KRISHI-AN ICONIC INTERFACE FOR FARMERS

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Abstract: In recent years, the emergence of smart phones has changed the world of mobile phones. Phone is not any longer just a communication tool, but also an important part of the people's communication and lifestyle. Various applications added unlimited fun for people's daily life. It is certain that the future of the network will be the mobile world. Now the Android system in the electronics market is becoming more popular, especially in the Smartphone world. Because of the open source, some of the development tools are free, so there is plenty of functionality generated.

Telecommunication, especially mobile phones have the potential to provide sufficient solution to the existing information asymmetry in various sectors like agricultural field. Information and Communication Technology (ICT) in agriculture is an important emerging field mainly focuses on the enhancement of agricultural and rural development areas in India. Using innovation is a key dimension in the rural domain. The advancement of ICT can be utilized for providing sufficient and timely relevant information details and services to the farmers. We propose an android based mobile interface consisting several applications like crop information, weather updates, NGO services etc. It is a iconic interface system with the advancement of technology, application world of computer are rising day by day.

Index Terms - information and communication technology, farming, agricultural information system, krishi interface

I. INTRODUCTION

Information and Communication Technologies (ICTs) is one of the important terms for Information Technology (IT), which refers to all applicable communication technologies, including the internet, wireless networks, smart phones, computers, software, middleware, video-conferencing, social networking, and other kind of media applications and various valuable services enabling users to access, retrieve, store, transmit, and manipulate information records in a digital manner. ICTs are also commonly used term to refer to the convergence of media technology such as audio-visual and telephone networks with the computer networks, by means of a integrated system of cabling (consisting of signal distribution and management) or link system. Information and communication technology in agriculture (ICT in agriculture) mainly looks on the rapid development of agricultural sector and rural development procedures through improved information and communication related processes.

The value of ICT strategies as a means of developing the digital divide and as a powerful device for economic and social development around the whole world should not be under estimated in agricultural area and related sectors. Improving extension of ICT services to farmers would sufficiently improve the transmission of global open data for agriculture sector and nutrition for development of sensible solutions addressing of various kind of food security, nutrition and sustainable agriculture problems.

The availability and accessibility of knowledge are the major points in taking the optimal decision at right time and right manner. Nowadays, advancement of ICT makes possible to find almost any kind of information from the global repository (internet). The information in internet is primarily maintained in English language. So, a large number of people are deprived from the benefit of internet due to the kind of technical and language problems.

This scenario is really bad in developing country like India where nearly 76 % is English illiterate people. Moreover, a large percentage of the English literate people are not able to find their exact need form the large database of internet due to lack of proficient knowledge in English language. Indian farmers belong to such type of people who are not much sound in both technical as well as sufficient knowledge in English.

So, they are unable to access required knowledge on the farming life cycle, seed selection, weather, pesticides, market price etc. from the internet. As a consequence, they are unable to take correct decisions at different stages of farming life cycle, which make huge impact on the farmer's revenue and lives. As a result, suicide rate has been increased rapidly among the Indian farming field.

According to the reports, those pathetic situations are mainly happened due to the reason for frustration that they are unable to pay their debts in time. These types of incidents create huge impact on the agriculture sector. We propose an android based mobile interface consisting several applications which include agro- crop related information, weather updates, market details etc.

Consequently, the focus of new generation is shifted from farming field which will be threatening the new future in India. Our primary studies find that farmers require information at the right stage of the farming life cycle to take the right decisions.

II. OBJECTIVE

The main objective is to propose this application, which could maintain the information and provide much user friendly. Knowledge is collected and stored in the database. The proposed system is designed to increase the efficiency and speed of the service in accurate and time manner.

1. To provide an Iconic Interface to access the agricultural information from the internets' global repository for Indian farmer community.
2. Addition of applications which will be fulfilling the required informational needs of the farmer.
3. All the above-mentioned functions have to be carried out using an inexpensive mobile phone with Android Operating System functionality.
4. All the applications will be ionized for easy understanding of its function for a technically illiterate farmer.
5. Through our proposed application we want to increase the curiosity among the farmer community with respect to technology which hopefully will lead to increase in the use of technology in the agriculture sector.
6. By proposing this technology, we also hope that this leads to encouragement of literacy among the remote villages of India.
7. And this application will also be helpful for the country's youth who want to make their career in this farming field.

III. METHODOLOGY

The methodology of our developed interface for the Indian farmer community is to access the agricultural details from the global internet repository. We integrate the existing search engine (Google search engine) choice with our proposed interface.

