REVIEW ARTICLE

ICT APPLICATIONS IN INVENTORY MANAGEMENT AND RURAL DEVELOPMENT

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ARTICLE INFO	ABSTRACT
	In the present paper a brief account of the role of information and communication technology in Inventory Management and Rural Development is explained. Its other practical contribution to various sectors of areas such as agriculture, telecommunication, telemedicine community, inventory business management and distant education are also described with the conclusion and references in the end.

INTRODUCTION

The villages epitomize the soul of India as more than 70% of Indian population lives in rural areas. Since rural population reflects the very essence of Indian culture and civilization, therefore, a holistic development of India as a nation rests on a sustained all round development of rural India. Information and communication technologies have emerged as important tools of reaching out to the people at grass root level.

In India the application of computers in governance process had started in 1980 with the following initiatives:

- Computerized rural information centre project by Rural Development Department, Government of India.
- District Information Systems of the National Information Centre (DISNIC), Project
- National Resource Data Management System (NRDMS) by the Department of Science and Technology, Government of India
- Another project was Land Records Computerization started by Government of India

Information technology doubtlessly can contribute to Inventory management and rural development in following ways:

- It can facilitate rural activities like provision of distance education, tele-medicine, remote public services, remote

entertainment, etc. to provide more comfortable and safe rural life as equivalent to urban areas.
- It can initiate new agricultural and rural business such as e-commerce, real estate business for satellite offices, rural tourism, and virtual corporation of small scale farms.
- It can support policy-making and evaluation on optimal farm production, disaster management, agro-environment resource management, etc. using tools such as geographic information systems (GIS).
- It can improve farm management and farming technologies by efficient farm management, risk management, effective information or knowledge transfer, etc.

In Japan IT policy for agriculture and rural development started late in 1980s , but could not succeed due to the policy of more priority to hardware than software resulting in inefficient data resources and poor applications those were not useful enough to convince farmers of the beneficial effect of IT in agriculture. Poor rural network of infrastructure and IT literacy contributed to this failure.

Computers in Inventory Management and Rural Development: In the wake of agricultural development through scientific means, the need for information and data has increased many folds. Computers having immense power of information about data processing, storage and retrieval has become an indispensable tool for this purpose. Computer networking and use of modems are extremely useful for

communication and dissemination of the processed data at lightning speed, moreover, with advent of very powerful personal computers and use of software have made things much easier. Thus, the opportunities for computer application in agricultural and rural development have further increased. Looking at the present status in Japan, we can identify existing issues that we need to solve in order to extend IT to the agricultural domain. Agriculture stands on the very complex interaction between biological, climate and geographical factors in addition to human economic activities. The information through such a complicated system is unpredictable, unstable, subjective, site-specific and reliant on empirical decisions given in the inherent variability of biological phenomena. Agricultural information with these features is typically beyond the scope of the information science used in industrial information system and that has surely led to the failure of IT in agriculture. So we should also consider how to easily collect field data.

Although, field data are the basis for farm decision support, yet a few people realize the importance of it in developing several decision support programs through the case-based knowledge management. A case-base is a kind of database that stores empirical cases and has a function to recommend relevant cases according to users' decision making queries. Otuka and Ninomiya (1998), and Otuka and Kitamurua (2002) developed a prototype case base system using a concept search engine that is based on latent semantic indexing by Deerwester (1990). In other words, this is a search based meaning that using the system, one can retrieves cases without entering any keywords. The user can enter normal sentences as queries to the system and the system searches for the recommended cases corresponding to the queries, based on the context or the concept of the queries.

The above mentioned case-based approach can be applied to several types of cases collected in many ways. E-mails exchanged in mailing lists are good examples of these cases. Images can be cases as well as ordinary texts. In the system they developed, farmers request that extension services to diagnose diseases and pests by sending queries and images taken by digital cameras by e-mail, and extension services and reply to these. These question-and-answer (Q&A) and images are automatically stored as cases for a forthcoming automated Q&A system. Here the stored images and queries will be automatically matched with new queries and images to find out the proper answer. Indian farmers need timely expert advice to make them more productive and competitive. So it is proposed a frame of a cost-effective agricultural information dissemination system (AgrIDS) to disseminate expert agriculture knowledge to the farming community to improve the farm productivity. Some of the crucial benefits of AgrIDS are given below:

- It is a scalable system which can be incrementally developed and extended to cover all the crops of Indian farmers in a cost effective manner.
- It enables the farmer to cultivate a crop with expertise seeking both crop and location specific advice from the agriculture expert
- On using AgrIDS we can reduce the lag period between research effort to practice be reduced significantly.
- The proposed system assumes a great significance due to the trend of globalization as it aims to provide expert advice which is crucial for the farmer to harvest different kinds of crop varieties based on the demand in the world market.

