Health Information Technology- A new initiative

Given information technology's potential and the ability to improve the efficiency of quality, it can be used as a tool to describe comprehensive management of health information across computerized systems. The promising tool called Health Information Technology (HIT) can provide new ways to health providers and their patients, to readily access and use health information. To summarize, IT allows health care providers to collect, store, retrieve, and transfer information electronically.

However, the health care system on the whole uses less IT than other industries, but surveys indicate that providers are now increasing their investments and are going the information technology way. The extent of IT and the types of IT deployed vary by settings and institutions ***(Report to the Congress: New Approaches in Medicare).*** Consistent adoption and utilization of the HIT can prevent medical errors, reduce health care costs and also lead to expansion of accessible health care. In fact WHOs Member States have set themselves the target of developing their health financing systems to ensure that all people can use health services, while being protected against financial hardship associated with paying for them ***(The World Health Report by WHO- Health systems financing: the path of universal coverage, vision 2012).***

Delivering quality health care requires providers and patients to integrate complex information from many different sources. The patients can obtain information to manage their health conditions in better ways. Nonetheless, we need a further research to understand what types of IT applications are most useful for improving care in different settings and the circumstances necessary to ensure successful implementation.

Classification of Health IT

While discussing information technology in healthcare, one can come across various classifications of HIT:

Health IT covers following areas;

1. EMR/EHR/PHR all are one and same with little difference
2. Telemedicine
3. Digital health knowledge resource e.g. Digital Medical Library
4. Hospital Information management system
5. e-learning technologies and application in health Science
6. Biomedical informatics for biomedical research applications
7. Artificial Intelligence in clinical medicine and health management
8. Public health informatics
9. Medical Internet
10. Virtual Reality and Simulation for health

Source; Presentation by Paolo Rosa, ITU Regional Director for the Americas a.i. Brasillia, State of the art of international standards in Telemedicine and e-Health.

Telemedicine: The goals and activities of Telemedicine and Health IT are complementary and synergistic. Telemedicine is the use of electronic communications and information technologies to provide clinical services when patients are at different locations. Closely associated with this is the term called **Telehealth**. This term is often used to encompass a broader application of technologies to distance education, consumer outreach, and other applications wherein electronic communications and information technologies are used to support healthcare services. Telemedicine does not represent a separate medical specialty; rather it is a tool that can be used by health providers to extend the traditional practice of medicine outside the walls of the typical medical practice. In addition, Telemedicine offers a means to help transform healthcare itself by encouraging

greater consumer involvement in decision making and providing new approaches to maintain a healthy lifestyle.

Electronic Health Record (EHR): These are generally viewed as part of an automated order-entry and patient-tracking system providing real-time access to patient data, as well as a continuous longitudinal record of their care.

Current Status of HIT in India

Despite India's recent ascendancy as the hub of the IT and IT-enabled services industry powered by a vast pool of skilled manpower, it has lagged tremendously behind other countries in HIT adoption. Looking at the health scenario of India, the GDP spend on health is 0.9%, whereas the WHO recommends a 5% of GDP for health ***(Telemedicine India Country Report, SGPGIMS, Lucknow, India, 2011).***

Today about 400,000 villages already have telephone connections, the recorded mobile users in India are 584.32 million as on 31st March, 2010 and there has been a tremendous rise in the number of internet users. With all these figures, the national HIT infrastructure of our country continues to lag. Relatively little is known about the level of diffusion of IT in hospitals and the strategies adopted by hospitals whilst making IT investment decisions. Barring a few preliminary attempts to computerize basic hospital administrative and some clinical functions, there has been little appreciation or impetus given to HIT adoption.

The scale of e-health services in India has been very small so far considering its size, mostly limited to medical transcription, health awareness through portals, telemedicine and hospital management system. In today's time, it is basically the private sector that is driving and paying for HIT.

Telemedicine has the potential for 80-90% of financial savings and high acceptability ratio in the rural communities of India. According to Sangeeta Reddy, Executive Director of Apollo Hospitals, a healthcare scenario, which uses IT and communication as an enabler, improves access and provides better preventive measures of treatment in time to urban as well as rural population. The key driver for health information technology for the people of India can be **public private partnership.**

Challenges and Issues at Policy Level for the Indian Government

The implementation of policies regarding HIT adoption has always been on the government's radar and serious exploratory initiatives are underway to explore coordination of a national health IT infrastructure and network. However, the challenges faced for adopting HIT are:

- **Government Funding:** Further improvement in government funding for HIT is required to avoid the restrained HIT adoption in government health facilities. Apart from this, it has to be ensured that the number of trained medical informatics professionals increases.
- **Computer literacy:** A high percentage of computer literacy among the government staff, and to a large extent in the private provider community should be one of the major objectives of the government.
- **Infrastructure and Coordination:** improvement in the supporting infrastructure and coordination between public and private sector.
- **Legacy Systems:** Except for a very few privately owned large hospitals, most patient records are paper based and very difficult to convert to electronic format.
- **Standards and Guidelines:** Local HIT systems that do not adhere to common standards for information representation and exchange. However HL7 and DICOM standards have been under consideration in some countries including India.

