
UNIT 6 ROLE OF ICT IN RURAL DEVELOPMENT

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6.0 LEARNING OUTCOMES

After studying this Unit, you should be able to:

- explain the importance of ICT in citizen service delivery;
- discuss the role of ICT in rural development;
- highlight ICT applications in agriculture development ; and
- describe the role of ICT in creating livelihood opportunities in rural communities.

6.1 INTRODUCTION

India is a country of villages and their socio-economic transformation shall always serve as an index to development. Rural development is generally taken as development of rural areas. The concept encompasses within its scope the prosperity of people and place in rural areas. While talking of rural development the target has to be an overall improvement of the quality of life in rural areas taken as a whole and not just the development of an isolated sector. Rural development means rather a comprehensive development of rural areas in its wholesome nature.

Since 1991, a new era has commenced which has brought drastic changes in economic environment of the country. Indian economy has opened up to the world economy and invited foreign capital, investment collaborations and technology in a big way. Today, every

sector of the Indian economy is attuning itself to the changing economic environment. The rural sector is no exception. New feature of today's globalisation that has profound impact on rural sector is the ICT. The major objectives of ICT in rural development are to bring efficiency, openness and responsiveness along with participation in the formulation and implementation of rural development programmes by the people. It contributes to qualitative and quantitative changes in rural life style.

In this Unit, we will now discuss and assess the role played by ICT in the field of rural development.

6.2 ICT IN PUBLIC SERVICE DELIVERY

Service delivery is a core component of any government's obligation to citizens. Today, citizens are demanding more efficient and responsive services from government. Therefore, citizen service delivery has become a key focus area among governments throughout the world. With advent of ICT, there is now a greater need for governments to draw on these mechanisms to provide more efficient and responsive services to the citizens.

Governments all over the world have taken major transformation processes in citizen service delivery with the use of ICT. ICT is enabling citizens' participation and streamlining the work processes of government to improve the quality of services and responsiveness towards citizens. It enables citizens to use information as a key resource for betterment of their lives and strive towards socio-economic development. It has enabled governments to use multiple service delivery channels, such as, internet, mobile devices, WAP, etc. to render effective services to the target group.

In the following paragraphs, we will be discussing a project namely, 'PRAJA' that is based on ICT applications to render services to the people in the rural areas.

PRAJA: Reaching People in Rural Areas

The Project aims to provide all public services to the rural people at the district and mandal (Block) levels. National Informatics Centre (NIC) technically supports this Project taken up for the first time in West Godavari district of Andhra Pradesh.

The Project 'Praja' (meaning citizens) is an effort to bring government closer to the people and empower them through ICT. It makes the government more accessible to the people. It is an effort to deliver various Government to Citizens (G2C) and Citizens to Citizens (C2C) services in the rural areas. The Project has provided web enabled rural kiosks termed Praja Seva Kendrams at mandal level and village level. The fully computerised Praja Seva Kendrams are on a district wide network connected through dial up circuits and internet, with the district server acting as a remote access server.

The Praja Seva Kendram runs a district portal that allows access to various citizen services. These services range from the issuance of various certificates to getting information about various programmes and also go to the extent of networking citizens to each other and allow them the flexibility and convenience of mutually beneficial transactions. The Project allows access to hitherto marginalised communities and therefore, helps in bridging the existing information gaps and is a step towards digital unite. Many of the Praja Seva Kendrams are run as self-employment units and are manned by unemployed

youths from Chief Minister's and Prime Minister's rural employment plan beneficiary groups. The Project envisages that all villages can become knowledge hubs and gain symbiotically from each other and derive benefits from global networks. In addition to providing government services, this Project encourages rural e-commerce and rural cyber forums in the villages.

The traditional channels of citizen service delivery are continuing and complementing electronic channels for transactions, as they cater especially to those who are unfamiliar with technology or electronic transactions. Therefore, it is of prime importance that governments create awareness and educate the citizens on how to use the electronic channels. Through proper education citizens can familiarise with the changes in service delivery mechanisms.

6.3 ICT APPLICATIONS IN RURAL DEVELOPMENT

ICTs have the capacity to significantly empower people and facilitate development. This major technological revolution can significantly influence the development capacity of any society. Their applications to agriculture and rural development are very extensive and pervasive. With telecommunication technology, computers and information processing technology, data and image transfer technology, and interactive technology, ICTs have made a qualitative difference in the way we can generate, disseminate and transfer knowledge and promote development. The convergence of these technologies has created not only a new technological and production sector, but also a new social and economic reality in the rural sector. Increased connectivity and quicker flow of information has opened new frontiers of knowledge.

ICTs develop in rural communities a learning and innovation capacity that increases the effectiveness of their efforts to solve problems and improve their lives. They empower these communities and increase the effectiveness of their development efforts through informed decision making to achieve the objectives of poverty eradication, food security and sustainable development in rural areas.

