



Medical Research Foundation



Information Technology & Systems / Tele-ophthalmology

Ibrahim Gani
IT Infrastructure Manager




The future is digital

About Sankara Nethralaya

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- Sankara Nethralaya is a not-for-profit missionary institution for ophthalmic care (an eye hospital) in Chennai, India. Est. in 1978
- About 50 % of the Out-Patients and 35 % of the surgeries are done free of cost to the underprivileged. Donations received have helped to cater to the medical and post-operative needs of indigent patients.
- The Sankara Nethralaya family today has over 1400 Employees , includes 80+ eye care professionals examining around 1,500 patients and performing 125 surgeries a day.
- 12 Branches in India Includes Eye care Hospitals, Vision Research, Academics, Tele-ophthalmology Etc..
- Our tele-ophthalmology project was inaugurated by the former President of India, Dr. A. P. J. Abdul Kalam, in 2003. At present our tele-ophthalmology services covers districts in Tamil Nadu and West Bengal.



Our Campus

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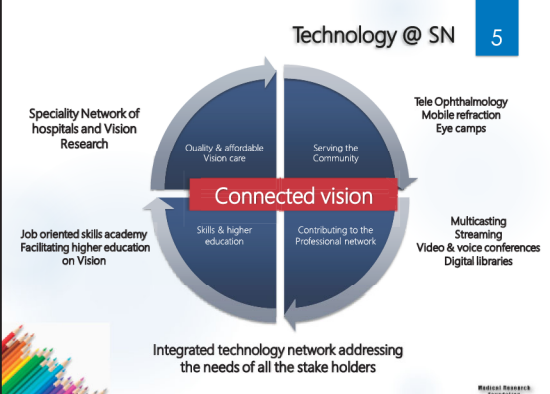

1. Technology @ SN

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Technology @ SN

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Speciality Network of hospitals and Vision Research

Tele Ophthalmology
Mobile refraction
Eye camps

Multicasting
Streaming
Video & voice conferences
Digital libraries

Quality & affordable
Vision care


Serving the
Community

Skills & higher
education

Contributing to the
Professional network

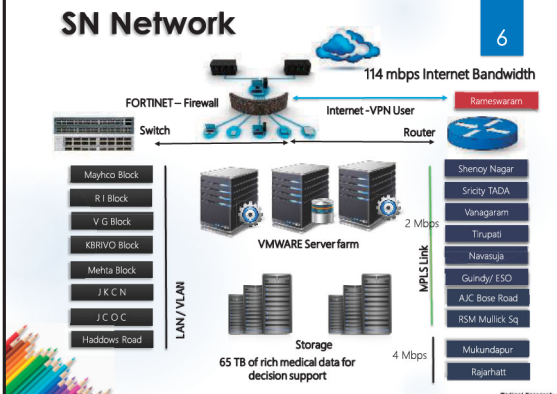
Job oriented skills academy
Facilitating higher education
on Vision

Integrated technology network addressing
the needs of all the stake holders



SN Network

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114 mbps Internet Bandwidth

FORTINET – Firewall

Internet-VPN User

Switch

Router

VMWARE Server farm

Storage
65 TB of rich medical data for decision support

LAN / VLAN

MPLS Link

2 Mbps

4 Mbps

Mayheo Block

R I Block

V G Block

KBRIVO Block

Mehta Block

J K C N

J C O C

Haddows Road

Rameswaram

Shenoy Nagar

Sri City TADA

Vanagaram

Tirupati

Navasuja


Guindy/ ESO

A.K. Bose Road

RSM Mullick Sq

Mukundapur


Rajarhatt



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2. HMS / EMR

Hospital Management system
Electronic Medical Records



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HMS / EMR

| | | | |
|-------------------|-----------------------|------------------------|---------------------|
| Indian Patients | 23,08,753 | International Patients | 108,977 |
| 32,78,184 | Regular Consultation | 25,81,517 | Review Consultation |
| Review Procedures | 16,48,517 | Glass Prescriptions | 628,424 |
| 249,557 | Medical Prescriptions | | |

Number speak

- Robust Time tested enterprise applications to handle high volume transactions
- Proven best in class Technology solutions
- Partnership with the India's largest Technology Vendor - Tata Consultancy Services for application development
- Partnership with Global Tech Leader - IBM for IT infrastructure management


Largest Ophthalmic database



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- Browser based
- Modern n tier architecture
- Modular, Secure & Scalable technology architecture
- HL-7 Compliance
- ICD adherence
- User friendly GUI



Registration

Appointment Scheduling

Neuro Ophthalmology

Slit Lamp

Fundus Exam

Uvea Workshop

Clinical History

Visual Acuity

Inventory

Security

Inpatient

Analysis

Surgery Scheduling

Equipment Management

Laboratory

Investigations


Optical Store

Auditing

Billing

Tele-Ophthalmology

- Online videos for user training
- Extensive reports
- Integrates to Accounting, Lab & medical equipment
- Integration to email, SMS alerts
- Extensive predefined templates for accelerated data capture
- Barcode support / generation



