were deployed and assessed for which has a 95% accuracy rate, is the best standard algorithm when applied to the presented datasets. The suggested model looked into when fertilizers should be applied and suggested a suitable time frame.

VII.FUTURE WORK

Future work will concentrate on periodically updating the datasets to generate reliable predictions, and the procedures can be automated. The provision of the appropriate type of fertilizer for the specified crop and area is another service that needs to be provided. To put this into practice, a detailed investigation of the available fertilizers and their interactions with soil and climate must be conducted. It is necessary to conduct a statistical data analysis. Quantify the best kinds to use by taking into account the elements that affect yield at

the moment. I want to measure these effects in order to make more exact recommendations.

Include extra weather-related factors hours of sunlight, humidity, and temperature.

Consider including soil data.

collect information about local variety for recommendations: Variety for which there was no prior data can be suggested to specific places if all the kinds can be examined at the various sites.

Try to employ mixed models (treating some predictors as random variables).

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