E-Health in INDIA: Opportunities and Challenges.

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Abstract

E-Health, broadly defined as the use of Information and Communication Technology (ICT) in health, can make a world of difference in all developed and developing countries. Most notable attribute of e-Health is that it is enabling the transformation of the health system from one that is narrowly focused on curing diseases in hospitals by health professionals, to a system focused on keeping citizens healthy by providing them with information to take care of their health whenever the need arises, and wherever they may be. Hospitals and hospital associations need to be aware of, prepare for, and properly manage, this transformation. It will change, forever, the role of hospitals in the business of producing health. It will make them more efficient, improve quality and strengthen processes. But it will also remove them as the centre piece of the health-care system, and give hospitals a more forward-looking and progressive role.

Public health service run by Government is overburdened and collapsing. Large geographical size, increase population density, lack of transport, inaccessibility, illiteracy, poverty, poor nutritional status, low budget for health, lack of funds and coordination and diversity in food habit and life style are various challenges that have triggered down trend in health services.

The present paper discusses the challenges and opportunities in ICT implementation in health care specific to Indian scenario.

Keywords: Information and Communication Technology (ICT), e-Health, Public sector.

1. INTRODUCTION

India is a vast country of 1.4 billion population occupying an area of 3,287,268 sq. km. It consists of 29 states and 6 Union Territories governed by a federal system. It has been observed that there is a great deal of disparity in quality and access to healthcare between urban and rural regions.

E-health is a relatively recent term for healthcare practice which is supported by electronic processes and communication. Definition published by eHealth researcher Gunther Eysenbach in the article what is e-health? is among the most frequently cited and reads: "*ehealth is an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies.*"

Overburdened and collapsed public health care system is also taking ICT route [1] in various part of the country. Changing the dynamics of healthcare is the prime objective. Web services are essential for medical professionals, administrative members and patients to organize, share and access medical services. Improving health care involves not only improving the knowledge and skills of medical Professionals, but also empowering people with the knowledge needed to make informed decisions about how to live healthier [2]. ICT offers a plethora of alternatives to communicating important health messages to the public.

Objectives of the Study:

- To study the present status of health care system in India.
- To study the challenges faced by health care system in India.

- To study the potential of ICT and its implementation in health care system in India.

Research Methodology

This is a Conceptual paper based on secondary data collected from books, papers from national and International Journals and Conferences, government and private websites.

2. CURRENT E-HEALTH SCENARIO IN INDIA

The Indian health care services are highly skewed in favor of urban population which is 28% of Indian population. Nearly one million Indians die every year due to inadequate healthcare facilities and 700 million people have no access to specialist care and 80% of specialists live in urban areas [3].

There has been undue delay in implementing e-governance and e-healthcare in India due to following reasons

(1) Absence of competition in health sector for long time healthcare is handled by Public Health System (PHS) with no competition.

(2) Weak customer with low bargaining power.

(3) Non-existence of funding system like insurance or social security agency.

(4) Strong professional culture among doctors hostile to new ICT applications.

(5) Doctors and nurses believe on their skill than on computer.

(6) Lack of computer-aid in medical and nursing education.

The National Health Policy endorsed by the Parliament of India in 1983 and updated in 2002[4] encourage the introduction of electronic communication media in health sector.

The government of India has launched "National Rural Health Mission" aiming at equity in best health care to this target group. The Ministry of Health & Family Welfare and the Ministry of Communication and Information Technology (ICT) are jointly creating a national health information infrastructure, for easy capture

and dissemination of health information. There are more than 165 telemedicine platforms supported by the Indian Space Research Organization (ISRO) and 76 by Communication and IT Ministry. The Ministry of Health had formed "Telemedicine Task Force" to address many issues relating to e-health technology based healthcare which will facilitate in forming a framework for e-health application for the country. The union government also recognizes ICT as the most efficient enabling tool for achieving the said goals. This is having the desired trickle-down effect and several state governments have earnestly taken up e-Health monitoring and reporting systems for their public health programmes [5]. Disease surveillance systems under IDSP in Andhra Pradesh and Tamil Nadu, and ICDS surveillance system in Orissa are some examples of such initiatives. Public-private partnership has been successfully used to achieve a convergence of technical resources and personnel in the e-Health sector, for such projects. Funding and technical assistance has also been received from several external agencies such as the World Bank and WHO.

