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Decision Support System for Agriculture Management

Authors

Vinita Patil[1], Snehal Payer[2], Trupti Teli[3], Prof Suja Jaychandran[4]

Department of Computer Engineering

Vidyalankar Institute of Technology Wadala (E), Mumbai-400037, India

Abstract

Currently climate change is one of the major problems encountered due to the climatic controls interacting in various intensities and in different combinations.[7]Agro Supply Chain will be an advisory and information system for the farmers. Agro Supply Chain will be available on mobile phones, which will be designed for farmers to help them stay on track, avoid troubles, manage their expenses in cultivation, receive all the latest and updated information, government schemes and strategies related to the field of agriculture along with suppliers details for sugarcane. The advisory system will enable its users to receive real-time and interactive advices and alerts on crop. Different alerts will be provided for plantation, insects, diseases and nutrition. Farmers will also receive regular pest, disease alerts and market price information to support on-farm decision making.

Keywords: *Budget Calculator, Schedule Calculator, Naive Bayes*

Introduction

Mobile communication technology has quickly become the world's most common way of transmitting voice, data, and services in the developing world. Given this dramatic change, mobile applications (m-apps) in general and mobile applications for agricultural and rural development (m-ARD apps) in particular hold significant potential for advancing development. They could provide the most affordable ways for millions of people to access information, markets, finance, and governance systems previously unavailable to them. M-apps are software designed to take advantage of mobile technology and can be developed for technology besides mobile phones.

This application contains three main modules:

Information system: This module includes creating different schedules and providing different strategies for cultivation of sugarcane.

Budget calculator: This module creates budget for cultivation of Sugarcane according to input provided by farmers. It also provides profit and loss calculation.

Reports: This module provides financial and non-financial reports for farmers.

Literature Survey

What Are Mobile Applications?

With mobile handsets being used in nearly every country and community, the development of applications for them offers uses that extend well beyond voice and text communications. Mobile applications for agricultural and rural development (m-ARD apps) could provide the most economic, practical, and accessible routes to information, markets, governance, and finance for millions of people who have been excluded from their use.

This section discusses m-apps generally; the report then switches to its focus on m-ARD apps. M-apps are software designed to take advantage of mobile technology, enabling the collection and transmission of data for economic and social activities—whether

for commercial, administrative, or entertainment purposes (McNamara 2009). Moreover, m-apps are not necessarily associated with specific access devices but focus on providing information and facilitating activities. M-apps can be developed for technology besides mobile phones. For example, in one of the case studies conducted for this report, e-Dairy—an agricultural extension service offering timely data on cow insemination in Sri Lanka—was designed for touch screens, which are larger and less mobile than cell phones. The touch screens are at fixed locations, and though their monitors can provide more information than the smaller screens on mobile phones, mobile phones have several advantages over less mobile (or fixed location) devices such as touch screens. Mobile phones:

1. Are owned by more people.
2. Provide delivery in an instant, more convenient way.
3. Can deliver personalized information to individual owners.
4. Are cheaper to deploy.
5. Provide other functions such as voice communication.

In addition, most m-apps can be replicated across different mobile interfaces and devices, such as SMS phones, mobile browsers, smartphones, and tablets. This is because the most challenging part of developing m-apps involves their common backend and infrastructure—especially if integration between databases is required.

In Existing system farmers not connected with any technology and analysis. So there is many chance of loss. Sometime wrong selection of farmers will effect on their income to reduce these we have to develop app which can able to predict what to choose when we can start process and cost also.Overview of existing applications from different technologies such as Android, IOS etc. For selection of the topic.

Disadvantages of Existing system:

Many chance of money and time loss.

This system is not user friendly.

User required to travel at district for new message. Many times user did not get correct messages.

Proposed System

We are going to develop a system which completely helps a farmer to make a decision which crop he should take depending on the season.

Naive Bayes classifier will be used and decision will be taken based on current scenarios.

Following module will be used in project

1) Registration: user can register with his name, password, email- id, and GCM id will used.GCM id: mobile generated id is system generated.

2) Login: user can do login by entering his username and password.

