

E-Agro Android Application (Integrated Farming Management Systems)

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Abstract— this software application is basically for sustainable development of farmers. Many times farmer is confused to take decisions regarding selection of fertilizer, pesticide and time to do particular farming actions. So to avoid this problem this application is very useful. Fertilizer schedule of each type of crop will get registered. Based on sowing date of crop, farmer will get reminders about application of fertilizer, herbicide as per schedule, pesticide for diseases and weather alerts if particular crop exceeds its favorable temperature range. Crop suggestion will be given based on Soil type, geographical location. Farmer will get real time national level crop rates to get more benefit. This system combines modern Internet and mobile communication systems with GPS for efficient and smooth farming. This review paper presents the introduction, theories and analysis of DBMS, use of Smartphone in agriculture. This paper is developed on brief study of some common problems faced by the farmers across the nation. This project aims at bringing the spark of 21st century to that 70% population who are land worshippers.

Keywords— Android, Smart phone, Agriculture, MySQL, Weather Forecasting, Management, Farming, GPS

INTRODUCTION

Indian agriculture currently faces a host of diverse challenges and fresh constraints due to the ever growing population, increasing food and fodder needs, natural resources degradation, higher cost of inputs & concerns of climate change. A phenomenal increase in food grain production is achieved using improved technology. The country's population is expected to reach 1660 million by the year 2050 and for which 349 million tons of food grains will be required. To meet this requirement there is urgent need to double the productivity of agricultural crops from the existing level. Since it is not possible to increase the land for cultivation, so the only option remains is to increase the productivity of farming using modern technology. For the sustainable development of farmer, it is necessary that decision making regarding farming should be perfect. The progress in production or steady growth in output is necessary to face the challenges posed by present economic, political and technological environment. It is also a fact that highly productive lands have been diverted from agriculture to infrastructural development, urbanization and other related activities. Under these circumstances the only option is to increase the productivity vertically. In view of these situations, using Information technology is the only way through which the target could be achieved. As we know IT is continuously increasing its roots in every fields and increasing their efficiency and from current scenario only farmers seems to be untouched with it, and probably the reason for the backwardness of our farmers. IT can improve the agriculture technique and hence a noticeable increase in crop yield can be noticed.

DESIGN

Basic design of app in the following diagram:

Here m_n =module, n=module no.

After entering into the module section we can select module one by one to get some information or alerts.

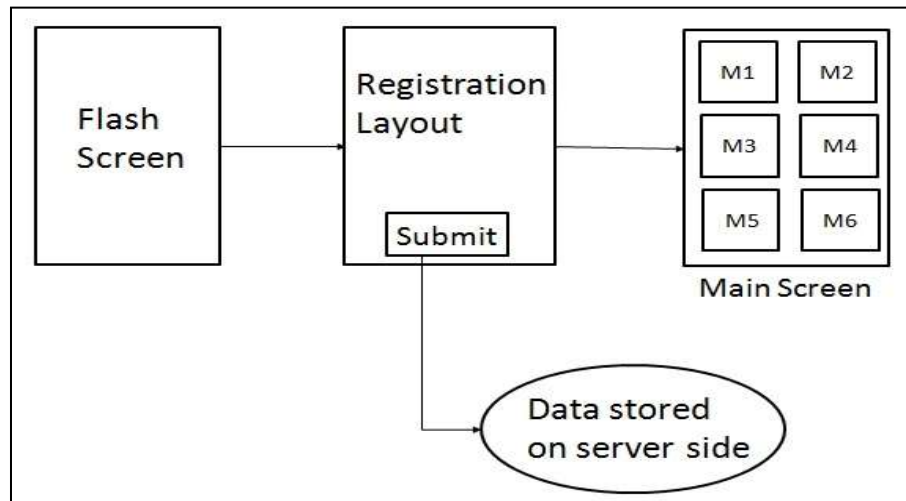


Figure1: Basic design

MODULE INFORMATION

• M0- Login And Registration

- This is 'one time registration' module i.e. user need to register only once in the process.
- This is registration module in which user need to feel particular details like
 - Name
 - Email ID
 - Mobile no
 - Address
- User gets registered on GCM which generate mobile id for further communication, messaging. Users add themselves to the system as well as authenticate and utilize the system, thereby providing access to valid registered users in the system.

• M1- Crop Details

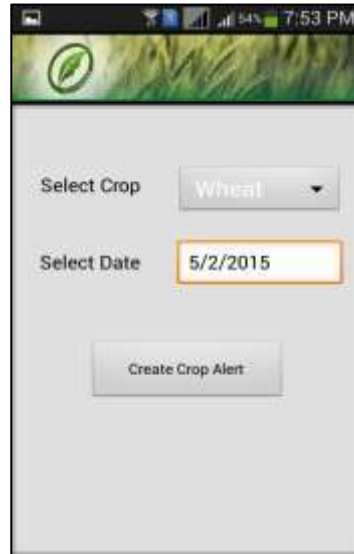
- It is the module in which we have added many crops such as maize, wheat, sugarcane, cotton etc.
- Details include basic information of each crop such as suitable environment, time, soil, temperature etc.
- This information can store on server side and we can update or modify the information whenever necessary.



