E-Governance & Telemedicine

20.1 E-GOVERNANCE INITIATIVES

Overview

Ministry of Health & Family Welfare is promoting eHealth or Digital Health i.e. use of Information & Communication Technology initiatives in the direction of "reaching services to citizens" and "citizen empowerment through information dissemination" to bring about significant improvements in the public healthcare delivery.

The purpose of such initiatives is to:

• Ensure availability of services on wider scale,

• To provide health care services in remote & inaccessible areas through telemedicine,

• To address the health human resource gap by efficient and optimum utilization of the existing human resource,

• To improve patient safety by access to medical records and helps reduce healthcare cost,

• To monitor geographically dispersed tasks and effective MIS for meaningful field level interactions,

• To help in evidence based planning and decision making,

• To improve efficiency in imparting training and capacity building.

The broad programmes/activities covered under eHealth are as below:
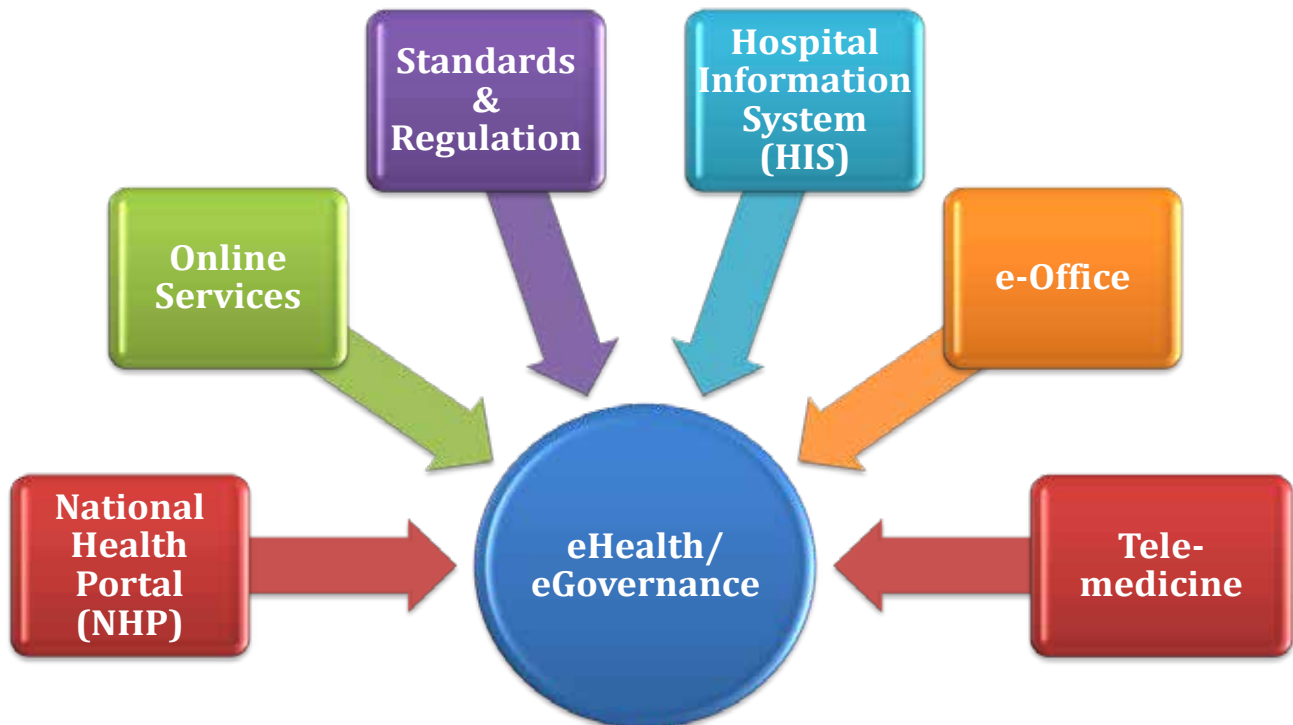
Progress and Achievements

There is a need to achieve convergence amongst various IT systems to provide services in a robust and efficient manner, to ensure efficient programme and service delivery and to provide timely response in the event of disease outbreak. Therefore, e-Health section has prepared plans to move towards a comprehensive, nationwide integrated e-Health system as opposed to the prevailing situation of isolated IT systems with little sharing of data or inter-operability of systems. The section is working on overall development of eHealth ecosystem to support growth and adoption of eHealth in the country by promoting Metadata & Data Standards, Electronic Health Record Standards, Inter-operability & Data Exchange Platform, Application Certification Programmes, Regulation of Data Security/Privacy/Confidentiality etc.

