

Agricultural Guide With Mobile Application

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Abstract –

Agriculture plays an important role not only in the economy but also for achieving the food security for states and countries. The main problem is to recognize the type of disease that is affected to the crop. This plays a key role in the prevention of the disease and yields more. This is a guide for the agricultural steps with easy and accessible mobile application.

1.INTRODUCTION

We often hear that India is Associate in agricultural country. This primarily implies that agriculture is a crucial a part of our support. In India, agriculture is our primary economic activity and regarding common fraction of our population is engaged within the same. This allows us to get conversant in kinds of farming wiped out India. [1]

The word agriculture comes from a Latin word- ager or agri which means soil, and 'culture' which means cultivation of the soil. In fashionable terms, agriculture contains "the art and science of cultivating the soil, growing crops and rearing livestock". [1]

You can believe cultivating to be somewhat a total framework which incorporates data sources, handling, and yields. The contributions here are seeds, composts, hardware, which at that point, experiences tasks like furrowing, planting, water system, weeding, and collecting. What's more, along these lines, we get the last yields like harvests, dairy and poultry items. [1]

Importance of agriculture in economic development is huge. The Agriculture sector plays a major role among the Indian Economy. Agriculture contributes regarding sixteen temperament issue form of total price. land exports Associate in Nursing outsize quantity of agricultural materials like fruits, vegetables, pulses, tea, spices etc. and additionally the government is exploit good revenue from it.[2]

Agriculture is to boot a provider of employment. It's providing employment to many of the oldsters. Many of the laborers get their wages daily through agriculture either they are tractor drivers, grass cutters, many technicians of farming apparatuses or everyone UN agency enjoys such cultivation activities. [10]

Agribusiness is the division which requests a ton of water for water system. This is a calling which for the most part relies upon climate. On the off chance that there would be less water supplies, at that point it can prompt harvest crash. Likewise a hurl downpour fall can wreck the yield. Thus, by great cultivating strategies and present day methods of cultivating can assist the ranchers with overcoming these issues.

2. PROFILE OF THE PROBLEM

This Agriculture mobile application is meant for the people who are passionate about farming in the agriculture lands and in the kitchen garden area, Nursery's etc. We have made this application for both existing farmers and young minds who are willing to engage in farming. It really helps the agriculture students and any farmers. This helps the people who are willing to build their career in the agriculture and who don't have a basic knowledge in the farming have to follow the steps given in this application. Some people don't have the predictable knowledge about the weather.

Horticultural crops are meant for protective and disease free food. They provide much needed minerals, vitamins. Other than their incentive in human utilization, agricultural crops assume a significant job in commerce, particularly in export trade and processing industry. So it is important to grow the horticultural crops in the places like kitchen garden, nursery, urban areas. It is easy to grow and creates user friendly environment.

It is user friendly application that can easily accessible with no confusion in the steps and instructions given in the app. It is mainly for the users with zero knowledge in the agriculture like students or any pupil willing to start farming. It also predicts the type of disease the crop is having if the user scan the image of the plant.

3. EXISTINGSYSTEM

3.1 Introduction

Well, till now no application is using this idea but many websites are there which are running with providing weather report, online marketing, types of crops, mixture of pesticides and fertilizers. And the types of seeds available and online buying of fertilizers and pesticides and their price fluctuations day-by-day.

3.2 Existing Software

There is no exact system existing but some mobile applications like Agricentral, Plantix provide some features of our application. But they are totally meant for all over India, this application is only for the Punjab state only. All the features in one application is not present up to now. One provides only weather and pests and other provides only diseases and their cure and reasons.

3.3 What's new in the system to be developed

The main objective of this project is to develop a agricultural related application that involves a disease prediction module and weather API. It defines from the start of the agriculture farming to the types of pesticides used.

Agri Help manages to predict the disease of the crops by the image processing method very accurately. All the functionalities required now are present in a single application. A farmer or hobby gardener or grow vegetables, fruit crops can easily access the application.

