Krushimitra- Android Based Solution for Indian Agriculture

Samiksha Wagh[1] Shrutika Maske[2] Swati Chittatwar[3] Prashant Jadhav[4] Vikranti Aglawe[5]
[1,2,3,4,5]Suresh Deshmukh College of Engineering, Selukate, Wardha

Abstract— Information and Communication Technology (ICT) in agriculture is an emerging field focusing on the enhancement of agricultural and rural development in India. The advancement of ICT can be utilized for providing accurate and timely relevant information and services to the farmers, thereby facilitating an environment for remunerative agriculture. This paper describes a mobile based application for farmers which would help them in their farming activities. We propose an android based mobile application – KrishiMitra which would take care of the updates of the different agricultural commodities, weather forecast updates, agricultural news updates. The application has been designed taking Indian farming in consideration.
Key words: Android, Mobile Application, Mobile Computing, Smart Phone, Google Web Services

I. INTRODUCTION

Agriculture in India is the means of livelihood of almost two third of the workforce in the country. It has always been India's most important economic sector. Agriculture may be defined as an integrated system of techniques to control the growth and harvesting of animal and vegetables. It is an uncomplicated endeavour comprising of technical and practical processes that helps in the maintenance of the ecological balance and protects human resources; most importantly it is a viable food production system.

The agricultural sector is critically important in any developing economy and so it is in India, where it contributes close to 20% of GDP. Here 60% of the population depends on agriculture, either directly or indirectly. Small-scale producers, who make up the vast majority of Indian farmers, are often unable to access information that could increase yield and lead to better prices for their crops.

The rapid growth of mobile telephony and the recent introduction of mobile enabled information services provide a means to overcome existing information asymmetry. It also helps to bridge the gap between the availability and delivery of agriculture inputs and agriculture infrastructure.

Mobile or smart phones are becoming an essential device for all types of users irrespective of the age group. In India mobile technology has unleashed a paradigm shift in the communication medium to reach out to the masses. Android, the open-source mobile operating system developed by Google, is quickly becoming the smart phone of choice for activists. It's growing in popularity around the world, and has recently turned out to be stand on number two in smart phones' popularity in the world behind Nokia's Symbian operating system.

II. BACKGROUND

Mobile phones now have higher resolution cameras and near high definition video with huge amount of memory to enable storage of images and music. Now the Internet can be browsed through your handset and 3G and Wireless LAN connectivity is also available on the phones.

The mandi (market) price was the second most important piece of information accessed by farmers. The interviews and focus groups in different areas indicated that farmers had a wide range of information needs, which varied through the growing season. However, the broad categories of information required were common to all of them, irrespective of their location and crops. The Table shows the farmer's information needs –

Stage		Typical Information Needs
Know-How	-Crops Choice -Seed Property	-What are the new crop options or seed properties? -Are there higher value crops or better seed Varieties I should plant?
Context	-Weather -Plant Protection - Cultivation Practise	- When should I sow? When should I Harvest given my climate/soil? - What are best Cultivation practices for my crops and soil? - What inputs should I use? How they can be applied, in the best way? Where can I find them?
Market Information	· Market Prices · Market Demand · Logistics	-What are the prices and demand in relevant Markets? -Has there been a transport breakdown?

Table 1: Farmers Information Needs

Small farmers cited market prices, weather information, and information on diseases/plant protection, pesticides and seed information as their top needs.

Market prices are valuable not only in deciding where and when to sell, but also in deciding the cropping pattern.

Farm ERP, and makes every day business activities easier and more profitable – whilst allowing us to maintain higher quality, staff performance, cost control, and traceability levels.

This service has some barriers because the data is sent through the SMS. And there could be delays in the SMS also. The LifeLines India initiative launched by One World International in collaboration with British Telecom (BT) and CISCO is responsible for promoting digital inclusion and supporting the realization of the United Nations (UN) Millennium development goals in India.

The project was originally designed to deliver critical information pertaining to agriculture and animal husbandry to farmers in rural India via a digital platform, using the telephone as a primary medium for information access and use.

III. EXPERIMENTATION DETAILS AND PROPOSED FEATURES

It is Android based mobile application which would provide all the facilities to the farmers related to their agricultural activities. It would be helping them in getting the weather updates and they can also access the news related to agriculture and farms.

Krushimitra would be based on client-server architecture. The server will provide all required agricultural market information, weather updates and forecasting. It is designed to meet the needs of the Indian farmers. The application provides its users with a plenty of valuable features.

− The application has easy to use Graphical User Interface (GUI) with the capability of creating/editing/deleting portfolios that store the user preferences of market prices.
− Portfolio information retrieval is done through:

GPRS: The connection cost in this case is reduced to a minimum since only those few bytes requested by the user will be downloaded to the mobile phone.

Wi-Fi: A feature available for smart/3G mobile phones having a Wi-Fi adapter. The application in this case directly routes the connection through Wi-Fi, hence totally eliminating the cost.

A secured connection using HTTP protocol would be there to prevent information fraud.