Given the integral role of technology in the healthcare delivery, National Health Policy-2017 envisaged extensive deployment of digital tools for improving the efficiency and outcome of the healthcare system. In addition, the policy intends to strengthen the health surveillance system and establish country-wide health information exchange network by 2025.

The Scheme of Telemedicine/eHealth has been augmented to "National Programme for strengthening of e-Health and Telemedicine Services" after 12th Plan period is over and made part of the umbrella scheme of "Tertiary Care Programmes" under NHM and includes primarily following projects:

➢ Integrated Health Information platform for interoperable EHRs,

➢ National Resource Centre of EHR Standards,

➢ National Medical College Network for Telemedicine,

➢ National Health Portal (by Centre for Health Informatics),

➢ Setting up of National Digital Health Authority of India,

➢ National Health Helpline: Doctor on Call.

MoHFW undertook various activities/ tasks during 2017 towards its aim of implementing e-Health in an integrated manner across central and state levels. These activities/tasks are described as below:

Interoperable Electronic Health Records

Ministry of Health & FW has envisaged establishing a system for interoperable Electronic Health Records (EHRs) of citizens to be created, made available and accessible online to facilitate continuity of care, better affordability and better health outcome and better decision support system. Following initiatives have been undertaken:

A. **EHR Standards:** The EHR Standards notified in December 2016 include standards for Disease Classification, Medicine and Clinical terminology, Laboratory Data exchange, Digital Imaging and Communication etc. for semantic interoperability. So far, total 35 sets of standards have been notified and development of certification scheme for EHR Standards compliance is underway/being pilot tested.

B. **Metadata & Data Standards (MDDS):** To enable semantic interoperability among healthcare applications, MDDS standards were developed following the guidelines of Ministry of Electronics and Information Technology (MeitY) and open standards policies of GOI. The MDDS standards has more than 1000 data elements to be used in healthcare applications and are aligned with the global health IT standards. The approved standards submitted to MDDS central committee for notification.

C. **National Identification Number (NIN) to Health Facilities in India:** The main objective of NIN to Health Facilities in India is to facilitate interoperability and information exchange between different health IT systems. NIN has been assigned to more than 2 lakh public facilities to be used as unique identifier in IT systems. Enrolment of private facilities in NIN Portal is underway.

D. **Hospital Information System (HIS):** HIS is being implemented for computerised registration and capturing EHR/EMR of patients in Public Health facilities upto PHC level. This will also facilitate workflow management leading to better delivery of

services to patients and improvement in efficiency of processes in these facilities. So far, financial assistance provided to 14 States/UTs for implementation of HIS application implementation viz. eHospital (NIC), e-Sushrut (C-DAC Noida).

E. **Integrated Health Information Platform (IHIP):** Integrated Health Information Platform (IHIP) is planned to avoid the situation of health data getting trapped in multiple silos and to enable Electronic Health Records (EHRs) of citizens to be created, made available and accessible nationwide through Health Information Exchange (HIE) by:

- Ensuring rationalization of treatment and avoidance of duplication of investigations.

- Aiding improved clinicians' decision-making by providing access to patient health record information when they need it. EHR streamlines the clinician's workflow, cuts delays, plugs gaps in care and helps in reducing medical errors.

- Bringing efficiency and improve professionalism in service delivery and ultimately strengthening the health care system.

- Making available useful macro information on health for policy makers.

RFP process for selection of SI for design, development & implementation of IHIP has been initiated and the first phase of implementation is expected to be rolled out in July, 2018.

