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E-Farming

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Abstract--The Indo-UK Advanced Technology Centre ofExcellence in Next Generation Networks, Systems and Services development effort, analyses the technological challenges faced aswell as discusses the feedback obtained from early field implementationand focuses on what needs to be done in future toscale such systems. (IUATC) is trying to address the future challenges identified bytheUK Government under the Digital Economy Theme and theDepartment of Science and Technology in India. One such areain rural India where Information and CommunicationTechnologies (ICT) networks can have a major impact is Agriculture. This paper presents a new approach to building andAgricultural Advisory System aimed at bridging the informationgaps that exist between farmers and extension workers andagricultural scientists in a country like India. It demonstrates thepower of two-way mobile phones today, which when combinedwith innovative methods could provide services to farmers thatcould not even be envisaged till yesterday. The customized andpersonalized advisory becomes especially important in the Indiancontext, where 52% of the population depends on agriculture butgenerates merely 13.9% of its Gross Domestic Product (GDP).With fragmented landholdings, the number of independentfarmers has risen to 88 million with near-stagnant productivity.Growth-acceleration is possible only with customized advisory. Today mobile and mobile based applications have become a part of our day to day life. With the revolution in mobile computing many great features were added to the field and the mobiles got smaller, faster and better as the decade passed. It gave rise to the introduction of new mobile based operating systems where the programmers where presented with open source operating system named "ANDROID".

With the introduction of android the programmers were free to program freely and with the much awaited programming language as the programmers did not have to learn anything new. The android was a classic mixture of java and mobile computing. Thus a model integration of ANDROID platform with a desktop application can be utilized for developing a E_FARMING application which will help farmers the information needed in day to day life to help make farming better.

Keywords— Cell phone applications, Agriculture Advisory System, Call Centre, Dashboard for farmers, Interactive Voice Response System.

I. INTRODUCTION

The contribution of agriculture to the overall Gross Domestic Product (GDP) of India has been falling rapidly and has gone down from 30 percent in 1990-91 to a mere 13.9 per cent in 2012 . Even though the shift away from agriculture is a trend that is to be expected as a nation develops, the sector still remains the backbone of our country as it employs 52% of its workforce. Limited land and water availability (made worse by degradation of natural resources), fragmentation of land into small holdings, changes in demand and consumption patterns, climate changes, new pest and disease outbreaks, liberalization of trade as well as a move towards high-value agriculture are some of the challenges faced by Indian farmers, especially those with smaller landholdings . The recent increase in global food prices should have provided these farmers an opportunity to increase their profitability, but lack of information at multiple levels prevented many from realizing its benefits. Information gaps exist in terms of what and where to buy much-needed inputs, how does one overcome stunted growth and disease outbreak, when and where to sell the produce as well as how and where to get information about financial services, transport and local weather. With the widespread use of mobile phones, voice and SMS solutions should find more use as they offer easy accessibility. However, they also face the following challenges: the SMS carries only a limited amount of information and requires a basic level of literacy. Voice-based solutions are complicated to develop for they require machines to produce natural speech, or in technical terms, good speech synthesis. They also do not offer detailed information such as pictorial illustrations as in web solutions. Nonetheless, the voice solution is still by far the most promising platform for the farmer as it can be customised for language, is readily accessible and very natural, as it entails using the mobile phone through direct responses to specific questions.

II. LITERATURE SURVEY

We have been gathering information about how the android operating system works. How it can be programmed. How a application can be deployed and all the information related to the android. We are also studying how a desktop application can be created in java and how it can be deployed. We are also studying how to use a cloud service like GOOGLE SPREADSHEET which comes

under GOOGLE DRIVE cloud service. So we have gathered some relevant information as follows.

A. What Is Android?

Android is a software stack for mobile devices that includes an operating system, middleware and key applications. The Android SDK provides the tools and APIs necessary to begin developing applications on the Android platform using the Java programming language.

