

Red Gram Agro Advisory System

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Abstract— Agriculture is very helpful to meet the basic needs of human and their civilization by providing food, clothing, shelters, medicine and recreation. Hence, agriculture is the most important enterprise in the world. Agriculture provides a free fare and fresh environment, abundant food for driving out famine; favours friendship by eliminating fights. Red gram production is major plant or seed in world. Average world production of red gram is at 3.0 million tons in the last six years (2000-05). The area under cultivation is stagnant at 4.5 million hectares in the same period. Red gram is drought resistant and can be grown in areas with less than 650 mm annual rainfall. Production of red gram is estimated at 46,000 km² in all over world. Around 82% of this is grown in India. Hence it is necessary to develop android application for red gram crop. It is helpful for farmer to have all information related to red gram crop. This app will contain crop information and disease related to crop.

Keywords— Agriculture, red gram, android application, crop information.

I. INTRODUCTION

Agriculture is very helpful to meet the basic needs of human and their civilization by providing food, clothing, shelters, medicine and recreation. Hence, agriculture is the most important enterprise in the world. It is a producing the free gifts of nature namely land, light, air, temperature and rain water etc., are integrated into single primary unit indispensable for human beings. Secondary products likely animals including livestock, birds and insects, feed on these primary units and provide concentrated products such as meat, milk, wool, eggs, honey, silk. Therefore the term agriculture means cultivation of land. i.e., it is technology of producing crops and livestock for economic purposes. It is also referred as the science of producing crops and livestock from the natural resources of the earth [9].

The purpose of agriculture is to cause the land to produce more abundantly, and at the same time, to protect it from deterioration and misuse. It is relative with farming—the production of food and other industrial materials [1]. India is the largest producer and consumer of red gram in the world, constituting 75% of world production and consuming 90 % of the world production. Other major countries are Myanmar, Kenya, Uganda and Malawi. Red gram accounts for about 20 percent of the total pulse production of the country. India annually imports 2-3 lakh tones of which 95% is from Myanmar. India annually produces about 2.0-2.5 million tones and the production has

been stagnant in the past 10 years. The shift in cultivation from pulses to commercial crops and lack of technological innovations to increase yields has hindered the rise in output. The major producing states are Maharashtra, Uttar Pradesh, Orissa and Karnataka. Among these, Maharashtra is largest producer of red gram which constitutes about 34% and these four states contribute nearly 70% of total output in the country.

II. MOTIVATION

In agriculture domain, the farmers might have concerns and queries regarding crop, soil, climate, cultivation process, disease, and pest. They express their queries in a natural language which are usually answered by agriculture experts. Due to lack of access, distance or time, the expert is usually not present physically to answer all the queries of the farmers. Hence, the farmers may not understand clearly what the experts wanted to convey. In such a situation, there is a possibility of communication gap between farmers and knowledge of agriculture experts. Based on such observations and situations, we are motivated to develop a system that can help to bridge that gap and able to answer basic queries for the farmers that might help them in improving their farming practices

MAJOR CONSTRAINTS

Network and Operating system permissions are major constraints.

1. It is limited to work on Android Environment only.
2. Device requires android version 4.0.1 (Ice-cream sandwich) or above.
3. Server System must have .Net framework.
4. System requires SQL Server 2008 installed on the server system which is very vital to maintain integrity of database.

APPLICATIONS

- This application can be widely used in personal as well as organizational level.
- This application consumes low cost.
- It will give efficient quality of services.

HARDWARE RESOURCES REQUIRED

- Android cell phone

Time Estimates

Accurate time estimation is a skill essential for good project management.

SOFTWARE RESOURCES REQUIRED

Platform:

1. Operating System: Windows
2. IDE: IDE- Eclipse (Android System)
3. Programming Language: JAVA (JDK 1.6)

Cost Estimate

The total cost required for the system includes the cost of hardware which will be used for implementing. Cost of hardware includes cost of computer, server, and various software's for maintenance of the system. Deadlines for delivery and planning of projects, and hence will impact on other people assessment of your reliability and competence. There are lots of different factors that affect the required time for doing tasks. Specie details in the task description, team efficiency and effectiveness, holidays, team members taking vacations. Consists of documenting on an ongoing basis through the project all external as well as internal risk.

Project Resources

System requires personal computer, android phone, Android Studio, Net-Beans 7.1 and MYSQL.