2.1 e-HEALTH AND TELEMEDICINE INITIATIVES IN INDIA

Evidence based clinical practice needs sufficient knowledge [6] on latest development in medical science. Automated information management tools like internet, web based libraries, Electronic Medical Record (EMR), Electronic Health records (EHR), and computerized prescriptions are important components. Computerization of hospitals Quality Assurance (QA) by Total Quality Management (TQM), medical and nursing audits supported by computerization of all processes like store, pharmacy, finance and purchase section, inventory and administrative machinery would save money, time and transcend human error. Computer help should be utilized for clinical decision making for selecting suitable tests, proper interpretation, and accuracy in diagnosis and update

management. Though computer can't be substitute for human brain, it is definitely useful as a neutral platform for unbiased analysis [7] to assist the physician against commission of error. Computer is highly useful for medical and nursing teaching, evaluation of entrance tests and various competitions for awards and certifications to eliminate human bias and error [8][9].

- Hospital Information System (HIS)

The majority of hospitals in the country are rooted in manual processes, which are difficult to access. The insurance sector demands more efficient information storage and retrieval. Automation alone can help hospitals to meet these challenges. Many sturdy, standard HIS solutions have been developed by the major IT companies e.g. Centre for Development of Advanced Computing (CDAC), Wipro, GE Healthcare, Tata Consultancy Services (TCS) and Siemens Information Systems Ltd (SISL). CDAC, an autonomous government IT organization developed the first total HIS software in collaboration with Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow in 1997. Wipro GE Healthcare cover the entire spectrum of the healthcare industry's needs including a HIS, Picture Archival Communication System (PACS) and telemedicine solutions.

- Tele-health Care Services

Healthcare is a state subject which follows a three tier system – primary health centers catering a group of villages, secondary level health care located at a district level and medical college hospitals constituting the tertiary level of healthcare located in big cities. Besides, there are few advanced medical institutes of national importance having clinical, teaching and research facilities in various super-specialties. In addition to the government run health system, same hierarchical healthcare service exists in the private sector too. Most of the

telemedicine platforms both in public and private health sector in the country are being launched as start up projects supported by the Indian Space Research Organisation (ISRO), Department of Information Technology (DIT), Ministry of Communication and IT and the Government of India in partnership with state governments. All the nodes are linked to multi specialty hospitals. Industries providing hardware and software supports are Apollo Telemedicine Network Foundation,[10] Hyderabad; Online Telemedicine Research Institute,[11] Ahmedabad; Televital India,[12] Bangalore, Vepro India,[13] Chennai and Centre for Development of Advanced Computing.[14] Telemedicine technology is getting familiar with healthcare providers in India. Some states have started adopting it but most of the applications are in project modes. It will take quite some time for the diffusion of this technology into a health delivery system.

Telemedicine is emerging Information and Communication enabled health technology which has the potential to facilitate access to healthcare in underprivileged population if adopted into existing healthcare delivery system.