1. The Android OS version 4.2.1 is chosen as the basic version which will be used to provide the iconic interface functionality.
2. A list of six applications was made after studying the required knowledge which is needed by the farmers farming life cycle like, Debt, Crop Availability details, Farmers' Market, NGO Help services, Soil related information, Weather information.
3. Software like MySQL is used to perform the required database operations.
4. Weather application by using windy API.
5. There was a web portal for admin to add soil, area, NGO HELP, market applications.
6. The admin web portal Is connected to the application.
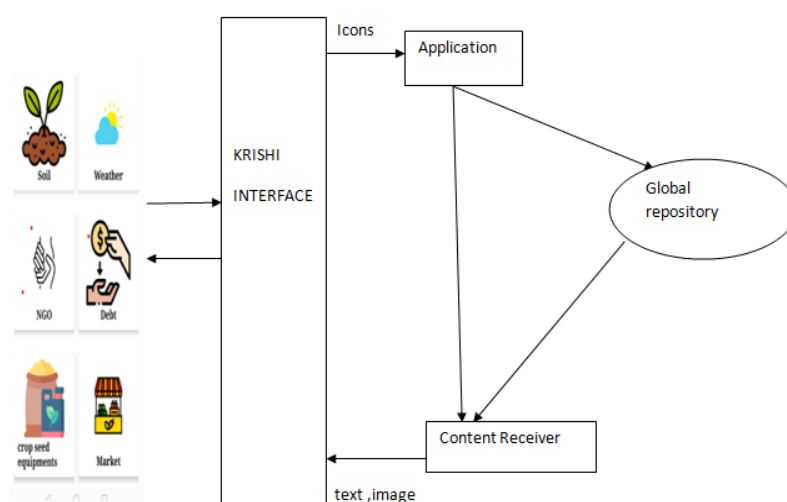
IV. KRISHI INTERFACE

An iconic interface is a user-friendly interface composed of iconic images. Each icon represents what particular task will be performed when the image is clicked. This iconic interface can be widely used with a computer operating system, computer games, software that controls hardware, etc.

In Krishi interface user searches their agriculture related needs through icons and gets the intended information in textual and image form. Here we have developed six applications that satisfies the basic requirement of a farmer, the applications are

4.1 Soil Availability

The growing season is a key term used for the period of time in a given year when the climate is important for both indigenous and cultivated plants to experience the most growth. This time period is observed in botanical, horticultural, and agricultural settings. The growing season time of a given area can be affected by its relative difference from the equator, as well as elevation.

Growing seasons are calculated in two ways; the first way is, calculating the number of consecutive frost-free days. This can be detected by looking at the average last frost day of the spring for a particular given area, and then looking at the average first hard frost date in the fall or winter season. The second way of determining the growing season is by looking at the number of days in the year when the average temperature is above the point at which a particular crop will germinate. This method of measurement is affected by which a particular crop you are intending on growing, so it varies considerably. For take example, the wheat will germinate at temperature measures above 40° F, while corn will only germinate at temperatures above 50° F.

This application was developed to help the farmers in understanding the growing season time period of the land. The application also contains an iconic interface. Depending upon the cultivating season time, the different soil type etc. conditions, and the application home page shows the images of the particular crops which will be most profitable to grow in the farm. When the image of particular crop is clicked the information related to crop species, their ideal water requirements, PH values, nutrients and other important information is told.

Each crop needs different types of soils, different types and amounts of nutrients and amounts of water. The amount of water required by the particular plant is also dependent on the growing season and the climate where it is suitable for grown. This application always provides a choice for farmers to select their soil type, and the result will display suitable plant information relating to the particular selected soil type. And also enter ph value; it will display corresponding suitable crop species details. This is more applicable for farmers to identity which will be most profitable to grow in the farm.

4.2 Weather

Weather is defined as the state of the atmosphere with relating components like wind, temperature, cloudiness, moisture and pressure. One of the most prime characteristics of the atmosphere is related to its water vapor content and the temperature which restores the water in three different properties or form such as solid, liquid and gas. Climate change and agriculture activities are interrelated processes, both of which take place on a global scale measure ways.

Climate variation affects agriculture sector in different ways, which mainly including through changes in average temperatures measures, rainfall, and climate extremes changes in pests and diseases; difference in atmospheric carbon dioxide and ground-level ozone measures; changes in the nutritional quality of various food items; and changes in sea level. Climate change is already affecting agriculture, with effects unevenly distributed across the whole world ways. Future level climate variation will likely negatively affect crop production sectors like low latitude countries, while effects in northern latitudes could also be positive or negative base. This type of climate problems will probably increase the risk of food insecurity for some vulnerable groups, such as the poor peoples.

