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Review Article

Digital Applications in Indian Health Care Services-A Review

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Abstract

Technology is widely used worldwide to deliver services to citizens in all domains, including health sector. The COVID-19 pandemic has driven every country to embrace digital transformation and reconsider current healthcare trends. In response to the emerging need for digitization of healthcare, Indian Government has designed and brought various health care applications into existence. The aim of these digital healthcare services is to address the issues of health quality, and affordability, and breaking accessibility barriers in the country's smaller cities and rural areas. Digital technology is adopted in big data analytics, Digital imaging, cyber security, telemedicine, Hospital information system, digital payments etc. Digital applications will provide numerous benefits to healthcare providers and citizens. They will facilitate the access of citizens to health services, regardless of their location or socio-economic status. There will be improved coordination between Government and healthcare providers, aiding to streamline the healthcare system, making it more efficient and reducing the administrative burden on healthcare providers. The use of digital applications will facilitate in availing accurate and comprehensive data on healthcare in India, which can be used to inform policy and improve healthcare outcomes. Government of India has been increasingly focusing on eHealth/Digital Health to bring about improvements in Indian public healthcare delivery by progressively using Information & Communication Technology under the overall objective of Digital India.

Keywords: Digital applications, Digital imaging, Cyber security, Telemedicine, Hospital information system, Digital payments.

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Technology is being used worldwide to deliver services to people in all domains, including health care. Digitization is rapidly increasing and is inevitably embraced in health sector across the world. The linkage of technology and health around the world has shown the potential to improve current models of delivery of care and steer them towards patient centricity and improve overall health outcomes.

World digital health services

A broad review of world best practices in digital health lends us clear understanding of how the countries globally, implementing health initiatives. The National Health service (NHS) of UK, one of the top ranked health service models, implemented digitization beginning with an NHS electronic care records that allows sharing of patient records with their permission. This streamlined the procedure for general physicians and other staff working in primary health care to fix appointments with doctors at hospitals, providing a system for electronic transmission of prescriptions, sharing of patient data and electronic referrals with higher centers.

Australia, can be stated as first country to develop population centric approach to implement My Health Record (MHR), country's repository of electronic health histories of patients, built with the aim of easing the patients journey to seek care. To stop fears of data violation and mistrust among public, MHR provided the choice to opt in and opt out as and when patients consider it appropriate at any point of time. This strategy provides important lesson for India where people personal data protection, consent and health data privacy are crucial issues.

Prescription Digital Therapeutics (PDTs) are a unique class of software applications in US that are designed to deliver evidence-based treatments—all through a patient's smartphone, tablet, or computer. These inventions represent a new therapeutic model across a range of disease states, making them a potentially useful complement to existing approaches to care. Unlike wellness apps, PDTs require a prescription from a licensed healthcare provider. By digitizing therapies, PDTs provide treatment in a standardized format, ensuring that every person who uses them receives the same quality and level of care.

Ministry of Health, South Korea also designed a tremendous master plan for National Healthcare Information and Communication Technology about twenty years ago. Healthcare Institutions in Korea have become increasingly digitized, with almost all hospitals implementing computerized order entry systems, patient management systems, electronic health record maintenance and insurance claim systems that use electronic data interchange, rendering better clinical decision support and access to healthcare. ICT implementation in Korean healthcare system provides important lessons for our country, which is currently focusing on digitization of health care system.

Post pandemic digital transformation of healthcare

Covid-19 pandemic posed numerous challenges for healthcare services worldwide, leading to largest social crises globally. Before pandemic, use of telemedicine, e-pharmacies etc. was very minimal. Even after Covid-19, 80% doctors in North, 50% in South and West and 35% in East India adopted some form of telemedicine. Patients as well as health service providers preferred traditional means of in-person engagement for healthcare delivery, but physical restrictions during lockdown led to increased demand for digital health solutions, highlighting the need for better incorporation of digital technologies in health care systems specifically in areas such as telemedicine, surveillance and remote clinical management.



Digitization initiatives of the central & state Governments

In order to improve efficiency in health care delivery, extend health care services to rural and remote areas across the country and to provide better quality at low-cost certain eHealth initiatives using ICT were undertaken by Ministry of Health and family welfare (MOHFW) across the country. This will also address the health human resource gap by efficient & optimum utilization of the existing human resource. Various activities covered under eHealth are National health Portal (NHP), e-office, telemedicine, Hospital Information system (HIS) and online health care services. Many of our states like Tamil Nadu, Kerala and Rajasthan have also launched digital health initiatives. Tamil Nadu is the first state to implement digital health program. In association with World Bank the state has developed Health Management Information System (HMIS) to streamline clinical, logistical and administrative processes.

