INFORMATION AND COMMUNICATION TECHNOLOGY AS A MEAN FOR EFFECTIVE IMPLEMENTATION AGRICULTURE EXTENSION SERVICES

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Abstract: Information Technology (IT) encompasses all of the technology that we use to collect, process, protect and store information. It refers to hardware, software (computer programs) and computer networks. Information and Communication Technology (ICT) concept involves transfer and use of all kinds of information. It is the foundation of economy and a driving force of social changes in the 21st century. It affects all aspects of life as we know it and without it, life would be virtually unimaginable. Distance is no longer an issue when it comes to accessing information, for example, work and distance learning, e - banking, e - government. The application of Information and Communication Technology (ICT) in agriculture is increasingly important. E-Agriculture is an emerging field focusing on the enhancement of agricultural and rural development through improved information and communication processes. More specifically, e-Agriculture involves the conceptualization, design, development, evaluation and application of innovative ways to use information and communication technologies (ICT) in the rural domain, with a primary focus on agriculture. ICT promises a fundamental change in all aspects of our lives, including knowledge dissemination, social interaction, economic and business practices, political engagement, media, education, health, leisure and entertainment

Key Words: Expert system, ICT, Mobile advisory service, Portal,

Introduction: Indian agriculture is facing a lot of pressure to produce more to get higher profit out of it. Now a day's subdivision and fragmentation of land resulted in uneconomical land holding. In these days farmers are struggling to get more profit out of their small holdings. To get higher yield they are using more and more chemicals and fertilizers. If the same situation continues for a long period land may lose its all properties and become barren. Apart from the above due to pollution and deforestation and converting the cultivable land into living areas the climatic pattern also changed a lot. Due to irregular rainfall pattern and insufficiency of water for cultivation leads to a lot of crop failure.

To overcome these problems various technologies are developed from research institutes and numerous polices have been implemented by the government. To popularize and for effective implementation of these programmes there is a need to achieve a well-established extension system such that people can access information easily. Now-a-days, society has gone under a rapid change that resulted in increased access to information, shift from traditional way of accessing information to improved means, like ICT.

IT encompasses all of the technology that we use to collect, process, protect and store information. Information and Communication Technology (ICT) includes use and transfer of all kind of information. Distance is no longer a barrier for accessing the information when we are using ICT tools.

The ICT term includes the aspects like handling of information and helps in effective communication. ICT comprises of information technology, Telephony, electronic media. These ICT tools play an important role in disseminating the information timely to the farming community resulted in high rate of adoption. These tools could be used for capacity building and imparting skills to the farming community.

The information can be acquired by means of ICT through,

Web Portal: A Web portal is a website that acts as a multi sources or single source for all information on a specific domain. The Web portal offers the user a broad array of information, arranged in a way that is most convenient for the user to access. When designed, implemented and maintained correctly a web portal becomes the starting or entry point of a web user introducing him into various information, resources and other sites in the internet. It has the power to draw together a common group of people, common on the basis of their age, profession, location etc. Portals are browser-based applications that enable activities including connecting business processes within the business and across the supply chain by unifying access to structured and unstructured data, integrating applications to support the business processes as well as providing access to real-time, current and consistent information.

Major Functions of Portals :

The web portal is having eight functionality areas:

- Search and navigation.
- Information integration (content management)
- Personalization notification (push technology)
- Task management and workflow
- Collaboration and groupware
- Integration of applications and business intelligence

Types of web portals

Search Engines: Search engines act as one of the most popular types of web portals. All an Internet user has to do is search for a certain topic, issue or problem, and potentially millions of pages show up as a result of the search query.

Hub Sites: Several websites on the Internet act as hubs online. Sites such as Live, Yahoo and Google offer everything from search engines to email accounts to news information. Because these hub sites regulate so much information, new websites show up through at least one of their channels, which mean that users can then find a new website, visit the site and determine if the website is good match for their needs.

Social Networks: Recently, social networks such as Myspace and Facebook have emerged into the fray. Both websites allow users to share certain articles, websites videos and photos with their friends.

Telecentre: A telecentre is a public place where people can access computers, the Internet, and other digital technologies that enable them to gather information, create, learn, and communicate with others while they develop essential digital skills. The telecentre definition given by various scholars is

- It is a shared facility that provides public access to information and communication technologies
- It is a place where public access to communication and information for economic, social and cultural development is provided through IT
- It provides information and communication services needed by the local community

The various types of telecentre are

- Non Governmental Organization (NGO) sponsored telecentre: They are hosted by an NGO, which manages the centre and integrates it, to one degree or another, into the organization's core business
- Local government telecentre: They often aim to disseminate information, decentralize services, and encourage civic participation, in addition to providing public ICT access.
- Commercial telecentre: They are launched by entrepreneurs for profit, range from the purely commercial cybercafé to the social enterprise, where profit and social good objectives are combined.
- School-based telecentre: They can be structured to involve community members during off-school hours, but costs need to be shared by the school system and the community.
- University-related telecentre: They can offer social outreach to disadvantaged and community groups, provide training, develop locally relevant content, and establish and facilitate virtual networks.

