Auto-Expert Precision System: A Live Detection and Prevention with Smart Solution for Leaf Disease

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Abstract: Many time's farmer throws their produce on road due to lower rates available in the market. This mostly happens due to excessive produce of same types of crops. Currently there is no mechanism for farmers to know about how many other farmers have planted the same crop. The proposed system will enable the farmers to upload their choice and crop related atmospheric and soil data to the cloud. A proposed android application will fetch the above data from the cloud. The android application will also fetch the data from cloud at a base where information regarding crop and corresponding atmospheric condition, fertilizers, pesticides, water supply amount, preventive measures for climatic changes is been stored. The Android application of farmers will carry out analysis and generate the optimal is to crops to be selected and planted.

IndexTerms – **Geo-location, pH Sensor, Aurdino Board, Android Mobile, Moisture Analyzer, Android API.**

I. INTRODUCTION

The very common problem that is existing among the farmer's are they don't select the correct crop based on their soil requirements. Because of this they face serious problems in productivity. This problem of the farmers has been addressed. Precision farming is a modern farming technique that uses research data of soil characteristics, soil types, crop yield data collection and suggests the farmer's their crop based on their site specific parameters. This reduces the wrong choice of a crop and builds up the productivity. As agriculture is a prime occupation in India from ages and thus plays a vital role in an Indian economy. India is an agricultural country with second highest land area of more than 1.4 million square kilometers under cultivation.

India tends to possess a huge potential to be in the field of agriculture. Agriculture promotes poverty and rural development. Agriculture is one of the India's biggest economic sectors and employed 52.1% of total work force in 2009-10. Number of farmer's in India is 23.4 Cr. In 2001 According to their search in 2011, India had a large agricultural sector, on average, for about 10% of export earnings and 16% of GDP. To this date in India, agriculture is being neglected which has led to losing hope of the farmers in agriculture which had led to increase in the number of farmer suicides. There is none of the universal system available to assist farmers in agriculture. India's population has been increasing at 1.6% per annum, which means that the growth in agricultural production must also increase at this minimum rate to ensure that the rear end supply bottlenecks. Solutions are obvious India must investing the agriculture sector, in RD, in irrigation, intermediary-less sales of produce and elective information centers to provide answers to farmer's queries. In India agriculture is carried out from many years and thus we have a very huge collection of agricultural previous data which can be used for the recommendation for the betterment of farmers. Data mining algorithms and techniques can be used for recommending single crop and pattern of crops for crop rotation.How ever to gain valid and optimized results, the system needs to be in continuous learning which can be done by including current data sets in the system.

II. THE RESULTS OF PROCESSING SYSTEM

Previously there are different applications and website available for farmer but, all have some limitations like, language barrier, all information not available on single platform, lack to detect disease for that they need to take suggestion form experts, lack to monitor quality of soil, they don't have much information about actual market rate of crops, they don't get area wise crop recommendation. We are developing android application which will help farmer to solve these problems. There are six modules in our application that are as follows

1. Recommendation - This module is going to provide Recommendation to farmer that which crop should be grown according to soil pH value, moisture, and humidity. It also provide information about which crop is grown by nearby people and demand or shortage of crop in market.

2. Government Scheme – This module will provide information about which schemes are launched by government. Farmers need not browse other websites for all these schemes.

3. Daily Bazaar – This module provide information about daily market rate for that admin have already add added different websites.

4. Weather Forecasting – This module predict weather for next seven days so that farmer get the information which action should be taken according to weather condition.

5. Crop Information – In crop information Different types of crops information is added like crop name, crop type, crop information, climate(which type of climate will suitable for this crop), water level, season, pesticides, fertilizer, suitable temperature, humidity value, soil pH value and duration for the crop.

6. Image Processing – When any disease attack on the crop farmer need to capture the photo and upload it on to the application then application will perform further image processing by using different algorithm like KNN and Naïve Bayes algorithm and detect detail information about disease along with solution.