Integrated rural level development and micro – level planning has also been in vogue for many years in the successive National Development Plans. Since India has different types of terrain, natural resources, climate, socio – economic levels, administrative set up, cultures, etc., .Micro – level planning and modeling requires a comprehensive village level, spatial and non – spatial databases and integrated information systems. Such database and integrated information system can be developed using computers and communication networks. Computers have also played a very significant in agricultural research. The use of computers for analysis of data pertaining to research experiments is well known. Research planning in agriculture is also a complex process. The research planner must identify a specific problem, define specific objectives, construct hypotheses, mobilize resources for experiments, disseminate results and continuously re- assess the research results. Computers are extremely useful for these activities. Research inventory management is another area where the use of computers has increased considerably for determining research priorities by allocation of resources for specific commodities or projects. The project management is an important area where computers are increasingly being employed. Optimal allocation of resources is important in multistate, interdisciplinary research programs. The activity network can be developed by scientists and administrators on computers to identify the critical research activity and to organize these activities in time and formulate the integration of research. That can lead to optimal allocation of limited funds/resources to research programs by assigning benefits, probabilities of success and time and resource requirements to alternative programs. Computers can be used for development of inventory management information systems for supporting such activities.

IT Application in Telecommunication Development: A conference in March 1998, sought to promote universal access to basic telecommunication, broadcasting and Internet as tools for development in rural remote areas. Rural and remote (or just "rural") areas exhibit one or more of the characteristics such as scarcity or absence of public facilities, kike reliable electricity supply, water, access roads and regular transport and so on. Research groups have found that the Internet is the most widely used platform adopted to deliver multimedia applications in rural areas of developing countries. Actually, much negative attention in developing countries has been focused in the use of the Internet as an illegal bypass mechanics in the international traffic arena. However, the long-term importance of the Internet for developing countries lies in its potential to improve the domestic flow of economic and educational resources between isolated rural communities and urban centers. Areas of application for Internet- and other communication-based applications include telemedicine and public health education, coordinating regional food security efforts, making government –sponsored agricultural extension services more effective and accessible to rural farmers. Internet enables more rural children, adolescents and post-secondary students to receive an education about heath.

Information technology and multimedia terminals: It is of the utmost importance that International Telecommunication Union Development Sector (ITU-D) strives to raise awareness of the rural information and communication needs of

developing countries within the computing and information technology industry. Unlike the telecommunication industry, which has been doing business in underdeveloped rural areas for several decades, companies in the IT sector are generally unfamiliar with the environmental and social requirements of rural areas of developing countries. Multimedia systems profiled. Some Research Group which were only launched during the period between June and August 2000, demonstrate many features with potential lifetime cost savings for rural areas. For example, information appliances supporting e-mail, World Wide Web (WWW) browsing and e-commerce applications provide simplified user interfaces in packages with fewer maintenance requirements than traditional PCs. Internet client network solutions can offer Internet Services Providers (ISPs) and the ability to upgrade their rural customers' browser and applications software remotely, reducing the skills requirement s for tele-center operators and rural schools. Finally technical Industries and R&D organizations in developing countries their own custom, low cost IT terminals and devices.

GIS and Its Applications in Health Care: Geography is information about the earth's surface and objects found in it, as well as a framework for organizing knowledge. GIS is a computer technology that uses a Geographical Information System as an analytical framework for managing and integrating data; solving a problem and understanding a past, present or future situation. It is capable of capturing, storing, analyzing, and displaying geographically referenced information i.e. data identified according to location. Crisis Helper aims to identify the disease through symptoms and finding the curing procedure using the concept of Geographical Information System (GIS). The diagnosis performed under emergency situation needs related cases in medical history. So to provide a helpline under such critical situation GIS was developed in health care. GIS can be used for scientific investigations, resource management and development.

Parts of Geographical Information System
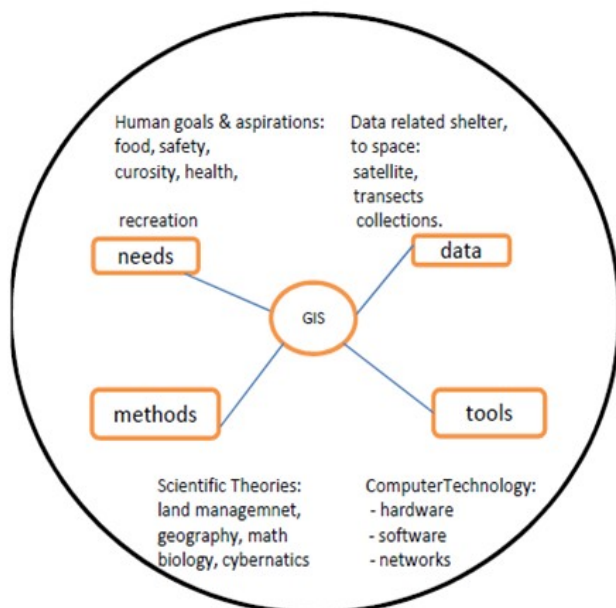
This diagram shows the four basic parts of a GIS in the contest of relationship with nature. In practice, a GIS consists of people using technology to work with data under various methods in order to meet specific human needs. This has a specific implication of human centered activity, in contrast to other technologies, databases and theories. GIS is a technology that is used to view and analyze data from a geographic perspective. GIS links location to information and layers that information to give you a better understanding of how it all interrelates.