However, technological applications are largely restricted to urban areas. Rural areas have not reaped enough benefits from them. ICTs must be used judiciously as important tools in developmental activities to address the problems of rural development in all sectors of the economy, such as, agriculture, energy, health and sanitation, rural engineering, housing and habitat, etc.

It is, therefore, necessary, to develop and introduce appropriate of so called green technologies coupled with sound delivery system, which ensures economic and ecological sustainability and optimum use of local resources emphasising on technology capacity building of rural people. In this endeavour, institutional linkages and active participation amongst voluntary agencies, science and technology based field groups, R & D institutions, financial agencies and above all, people who are primary stakeholders, become crucial for improving the quality of life in rural areas to achieve long term sustainability.

Essentials

In above process, technology choice can have a critical impact on many aspects of rural development, especially, the way we choose them, the way we innovate and design them, and the way we deliver them to masses. Therefore, technology must be carefully chosen

to enable rural people to:

- acquire and imbibe knowledge of technologies appropriate to their needs and environment;
- upgrade their traditional skills and capabilities;
- minimise fatigue and reduce drudgery; and
- be innovative

Equally ICT should:

- be capable of easy assimilation;
- generate significant and assured added value to existing methods of operation;
- generate employment and use local resources, both men and materials;
- need low capital investment and result in low cost production of goods;
- be capable of replication and adoption; and
- blend harmoniously with existing ecosystems leading to tangible improvements in the living conditions and self-sustained development of the rural people.

Thus, appropriate or green technologies, with above features, can play crucial role in building up local capacity, devising solutions for tackling the identified problems, and improving the lives of rural people by improving their surroundings and daily activities. Focus must be on technological empowerment of people with skills and critical thinking that fosters a sense of self-reliance and ability to evaluate what is beneficial or detrimental to their interests. This will improve their access to affordable, environmentally sound technologies and generate meaningful employment in local economic structure.

However, success in development and dissemination of such green technologies lies in participatory systems with down to earth approach or effective percolation of technology from people's acceptance point of view as well as to make proposed intervention sustainable to be managed by them. This involves:

- need identification/assessment of the people by local voluntary or science and technology based field groups;
- identification of ideal technological options as per location specific needs, skills and resources available;
- in-house technology appropriation or with assistance of nearby technical institution to a scale and level, which is acceptable to the people for long term sustainability;
- technology back up for 2-3 years through continuous handholding to people; and
- establishing backward and forward linkages for long term sustainability.

Once total system is in place with the complete technology package, the field group can gradually withdraw giving the entire responsibility to locally formed people's groups/organisation for further dissemination.

With above approach in mind to reach majority of the people who live in the vast areas of rural India, several grassroots level organisations with scientific and technological capabilities are providing crucial link between the emerging new developments in knowledge and technology, and also helping to strengthen and diversify the local economy, utilisation of local resources, and upgrading the skills of artisans, land-less labourers and other disadvantaged sections. By adopting above mentioned approach, such groups have developed proven and viable models of a large number of green technologies for socio-economic up-liftment through skill upgradation, income generation, drudgery removal, sustainable use of resources, etc. Such interventions have brought in visible changes in the lifestyles in rural areas and can have multiplier effects in different parts of the country.

6.3.1 ICT Applications in Agriculture

ICTs have played an important role in promoting agriculture during the last several decades. The role of television and radio in rural education and extension services has been well documented. These technologies will continue to play a crucial role in and along with the new ICTs.

ICT revolution is leading to the need to develop a new paradigm for agriculture. Beyond databases and information systems, application of ICT to agriculture are appearing everywhere. ICTs are profoundly transforming extension services through the use of multimedia technology, distance education technology, as well as through innovative approaches based on interactive knowledge development processes. They are having a clear impact on our capacity to monitor the environmental impact on agriculture and degradation of natural resources through remote sensor data. GIS are opening new approaches to regional planning and to the management of natural resources.

In the context of agriculture, there are five key services or functions that are very closely related to ICT:

- access to information through different types of **Agricultural Information Systems (AIS)**;
- monitoring the situation of natural resources and environmental impact through different **Information Processing Tools** (i.e. analysis of environment deterioration, soil erosion, deforestation, etc.);
- **Education and Communication Technologies** that are playing a very important role in generating new approaches to learning and knowledge management;
- **Networking** where ICTs can contribute greatly to relating people/institutions among them and facilitating the emergence of ‘Virtual Communities of Stakeholders’ that generate and exchange information and knowledge among themselves. If well managed, networking is a first step in the direction of developing interactive knowledge development processes that may lead to learning networks; and
- **Decision Support Systems (DSS)** through which data and information provide relevant knowledge inputs for informed decision-making. These tools are playing an important role in converting information systems into knowledge systems.

The main objective of these ICT applications, from a development perspective, is that of empowering people through knowledge. It means developing in people a capacity to

achieve their development objectives and goals through the generation, acquisition and use of knowledge.