III. RESULTS AND DISCUSSION

3.1 ARCHITECTURE

IT Enabled Farming for farmer is a system which provides the solution of problem that farmer was facing and the system completely reduced the farmer working and makes them efficiently do their task. Naïve byes technique is used to classify the crop disease based on color detected using Sensor.
Provide the updated information such as daily market update, soil or pH value, recommendation about crop for farming, information of crop that other farmer using for farming.
This system increase the efficiency and working of farmer and it also increase security and provide real time market update, crop recommendation to farmer. Using this system it will enhance the performance and profit of farmer in real time world. Expert Machine recommends the good quality crop to farmer at any time in working hours.
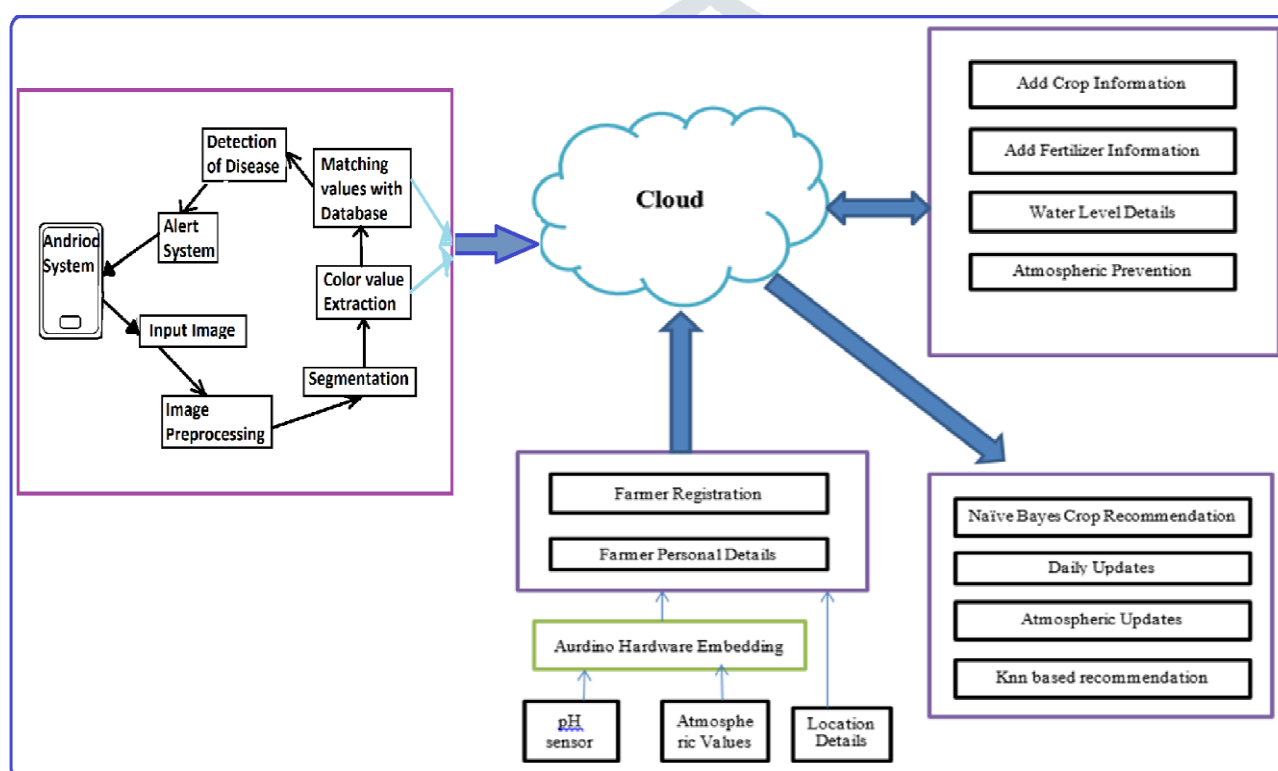
3.2 DETAIL WORKING

1. Login of Admin

The login snapshot is for login of admin and admin will login in android app by entering their name and password in login form. It will login and if admin forgot his/her password then he/she is also able to get his password through email-id and username by using forgot password option. When login of admin is done successfully then username and password of admin also stored in android app. The admin has to login in android application every time whenever admin wants to make changes in application and provide solutions to farmer.

2. Registration Form

In this registration form farmer enter their name, contact no, weather details, crop details, location, password, username or all basic details of farm and their own details then it all his/her information will be stored in database and farmer will registered. Through this registration form the expert machine or admin get information about farmer and expert machine will provide daily recommendation, weather details, and crop information to farmer.

3. Recommendation to Farmer

Recommendation to farmer is based on the weather or climate in daily basis means first task is performed by farmer itself to inform or ask about crop by specifying problems and then the role of expert system to provide best suggestion to farmer. Recommendation is another option this will provide recommendation to farmer on basis of the weather in daily basis means first task is performed by farmer itself to inform or ask about crop by specifying problem and then the role of expert system to provide best suggestion to farmer.

