



Telereferral Services of NIC – A Helping Hand for the Doctors and Inhabitants of KBK Districts of Orissa

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ABSTRACT

Providing health services to the rural community has been a real challenge on part of the government. There are some attempts to address this issue in the form of telemedicine. However, little has been achieved for the benefit of the rural community because of the associated cost factor and other implementation issues. Therefore, an urgent need is felt to extend some form of health care service to the underprivileged. In this paper, the concept of telereferral service has been introduced that facilitates need based medical advice to the inhabitants of the remote KBK districts of Orissa from experts located at designated centres. The emphasis is on utilizing the existing infrastructure of NIC to provide the service, which makes the entire project affordable. The paper describes various services of the pilot project, the architectural components and scope for future enhancements.

Keywords: Telereferral Services, GRAMSAT, KBK districts, E-Governance, Rural healthcare, Mobile Videoconferencing, Virtual OPD

1. Introduction

In Orissa the undivided districts of Koraput, Bolangir and Kalahandi popularly known as KBK [5] districts, have since 1992-93 been divided into eight districts: Koraput, Malkangiri, Nawrangpur, Rayagada, Bolangir, Sonapur, Kalahandi and Nuapada. These eight districts comprise of 14 Sub-divisions, 37 Tahsils, 80 CD Blocks, 1,437 Gram Panchayats and 12,104 villages. This region is one of the poorest regions in the country where 87.14 per cent people live below the poverty line (As per the 1999-2000 NSS data), The literacy rate at 36.58% is much lower than the State average of 63.61%. The female literacy rate 24.72% is also around fifty percent of the State average of 50.97%. The KBK districts account for 19.72% population over 30.59% geographical area of the State. 89.89% people of this region still live in villages. Lower population density (152 persons / sq.km) in comparison to 236 for Orissa indicates difficult living conditions and an under developed economy. Tribal communities dominate this region. As per 1991 Census, about 38.72% people of these districts belong to the Scheduled Tribes (ST) communities including four primitive tribal groups (PTG), i.e., Bondas, Dadai, Langia Sauras and Dangaria Kandhas. In addition, 16.63% population belongs to the Scheduled Castes (SC) communities. Though this region has rich natural resources, there is no substantial progress in many areas during the last 50 years. The population suffers

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from high morbidity on account of under-nutrition, endemic malaria, lack of quality healthcare facilities, the hospital ratio and the doctor patient ratio is much more less than the National figures. The constant effort of Govt. to make available qualified medical professionals in the Govt. hospitals of this region is never filled-up. No doctor is interested to work in these areas, due to lack of common facilities for their family. The Doctors once posted are indirectly forced to continue in these districts for years together. They hardly get opportunity to update their professional knowledge. The Government sponsored healthcare programme fails due to shortage of sufficient number of healthcare staff. Most of the rural population have ever visited any primary healthcare centre, rather they are treated by the village Quacks due to lack of awareness. The infant mortality rate is very high in these regions as more than 90% child deliveries are not institutional. Unless the healthcare facilities in the KBK region is not improving the overall development of the area is not possible. As the population is predominantly rural and geographically distributed far away from the highly facilitated urban areas, to provide the basic minimum healthcare has been one of the priority of the administration. The people living in this region don't have access to specialist medical care due to poverty, lack of awareness, transport and communication constraints. The delivery of specialist healthcare services to these remote areas has always been challenging.

2. Telereferral Services

When healthcare professionals want to offer their services to more patients over greater distance, they do it by providing “*Tele-services*” by the help of Information and Communication Technology (ICT). Many examples of current Tele-services in healthcare and medicine are Teleradiology, Tele-cardiology, Telepathology, Tele-dermatology, Tele-surgery, Tele-diagnosis, Tele-consultancy, and Telereferral Services etc. The basic idea behind the Telereferral Services of National Informatics Centre (NIC) is to take Tele-healthcare to reach the villages of rural and inaccessible parts of India. It is an innovative effort to use available Information and Communication Technology (ICT) infrastructure to enable Clinical consultation between geographically separated individuals such as healthcare, Teleconsultation, Tele-Continuing Medical Education (CME), Telefollow-ups, Tele-education etc.