F. **Personal Health Record Management System (PHRMS)** provides a single online personal medical record storage platform to citizens of India to enable them to manage their own medical records in a centralized way, which greatly facilitates storage, access and sharing of personal health data.

PHRMS can be accessed from anywhere, anytime by the patients and also by physicians, thus increasing flexibility of a patient to visit any doctor without carrying the burden of physical files, benefiting both the citizens and the physicians. Further:

a) It helps in recovering medical records which might be lost in physical form.

b) The data stored in a standardized format can be used for data analytics to understand disease trend etc.

c) Reduces medical error and improves patient compliance.

d) Helps patient in taking second opinion and provides emergency medical records for unconscious/unattended patients.

National Digital Health Authority (NDHA)

National Digital Health Authority has been envisaged to be set-up as a statutory body for promotion, adoption & regulation of e-Health standards and also to function as nodal national body for strategic initiatives in e-Health. It is proposed to be set up through legislation (Act of Parliament) with the following vision/goals:

a) To guide the adoption and regulation of e-Health standards and e-Health solutions at various

levels and areas in the country in a manner so that meaningful aggregation of health and governance data and storage/exchange of electronic health records happens at various levels in a cost-effective manner,

b) To facilitate integration of multiple health IT systems through health information exchanges,

c) To oversee orderly evolution of State-wide and Nation-wide Electronic Health Record Store/ Exchange System that ensures that security, confidentiality and privacy of patient data is maintained and continuity of care is ensured.
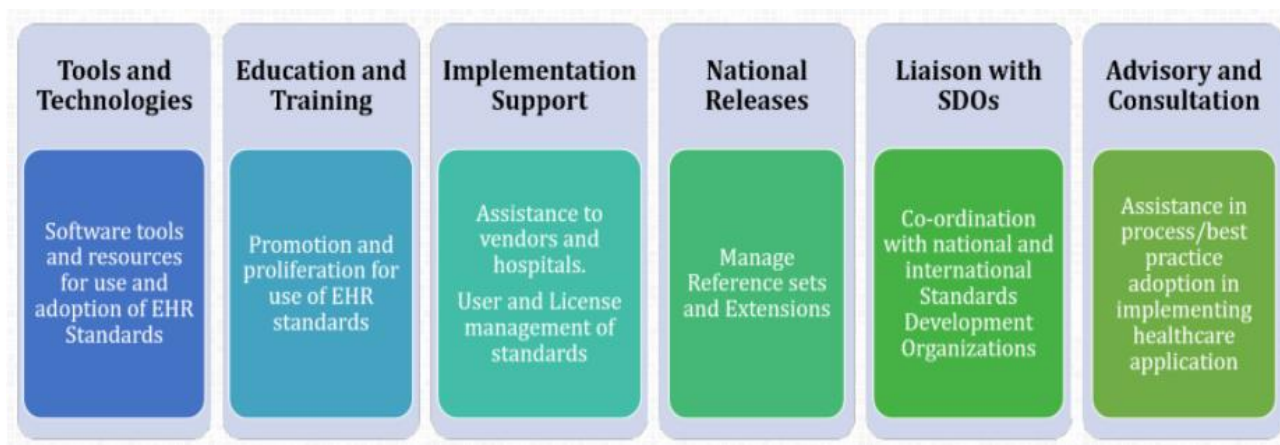
Ministry with support of National Law School, Bengaluru has prepared draft National Digital Health Authority Act which will take care of health data privacy and security issues. This Act will be put into public domain for wider consultations before being sent to Legislative Department for review.

National Resource Centre for EHR Standards (NRCeS)

MoHFW has established a Centre of Excellence for EHR standards viz. National Resource Centre for EHR Standards (NRCeS) at C-DAC, Pune to accelerate and promote adoption of EHR standards in India. NRCeS is a single point of contact for assistance in developing, implementing and using EHR standards in India. NRCeS provides the knowledge base for EHR Standards and associated resources and facilitates acceptance of and adherence to EHR standards.

NRCeS offers different services to facilitate adoption of the entire set of notified EHR Standards for India in healthcare applications.

