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Agricultural Analysis System Using IOT

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Abstract: *Agrarian sector in India is facing rigorous problem to maximize the crop productivity. More than 60 percent of the crop still depends on monsoon rainfall. Recent developments in Information Technology for agriculture field has become an interesting research area to predict the crop yield. The problem of yield prediction is a major problem that remains to be solved based on available data. Data Mining techniques are the better choices for this purpose. Different Data Mining techniques are used and evaluated in agriculture for estimating the future year's crop production. This project presents a brief analysis of crop yield prediction using data mining algorithms. Agriculture in today's life is not like as our forefather done. The strong Climatic changes due to many reasons like global warming cause difficulty to under- stand climatic conditions. So, the farmers unable to understand which crop to select by which the production will improve. By understanding soil and climate conditions by using these data mining system farmers will be able to take right crop at right place which will improve yields. So, it is easy for farmers to decide which crop to take in unpredictable climate conditions. This project will help to solve these agriculture problems using data mining algorithms. Algorithms like SVM, Naive Bye scan be used.*

I. INTRODUCTION

The agricultural industry is the bedrock of every nation. Agriculture offers food and raw resources to the country's people. For many people, it is their sole source of income. People who are members of Agriculture confronts various issues, including as diminishing production, as a result of inappropriate climatic changes, floods, scarcity, and a variety of other environmental factors and rarely variables. They are unable to work in agriculture for these reasons. We can employ IT technology to help us solve these problems (IT). In today's society, information technology is used in almost every industry. Data mining is a type of information technology that can be used to address the aforementioned agricultural concerns.

The core idea of data mining is that it extracts meaningful data from big datasets. To be more exact, it is a means of collecting important information from large amounts of data. It is the process of automatically examining large data sets for connections and patterns that are beyond the scope of simple analysis. Data mining can provide answers to questions that simple query and reporting approaches cannot. In this project, we provide a method for determining the optimum crop for sowing.

To get the necessary output from the web, a web-based framework is used. As databases, we employ the India Weather Forecast Report, the Soil and Land Use Survey, the Soil Report Survey, and the Crop Survey. Agriculture Framework. The guidelines for the use of data mining are based on the following steps: A farmer's registration for the scheme. His username, password, name, address, land details such as altitude, latitude and longitude, contact information such as telephone number and mailing address may be included in this registration.

II. BRIEF LITERATURE SURVEY

Qualitative data analysis using regression method for agricultural data, Pallavi V. Jirapure; Prarthana A. Deshkar, Published in: 2016 World Conference on Futuristic Trends in Research and Innovation for Physical well-being (Startup Conclave). This paper focuses on the provision and development of a farm-based customer and farmer engagement information system where access to information can be scalable, secure and integral through cloud-

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based technology. In order to forecast crop production, this paper aims to analyze and use data mining techniques, especially Regression Analysis. The forecasting of the respective crops analyzes patterns of knowledge of certain parameters and historical evidence.

A survey on application of data mining techniques to analyze the soil for agricultural purpose, N. Hemageetha, published in: 2016 3rd International Conference on Computing for Sustainable Global Development (INDIACom), this paper explores various proposed algorithms for analyzing soil using data mining techniques.

Research on predicting agricultural drought based on fuzzy set and R/S analysis model, Xin Huang; Hong-liang Li; Lin Qiu published in: 2010 3rd International Conference on Advanced Computer Theory and Engineering (ICACTE), this paper sets out the model for forecasting research on time series data mining of rainfall, then predicting the years of agricultural drought incidence. The outcome of the application in the irrigation region of Puyang, which is in the province of Henan, shows that the model is convenient and up-to-date and is genuinely feasible in applying the forecast of the years of occurrence of agricultural drought, which has a guiding impact on agricultural development.

The design of algorithm for data mining system used for Web Service Ren Yanna; Lv Suhong; Wang Qiang, published in: 2011 IEEE 3rd International Conference on Communication Software and Networks This paper only analyzes the major problems of the data mining system algorithm library in customization, sharing and dynamic maintenance and constructs the fundamental structure of the data mining system algorithm library module. The definition of the primary metadata in the data mining algorithm as well as the design and materialization of the library management module for algorithms and the dynamic interface in the data mining framework are also studied.

A study on crop yield forecasting using classification techniques, R. Sujatha; P. Isakki, published in: 2016 International Conference on Computing Technologies and Intelligent Data Engineering (ICCTIDE'16), in this paper, we have shown that, using data mining techniques, we estimate the crop yield, pick the most excellent crop, and thus increase the value and benefit of the farming area.

III. IMPLIMENTATIONS

1) SOFTWARE

Our proposed system will have three modules:

- Farmer
- Consultant (Expert)

Admin

- Back End (Data Mining) Admin:
- Admin is having pre-defined username and password.
- Admin can log in to the system and can add the consultant.
- Admin will assign username and password to consultant.
- Admin will have other general rights as to view number of users, their details, etc.

Consultant:

- Consultant is the expert in agricultural field.
- Consultant will resolve the queries of the farmer in his area.

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Farmer:

- Anyone can register and can become a part of the system as a farmer.
- Farmer have to fill up one form after registration with the details like environmental factors, his last crop, his area, and some other parameters.

