

ROLE OF INFORMATION TECHNOLOGY IN AGRI-BUSINESS

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ABSTRACT

The potential of Information Technology Is not fully tapped in the Indian agriculture sector. While IT opens up possibilities ranging from precision farming at farm level to support for efficient decision-making to the policy-makers, unfortunately, the current levels of induction of IT In the agricultural front is far from satisfactory. This paper makes an effort to provide an overview of the prospects from IT in Indian agriculture. Special emphasis is laid on fertiliser marketing operations, which constitutes an immediate area of concern.

It is to be noted that, the farmer is in no position to use IT directly. The literacy levels, language barrier (as most of the application software are predominantly in English), cost of computers, poor communication infrastructure make it impossible for individual farmers, particularly small farmers to directly adopt IT. This calls for institutional effort to harness to create the necessary IT based services to farmers.

Key words: *Revolution, spectrum, Bottleneck, Horizon, Parameter, Feedback*

Introduction :

The immense scale and diversity of Indian agriculture provides the ultimate challenge to the potential of information technology. The rapid strides that the country has registered In the IT field will remain incomplete unless IT is fully utilised to ensure more efficient and productive Indian agriculture. Practically there is no area in agriculture in which IT has no role to play. It can be argued that the next revolution in urgent need of focus is IT revolution in Indian farming.

Since the subject under discussion is vast, it is not possible to examine the entire spectrum in detail. Consequently, the discussion is restricted to the issues based on the key players who are involved in Indian agriculture. An examination of the subject from the perspective of these key players can provide us with a workable strategy to gain from a proper utilisation of IT in agriculture.

The key players may be broadly classified into:

- (i) The farmer — who is the actual person who can directly bring about an improvement in efficiency and productivity in agriculture,
- (ii) Various industries that provide inputs to agriculture,
- (iii) Various industries that deal with agricultural output,
- (iv) Central and state governments,
- (v) Institutions/ organisations and NGOs working for the benefit of farmers such as agricultural universities and research centers. The key players listed here can make a big contribution to the economy with the assistance of Information Technology.

The farmer, towards whose welfare a huge government machinery and industry is devoted, still suffers from the absence of right information at the required time. The farmer requires timely inputs on weather forecasts, sowing time, availability and recommendations on inputs, availability of credit, expert advice on maintaining his crop in healthy condition, information on markets and on all other areas of

interest to him and his family. Despite the best efforts and expenditure, the conventional apparatus could not meet these requirements satisfactorily. Herein lays the potential of IT which can efficiently address the concerns of farmers stationed at even remote locations.

The major bottleneck in spreading e-culture to rural areas is related to connectivity i.e. ensuring that the access points can get connected to the databases which are in selected locations. Since dialup lines are very slow, other viable options are required to be explored. Unfortunately, the alternatives are expensive and may not be feasible. One silver lining is that several private operators are connecting important cities with fiber optic which provides a very reliable and fast access. Since, these will pass through rural India, it is possible to explore the possibility of tapping this potential by laying the last mile connectivity. Once, this is done, substantial segment of rural India can access the IT based services.

Information Technology is one of the swiftly growing sectors in the 21st century. The sector has various horizons for overall development of human race. Information Technology has metamorphosed the old communication system and has consorted the whole world. Information Technology has brought rigorous information pertaining to the different subjects to the threshold of user's. It is a multimedia system which is able to provide information up to the grass root level of the society. The sector has tremendous potential in the upliftment of the lower strata of the society and diverting them towards national development.