Tools and Technologies	Education and Training	Implementation Support	National Releases	Liaison with SDOs	Advisory and Consultation
Software tools and resources for use and adoption of EHR Standards	Promotion and proliferation for use of EHR standards	Assistance to vendors and hospitals. User and License management of standards	Manage Reference sets and Extensions	Co-ordination with national and international Standards Development Organizations	Assistance in process/best practice adoption in implementing healthcare application

Progress so far

➢ SNOMED CT Affiliate Licenses issued to more than 60 stakeholders.

➢ New NRCeS website (http://www.nrces.in) launched to disseminate knowledge and information about notified EHR Standards and related resources and software tools.

➢ Developed Drug Information Repository portal to collect and curate information. SNOMED CT National Drug Extension covering a number of codes for tablets and capsules with oral dose form was released for use in medical software.

➢ Provides implementation support to hardware/ software manufacturers and public/private hospitals.

➢ Facilitates e-Learning courses operated by Standard Development Organizations (SDOs).

➢ NRCeS released free and open-source Software Development Kits (software function libraries) to ease incorporation of notified standards.

Training & Workshop

➢ A number of workshops and trainings have been conducted across the country. Till date (since 2014 including previous programme) 10 Workshops, 28 Training programmes and 8 Lectures were conducted and 2786 people have

been trained or sensitized regarding standards.

➢ NRCeS represented India in various meetings of IHTSDO General Assembly, Member Forum, Advisory Groups during April, 2017 to October, 2017 SNOMED International Business Meetings.

SNOMED International Business Meeting, October, 2017

Online Services

The eHealth section has also been entrusted with the task of Implementation of IT-enabled services/applications in select key areas covering Government-to-Citizen (G2C), Government-to-Business (G2B) and Government-to-Government (G2G) domains of governance so as to improve efficiency and efficacy of service delivery and management of internal business processes, including use of Telemedicine.

MoHFW has also integrated 40 Health services at the Government Services Portal of India (https://services.india.gov.in/) which is developed with an objective to enable a single window access to services being provided by the various Indian Government entities. It is designed and developed by National Informatics Centre (NIC), Ministry of Electronics & Information Technology, Government of India.

These activities/tasks are following:

A.   Online Registration System (ORS): Online Registration System (ORS) for public hospitals, launched in July, 2015, has been able to bring about a significant change in the patient registration and appointment system and as a result patients now don't need to wait at hospitals for taking appointments.

More than 120 hospitals are currently using ORS application out of which more than 80 hospitals came on board this year including 7 All India Institute of Medical Sciences (AIIMS), most of the Central Government hospitals and many State Government hospitals.

B.   Mera Aspatal (Patient Feedback System): 'Mera Aspataal' (My Hospital) is an IT based feedback system launched in August, 2016. A multi-channel approach is used to collect information on level of patient's satisfaction i.e. Short Message Service (SMS), Outbound Dialing (OBD), Web Portal and Mobile Application. The application automatically contacts the patient (out-patient after the closure of the OPD and the in-patient at the time of discharge) using the above information to collect information on level of patient satisfaction.

Progress so far

➢ Available in seven different languages. The application provides almost real time analysis of data and meaningful insights to analyze the performance at different levels i.e. from facilities to national level.

➢ Helps the Government and the participating institutions to develop action plans based on the feedback leading to improved patient experience and quality of care.

➢ Currently, more than 900 hospitals are covered in 23 States/UTs. So far more than 10 lakh feedbacks have been received out of which 76% reported satisfaction with the service.

National Health Helpline (Doctor on Call)

To bridge the knowledge gap between Patients and doctors regarding diseases conditions, health care services and to increase the health posture of the patient and the country, MoHFW is already working to rollout similar but enhanced services through **"Doctor on Call" (DoC)**, initially with 500 seats on 24x7x365 basis. This initiative focuses on harnessing the high number of mobile phones currently being used by almost every household in the India to create a tool to get free consultation by a qualified doctor on the phone based on standardized and uniform code that too 'for free' to all citizens.

Currently, Health Helplines are running in 11 States in the form as 104. Keeping variable services offered in mind, DoC will provide additional services as provided by States running it. The architecture of DoC will be designed in such a way that it will seamlessly integrate with existing running locations.

