

Intervention of IT in Indian health care system

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ABSTRACT

This paper is elaborating the benefit of Information Technology (IT) in the healthcare system. Discussing how the paradigm is shifting from traditional health care to telemedicine based health care system. Telemedicine is low cost and wide reach due to satellite or fibre optic bandwidth. It is fulfilling the gap of Urban-Rural divide causing disparity in medical facilities. Government can focus on healthcare for all in case of shortage of qualified medical professionals. Internet of Healthcare Thing (IoHT) is providing the disease management framework. It is enabling healthcare facilities in far-off regions. Information and Communications Technology (ICT) is developing new healthcare infrastructure.

Keywords: IT, IoHT, ICT, IoMT, IoT.

I. INTRODUCTION

India's population in 2021 is reaching to be 1.38 billion (138 Crores)[1]. This big data is creating the challenge to WHO theme of 2018 "Universal Health Coverage-Everyone, Everywhere.". 86% of rural population and 82% of urban population are not covered under any scheme of health expenditure support. Due to high out of pocket healthcare expenditure, about 7% population is pushed below the poverty threshold every year.[2], Thereafter impacting the delivery of healthcare services to systematically marginalized, socially disadvantaged and economically weaker sections [3]. Others challenge unequal distribution of health care resources to rural populations keeping far from physical accessibility of public or private healthcare facilities. In rural areas, to seek OPD treatment 32% of rural respondents had to travel over 5 kms, while 68% travelled less than 5 kms for the same[4]. Buzz of IT in healthcare is changing the paradigm of the health care sector. Therefore, it is fueling the advancement of the human health care system. And, it is unraveling the paths for research and development in this domain. Indeed, Technology is not changing life basic principles such as aging. But, it is making life easier and comfortable. Moreover, it is changing the paradigm from hospital-centric care to home-centric care. Indeed, it's minimizing the health care cost and maximizing the ease of patients.

II. LITERATURE REVIEW

Orientation of this subject is referring in cover image of the Radion News Magazine as coining the term "Radio Doctor". First application of telemedicine is found in scientific literature of project for transmission of radiologic images by telephone between West Chester and Philadelphia, Pennsylvania. In 1960 NASA used Telemedicine for monitoring astronaut health on space missions. First real-time applications started in 1970.

Project STARPAHC began Telemedicine in the rural Papago Indiana Reservation in Arizona[6]. Evolution of Telemedicine specialty specific applications started from 1980. Thereafter, Telepathology was developed in 1986. Growing speed of telemedicine project is fasting after 1990 due to invention of internet and affordable computers. In 1996. CDAC Noida developed the Hospital Information System and deployed it in SGPGIMS, Lucknow, U.P., India. In 1999 AIIMS, New Delhi, PGIMER Chandigarh and SGPGIMS Lucknow deployed indigenous technology based software. . In 2000 ISRO deployed SATCOM based Telemedicine ISRO at Apollo hospitals, Aragonda [7]. ATM Based Kiosk for Rural Healthcare and Portable Mobile Telemedicine Kiosk Yolo Health Kiosk Opened in India. World Health Partners & Melinda Gates Foundation is also contributing in this area. Lifeline Express is WiFi enabled, which helps doctors and experts sitting in metropolitan cities examine patient's diagnostic reports and other images. AmbuPod, a patent (pending) telemedicine enabled clinic and micro-Ambulance. Apollo Tele Health services is providing 24/7, quality, affordable, remote health care, to 34,000 citizens of Lahaul and Spiti (height of 14,000 feet in the Himalayas) in Himachal Pradesh. Collabdds Developed by NIC, Pilot Test funded by NKN & PAN India Expansion by MoH&FW PGIMER, Chandigarh & Clinton Foundation in association with Philips Healthcare & RAD-AID International. Srikiran Institute of Ophthalmology connect satellite clinics with the main hospital to treat ophthalmology patients from different districts where specialized care is not available. Teleradiology for Tripura Telerad in MoU with Govt. of Tripura. Began in Sep 2016. Common Service Center Scheme (CSC) is also providing telemedicine facility[8]. Many mobile based app such as Doctor on Demand, Amwell, MDLive, Talkspace Demand, Amwell, MDLive, Talkspace, Lemonaidhealth, Plush Care, LiveHealthOnline, Teladoc, BabylonHealth, Maple, HealthTap, Dialogue, FirstOpinion, SimpleContacts, Pager.Doxy.m

e,AMC Health,Express Care Virtual,K Health Primary Care,Cigna Telehealth Connection also providing the telehealth services[9].

