

ERNET India

An Autonomous Scientific Society

under

Department of Electronics and Information Technology

**Re-defining landscape of ICT in Healthcare
Education**

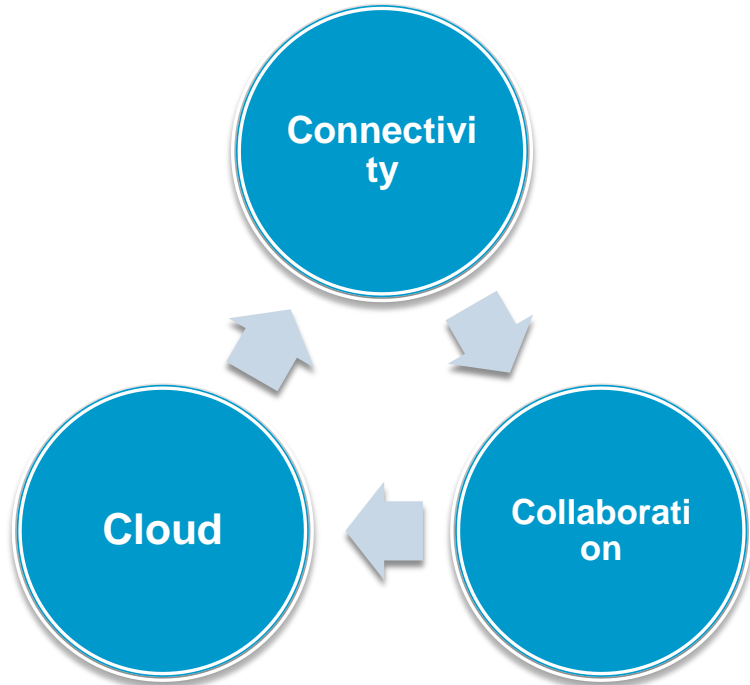
24th November, 2013

New Delhi

Agenda

- ❑ **The three C's → The new Connectivity Paradigm**
- ❑ **The new Internet technology**
- ❑ **Is Today's Medical Education preparing our students for the next technology wave?**
- ❑ **Framework of Medical Education using ICT**
- ❑ **ERNET**

The three C's → the New Connectivity Paradigm



Internet: Standard Applications



Impact:

- Smart Classes
- eLearning
- Mass Communication
- eCommerce
- Social Media
- CLOUDS