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3. Tele Ophthalmology



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Tele-Ophthalmology



Mobile Teleophthalmology Camp: A Routine Work

- Combining medical expertise and technology, mobile Tele-Ophthalmology units improve the quality, access, and affordability in health care for rural indigent patients.
- It can reduce the need for travel and provide the access to a super-specialist for patients.
- Comprehensive eye examination in rural areas




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Health care availability in India



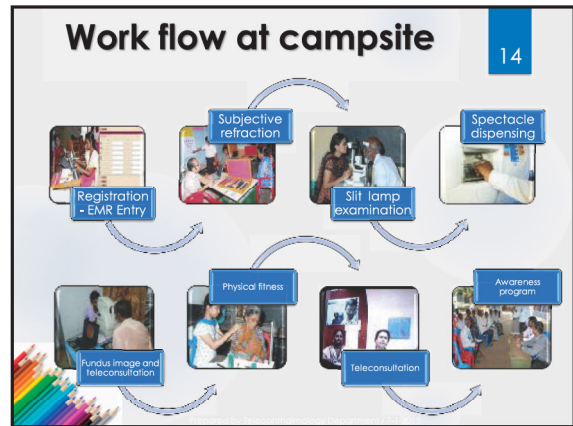

- 80% of population resides in in urban area
- 70% of them practice in Urban rural area
- 70% of health care resources are Urban areas.
- 1 Ophthalmologist / 100,000 population.



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Our Tele- Ophthalmology team at camp site

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At base Hospital

At Camp Site

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- > 100 Mbps internet Bandwidth
- > High Definition Web camera
- > Screen sharing of the images
- > Sound proofing room

- > Camp site – Data card with 4 Mbps internet Bandwidth Web Camera
- > Vsee Software supports video conferencing at low bandwidth 1 - 2 MBPS



Tools Used for tele-Presence

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Hardware :

Extron, CRESTRON, Polycom, SONY

- > Extron CrossPoint 1600 -5U -Switching System
- > Crestron 3-Series -Control System
- > Polycom RealPresence Group 700 – VC system
- > Sony Aethra Codec – VC system
- > Sony PTZ -SRG-300SE - Camera

Software :

Vidyo, VSee, WQWZA

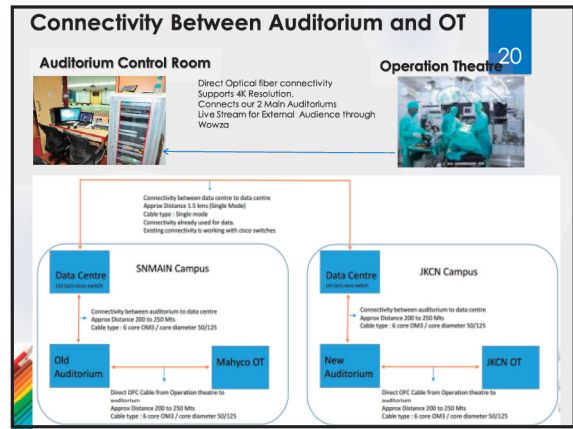
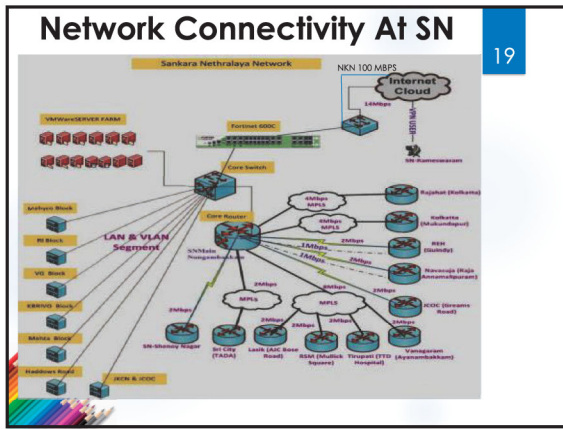
- > Vidyo - Video Conferencing
- > Vsee - Video Telemedicine Platform
- > Wowza - Media Streaming Engine

Our Camps

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| S.No | Details | Nos. |
|------|---------------------------------------------------------------------------------|--------|
| 1 | Total no. of Tele ophthalmology Camp | 5149 |
| 2 | Total no. of Teleophthalmology Consultation and Expert Opinion Consultation | 51403 |
| 3 | Total no. of patients underwent complete Ophthalmology examination | 470503 |
| 4 | Total no. of School Children underwent Vision Screening | 10317 |
| 5 | Total no. of general Public benefitted due to awareness | 38627 |
| 6 | Total no. of people benefitted due to Enumeration at village | 50357 |
| 7 | No. of School Children benefitted due to Awareness | 9139 |
| 8 | No. of Teachers benefitted due to Awareness | 459 |
| 9 | No. of Spectacles Issued (Tamil Nadu, Karnataka , Maharashtra and west Bengal) | 92723 |

