
VAJIRAM & RAVI

EMPOWERING CITIZENS THROUGH E-SERVICES

- The Digital India Programme was launched in 2015 for ensuring digital access, digital inclusion, bridging the digital divide and digital empowerment.
- It is leading to India's transformation in to a **knowledge based economy and digitally empowered society**. It has ensured citizen participation and empowerment with the technology that is sustainable.
- India is among the top countries that have digital adoption momentum. Presently, digital transformation of India is on an exponential growth path and **aiming towards a trillion dollar digital economy by 2025**.
- Government is taking strategic steps to realize the trillion Dollar digital economy potential.

Strategic Steps Taken by Govt. to Realise Trillion-Dollar Economy Potential

- **Aadhaar** has provided a **cradle to grave digital identity**. **Aadhaar enabled Digi Locker** is enabling paperless governance by providing public documents to citizens digitally and facilitating **consent-based data sharing for availing services**.
- **Aadhaar Enabled payment system (AEPS)** facilitates banking services and digital payment.
- Aadhaar is the largest **de-duplication mechanism** for government schemes in the country.
- The coverage of Aadhaar (123crore), Jan Dhan Yojana (36 crore) and mobile connections (118 crore) has moulded the digital profile of India.
- **Jan Dhan Yojana** has provided financial inclusion to unbanked people and thereby, it has enabled banking, pension (PMSBY and PMJJBY) and insurance (Atal Pension Yojana) services to common citizens. Mobile has also accelerated the accessibility of government services in rural hinterland.
- Digital delivery of services has been strengthened with the help of **Common Services Centres (CACs)**. It provides digital access to over 350 services especially in rural areas at an affordable cost.
- These centres have also **led to empowerment of marginalized sections** of the society by creating jobs for over 12 lakh people and by promoting rural entrepreneurs including women VLEs.
- CSCs have also undertaken **Stree Swabhiman initiative** to create awareness about menstrual health and have set up over 204 sanitary pad units.
- Digital India has resulted into a **remarkable shift** from **project based approach to platform based approach**.

Some of the important citizen centric initiatives of Digital India programme are:

A. DIRECT BENEFIT TRANSFER

- Enables transfer of government benefits directly to the bank account of beneficiaries.
- Led to the **integration of 440 schemes** and the disbursement of INR 7, 33,981 crore, **resulting in saving of INR 1, 41,677 crore**.
- The number of transaction for financial year 2019-20 alone, stands at 21 crore.

B. DIGI LOCKER

- Enables paperless governance by providing private space on public cloud to citizens for storing their public and private documents.
- 352+ crore documents are available at DigiLocker.
- 200+ Types of documents are available

C. UMANG

- Provides one mobile app for **availing government services** through backend integration with several government applications and database.
- 362 Services are made available from 73 departments and 18 States

D. E-HOSPITAL

- Facilitates automation in hospitals through 20+modules of Hospitals Management Information System, namely patient registration, IPD Pharmacy, Blood bank, etc.
- 322 hospitals are integrated with e-hospital

E. e-NAM

- Integrated 585 Agriculral Mndis across 16 sates and 2 union territories

F. SWAYAM

- A massive online open courses (MOOCs) platform, it offers more than 2000+progeramme categories.
- Allows credits to students on the completion of course. The credit is recognized by Universities.

G. National Scholarship Portal

- Provides facility of multiple scholarship schemes through a single online portal and includes application submission from students, verification by School Administration, approval by authorities and disbursal through DBT.
- 20 scholarship schemes stand integrated.

H. PMGDISHA

- Padhan Mantri Gramin Digital Saksharta Abhiyan has been started with an aim to make **at least one persons per family digitally literate**.
- Target is to train 6 crore persons in rural areas.

I. India BPO Scheme

- A unique initiative to incentivize BPO employment in smaller towns (Tier 2/3 towns) that cover 108 cities and approved 276 units.

J. GeM

- An ecommerce platform for public procurement of common use goods and services
- For the first time, many sellers from small towns are participating in public procurement due to end-to-end automation.

K. Digital Payment

- Many innovative digital payment tools, namely BHIM-UPI, BHIM-Aadhaar, BHARAT QR Code, National Electronic Toll Collection etc., have been implemented

L. Jeevan Pramaan

- Facilities pensioners to submit their life certificate digitally from anywhere, anytime basis.

M. Courts Mission Mode Project

- Promotes automation in Courts including Supreme Court, High Court, District Courts Complexes
- Several services like case status. Cause list, court order, caveat search, etc.
- **National Judicial Data Grid** is also implemented which analyses the data gathered from all integrated courts and shows all India figures through dashboard.