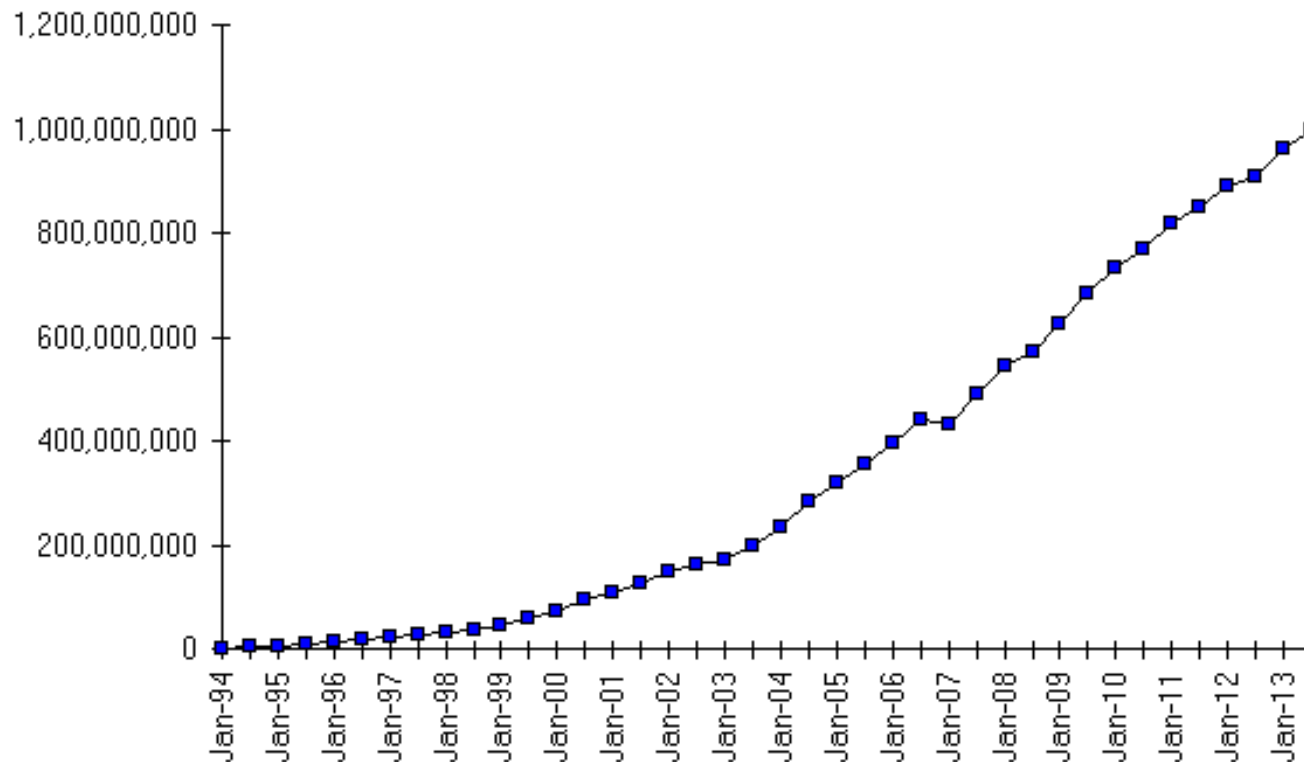
Platforms: IT Enabled Education

- One (Teacher) to Many (Students):
 - Multicast over TV
 - Webcast the class/lab/live Healthcare Procedure
 - Smart Class Room
 - Video Libraries
 - Digital Libraries
 - Public Cloud based eLearning platform
- Enabling Collaboration among clinicians, for example:
 - Cancer Board across location
 - Remote consult
 - Remote Patient Monitoring

The New Internet Technology!!!

