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Android Agro Advisory System

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Abstract:

In the agricultural domain, the main challenge is to present the new information and research to the farmers so that they can leverage the power of ICT to improve their agricultural practices and there by the production.An agro advisory system helps to bridge the gap between farmers and the agriculture domain experts.The system consists of three basic component: Ontology, Web Services, and Mobile Application Development.The ontology maintains domain knowledge required for answering farmer queries. The ontology contains information regarding crop, soil, cultivation process, disease, pest, and other relevant information.Huge amount of agriculture related data like weather data,soil health records, cropping pattern, location specific crop disease and pest are collected from different sources like services, remote satellites, and network of sensors.

Keywords — **Ontology,Web services,ICT->Information communication technology.**

I. INTRODUCTION

We develope a app for mobile device like android smartphone,etc.In this app we provide the services like weather information, soil health status, cropping pattern, location specific crop disease,etc.

We develope to better GUI based app then farmer can understood i.e they do not have difficulties to find answers for their question.They can chat with experts,they can call and ask the questions to experts,etc facilities we can provide in this app.

This app ecosystem provides an integrated view of the farmers profile,farming history, and the required farm parameters on a console at a remote location to an expert. Farmers can also send pictures of their crops and pests captured with mobile phone cameras, sensors provide farm specific soil and crop data, weather stations provide microclimate details and voice based querying system gives freedom to the farmers to ask any query in their local (natural) language.

II. GOALS & OBJECTIVES

- To design less expensive and more efficient expert advisory systems.

- To design user friendly User Interface.

III. MOTIVATION

Agriculture plays an important role in Indian economy due to the large rural population.Because of this,in the current age more/large amount of data related to agriculture like weather,soil,etc being collected by different sources.But this all data is notused efficiently by the farmers due to lack of mediums for that information to flow.In agriculture domain,the farmers might have queries regarding soil, crop, diseases, weather, etc.Based on such observations and situations, we are motivated to develop a system that can help to bridge the gap between farmers and expert and able to answer basic queries for the farmers that might help them in improving their farming practices.

IV. EXISTING SYSTEM

Krishimantra: Agricultural Recommendation System

This paper suggests a semantic web based architecture to generate agricultural recommendations, using spatial data and agricultural knowledge bases. With the evolution of Web 2.0, ICT has become the primary need of human beings.There is a gap between the farmers and the knowledge of agricultural experts. ICT can

fill the gap between farmers and the experts.The knowledge base acts as a domain expert and will send recommendations to the farmers based on climate conditions and geographic data.
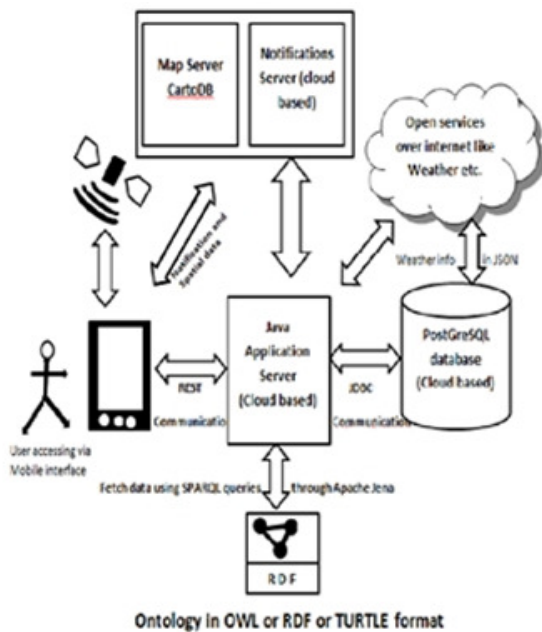
Agrisnet

Agrisnet provide a web based portal that gives access to various kinds of information like seed,plant protection, fertilizer, Soil Health Card , Weather etc. to the registered farmers. The objective is to create a scalable data bank for agricultural inputs throughout the state of West Bengal, India.

V. SYSTEM ARCHITECTURE

Ontology in OWL or RDF or TURTLE format

On android platform we are having our apllication.Farmer Can put their information like name,crop,soil,weather condition,etc information which will be stored on cloud on static database such as PostgreSQL based database. This database will also store frequently asked question. This database will be connected to Java server and through REST services android app can operate on it.Farmer can also store his geographic information and for storing this we will use CartoDB database.