III. ROLE OF IT IN HEALTH CARE:

Due to the invention of the IT based new devices which is the combination of sensors, software and hardware. It is shifting paradigm from health care to quantified health care.It is using sensor based medical devices for capturing the human health data. Thereafter, data is communication through wireless networking to health care IT systems[5] . Important role of Internet of thing in health care (IoHT) is following:

Saving diagnoses time of critical patient during emergency:

Diagnosis is time consuming decision making process by the clinical professional. Because, it required a vast amount of variety of data, Internet of Medical Thing (IoMT) based devices provides the accurate real time data quickly from the human body. And, this vast data goes through the internet to health IT systems. Health IT systems are embedded with analytical tools. Thereafter, analyzing the human health data in IT system. Doctor's predict the actual cause of the diseases through a data driven insight process in short time. Therefore, in case of emergency it reduces the diagnosis time of patient. So, it provides highly effective way to prevent and cure the patient from the emergency.

Easy access of Remote health care:

Due to IoT technology, Demographic barrier is not a constraint for human health care. Before IoT, the Healthcare system was hospital-centric, because for capturing the health data the patient must be in front of medical devices, so patients must visit the hospital for giving the health data. After IoT, the Healthcare system is home-centric; therefore patients need not to visit the hospital, because human health data can be accessed through the internet through IoT enabled medical devices from anywhere.

Curing chronic diseases:

IoT with machine learning is fostering human health care for research. Its impact can be seen by using robots for many incurable diseases, it is giving solutions to incurable diseases. To cure chronic diseases is a challenging task. Such as Brain surgical operation is a very risky task, because the tiny error can lose the patient's life. But this operation can be performed successfully by the Robot. On the other hand, Chronic diseases require the continuous monitoring of patients, so regular hospital visits are the primary condition for chronic diseases based patients. This is costlier, uncomfortable and unaffordable to most of the patients, But IoT provides the solution for continuous monitoring of patients.

Enhancing Drug Management

In critical situations a right drug is an important way to overcome from this situation, so different specialist doctors suggests the different drugs. In this context, Health care IoT enabled based IT systems recommend the parameter of drugs from previously trained machine learning data. Therefore, enhance the decision capability of clinical

professionals for choosing the appropriate drugs. On the other hand, Pharmaceutical companies are involved in fraud by producing the less efficacy drugs, and selling at high cost. Thereafter Health care services providers keep pharma manufacturing vigilance through IoT. Moreover, new trends are starting to develop edible IoT, smart pills [10].

Early Prevention care

The disease can be a disaster, if it is not prevented at an early stage. After the intervention of IoT many sensor based medical devices have developed. Such devices are following: Blood-glucose meter measures the glucose levels of patients. Electronic Stethoscopes securely deliver heart and lung sounds to a computer so that patients' vitals can be shared immediately with healthcare providers. Multi-use wand and corresponding cartridge increase the ways that patients can track their own health. With this smart medical device, patients can take their health into their own hands testing their nasal fluids, saliva and blood. IoT based Thermometer is an ear thermometer that communicates with a mobile app, wirelessly transmitting temperature data to a tablet or computer. For immediate medical attention, it can send the patient health information it collects directly to physicians. Cervical cancer screening tool that connects mobile colposcopes to cell phones, allowing clinicians to quickly take a cervical image that can also be sent out for a second opinion [11]. All devices improve the efficiency of health care delivery. And, provide the data for further preventive action. Therefore disease can be prevented at the starting stage.

IV. CONCLUSION

Intervention of IT in healthcare is fostering advancement in human care. Thereafter, It is projecting human health care towards Automation. A report by the Institute for Health Technology Transfor mation says, "Automation makes population health management feasible, scalable and sustainable". Automation is transforming the whole health care system. However, Impact of automation is in favor of patients, because it is cutting costs of services, improving efficiency, throughput and performance. And, It's reducing manual work, therefore it is labor saving. Moreover, Due to use of Data insights clinical professionals are able to take the right decision. Thereafter, accurate outcomes increased the patient's satisfaction. [12][13].

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