B. What Is JAVA?

Java is a programming language originally developed by James Gosling at Sun Microsystems (which has since merged into Oracle Corporation) and released in 1995 as a core component of Sun Microsystems' Java platform. The language derives much of its syntax from C and C++ but has a simpler object model and fewer low-level facilities than either C or C++. Java applications are typically compiled to bytecode (class file) that can run on any Java Virtual Machine (JVM) regardless of computer architecture. Java is a general-purpose, concurrent, class-based, object-oriented language that is specifically designed to have as few implementation dependencies as possible

C. What Is Google Spread Sheet?

Google Spreadsheets is a Web-based application that allows users to create, update and modify spreadsheets and share the data live online. The Ajax-based program is compatible with Microsoft Excel and CSV (comma-separated values) files. Spreadsheets can also be saved as HTML.

Google's product offers typical spreadsheet features, such as the ability to add, delete and sort rows and columns. The application also enables multiple, geographically dispersed users to

collaborate on a spreadsheet in real time and chat through a built-in instant messaging program. Users can upload spreadsheets directly from their computers.

D. Algorithm

The Advanced Encryption Standard (AES), also known as Rijndael (its original name), is a specification for the encryption of electronic data established by the U.S. National Institute of Standards and Technology (NIST) in 2001.

AES is based on the Rijndael cipher developed By two Belgiancryptographers, Joan Daemen and Vincent Rijmen, who submitted a proposal to NIST during the AES selection process. Rijndael is a family of ciphers with different key and block sizes.

For AES, NIST selected three members of the Rijndael family, each with a block size of 128 bits, but three different key lengths: 128, 192 and 256 bits. AES has been adopted by the U.S. government and is now used worldwide. It supersedes the Data Encryption Standard (DES), which was published in 1977. The algorithm described by AES is a symmetric-key algorithm, meaning the same key is used for both encrypting and decrypting the data. In the United States, AES was announced by the NIST as U.S. FIPS PUB 197 (FIPS 197) on November 26, 2001. This announcement followed a five-year standardization process in which fifteen competing designs were presented and evaluated, before the Rijndael cipher was selected as the most suitable (see Advanced Encryption Standard process for more details).

AES became effective as a federal government standard on May 26, 2002 after approval by the Secretary of Commerce. AES is included in the ISO/IEC 18033-3 standard. AES is available in many different encryption packages, and is the first publicly accessible and open[cipher approved by the National Security Agency (NSA) for top secretinformation when used in an NSA approved cryptographic module (seeSecurity of AES, below).

The name *Rijndael* (Dutch pronunciation: is a play on the names of the two inventors (Joan Daemen and Vincent Rijmen). It is also a combination of the Dutch name for the Rhine river and adale.

E. Methodology

Inventory is limited to documenting innovative farmer information services. It is focused on projects/services that provide agricultural training and information to farmers directly, through the use of ICTs, rather than documenting services that facilitate exchange of information among researchers and policymakers. It also does not include the many research initiatives that exist to study the possible application of ICTs to agriculture or organizations or projects that focus exclusively on the development of linkages with input agencies, credit organizations and markets through the use of ICTs.

Entries include projects using ICT solutions or implementing ICT-based activities, institutions/groups providing services using ICTs

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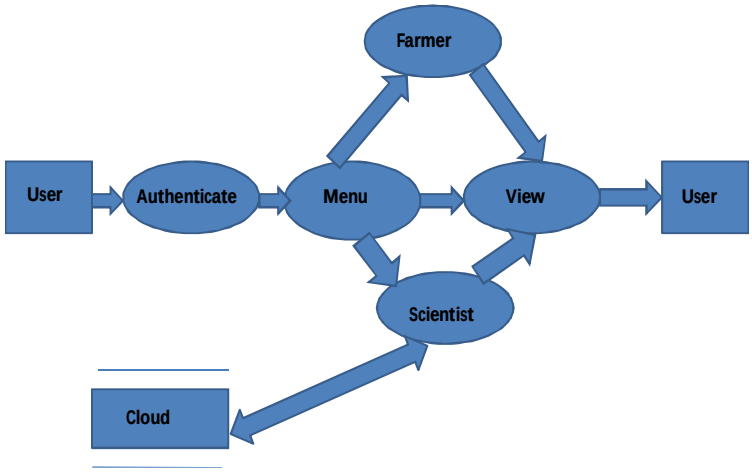
as well as ICT solutions software providers, both at the national and regional level. While many of the entries are projects with a definitive beginning and end date providing one or two services, others are national or regional information systems providing many agricultural services using ICTs.

