



Tech Productivity - An Android Based Solution for Indian Agriculture

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ABSTRACT

Information and Communication Technology (ICT) in agriculture is an emerging field focussing on the enhancement of agricultural and rural development in India. It involves innovative applications using ICT in the rural domain. 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 – Krishi Ville 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, Google Web Services, Mobile Computing, Smart Phones, Mobile Applications.

INTRODUCTION

Agriculture in India has been characterised by low productivity growth despite periods of strong growth in past. Serious challenges must be addressed in order to get faster productivity growth. Agriculture in India means livelihood of almost two third of the workforce in the country¹. Agriculture may be defined as an integrated system of techniques to control the growth and harvesting of animals and vegetables. After the green revolution in mid – sixties, there has been no major technological innovation, which could give a fresh impetus to agricultural productivity. Insufficient extension services and poor access to information further widen the gap

in the adoption of technology and lead to poor productivity level².

The agriculture 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 the information that could increase the 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.

Many developing countries are focussing on extending telecommunication services in rural areas³. The Information and Communication Technology for Development (ICT4D) is a program of the International Research Development Centre (IRDC), a crown corporation in Canada.

The mass is surprised by the rapid emergence of mobile telephony and consider this connected world to be the virtue of mobile devices. There are so many possible applications arising, but as usual, the challenge is to understand the right place and role of the technology in social, economic, educational interactions³.

The main objective for such project is to develop a mobile phone based solution that helps in farm management, leads to agricultural yield improvement and helps in care/maintenance of the farms.

The recent introduction of a number of mobile-enabled information services suggests that it is time to take a fresh look at their impact of agriculture on India. These services deliver a wide range of information to farmers. We can look for the impact of mobile phones on the crop sector in India with a closer focus on small farmers.

Android⁴, 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.

We mistakenly believe that it is the mobile phone that provides us with large number of utility and fun applications while we are unaware that the applications come from the hands of the developers.

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.

There are several products available for agriculture and farming in the United States' market but there is no such product available in Indian market.

In NSS (National Sample Survey Organisation) 59th round survey [5], the information regarding seeds was the most frequently accessed information in the sample. The Mandi price was at the second most important piece of information accessed by farmers.

Table 1: Farmer's Information Needs

Stage	Typical Information Needs	
Know-how	Crop choice	What are the new crop options or seed varieties?
	Seed variety	Are there higher value crops or better seed varieties I should plant?
	-	When should I sow?
	-	What are the best cultivation practices for my crops and soil?
Context	-	What inputs should I use?
	Weather	How they can be applied?
	Plant protection	Where I can find them?
Market information	Cultivation practice	
	Market prices	What are the prices and demands in relevant markets?-
	Market demand	Has there been a transport breakdown?
	Logistics	

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 [2] shows farmer s' information needs –

Impact of mobile telephony

Before we can make policy recommendations concerning the role of mobile phones in sustainable rural poverty reduction, let us consider some of the benefits that results from the provision of affordable access to mobile telephony⁵. Although, as we have demonstrated, mobile telecommunications is a substantial driver of economic growth, there are very few in-depth studies which have been to document the impact of mobile phones on economic development.

Economists traditionally believe that there is a strong co-relation between the high GDP per capita and the mobile telephone penetration.

More analysis indicates that a low GDP per capita is not necessarily an indication of mobile penetration. In Africa, 8 out of 18 countries analyzed have achieved over 70% population coverage, despite per capita income of less than \$1,000 (see fig.2) ⁶.

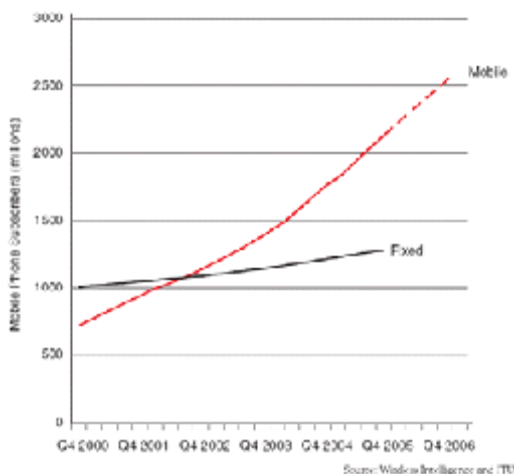


Fig. 1: Status of mobile telephony-growth of worldwide fixed and mobile phones

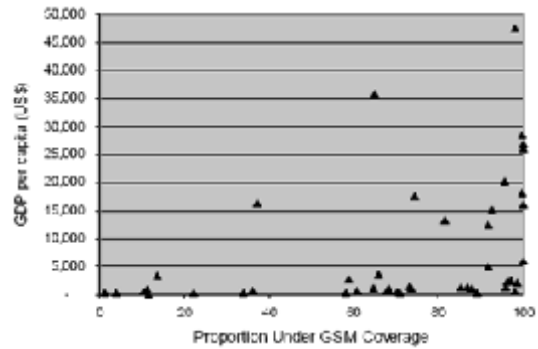


Fig 2: GDP per capita Vs Mobile penetration in Asia

Experimental details and proposed features

It is Android based mobile application which 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.

Krishi Ville 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 price.

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 adaptor. 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.

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 surrounding. 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. 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. 3: Features of Krishi Ville

It would also help them to maintain¹ a list of suppliers and sellers of the different commodities and items sold in the market. The application could also 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. A Hyper Text Transfer Protocol (HTTP) connection would be made to the server to send the request and to parse the received data.

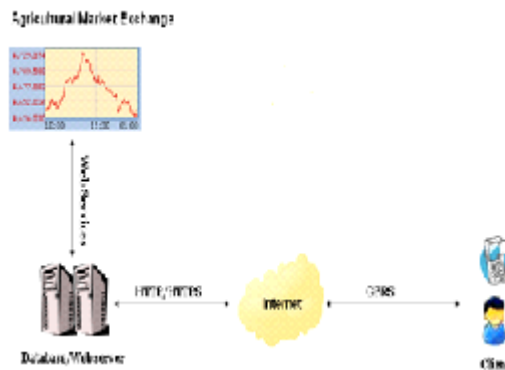


Fig. 4: Client-Server architecture of Krishi Ville

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 price of various agricultural products across the country. The user would connect the handset to the internet through GPRS or Wi-Fi and then a HTTP Connection would be getting the data from Agricultural Market Exchanges through Web Services.

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

Similarly the contact address of Krishi Vigyan Kendra⁷ around India is 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 and so these are the difference between this product and Kissan Kerela.

In Kissan Kerela⁸, the information was provided by the SMS services and in Krishi Ville, all the services are provided by the handset itself.

He does not have to message anything to get the news. He just needs to click on the feature he want to use and the information would be provided to him through the server. That's the most advantageous feature of the application.

CONCLUSION

The application Krishi Ville would be 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 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.

The most common benefit of mobile found in the research was derived from the use of mobile phones as a basic communication device. As for many of the farmers interviewed, it was the only convenient mode of communication they had accessed to.

But there are some constraints with this application. In order for the farmers to realize the full potential of access to new information, they must be able to use it effectively.

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