Screenshot1: Crop details

- **M2- Crop Alerts**

- After entering into crop alert farmer need to choose crop as well as date at which farming starts.
- In this module farmer will get the alert regarding different farming procedure which include fertilizer, pesticide, herbicide, seed used for crop and weather alert if favorable temperature range of any crop exceeds.



Screenshot 2: Crop Alerts

- **M3- Ask Questions?**

- This section includes the ‘customer care’ type service. So that farmer can directly ask questions to Central Government “Kisan Call Centers” via phone as well as by e-mails.
- They can download the PDF file if they required contacts other than Pune region.



Screenshot 3: Ask Questions?

- **M4- Weather Info**

- It gives real time weather data of any location in India by using yahoo weather api.
- This is mainly useful for the farmers having green houses where we require data such as humidity after fix interval of hours.
- It gives following details:

1. Temperature
 2. Humidity
 3. Pressure
- We can manually enter the location or it automatically show weather info of your location using GPS. This facility is useful when our farm is located away from our destination.



Screenshot 4: Weather Info

- **M5- Crop Rates**

- This include real time rates of crops.
- Rates will be fetched from national level markets.
- This module is very helpful for farmer beause he will get more price for perticular crop.



Screenshot 5: Crop Rates

- **M6- Settings**

- We can ON or OFF the alerts.
- We can see our profile and change accordingly.
- More things can be added .

IMPLEMENTATION

- Activity Life Cycle and intent –

- An activity represents a single screen with a user interface. For example, in this app registration page is an activity.
- **Activity** starting with a call on *onCreate()* callback method. There is a sequence of callback methods that start up an activity and a sequence of callback methods that tear down an activity as shown in the below Activity lifecycle diagram:

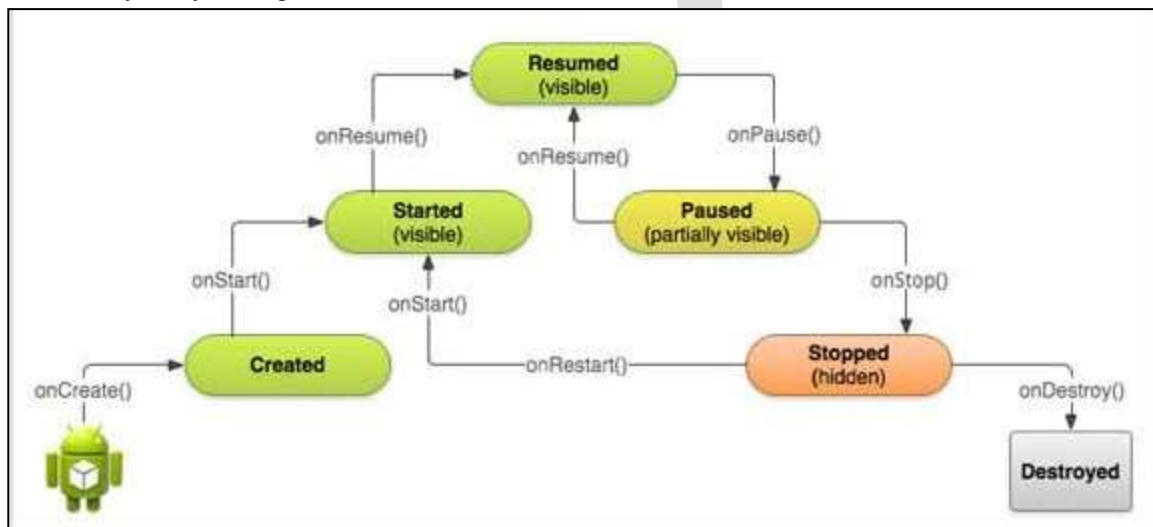


Figure 2: Android Activity Life Cycle

- An Android **Intent** is an object carrying an *intent* i.e. message from one component to another component within the application or outside the application. The intents can communicate messages among any of the three core components of an application - activities, services, and broadcast receivers.
- For example, let's assume that you have an Activity to launch an email client and sends an email to "kisan online help center" using your Android device. For this purpose, your Activity would send an **ACTION_SEND** along with appropriate **chooser**, to the Android Intent Resolver. The specified chooser gives the proper interface for the user to pick how to send your email data.

- **MySQL :**

- MySQL the world's second most widely used relational database management system and most widely used open-source RDMS.
- It is open source and we create the web application so we use the MySQL in our project to manage the database.

We use MySQL as,

- 1) To create and manage MySQL database.
- 2) Build database structure (Ex. Crop table, Soil table etc.)
- 3) Back up data. (user profile.)
- 4) Inspect status.
- 5) Work with records which will use to give the weather alerts, crop suggestion, fertilizer suggestion etc.