These services started first as Tele-CME programme through the [1] Community Information Centres (CICs) in the North East states of India, bringing the Specialist Medical professional to the NIC State Centres using NIC's Video Conferencing facility. Then different Tele-CME lecturers were organized once in a month on specific topics. Most of these Tele-CMEs were organized in collaboration with Sanjay Gandhi Post Graduate Institute of Medical Sciences (SGPGIMS), Lucknow, where there is a state-of-the-art Video Conferencing Studio. Later the same Tele-CME programmes are also started for the Doctors of KBK districts of Orissa on a regular basis. To take the reach of the service to below district level, several trials are made in Khariar and Jeypore the two remote Blocks of Nuapada and Koraput districts respectively, using existing GRAMSAT network with a Videoconferencing camera unit. Lectures on recent medical trends and updates by specialist from SGPGIMS, Lucknow were held for the Doctors of the Primary Health Centres of the said block. These Tele-CMEs are diversified to Telereferral services with an objective to provide better healthcare facility in the remote part of the country. A special lecture by Prof. S.K.Mishra of SGPIMS, Lucknow, with all the doctors of KBK districts of Orissa, for explaining the methodology and uses of Telereferral Service, was organized by the first three authors of this paper, the local NIC and the district administration as shown in the following snapshot (Figure 1).

Several programmes were organized in a regular interval to discuss the latest trends in diagnosis, management and treatment of prevalent diseases, which encouraged the doctors to bring the difficult cases (patients) to the district videoconferencing studio and two GRAMSAT centres at Block Headquarter. Doubts on different new treatment methods were discussed openly for knowledge of all the doctors.

With the request of the Medicine Specialists dealing with Heart cases, a series of lecturers by

Dr. A.N.Misra, Heart Specialist, North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS) Shillong, were organized from Shillong NIC, as follows.

- Risk Factors for Coronary Artery Diseases.
- Diet and Coronary Artery Diseases
- Life style modification for prevention of CVD
- Prevention of Rheumatic Fever
- Modern Techniques for Management of Heart Diseases



Figure 1: Professor of SGPGIMS, Lucknow delivering lecture to the doctors of KBK districts of Orissa.

To share the knowledge of the doctors of Orissa, a workshop over videoconferencing was organized from NIC Bhubaneswar, in the presence of Principal Secretary Health, Govt. of Orissa on “Prevention of Sickle Cell Disease by DTN formula of genetic counseling and treatment by Hydroxyurea Therapy”, which was presented by Dr. Gyana Ranjan Padhy from CDMO office Nuapada. The workshop was attended by Director Health Services, Orissa, all the Chief District Medical Officers (CDMOs) and other Doctors of all 30 districts of Orissa.

The Figure 2 describes the deployed network architecture of the Telereferral services provided by National Informatics Centre(NIC), which shows the specialist doctor could address from any state or district videoconferencing studio instead of a customized studio at a central point.