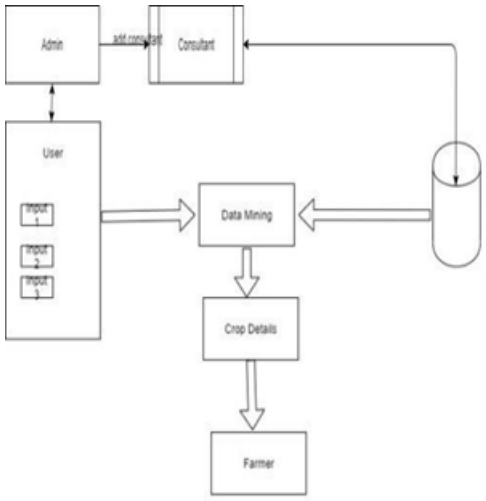
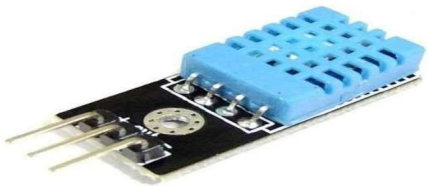


Fig: Agricultural Analysis System

The parameters entered by the farmer will be compared with the predefined parameters and the system will give the farmer suggestions on which crop, taking into account its geographical area and environmental parameters, will be most acceptable.

2) HARDWARE

NODE MCU



DHT SENSOR

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3) MATHEMATICAL MODEL

Let,

S be closed system defined as, S = Ip, Op. Ss, Su, Fi, A

To select the input from the system and perform various actions from the set of actions A so that Su state can be attained.

S-Ip, Op. Ss. Su. Fi, A

Where,

IPI-Username Password, Parameters Set of actions-A-F1, F2, F3.F4

Where,

F1= Preprocessing F2= classification F3= Analysis

F4- Crop Detection S Set of users

Ss-rest state, registration state, login state Su-success state is successful analysis

Fi- failure state Objects:

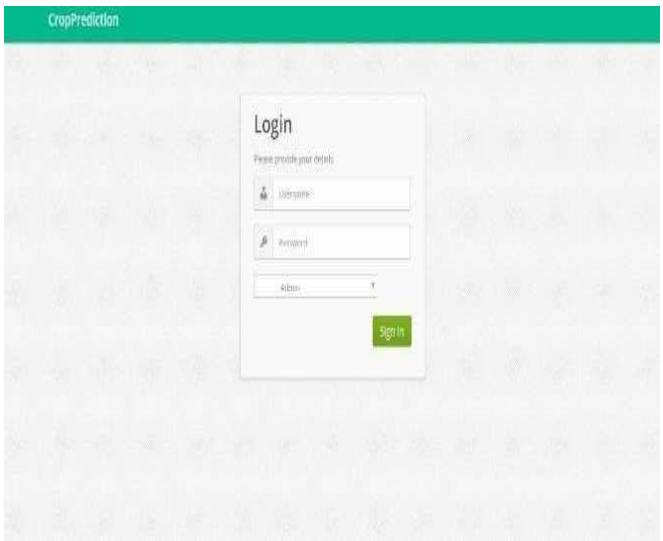
1. Input 1: Ipl = Username, Password
2. Input2: Ip2= Input Parameters

1. Output1: Opl - Authentication and Data Processing
2. Output2: Op2= Detection of Crop
3. Output3: Op3= Answer to farmer query

4) ALGORITHMS

SVM or Support Vector Machine is a linear model for classification and regression problems. It can solve linear and non-linear problems and work well for many practical problems. The idea of SVM is simple: The algorithm creates a line or a hyperplane which separates the data into classes. At first approximation what SVMs do is to find a separating line (or hyperplane) between data of two classes. SVM is an algorithm that takes the data as an input and outputs a line that separates those classes if possible.

IV. RESULTS



5.1 ADMIN LOGIN

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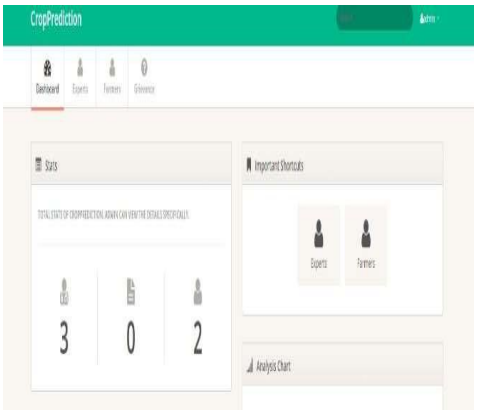
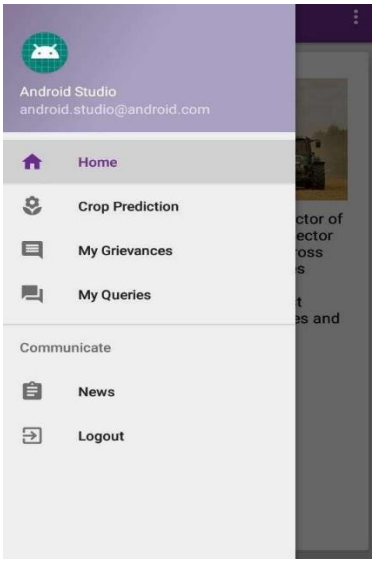


5.2 ADMIN HOME INTERFACE

5.3 DHT SENSOR OUTPUT



5.4 FARMER APP HOME INTERFACE

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V. CONCLUSION AND DISCUSSION

Thus, we have developed a system for agricultural analysis system using machine learning for crop prediction. We have developed an android application where user can register and can become a part of the system as a farmer, user can get the predicted crop after entering the parameters. This app is useful for user to communicate with the expert also. Here user can also register his complaint if any about any bank or government authority. This app will be very useful for the farmer and will solve 90 percent problems of the farmer. This app will promote the farmer to be a part of modern agricultural system. This app supports the digital India and smart city schemes of Government of India. The performance of this app will depend upon the dataset provided.

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