F. Data Flow Diagram



G.Figure

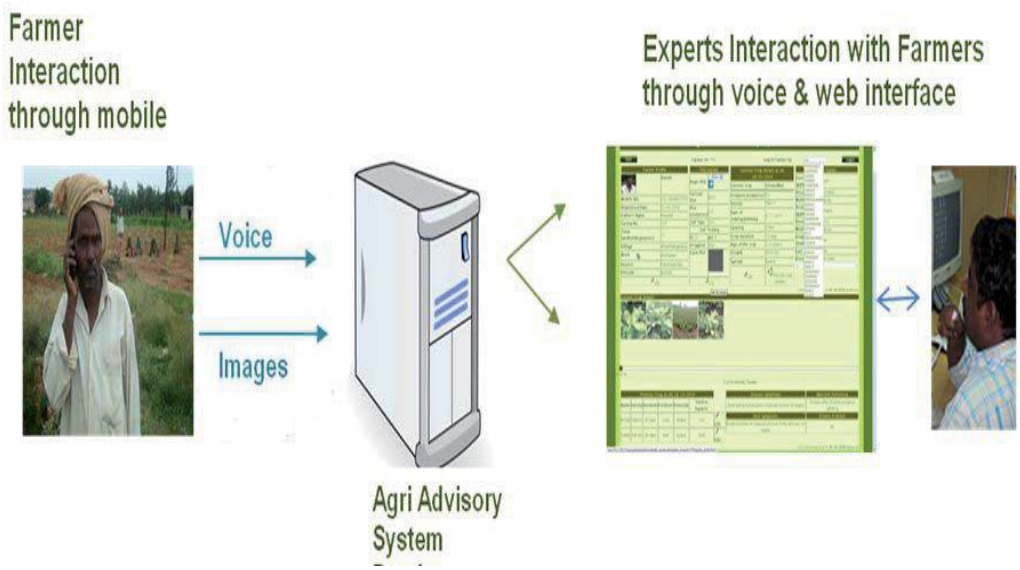


Fig.Simplified diagram illustrating the architecture of the syste

III. CONCLUSIONS

While the discussions in the paper are based on work thathas so far been carried out only in one state in India, TamilNadu, very recently the model was put in place for trial,through replication in another State in North India, HimachalPradesh. It is interesting to note that while the crops that are infocus there are different and so is the terrain, the feedbackobtained thus far is very encouraging. Discussions that havetaken place with different Government officials and NGOsworking with farmers indicate that the system could be evolvedto be applicable to provide personalized advisories in most
parts of India.

To conclude, mobile telephony reaching even remote partsof India does have a potential of transforming the underdevelopedregions of the nation. As the capacity and QoS inwireless networks, especially those offering data services,improves, there will be greater and more robust mobileconnectivity in rural India. Personalized agricultural advisory
leveraging this mobile connectivity may be the next mostimportant thing for strengthening Indian agriculture andimproving the productivity as well as livelihood for largesections of people in India.Whether such a system would be useful in other countriesin the world needs to be examined. It is highly likely thatfarmers of most developing nations would benefit from such approach. Similarly, there are enough reasons to believe that with some modifications, the approach could be equally usefulin providing customized service to farmers in more developedcountries, for example that of Europe. One has to figure out therelative usefulness of using voice or data to provide theservices in such a context; may be a combination would be themost effective approach. It is also possible that such services may be provided remotely from outside the country, similar tomany other call-center services being provided today.