It is very important for us to foresee what are the next weather conditions in order for them to anticipate what is going to happen. By doing this, we will be able to know on how to provide an effective solution to a particular problem. This proposing application helps the farmers in doing so. This will also provide a great help to farmers in order to prevent their loss and modify the farming practices which they make use of.

Global warming is the one of the toughest environmental issues of today that all nations are combating. In this case, the farmers need to get educated on the types of farming techniques and relevant strategies that must be used in order for them to give solution to any kind of effects weather has something to do with the crops and livestock.

4.3 Ngo Help

Indian agriculture field is largely an unorganized sector. No systematic institutional and organizational planning method is involved in cultivation, irrigation, harvesting etc. Institutional financial support is not adequately available and minimum purchase price fixed by the government do not reach the poorest farmer's hand. Government has added agricultural debt information. Direct agricultural loan to stressed farmers under so called Kisan credit Card were also covered under this scheme types. However, most of the subsidies and welfare schemes implemented by the Central and State governments do not reach the poor farmers. On the contrary, only big land lords are benefited by those types of schemes.

The governments as well as the local NGOs are not able to reach the poor farmers. The NGOs provide various types of help but as there are very less farmers who know about such kind of NGOs, they rarely approach an NGO for help. This application helps the NGOs reach the common farmer's hand. A farmer can get the details of the Ngo services with location base which can help them out regarding different problems whether they are related to family or the farm. This proposed application helps them in placing a call to the Ngo and to share their farming related problems.

Non-governmental organizations (NGOs) have a major role to play in agriculture and farming area development activities, mainly in rural and underprivileged areas. Monitoring progress and co-ordination among volunteers remains an important challenge for NGOs working with farmers. Furthermore, gauging the impact analysis of the activities based on key performance indicators is very crucial, as program managers and volunteers at these NGOs implement real time information reports, beneficiary details to successfully implement the different types of programs.

Farming has always been one of the most relevant economic activities in India. With about two-thirds of the total population engaged in various kinds of agriculture and agriculture-related activities, it is really important to understand the plight of farmers in India and why they are very struggling to survive. Farmers need to be educated about the different schemes and grants that are provided by the government. They must also require training in newer and more powerful agricultural practices.

4.4 Market

A farmers' market is a physical retail market featuring foods sold directly by farmers to the consumer's ways. Farmers markets mainly consist of booths, tables or stands, outdoors or indoors, where farmers sell fruits, vegetables, meats, and sometimes require prepared foods and beverages. They are really varies from the public market models, which are generally placed in permanent structure base, open year-round, and offer various kinds of non-farmer/producer vendors, packed foods and non-food products types. Some farmers also choose the simplicity, immediacy, transparency and independence of selling goods direct to consumers.

Farmers markets serve not only as a way for people to purchase locally grown produce but also as a choice for them to connect with others within their communities. Purchasing local goods item is an experience that promotes a sense of place, important in making individuals feel tied to their common communities. Managing markets properly will achieve the accurate social setting for people to meet and greet while they purchase their required goods. Markets are anchored in community, connect people with each other and whole valued commodities, and develop opportunities for business. Hence understanding the purpose of farmers market, the application "Market" has been created.

In this developed application whenever there is a farmers market organized by government or any other non-government organization, the organization can register the particular event through the web portal. Once the event has been registered it shows up on the home page of market application and also the farmer as interested to participate the particular event. This is one of the important ways of a farmer is made aware of the farmers market event happening in his region.

4.5 Crops, Seeds, Equipments

Crops

The major requirements of farmers are seeds, pesticides, different types of equipment's and insecticides. Pesticides are the basic component for attracting, seducing, and then destroying any pest. They are a group of biocides. The most commonly using of pesticides is as a method of plant protection products (also known as crop protection products), which in general purpose is protect plants from damaging influences such as weeds, fungi, or insects. In commonly, a pesticide is a kind of chemical or biological agent (such as a virus, bacterium, and antimicrobial) that deters, incapacitates, kills, or otherwise discourages pests.

Seeds

The good quality seed in a good field produces abundantly. Therefore, it is very important factor that the farmers must use pure, healthy seeds as per the minimum certification standards which have standard germination percentage. In fact, that the seeds are foundation of farming. The high-quality seeds are those which have contains genetic purity, physical purity, health standards, germinability and moisture percentage in accordance with the minimum seed certification standards. Hence the farmer can increase approximately 20% production while the usage of good high-quality type of seed. The farmer does make use for many inputs but the seed is the chief input among other inputs. If the seed is of bad or low quality/ standard then the labor and other expenses which the farmer does are varying rapidly.