Centre for Health Informatics

The Centre for Health Informatics (CHI) has been mandated the task of implementing e-Health Projects of MoHFW for improving health literacy and healthcare system across the country. CHI has under taken several new initiatives in order to guide and support India's journey in eHealth/eGovernance and consequent realization of benefits of ICT intervention in Health sector. A brief illustration of CHI's ongoing and upcoming activities is as under:

Portal / Websites

➢ **National Health Portal (NHP)** (www.nhp.gov.in) was set up with the objectives to improve health literacy, improve access to health services, decrease burden of diseases through awareness and to provide as a single point of access for consolidated healthcare related information to the citizens of India. NHP is continuously adopting various new initiatives in the form of *voice-web, mobile applications, mHealth, digital platform, digital media* etc. for dissemination of authentic health information.

➢ **PMSMA** portal developed for supporting the Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) programme. Under this, free Antenatal Care is provided to pregnant women with the voluntary participation of Private Doctors on 9th of every month across the country. CHI has developed and is managing the portal/mobile application/help desk to facilitate PMSMA programme.

> **'Hum Do' Website** launched for Family Planning division on 11th July, 2017 (www.humdo.nhp.gov.in) is designed, developed by the CHI. It aims to provide information and guidance on family planning method.

'Hum Do' Website

a. Mobile Applications

No More Tension	NHP Indradhanush	NHP Swasth Bharat
India Fights Dengue	NHP Directory Services	PMSMA

Creation of Umbrella App to bring all Mobile Apps in single platform is underway.

b. mHealth Initiatives

> **mCessation (Tobacco)/mDiabetes):** Ministry of Health & Family Welfare, in partnership with World Health Organization started mCessation (Tobacco)/mDiabetes programme in 2016 utilizing mobile technology for tobacco cessation in India.

> **MeraAspataal (मेरा अस्पताल) Mobile Application:** To capture patient feedback on the services received from both public and empaneled private health facilities.

> **NHP Voice Web:** Users need to dial 1800-180-1104 from their telephone to access the NHP voice web. This system does not require any internet connectivity or a Smart phone.

c. NHP Health Information Kiosks have been installed in 17 Hospitals for dissemination of authentic health related information to the citizens through the touch screen based Kiosks.

d. Social Media: Undertaken social media publicity campaign on healthcare, health education and various other initiatives through Twitter and Facebook for generating awareness on Health.

e. Central Dashboard: is being developed for monitoring of key indicators related to different health programmes of the Ministry. Dashboard system collects data from existing public health information systems (i.e. HMIS, IDSP, MCTS, Nikshay, etc.). The Dashboard system will also help in analyzing/measuring progress on newer healthcare initiatives of MoHFW.

f. Other Dashboards: The dashboard for the other division viz. PMSSY, Medical Education and National Health Policy, 2017 has also been developed and made functional.

Online Consultation- Telemedicine

I.   National Medical College Network (NMCN)

National Medical College Network (NMCN) project is being implemented to interlink all medical colleges of the country with high speed optic fiber backbone from National Knowledge Network (NKN). The prime objective of the project is to create a standard and cohesive environment for medical education to meet the rising demands of medical community spread across the Public Health institutions of the nation by deployment of advanced information and communication technology systems for tele-education, knowledge sharing, Continuous Medical Education (CME) and capacity building for Doctors, medical experts and Citizens.

e-classroom at 50 Medical Colleges is being setup to facilitate Distance Learning and Education using High Definition Video conferencing systems based setup with Audio and Visual Control system and other accessories using high speed NKN Network. The facilities under this project comprise of virtual classroom, lecture and educational content sharing, remote participation, skill sharing and open online courses etc. It will enable researchers and students from different backgrounds and diverse geographies to work closely in critical and emerging areas.

