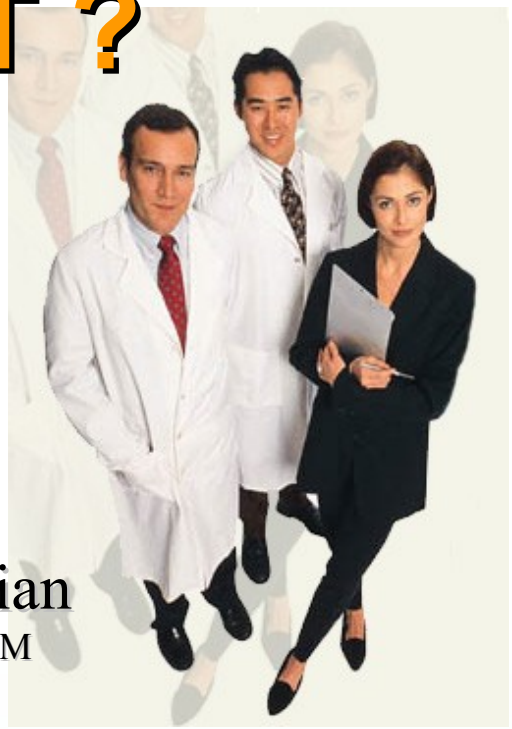
Why Electronic standards in Healthcare IT ?



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