4. Government Policies

As help to farmer the government has defined some policies and scheme which will help the poor farmer for making good crop and as support to their family members. In android application the expert machine have already included all government schemes and policies just former has to login in application and after successful login farmer will get all details about s schemes and polices and can apply for that scheme and policies. After clicking on start farming this screen will be open after clicking on Government schemes will list of all schemes provided by government to farmer which will help the poor farmer for making good crop and earn good money. We have also included another link which is Google this will help farmer to perform search action if farmer wants to search another websites then famer can search though our application there is no need to go back on home screen for purpose of Google search

5. Disease Detection

In disease detection process the plant disease detection is done using image processing technique in which farmer will send image of crop and farmer having different option for sending those image such as gallery, camera etc. and based on RGB color standard the detection of disease is done.

6. Daily Bazaar

Using android application the farmer will also get the details regarding market updates which include all vendors and as benefits to farmer the selling of crop is easy and efficiently done because farmer and vendors they both are in same platform. Daily Bazaar is another option will also get the details regarding market updates through which crop selling becomes very easy.

7. Crop Information

In crop information the farmer has to enter all details about crop such as crop name, soil value, ph value etc. And after that all details the vendor can easily take it from android application and make communication with farmer for selling their product.

8. Weather forecasting

The purpose of weather forecasting is to show the weather of next few days to farmer so that the farmer will make proper management and it will also make farmer to efficiently handle all situation or the problems may occurred in between this days.
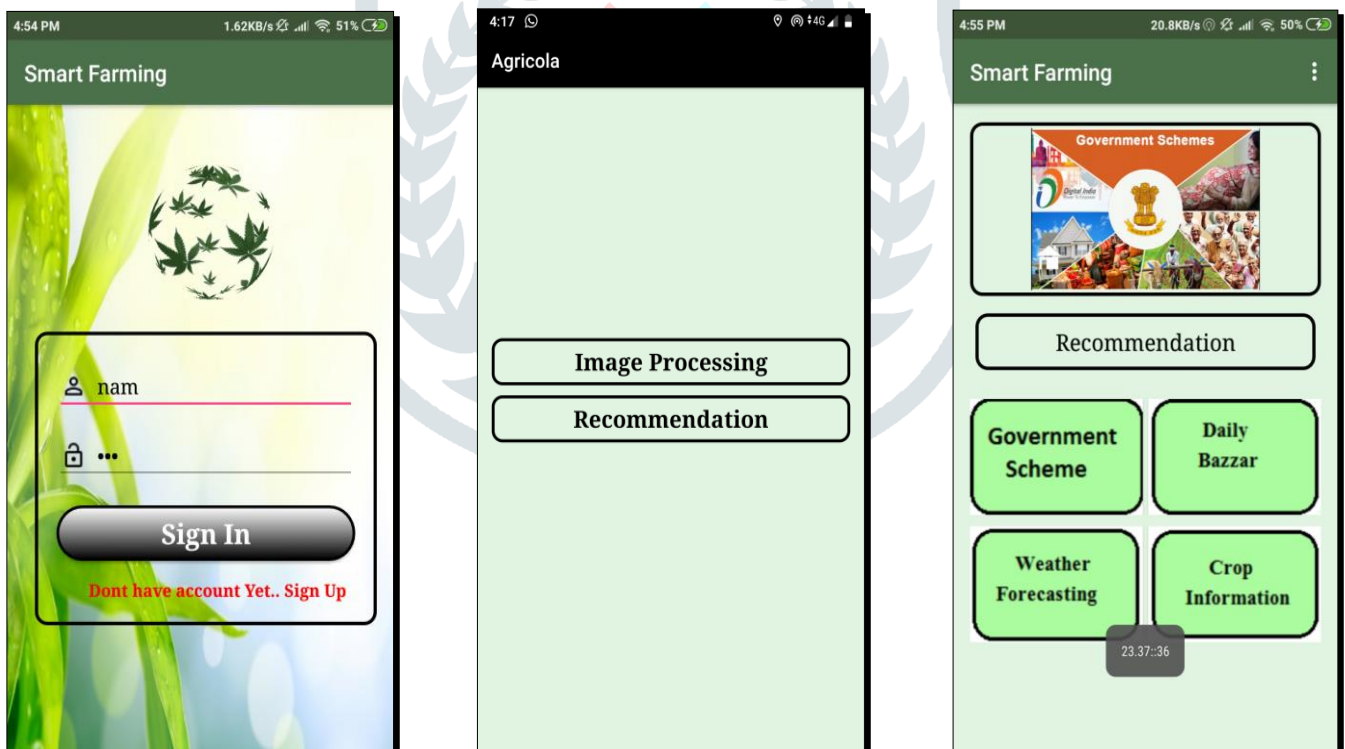
Out of this screens first one is useful for login or sign up if user does not have account the user have to create account by entering details like name location, contact etc. but it user already have existing account the user will directly sign in user will login in Android app by entering their name and password in login snapshot. It will login and if user forgot his/her password then user is able to get the password through email-id. After login in app users have two options which are shown in second snapshot out of these two options fist one is image processing which will help farmers to detect diseases of crops and take immediate action and also provide solution on disease second option is about recommendation which is further categories into different section are as mention in above third snapshot this options will work accordingly as mention in above section.
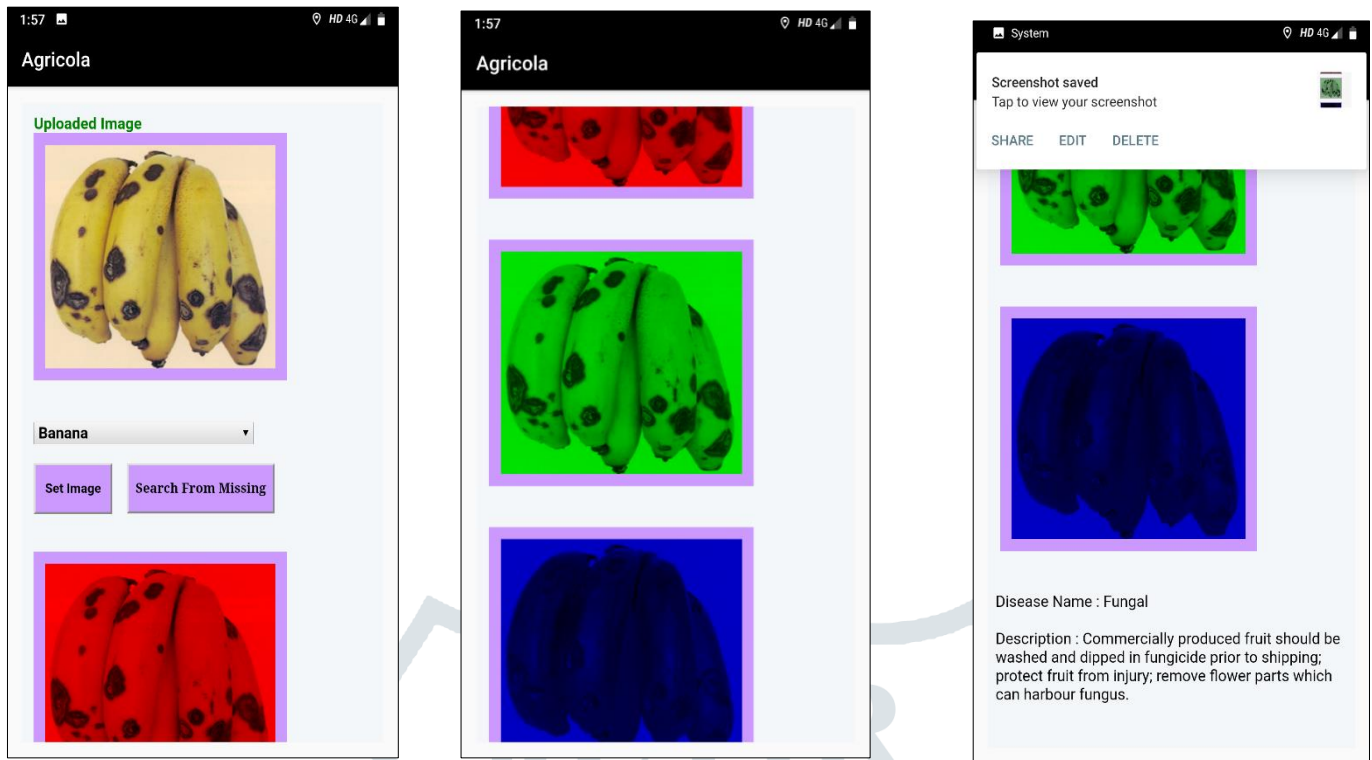
This above three snapshots will shows the further processing on image processing it show how the disease detection is done by image processing. For detecting disease user have to upload the image of detected crop then our system will convert image into RGB color format by using machine learning algorithms then our system will calculate this RGB color values after that system will show the name and description about disease as a result.