Internet Devices Growth

Internet Domain Survey Host Count

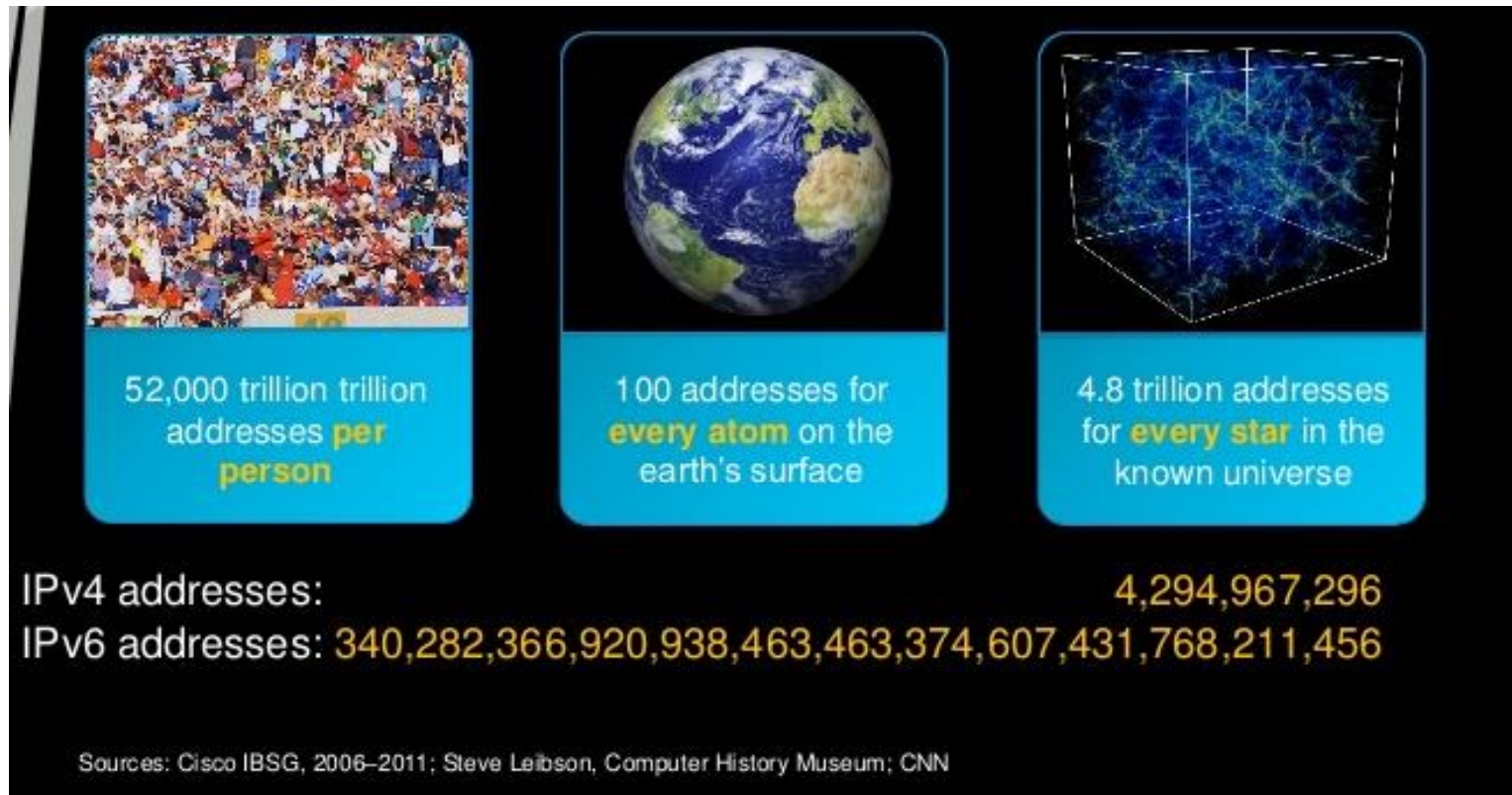


Source: Internet Systems Consortium (www.isc.org)

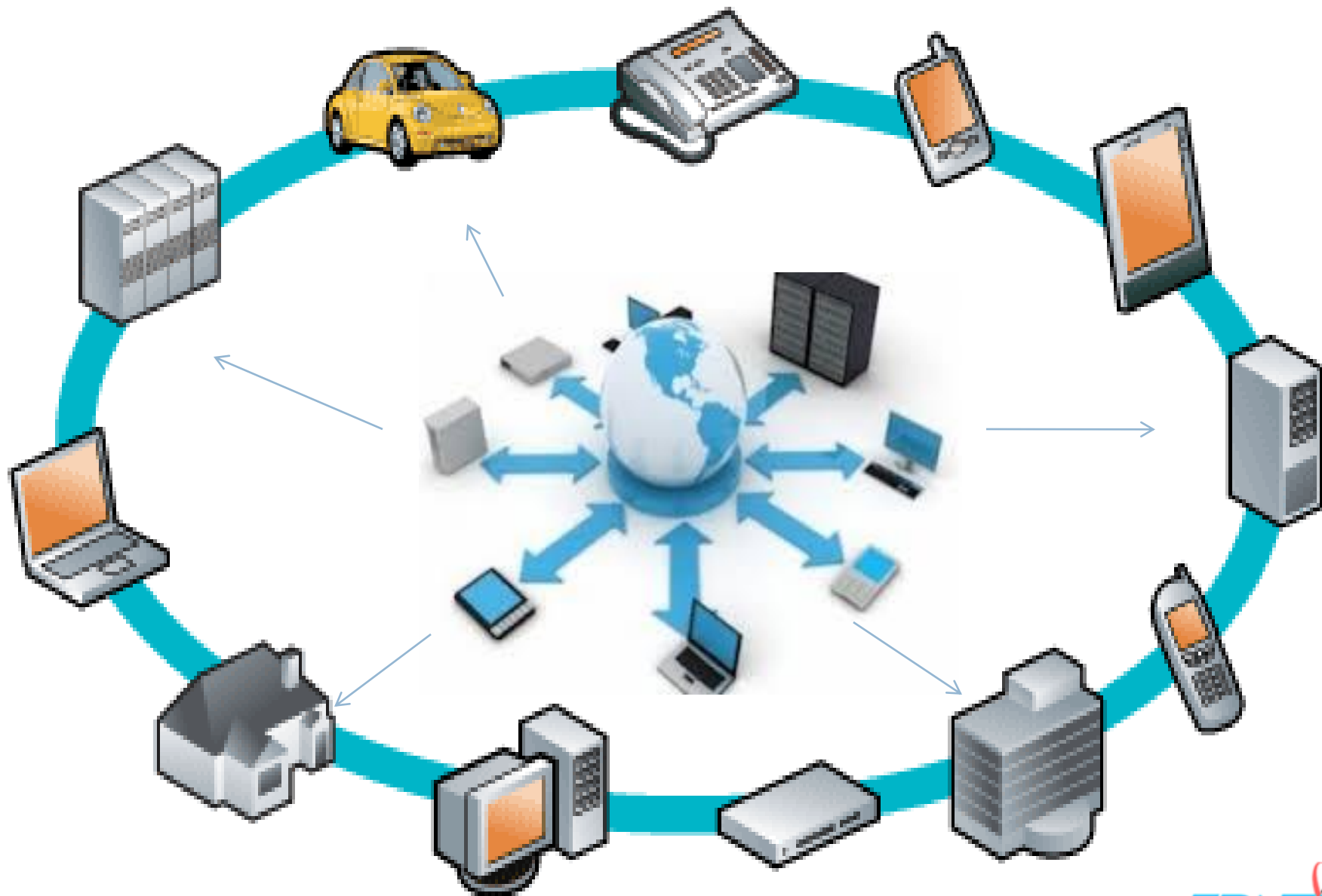
- **India is the worlds third largest in Internet usage**