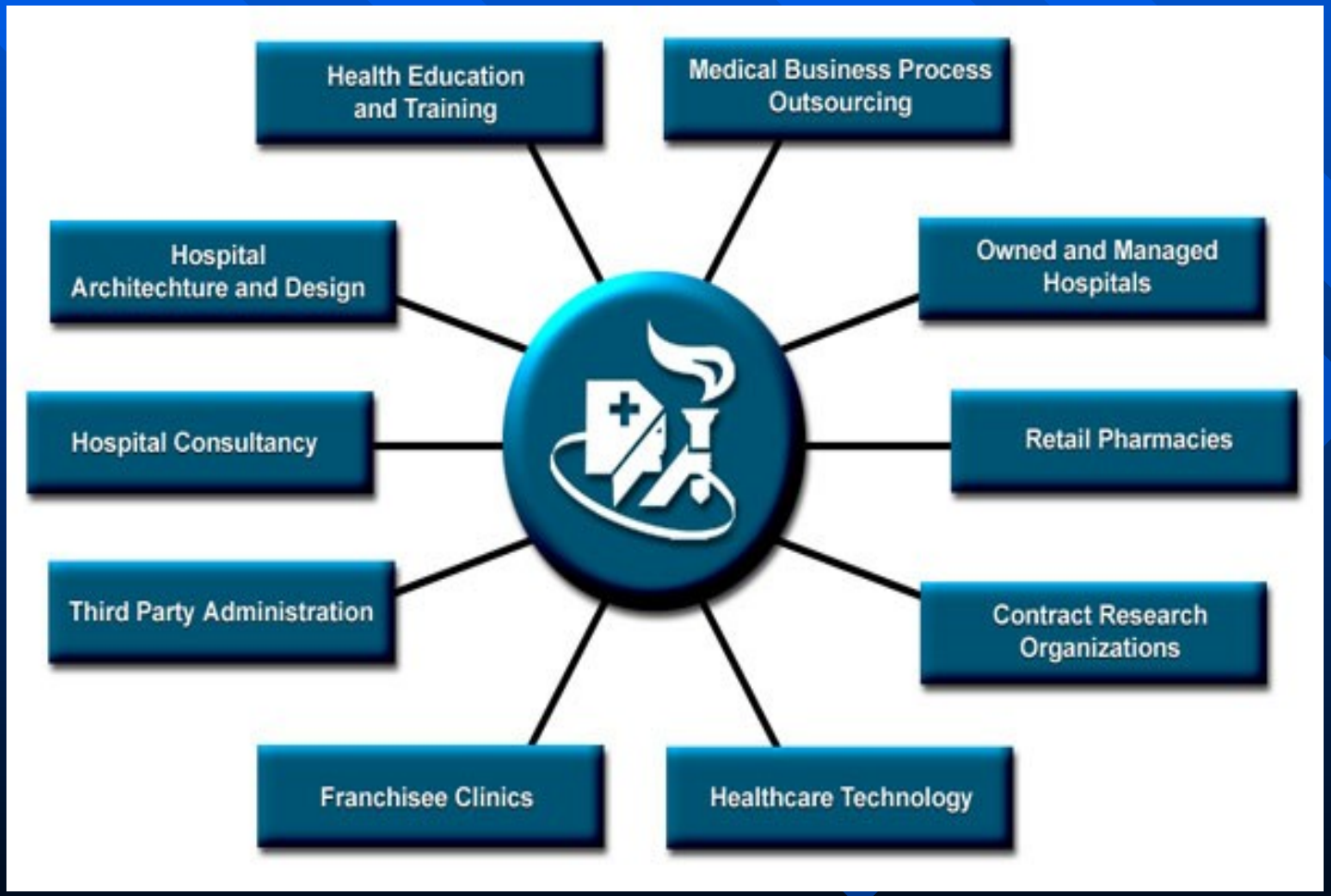
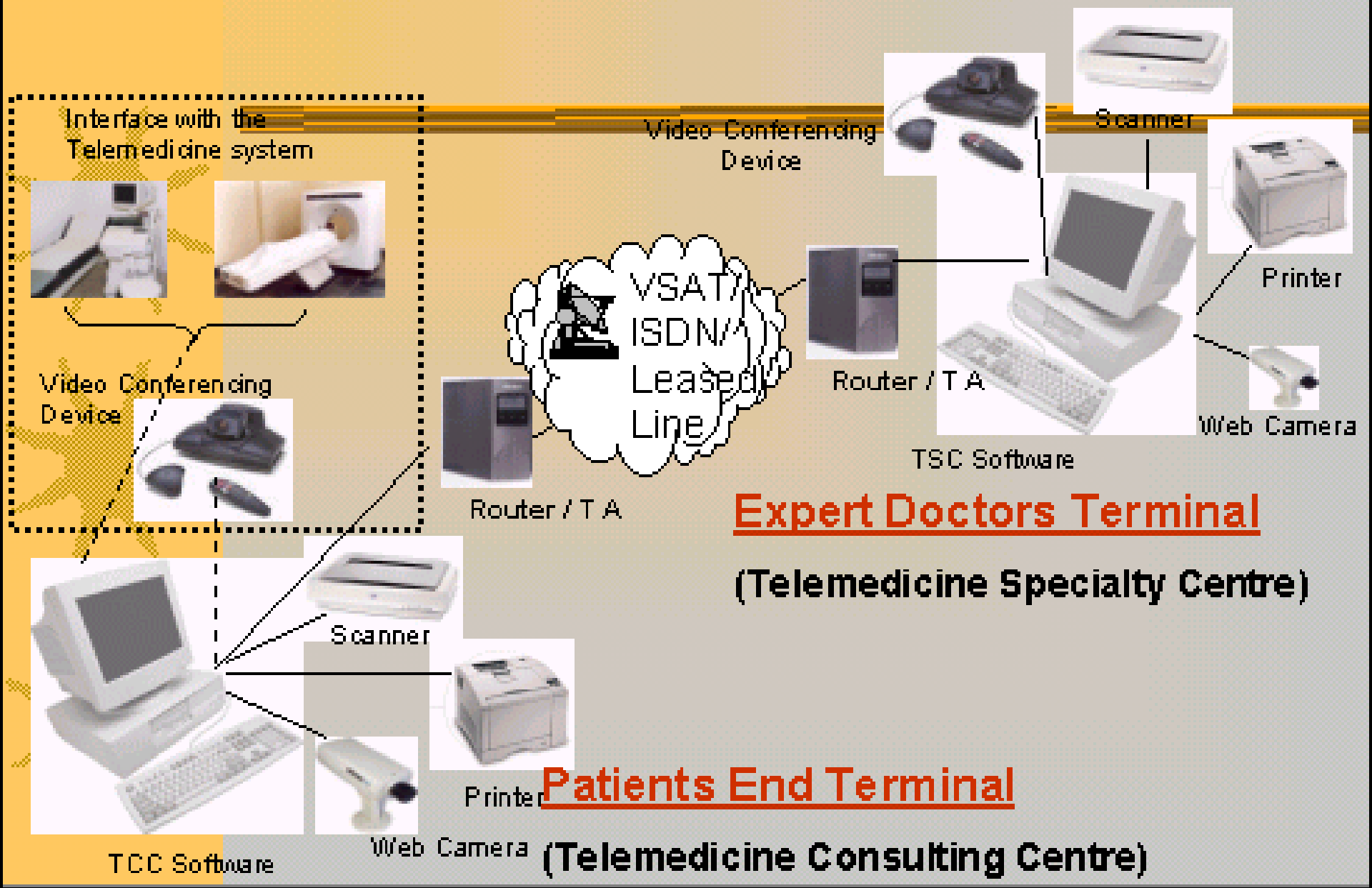
A few words about Apollo