- **Interoperability:** Discussions of interoperability focus on development of standards for content and messaging, among other areas, and adequate security and privacy safeguards. Interoperability needs to be achieved in the rapidly expanding applications in areas such as home telehealth and remote monitoring for patients and consumers.
- **Privacy:** Patient confidentiality is an open area and he Supreme Court of India has not addressed the specific right of privacy issue with respect to health information.
- **Information Overload**: Health IT or Telemedicine is not a cure for the inadequacies related to health delivery system and neither HIT is supposed to be a cure. In fact too much information on wireless media and information coming from a large number of patients to a single doctor or miniscule group of doctors may result in over information or less remedial actions.

Business Opportunities for India Regarding HIT

The privatization of medical insurance will become a major driver of HIT adoption in the future, which will create a big push for comprehensive patient information and consequently the use of HIT. Information technology professionals, necessary hardware and software, and the emerging technology of grid computing have enabled India to afford terrestrial telecommunication network and infrastructure. The tele-linking of all health centers and augmenting them with latest and robust infrastructure comprising ECG, EMG , patient monitoring, imaging facilities etc. will create enough demand for entire chain of Health IT Players.
Looking at the brighter side, in India many Telemedicine programs have been actively supported by **Department of Information Technology, ISRO, Apollo Hospitals, Asia Heart Foundation, State Governments and NEC Telemedicine program for North-Eastern states.**

Initiatives by Department of Information Technology

The DIT, Ministry of Communication & IT had initiated some successful pilot projects to build framework for telemedicine and health IT. Further, most of the telemedicine platforms both in public and private health sector in the country have been launched by ISRO and DIT. Some of the selected projects by DIT are as follows:

- Development and application of tele-radiology-West Bengal
- Diagnosis and monitoring of tropical diseases-West Bengal
- General Telemedicine system-various states
- Standardization activities in e-health/Telemedicine
- Prepared an outline for IT-infrastructure for health
- Design and Development of Electronic Portal Imaging Device (EPID) for radiation therapy by CSIO, Chandigarh and TSG, Integration, New Delhi.
- Design and Development of Multileaf Collimator (MLC) for use in Medical Linear Accelerator machine
- Deployment of indigenously developed 6 MeV medical linac for cancer treatment – Jai Vigyan Phase II

Build Up by the Ministry of Health and Family Welfare

The Ministry of Health and Family Welfare has taken keen interest after some of the major Telemedicine projects were initiated by DIT and ISRO. A taskforce for Telemedicine in India by the Union Ministry of Health and Family Welfare has been constituted in 2005 for the implementation of Telemedicine projects. This taskforce includes members from the concerned ministries; technical agencies like; ICMR, ISRO and MCI; academic medical institutions and corporate hospitals practicing telemedicine actively. One of the motives of the taskforce is to draft a national policy on “Telemedicine and Telemedical education” and to prepare a

central scheme for the 11th five year plan. The ministry is working towards a defined framework for interoperability and scalability in today's health scenario.

Furthermore, the Ministry of Health and Family Welfare had suggested a National Health Portal proposal at the International Conference on Medical Electronics in June, 2011, which has been approved by the Finance Ministry. The portal could be an interoperable network, with all the information regarding health care.

Case Studies Related to Health IT

1. Application of Telemedicine technology to provide tele-healthcare during *mela* festival and disaster year 2001 by DIT-SGPGIMS. Tele-consultation has been provided by SGPGI to about 174 patients and exchange of health information took place on daily basis for various diseases and preventive measures.
2. Development and application of Telemedicine for tropical diseases was initiated in the year 2002 at the School of Tropical Medicine in Kolkata at its referral centre. IIT Kharagpur and Webel ECS Ltd. Have introduced Telemedik software, which another initiative by the Department of Information Technology.
3. Development and application of Telemedicine for radiology for government hospitals was started in the year 2002 in West Bengal. The activities that took place with a connectivity of 64/128kbps leased line & WBSWAN as backbone were; cases of radiology, cardiology, medicine and haematology.
4. Development of Telemedicine technology and its applications towards optimization of medical resources in the year 2002 was started by networking the three premier institutes of the country. Mercury Telemedicine software was set up to connect the remote health centres with specialty hospitals.
5. Common service centres have been set up in 600,000 villages of India, which provide 80 services related to e-governance, education, health, telemedicine, diagnostics and vaccination schedule.
6. Another project initiated by DIT was the Karnataka Telemedicine project in the year 2002, where the referral hospital in Bangalore was connected via satellite to remote hospitals in the district of Chamarajanagar and interior south Karnataka. The activities conducted are tele-cardiology, women & child health, orthopaedics and pathology.
7. The Ministry of Health and Family Welfare, Govt. of India has started projects like **Integrated Disease Surveillance Project(IDSP), OncoNET India, Tele-ophthalmology project, National Digital Medical Library Consortium, National Rural Telemedicine Project and National Medical College Telemedicine Network.**
8. To improve the efficiency of surveillance activities, detect disease trends; evaluate control strategies of the disease control programmes, **Disease Surveillance Integrated Disease Surveillance Project** were initiated in the year 2004. The satellite used for surveillance and connectivity was called EDUSAT and today it has connectivity in 559 locations of the country.

Source; Prof S K Mishra HOD Endocrine Surgery and Nodal Officer Telemedicine Programme, School of Tele medicine and Bio Informatics, SGPGI, Lucknow