

# Integration of Various Infocommunication Technologies for Agricultural and Rural Development

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## I. Introduction

The occupational structure of India is dominated by the “agricultural sector” and the “manufacturing sector” and the “service sector” is lagging far behind in this context. This shows that India is predominantly an agricultural economy and hence it requires strongest protection and development of its “agricultural resources”. India is facing certain “Agricultural Challenges” that must be resolved as soon as possible. The major challenges to “Agriculture Sector in India” are:

- 1) Insufficient agricultural infrastructure and support facilities.
- 2) Insufficient institutional capacity to deliver farmers specific services.
- 3) Lack of awareness regarding suitable agricultural methods among the farmers.
- 4) Agricultural content development and its up gradations.
- 5) Insufficient use of ICT for agricultural purposes, etc.

In our project we propose a system which is an information portal in which all these primary and major problems are automated or overcome. This system includes all government rules and schemes regarding agriculture, and of other nature like women & child development, medical health, etc. along with access to document like 7/12, etc. This system can be continuously updated by the officers (admin) of government, which ensures that the system contains latest Schemes. In this system, officers (admin) can add new Schemes according to their criteria (age, area, field) and also be able to update, delete schemes. On the other hand users (people) can see all the Rules and Schemes related to them. This system is very useful in the rural areas and in villages. This system reduces the paper work, human effort. Another

feature of this system is to support the Government of our country. This system is very useful in the rural areas and in villages. This system reduces the paper work, human effort. Another feature of this system is to support the Government of our country. Thus the system we propose is for the purpose of providing easier access to a lot of information and services to the farmers and people using web technologies. The identification of citizens via state-issued documents is nowadays one of the core activities of most of the world’s public admin<sup>[1]</sup>. E- government is evolving into seamless integration which is a primary focus for many countries. With this premise we proceed to measure and understand the E-government quality with reference to the Middle East region<sup>[2]</sup>. The recent development of the information Technology and network (ITC’s) have developing significant increment in Electronic Government (e-Gov.) services, allowing high social involvement transparency and democracy [3].

Infocommunications is the natural expansion of telecommunications with information processing and content handling functions including all types of electronic communications through the internet. The term “infocommunications” is also used in politics in a wider sense as a shorter form of information and communication technology (ICT). A new concept about Agricultural informatics that has arisen following the rapid development in information and communication technologies (ICTs) and of the internet. Referred to as e-agriculture, agricultural informatics is an emerging field which combines the advances in agricultural informatics, agricultural development and entrepreneurship to provide better agricultural development and entrepreneurship to provide better agricultural services, enhanced technology dissemination, and information delivery through the

advances in ICT and the internet. The eAgriculture concept, however, goes beyond technology, to the integration of knowledge and culture, aimed at improving communication and learning processes among relevant actors in agriculture at different levels i.e. locally, regionally and globally<sup>[4]</sup>.

### 1.1 Agriculture In Wardha

Wardha is a small city cum district in Maharashtra and is famous for being an important tourist destination that is frequented by travellers of all kinds from all over the world, throughout the calendar year. Like most of the other parts of the country, Wardha too has a predominantly agrarian economy. The most important crops grown and cultivated in Wardha are Soya Bean (principal crop), Pigeon Pea, Cotton (cash crop), Sorghum, Oranges and Bananas. The seasonal cropping pattern may be represented as –Rabi crops - Wheat, Green Chickpea  
Kharif crops - Soybean, Sorghum, Cotton, Pigeon Pea, Rice and Groundnut.

Agriculture department in Zilla Parishad is one of the most important and prominent department for agriculture development and increasing crop production. Agriculture development Officer is the head of this department at district level by which different agriculture developmental schemes are implemented through agriculture officer at panchayat samiti level. The main objective of the department is to increase the crop production and income of the farmers by providing them guidance and various agriculture inputs and implements on subsidy. Similarly this dept. is also to make available inputs like Seed, fertilizer, pesticides for the farmers keeping quality control over in every crop season.

Most farmers in Wardha are smallholders. As of 2001, a mere 1.2% of farmers held more than 10 hectares. On the other end of the spectrum, 16.3% of individual holdings in the district were of one hectare or less, 40.1% were between one and two hectares, and another 19.3% were two to three hectares. Altogether, three-quarters of all individual landholdings were three hectares or less. The average individual landholding was 2.4 hectares.