Live Web Streaming of Medical Lectures in Tele-medicine Portal can be seen at: __*http://nmcn.in/webcast.php.*__

II.   State Tele-Medicine Network (STN)

State Telemedicine Network (STN) initiatives was approved with the vision to provide Telemedicine Services to the remote areas by upgrading existing Government Healthcare Facilities (MC, DH, SDH, PHC and CHC) in States. Challenges faced in the present healthcare system viz. lack of specialist and inaccessibility of doctors in rural areas, is addressed by use of information technology in delivering healthcare services. It is based on *'Hub and Spoke Model'* of service where selected PHCs will be the spokes and a hub of doctors (Residents/MBBS doctors) will be created to give the first line of consultation followed by connecting patients to specialist or referring them to hospitals for diseases the doctors scope.

The States/UTs are being supported under National Health Mission (NHM) under Programme Implementation Plan (PIP). Ten States have been financially supported for strengthening State Telemedicine initiatives under STN in the last two years. To create reliable, ubiquitous and high speed network backbone, all available and future network technologies such as NKN, NOFN, SATCOM (satellite communication) and terrestrial high speed internet is utilized. A Sustainable Operating Model will be created by State Government.

III.   SATCOM based Tele-Medicine Nodes at Pilgrim places

In line with the Honorable PM's vision, setting up of new Tele-medicine Nodes at Pilgrimage places has been envisaged using Space Technology Tools for tele-medicine facility between identified remote health facility and specialty hospital in collaboration with Department of Space. This service provides for health awareness, screening of non-communicable disease (NCD) and specialty consultation to the devotees visiting these places. Currently the active sites are:

➢ Kashi Vishwanath Temple, Varanasi, Uttar Pradesh;

➢ Maa Vindhyavasini Mandir, Vindhyachal Dham, Mirzapur (UP);

➢ Sheshnag, Amarnath Pilgrimage (J&K); and

➢ Pampa Hospital, Ayyappa Temple at Sabrimala in Kerala.

Currently the identified patient nodes are proposed to be interlinked with specialist nodes in their respective State. However, the tele-consultation can be obtained from any of the super-specialty nodes setup across the country such as PGIMER (Chandigarh), SGPGI (Lucknow), AIIMS (Delhi), JIPMER (Puducherry) etc.

IV. JIPMER BIMSTEC–Strengthening Regional Healthcare: In an effort to provide better access to health care facilities in the developing nations,

especially in the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) region, the JIPMER-BIMSTEC Telemedicine Network was inaugurated on 13th July, 2017. The aim of JIPMER-BIMSTEC Telemedicine Network is to improve regional cooperation in the field of health care by strengthening telemedicine-based patient care services and share medical knowledge among BIMSTEC Countries.

V. TELE-EVIDENCE: Tele-evidence, a modality via which doctors can testify in the judicial process utilizing the video conferencing facility without visiting the courts. The project is operational in PGIMER, Chandigarh since March 2014 and more than 4,000 Summon Cases have been attended till date. The tele-evidence facility streamlines the process of doctors appearing in courts in response to summons and saving their time not only for patient care but also for medical education and research.

National Resource Centre for Telemedicine: Sanjay Gandhi Post Graduate Institute of Medical Sciences (SGPGI), Lucknow

The National Resource Centre (NRC) for Telemedicine has been established at Sanjay Gandhi Post Graduate Institute of Medical Sciences (SGPGI), Lucknow. It functions as Central Hub/National Resource Centre for development of nationwide network linking of all the Government medical colleges, Universities, Central/State and autonomous medical institutes under Centrally Sponsored Scheme on National Medical College Network (NMCN). The facilities created under the centre are being utilized to meet Tele-education, Tele-Consultation, e-learning and professional development demands of students,

teachers and healthcare professionals across the country with high speed optic fiber backbone from National Knowledge Network (NKN). The NRC is networked with Seven Regional HUBs, Regional Resource Centers (RRCs) located at different regions of the country which in turn will be networked with Medical Colleges in that region. Standard Operating Procedures (SOP) for operation of NMCN have been formulated by NRC. Real time streaming and web casting of medical lectures, workshops, conferences are performed and hosted at National Tele-medicine web portal from NRC.