A. Proposed Features

Weather is one of the most crucial features for the farmers. They are usually concerned about the changes in weather and other details related to the shifts in the surroundings. It helps in observing the temperature, dew factor, dryness and other minute details about the weather and forecast for next 4 days. One of the biggest challenges that each farmer faces is decisions related to marketing his grain and how those decisions will affect his bottom line. This application for agriculture enables the farmer to calculate profitability based on where the grain markets are currently trading and to see how higher or lower grain markets are presently. They would be able to get the current market prices depending upon the commodities. It should carry grain and livestock prices from major Indian agricultural market.

The application features customizable news feeds (related to agriculture and farms). The farmers can view the market news with the help of News RSS Feeds.
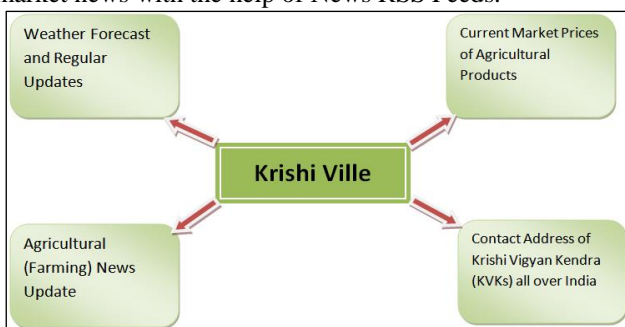

Fig. 1: Features of Krishimitra

It would help them to maintain a list of suppliers and sellers of the different commodities and items sold in the market. The application could help in guiding the people to manage and organize their tasks and particularly help them in remembering those tasks during usual hectic routines.

The application would also provide the farmers with the information about the various loan schemes offered by different major banks in India. E.g. National Bank for Agriculture and Rural Development (NABARD), State Bank of India etc.

A Hyper Text Transfer Protocol (HTTP) Connection would be made to the Server to send the request and to parse the received data.

Information on availability of market prices from recognized and authentic source is a primary information requirement for the farmers. Through this service, the farmers can explore the prices of various agricultural products across the country.

The user would connect the handset to the internet through GPRS or Wi-Fi and then HTTP Connection would be made to the Database/Web Server which would be getting the data from Agricultural Market Exchanges through Web Services.

This weather service is a novel concept which helps the farmers in exploring the intricate details of the weather of a particular location. The farmer can avail the details like rainfall, max temperature, min temperature, total cloud coverage, max relative humidity, and minimum relative humidity of any district on the given day. The farmers can also have the privilege of knowing the weather predictions for four days in advance which would help them in taking timely decisions.

The weather data is also in the form of XML from Google Weather Application Programming Interface (API) Web Services. The XML data has to be parsed before showing it to the user on the mobile screen.

The loan schemes for different nationalized and agricultural banks have been hard coded in the application. As they change from time to time, the updated versions will have the latest schemes.

Similarly the contact addresses of Krushi Vigyan Kendra around India are also hard coded just to provide the information to the farmers about them so that they can get their contact details any time. These are the proposed features for the application.
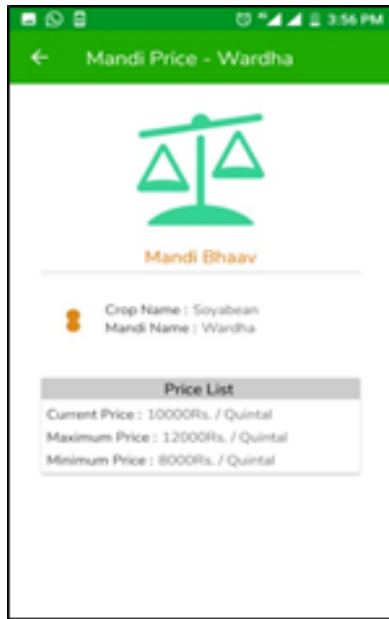

Fig. 2(a): Launch of Application

Fig. 2(b): Market Rates (Mandi Bhav)

The fig.2 (a) shows the launch of the application where the user can select the feature he is interested in and fig.2 (b) shows the market rates of the crops available.

The speed with which the user will get data from net would be dependent on the network bandwidth of the service provider the client is using. But now, in India we have 3G mobiles also. The application developed consists of several features such as– Market Prices, Weather, Loan Schemes, News, Krushi Vigyan Kendra (KVKs).

IV. CONCLUSION

The application Krushimitra would be a boon to the Indian farmers as it addresses the key problems of getting the market updates of different products. The farmers will derive greater benefit when they can make better decisions about where to sell their output after getting market prices for a variety of local and distant markets. They can also yield their crops after having the weather updates and information about the rains. There are many advantages of the Android based mobile solution for agriculture-

− One Stop Solution to all Agri information needs
− Location specific information delivery
− Highly authentic and reliable database on agriculture and allied sectors

Moreover, the current version of the application is in English, but to make it accessible to large rural domestic market, the next versions of this application would be in the local languages. So it would help the farmers to use it effectively and would be beneficial to most of them.

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