N. My Gov

- Facilitates participatory governance in the country by providing a common digital platform where citizens can share their views on government programmes and schemes.

Statistics

- As per the data from **Electronics Transaction Aggregation and Analysis Layer (eTAAL)**, the portfolio of electronic services has grown to 3,702 and an *average number of electronic transactions on a daily basis (till April 2019) is around 9.5 crore.*
- This signifies that the benefits of Digital India have percolated down to a large section of the society.
- The BPO movement for smaller towns is facilitating balanced job opportunities. As of now 222 BPO units cities and 27 States and UTs.
- Under the Digital India programme, India has witnessed a steep growth in mobile manufacturing units. From just 2 units of mobile phones manufacturing in 2014, 268 units of mobile phone and accessories are now operational in India.

Restructuring of Digital India

- Digital India is getting restructured and revamped to raise its bar and in this direction, several new and innovative schemes have been planned.
- Some of the major planned initiatives are **India Enterprise Architecture (IndEA)**, **National Programme on Artificial Intelligence, open API platform**, On Click consent driven address change in all public databases, **Meity Startup Hub** and GIS based decision support system for Districts, etc.,
- **IndEA** aims to offer one government experience by establishing the best-in-class architectural governance, processes and practices with optional utilization of ICT infrastructure and applications.
- A **National Software Product Mission** is planned to implement **National policy on software products-2019** that inter-alia includes nurturing 10,000 technology startups in software products industry and upskillings of 1,000,000 IT professionals.
- **National programme on AI** has been designed with priority mission areas, namely Healthcare, Agriculture, Education, smart cities, Transportation, Cyber security energy, finance and Indian Languages.
- This programme will be implemented in a **hub and spoke model**, wherein the proposed **National Centre on Artificial Intelligence** will act as the hub and Centres of Excellence (CoEs) along with startups will act as spokes. CoEs will facilitate startups industry and deployment of AI based solutions and will aid Research and Academic institutions in the applied research.
- **Meity Startups Hub (MSH)** has been set-up under the aegis of ministry of Electronics and IT to promote technology innovation, startups and creation of Intellectual Properties.
- MSH will become a **one-stop solution for all technology startups** in the country. It will also facilitate **Technology Incubation and Development of Entrepreneurs (TIDE 2.0)** that includes coverage of 51 incubators and 20000 tech startups.
- MeitY has recently released “**INDIA TRILLION DOLLAR DIGITAL OPPORTUNITY**” report to boost the scale, scope and digital innovation of citizen centric services which can result in a quantum jump in digital contribution to the Indian economy USD 1 Trillion by 2025. **Nine specific areas** have been identified for **government intervention**.
- These are: i) *Doubling farmers’ income*; ii) *Make in digital India, make for India, Make for world*; iii) *Jobs and skills for the future*; iv) *21st century IT infrastructure & software capabilities*; v) *e-Governance*

of the future; vi) Healthcare for all; vii) Quality education for the future; viii) Energy for all; ix) Next-generation financial services

Conclusion

- India's resonance towards digital technologies has now moved from the corridors of the empowered society and providing substantive benefits to the common masses, thus demonstrating the power of technology.
- Govt is embracing changing landscape of technology & is committed to ensure state-of-the-art technology enabled citizen, welfare of society and for socio-economic development of the country.

DIGITAL INFRASTRUCTURE: CORE OF GOVERNANCE

- **National Informatics Centre**, an attached office of ministry of electronics &IT, has been closely working with government in provisioning state of the art infrastructure. Digital Infrastructure for government was further strengthened through a number of initiatives taken under the **National e-Governance Plan**.
- Key components of digital infrastructure for government are:

A. PAN INDIA NETWORK

1. **NICNET** - the *pan India communication network* for exclusive use of government has continuously evolved since 1980s. Today it connects government offices across the length and breadth of India. NICNET is at the base of all government communications right from Government to Government, Government to Citizen as well as Government to Business communication.
2. **NATIONAL KNOWLEDGE NETWORK (NKN)** is another important initiative which provides multigigabit nationwide network connected through 10G backbone. It also extends high-speed *connectivity to leading research and academic institutions* of the Country. NKN is steadily evolving as the national education research network (NREN) of India.

- B. **DATA CENTRES: A Host to e-Governance Applications:** Realizing the importance of Data Centres, National Informatics Centre (NIC) has **established large data centers at Delhi, Hyderabad, Bhubaneswar and Pune**. Mini data centers are also operational in all NIC state centers to cater to the state level.

