E-HEALTHCARE IN INDIA: ADVANTAGES AND SCOPE

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ABSTRACT

As healthcare enterprises seek to move towards an integrated, sustainable healthcare delivery model an IT-enabled or e-Healthcare strategy is being increasingly adopted. In this study we identified the critical success factors influencing the effectiveness of an e-Healthcare strategy in India. The performance assessment criteria used to measure effectiveness were increasing rea and reducing cost of healthcare delivery. A survey of healthcare providers was conducted. Analytic Hierarchy Process (AHP) and Interpretive Structural Modeling (ISM) were the analytical tools used to determine the relative importance of the critical success factors in influencing effectiveness of e-Healthcare and their interplay with each other. To succeed in e-Healthcare initiatives the critical success factors that need to be in place are appropriate government policies, literacy levels, and telecommunications and power infrastructure in the country. The focus should not be on the IT tools and biomedical engineering technologies as is most often the case. Instead the nontechnology factors such as healthcare provider and consumer mindsets should be addressed to increase acceptance of, and enhance the effectiveness of, sustainable e-Healthcare services.

INTRODUCTION

E-Health refers to Electronic Health. It is the future of healthcare services in India. It uses IT Technology that results in innovation. Its major beneficiaries are the citizens of India. 25308 Health Care centers are there in India. The primary focus of the Health care centers is Infant immunization programs, Anti epidemic programs, Birth control, Pregnancy and Health Care.

By Adopting E-Health technologies we can reduce the overwhelming burden on hospitals [1]. It refers to digital services used in Healthcare. In the Figure 1 and the E-Health Data Revolution is being illustrated the use of E-Health in different sectors of Industry with their Sources, Stakeholders and Capabilities. The Sources of Health Data are of two types i.e. Standard and Expanded. In the Standard Sources the fields like Research, Public and Healthcare Services are there and in the Expanded Sources the fields like Environment, Lifestyle and Social fields are involved. The group of Stakeholders involves Individuals as well as groups, Health Services provided by the government Research in the field of Medicine and Innovation in the field of Healthcare Industry. In this Government also plays the major role. The Capabilities are of three types i.e. Policy, Technological and Analytical. Policy involves Principles, Aims, Tools, Governance and Ethics related to Healthcare Industry. Technological aspect of Health Data involves Generation, Storage, Curation, Extraction, Interoperability and Protection. Analytical aspect involves Visualization, Integration, Prediction, Modeling, Synthesis and Insight of the Health Data. The Organizations (W.H.O. & U.N.) across the world have inscribed E-Health as a replacement to address serious health problems in the developing nations [18-19]. The restrained accessibility of Laptops, Personal Computer (P.C.) and Internet is an area of major concern in developing countries. The citizens of developed country are more technology savvy as compared to the developing nations [9]. The barriers like Digital Divide (D.D.) have restricted the advantages that they could get from Latest Technology [20]. Different forms of E-Health exists namely Electronic Health-Related Records (E.H.R.) [4], Electronic Doctor Prescription (E-Prescription) [8]. Electronic Health Records maintains all the records of the hospital electronically. Computerized Physician Order Entry involves the entire inventory within the Organization. Electronic Prescribing helps the patients as well as doctor for seeing the Prescription online. Clinical Decision Support System involves taking clinical decisions online providing help to patients as well as doctors [7]. The latest technology in the field of Telemedicine is the use of Wi-Max for building Medical Applications [33], the use of Mobile and Cloud Computing to reduce the costs associated to the Healthcare Industry [34], the use of Authorization System to share the Health data with different Hospitals [35] and the use of Wireless Sensor Network (W.S.N.) in the Telemedicine Industry plays a vital role in bringing innovation to this field [37- 40]. Many Challenges were faced in implementing E-Healthcare centers online. Some of the challenges are as follows crisis of Human Resources, high expectation for excellent quality treatment at lower cost, financial crisis of funds and lack of knowledge [2]. The benefits of adopting E-health are as follows firstly the costs are saved,

time is spared and information is shared globally [11]. The Primary Healthcare Centers, Government Hospitals, Private Hospitals and Clinics all clubbed under a single objective of promoting Healthcare [5]. To achieve this objective all the doctors, surgeons and pharmaceuticals must join the initiative to provide world- class facility to the citizens. All the Health Data related to patient is strictly confidential and private so the concerned Security standards providing high level of security which helps in processing Health Data [3]. In Figure 1, The Participants are Government users, Patient users and Healthcare Experts.