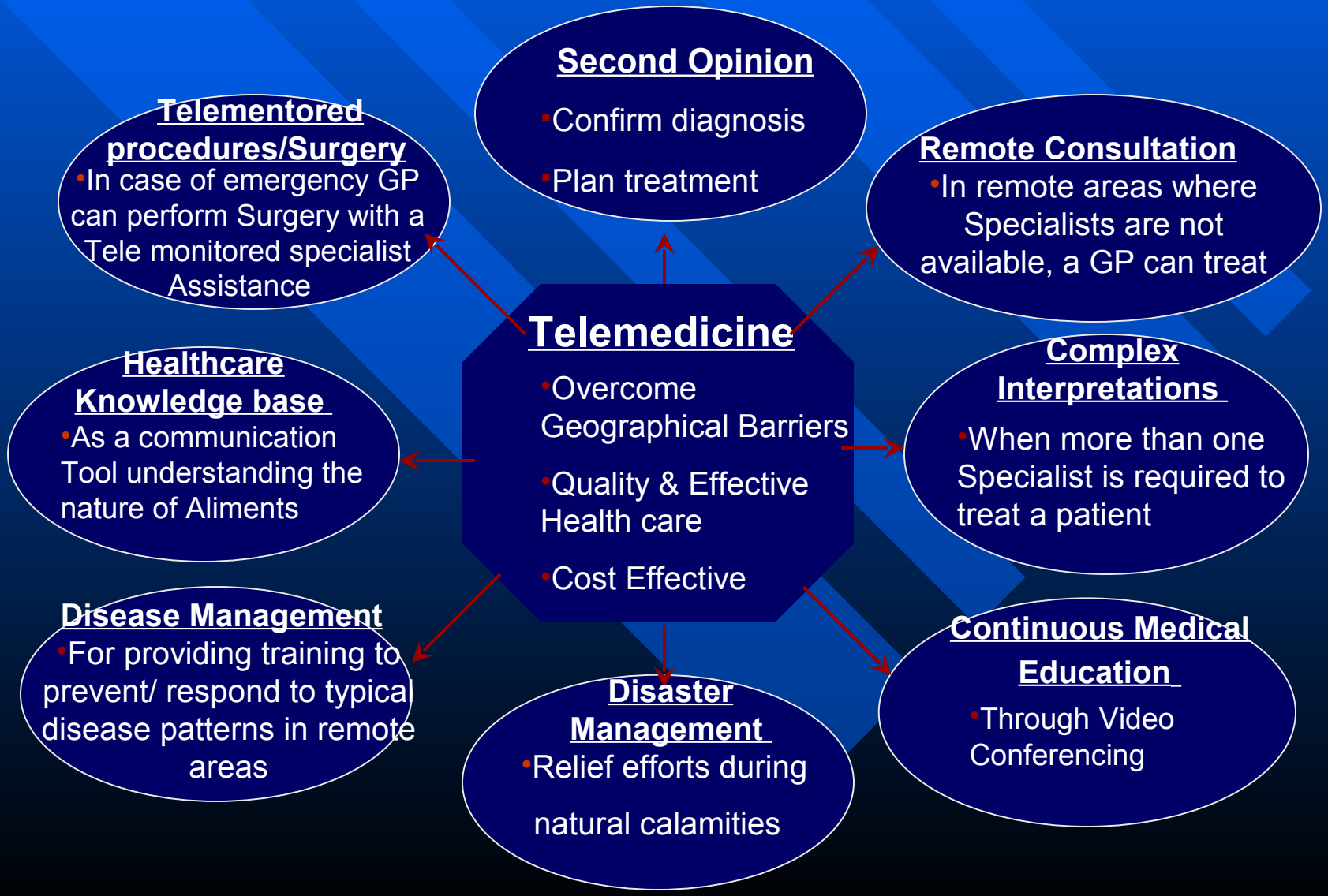
Telemedicine – A Brief

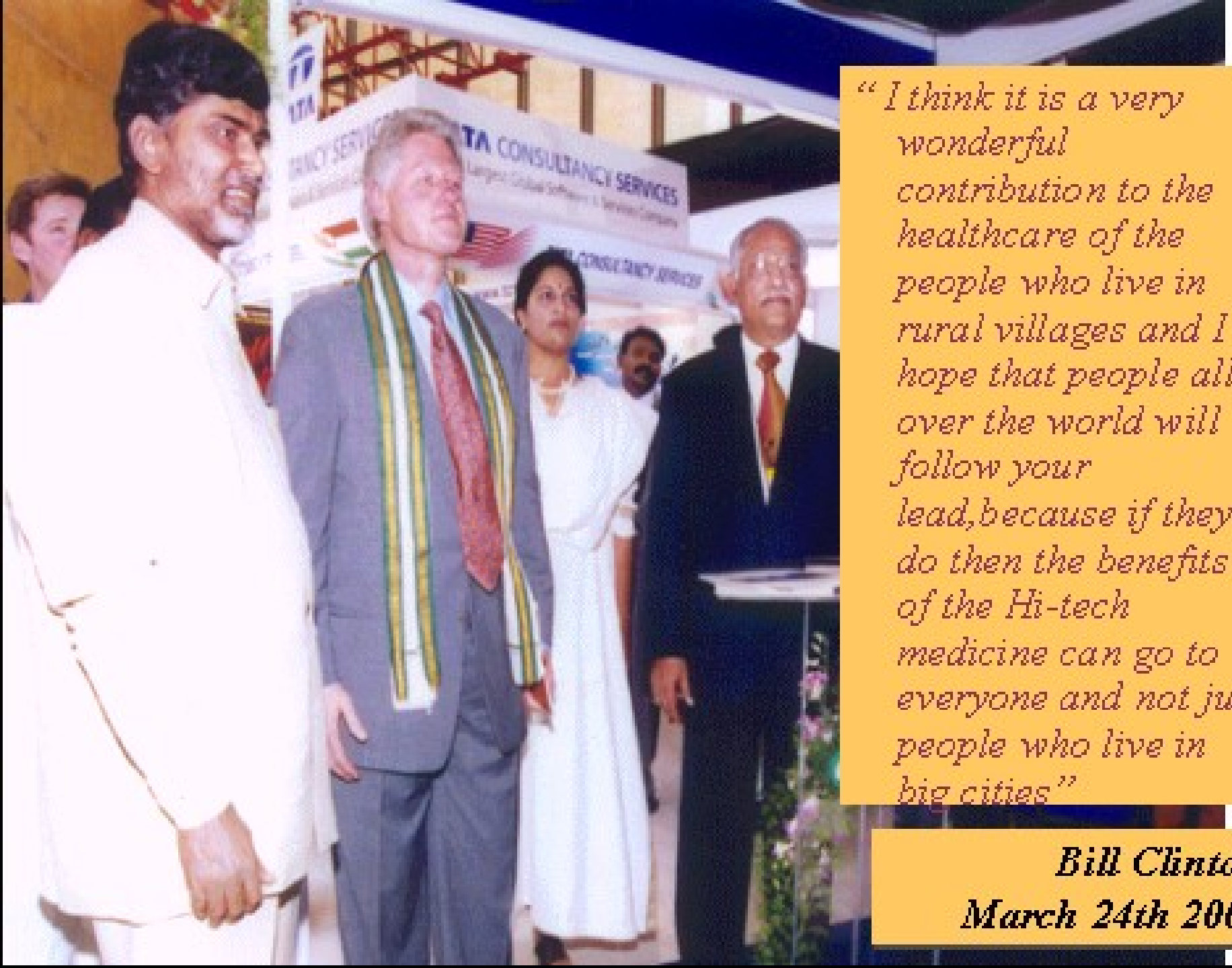
- Telemedicine involves sharing/exchanging the patient related data and medical opinion between a medical specialist and a doctor in a remote location through telecommunication networks.
- It is now possible to transmit text, verbal commentary and graphic and microscopic images from one location to another, irrespective of Geographic distance.
- Legal and security: Medical practitioners can assure their patients of the confidentiality and security of data transmitted via telemedicine networks.
- Methodology: Standard terms, procedures and protocols have to be used to communicate within telemedicine