National Institute of Agricultural Extension Management

Agriculture continues to be an occupation and way of life for more than half of Indian population even today. Sustainable prosperity of this class, that is, farmers and landless agricultural labourers, holds key for improving the over all human resource development scenario in the country. Various efforts are being made to improve the social and economic conditions of this class through ICT.

National Institute of Agricultural Extension Management has taken up a number of “Cyber Extension” initiatives across the country. District level websites are hosted, information kiosks are established at block /mandal and village levels, and technical and other need based information is collected, digitised and hosted on the internet.

The Institute has taken initiative to provide linkages to the technical and other farmer-friendly information through its websites. In Andhra Pradesh, websites of 24 districts contain very important information on district profile, land use pattern, district agriculture scenario, strategic research and extension plans, replicable success stories and information on important contact persons with their telephone numbers and e-mail addresses. These websites have improved information dissemination significantly.

As an apex national institution, the Institute through its various projects and programmes is working towards providing cyber connectivity to all Indian villages to make available the benefits of ICT to the Indian farmers and change the face of Indian agriculture.

Village Knowledge Centres

The future of food security in the developing world is dependent less on resource-intensive agriculture and more on knowledge-intensity. In the coming years, agriculture will have to be developed as an effective instrument of creating more income, jobs and food and such a paradigm of sustainable agriculture will be both knowledge and skill intensive. The development of precision agriculture is need of the hour, which emphasises knowledge intensity. Precision agriculture refers to exactness and implies correctness or accuracy in any aspect of production. Precision agriculture is the application of technologies and principles to manage spatial and temporal variability associated with all aspects of agricultural production for the purpose of improving crop performance and environmental quality. The enabling technologies of precision agriculture can be grounded into four major categories: Computers, Geographic Information System (GIS), Global Positioning System (GPS), and Sensors and Application Central (SAC).

The new agriculture paradigm in India will have to take advantage of knowledge availability to achieve the triple goals of increased income, jobs and food. The emerging ICTs have a significant role to play in evolving such a paradigm. The key step in the use of ICTs in sustainable agricultural and rural development is the value addition made to generic information to render it local specific. A programme has been launched in 1998 in the Pondicherry region to determine the manner in which ICTs make an impact on rural livelihoods. The Village Knowledge Centre Project has an operational centre/value addition centre at Villianur, which is the headquarters of the Villianur Commune. The value addition centre has access to the internet through two dial-up accounts. This also functions as the

hub of a local area network for data and voice transmission covering the project village. The value addition centre in Villianur has generated a number of databases to fulfil requirements of the people in the villages. Some of the databases pertain to the following:

- entitlements to rural families: this database provides details of about 130 schemes, which are operational in Pondicherry Union Territory;
- families below poverty line: details of families in the communes of Ariyankuppam, Villianur and Nettapakkam have been provided in this database, which has been compiled from the UT Administration. Approximately 22,000 families are listed;
- grain prices in Pondicherry region;
- input prices (quality seeds/fertilisers) in Pondicherry region;
- directory of general and crop insurance schemes;
- integrated pest management in rice crop;
- pest management in sugarcane crop;
- directory of hospitals and medical practitioners in Pondicherry-grouped with specialisations, such as, orthopaedics, paediatrics, etc.; and
- bus/train timetables-covering Pondicherry region and two nearby towns

These databases (except the data on families below poverty line, which is an official document in English) are available in Tamil language at all village centres. Updates are transferred using the wireless network. In addition, interactive CD-ROMs for health related issues have been developed, where FAQs (frequently asked questions) are posed to medical practitioners, whose replies are video-graphed and converted to Real Video format for retrieval, using a PC. Topics related to 'general hygiene', 'dental and oral hygiene' and 'eye' have been covered.

In addition to such defined content, daily transactions take place covering important public events and government announcements for rural families. Cricket information is much sought after through well-known websites. One important service provided is the announcement of examination results of 10th and 12th classes. The results and mark sheets are available on the web, cutting short the time of waiting by at least one week.

Recently, a significant new dimension was added with the commissioning of solar-mains hybrid power systems in all the centres.

This Project has received mention both in India and abroad (in the 136th Presidential Address at the US National Academy of Sciences by Prof. Bruce Alberts in April 1999). The Human Development Report (UNDP 1999) cites this as an example of a creative project in addressing the global information divide.

