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Smart Farming using Mobile Application

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Abstract: *In the past, most farmers have taken care of their products by relying on basic observation and general knowledge. The quality of agriculture products depends on the farmer's skill and experience. Thus this application is basically for sustainable development of farmer. Many times farmer is confused to take decision regarding selection of fertilizer, pesticide and time to do particular farming action. So to avoid this problem this application is been development using android application. Initially the farmer will able to view the crop details like the soil temperature, pH level, arable, broad acre, crop rotation, drill, estate of each crop, haymaking, market garden, plantation, terrace, uncultivated, unproductivity. Farmer will get real time national level crop rates to get more benefits. This application will give direct communication to farmer and supplier where the supplier can buy the crops through banking in the application itself. The main feature of the information system includes information retrieval for user from anywhere in the form of obtaining statistical information about fertilizer, research institute diseases, suitable soil concentration for the corresponding crops, statistical information about export of crops. This system will be retrieving information about the geographical location of lands, government announcement which are be notified, NGO center number, customer care number and feedback form to both the farmer and supplier to make the corresponding changes to be done in this application by the authorized user. Therefore the designed system is used for all purpose for farmer to integrate their crops.*

Keywords: Smart farming; Weather condition; Aprior algorithm; Precision agriculture.

I. INTRODUCTION

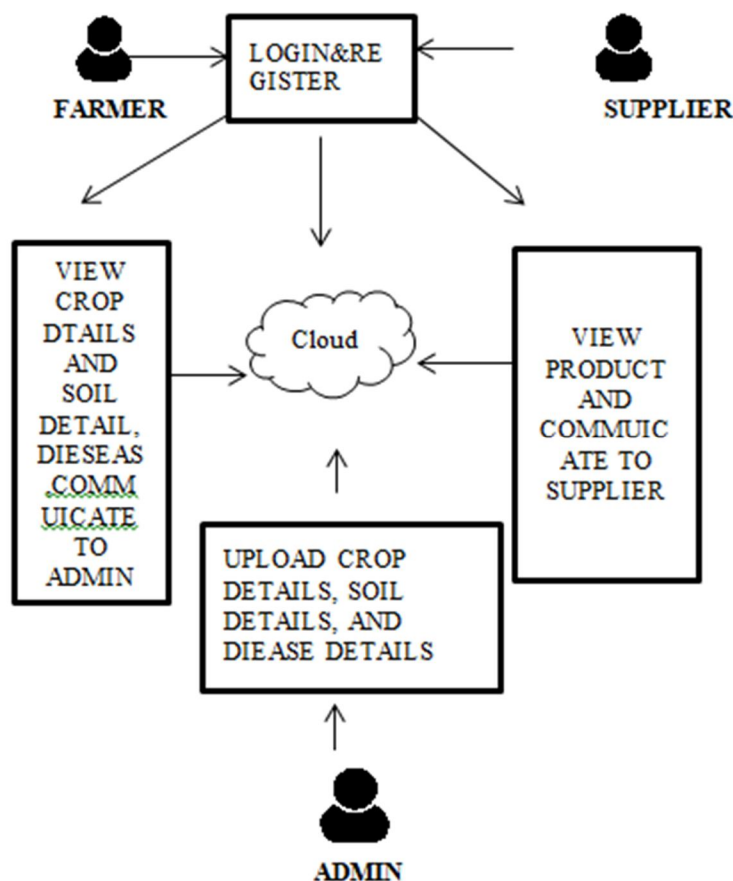
Agriculture plays an essential role in the society and economy of many income countries. Agriculture is one of the key factors in economic growth but by using smart farming it can be precisely managing the input based on variation of field parameters in order to achieve optimized outputs at minimum disturbances to the environment. Agricultural products play a significant role in sustaining the local economy. Initial farmer are facing difficulties in development of the crops and selling the crops to make profit with them but it was not possible in early days. The smart farming was established by combining agriculture with information communication and technologies. For example markets that sell agriculture products are often inaccessible due to lack of transportation or knowledge about buyers to avoid the cash crop and make some small profit to farmer we are introducing this application. This can lead to farmer with little negotiating power and receiving sub optimal prices for their goods from buyers in large central markets where both resource and information advantages. This application is based on providing the required information to the farmer. Environmental conditions are been satisfied by the application which generated weather condition based on the latitude and longitude value of the land areas. This system will be giving a detailed view about the cultivation of crop and selling of crop on particular rate which is estimated by the farmer. Android based application which is a user interface which can be accessed anywhere and anytime with mobile network. In this each plant has its own susceptible to certain growing condition such as air temperature, humidity, soil temperature, wind and light etc. Generally crops are developed based on soil concentration it is been generalized in this application. Whenever the farmer wants to develop a crop without any knowledge about it this system will describe briefly about the cultivation of the crops from initial stage to final stage which is step by step description. After selecting the particular crop to cultivate initially land should be ploughed up to make the crops cultivation for that many types of machines are available so farmer are confused to refer which machine is efficient and easy understanding machines to plough the land. The machinery are been listed in this system which can be referred by farmer and can make the land more concentrated in cultivation. The major disadvantage of farmer is to selling the goods after cultivating the crops. This problem can be solved in this application where the farmer can make their advisement of crops which are gathered in and the supplier can view the goods and can buy the goods through banking or by direct communication with farmer. If any problem in implementing the crops it consists of feedback form farmer may ask their queries and get suitable answer, and has customer care number to get details about the crop, government announcement is notified to the farmer initially itself which makes farmer no loss of crop and no cashless crops are cultivated.