Telemedicine – Process Overview



Telemedicine - Applications



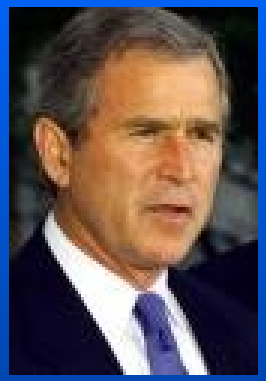


" I think it is a very wonderful contribution to the healthcare of the people who live in rural villages and I hope that people all over the world will follow your lead,because if they do then the benefits of the Hi-tech medicine can go to everyone and not just people who live in big cities"

Bill Clinton

March 24th 2000

President Bush stated…



…in his January 20 2004 State of the Union remarks that, the nation's healthcare system is "in a time of change. Amazing medical technologies are improving and saving lives…By computerizing health records, we can avoid dangerous medical mistakes, reduce costs and improve care." He emphasized that utilizing information technology more fully to improve health and healthcare requires bipartisan effort and cooperation.

Grim statistics

- An Institute of Medicine report claims that medical errors kill 44,000 to 98,000 patients in United States hospitals each year [(1)]
- A 2002 Commonwealth Fund report estimated that 22.8 million people have experienced a major medical error, either personally or through at least 1 family member, at an annual cost of USD $17 to $29 billion
- Adverse medical event rates in [(2)]
  - The United States 3.8%
  - New Zealand 11.3%
  - UK 10.8%
  - Australia 10.6 %
- Overall, between 12% and 15% of adverse medical events were directly related to diagnosis error
- Between a third and a half of all non-operative adverse medical events were related to medications. 20-50% of these were judged preventable
- In the UK study, of the proportion of medical errors that were highly preventable, 50% of medication errors were considered preventable, and 100% of diagnosis errors were preventable

1: http://www.labmedicine.com/2005/Issue_05/1001033.html
2: http://www.medicalnewstoday.com/medicalnews.php?newsid=21361

So what's the answer ?

Evidence suggests that it is possible to prevent medication errors and improve quality of healthcare by the implementation of IT in Healthcare in the form of :

- CPOE (computerised physician order entry)
- HIS (Hospital Information systems)
- RIS (Radiology Information Systems)
- LIS (Lab Information Systems)
- Telemedicine Applications
- PACS (Picture Archiving and communication Systems)
- EHR/ EMR (Electronic health/medical record)
- E-Training applications
- Billing and coding Applications
- Other healthcare applications and solutions

However…a note of caution

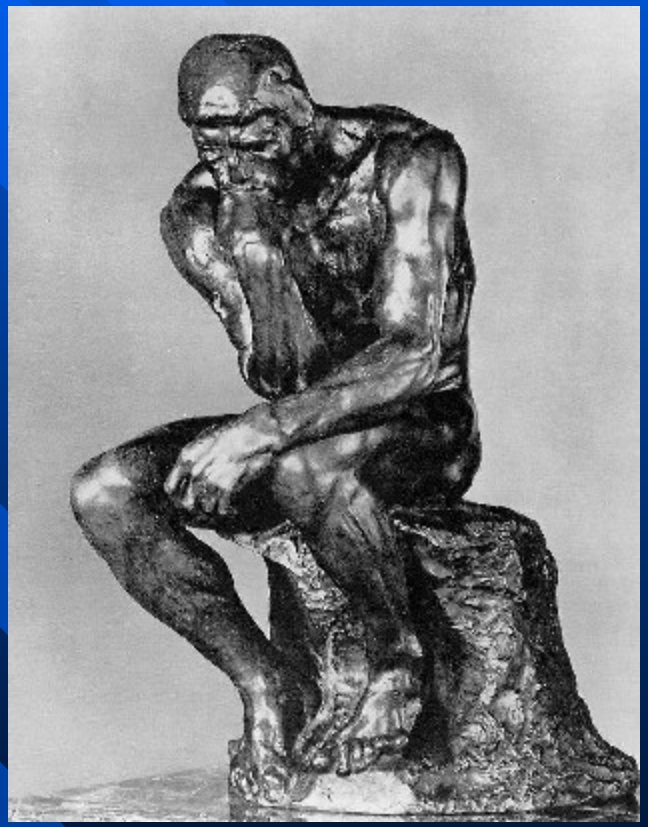
- Complex healthcare applications cannot just be created ground up without adhering to *some kind* of standards.
- The obvious question – why standards ?
- …and where do you get these standards ?