6.3.2 ICT and Women Empowerment

ICT applications in rural areas should benefit the agricultural sector and reduce rural poverty. Participation of the poor in planning and implementation of anti-poverty programmes is required to reduce the chain of intermediaries between the government and actual

beneficiaries and to improve their bargaining power. There is a need for institutional mechanism at the grassroots to safeguard the interests of the poor. Therefore, organising the poor in the form of self-help groups (SHGs) around thrift and credit services is one of the most effective methods, not only for alleviating poverty but also for empowering rural poor. In this context, the Government of Andhra Pradesh has provided a larger space for women self-help groups in its strategy for poverty alleviation and women empowerment. The Development of Women and Children in Rural Areas (DWACRA) Programme was started in 1982-83 in the State with UNICEF cooperation to provide opportunities of self-employment on a sustained basis for the rural poor women. National Institute of Agricultural Extension Management has provided multimedia computer system with UPS, printer and internet connectivity to Mutually Aided Cooperative Thrift and Credit Societies (MACTCS) organised by DWARCA groups. Four members identified by the group were trained in basic computer operations and internet browsing. Multimedia CDs on Agriculture-Intensive Self-Learning Packages on Watershed Management, Vyavasya, Panchangam (Encyclopedia of Agricultural Practices), Paddy Cotton, Mayo and Coconut Cultivation, Expert Systems on Selected Crops and Rural Development – pickle making, child labour, child education, nutrition and health education, etc. were given to all the groups. A user-friendly accounting package was given to all the MACTCS to maintain their accounts and two members were trained to use it.

The experiences of these groups have shown that they have been using the internet in innovative ways. They are browsing DRDA Websites for government programmes and schemes. They are looking for weather forecasts, market prices, job opportunities and news on the net regularly. They have also started to charge some of these services selectively. This has provided a good opportunity to the rural information kiosks to earn some revenue. Farmers are also using the net for getting technical advice online from various sources. Rural people have created their own e-mail accounts for faster communication. They are sending mails to DRDA, district collector and other district and state-level officials.

The studies conducted on the impact of these groups on women empowerment highlighted that woman's access to and control over their savings, credit and income has improved. Further, women have improved freedom to move and interact with the officials and other women after joining the SHGs of DWACRA. But, the studies also have revealed that empowerment varied across different social groups since issues of women empowerment are interlocked with caste, religion, headship of households and their age. The fundamental pre-requisite for sustainable women empowerment is intensive participation of women in the activities of respective SHGs facilitated by ICTs.

6.4 SUGGESTIONS FOR EFFECTIVE ICT IMPLEMENTATION IN RURAL DEVELOPMENT

Limited local participation, lack of availability of local resources, fractured relationship with state agencies and exogenous social and economic environment are identified as some of the factors for the inability of ICT projects to deliver their full range of outputs in rural areas. E-governance is invariably a passive system of information empowerment. There is need for promoting participatory methodologies of content creation and knowledge management. The approach to rural women and men should be one of partnership and

not patronage. In the field of agriculture, a Farmer Participatory Knowledge System (FPKS) could replace the existing beneficiary and patronage approach to knowledge dissemination. Information should be demand driven and should be relevant in terms of time and space.

There is need for more on-farm and non-farm employment opportunities in villages. This will be possible only if there is diversification of farming systems and value addition to primary products through improved post-harvest technology. Training should be with reference to market-driven skills. Small-scale industries and khadi and village industries should receive particular attention from the point of view of the upgradation of both technology and marketing skills. There is also need for synergy between the private sector and public and cooperative sectors in promoting more avenues for skilled jobs in villages.

The usefulness of a computer-aided knowledge centre in villages will be directly proportional to the social, ecological and economic significance of the static and dynamic information being provided. Hence, a consortium of content providers will have to be developed for each agro-ecological zone. Leading industries could participate actively in such a knowledge and skill empowerment revolution by adopting specific villages where they could provide, in addition to monetary support, marketing and management information.

A culture of change, knowledge and lifelong learning should be encouraged by rural communities and the government agencies serving them, along with openness to a wide spectrum of ideas in the knowledge age. Cultures of merit, analysis, professionalism and evidenced-based decision-making should be embraced in rural ICT4D (Development) initiatives. Online services should be designed with a mix of free and fee-based services so as to ensure commercial sustainability of rural ICT4D initiatives in the long run. As a major consumer of ICT products and services, governments in developing countries can also lead by way of example in the use of ICT, implementing best organisational practices and spurring local markets in rural areas.

ICT4D policy initiatives should have a strong grounding in local communities of villages. Online and offline forums should be promoted for communities of interest and communities of practice to exchange knowledge on harnessing and creating ICTs in the rural context. Multi-actor alliances targeting rural ICT4D initiatives should be encouraged and nurtured. Creating funding options for rural ICT4D initiatives should be explored. Special financing should be set aside for ICT initiatives involving marginalised communities, physically challenged, refugees, migrant population and youths. Measures should be implemented to increase ICT literacy in rural areas. Technical, managerial and design capacity should be built up in the adoption of ICT for rural communities, creation and maintenance of secure ICT infrastructure and scaling up of rural ICT initiatives across dimensions of depth and breadth. Capacities should be built up not just in adoption of ICTs in rural areas, but in creativity with regard to devising new applications, R&D focus areas and harvesting of local knowledge. Government of India should liberalise policies for the operation of community and ham radio stations. This will help to confer the benefits of the knowledge age to every woman and man in a village. Reaching the unreached and including the excluded will be possible only through an integrated ICT system.