3) Crop recommendation: depending on current scenarios user will get recommendation for cultivating a crop Naive Bayes classifier will be used.[1]

4) Language support: User can see output in Many languages

5) Audible: When user wants to listen any recommendation, updates it is required to make it audible as it helps a lot

6) GCM: Google Cloud Messaging system: This module is used to give alerts to user.

GCM Modules

Google Cloud Messaging GCM for Android and Push Notifications

Google cloud messaging (GCM) is an Android platform API provided by Google for sending and receiving push notifications to and from an Android application. This is one of the most important arsenal in an Android developer's armory.[5]

Let us consider an email android application, it is not efficient to have the application ping the server to check for updates regularly. Mobile devices' resources should to be used wisely as they are scarce. Google Cloud Messaging GCM API

We can use GCM as a notification engine. On an event it will send a notification to an android application and vice-versa.

A notification is a small piece of information. Using GCM,. For now GCM is a free service

Prerequisite for Custom Application

Google API Server Key:

Applications can use simple API access keys in order to associate API calls with their project. This will not give permissions to retrieve user data, but will allow access to APIs which have been configured for that project.

Server keys:

Create and use a server key if your application runs on a server. Do not use this key outside of your server code.

GCM RegId of the Android Device to communicate via GCM Naive-Bayes Classification Algorithm.

Bayes Theorem

Bayesian reasoning is applied to decision making and inferential statistics that deals with probability inference. It is used the knowledge of prior events to predict future events.[1]

Advantages of proposed system

Help farmer for managing his expenses and schedule: Using this application farmer can get approximate budget for planting sugarcane. Farmer insert details like area of land, type of soil, month of plantation. Depending on input harvesting period, amount of fertilizers, amount of water are display. Depending on input all expenses requires for plantation are display to farmer like price for land, price for fertilizers ,price required for water , price required for plantation , price required for preplantation etc. By using these application farmers will also get the exact schedule depending upon the plantation he has chosen for e.g. “Suru Plantation”, “Preseasonal Plantation”. He will also get the schedule for irrigation and fertilization. [1]

Latest Government Policies are easily available. Farmers will get latest government policies related to agriculture Government policies available on Ministry of Agriculture web site but for farmer always it is not possible to check government policies on site.

Provide new Strategies and Technologies for Farming. This application will provide new strategies in plantation and upcoming technologies for better production of crop. For example, plantation technique, amount of irrigation to be done, type and amount of fertilizers to be used in plantation. Reuse of seed for next plantation called as “Khodwa Plantation”.

Applications

Agriculture: Help farmer for managing his expenses and schedule: Using this application farmer can get approximate budget for planting sugarcane. Farmer insert details like area of land, type of soil, month of plantation. Depending on input harvesting period, amount of fertilizers, amount of water are display. Depending on input all expenses requires for plantation are display to farmer like price for land, price for fertilizers ,price required for water , price required for plantation, price required for preplantation etc. By using these application farmers will also get the exact schedule depending upon the plantation he has chosen for e.g. “Suru Plantation”, “Preseasonal Plantation”. He will also get the schedule for irrigation and fertilization.[1]

Weather reporter: The advisory system will enable its users to receive real-time and interactive advices and alerts on crop. Different alerts will be provided for plantation, insects, diseases and nutrition. Farmers will also receive regular pest, disease alerts and market price information to support on-farm decision making. It gives weather report that help the farmer while planting the crops.[4]

Agricultural Education: Giving the farmer all the educational details like planting crops, adding fertilizers to the plant in proper amount. Giving the all plants details.Giving all the knowledge about the government policies and many more activities. That will help him to increase their production.[2]

Conclusion

This android application is the complete package for farmers who want to do farming on multiple plants or crops and obtain good production with proper management. It gives the farmers also the government policies details .This is multi language application that help any type of farmer. It also includes audio feature that help the illiterate farmer

only by listing the audio. Also it gives proper information about the fertilizers for the plant and what amount that can be added to the crops. When they plant and when they cut the plants or crops all the information that can be given in this app. This is complete package for farmer knowing about the plantation and farming.

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