Why Standards ?

- Sharing of medical data
- Accessibility to a larger subset of data
- Quicker insurance claim payments
- Interoperability – ‘Apps talk to each other’
- Greater safety for the patient
- Accreditation
- Quality, Quality, Quality
- Bigger market

So how do we obtain standards?

- Create them ground up
- Adopt standards already available
- Study standards available and modify for own use



Common Standards

- Terminology
  - LOINC
  - SNOMED CT
  - CPT
  - HCPCS
  - ICD
- Data Transfer/storage/ capture
  - HL7
  - DICOM
  - OpenEHR
- Legal
  - HIPAA

Terminology: LOINC

- LOINC® - Logical Observation Identifiers, Names and Codes
- Developed by the Regenstrief Institute, Indianapolis and the LOINC committee (initiated in 1994)
- LOINC codes are universal identifiers for laboratory test results and other clinical observations
- The LOINC medical database carries records for>30 000 different observations
- LOINC is designed to be compatible with HL7 messages.
- LOINC has been endorsed by the American Clinical Laboratory Association and the College of American Pathologists
- The LOINC database can be downloaded for free use
- RELMA® (the Regenstrief LOINC Mapping Assistant): a Windows-based mapping utility designed to facilitate searches through the LOINC database and to assist efforts to map local codes to LOINC codes.

Terminology: SNOMED CT

- Systematized Nomenclature of Medicine
- A comprehensive set of concepts, terms and codes used by physicians, dentists, nurses, allied health professionals, veterinarians, and others
- 35 year history of providing coded terminologies
- Developed by the American College of Pathologists & United Kingdom's National Health Service
- As of January 2005, the fully populated table with unique descriptions for each concept contains more than 984,000 descriptions.
- Approximately 1.45 million semantic relationships exist to enable reliability and consistency of data retrieval.
- It is available in English and Spanish language editions.
- DD-84820 – Toxic effect of eating Mushrooms

Terminology: CPT

- AMA issued the Physicians' **Current Procedural Terminology** in 1966
- Originally it was a four-digit numeric coding system with narrative descriptions of services and procedures performed physicians.
- CPT® expanded to five digits in 1970
- The second edition expanded CPT® to a five-digit coding system with corresponding narratives and included two-digit modifiers.

Terminology: HCPCS

- In 1983, Medicare created HCPCS, the **Health Care** Financing Administration's Common Procedure Coding System. Based on AMA's copyrighted CPT®. HCPCS was the beginning of a national procedure coding system.
- HCPCS is a three-level coding system required when reporting services and procedures provided to Medicare and Medicaid beneficiaries.
- HCPCS has 3 levels
  - HCPCS Level I describes physician and hospital outpatient procedures and services.
  - HCPCS Level I generally does not provide codes for drugs and supplies.
  - HCPCS Level II codes supplement CPT®, which does not include codes for non-physician procedures, such as ambulance services, durable medial equipment, specific supplies, and administration of injectable drugs.
  - HCPCS Level II codes consist of one alphabetic character plus four-digits.
  - HCPCS Level III:Medicare carrier or fiscal intermediary may create "local" codes for use within its administrative region.
  - Local codes are five-digit, alphanumeric codes using the letters S, and W through Z.
  - Local codes are used to denote new procedures or specific supplies for which there is no national code.

Terminology: ICD

- The International Statistical Classification of Diseases and Related Health Problems
- Built and maintained by the United Nations World Health Organization, Geneva
- The ICD family of codes has historically been the most widely used classification system in healthcare.
- ICD 9 was designed for the classification of morbidity and mortality to gather statistics
- Classifications such as ICD-9 and ICD-10 (and OPCS-4) are used to summarise the incidence of diseases and operations on a national or worldwide level. ICD 9 was limited to diseases.
- ICD 9 CM The first ICD standard was developed by WHO in 1977. ICD is divided into categories based on a five digit code (which limits the size of the vocabulary), where round numbers (eg 200) represent the more general concepts. Form: strict hierarchy; code determines position in hierarchy. The code is both the concept and the unique identifier. No multiple contexts or multiple inheritance so duplicate terms exist.
- ICD 10 The International Statistical Classification of Diseases and Related Health Problems, tenth revision. . ICD 10 entered use in April 1994.
- ICD 10 CM International Classification of Diseases, Tenth Revision, Clinical Modification.
- ICD 10 PCS International Classification of Diseases 10th revision, Procedure Classification System.