4. PROPOSED TECHNIQUE

Agri Help is basically a agriculture related mobile application where the main steps and instructions of farming are published. In this application any type of user can login and see their present district's agricultural land's situation of NPK content and based on the crop how much amount of extra amount of fertilizers are needed for the best yield. NPK are used as nutrients for the soil. NPK is brief kind of N (N), Phosphorus (P) and metallic element (K), that are the 3 major components during this reasonably fertilizer. They're essential for plant growth and increase the fertility of the soil lacking these macronutrients. We recommend the amount of extra NPK content needed for the land based on their districts agricultural soil content values. Our weather API works on Google weather API, it shows the temperature, present situation of the day whether it is rainy, sunny, snow and cloudy in the description box.

Features of Agri Help

- Agriculture Section: Our agriculture module suggests the user crops that are suitable for the present crop season and amount of quantity of fertilizers to use based on the district of user's land.
- Horticulture Section: Horticulture section is meant for the user's having small land's like kitchen garden, any small perennial plant holders and nursery's. It defines the plants with no use of pesticides. [5]

- Diseases Section: Diseases section predicts the diseases that people scan in the application. And recommends the necessary pesticide that cure the disease.
- Weather Section: Our weather module works on Google weather API means all the weather updates are taken from the Google weather.

4.1 FEASIBILITY STUDY

Technical Feasibility

Technical Feasibility of Agri Help needs to be follow these aspect

- First we need to ensure that saving and retrieving of data given by user is done fine in firebase or not.
- Mainly in the disease module the scanner must be able to scan the crop and image must be processed and reply of which disease and pesticide to use should be given as soon as possible.
- While user is requesting for any page to access from server then server should be reply to user ASAP
- Our information should be able to handle a good no. of visitors.

Economic Feasibility

In monetary plausibility we see that on the off chance that we have to live our task and what will be cost required. While we are making a versatile application then we have to deal with our database cost and show casting cost.

Operational Feasibility

After the completion of the project we'd like to possess some operations that require to be done time to time. In Agri facilitate we'd like to figure on these operational activities.

- Changing the data (if required): if there are any new crops that can grow in their particular district, micro and macro nutrients content, and any new diseases that can the crop.
- Changing the info on regular basis: Mobile application outline and content are two main assets that attract the user. We need to work upon to make app more user friendly.
- Firebase backup: It is very important to back up the application and user data because there could be any chance to lost the data due to any software failure.

5. SOFTWARE REQUIREMENT ANALYSIS

5.1 Introduction

These are the technologies that we need:

Android: Automation could be a mobile OS currently developed by Google, based on the UNIX system kernel and designed principally for bit screen mobile devices like good phones and tablets. [9]

XML: Extensible nomenclature or XML, a nomenclature created as a regular thanks to encipherinformation in internet-based applications. automation applications use XML to form layout files.

JAVA: Java is Associate in nursing object-oriented, cross platform, multi-purpose programming language made by Sun Microsystems. It absolutely was developed to be a machine freelance internet technology. We tend to use the java library and code in java, C, C++ and the other programming languages.

Firebase: Base of operations provides a true time information and backend as service. Theservice provides application developers Associate in Nursing API that permits application information to be synchronic across shoppers and keep on Firebase's cloud.

Python: Python could be a wide used general, high level programming language. it absolutely wasprincipally developed for stress on code readability, and its syntax permits programmers to precise ideas in fewer lines of code.

Tensor flow: Tensor Flow provides a group of workflows to develop and train modelsexploitation Python, JavaScript, or Swift, and to simply deploy within the cloud, within the browser, or on- device regardless of what language you utilize.

Teachable Machine: Teachable Machine is a web-based tool that makes creating machinelearning models fast, easy, and accessible to everyone. Teachable Machine is flexible – use files or capture examples live. It's respectful of the way you work. You can even choose to use it entirely on-device, without any webcam or microphone data leaving your computer.