Based on data from 2004-2005, the largest crop in Wardha is soybeans (1955 hectares), followed by cotton (998 hectares). Together, these two crops make up more than 70% of the area cultivated in 2004-05. Together, all pulses and legumes make up 18.8% of the area cultivated and all cereal crops (mostly sorghum and wheat) make up a mere 9.8% of the area cultivated. The remaining 0.6% were sown in other oilseeds (10 ha) and sugarcane (16 ha). Wardha is distinct within Vidarbha for prioritizing cash crops (cotton, soybeans) over food crops to this extent. During the same crop year (2004-2005), only 46.5% of the region's cropland was sown to soybeans and cotton, 27.5% to cereals, and 24.3% to pulses, although there was much variation from one district to the next.

### 1.2 InfoCommunication Technologies/ICT

ICT is an umbrella term that includes any communication device or application, encompassing: radio, television, mobile and fixed phones, computer and network hardware and software, satellite systems and so on, (as well as the various services and applications associated with them, such as videoconferencing, distance learning, etc) necessary for the delivery of information in the form of audio, data, video, image, etc from Point A to Point B. ICT consists of all technical means used to handle information and aid communication. Several reports underscore just how significant and extraordinary ICT productivity gains are not only for individuals and businesses, but for a nation.

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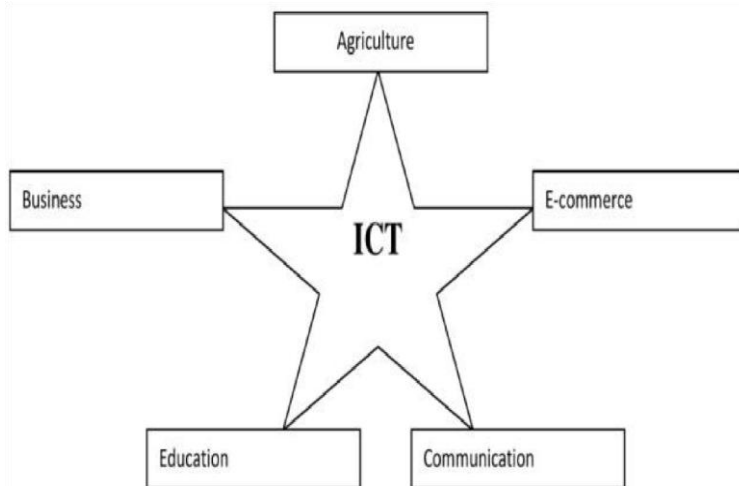


Fig.2 Application of ICT

### 1.3 Applications for ICT in Agricultural Welfare

Today we witnessed two types of potential economic gains of ICT in India, the Static and the Dynamic. Former is onetime, and come from more efficient use of scarce resources, allowing higher consumption in the present. The later pertains to increases in operating efficiency, and aims for reduced transaction costs. For example Information technology based machines at milk collection centers are being used in cooperatives to measure butterfat content of milk, test the quality of milk, and make prompt payments to farmers. "This has resulted in the removal of incentives to cut the milk by adding water, reduced time for payments from 10 days to less than five

minutes, and has thus instilled confidence in farmers in the cooperative set up."

## II. Literature Survey

The system discussed and implemented in this project has been studied before, with the new technologies the previous works regarding the same topic can be improved drastically. The system we propose is related to the various problems concerning agriculture and farmers welfare. We approach this problem by developing an information portal for providing information with easy access to the farmers. Previous works implemented for the same purpose often propose a complex system with particular objectives like the different government websites which provide information for a specific subject in a website. There are different websites for different purposes, some websites are for document retrieval, while others are for accessing government schemes, and other agricultural details. The proposed system provides a number of services in a single place, thus providing the user the opportunity to access the information from a single source this is our system rather than search around and browse through the different sources thus wasting their time and efforts. The system also provides this information in English as well as Marathi which is more commonly used in the Vidarbha region. The idea is to provide a system in which all the primary and major problems are automated or overcome. This system includes all government rules and schemes regarding agriculture, crop details, diseases and its treatment, market details, and access to documents like 7/12 and 8A.