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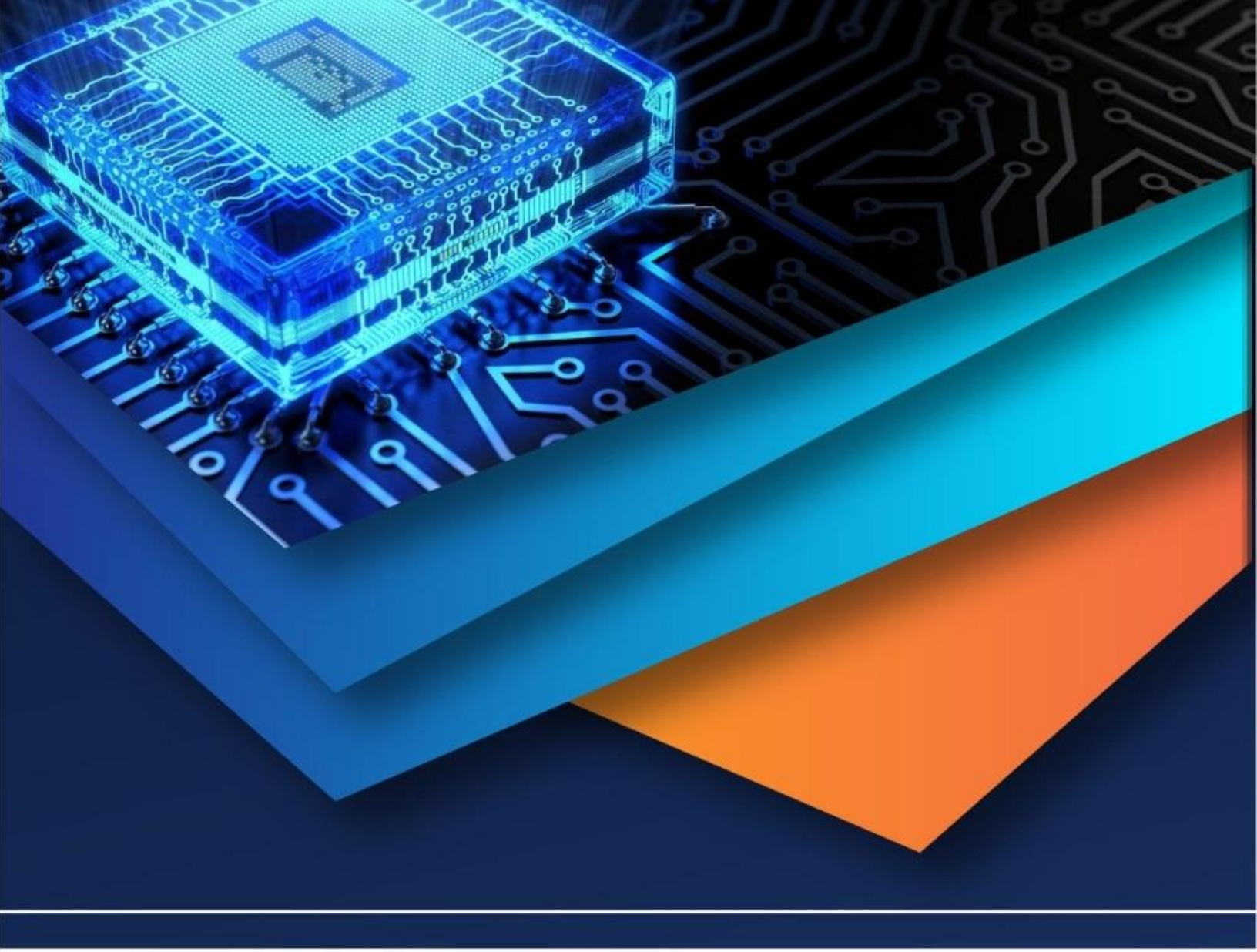

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