5.2 General description

General Description of XML

XML is a markup language much like HTML used to describe data. XML tags are not predefined in XML. It is used for designing our layouts because xml is lightweight language. By storing the UI as XML, it may be easier to parse so the designer can be simpler to implement, totally a Domain Specific language. [8]

General Description of Tensor flow in Python

Steps of using tensor flow by python development:

1. **Load and preprocess data** – Load large and small data sets with tf.data
2. **Build, train and reuse the data** – Tensor flow provides a method to trainthe model
3. **Deploy** – Deploy using python

General Description of Teachable Machine

Steps of using Teachable Machine:

- **Gather** - Gather and group your examples into classes, or categories, that you want the computer to learn.
- **Train** - Train your model, then instantly test it out to see whether it can correctly class if new examples.
- **Export** - Export your model for your projects: sites, apps, and more. You can download your model or host it online for free. [6]

5.3 Software and Hardware requirements:**Environment Involved:**

- **Operating System:** Microsoft Windows 7/8/10
- **Data base server:** Google Firebase
- **Clients:** Mobile App
- **Tools:** Notepad++, Microsoft Word, Microsoft excel sheets
- **User Interface:** XML (Android Studio)

Hardware Requirements:

- Microsoft Windows 7/8/10(32bit or 64bit)
- PC with 3GB RAM minimum, 8GB RAM counseled(plus 1GB for automation emulator)
- 2GB accessible disk space minimum, 4GB counseled(500 MB for IDE + 1.5 GB for automation SDK and some system image)
- 1200*800 minimum screen resolution
- Smart Phone with minimum 2GB RAM is required for developing and debugging the application.

Software Requirements:

- Windows 7/8/10
- Touch Screen Mobile(Min 2GB RAM)
- Android Studio 3.5.2
- Google Firebase
- Teachable Machine with Google
- Microsoft Word
- Microsoft Excel Sheet

6. DESIGN

6.1 System Design

It is the technique of depicting the development, parts, modules, interfaces and information for a frame work to full fill indicated necessities. One could comprehend it as the requesting of frame works hypothesis to item improvement. There are similitude with the controls of frameworks investigation, frameworks design and framework building. [3]

