Surgical Picture Archival Communication System (S-PACS)  
SGPGI, Lucknow Case Study

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• Outline
• Background
• Work in Progress
• Design, Development & Operation
• Technological Advancement
• Enterprise Digital OT infrastructure
• Conclusions
• Contact info of Presenter
Background

- Demonstration of Live surgical procedures from a gallery attached to the operation theatre
- Current system of education: Glass partition between OT and gallery. No interaction.
- Surgical Workshop using interactive local audio-video network, Tele-medical videoconference and edited video
- Web based system: Live web casting, VoD
- Advancement in interventional procedures and complex technology aided surgical intervention demands skill education.
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Work Flow in the hospital
Clinical Data Exchange
Work Flow in the hospital

- MRI
- CT Scan
- X-ray
- USG

Patient

Registration

Clinical Diagnostics

Doctors

Laboratory Test

Nursing Care

P. Admit

Anesthesia

Pre-operation

OR

Tele-presence Suite

Transmission of live surgical procedure

EMR

Needs to define high standard

Archive Server

Live Transmission

Telemedicine Partner Nodes

Post-OP

Ward

P. Dis. With smart Card

- Pathological
- Microbiological, etc
Computer Assisted Digital Exchange

Video Endoscopy Monitor

Image Manager - Report

C-Arms Images

ECG Monitoring

MRI Images - PACS

C-Arm Fluoroscopy

IMG Monitoring

Teleconferencing - telesurgery

Left Side OR

Image view Boxes

Laser Generator

Surgical Picture Archival Communication System (S-PACS) SGPGI, Lucknow Case Study
• Integrated Operation Theatre
• Surgical Skill Transfer & Management System
• Preparation of web based video content which can be accessed by outside world through interactive videoconferencing/ real time streaming/Video on Demand (VOD) was the main objective of this project.

• Integration of image inputs
  – In light camera
  – Laparoscopic camera
  – Operative microscope
  – Room camera mounted in the ceiling
  – Audio / Videoconference system
  – Intra-operative Ultrasound, Fluroscopy
  – Vital Sign monitor record
  – Any other equipment used during surgery
Design, Development and Operation

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Intra Hospital Telemedicine Network
Riding over Hospital Information System Network
Integrated Operation Theatre
Surgical Telepresence

Digital Imaging and Communications in Medicine

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Surgical Picture Archival Communication System (S-PACS)  SGPGI, Lucknow Case Study
Live Streaming of Surgical Video
Mobile Learning Platforms
SGPGI Knowledge park

Archival
Storage
Knowledge Management
Live Surgical Data Workflow

**Harvest**
- Professional Camera
- Video Conference
- Hi-tech Digital Lecture Theater
- Integrated Operation Theater

**Edit**
- Green Valley Edius
- FCP (final cut Pro)
- Adobe Premiere
- Maya
- B4M

**Storage**
- Data Center
- Rack Servers
- Streaming Server

**Sharing**
- Online sharing
- Streaming
- Video Conferencing
- Offline Sharing
- Developed Content
- Website
Knowledge Processing

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FCP (Final Cut Pro)  Apple Platform

Edius Edit Station  Windows Platform
Knowledge Parking:
Data Center (Health Knowledge Park) &
Telemedicine Network Monitoring Stations

Telemedicine Network Monitoring Stations

Data Center (Health Knowledge Park)
Conclusion

• With the maturity of Video over IP technology and lowering cost of high definition video and audio and high resolution visualization enterprise medical image network needs to be designed at least in academic medical institutions.

• SGPGI case study can be studied as a model to work further in this field of medical imaging in particular building infrastructure for skill based training both in house and distance education mode.
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Thank you for your attention!