Risk Management w.r.t. NP Hard analysis

Risk Identification

The process used to determine the risks that could potentially prevent the program, enterprise, or investment from achieving its objectives. It includes documenting and communicating the concern. It is process of systematically identifying all possible risk events which have a potential impact on the project. It

III. LITERATURE SURVEY

An advisory system presented [1] in this paper helps to Connect between farmers and the agriculture domain experts and developed for the cotton farmers in Gujarat region of India. The system consists of three basic components; Cotton Ontology, Web Services, and Mobile Application Development. The Metaphysical Science maintains domain knowledge required for answering farmer queries. The Metaphysical science maintains information regarding cultivation process crop, soil, disease, pest, and other relevant information. Metaphysical Science is used to develop this ontology. (e-sagu [8], BHOOMI [9], Sam park [10]) are Three award winning projects of the Government of India Played very important role to connect farmer and System. 'A AQUA' [2] and 'Agro Advisory System' [7] Developed by IIT Bombay Using Agro Advisory System, farmers can pose their Queries to the system and get the appropriate solution for their problems. AQUA is a discussion forum to help farmers in solving their queries related to crops. It is Multimedia based multitasking questions and answer forum Advisory system. M-Krishi [3], developed by TCS, is a Mobile based agro advisory system. It provides the farm Specific soil and crop data, and expert's advice farmers through audio-video agro advisory services.

Farmers can pose their queries to the system and get the appropriate solution for their problems. It uses cotton ontology for varieties of cotton, pest and diseases affecting cotton and their cure and precaution related to them. Agropedia [4][5], Android based application providing production practices of cultivable crops in kannada and English language. Android based mobile applications [13] like Kisan Yoga a(providing useful information to the farmer about government scheme for perspective) magazines in the agriculture sector, under publication since 1965 and it is published by Department of Agriculture, Maharashtra.) and Farm pedia (targeted for rural Gujarat) are available on Google Store.

IV. SYSTEM DESIGN

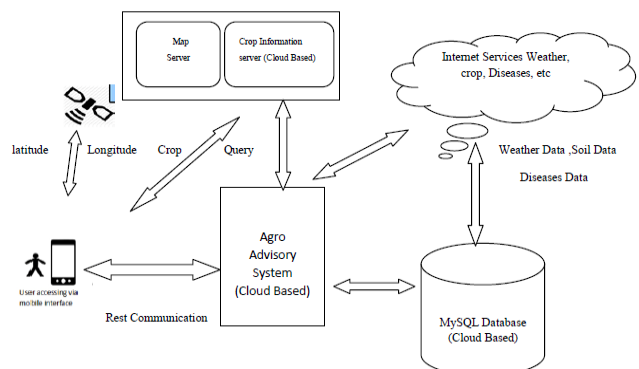


Fig1. System Architecture.

As per above System Architecture there are five modules User Access via mobile interface: user needs to download the mobile app and register. Registration detail will be stored into the agro advisory system. Map server gives the details of the longitude and latitude of the register user through satellite.

Crop Information Server: Different Red Gram crops details are stored.

My SQL database: This database holds the static information of user, crops and zonal details.

Geographical Database: This Database provides information about farmer region, climate condition, which Red Gram Crop is suitable for that region, different diseases information on particular climate condition. Mapping Services are provided by using app like Carto-DB or Google Earth.

The Restful services: The services are responsible for the communication that takes place between the components of the system it connect the SQL Server.RDF Query.

Methodologies of Problem solving and efficiency issues

Different ways in which for providing a correct system is several and there are often several methodologies and potency problems associated with them. Some are mentioned below:

1. In previous system we have a tendency to weren't having a correct system that had a connectivity to entertain an effectively.
2. In projected system, we have a tendency to have system for providing higher and e-client services as compared to the previous model that was a distributed one we've enclosed a module for common diagnosing of diseases. Efficiency issue. In previous system there was distributed approach for determination the matter statement specified and by employing a additional balanced model we have a tendency to tried to increase the potency of the project.

V. RESEARCH CHALLENGES

Following are the research challenges to develop the system given in this paper:

User Interface Design: Interface is the main research issue. It should be user friendly. Most of the users. Won't be able to use a system, If it demands a lot of manual input and has complex user interface.

Red Gram for North Karnataka region: North Karnataka state is widely growing Red Gram Crop. There is not a single knowledge based system available for Red Gram for North Karnataka region. To have effective Agro Advisory system for the North Karnataka region Red Gram farmers, a

complete Red Gram Android Advisory System is yet to be developed.

Inference based query: answering is a challenging research issue. All the information in the Advisory is not explicit. To access implicit information, we need reasoning capability in the System. Reasoners are required to do such tasks. The system should be capable to generate. Natural language based queries: The system should be capable to answer queries which are often asked by Farmers to the agro experts. In case of new queries, the system may fail to generate recommendations. To address this issue, the system should have capabilities to handle natural language queries.

Regional language based interface: Every region in India has its own regional language and farmer usually have knowledge of their regional language only. The system's interface should be easy to use for farmers. To build such system can be a challenging task.

Integrating online services like weather information and mapping server: To display information with Geographic attributes, we had to use a mapping server which follows OGC standards and is capable of displaying dynamic information on a map. We have used other available services like Open Weather Map and Android GPS for pulling information about weather and current location of the user.