II. PROPOSED SYSTEM

In proposed system the farmer will be able to get more information about the cultivation, crop details, fertilizers, soil temperature range, seasonal condition and weather details. The system runs on android application in which its applicable for all android versions. Its integrated system so its retrieves the information about the materials required, machinery to cultivate and solve the queries based on crop diseases. It will give a detailed view about the crops and its symptoms and solution for each symptom briefly in step by step process. It targeted to those farmer who wish to professionally manage their farm by planning, monitoring, recording, tracking, and analyzing all the farming activities. Notification is been provided to the farmer about government announcement and research institute number are provided.

III. SYSTEM ARCHITECTURE

System architecture is the conceptual design that defines the structure and/or behavior of a system. An architecture description is a formal description of a system, organized in a way that supports reasoning about the structural properties of the system.



The architecture basically describe about the cultivations of crops to the farmer. We start with four components: (a) crop details description, (b) weather details and cultivation details, (c) farmer advertisements, (d) feedback and queries description. Each component will be explained briefly to make the farmer understand about the cultivation of crops.

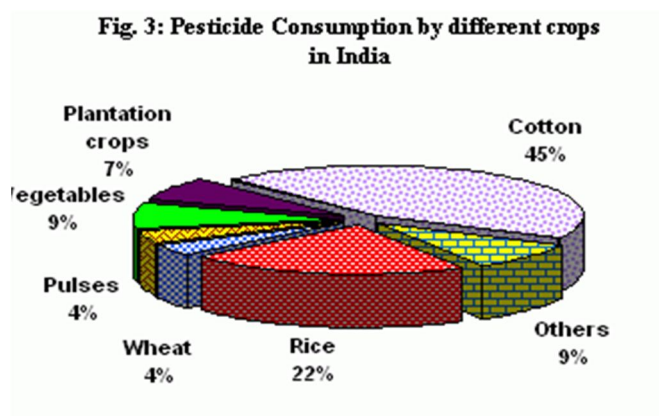
Initially the farmer will be registered with personal details and it will generate a unique id to the farmer in which we can login with particular id. The details of the farmer will be stored in the cloud and the supplier will also login into the application and can buy the goods which are been advised by the farmer these details are been managed by the admin in cloud database.

Through this application the farmer will be giving a detail overview of the land, cultivation, machinery, weather conditions, symptoms of crop diseases, seasonal cultivation, marketing goods, government allowances, online chatting with supplier to farmer, many parameters are be considered in this application. The main description of the application is to make the cultivation easier to the farmer and give more information to upcoming generation without any difference in development of the cultivation of crops in next generation also. We can also be able to make small market goods with the help of this application.

A. Crop Detail Description

In this we will be giving detailed description for the crop like suitable environment, season details, and soil temperature, pesticide. The crops details is been updated manually by the admin based on the land details by using the longitude and latitude. It will be updated all kinds of crops like traditional crops, semi-commercial crops, commercial crops. Each crop will have its own concentration values and it will be generated based on availability of water, climate and efficiency.








For example consider crop as rice initially we have to check whether the land is productivity or not. Now we have to check the soil temperature, ph levels, and soil concentration and we will be plough the stack which is seeds for cultivating and the next step is keep the crop protect from the disease if it occurs then the symptoms is been briefly explained in this system. The crop will be formed as chaff to remove this particular machines are been used which form as a brown rice after by hand or by polish the rice will be cleaned and sold by the farmer in this application itself which leads to no loss of crops and money to the farmer.



B. Weather Details and Cultivation Details

The farmer will be view the information about the weather condition based on the land which is been located. The weather details are been updated manually by the admin where it will be given a detail description about where to cultivate the crops are not which will not leads to any loss of cultivation. The important aspects of cultivation is based on climate condition for example the terrace cultivation cannot be done in south side of India because it will grow only warm and humid with rainfall measure of 100 meters a year so based on this condition only the crop is cultivated so climate is important aspect in developing crops.