Immediate Need: Numbering → IPv6

The world ran out of IPv4 addresses in Feb 2010. Introduction of IPv6 makes the management of networks easier due to auto configuration capabilities and larger address space

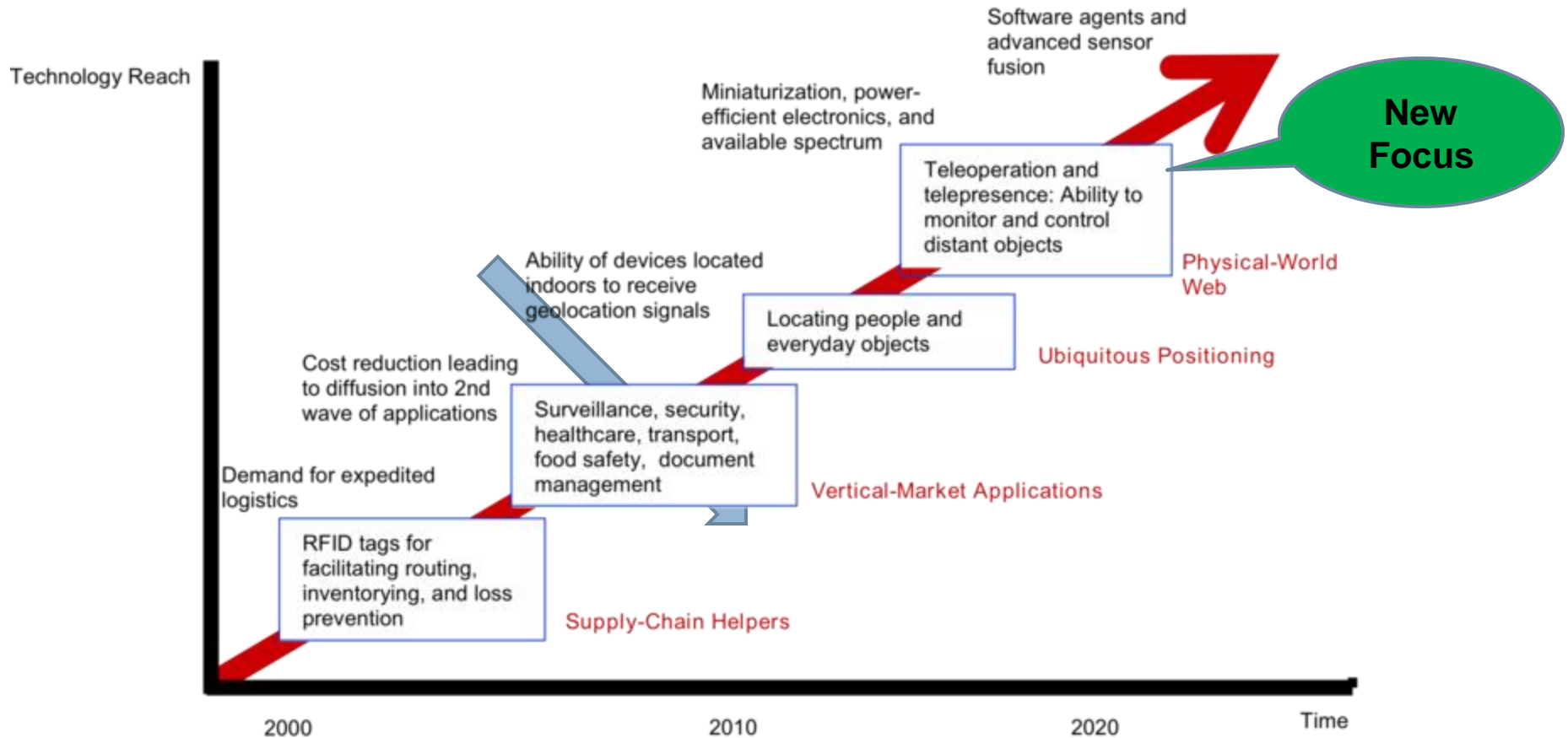


The New Internet → Internet of Things



The New Internet

TECHNOLOGY ROADMAP: THE INTERNET OF THINGS



Source: SRI Consulting Business Intelligence

Source: Wikipedia

Is today's Medical Education Preparing our students for this new technology wave?

Technology in Medical Education:(<1% penetration)

- Digitization of library