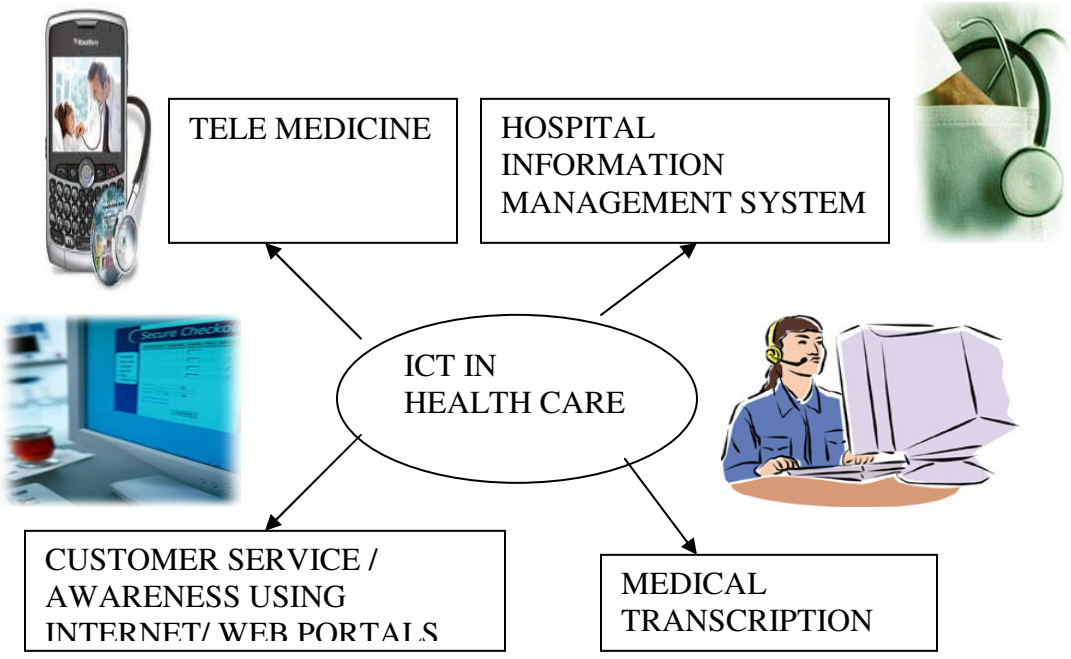

Fig 1. **Application of ICT in Health Care**

3. E-HEALTH CHALLENGES

India faces a number of challenges in the development of effective e-Health solutions like the inertia of traditional agendas, and ways of doing things. Divisions between health-professions, the public-private sectors, facilities, levels of government and cultural communities generally mitigate against large national inter-jurisdictional projects in the public sector, and new large-scale investments in the health sector. The technologies themselves, as well as their deployment, are challenging matters.

There are questions about how to properly automate the health-system, which technical standards are to be adopted, Is the current level of technology and technological sophistication of the providers and public sufficient to the task. Socioeconomic, cultural and geographic influences limit connectivity, performance and possibilities of Internet. Public and professional acceptance of the new technologies in the place of old ways -such as, keying up a live on-line Internet consultation instead of sitting in a waiting room- is essential. [15][16] Clearly, large financial and human resources must be invested in e-health to realize the full potential of the technology. Evidence suggests that e-Health is at least 10 years behind other information management intense sectors, such as banking. [17]

Areas of health informatics [18]

· Consumer informatics

· Medical and clinical informatics

- **Consumer informatics**

Consumer Informatics is the one commonly referred to as e-health and focuses communications to patients and the public about health topics. Consumer-to-

consumer (C-to-C) applications are potentially strong means of empowering individuals and the public. There are 25,000 to 30,000 health-oriented websites and they are among the most visited. There is an urgent need for all concerned, including politicians/lawmakers, health professionals and industry to put in place adequate standards and quality control for these websites.

- **Medical/Clinical informatics**

This category relates directly to health care structure, processes and outcomes. A main application is computer-based medical records, a sub-category of which is computer-based personal records that will facilitate access to low cost therapies, for example, with certain areas of mental health, such as depression.

Another sub-category is computer-based patient records that will facilitate clinical decision-making. These later records may be linked to knowledge-oriented systems that may contribute to quality control of clinical processes. Such a decision support has been demonstrated to improve outcomes. Computer- based population or community health records are usually anonym zed patient and/or personal records. These systems are particularly valuable in public health where one is trying to trace different types of health hazards, linked either to medical, environmental or social agents.

- **Telemedicine**

Telemedicine, meaning healthcare delivered by electronic means, has been on the road for over a century, if care provided by telegraph and telephone is considered. However, towards the end of the last century, this emerged as a delivery system with huge potential due to the information technology revolution, which made two-way, audio-visual transmission possible at reasonable cost. [19]. It has a long way to go before it can be effectively integrated into a healthcare delivery system. One crucial difficulty is that many telemedicine applications have yet to be

developed, evaluated and implemented in the hospital environment, before application of the system over longer distances.

- **Telehealth vs. E-health**

Although E-health is an outgrowth of telehealth, it is differentiated in several important ways. Telehealth has been largely non-Internet based and has been characterized by point-to-point and dial-up information exchange. E-health, on the other hand, is more accessible due to its increasingly affordable ability to communicate through a common set of standards and across operating systems. The increase in access has also led to an increase in the number of uses of the Internet for healthcare. These increases also lead to greater concerns for privacy, confidentiality [2].

4. CONCLUSION

ICT can support improvements in the quality of health care by helping to increase the qualifications and skills of health and medical professionals and thereby improve the delivery of health services. However, access to information may not be sufficient in and of itself. Health professionals need to gain an understanding of how to evaluate, interpret, and apply this information to their specific practice. ICT can also be instrumental in helping the public to become more informed about their health and how to be healthy, though until a greater percentage of the population is on-line and technologically literate, low-tech solutions are likely to be more effective. Finally, Information and Communication Technologies can play a powerful role in improving the efficiency of health services. Through computer-based records and other technological infrastructure-building, health care institutions can better manage and share information, thereby improving the efficiency of the health system as a whole.

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