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.

CURRENT E-HEALTH SCENARIO IN INDIA

The growth of a nation is not just about tallying its industrial, agricultural and services balance sheets. It is equally about tallying its performance on the human development indices. The state of its healthcare is one of the critical measures of how a nation state is performing. For a country the size of India, that is even more important. The Indian healthcare industry is all set to grow to over USD 280 billion by 2020, which is a growth of over ten times from 2005. This growth has been driven by several factors, including demographics, increase in awareness levels and availability of medical care in India.

Changing with the times

Conducive demographics: While the population growth rate for India has steadily gone down, it is still at over 1.3 percent and is not expected to go below one percent in the near future. Also, it is interesting to note that our population aged above 60 years is projected to grow to around 193 million, compared with over 96 million in 2010. This change in the population pyramid is expected to fuel the demand for healthcare in general, particularly lifestyle diseases. Rising affordability: In the past decade, India has witnessed a rapid increase in

levels of wealth and disposable incomes. Coupled with a better standard of living and health awareness, this has led to an increase in spending on healthcare and wellness. Increase in lifestyle diseases: Lifestyle-related diseases comprised 13 percent of total ailments in India, according to a 2008 data, and this number is expected to increase to 20 percent by 2018. This is expected to trigger an additional demand for specialised treatment, which in turn, will lead to increased margins for hospitals since these diseases lie at the high margin end of the spectrum. Health insurance and medical tourism: While out-of-pocket spending remains the mainstay of healthcare expenditure, health insurance is gaining momentum in India.The increasing penetration of health insurance is expected to significantly increase the affordability of healthcare services, driving up the demand for preventive healthcare and curative services. Medical tourism is also driving the healthcare market in India. The fact that the treatment for major surgeries in India costs approximately 20 percent of that in developed countries; coupled with the high quality of care in Indian tertiary and specialty hospitals makes medical tourism attractive for patients from developed as well as emerging economies.

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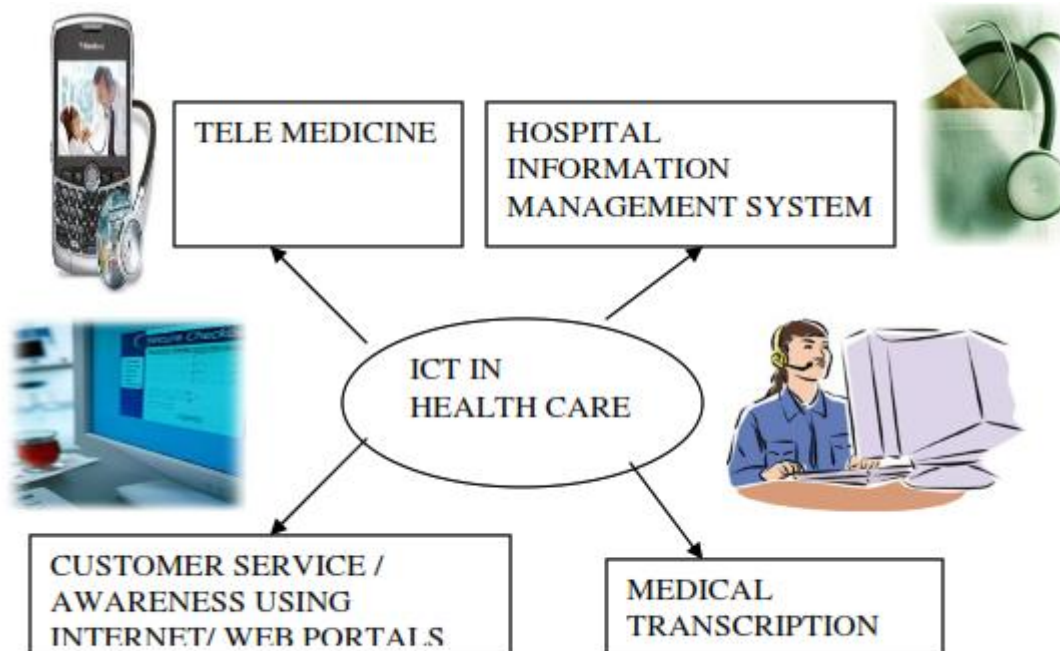
Fig 1. **Application of ICT in Health Care**

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.

Areas of health informatics

· 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 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

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• 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].

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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