Data Transfer: HL7

- **Established in 1987, Health Level Seven (HL7) is an ANSI accredited, not-for-profit standards-development organization, whose mission is to provide standards for the exchange, integration, sharing, and retrieval of electronic health information; support clinical practice; and support the management, delivery and evaluation of health services. ANSI accreditation, coupled with HL7's own procedures, dictates that any standard published by HL7 and submitted to ANSI for approval, be developed and ratified by a process that adheres to ANSI's procedures for open consensus and meets a balance of interest requirement by attaining near equal participation in the voting process by the various constituencies that are materially affected by the standard (e.g., vendors, providers, government agencies, consultants, non-profit organizations).**

Data Transfer: DICOM

- ACR (the American College of Radiology) and NEMA (the National Electrical Manufacturers Association) formed a joint committee to develop a Standard for **Digital Imaging and Communications in Medicine**.
- This DICOM Standard was developed according to the NEMA Procedures and published in Jan 1988.
- This Standard is developed in liaison with other Standardization Organizations including CEN TC251 in Europe and JIRA in Japan, with review also by other organizations including IEEE, HL7 and ANSI in the USA.
- This standard :
  - Promotes communication of digital image information, regardless of device manufacturer
  - Facilitates the development and expansion of picture archiving and communication systems(PACS) that can also interface with other systems of hospital information
  - Allows the creation of diagnostic information data bases that can be interrogated by a wide variety of devices distributed geographically.

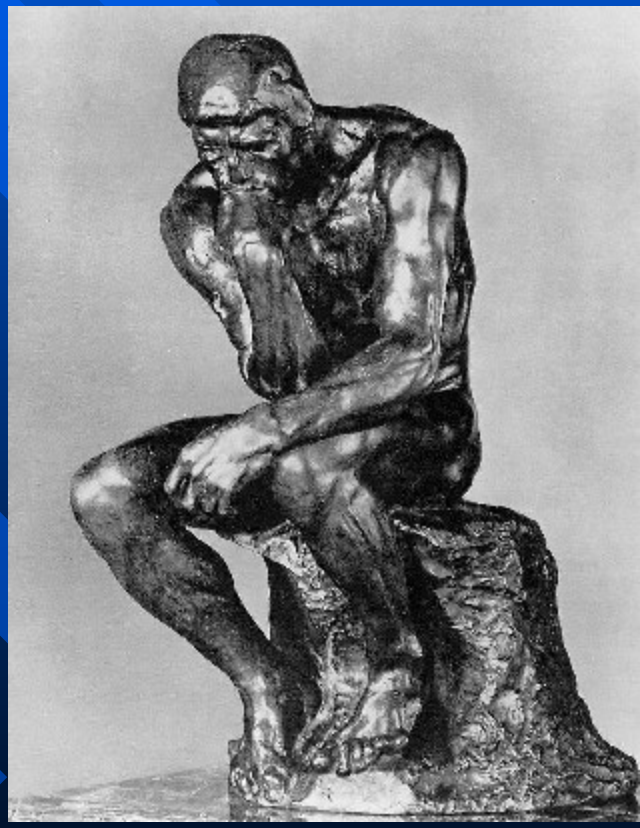
Legal: HIPAA

- HIPAA is the acronym for the "Health Insurance Portability and Accountability Act "of 1996
- Applicable from 16 Oct 2003
- Involves all entities directly or indirectly involved in electronic billing/coding
  - Claims or equivalent encounter information
  - Payment and Remittance Advice
  - Claim Status Inquiry/Response
  - Eligibility Inquiry/Response
  - Referral Authorization Inquiry/Response
- Privacy Regulations :Covered entities (health plans, health care clearinghouses and health care providers who transmit health information in electronic form) may not internally use or externally disclose protected health information except as allowed or required by HIPAA.
- Security Regulations: With respect to PHI electronically maintained or submitted, covered entities must conduct internal assessments of risks and vulnerabilities, develop and implement appropriate security measures and document implementation of such measures with appropriate policies and procedures.
- Transactions Regulations: Covered entities that transmit certain transactions electronically must ensure compliance with two sets of standards: uniform formatting standards and uniform data elements standards. Electronic media