- **GCM :**

- Google Cloud Messaging is a service that enables developers to send data from servers to both Android application.
- This service provides a simple, lightweight mechanism that server can use to tell mobile mobile applications to contact the server directly.
- We use GCM to send alert messages to the server using the unique mobile id's which is store at the server and which is generated by GCM after making the registration of user mobile at GCM.

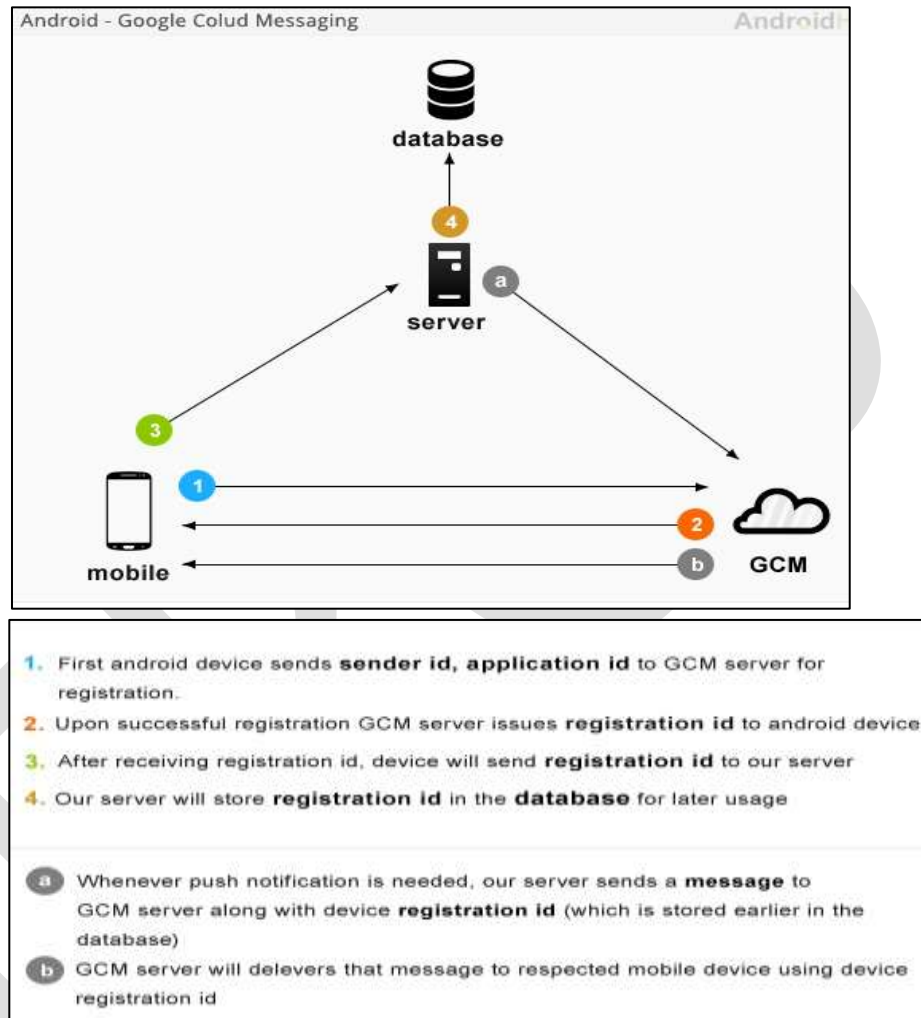


Figure 3: GCM

- **JSON Parser :**

- JavaScript Object Notation, is an open standard format that uses human-readable text to transmit data object consisting of attribute-value pairs.
- It is used primarily to transmit data between a server and web application, as an alternative to XML.
- So we use the JSON parser to convert the value which is present at Yahoo weather api. to human-readable text to transmit data object consisting of attribute-value pairs and display it on the module M4 i.e. Weather info. Also due to this we can store that value into database for giving the weather alerts to farmer (like as if temperature increase than the favourable condition.)

FUTURE DEVELOPMENT

- As app is available in English language there are certain restrictions for farmer to understand it. So we can develop this app in many local languages such Marathi, Hindi, Gujarati, Tamil etc.
- We can fetch crop rates from local markets which will be more suitable and economical for farmers.
- We can give facility in this app to order fertilizers, pesticide, herbicide using online platform.
- By scanning leaf, we can identify the diseases by which crop is infected using Image Processing Technique.

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CONCLUSION

eAgro will offer expertise service to farmers regarding cultivation of crops, pricing, fertilizers, and disease detail method of cure to be used etc. and even suggestions regarding modern techniques for cultivation, usage of bio-fertilizers, can obtain best crop cultivation in the recent history of the region etc. Our main aim will be concentrated on bringing the modern agricultural techniques to the remote farmers. The relentlessly increasing importance and application of Information Technologies (ITs) in Agriculture have given birth to a new field called e-Agro, which focus on improving agricultural and rural development through a variety of technologies. Our android application eAgro will support all the smart phones on android OS(4.2.2 onwards). It will not only displays current weather parameters but also gives weather alert to avoid future crop damage and will suggest them the most suitable crop and even with the required fertilizers, pesticide, herbicide throughout their work.

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