Equipments

Modern farm machinery equipment's and methodology have now become so indispensable that farming won't be the same without them. To be very clearly specify, by the use of modern farm machinery types can be any equipment that help farmers till, cultivate, plant, harvest, and feed crops. They can be included tractors, disks, plowers, wagons, planters, and more. One of the most important contributions of farm machinery is time. With the usage of farm machinery to help farmers, farming time is sufficiently decreased. Now with farm machinery, more work can be done in just a fraction of the time measure that it took before. When farmers make use of a tractor and plow, it will only take him a couple of hours to cultivate an entire part that would take him a whole day if he used a horse-pulled plow. Farm machineries also help farmers and other large scale farm companies to save on capital amount and labor hours.

Farmers are often not much aware of the shops where they can buy the seeds, pesticides, insecticides, and other items. This developed application gives the location-based information of all the shops that sell items related to farming. Also, this particular application will be helpful for farmers to compare the cost of the items in different shops. The home page is consisting with icons which holds the image of seeds, pesticides, insecticides and equipment's on clicking one of these icons the details of the shop that sell the agricultural related item is displayed and the farmer is also provided with mobile number of the shop. Hence this application will be very much helpful for a farmer to choose a right shop to buy the quality goods.

4.6 Debt

India is like an agrarian country with around 60% of its total people choosing directly or indirectly focus on agriculture sector. The reports of farmer suicides account for 11.2% of all suicides in India. Activists and scholars have offered a number of conflicting main reasons for farmer suicides; one major reason is debt burdens. Around one-fifth of the total debt of the farmers is through the type of non-institutional sources, of which commission agents are the most popular medium as they facilitate easy accessibility of credit at all the times and for all purposes. Even though the farmers are being exploited by the non-institutional sources of credit, they turn towards them in times of need as they face a large number of problems in getting credit from institutional sources, including bank.

Therefore, farmers are more likely to be cheated by this type of commission agents. The one of the major reasons for this would be because they do not maintain a proper record of the monthly interest to be paid and the number of installments too be paid. In this developing application we try to help farmers in keeping account of all the kinds of debts that is being taken from the bank or any other non-institutional sources. The home page of the application contains an add user button which can be used to make record of a new loan that is to be taken from a bank. The home page also shows the listed view of all the debts that is taken from any kind of financial organization on clicking any particular item from the listed view a Detailed description will be displayed.

V. FUTURE TRENDS

At the current stage the Krishi-iconic interface is limited to access the agricultural related information in the context of Indian languages. However, it can be extended toward the agricultural context of any country in the whole world, which proves that the approach is generic manner. In future the speech to text can be added to the iconic interface to provide additional benefits to the farmers in agricultural sector. It has to be enhanced to spread the entire Indian subcontinent scenario. The GPS Systems can also be integrated and various other types of applications can also be added into the iconic interface.

An Iconic Interface integrated system with a text to speech (TTS) engine to access the agricultural information from the internets' global repository for Indian farmer community. Integrating a local repository with the iconic interface to access urgent required information without connecting to the internet.

VI. CONCLUSION

The potential of detailed information that affects the agricultural sector as a whole is very large. There is rapidly growing awareness about very importance of information and its use among the farming community. Farmers must be able to get knowledge delivered to them at a right time and place of their choosing and it will be beneficial to farmers to realize productivity gains from the adoption of new farming technology practices and actions to mitigate crop losses. As mobile phone usage continues to increase among the farming sector and detailed information services continue to adapt and proliferate, sufficient potential exists for a very much deeper rural productivity impact in the future, but achieving full productivity potential will depend on reducing other factors which limit the use of knowledge that farmers can obtain through their mobile phones.

Increased public and private investments will be necessary to bridge the crucial infrastructural gaps. Policy difference may also be needed to encourage better access to very high-quality inputs and credit for small farmers lives. Rapidly increased extension services and capability-building efforts can complement knowledge dissemination via mobile phones and various kinds of associated services to accelerate the adoption of new techniques and methods.

Mobile phones provide access to various kind of information which otherwise may not be available, especially to marginal and small farmers and farmers in the hilly regional area of the state. However, full realization of sufficient benefits of mobile phones is controlled by certain constraints which seem to apply more and more too marginal and small farmers rather than large farmers. These also include infrastructure related problems and availability of inputs, indicating that implementing interventions that are necessary to enhance agricultural productivity field.

Lastly, it is very essential to note that the usage of ICTs may be motivated by needs other than "getting useful details report". In this case, mobile phones were widely being used to fulfill social requirements and their developmental use appears only incidental as indicated by high use for maintaining social networks and low usage to contact subject related matter experts. However, successful cases represent that mobile phones can be mainly used for transforming agricultural practices information's. This would require appropriate and relevant content reports, enhanced trust in technology mediated communication and addressing of other crucial factors simultaneously.

VII. ACKNOWLEDGMENT

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