6.5 CONCLUSION

Indian economy can rightly be called a rural economy, as sixty percent of the country's population resides in villages and thrives on agriculture. Socio-economic transformation of rural areas is, therefore, an indicator of the nation's economic development. ICT, especially as an important feature of good governance, plays an important role in bringing in this transformation extensively by:

- rendering effective and varied delivery channels to reach the target groups in rural areas;
- empowering people through knowledge and information creation and dissemination; and
- enabling food security, livelihood, poverty eradication and sustainable development.

By building up technical, managerial and design capacity in the adoption of ICT for rural communities; creating and maintaining secure ICT infrastructure; and scaling up of rural ICT initiatives across dimensions of depth and breadth will ensure rural development to reach the rural poor and disadvantaged. Technology has to be used as a strategic innovation and not as a tactical automation in this effort.

6.6 ACTIVITY

Mention some of the ICT initiatives/ projects/experiments undertaken in areas of agriculture and women empowerment in your State or Region.

6.7 KEY CONCEPTS

- Wireless Application Protocol : a secure specification that allows users to access information instantly via handheld wireless devices, such as, mobile phones, pagers, two-way radios, smart phones and communicators. WAP supports most wireless networks. These include CDPD, CDMA, and GSM.
- GPR : short for Ground Penetrating Radar, a UWB imaging technology used for subsurface earth exploration. GPR uses electromagnetic wave propagation and scattering to image and identify changes in electrical and magnetic properties in the ground. GPR systems have wide applications, such as locating underground utility lines, monitoring airplane runways for structural integrity, detecting unexploded land mines, conducting groundwater studies or forensic research, and surveying land for construction purposes.

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6.9 ANNEXE

A. E-nabling India's Rural Reaches

Just two hours out from Bangalore on the railway main line to Chennai, Kuppam is a two-minute halt on most trains. But that is time enough for most passengers to snatch a quick look at the posters lining the two platforms, welcoming them to Kuppam's 'inclusive' or i-community.

For those who choose to alight, the contrast with other rural clusters in this southern corner of Andhra Pradesh is palpable: neatly signposted lanes, a clean bus shelter and something one is unlikely to find anywhere else in rural India: bright red-and-yellow booths which say: 'Emergency Telephone' in Telugu and English.

They are free phones supported by a wireless (802.11b) network and connect instantly to the local police, fire and hospital services.

They can also reach two other numbers: World Corps India, the voluntary agency that

has been instrumental in training local entrepreneurs to set up over 15 wireless internet-enabled Community Information Centres (CICs) spread across the five villages or mandals of Kuppam; and Hewlett Packard, whose adoption of Kuppam as one of the first sites of its global e-inclusion programme of 'appropriate' Information Technology has inspired the State Government as well as a dozen private companies, charitable foundations and non governmental agencies to come together and co-create a sustainable future for this so-called backward area, using cutting edge technologies that have largely been the preserve of urban pockets of plenty.

Digital Photography

Last week was a busy time for Neelamma and 15 other local women mobile photographers in the Kuppam community. Armed with Photosmart Digital Cameras, they 'covered' dozens of Ganesha 'nimarjan' (immersion) ceremonies, and using the field kits loaned to them by HP, converted the shots into instant colour photos using solar-powered direct photo printers and sold them at Rs. 30 a print.

On other days they routinely cover weddings, baby 'naming' ceremonies, bus route inaugurations, accident sites, etc. They earn anything from Rs. 750 to Rs. 2000 a month and are currently moving from a model where HP supplies all the material and takes away Rs. 20 for every print to a more lucrative one where they just lease the camera and buy all the consumables.

The change has come because of the sudden access to doorstep photo services in Kuppam which has created a big enough market for nearby towns to stock digital printer consumables. 'We want to move away from the 'pappad-and-pickle' stereotype of employment for rural women,' says Anand Tawker, Director of HP's emerging market solutions in its e-inclusion programme, who has nurtured this initiative from day one. 'We are thrilled that they are so confidently handling technology that may seem disruptive even to hardcore professionals in the metros'.

In his community kiosk in Kothaindlu village, a proprietor M. Kumarswamy has just one PC and a multi-function printer. He sells toiletries and sweets to attract the local customers then offers to cast their horoscopes using special software at Rs. 30 a go. He has also discovered a new and gainful use for the spare disk-space on his PC: he calls it 'surakshita dakhhalu' ('electronic safe deposit locker'). Villagers usually have a hard time preserving their precious documents: birth certificates, land title deeds or 'pattas'...from the ravages of time and weather. Kumarswamy charges a one-time fee of Rs. 20 to scan and preserve the documents on his PC for as long as the customer wants.

Touch Typewriting

At the Mamidipudi Nagarjuna Social Welfare Residential School for Girls, 10 year olds crowd around a dozen PCs, learning 'touch typewriting' in Telugu or browsing language software created by the Azim Premji Foundation, another partner in Kuppam's i-community. A single PC running Linux fuels four monitors, which can work independently.