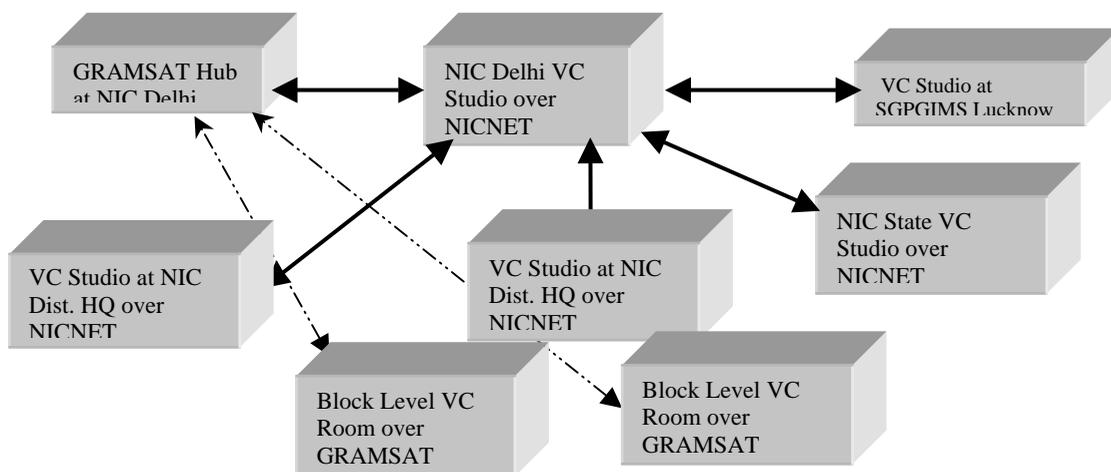


Figure 2 : Telereferral services deployed network architecture

3. Orissa GRAMSAT Project

The Orissa GRAMSAT [2] pilot project is a satellite based digital communication network, jointly funded by Department of Space, Govt. of India; Ministry of Rural Development, Govt. of India and Govt. of Orissa. It has two components:

- Direct Reception System (DRS) Network, with the objective of conducting interactive training programme, broadcasting and Tele-education. It operates on INSAT-3B using extended C Band. The programmes are transmitted from the studio situated at Orissa Remote Sensing Application Centre (ORSAC), Bhubaneswar, which also acts as the nodal agency for the GRAMSAT project. This network is installed at 30 DRDAs, at 314 Blocks, 9 other state Govt. offices and 800 grampanchayats of KBK district.
- Very Small Aperture Terminal (VSAT) Data Network, with the objective of providing digital communication between the state capital, Districts and Blocks, for implementation of different e-governance projects of Orissa for providing right of data access to common public for development and social justice. It also facilitates dissemination of Government Information, monitoring of schemes and fund utilization and bringing about transparency in various projects getting executed at Panchayat / Block levels. It operates on INSAT-3A using Ku Band. The remote VSAT uplinks at 8 Kbps to 128 Kbps and downloads at 32 Kbps to 8 Mbps. The remote VSAT network is installed at 30 DRDAs, at 314 Blocks, 3 Revenue Divisional Commissioner(RDC) office and 8 other state Govt. offices, total 355 VSAT nodes across the state. The network is presently using TDMA-DVB technology with its Hub at National Informatics Centre(NIC) head quarter, New Delhi. The server at ORSAC is connected with the NIC Hub with a 2Mbps BSNL Leased Line and a back up satellite link, as shown below in Figure 3.

