

TELEMEDICINE IMPLEMENTATION EXPERIENCE IN SRI LANKA

Sri Lanka is a small developing country situated in the Indian Ocean with the total population of 20,064,776. Even though it is small, it has an uneven terrain with altitude ranging from sea level to 2,524 meters above sea level. The terrain in the country leads to very difficult transportation especially in hilly areas and this is further aggravated by the poor highway system in the country. This makes more than 3 hours difficult journey to reach a Tertiary Care Medical Institution from most of the remote hospitals in the country.

In addition to this, Sri Lanka's 20 years of war has displaced thousands of people during the last two decades. Hospitals have been destroyed and most the Medical Specialists fled and vacancies for government doctors remain vacant. Limited access to treatment facilities and disrupted disease control activities has led to a rise in infectious diseases and other health care problems at some regions in the country. War affected coastal regions and some other coastal regions in the country were affected by the Tsunami disaster in 2004. There were severe destruction to the health care facility infrastructure and displacement of health care professionals.

Therefore, Telemedicine has to play a vital role in the provision of national health care in Sri Lanka.

In November 2003, first and foremost Telemedicine activity in the country was started as a pilot project of the Ministry of Health and the World Health Organization (WHO). This project was totally funded by the WHO as a part of WHO's activity of establishing pilot Health Telematics System (HTS) in South East Asia Region (SEAR).

The Health Telematics Pilot Project in Sri Lanka, Sri Lanka Health Telematics (SRLHT), was started in 8 hospitals over 5 districts in the country as follows.

1. Kandy District

Kandy General Hospital (Telemedicine Hub and the Centre for Telemedicine)

2. Hambantota District

Tissamaharama District Hospital
Hambantota Base Hospital

3. Ampara District

Ampara Base Hospital
Dehiattakandiya Base Hospital

4. Badulla District

Badulla General Hospital
Bandarawela District Hospital

5. Anuradhapura District

Anuradhapura General Hospital

SRLHT distribution



Sri Lanka Health Telematics (SRLHT)

This is a Low Cost, Store and Forward Distributed Telemedicine System which has been developed to help medical professionals to seek second opinion and advice from their peers and medical experts on medical and health care problems / case studies and Continuing Medical Education. The aim of the system is to provide a user-friendly simple interface to enter the data required for consultation and send them off to a specialist. Therefore it has being built on an infrastructure of standard software and hardware that will provide an unprecedented level of interoperability. To the users, this system is nothing but the applications that ride on Windows Architecture and MS-Outlook e-mail system. Rest of the tasks like Auto Archival and Demand Retrieval are handled by the software running at the Hub site servers.

SRLHTS is augmented with Voice over Internet Protocol (VoIP) for real time communication during tele-consultation sessions. In addition to this it has limited capability of real time video conferencing through H.323 (IP based) standards through its broad band ADSL (2Mbps) and Leased Line (128kbps).

SRLHTS has following 3 modules:

- a) MS-Outlook based module – Consists of 2 forms, Inquiry form and Response form, which is installed at all sites.
- b) Web-based HTS USER/ADMIN account– This helps to view / search of archived data. The web-site need for this has been created at hub site (www.srlht.org/hts).
- c) Visual Basic based mail auto archival module -This will poll the Archive mailbox and transfer data to a predefined SQL Server database at the hub site.

Connectivity

There are 2 types of connectivity in the system.

1. Point to Point Data Circuit

General Hospital (GH) Kandy is the Centre for the Sri Lanka Health Telematics System and therefore, all the servers, namely Email Server, Web Server and FTP Server are installed in GH Kandy. Therefore, GH Kandy is equipped with 256K Frame Relay Link Circuit (Leased Line) and it is terminated at Sri Lanka Telecom's (National Telecommunication Provider) Hub at Kandy.

Four other sites, namely Base Hospital (BH) Ampara), GH Badulla, BH Hambantota and GH Anuradhapura are connected through 64K Frame Relay Link Circuit (Leased Line) and all four links are also terminated at Sri Lanka Telecom's (SLT) Hub at Kandy.

2. Internet connectivity

For the internet access 128K link is provided through SLT Internet Gateway. All five sites are using this link for internet connectivity. In case any site needs point to point access with other sites on the Wide Area Network (WAN), the traffic is routed within the network and not through the Internet, allowing the maximum bandwidth for internet access for e-Learning activities. This approach will maximize the use of leased line and provides the most cost effective approach for telecommunication requirement as compared to using regular dedicated Internet Leased Lines at each site.

Live IP addresses have been provided by SLT to all five sites having leased line connectivity. This will help future expansion of the HTS by establishing Web Servers, Mail Servers or FTP Servers on any of these sites.

District Hospital (DH) Bandarawela, DH Tissamaharama, and BH Dehiattakandiya are provided with Analog Dialup Internet connections.

Hardware and Software

SRLHTS is equipped with very minimal number of basic hardware and commonly using software for Store and Forward Telemedicine Consultations. We are using windows based operating systems (Windows NT Server, Windows 2000, Windows 2000 Advanced Server and Windows XP) and basic communication software (Microsoft Outlook, Outlook Express and Netmeeting) for interoperability and easiness.

Implementation

Three persons from each hospital, including two Doctors and one Paramedical person were trained by the WHO. All the computers and other equipment were purchased and brought directly from India. Installation of the network and the equipment was done by a technical team came from WHO (SEARO) office in India. Communication links were purchased from the SLT and Routers and communication links were configured by private local vendor. Two technical persons were appointed by the WHO on contract basis.

Consultations were started on 1st November 2003. Consultants in the General Hospital Kandy were very enthusiastic and gave consultation within minutes.

The presentation will be focused on

1. network and connectivity
2. forms and modules
3. hardware and software
4. pre implementation planning
5. selection of centres and trainees
6. equipment and vendors
7. maintenance and scalability
8. present status and future planning
9. lesson learned

Dr. Palitha Gunawardena
Centre for Telemedicine
General Hospital Kandy
Sri Lanka