Deployment of the system: We need to deploy the System on a cloud based system that is easily accessible. The web services and database both should be deployed online so that the users can access irrespective of their locations.

VI. RESULTS AND DISCUSSION

Considering the developed system and testing performed, we have a system in place that is accessible from the internet on a mobile device with internet access. The SQL database is deployed on Hurok PostGreSQL server. The RDF data is stored as an Extensible Mark up Language (XML) [22] file along with the web services (.war format) on the Hurok server. The geographic data is stored at Carto DB web portal which is accessible to our web services for query and updating. The users will be able to access a variety of data like crops, crop types, fanner information and other relevant data on their mobile phones without being concerned about the source of data. The mobile device only needs to communicate with the web services. The interface for the mobile phone system is very easy to use and does not require much training. Automated recommendations can be generated using ontology and RDF concepts that will help the users get the most common queries answered fast and easy. The system is capable of answering queries like Disease preventions and pest cure based on symptoms, obtaining types of crops and soils etc. We have used the Open Weather Map web services to get the weather data. The farmers/users can get current weather information for their current locations through the system. Apart from that we

have gathered past weather data to deduce patterns and detect spikes in weather conditions.

VII. ADVISORY SYSTEM



Fig 1(a). Login Model

In this module user can login to system with his user name and password, before that they need to sign up with his details

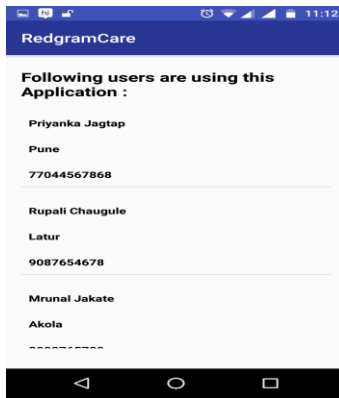


Fig 1(b).Registered Information Module

User can register to this system by giving information displayed as per above figure.

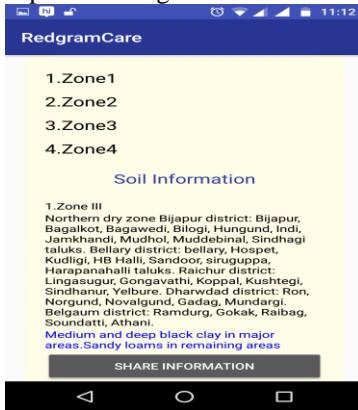


Fig 2(a). Zone Module

In this module user will get information about which zone is better for which crop and get detail about which soil is better.

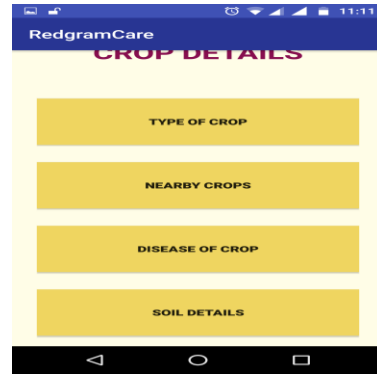


Fig 2(b).Crop Detail Module

In this module user can get information about Red Gram varieties, type of diseases in Red Gram crop, and soil details in that zone?

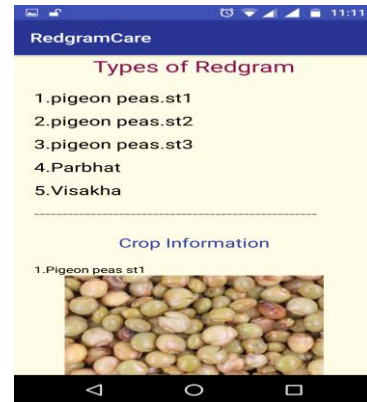


Fig 3(a).Type of Red gram

In this module user can get information about type of Red Gram can be grow depends on Zone and Weather condition.



Fig 3(b).Diseases Planning Module

In this Module user can identify what type of diseases affected by crop depends on feature Like Pod fly, Pod borer, Blister beetle, plume mouth soil symptoms and Pesticides.

VIII. CONCLUSION AND FUTURE WORK

Red Gram Advisory System helps farmer to improve their Red Gram Crop in Northern Karnataka Region. User can directly get information regarding Red Gram Crop with his query and which zone is better for which varieties of crop including weather predictions techniques. The system responds to user's regarding information about location based, check information about surrounding farms, report diseases, request for recommendations regarding cure and prevention of diseases, and pest infections. The more concepts the ontology has, the effective will be the reasoning capability of the system to provide the users with better recommendations. The system can be improved by generating recommendations using natural language based queries and supporting regional language to make it truly user friendly.

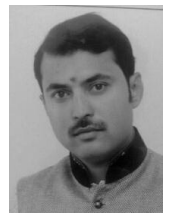
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