## III. System Analysis

### 3.1 Existing System

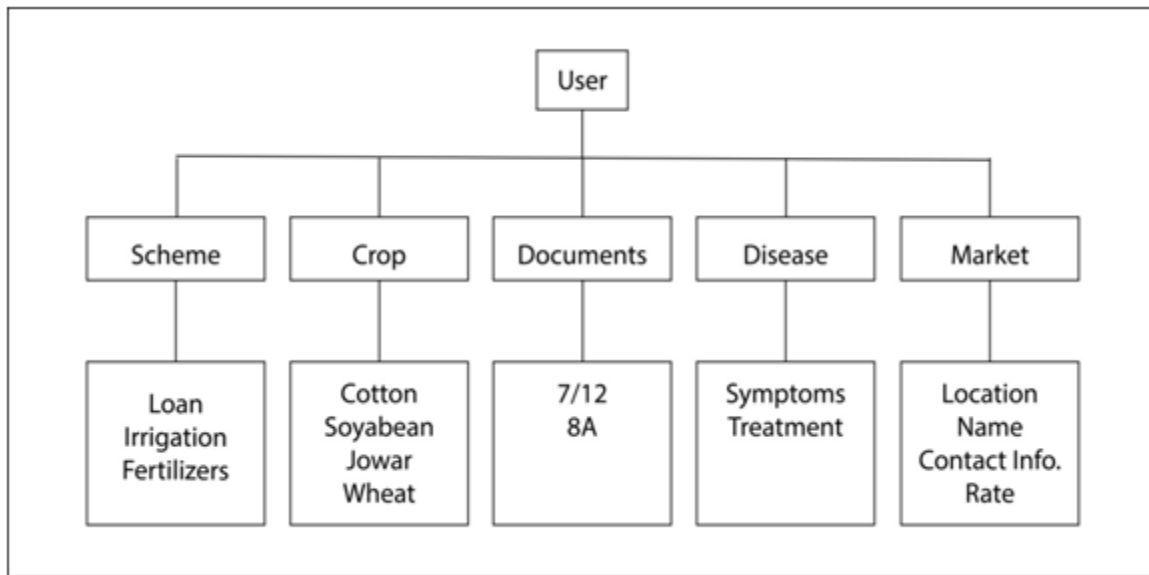
Electronic governance or e-governance is the application of information and communication technology (ICT) for delivering government services, exchange of information, communication transactions, integration of various stand-alone systems and services between government-to-citizen (G2C), government-to-business (G2B), government-to-government (G2G), government-to-employees (G2E) as well as back office processes and interactions within the entire government framework. Through e-governance, government services will be made available to citizens in a convenient, efficient and transparent manner. The three main target groups that can be distinguished in governance concepts are government,

citizens and businesses/interest groups. In e-governance there are no distinct boundaries.

E-government appeared as a term in the literature and practice in the mid to late 1990s.[1] E-participation became a reference term later, after the turn of the century.[2] (E-democracy was for some years an equivalent term but has more recently given way to e-participation; differences between the exact meanings of the two terms are nonetheless discernible.) Interestingly, in the US e-government was never used with the same frequency as it was in the EU; the term digital government was preferred. However, e-government has occasionally been used in the literature to refer to e-participation, or as a super-term to cover both areas, resulting in fuzzy definitions of both terms. Abstracting from several definitions from international organizations, consulting companies, and the academic and research community, we can define the governance system as the union of the political, the society-to-political system interface, which includes interactions through processes of public policy analysis, formulation, and selection; and the society-to-administrative system interface, which includes interactions through the public-service provision process, covering both internal and external communications: government to government (G2G), government to citizens (G2C), and government to businesses (G2B).

### 3.2 Proposed System

In this project we propose a system which is an information portal in which all the above mentioned primary and major problems are automated or overcome. In this system there are different sections or departments like agriculture, women and child development, medical/health, etc. This system also has support for regional language. Each department has their own subsections like in agriculture section there is fertilizers, irrigation, loan and others subsections. The user can access this information easily due to the simple user interface. The user can login within the system with either the aadhar information or their identification information. The information is provided in pdf documents which can be viewed within the system. An admin will control all services within the system. The admin plays an important role in the system, which controls all the information of citizens like personal information, documents (Aadhar card) and farm related information. The admin can upload new information in different sections with different eligibility criteria like area, age, field size, etc.