TOTAL NO.OF PATIENTS BENEFITED SO FAR : 5,32,223
(Complete Eye examination)



Connectivity / Bandwidth/ ISP/Servers

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- Internet Connectivity from National Knowledge Network – 100 Mbps
- Internet Connectivity From Aircel – 14 Mbps
- Data Cards for our Camp sites Airtel /Aircel – 3 G/ 4 G
- Within Auditorium's /OT's Connected with Optical fiber cables – Supports 4k Resolution
- IBM X 3650 Servers and Intel Quick sync technology for Streaming server

Few Photos of our AV Equipments /Control Room

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Distance Education&E-Learning

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E-Learning Portal - www.ekalavya.org

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1. User registration
2. Registered users can attend LIVE classes through webcasting
3. Registered users can view recorded videos in On-Demand videos section
4. Monthly class schedule available for user reference
5. Class schedule will be notified to the users through email and Social Media network (face book)
6. Ekalavya users are Ophthalmologists and Optometrists.

Major ICT challenges

- ▶ Infrastructure
- ▶ IT Security
- ▶ Stable and Good Internet Bandwidth
- ▶ Quick obsolescence due to fast changing technologies
- ▶ Periodic Updates and Investment needs
- ▶ Adoption of new Technology
- ▶ Operations management
- ▶ Strict Adherence to processes to be paperless
- ▶ Software Development / Application Delivery

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WARNING
CHALLENGES AHEAD

4. The emerging immediate future

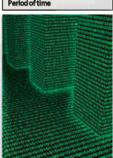
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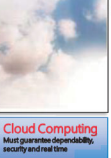
Technology Mega trends

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Big Data
Only 7% of data stores meaningful and for a short period of time




Cloud Computing
Must guarantee dependability, security and real time



Mobile
Participate work force with secure integration of home work



Social
Potential risk to secured transactions and productivity



Technologies driving transformation

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Enterprise Mobility

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Enhancing Patient services through mobile engagement

Patient engagement

- ▶ Appointments
- ▶ Personal Medical records
- ▶ Reminders / Alerts
- ▶ Medication

- ▶ Wellness education
- ▶ Mobile Ordering
- ▶ News & updates
- ▶ Location based services

Integration with HMS / EMR

M-Commerce

- ▶ Mobile payments / Wallets
- ▶ Mobile Video Conferencing
- ▶ Ordering / tracking

Clinical Apps

- ▶ Near eye refractive tools
- ▶ Basic Vision screening for camps
- ▶ Annotations & references
- ▶ Educational apps

Productivity Enhancement

- ▶ Performance analytics
- ▶ Reminders / Alerts
- ▶ Collaboration tools
- ▶ Integration with Support services / stores

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Our SN Technical Team

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| S.no | Designation | Head Count |
|--------------|--------------------------------|------------|
| 1 | HOD /Sr. Consultant | 1 |
| 2 | Ophthalmic consultants | 2 |
| 3 | Optometrists | 4 |
| 4 | Tele-ophthalmology Technicians | 2 |
| 5 | Multimedia team | 5 |
| 6 | Web Development Team | 4 |
| 7 | Network Engineers | 2 |
| 8 | Database Engineer | 1 |
| 9 | IT Support Engineers | 7 |
| 10 | IT Coordinator | 1 |
| 11 | Software Developers (Net) | 5 |
| Total | | 34 |

SESSIONS AT APAN41 MANILA (24Jan – 29Jan2016)

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My Observations during the Meetings :

- ▶ Very well organized work Group
- ▶ High Class meeting environment
- ▶ High Class Food
- ▶ Cutting Edge Technology
- ▶ Good Technical team
- ▶ Good Coordinators
- ▶ Less complexity in wirings/ Equipments.
- ▶ A friendly Working Group

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Learnt at the APAN41 Sessions 31

- How to organizing a Tele-Medicine Conference.
- How to Coordinate with the Participants before/ During / after the conference
- State of The art Technology in Tele- Medicine
- Latest trend in Tele- Medicine
- Guidelines for the participants.
- Trouble shooting tips during the Tele-Medicine Conference
- Plan/Test/ the Equipments before the event starts
- Always we should have a alternate plan, when there is an issue in the live session.

Preparing Reports about the Sessions



Feedback 32

SANKARA NETHRALAYA

Ibrahim Gani
Manager – IT Infrastructure.

Email ganil@smmail.org
Mobile 9894314934

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41st Asia Pacific Advanced Network Meeting
Manila Revisited: Enabling Connectivity for an Integrated World
Marriott Grand Ballroom, Manila | 25 - 29 January 2016

THANK YOU ...

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