Women Self Help Aid (WSHA): Self-help is a way to deal with problems that everyone faces from time to time in their lives like illness, divorce, the death of a loved one, emotional upsets or strains, etc. Talking over these problems with other people who have lived through them can help us to deal with tomorrow. The knowledge base of self-help mutual support groups is experiential, indigenous, and rooted in the wisdom that comes from struggling with problems in concrete and shared ways. Self-help groups build on the strengths of their members (2002). A significant development in recent years has been the mushrooming of community –based organizations and initiatives at the local level for women. WSHA was initiated with the intention to combat unemployment and poverty and, above all, to procure earnings for the participants. Many rural women are landless laborers and are economically very poor; most of them are illiterate or semi-literate. These women can be organized into self-help groups. The goal of this program is to promote savings and credit activities, and to promote employment of these women into production units. This will lead to a strong and permanent improvement of their socio-economic conditions in number of ways.

Initiation of savings and credit activities and promotion of income generating programs in these self-help groups will bring more economic development and independence to these women and their families. As consequences of the welfare of these families, more children will be able to attend the school instead of being forced into agriculture child labor. For the first time in their life, these disadvantaged rural women become organized into groups. The formation of these self-help groups will facilitate the discussion of many issues pertaining to their socio-economic, educational and health status. Thus, the formation of this group provides a forum to initiate many participatory activities (including training and awareness camps). This process will also lead to increase confidence in these women, and will help them to get decision-making status in their society. This will encourage these women to participate and contribute in general social and political matters in their respective villages, including women rights.

Other Applications: There are many other applications also of IT and some of them are discussed as follows:

Community and business development: A great of progress is being made in rural community and business development through the introduction of telephony, tele-centers, e-mail, and radio broadcasts. For example, People-Link, an organization sponsored by info-Dev (the Information for Development Program of the World Bank) has established an e-commerce program allowing local artisans in developing countries to bypass middlemen and market their products directly to first world consumers. Two of the key requirements for the success of community and business development applications were found to be local language support and the availability of relevant content.

Telemedicine: The motivation and commitment to telemedicine in developing countries is very strong. This motivation is often backed by a willingness to pay for systems which are expected to improve health outcomes and lower

medical costs in the long run. Telemedicine services may be perceived as more of a necessity in developing countries than they are in the industrialized countries, resulting in a greater willingness among the former to change established methods of doctor-patient interaction and health care administration. Telemedicine and tele-health applications are not limited exclusively to expensive, high bandwidth services. As long as the local medical community remains motivated and committed to implementing telemedicine and tele-health programs, there are wide range of health benefits that can be achieved through remote patient monitoring and diagnosis, multimedia communication links between urban and remote facilities, and broadcast of health information over radio and television.

Distance Education: Unsurprisingly, the focus group found that university-level distance education programs lend themselves to cross-border implementation. Using distribution by satellite or Internet, the administrative costs of running distance education courses can be spread over a very wide potential student base. A number of existing programs, such as the African Virtual University (AVU) and the distance education network of the University of the South Pacific (USPNet), are already based on the concept of cross-border educational access.

Data Mining: Data mining is useful for discovering and outlining hidden patterns in the data base. As the data in the database expand as a result of wide use of the portal, it becomes difficult to find information manually. Data mining provides algorithms which allow automatic pattern discovery and interactive analysis. Data mining has two basic goals namely prediction and description.

- Prediction includes the use of parameters, in order to predict unknown or future values of a variable in our database records.
- Description focuses on finding pattern models, which categorize data via clustering. In clustering data are divided in group and each record is assigned to a specific group according to the training technique and the training data set. In comparison with the classification technique there are no predefined groups; records are classified taking only similarity criteria into consideration

REFERENCES

1. Deerwester, S., S.T. Dumais, G.W. Furnas, T.K. Lamaier and R. Harshman (1990), "Indexing by latent semantic analysis", American Special Inf. Sci.41, 391-409
2. Lalitha, N. and B.S. Nagarajan (2002), "Self-help groups in rural development", Dominant Publishers and Distributers, New Delhi,.
3. Otuka, A. and S. Ninomiy, (1998), "Conceptual retrieval of agricultural cases with latent semantic indexing approach", Proceeding of Decision Support Systems in Bio-Industries, Montpellier, France, 37-38.
4. Otuka, A. and C. Kitamura (2002),Agriculture case base; decision support by harnessing knowledge and experience, Bul. Natl. Agr. Res. Centr.1, 45-56.
5. The Importance of Projects in Rural Development, Annah Sizakele Mzizi, February 20, 2004.

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