They are the first beneficiaries of an exclusive 2 MBPS 'pipe' provided by the State Government and fed from the Software Technology Park at Tirupathi, via fibre, to all five mandals of Kuppam. From here, a WiFi umbrella set up by Convergent Communications,

Bangalore, unfurls over the whole community of 3.2 lakh citizens even while fuelling the community Net portal (www.kuppamhpi-community.stph.net) that is already delivering a variety of local services under the 'Yojanalu' head. Last week, a domestic gas outlet was advertising a vacancy, as were World Corps and some of the local voluntary agencies.

The Web for Kuppam is also the gateway to a range of health and educational services: tele-medicine software from Tele-Vital, which connects remote villages to the P.E.S. Speciality Hospital and Medical College; computer-aided-education steered by World Links and the America India foundation; and documenting farm land productivity using remote sensing satellite data collated by Samuha, a voluntary agency.

Kuppam's i-community mobile van was parked in Vasanadu village. Local residents brought soil samples for immediate testing in the field lab even as others queued up to have their eyes tested for a possible referral to the Arvind Eye Hospital. And a crowd of school children waited to take possession of a laptop computer – their weekly treat.

It is very much in the spirit of Dr. A.P.J. Abdul Kalam's favourite blueprint, PURA: Programme for Urban Amenities in Rural Areas. The challenge remains to sustain the 'inclusive' drive, even while striving to create hundreds of other Kuppams.

Anand Parthasarathy

The Hindu

n. d.

B. Medical Advice Comes Calling to Woman at Remote Village

Gandhimathi, a 37-year-old agricultural labourer in Tiruvaiyaru village near Thanjavur district in Chennai, began complaining of breathlessness about four months ago. 'I could not work. I was finding it difficult to go through everyday chores,' she said.

Today, she consulted a specialist in Chennai – without stepping out of her village.

A Village Resource Centre (VRC) Project established by the Indian Space Research Organisation (ISRO) and M.S. Swaminathan Research Foundation (MSSRF) made it possible for her to consult the Vice-Chancellor of Sri Ramachandra Medical College and Research Centre (SRMC), Shri S. Thanikachalam.

The cardiologist wanted to see her echocardiogram and this was instantly flashed on the screen from Tiruvaiyaru. Dr. Thanikachalam confirmed this diagnosis of a defective valve and reassured Gandhimathi.

This interaction was part of a live demonstration of the on-ground effectiveness of the VRCs located at Tiruvaiyaru in Thanjavur district, Thankatchimadam in Ramanathapuram district and Sempatti in Dindigul district and at the MSSRF and SRMC in Chennai.

Tele-medicine is not the only application of the Project inaugurated by the Prime Minister, Dr. Manmohan Singh, from New Delhi, today. As Dr. Singh watched from the Capital, a wide range of interactions took place between the experts at the MSSRF, Chennai and farmers and fishermen in the villages.

This satellite-based ISRO-MSSRF-VRC Project aims to provide digital connectivity to remote villages to render services such as telemedicine, tele-education and remote sensing applications through a single window.

Inaugurating the VRC Project via INSAT link from New Delhi, the Prime Minister said that unless the benefits of science and technology were taken to the villages, the country could not eradicate poverty, ignorance and diseases.

The concept was evolved by ISRO and implemented through a partnership with the MSSRF. ISRO's capabilities in satellite communications and satellite-based earth observation system to disseminate a variety of services emanating from the space systems have been integrated with other information technology tools to address the changing and critical needs of rural communities. The VRC works on an interactive Very Small Aperture Terminal (VSAT) network.

19 October 2004, The Hindu

C. 250 Satellite Linked Village Resource Centres by March 2006

G. Madhavan Nair, Chairman of Indian Space Research Organisation (ISRO) has said that at least 250 villages in the country will have satellite-linked Village Resource Centres (VRC) by March this year, taking the benefits of space technology to the rural people. He said that VRC Project, jointly launched by the ISRO and the M. S. Swaminathan Research Foundation in October 2004, would provide multiple services such as tele-medicine, tele-education and remote sensing applications to remote villages. He further informed that at least 10,000 'virtual class-rooms' would be functioning in the country by the close of 2006.

3 January 2006, The Hindu

D. Net-based Information Kiosk for Farmers

The Haryana State Cooperative Supply and Marketing Federation Limited will launch a novel 'Kisan Choupal', and internet based Touch Screen Information Kiosk and Facilitation Centre at New Anaj Mandi, Jagadhri. The Facilitation Centre would also display the current and future prices listed on the National Commodities and Derivatives Exchange on an electronic board. A joint effort of HAFED and IFFCO, the Kisan Choupal is a significant step towards modernising and empowering farmers and member cooperative societies. The touch screen information portal would enable the farmers to access relevant and timely information at the touch of a finger.