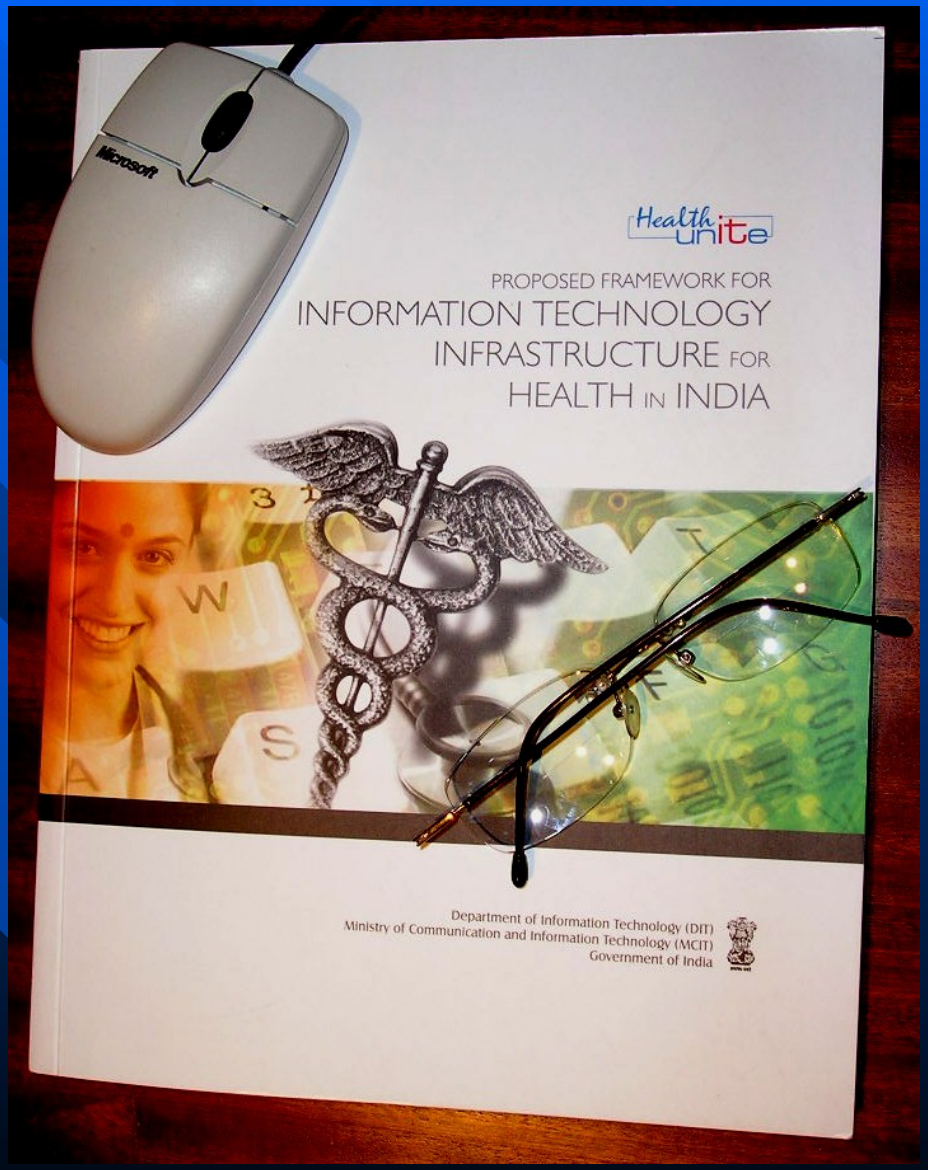
….and now that we are familiar with standards, which are the ones that we need to use and how do we go about it……

In other words how do we assess what WE require….?

Well here is a case example…..



India's experience in Assessment and adaptation of Electronic standards for Healthcare Quality