For the purpose of image processing it will make use of two different machine learning algorithms KNN algorithm and Naive biased algorithm.
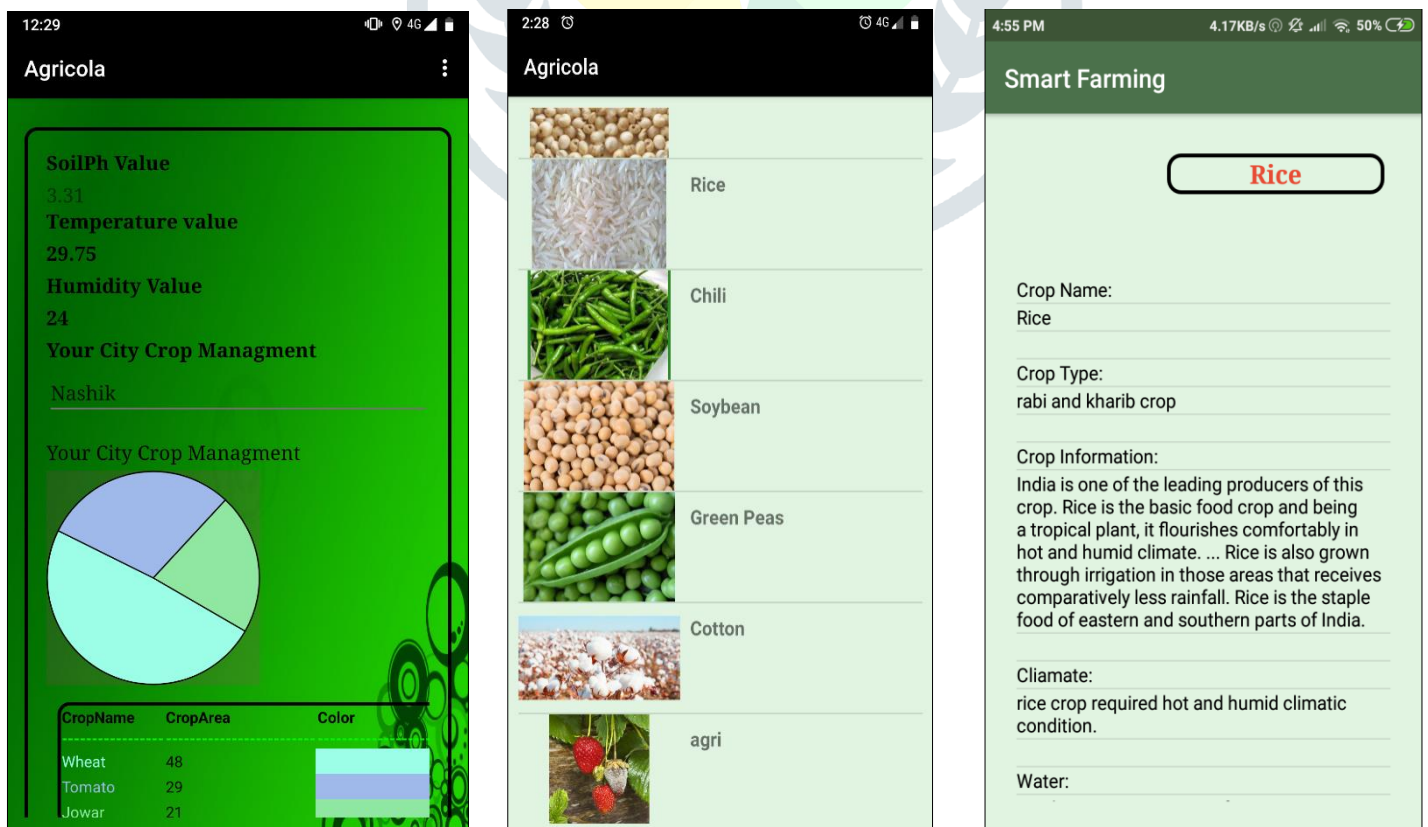
These snapshots show the further processing of recommendation for the purpose of recommendation it will take input from soil and shows details about soil according to quality of soil and give recommendation that which crop should be grown in that soil. It will also provide details information about crops like name, type and climate requirement of that crop.

IV. CONCLUSION

Our system will help farmers to sowing the right seed based on soil requirements to increase productivity and acquire profit out of such a technique. We also proposed the use of data mining techniques to provide recommendations to farmers for crops, crop rotation and identification of appropriate fertilizer. Thus the farmers can plant the right crop increasing his yield and also increasing the overall productivity of the nation.

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