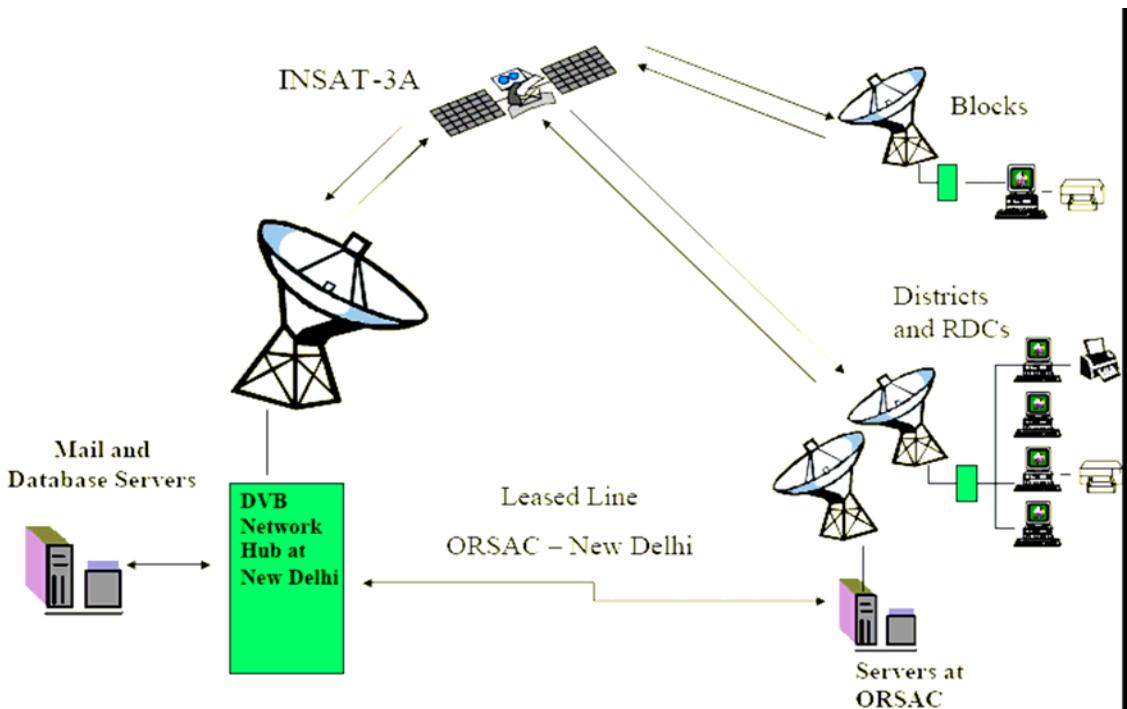


Figure 3: GRAMSAT Orissa Data network Deployment Architecture

4. Videoconferencing facility of NIC

NIC is currently providing videoconferencing [3] services from 490 locations in India including all north-eastern state capitals over its high speed satellite based network called "NICNET". This is the largest videoconferencing network in India. NIC has an in-house Multipoint Conference Server (MCS), which enables several sites to participate in a live conference with audio-video and document sharing. MCS is the central point of connectivity for endpoints. It enables different networks, different bandwidths and different types of endpoints to communicate effectively. MCS supports both "Voice Activated" and "Chairman Control" mode of conferencing. NIC also supports international connectivity using public ISDN network. More than 50 ISDN based Videoconferencing locations are also working with this Videoconferencing network. It also provides seamless Integration of ISDN, VSAT and LAN based videoconferencing site through MCS and anytime, anywhere Mobile Videoconferencing using Quick deployable VSAT.

5. Future Scope

The same service could be extended to all the 314 blocks of Orissa, over the existing GRAMSAT network with minimum expenditure to provide specialized virtual Out Patients Departments (OPDs) to facilitate better health care services to the remote areas. This service could be helpful for diseases surveillance and to have control over the communicable diseases and epidemics to reduce unnecessary panic. The services could be more efficiently used by sending detail patient report offline by e-mail to specialist prior to consultation. The e-mail facility available in the e-Grama [5] IT Kiosks of KBK districts may be used by computer illiterates for sending their reports. Efforts are made to form a special discussion forum through group mail, for the doctors in KBK districts for sharing information.

6. Concluding Remarks

This project is an attempt to address the immediate health needs of the people living in the remote places of the country. We are aware of some other projects, which have been undertaken by other agencies to provide the best of the medical services to the rural community. To the best of our knowledge, most of them are only at a very nascent stage and the rural mass is yet to enjoy the benefits. The work reported in this paper is a humble beginning but have begun to cater to the requirements of the people living in the KBK districts of Orissa. As it is a viable project and can definitely be replicated to other states of India. With patients scattered in the remote areas it would definitely benefit them as well as the doctors; it would improve health care services as well as upgrade knowledge skills of the doctors.

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Rama Krushna Dash is a Technical Director (Scientist-E) working with National Informatics Centre (NIC), Government of India for the last 19 years. He is involved in different E-Governance projects of NIC. He has led the group in the implementation of the e-grama project in Orissa. His research interests include e-governance and software engineering.

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