- Supporting Tele-Education & Tele-consultation
 - ❖ Videos of Clinical Processes for doctors & nurses
 - ❖ Videos of medical Procedures for Continued medical education both for doctors & nurses
 - ❖ Smart Class Rooms for Continued Medical Education(CME)
 - ❖ Webcast/Relay of Operations/Procedures from the OTs directly
 - ❖ Hub & spoke model for second opinion from Super Specialist doctors
- Institute Administrative control process: Supporting Admission to Graduation lifecycle

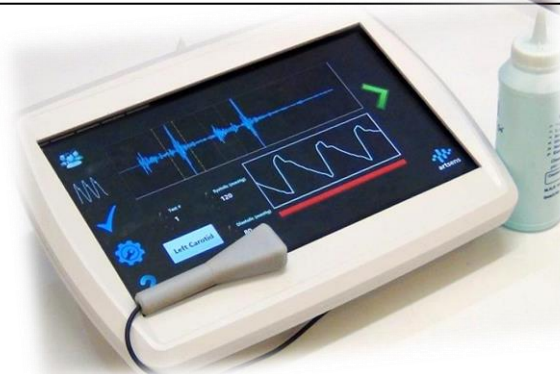
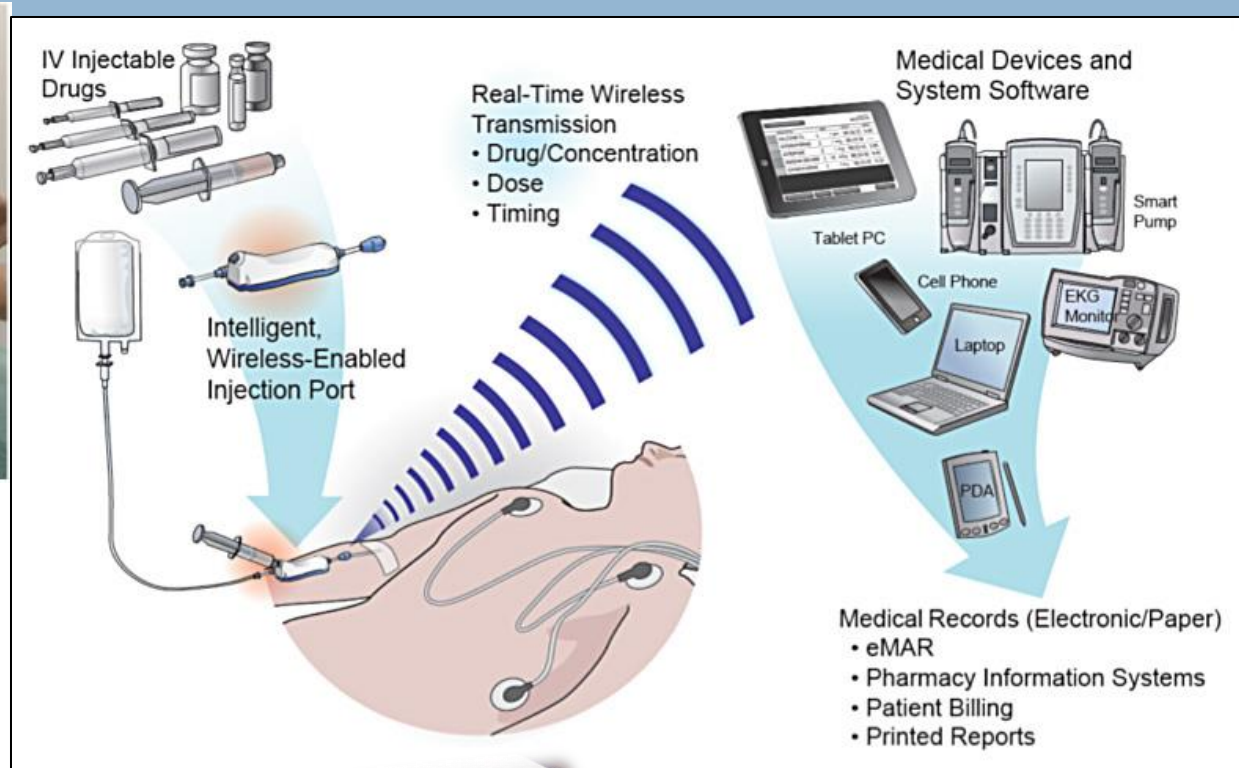
Available in
some
colleges