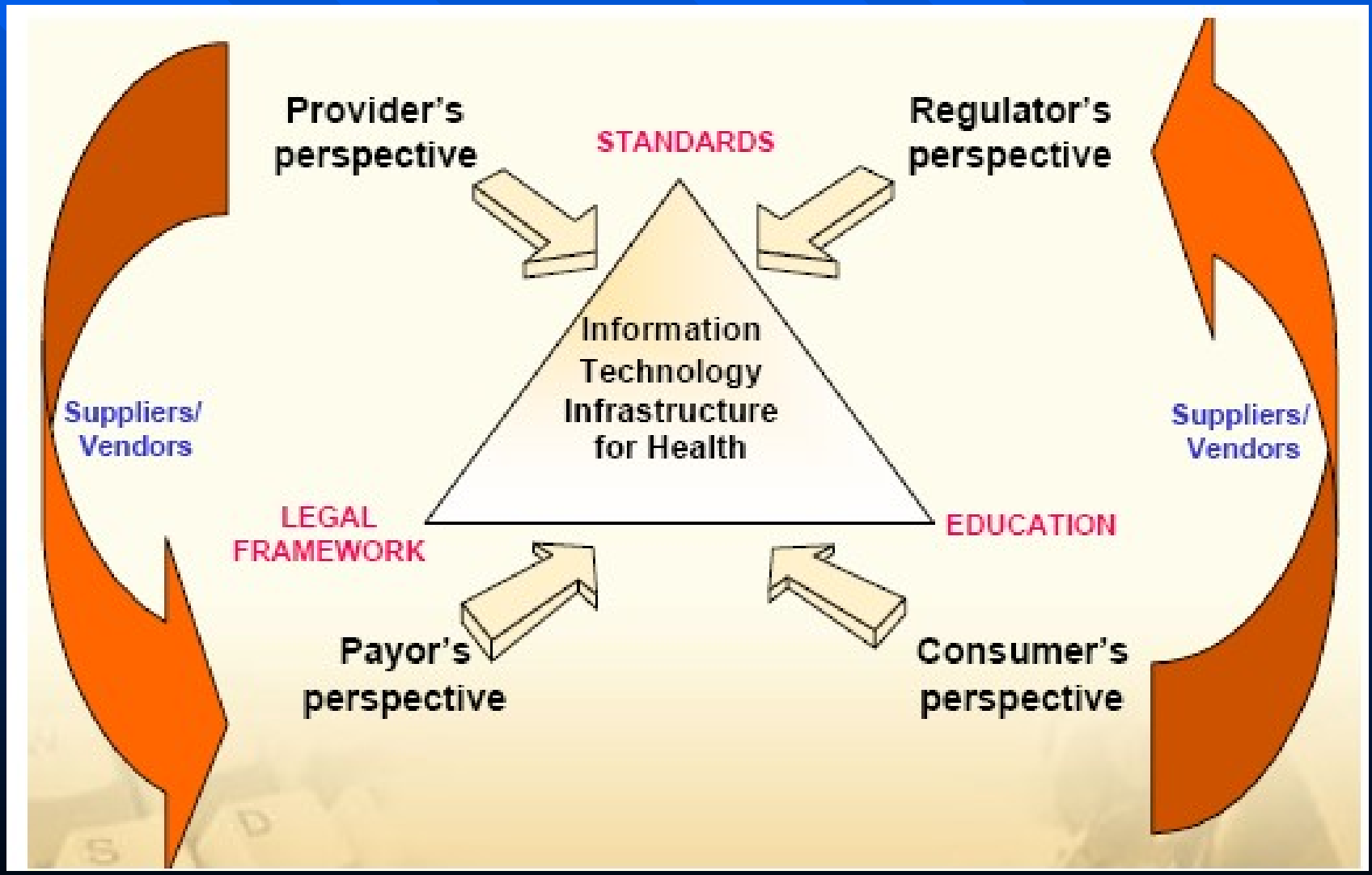


The Indian Experience

- Before 2002 – no healthcare standards in India
- Wanted to learn from others errors
- The Min of Comm and IT(MCIT), Govt of India worked with Apollo and other stakeholders to create comprehensive Health Information standards (incl telemedicine)
- The project was called 'Health UnITe' and proposed a framework for Information Technology infrastructure for Health in India (ITIH)
- ITIH focused additionally, on the Legal and educational framework

Road map

- Get all stake holders together
  - Public health agencies at various levels
  - Health professionals and institutions
  - Insurance companies
  - Public and private healthcare organizations
  - Policymakers
  - Consumers – can be patients or the population in general, etc.
- Form committees to study each aspect
- Interview a cross section of the users
- Study standards across the world
- Localize it where necessary
- Put together the proposed standards
- Publish recommendations
- Legislate the recommendations

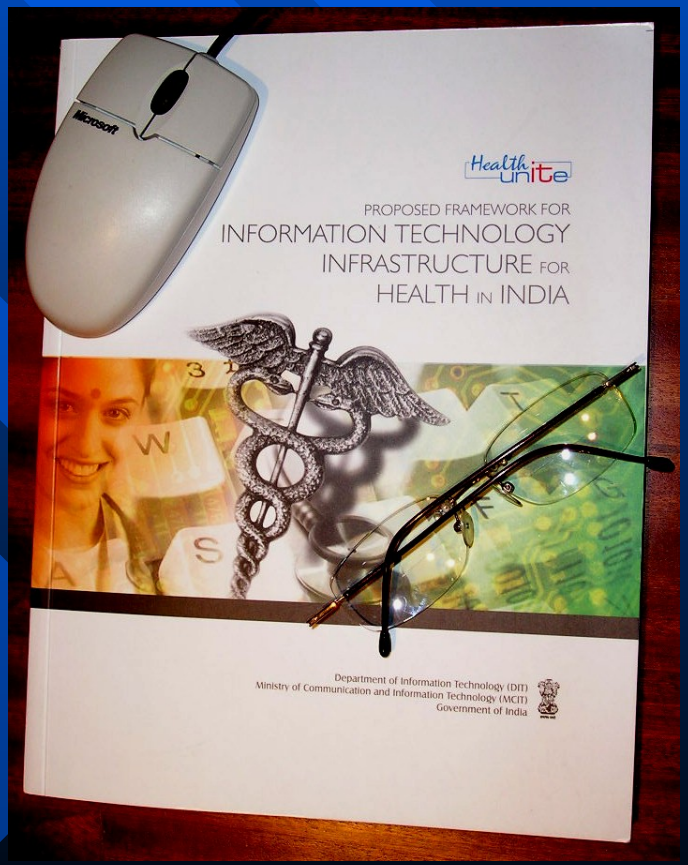

Provider's perspective
STANDARDS
Regulator's perspective
Information Technology Infrastructure for Health
Suppliers/ Vendors
Suppliers/ Vendors
LEGAL FRAMEWORK
EDUCATION
Payor's perspective
Consumer's perspective

Eight working groups made to study:

- Clinical Standards
- Data Elements
- Health Identifiers
- Minimum Data Sets
- Healthcare Billing Formats
- Messaging Standards for Exchanging Health Information
- Legal framework for the privacy and security of health
- information
- Health informatics education

Recommendations submitted on

- Billing Formats
- Clinical Data Representation
- Data Elements
- Health Identifiers
- Messaging Standards
- Minimum Data Sets
- Health Informatics Education
- Privacy and Confidentiality of Health Information



- For full details please visit:

www.mit.gov.in/telemedicine/

Another example: Selecting a Telemedicine App

The Telemedicine App

- Should be web and browser based
- Be a many-to-many app
- Easy to use
- Easy to train on
- Up-gradable
- Up-scalable
- Interoperable
- HL7, HIPAA and DICOM co
- Secure
- Easy to implement
- Easy to maintain

To summarise

- Many standards available
- Must select those appropriate for you
- Introduce these standards into all your processes
- Get accreditation
- Carry out 6 monthly audits to study impact of changes
- Replicate at other sites

Thank You

Important Web Links

www.regenstrief.org/loinc/
www.snomed.org
www.ama-assn.org/ama/pub/category/3113.html
www.cms.hhs.gov/medicare/hcpcs
www.nlm.nih.gov/mesh/meshhome.html
www.cdc.gov/nchs/icd9.htm
www.hl7.org
medical.nema.org/
www.openehr.org/
www.hipaa.org
www.mit.gov.in/telemedicine/
www.telemedicineindia.com

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