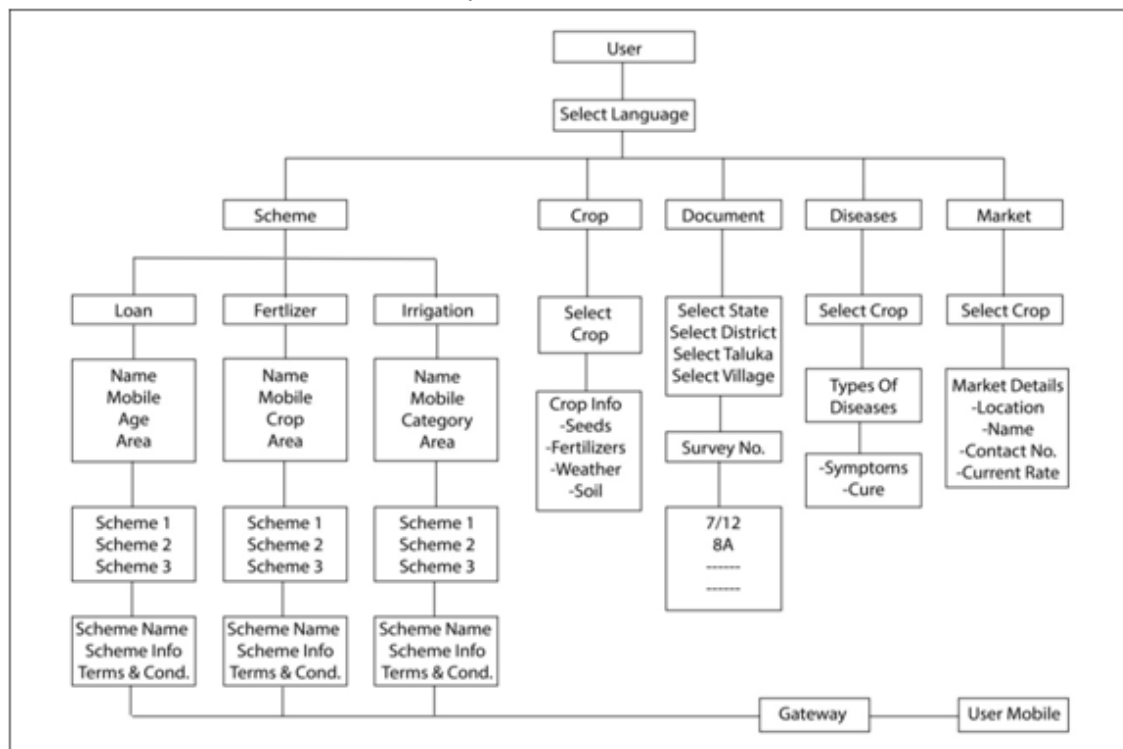


**Fig 3.2.1 Block Diagram**

**A. AdminServer:** Admin play’s important role in the application which control all the application .Here admin have authority to change the services accordingly to the citizen. In that admin add the new services which provided by the Indian government. Admin provides all the information related services with term and condition and also manages the database, which contain the personal information and the documentation of the user as well as all the information.

**B. User:** The user can access any information on the system from all sections or departments. A block diagram of the system is given below. Users can also use their aadhar card to log in the system and get notification services on their registered mobile number. The user information as well as the information on different departments is all stored on the database. The system has a simple user interface for easier navigation through the system.

**IV. System Architecture**



**Fig. 5.3.1 System Architecture**

The diagram for system architecture as shown above depicts a system with various modules. The system is designed to provide users to have an option for the language in which they would like to access the information provided by the system, i.e. English and Marathi. Further the system has five different categories in which different information can be accessed, i.e. schemes, crops, documents, diseases, market. These five categories further have sub-categories which are relative to each individual category. The five main category provide information regarding government passed schemes, details on crop and its cultivation, access to agricultural documents (7/12,8A), information related to common crop diseases and its treatment, and lastly the markets available in the district with their current rate for crops. The system accesses the data which is stored in the database, and provides this data to the farmers, and in case of documents only to the authorized people. The system is a large structure and thus it is divided into the five modules which are explained below

### 2.1 Schemes Module

The scheme module is the module which contains the information regarding the schemes passed by the government for the welfare of the farmers. The schemes can be classified into four types, namely - fertilizers for schemes related to fertilization and fertilizers in general, loan for schemes related to government loans for supporting the farmers financially and in dire conditions, irrigation for schemes related to the irrigation problems in farms, and other schemes which are passed for the welfare of the farmers but cannot be placed in the previous types of schemes. In this system each section contains a number of schemes which can accessed by the farmers by entering their aadhar UID number and their land size in acres for accessing those schemes which apply to their fields, and in loan related schemes the age of the enquirer.