This database also be connected to Java server.We are using google weather API to provid   weather information to farmer.Ontology will be used and will be stored in RDF which can be used by Apache Jena Framework and we need simple protocol and RDF Query   language will be used to querying ontology.Query results will directly provided to farmer's apllication and will also be stored on database.

There are experts sitting on server side who can analyse current situations and current queries and can add new knowledge in database.

Farmers can put their queries on forum where experts can analyse them and give their precious suggession.So that housands of farmer's with similar query will get benefited and experts time will be saved.

VI.   IMPLEMENTATION DETAIL

A.   Hardware and software requirements

We have used the following tools and softwares for development, testing and deployment :
JDK 1.6 or higher,Android Studio 2015,Java Application web server,PostgreSQL 9.2, pgAdmin, PostGIS 2.0, Quantum GIS Lisboa version or higher, Android SDK v4.0 or higher,Apache Jena for RDF queries, and Mapping service providers like CartoDB,REST full services.

VII.   CHALLENGES

- User Interface Design.
- Ontology Based Agro Advisory System Development
- Cotton ontology for region
- Ontology reasoning
- Natural language based queries
- Regional language based interface
- Integrating online services like weather information and mapping server.

VIII. APPLICATIONS AND BENEFITS

1. The gap between the farmer's and the experts
   will be reduced.
2. Time required to give experts advice will get reduced because now experts don't need to visit each and every farm.Only just by reading queries experts give their advices to each farmer's in personal.
3. Farmers can also put their query in on web forum where experts can answer them   and
   thousands of farmer's with same query an read answers given by them and can get benefited.

4. Farmers will also get weather notifications
   so that they will be aware of any future weather conditions.Now they can protect their farms from upcoming weather disasters.
5. Graphs can describe situations better than numbers.So that when any big diseases get spread over large areas.Then just by looking at graphs.Experts will get to the conclusions in very less time and can give their expert advise so that many farms will get saved.

IX. CONCLUSION

This android app will come with a revolution in farming and many farmers will get optimum advice for their crop.And the problem of lack of knowledge of farming will get solved.

X. FUTURE WORK

We can make the system more useful by including weather predictions techniques. Alerts and notifications related to weather can be sent to the farmers so that they can take appropriate precautions before any damage is done by the weather anomaly. As the system grows, more data relating to Villages/Talukasl Districts would be added and more people would be able to take benefit   of   the system.

REFERENCES

1. Tim Berners-Lee, James Hendler, Ora Lassila "The Semantic Web " Scientific American, pp. 02, May 17,2001.

2. V. Kumar, V. Dave, R. Nagrani, S. Chaudhary, and M. Bhise "Crop Cultivation Information System on Mobile Phones" in IEEE Global Humanitarian Technology Conference (GHTC), pp. 196-202, ISBN:978-1-4799-1094-6, 2013.

3. S. Chaudhary and M. Bhise "RESTful Services for Agricultural Recommendation System" in Proceedings of NSDI-2013 , llTB,Mumbai, pp. 46-52, November 29-30,2013

4. V. Kumar, V. Dave, R. Bhadauriya, and S. Chaudhary "Krishimantra: Agricultural Recommendation System" in Proceedings of the 3rd ACM Symposium on Computing for Development, Article No. 45,ISBN:9781450318563,DOI:O.1145/2442 882.2442933, 2013.

5. M. H. Bohara, M. Mishr, and S. Chaudhary "RESTful Web Service Integration Using Android Platform" in Fourth International

Conference on Computing Communication and Networking Technologies , Tiruchengode, Tamilnadu,India, July 4-6, 2013.

6. P. Krishna Reddy, G. V. Ramaraju, and G. S. Reddy "eSagu" Media Lab Asia Project International Institute of Information Technology (IIIT-H),Hyderabad,India.

7. " Agrisnet: A Mission mode project to promote agricultural informatics and communications, http://wbagrisnet.gov.in, June, 2014.

8. Kissan Kerela:An Integrated multi-modal agricultural information system for kerela" llITM-K,Thiruvanathapuram, http://www.kissankerala.net.June. 2014.

9. Ramamritham Krithi, Anil Bahuman, Ruchi Kumar, AdityaChand, Subhasri Duttagupta, G.V. Raja Kumar, and Chaitra Rao. "aAQUA A Multilingual, Multimedia Forum for the community" in IEEE International Conference onMultimedia and Expo, vol. 3, 2004.

10. S. Sahni, "Ontology Based Agro Advisory System", Computer Science and Engineering, lIT Mumbai, M.Tech. thesis , June 2012.