Rajasthan incorporated digital initiatives in health sector way back in 2015. Health Information system for Government, Computerized Human Resource Information System, E-Mitra, ASHA Soft are some of the digital applications launched by the state. Kerala, as a part of digitization of health sector launched e-health Kerala scheme in 2017. It gives unique ID to each patient by linking comprehensive medical history of the patient.

CoWIN portal

Even amidst pandemic Government of India successfully developed and launched Covid Vaccine Intelligence Network (CoWIN) and Arogya Setu. Around a billion people with more than 1.78 billion doses have been registered in CoWIN portal. CoWIN certificate became a secure and trustworthy evidence for the citizens during their travel.

Arogya Setu

Arogya Setu is another digital application developed by the Ministry of Electronics and Information Technology to guide our nation's effort to contain Covid. The app records details of people whom a person meets during covid period. If any of them tests positive in later time, it immediately informs the person and alerts for medical intervention.

Mera Aspatal/ My Hospital (Patient Feedback System)

It is a mobile application that collects feedback from patients on their satisfaction regarding hospital services. It uses a multichannel approach like Short Message service (SMS), Out Bound Dialing (OBD), Web Portal and mobile application. A total of 11681 hospitals are covered under the scheme and 7838141 feedbacks were received. Out of them 6001978 are satisfied and 1836163 are dissatisfied feed backs. This provides a clear information to the health care providers about the gap to be fulfilled.

Ayushman Bharat Health Account (ABHA)

Ayushman Bharat Health Account is a voluntarily generated 14- digit identification number through self-registration. It works on linking and sharing of Personal Health Records (PHR). A person can access his health records from admission to treatment and discharge online. This helps to create digital health records of the people, giving doctors a clear understanding of the disease history and treatments undergone.



Health Professional Registry (HPR)

HPR is a database of all healthcare professionals who are involved in healthcare services. This includes doctors, nurses, paramedics and other healthcare providers. It is a citizen centric and practitioner centric platform that provides unique ID to the healthcare professionals and provides communication with stakeholders. This speeds up the presence of verified professionals who can facilitate telemedicine.

LaQshya

It is a portal launched to improve the quality of care in labor room and maternity operation theatres.

Pradhan Mantri Surakshit Mantritva Abhiyan (PMSMA)

Centre for Health Informatics (CHI) has developed PMSMA portal and created helpdesk. The program is aimed at providing quality antenatal care free of cost to all pregnant women.

National Health Portal (NHP)

NHP was set up by the Ministry of Health and Family welfare with the objective to provide single point access for authenticated health information for citizens, students, health care professionals and researchers. Time to time NHP is incorporating new initiatives in the form of voice web, mobile applications, mHealth, digital platform, digital media etc.

No More tension app

It is a mobile app launched by the central government with the aim to help to manage & reduce stress. This app provides information of how stress is caused, its effects on the body, how to identify and manage it. It helps the users to measure their stress levels and advises various controlling measures like meditation, Yoga etc. to lead a healthier life.

India fights Dengue app

This is a mobile app that helps the patient in case of dengue to find nearest hospital and blood bank information. It also educates the community for prevention of Dengue. A game, video, myths, FAQs etc. are incorporated to disseminate information about the disease.

Overcoming challenges & setbacks

The landscape of digital healthcare in India is a mixed bag of benefits and challenges. The challenges should not be underestimated. For instance, the absence of clear regulations and guidelines may lead to fraudulent practices, misuse of digital prescriptions, data theft, and misuse of electronic health records (EHR). Another roadblock to the digitalization of the healthcare system in India is the lack of digital infrastructure and skilled professionals. While digital upskilling and robust infrastructure can prove to be expensive trials, India has to take steps in this direction, besides overcoming data privacy and cybersecurity, to unlock its full potential in digital healthcare. In this direction, the 2023 Budget announcement of setting up 157 new nursing colleges is a welcome move.

The road ahead

Digital health is more of a necessity today, although driven by the unprecedented health crisis. Building India's digital health ecosystem will not only accelerate the development of digital health tools but also



make them available to both the general populace and private organizations. Seeing the health trends like AI and telemedicine that have emerged in the last year, the Indian healthcare system is projected to witness a massive spike in demand as well as supply of digital healthcare services.

Conclusion

Digital health system has huge potential of improving the healthcare delivery service and capable of changing the landscape of healthcare sector across the globe. Indian government has been increasingly focusing on e-Health/ digital health to improve public health care delivery by progressive usage of Information Communication Technology under the overall objective of Digital India.

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