### 2.2 Crop Module

The crop module contains the crops which are most commonly cultivated in Wardha district, i.e. cotton, soyabean, sorghum(jowar), wheat. Upon entering the crop module the user can select which crops do they want the information on. The information stored in the crop section are information related to seeds, fertilizers, weather, and soil and its treatment. The seeds section contains the general information regarding the seeds of a particular crop and the variety of seeds available in the local market. The fertilisers section contain the general information regarding the fertilisers and its most commonly used compositions used for a particular and the variety of fertilizers available in the local market. The weather section contains information regarding the weather, environment, temperature and conditions in which a particular crop should be cultivated.

The soil section contains the information regarding the type of soil suitable for the cultivation of a particular crop as well the treatment recommended before and during the cultivation of a crop. The system contains all this information for the major crops which are included in the system.

### 2.3 Documents Module

The document module contains the agricultural documents, i.e. 7/12 and 8A which are essential for smooth government work of farmers regarding loans, subsidy and other important use. The documents contains and is identified using the survey number which is unique to all farmers. The 7/12 extract document is an extract from the land registry of any district, maintained by the revenue department of the state government of Maharashtra. It is traditionally called 'Saath Baara Utara' in Maharashtra. The 7/12 extract is only the land record for revenue purpose and it can be used to show the possession rights of the land. This also helps in checking for any past disputes or any litigation orders passed affecting the land. It has a record of all activities that were carried out on the land. The 8A extract is a document which gives us the idea about the exact holding if the owner. The system provides the service to access the 7/12 and 8/A documents from within the system. The documents are added by the admin of the system and the user can access these documents by providing the required information like district, taluka, village, survey number, owner name.

### 2.4 Disease Module

The disease module is like a branch section of the crop section, where the crop module provided information for the seeds, fertilisers, weather and soil treatment; the disease module provides information regarding the the most common and newer crop diseases that are encountered in the farming scenario. The module provides options to choose which crop and its diseases would you like to access, for example the cotton crop has a number of diseases like angular leaf spot, vascular wilt disease, dahiya disease, anthracnose disease, root rot disease, boll rot disease. The disease module has the disease information regarding the general information of that disease along with its symptoms and the cure or treatment needed to exterminate the disease altogether. The disease module conatins various diseases and its cure and treatment for cotton, soyabean, sorghum, wheat.

### 2.5 Market Module

The market module contains the information regarding the markets for selling the crops. In this system we are concentrating on the government markets which are available in Wardha district. There are a total of six markets



which are present in Wardha district namely the Agricultural Produce Market Committee (APMC) which are located at Ashti, Hinganghat, Sindi, Pulgaon, Samudrapur, Wardha and Arvi. The market module contains information for location of the markets, contact details, and the current rate for the crops. Mostly all these crops can be sold at any of the markets, the users first have to select the crop and then they get a table containing the markets with all of its information.

### V. Future Scope

The goals and objectives of this study were decided and research was done accordingly. Since in depth studies in these areas have long term benefits to farmers, citizens and the public sector organizations and the government. E-agriculture is incredibly useful for the young farmer and supply them helpful information relating to the plantations that they need fully grown. The government ought to additionally take measures to increase awareness for the farmers on however best they will use information technologies to conduct business enterprise. The scope of the research can be further expanded as follows: Researcher can study Government-to-Citizen (G2C) e-Governance services delivered by e-Governance projects for problems and prospects of ICT in e-Governance, Moreover, more research could be carried out in the same area and with the same methodology while concentrating on the projects dedicated to the Government-to-Business (G2B) and Government-to-Government (G2G) services. (2) The future research could be of comparative nature. The identified factors as barriers and drivers for ICT based e-Governance can be compared on use of e-Service and citizens satisfaction to use e-Service so as to indicate the aspects that need extra effort to enhance the usage of e-Services for e-Governance projects.

### VI. Conclusion

In this project we examined the efforts taken by other researchers and the various use of ICT and web technologies by other countries for agricultural development and e-governance. The system proposed in our project is for the potential benefit of agricultural development in rural areas and for providing information to the farmers. Increase in awareness of new agricultural technologies and schemes passed by the government for the relief of the farmers leads to better crop quality and quantity as well as ensuring that the farmers are able to benefit from the government schemes. We have observed that several initiatives have already been taken by East Asian countries and they need to be just tuned with Indian scenario. The system cuts the time required by the farmers to travel to the regional officers to enquire about information and get documents like 7/12, etc. Since the system has support for regional languages it is

much more easier to access and understand information by the farmers as well as non-farmers. Thus the system can be beneficial for the farmers, citizens as well as the government to be better connected with the farmers.

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