This is a very large opportunity area

Some new trends in Medical Education

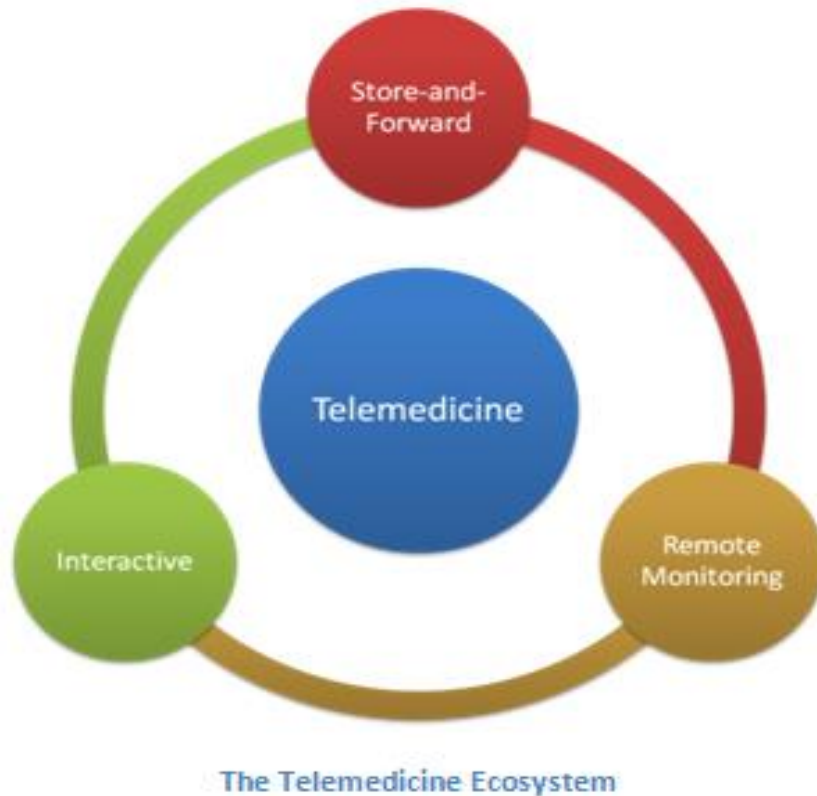


Virtual Operations & Virtual Reality for 3-d training



ARTSENS – technology for vascular screening from HCIT

Tele(remote) Medicine: an additional way for healthcare delivery



Improving Resource Utilization →

1. Existing connectivity to be used for tele-medicine
2. Basic Eye check-up, remote X-Ray, tele-consult to be tried in first pilot with tele-medicine
3. Training on new devices/mHealth products
4. Training on remote patient monitoring

With Device Convergence, **mHealth** is another form of Tele-Medicine

Framework of Medical Education using ICT:

Framework

Change Management Process for ICT enabled Healthcare to start Early

Phase I	Phase II	Phase III	Phase IV
Connectivity & Remote Education	Tele-Diagnostics as part of Medical Training	ICT as Support tool	Predictive Analysis & Clinical Research
<ul style="list-style-type: none"> • Connectivity • Collaboration • Smart Class Room • Webcast • CMEs • Digital Library <ul style="list-style-type: none"> • Journals • Videos • eLearning Content <ul style="list-style-type: none"> • Videos • Animations • content 	<ul style="list-style-type: none"> • Tools <ul style="list-style-type: none"> • Mobile devices • PACs • Patient Info system • Hospital Info System(HIS) • Tele-radiology • Tele-consult • Remote patient monitoring tools • Tele-pathology 	<ul style="list-style-type: none"> • Tools <ul style="list-style-type: none"> • Handwriting recognition • Voice recognition • mHealth Tools • Electronic Health Records • Assisted Diagnosis <ul style="list-style-type: none"> • Notifications • Allergies & Reactions 	<ul style="list-style-type: none"> • Analytical Tools • Computer Assisted Diagnosis • Clinical Pathways & Disease Management • Research <ul style="list-style-type: none"> • Clinical Research

Summarizing Technology tools

New Healthcare Delivery Mechanism

- Tele-medicine
- Specialized ambulatory care
- mHealth
- Homecare Devices
- Remote Patient Monitoring

Accountable/Outcome based care

- Documentation
- Managing Allergies/Reactions

Research & Innovation

- Medical Image(Eye, XRay) analysis
- Voice Recognition for reporting
- Handwriting recognition
- Medical Informatics
- Predictive Modeling for Care

Tools for Processes Management

- Hospital Information System(HIS)
- Electronic Health Records System
- Radiology/Imaging System

The future can be Network Operation Center(NOC) for remote patients, where a doctor can seamless review a remote patient

ERNET: Major Activities

1. Connectivity

- ❑ Wire line : Through Leased Lines hired from BSNL, Railtel, etc
- ❑ Wire less : Through own VSAT network and RF

2. Service Oriented Projects

- ❑ ICT infrastructure & Campus LAN
- ❑ Movement to dual stack(IPv6/IPv4)
- ❑ Web Hosting Services
- ❑ Domain Registrar (.ac.in, .edu.in, res.in)
- ❑ Video Conferencing
- ❑ Smart Classroom
- ❑ Digital Libraries
- ❑ Eduroam

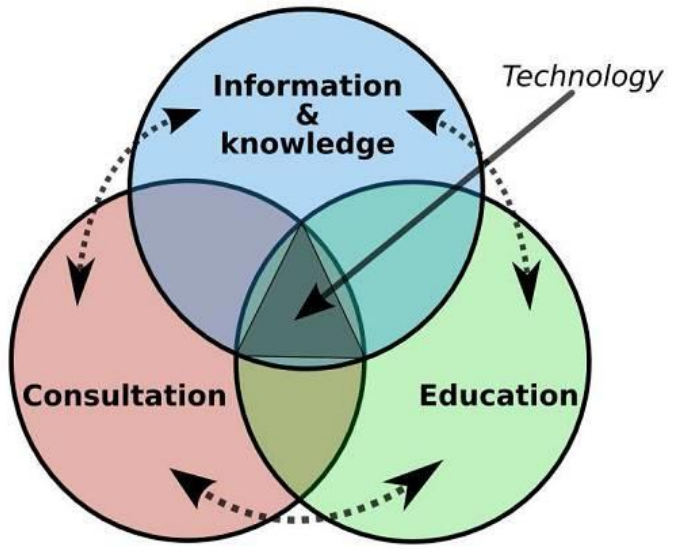
3. R & D Networking

- ❑ Test bed for Educational Cloud Services for schools
- ❑ 6LowPan (Low Power wireless Personal Area Network)
- ❑ IPv6 Test setup for global performance and compatibility testing

4. Training

- ❑ Computer Networking
- ❑ Basic Computer & IT Security Courses
- ❑ IPv6 Training
- ❑ Training on Eduroam

Enabling Remote Healthcare



- ERNET provides connectivity and a computer lab environment together with operations support to remote schools/villages.
- CDAC's tele-medicine product to plan tele-consults. They will cover
 - ▣ Internal Medicine - Screening consult and basic Cardio Monitoring using HTIC's ARTSEN
 - ▣ Eye consult using HTIC's product





Thank You

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