Mobile Advisory Services:

Farmer Call Centre (Kissan Call Centre) : The Department of Agriculture & Cooperation (DoA&C), Ministry of Agriculture, Govt. of India launched Farmer Call Centres across the country on January 21, 2004, to deliver extension services to the farming community. The purpose of these call centres is to respond to issues raised by farmers, instantly, in the local language. There are call centres for every state which are expected to handle traffic from any part of the country. Queries related to agriculture and allied sectors are being addressed through these call centres.

The Farmer Call Centre is a synthesis of two hitherto separate technologies namely, the Information and Communication Technology (ICT) and the Agricultural Technology- both have their specialized domains and work cultures. To optimally utilize the strengths of both these systems, it was proposed to take full advantage of professionally managed Call Centre mechanism and dovetail it with the specialized Subject Matter Specialists knowledge of Agricultural Scientists and Extension Officers, so as to facilitate its reach to the farming community.

It was accordingly proposed to make use of existing specialized infrastructure of Call Centres (which are normally industry-driven and serve to high-end and many a times, mission critical service sector) and make this communication backbone available to the Subject Matter Specialists of Agriculture, Horticulture, Animal Husbandry, Marketing and other related areas. The Farmer Call Centre consists of three levels – namely Level-I (the basic Call Centre interface, with high quality bandwidth and local language proficient Agriculture Graduate), Level-II (Subject Matter Specialists on concerned important crops and enterprises, connected through good bandwidth telecom and computer connectivity) and Level-III (the Management Group to ensure ultimate answering and resolution of all the farmers' queries which are not resolved at Level-II, connected on and off line mode)

a. Mobile Advisory Services by ICAR-KVKs : Mobile advisory services to the farmers by the Farm Science Centres (KVKs) of the Indian Council of Agricultural Research (ICAR) have been operational since, 2008. The Farm Science Centre (Krishi Viigyan Kendra -KVK), Babhaleshwar, India has pioneered in the IT-enabled service aiding instant messaging from Farm Science Centre to individual farmers for extending Agricultural information through SMS alerts. Weekly SMS alerts are issued on various agricultural developments like weather forecast, disease forecast and market information

b. Market Price by SMS by Rubber Board, India: The Rubber Board provides the update of both national and international rates of natural rubber through SMS throughout the country. Through this

service the rubber farmers and dealers in India (especially those in the state of Kerala in South India) are tracking the prices of the commodity in real time by SMS. The rubber growers are helped by this SMS service by the Rubber Board which provide updates on the global as well as domestic market rates to the farmers, which is also displayed in the Rubber Board's web portal.

c. mKisan : The mKisan project has been launched with the support of mFarmer initiative challenge fund. The International Livestock Research Institute (ILRI), India is implementing the mKisan project in partnership with Handygo technologies, a mobile value adding service provider, CABI South Asia, and Digital Green, an NGO for video enabled extension. The project proposes to develop comprehensive agro-advisory services for small holders with access to a mobile phone in India. The project has objectives such as to provide daily bulletins on agro-meteorology, crop pest and livestock diseases outbreaks, market information, and information on local service provision sources and information access to women farmers. The CABI will be providing scientifically validated and actionable information from its "Direct2Farm Repository". mKisan project aims to reach-out one million small holder farmers in the states of Utter Pradesh, Bihar, Madhya Pradesh, Maharashtra, Andhra Pradesh and Karnataka in India, over a 24 month period.

Expert Systems: An ES is defined as "a computer program designed to model the problem solving ability of a human expert" (Durkin, 1994). It is also defined as "a system that uses human knowledge captured in a computer to solve problems that ordinarily require human expertise". It is a computer application that solves complicated problems that would otherwise require extensive human expertise. To do so, it simulates the human reasoning process by applying specific knowledge and interfaces. ES also uses human knowledge to solve problems that normally would require human intelligence. It represents the expertise knowledge as data or rules within the computer. These rules and data can be called upon when needed to solve problems. Books and manual guides are having tremendous amount of knowledge but a human has to read and interpret the knowledge. The idea behind creating an ES is that it can enable many people to benefit from the knowledge of one person i.e the expert.

Capabilities of Expert Systems

- Explore impact of strategic goals
- Impact of plans on resources
- Integrate general design principles and manufacturing limitations
- Provide advice on decisions
- Monitor quality and assist in finding solutions
- Look for causes and suggest solutions

Apart from the above mentioned ICT tools there are many other tools are available which could be used as it is or with some modifications to suit to the existing situation and objective of the programme for which we are using the technologies

Conclusion: Internet and World Wide Web have provided opportunity for the agricultural extension scientists to disseminate the technology, share the research findings and get the farmer feedback in most economic manner. The internet services like WWW, e-mail and Facebook may help to keep in pace with recent trend in the field. Extension professionals fully equipped with the modern tools help to serve the farming community. ICTs modify the practice of extension services and open interesting avenues for the collection and dissemination of local knowledge and its integration with modern and global knowledge. It facilitates information delivery and bridge the gap existing between different actors in the agricultural development system. Farmers started using different ICT tools and it shows the greatest revolution in the field of agriculture.

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