6.2 Use Case Diagram

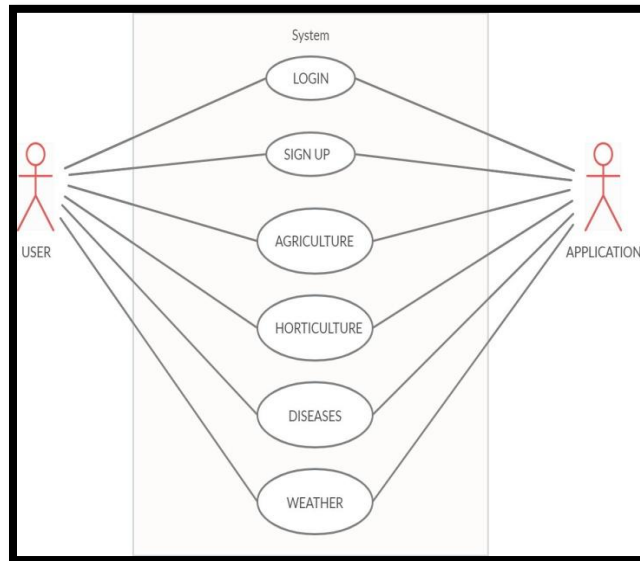


Fig 6.1 Use Cas

6.3 Detailed Design

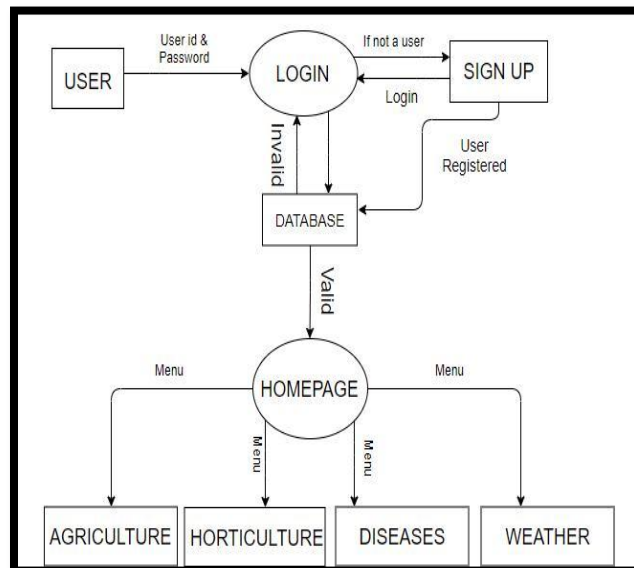


Fig 6.2 Data Flow Diagram

6.4 E-R Diagram

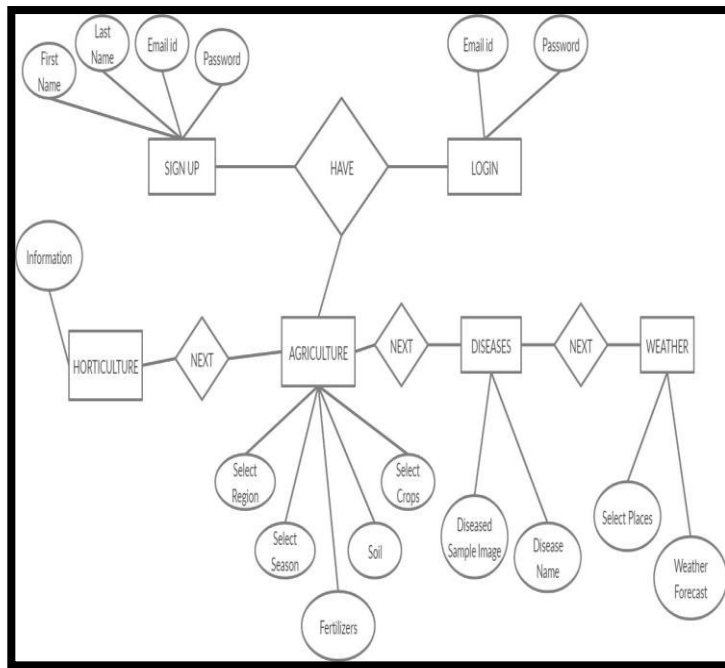


Fig 6.4 E-R Diagram [4]

8. EXPERIMENTAL RESULTS

8.1 Implementing User View

The Application looks in a more attractive way which is made using XML in Android Studio. The designing of the User Interface started with the Idea of designing the Logo first. After the Logo is displayed then follows the Main Page with attractive User Interface with logo transparent on the background. Android Studio provides us many ways to create the backgrounds of the User Interface.



Fig 8.1 Logo of the Project

8.2 Implementing Back End

The back end of the application deals with JAVA for programming and functioning the application. It involves Google Firebase for Login and Sign Up features. The most important thing is that there is a facility of taking the picture of disease sample of a plant and the application will provide which disease is it and also the required pesticide for that disease. Also the weather forecast in this application uses the correct weather forecast time to time and display to the user. [4]

8.3 Outcomes

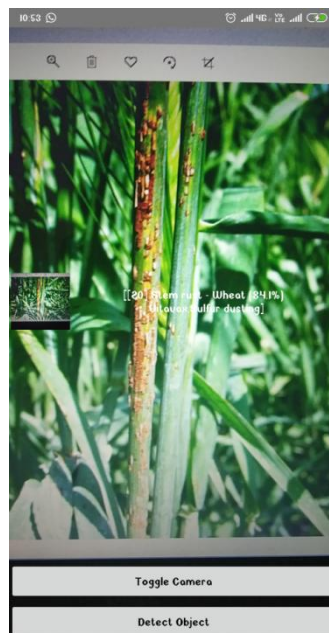


Fig 8.2 Diseases Module

**Fig 8.3 Suggested Crops**

9. PROJECT LEGACY

9.1 Current Status of the Project

At present, we are focusing to make this application more user friendly, and to make changes in the user interface, we have taken more information from many people, we don't want to waste that information. We are also working on some more features in the application like developing UI, farm machineries used at the time of harvesting.

