CUMULATIVE COMPONENT PREDICTION IN SUSTAINABLE AGRICULTURAL CULTIVATION UNDER IOT ENVIRONMENT

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Abstract- The awareness about Agriculture practice is increasing now-a-days. The present generation should be motivated to improve their interest on the agriculture. Technical Implementation in agriculture will increase the interest of present generation. The main cause that makes agriculture on down track is profit. Our system, which provides future prediction, will help the farmer to select the cultivation that suits them the most according to the various constraints like climate, market price rate, and soil type and water condition. The sudden price decline of cultivated product is one of the main issue. The climatic record is considered and the price prediction is made based on climate. The farmer gets to know the price according to the climate, which gives them idea about selecting better crop to plant.

Keywords- Sustainable Agriculture, Agricultural Prediction, IoT, Agri Mining.

I. INTRODUCTION

A. Effects of weather forecasts and climate prediction on sustainable development of agriculture Short-term and mid-term forecasts are often directly applied in various management strategies, such as sowing date forecast, weather condition forecast for sowing date or harvest date, agro-meteorological condition forecasts in winter for over-winter crops, weather forecasts for agricultural operation activities (irrigation, fertilizer application, herbicide application, insecticide application), as well as weather forecasts for processing and transporting of agricultural products, etc.

B. Disadvantages

- Price prediction is not provided.
- No separate record is maintained for each farmer.
- Climate prediction alone is not enough to predict a crop to be planted.
- The details about net investment is not described.
- The farmer is not guided based on their soil type and water condition.
- The system considers only about the cultivation and not about the profit of the farmer.
- There is no information for the farmer regarding the price of product at sale stage.
- The farmer is unaware about the daily market rates.

II. PROPOSED METHODOLOGY

The prediction of climate alone is not enough for the effective increase in the yield and farmer profit. Apart from the climate some other basic components are also to be considered. For instance, there may occur a situation where the yield depends on soil condition and drought also. The system take other basic components like soil condition, water level of the particular farmer's irrigation, past 10 years climate at that particular area, price of the product in past couple of years and budget of the respective farmer as input and gives prediction of yield and profit as output. The user (Farmer) information are gathered based on the above mentioned resources and stored as data in back end and they are provided with unique id.

Once the farmer needs the information about the prediction, he/she should login using the unique id. If the login is successful, the farmer will be redirected to the information page. The prediction is done with the farmer's investigated data. For example, Onion can grow better in the month of May based on the tradition sessional planting culture. But it is not sure that the harvesting of onion after some 90days will give the profit as expected without considering the previous results of the profit gained by onion cultivation at the former years.

In order to overcome these kind of issues, we use the previous data of profits for the prediction of crop. The information will vary to each farmer based on the prediction. The price of a particular product vary according to climate. For instance, corn in Tamilnadu have high demand and price during the month of October and November, but the same will be low in the month of January and February. So if the farmer is provided with this price prediction according to the climate, the awareness will be created among them to plant the right crop.

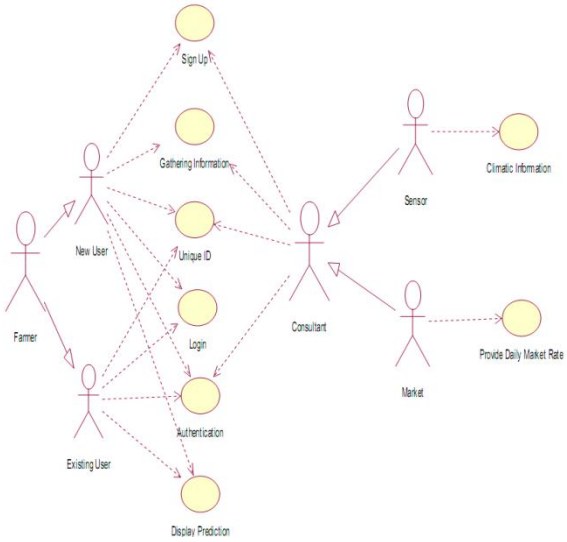


Fig 2. Use case diagram of the system

III. DATA ACQUISITION

Data acquisition is the process of measuring the physical conditions in real world and converting these entity into numeric values to make computer operations. In agriculture, Data to be gathered includes,

1. Daily temperature- A central location is chosen for each district and by using Wireless Sensor Networks, the daily temperature is monitored and the data is transmitted to main server through TCP/IP. Other standards like Bluetooth and Wi-Fi can be used but it is ranged with certain circle of location only. This daily temperature[10] is used for the future prediction. Along with the temperature update, other climatic conditions like rain, humidity are also monitored and those data are used to aware the farmers around that area.

2. Soil condition - During the registration phase, the farmer soil is sampled using soil testing tools. The gathered information is feed into the particular farmer's database by using ION Selective electrodes.

A. Data Analysis

The Data so collected is stored in the web data base. By using OLAP tool, the data are analysed for the prediction. Based on prediction, the output is generated and the farmer is provided with the predicted crop cultivation method.

B. Data Range

The range of data we collect is for the past 10 years and both time series values and normal values are analysed. The data set ranges within some Gigabytes.

IV. RESULT AND CONCLUSION

As a result,

• The price prediction is provided and Separate account is provided for each farmer and the planting is monitored, so that the historical data of the same farmer is used for prediction.

Apart from climate prediction other components like soil type and water condition are also used to predict the crop to be planted.

• The complete details about net investment and budget is described for farmer convenience. The system considers about the cultivation and also about the profit of the farmer.
• The information for the farmer regarding the price of product at sale stage is provided.
• The farmer is made aware about the daily market rates using simple GUI.

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