The potential use of Information Technology in agriculture can lead to timely information regarding crop cultivation, information about climatic parameters through meteorological data, insect and disease forecasting based on the same, timely plant protection including prophylactic and post infection measures, maintenance of quality parameters, proper market intelligence and market information to the farmers. Following are the some areas where Information Technology can do huge changes-

Agriculture Marketing	Flood control and water harvesting
Agriculture Extension	Animal Sciences
Rural Health	Rural Education
Rural Employment	Rural Finance
Rural Governance	Women Empowerment
Village Entrepreneurship	Rural Energy

Role of Information Technology and Agriculture :

There are number of problems associated with farmers and to solve or minimize these problems Information Technology can help the Indian farmer to a great extent. Some of the areas where the Information Technology can work in collaboration with agriculture are—

1. Decision support system-It includes Multimedia and Expert Systems—GOSSYM-E-agro-tech-POMME-Grain marketing Advisor—COMAX-SBER-MAX-SOYES
2. Remote Sensing
3. E-procurement in dairy sector
4. Gyandoot-Community-owned rural Internet Kiosks
5. ITC E-choupal

The agriculture scenario all over the world is undergoing a rapid change particularly after WTO Agreements came to existence. In order to take full advantage of the changing global agricultural scenario interconnecting of policies related to pricing, marketing and trading of agricultural commodities are also reviewed. Simultaneously there is also need to review and revitalize the mechanism for transfer of technology under changing environment. It is readily accepted that increased information flow has a positive effect on the agricultural sector and individual firms. However, collecting and disseminating information is often difficult and costly. Information Technology (IT) offers the ability to increase the amount of information provided to all participants in the agricultural sector and to decrease the cost of disseminating the information.

An understanding of the factors associated with IT adoption and use in agriculture will enable the development of strategies to promote IT adoption and increase the effectiveness and efficiency of information used in agriculture. It is a fact that access to information holds the key for successful development. Improved communications and information access is directly related to socio-economic development of any nation. Agriculture is one of the prospective areas in which IT can effectively be applied particularly for the social and economic development of the Indian agrarian community. However,

rural population in our country still have difficulties in accessing crucial information in the forms they can understand in order to make timely decisions for better farming. IT is generating possibilities to solve such problems of different categories of end users. For this purpose electronic communications infrastructure needs to be established in the country for remote rural areas. The challenge is not only to improve the accessibility of communications technology to the rural population but also to improve the relevance of information to local development.

Information Technology for Agricultural Production and Marketing :

Information Technology is playing an important and vital role in agricultural production and marketing. IT allows farmers to save time on order and delivery and getting feedback. In the existing competition, there is a need to rapidly attract new customers as well as retain existing customers. In order to take the real status of agricultural production and marketing, there is an urgent need to develop the following items—

1. **Farmers' crop database must be managed.** The database includes the kinds of crops, the size of cultivated area, time of harvest and yield. Farmers or the extension personnel transmit those data via the Internet to database server. Further, information, provides the farmer with an important instrument for decision-making and taking action.
2. **Crops information service system should be created.** This system analyzes the crop data to create some statistical tables. Farmers can access these statistical data by browsing the homepage and make their production plan. Changes within the structure of agriculture will probably have an impact on the selection and types of acquisition of software and other integrated systems made by the farmers.
3. **Production techniques and information inquiry system should be created.** This system integrates the production techniques and information, which are developed by experimental agricultural institutes and agricultural improvement stations. Farmers can find out relevant production information through this inquiry service system.
4. **Production equipment's inquiry service system should be created.** This system gathers information from the companies of seeds and crop production equipment to build the production equipment's inquiry service system. At the same time, allow relevant companies to access this system and enter their own data. Therefore, farmers can order the needed items through this system.

Information is critical to the social and economic activities that comprise the development process. Development economy has witnessed for revolutions in agricultural (i.e. Green, white, yellow and blue revolution), bio-technological, industrial and information technology. Good communication system and information system reinforce commitments to sustainable productivity. The Government of India is giving more thrust on agriculture, food and information technology sectors towards achievement of economic reforms to achieve high growth rate in production in the years to come.

The National Agricultural Policy announced addresses the challenges arising out of economic liberalisation and globalisation. It seeks to actualize the vast untapped growth potential of Indian agriculture, strengthen rural infrastructure to support faster agricultural development, promote value addition and secure a fair standard of living for farmers and farm workers. The National Agricultural Policy lays emphasis on the use of Information Technology for achieving a more rapid development of agriculture in India.