We performed testing phase and we found many bugs in application. We have taken lots of effort to fix all the bugs.

9.2 Remaining Areas of Concern

- User friendly Interface
- A much more perfection in suggesting pesticides and fertilizers
- Improved Database(Firebase)
- Correcting all the test cases if wrong.

10. Research Work**Table 10.1 Fertilizers for Soil Fertility according to crops**

CROP	Nitrogen (kg/Hect)	Phosphorus(kg/Hect)	Potassium(kg/Hect)
Rice	80-100	60-80	30-45
Cotton	20-40	20	20
SugarCane	250	100	120
Maize	120-150	60-75	35
Tomato	50	150	150
Chilly	60	80	80
Wheat	80-100	60-80	30-45
Potato	250	100	120
Carrot	50	150	150
Nitrogen - Urea, Phosphorus - DAP(Di Ammonium Phosphate), Potassium - MOP(Murate of Potash)			

Table 10.2 District Wise NPK Content

Districts	Nitrogen	Phosphorus	Potassium
Pathankot	Low	High	High
Gurdaspur	Low	High	High
Hoshiarpur	Low	High	Medium
Tarn Taran	Low	High	High
Kapurthala	Low	High	High
Jalandhar	Low	High	High
Nawanshahr	Medium	Medium	High
Rup Nagar	Medium	High	Medium
Ferozpur	Low	Medium	High
Moga	Low	Medium	High
Ludhiana	Low	High	High
Fatehgarh Sahib	Medium	High	High
Chandigarh	Medium	Medium	High
Faridkot	Low	Medium	High
Fazilka	Low	Medium	High
Muktsar	Low	Medium	High
Bathinda	Low	High	High
Barnala	Low	Medium	High
Sangrur	Medium	Medium	High
Patiala	Medium	Medium	High

Mansa	Low	Medium	High
Amritsar	Low	High	High
Kharif -- June to Sep Rabi -- Nov to Mar Zaid -- Mar to Jul			

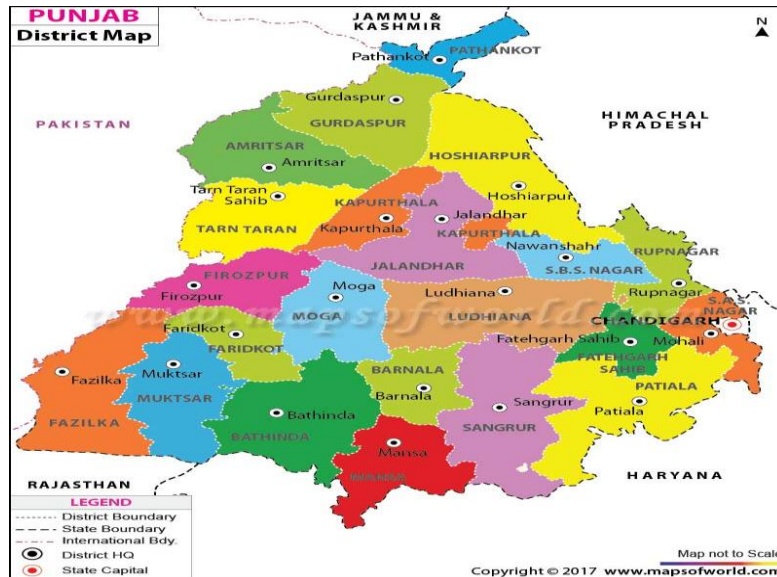


Fig 10.1 Districts in Punjab

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