8 January 2006, The Hindu

E. Intel launches PC Platform to suit Rural Conditions

Intel launched a personal computer (PC) platform to suit the rural environment. The PC platform, conceived by the Platform Definition Centre set up in India in June last year, is one of the many platforms for specific uses. It can work in temperatures of up to 50 degree celsius and can even run on a battery that can be charged by pedalling (as in a bicycle dynamo) and other means.

The battery works as a backup in areas where the power supply is erratic. The PC can also operate in high dust environment and in surroundings where there are a lot of insects.

Intel had positioned the personal computer as a community PC that could be used in citizen service centres and other applications like education. The PC platform would be priced between Rs. 20,000 and Rs. 30,000.

The applications for PCs would be developed by independent software vendors like TCS, Microsoft and Red Hat.

30th March 2006, The Hindu

F. Rural Bazar – An Internet based Solution

NIC, MIT, GOI is committed to strengthen the efforts of groups and agencies working for the benefit of rural poor and to that end, offers a solution in terms of an IT based marketing infrastructure to provide better visibility and sale of products produced by rural artisans.

NIC addresses the problem by adopting the e-commerce approach through its product Rural Bazar. Rural Bazar is a web store that allows customers to carry out the complete business transaction starting from browsing the products to paying for the chosen products. It offers several services to its users who may be broadly classified as the producer, the content manager, the business manager, the technical manager and the customer. The following paragraphs highlight the services offered by Rural Bazar to each of its users.

Customer Services

- allows a customer to browse a product catalogue online or offline (by downloading the catalogue from the web-site or through e-mail);
- provides a comprehensive search facility;
- accepts orders online or offline (through e-mail);
- accepts payment online using credit/debit card and offline through demand drafts;
- allows the customer to track order status;
- automatically confirms on order through e-mail;
- accepts customer feedback;
- maintains customer data on profile, preferences, bill and shipping addresses, etc.;
- provides individualised customer services on the basis of customer profile and preferences; and
- a host of other services and help facility.

Producer Services

The producer is the individual or group who is responsible for producing the products.

Keeping in mind the literacy standards of the rural poor and with a futuristic view, Rural Bazar offers the following services to the rural poor:

- it automatically generates letter or e-mail (whichever is desired) in the local language, intimating the producer of any new order placed for his products. The same information can be viewed over the web also, again in the local language;

- once payment is received for an order, Rural Bazar offers a facility to automatically credit the earnings to the respective producer's account, thus eliminating the role of any unwanted intermediaries; and
- the producer can also choose to be educated/updated, through reports, about the demand for his products as well as for any new products. This will help the producer in modifying or changing his product line.

Business Manager Services

The role of business manager is to manage the whole business of marketing the products. Rural Bazar provides an interface to the business manager through which he/she can:

- conduct an on-line market survey either by posing questions directly to the customers or collecting data from customer profile, preferences and behaviour;
- analyse the data collected from the market survey through a number of pre-defined textual and graphical reports; and
- launch advertisement and discount campaigns for the products.

Content Manager Services

The content manager is responsible for maintaining the content of the web site. Rural Bazar provides a user-friendly interface for the content manager to do the following:

- updation and maintenance of the product catalogue, such as, modifying the price and other information about products;
- updation and maintenance of producer information; and
- automatic generation of letters that may be required to be posted to a customer, a producer or a bank.

Technical Manager Services

Technical manager of the web store is the key person maintaining the technical aspects of managing the equipment and ensuring the smooth functioning of the same. Rural Bazar helps the technical manager modify the functional capability of the site on the fly without requiring re-development of the software.

Special Features

Besides the above services, Rural Bazar has certain features that are unique and therefore merit special mention:

- it may be configured to market the products of the rural poor belonging to a particular state or a particular district in a state;
- Rural Bazar can be configured to act:
 - as a simple advertising medium that displays product images and their information; or

- as a site that accepts orders but accepts only offline payment (through demand draft); or
- as a total e-commerce site that accepts orders as well as payment online.

(Authors: D.C. Misra, Avijit Dutta, Omkar Rai, Rama Hariharan, Rajiv Goel, Manie Khaneja) <http://crisp.nic.in/ruralbazar>

G eNRICH: Web-Based Community Software Solution Framework

Introduction

As part of the cross cutting theme on the eradication of poverty, UNESCO (<http://www.unesco.org/webworld>) launched a new pilot initiative to put ICTs to work in the hands of the poor under its ICT PR Project. The focus is not so much on technology itself, but on its innovative use to empower the poor with tools to change their circumstances. To test and introduce sustainable ICT access and utility models to empower the under privileged, UNESCO desired to produce a generic ICT browser that:

- acts as a one stop access and delivery mechanism for communities;
- is customisable in terms of local language and content;
- encourages local content production;
- allows easy access to relevant and authenticated information; and
- enables efficient interactivity within and among communities.

In response to UNESCO's request for generic software fulfilling the above requirements, the National Informatics Centre (NIC <http://home.nic.in>) undertook the design and development of eNRICH- a Community Software Solution.