In pursuance thereof, the Department of Agriculture and Cooperation (DAC) has formulated Information Technology (IT) Vision 2020. This vision inter-alia envisages that: (a) Information relating to agriculture sector would be available to the ultimate users —

- (a) the farmers — for optimizing their productivity and income;
- (b) Extension and advisory services making use of information technology would be available to the farmers on round the clock basis;
- (c) The tools for information technology will provide networking of agriculture sector not only in the country but also globally and the Union and State Government Departments will have reservoirs of data base; and
- (d) The long-term vision on 'Information Technology in Agriculture Sector is to bring farmers, researchers, scientists and administrators together by establishing 'Agriculture on-line' through exchange of ideas/information. In future, information technology will reduce the cost and time of information system. IT will bring new information services for agricultural development that will enable the farmers to have much greater control over the information channels.

Agricultural Implications of IT:

Information technology provides answers to a number of questions to the farmers. For example, what are the benefits of more irrigation? Is it cost-effective to apply additional chemicals? When is the best time to sell crops or buy inputs? With improved record-keeping, more detailed cost analysis and more sophisticated marketing strategies, farmers are making better decisions and earning higher profits. The Internet is increasing communication and business opportunities within the agricultural community, which previously operated in the relative isolation of rural areas. Farmers, agricultural researchers, cooperatives, suppliers and buyers use the Internet to exchange ideas and information, as well as to conduct business with each other. Machinery, seed chemicals and other types of agricultural products can be purchased and sold online. People can search for jobs and employees.

It is to be noted that, the farmer is in no position to use IT directly. The literacy levels, language barrier as most of the application software are predominantly in English, cost of computers, poor communication infrastructure make it impossible for individual farmers, particularly small farmers to directly adopt IT. This calls for institutional effort to harness to create the necessary IT based services to farmers. But in India, one prominent problem is that most of the farmers own small holdings, this seems to be difficult. In this situation, it may be made possible by adopting the corporate farming system, which is the need of the hour with advent of new agricultural policy. By taking up corporate farming, a group of farmers can install a computer and any educated young man from that group can undergo training of how to browse the internet. He can provide the farmers current commodity, analysis reports on world markets and trade for different commodities. Food market overviews provide valuable information about some of the most important export market.

Information Technology can help to provide the information on the likely price distribution of key commodities over the coming years. Such information helps farmers and traders make decisions on when and in what ways to market their grain. Whether, to sell at harvest or store on-farm in anticipation of higher later in the season. When combined with enterprise budget data, the information can also be used in deciding which crops to produce in the coming season. In order to encourage farmers to obtain best possible price, information on various agricultural output markets is also being provided. The objective of this activity is to provide status of price at different markets to facilitate farmer to move his produce to the market where he can expect better price.

The contribution of information technology in bringing down costs, increasing efficiency and improving productivity and thereby contributing to the bottom line needs no special emphasis. In the fertilizer marketing context, IT can play a major role in efficient sales operations, checking the marketing costs, safeguarding market share and providing efficient customer services. A well conceived IT set up can endow decision-makers at all levels with better reflexes to effectively respond to market conditions. IT helps producers monitor and respond to weather variability on a day-to-day basis. Solar-powered weather stations in the field can be hooked up to a farmer's computer to relay information about current air and soil temperature, precipitation, relative humidity, leaf wetness, soil moisture, day length, wind speed and solar radiation. Producers use the Internet to monitor prices quickly and as often as they like. Farmers from around the world can exchange ideas, post questions and get answers about specific topics.

Thus, it is said that the importance of information technology in the field of agriculture is emerging. The challenges of cost intensive, highly technical agricultural technologies are knocking the door to the farmers which is ignited by the globalisation. There is significant shift from agriculture supply driven to demand driven paradigm in new emerging and changing economic policy. It is viewed that future agricultural growth would be information driven. New information must reach to the ultimate user at the fastest speed to harness its potential .benefits. Information like seed, water, nutrients and plants protection biological is one of the key inputs for successful farming. Knowledge intensive and precision farming techniques will be the guiding lines for sustainable agriculture in the future.