The haymaking is done by labor where farmer should wait for them and pay the wages based on their works days it was a very difficult task to the farmer to make it easy for any purpose machines are be created. But now days every farmer is based on cultivating the crop using its own machines. This application will be giving detailed information about the machinery for cultivating in which there they are need .for example for plough the land harrow machines, for planting seed drill machine, for fertilizer control slurry machine, for harvesting grain chart like this different type of cultivation and it machines are be described in this application.

Redmond Weather		
	48° F	
	Partly Cloudy	
Tuesday		52° F 41° F
Rain		
Wednesday		49° F 41° F
Rain		
Thursday		52° F 43° F
Rain		
Friday		52° F 40° F
Rain		
Saturday		52° F 38° F
Mostly Cloudy		
Sunday		54° F 40° F
Mostly Cloudy		



C. Farmer Advertisement

The major difficulty for the farmer is cultivation and selling the crop within time. Most of the crops cannot be suitable for more than 3 to 4 weeks within that period only the crops should be sold by the farmer. This application will be overcoming the difficulty by making the crop advertisement. The farmer should update the details like the crop name, photo of the crop, no of sack present, phone number for communication, longitude and latitude value, distance between you and the supplier to make transport of goods.

This advertisement can be viewed by the supplier and make a communication between them through online chatting or message. Afterwards the supplier can buy the goods through banking in this application or direct communication. If any kind of problem arises between the farmer and supplier then both of them can make a query and that can be overcome by the admin for example if the farmer is uploading as I have 65 sack of rice but if farmer supplied the goods before itself then he has to update the crop details and the supplier can verify after goods. Similarly if the supplier has attempted to take the goods then he has to come to conclusion that whether he is buying the goods or not because the farmer may supply the good for another supplier with its best rate. If any problem in the updating the admin will verify and update it.

D. And Queries Description

The farmer will be facing multiple problems when they are cultivating crops, advertisement of crop etc. until the crop is sold by the farmer it will be very risky to complete the cultivation of the crop. Because sometime due to over water the crop may get some diseases, by using other kind of pesticides it may affect the crop completely by not taking the particular precaution to that problem. For example when the crops are facing with some disease the farmer uses many pesticides but it will not show the corresponding result so this leads to loss of crop and the farmer may end the cultivation or end their life this major fact which is placed in overall India so to overcome this our application is useful by the farmer. This application will be having the query section where the farmer can upload facing by them by describing them or by making taking the photo of particular crop which is facing a problem. The admin will verify with particular problem and be able to get the solution or some caution to farmer by referring the research institute nearby them or if the problem is about soil erosion the referring a NGO center to solve the problem.

Most of the farmers will not be able to get the information about the government sanction, rewards etc. many times farmer will not be able to verify the websites or through television about it will not show major impact on farmer. This application will be giving a notification about the sanction, government allowances and all kind of information which are provided by the government. This system will be used for multiple purposes for developing smart farming for small area cultivation or by large amount of cultivation. This application will provide the information detailed which makes farmer more secure and makes the cultivation properly. Now days farmer are facing multiple problems based on that consideration crop and cultivating them so using them kind of problem can be solved. Many people like to plant their own goods as organic farming. For the organic that is known as small marketing can be done by verifying with this application which makes cultivated their own food by themselves which makes them more healthy and will be a good encouragement to future generation about the farming and its importance.



Result

IV. CONCLUSION

This paper presents the development of a smart farm using android application. The application is based on getting the information about the crops from initially and final step with description of each requirement. The crops are details describe about their pH value, soil temperature, weather condition, pesticides, etc. In this application we will update the weather condition and machines for the crop with low cost and more efficiency are provided. And in this application the farmer can make their own advisement of their crops provided by them and the supplier can buy the crops through online banking itself. This system will provide a feedback form in which the farmer and supplier can request for their requirement and if farmer has can queries can be clarified by the admin. If any kind of difficult in cultivation the admin will be verifying it and gives the farmer particular solution for it. So by this application the future generation will know the knowledge about the farming and the importance and needs to cultivation. This can make farmer gain their own profit with no loss of crop or no loss of farmer in the world by making the land to cultivate the crops using the application.

In future study although a smart farm has the ability to improve production with use of technology and using sensor to controlled the cost of weather condition. And this application should develop testing the land and water scarcity using the mobile application itself. And to check the environment condition with using the sensor or using the mobile based system. This system can be developed both for horticulture and livestock production and for developing water based all kind of sea developing of the goods like fishing, shrimp, oysters, etc.

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