The Need

The concept of Community Information Centres or Community Information Resource Centres (as they are variedly called) adopts a people centric approach where community members converge to identify their information needs and fulfil these needs through whatever medium is available to them. Many projects have been undertaken by various national and international agencies and NGOs to address the needs of the underprivileged through the use of ICTs in such community centres. Several models have been tried out- while some established a computer centre with internet facility, others went a step further and developed a web site for the community in an attempt to fulfil their information needs. However, all these models suffer from one or the other of the following drawbacks:

- web site development is both time consuming and needs special skills to modify, revise and upload information. This reduces the self-sustainability of the project;
- effective communication within and among community is necessary ingredient for empowering the communities. However, these web sites invariably focus more on information retrieval and less on providing facilities for community communication;
- the web site lack provisions for community members to participate in building the

web site; thus the community members are passive rather than active participants in the community building exercise;

- search for relevant information is time consuming, costly and requires special skill set. Even when information has been gathered, its relevancy and authenticity cannot be judged immediately. This problem is further compounded by the low standard of living and low literacy of the underprivileged section of the society; and
- last but not the least, research data on access habits of community members is severely lacking. Such data, if made available can greatly enhance the effectiveness of ICTs in improving the lot of the underprivileged.

eNRICH addresses all the above issues in two ways:

- it enables communities to quickly and efficiently build their own gateway, enriched with their own local content, connected to knowledge sources and services that are tailored according to their own information and communication needs, available in their own local language in a format and medium that is tuned to their assimilation capacities; and
- eNRICH attempts to reduce the challenges faced by disadvantaged communities, such as, lack of suitable skill set, language barriers and low literacy in using ICTs and the internet:
 - through a simple, consistent and easy-to-use interface that requires a low level of competence from users; and
 - through accessibility to the use of multiple media (textual, audio, visual).

Conceptual Framework

eNRICH has been developed as a web-based community software solution framework that adapts to the needs and circumstances of the poor. Through its customisable, multi-lingual interface, eNRICH truly puts ICTs to work in the hands of the poor. Its multiple features not only enable communities to identify, build and organise relevant information but also promote communication between and among communities. The framework encourages collection, preservation and sharing of indigenous knowledge. With the ultimate aim of empowering communities through a collaborative approach, eNRICH acts as a platform for voicing the thoughts and feelings of the poor.

Two Components of eNRICH

eNRICH comprises two main components, namely:

- Desk Manager User Interface (DMUI); and
- Communication Interface (CBUI)

Desk Manager User Interface (DMUI) – this interface, also called the Desk Manager or DM interface, will be used by the managers of the eNRICH site as well as by researchers. This is a broad administration and analysis tool for managers and researchers. Managers will use the DMUI to:

- specify the knowledge resources and services that should be provided to the community users on the Community Browser site;
- interact with community members to render the Community Browser more relevant and useful to them;
- identify issues for opinion poll, message of the day, etc.;
- moderate the contents and messages uploaded by community users so as to make them more authentic and relevant; and
- generally administer the site.

Community Browser User Interface (CBUI) – this interface, also called Community Browser interface, will be used by the community members. Using this interface, community members will:

- access various knowledge and services made available locally and/or on the internet;
- post announcements and public messages, such as, local meetings, bartering, auctions, etc. on bulletin board for other members to see and respond;
- upload content in the local database on community specific information;
- express their views on important community issues and also view peoples' opinion;
- communicate with their dear and distant ones through e-mail, chat, instant messaging service;
- learn through multiple media; and
- communicate their information and communication needs, suggestions, complaints, etc.

Enhancement

eNRICH Community Software Solution Framework has been enhanced further to include the following features:

- introduction of Content Managers (government officers) at national, provincial and local levels with a view to extend the reach of e-governance services to the rural communities;
- provision for engaging domain experts for contributing knowledge in their respective areas and authenticating content uploaded by others; and
- enhanced inter and intra community communication through specifically designed messaging services.

Key Design Features

- a customisable web-based community software framework that caters to multiple scenarios through its twin-component structure comprising DMUI and CBUI;
- addresses local language issues through its Language Manager Interface;
- allows site configuration to suit user's requirements through its site manager;

- allows building of an Information Category Structure that could be any level deep, within and outside of a category, thus generating a flexible framework for uploading and organising content through the site manager;
- provides specific spaces for community people as well as desk manager (site administrator) to post content thereby:
 - promoting participatory approach;
 - establishing two-way communication between user and manager; and
 - generating content of local relevance (contributed by community people) as well as global relevance (contributed by the desk manager)
- allows posting of content in multiple forms that include text, file and audio;
- allows moderation to prevent publishing of undesirable content on the site;
- provides flexibility to switch-on or off any of its features at will; and
- captures, analyses and generates reports on user's profile and usage patterns for registered users, facilitating research activities.

Source: <http://enrich.nic.in/keydesign.htm>