Role of Information Technology in Agri-business :

The Information system primarily aims at filling out the information and communication gap that exists in various sub-sectors of agriculture economy general and agriculture commodities trade in particular. The ultimate aim of Information Technology is to reach the highest level of sophistication of agribusiness sector, so as to achieve a perfect flow of information analysis, communication and e-commerce plays an important role. The main objective of agri-business information system are to enable various participants in

agri-business sectors such as farmers traders, processors of agriculture outputs, suppliers of agriculture inputs, etc. by providing latest and accurate information. To provide valuable analysis to trade participants that will enhance their decision taking abilities in trade. By the adoption of Information Technology in Indian business like any other business and reduce the uncertainty and fluctuations.

Expert Systems in Agriculture :

The expert system is designed to answer questions typed at a keyboard attached to a computer on such diversified topics, such as in pest control, the need to spray, selection of chemical to spray, mixing and application, optimal machinery, management practices, weather damage recovery such as freeze, frost, drought, etc.

An expert system is an intelligent computer programme that uses knowledge and inference procedures to solve problems that are difficult enough to require significant human expertise for their solution.

Expert systems a recent advance in the use of computers, give advice on any field of agriculture considering the widespread use of extension agents in the field. Aid from experts who have encoded their knowledge in computer programs can solve some of the problems in agriculture. Experts systems have the potential to help farmers run their business more economically.

Commodity Exchanges :

Commodity derivatives have had a long and a chequered presence in India. There are 25 commodity derivative exchanges in India as of now and derivative contracts on nearly 100 commodities are available for trade. In the year 2003 four national commodity exchanges became operational, i.e. National Multi-commodity Exchange of India (NMCE), National Board of Trade (NBOT), National Commodity and Derivatives Exchange (NCDEX) and Multi-Commodity Exchanges (MCX). The onset of these exchanges and the introduction of future contracts on new commodities by the forward market commission have triggered significant levels of trade. Now the commodities future trading in India is all set to match the volumes on the capital markets.

Due to IT online commodity trading was possible which offers a way for an open, many too many system where every user has equal access to price quotes and trading functionality. It provides a level playing field for all. Without favouritism or control by a chosen few, where any user can view all quotes posted by other users in real time, act or trade on quotes posted by others, post their own prices and quantities for other to trade.

Information Technology and Government :

Proper planning, monitoring and corrective action requires availability of timely information of right quality. The central and state governments require hastening the process of computerization of all the records and transactions. Since, the government has major say in promoting agriculture, this will have cascading effect on the entire rural areas. To begin with, it is necessary that the government agencies should accept conventional reports in the electronic format. This will bring about much desired speed and effectiveness in governance. Many state governments are showing interest in developing proper systems for e-governance. But the implementation of the same is still requires a lot to be desired.

These measures will encourage end user i.e. Farmer's participation and will provide the much needed input from them.

Conclusion :

It can be rightly started that though IT in the agriculture is in budding stage in the Indian context and has just started to spread it shoots, but with its immense potential to standardize and regulate the agricultural processes and solve examples of successful application of IT in agriculture has proved beyond any doubt that its one of the best tool for prospering Indian agriculture.

It can be rightly stated that though Information Technology in the agriculture is in growing stage in the Indian context. It has just started to spread its shoots, but with its immense potential to standardize and regulate the agricultural processes and solve the problems, it is sure that IT will be one of the most important areas in the near future for agricultural development. It is hoped that Information Technology will bring a highly developed agriculture by its worthwhile contributions to the society by narrowing down the enormous

gap between the researchers and farmers. It is suggested that the farmers are to be made aware of the utility of the Internet and other related information regarding Information Technology.

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