NRC & RRCs

➢ NRC cum Central RRC -SGPGIMS, Lucknow

➢ RRC, North - PGIMER, Chandigarh

➢ RRC-Central - AIIMS, New Delhi

➢ RRC-South - JIPMER, Puducherry

➢ RRC-East -IMS, BHU, Varanasi

➢ RRC-West - KEM, Mumbai

➢ RRC-North East- NEIGRIHMS, Shillong

➢ RRC-South II- SCTIMST, Thiruvananthapuram

Following Facilities have been created at this centre:

a) State of the art Digital lecture theater integrated 3D projection system.

b) Tele-Medical Video collaborative environment (Virtual Tumor Board) for cancer patient management.

c) Centralized Multipoint Control Unit (MCU) integrated with gatekeeper facilities.

d) Centralized web casting / streaming solution.

Websites

I. **CMF based MoHFW Website:** In view of standardization and improvement in presentation and content delivery of various Ministries websites under GoI, MoHFW Website (http://mohfw.nic.in/) launched on 26th May, 2017 as per new Content Management Framework (CMF) and all the content migrated from old website to new Website.

II. **Cloud Hosting:** Cloud computing is changing the way, Government manages its ICT services. Cloud as a means of provisioning ICT infrastructure provides setups that are cost effective, agile and sustainable to ensure rapid deployment and delivery of services. In order to utilize and harness the benefits of Cloud Computing, more than 40 applications/ Websites have been migrated from local servers to *"GI Cloud" ('MeghRaj')*.

III. **GIGW compliance for websites:** Government of India Guidelines for Websites (GIGW) is for setting a minimum benchmark for all Government websites to fulfill the needs of all citizens, including those with different abilities, such as audio-visual impairments, information & services are rendered in a manner that allows access by all. The work was undertaken to make all websites compliant to GIGW and more than 20 websites under DoHFW are made GIGW compliant.

IV. **Security Audit of Web site (WSSA):** WSSA examines website pages, applications and web servers to find security weaknesses and vulnerabilities that would give hackers an opportunity to do damage. The security audits of all GIGW compliant websites have been completed successfully.

Office Automation

A. **e-Office:** In recognition of the long-felt need for efficiency in Government processes and service delivery mechanisms, MoHFW has started implementation of e-Office for significantly improving the operational efficiency of the Government by transitioning to a "Less Paper Office", to reduce processing delays and to establish transparency and accountability. MoHFW has shown its complete commitment towards implementation of e-Office and around 50,000 e-files have been created. Support for digitization of old physical file, hand holding support to the staff, allocation of DSCs/ e-Sign and bug fixing have been provided by this section.

B. **Video Conference facility:** To increase the efficiency of the officers and speeding up office procedure and also to make work more collaborative and for anytime availability of officials to discuss important matters irrespective of geographical locations, software based video conferencing system has been implemented. All the Officers in Ministry of Health & Family Welfare are using this Video Conferencing application. This facility has also been extended for State Principal Secretaries (H&FW) and Mission Directors of NHM.

Digital Payments

The Digital India programme is a flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy. "Faceless, Paperless, Cashless" is one of professed role of Digital India.

Promotion of digital payments has been accorded highest priority by the Government and is one of the key highlights of the Union Budget 2017-2018. Accordingly, a pan-India target of total 2,500 crore digital transactions through five payment modes namely UPl, USSD, Aadhaar Pay, IMPS and Debit cards.

➤ **91 crore digital transactions - FY 2017-18 allocated for health sector**

• Centre + State/UT

• Public + Private sectors

Progress so far

➤ Webpage for promotion of Digital Payment to facilitate all States/UTs in providing latest updates and other necessary information like IEC material links of various web & mobile applications, videos etc. created by MoHFW.

➤ Web-based MIS Portal created for reporting and monitoring the progress of Digital Payments in States/UTs and Central Government Hospitals.

➤ Geography wise and category wise digital transaction targets allocated among States/UTs and Central Government Hospitals.

➤ Issued various advisories to different stakeholders including States & UTs to enable all customer touch points with Digital Payment acceptance infrastructure and incentivisation.

➤ 9 sensitization workshops cum consultations organized by Ministry to promote Digital Payments. Consultations also held with private sector associations such as IMA, All India Organisation of Chemists & Druggists (AIOCD) etc. for promotion of digital payments.