Hosting support is being provided from Data Centers and National Cloud for approximately 10,000 various critical e-governance projects, viz. E-procurement, Public Financial Monitoring System (CPSMS), e-Lekha, e-panchayat, Aadhaar Enabled Biometric Attendance System (AEBAS), etc. To accelerate the delivery of convenient.

C. Command and Control Centre

- There was a need to setup a specialized center to provide nationwide view for ICT infrastructure for effective monitoring and management and also to ensure **availability of all critical services**.
- **Command and Control Centre** have been set up at **NIC Headquarters** which has increased the agility of NIC's ICT infrastructure.

D. National Cloud (MeghRaj)

- Govt of India initiated a Government Cloud initiative titled "MeghRaj" in 2014. Setting up a secured cloud infrastructure has reduced considerable amount of time in provisioning of digital infrastructure.
- Various Government initiatives and schemes, such as Swatch Bharat Mission, My-Gov, e-Hospital, National Scholarship, e-Transport etc., have been successfully launched due to a robust and agile cloud infrastructure.

E. Geospatial Technology

- Geographical Information System (GIS) have improved the accessibility of various e-Governance services by offering location based access.
- Bharat Maps is a multi-layered GIS platform/web services comprising of seamless country wide bases maps aligned as per the global geo spatial standards.
- GIS is helping MGNREGA workers to get information about availability of works in the near locations, work site location information, real time transparent attendance and payments information.
- At the same time, it is benefiting the citizens by enabling geo portal for MGNREGA assets, which will enhance the concurrent social audit by citizens and facilitates feedback information on current status of work, quality validation, etc.

F. Direct Benefit Transfer (DBT)

- **Public Finance Management System (PFMS)** electronically interfaces with all banks and given a holistic view of the overall flow of funds in the Government, thereby eliminating delay and increasing transparency.
- With the advent of technology and Direct Benefit Transfer (DBT) coming up a paradigm shift has been experienced in the way benefits are transferred to the citizens.

G. Email Services

- As part of the mandate under the Digital India Programmed, the Government provided a secure email service to all for official communication.
- Further, to improve citizen engagement, SMS Service was launched encoring real time updates to users.

H. Video Conferencing

NIC has been offering Video Conferencing services since 1995 for connecting and bringing administration close to each other. Video Conferencing is now extensively used at all levels of government.

I. Cyber Security

- To address ever increasing threat of cyber-attacks in terms of their magnitude as well as their sophistication, **Computer Emergency Response Team (NIC-CERT)** group has been constituted with an objective of analyzing, monitoring and responding to cyber threats on critical government cyber infrastructure, like websites, emails and various services.
- NIC-CERT works in close guidance of CERT-In, which is the national nodal agency for responding to computer security incidents as and when they occur.

J .Digital Platforms

- Availability of cloud infrastructure in Government has given rise to launch of number of digital platforms at National level (**One Nation One Platform**).
- With a stable, reliable and best in class digital infrastructure, the government of India along with NIC and other key stakeholders have successfully set-up various services such as e-Office, e-Transport, e-Hospital to name a few.
- New citizen focused initiatives like mobile-based traffic enforcement solution through e-challan, mobile extension for service in the form of Parivahan app are innovations emerging from such platforms.
- **e-Way Bill** system has been a key lever in the success of Good and service tax(GST) implementation.

- For rural development, the government has harnessed technology for implementing various ICT application in various programs such as Pradhan Mantri Aawaas Yojana- Gramin (PMAY-G), National Social Assistance Program (NSAP), Deen Dayal Upadhyay Grameen Kaushalya Yojana (DDUGKY), etc.

Way Forward

- In line with the approach of embracing new technologies areas such as Artificial Intelligence, IOT, 5G, Edge computing, etc., have been identified.
- Initiatives have been undertaken to establish Centres of Excellence for Data Analytics, Block Chain, Artificial Intelligence, etc. to ensure that the Government infrastructure is future ready in terms of technology adoption and its applicability in various initiatives.

TRACKING SCHEMES THROUGH GIS

The use of geographic information system (GIS) as a decision support system for development planning is a **critical component of e-Kranti pillar** under the digital India programme.

NCoG

- To leverage GIS under digital India, Ministry of Electronics and Information Technology (MeitY) had launched **National Centre of Geo-informatics (NCoG)** in December 2015.
- NCoG platform is aimed as a **single source GIS platform** for sharing, collaboration, location-based analytics and as a decision support system, catering to the central and the state government departments across the country.

Potential of GIS

- GIS has the potential for **enabling good governance through effective and efficient monitoring of schemes**; proactive *identification of gaps in the implementation* of schemes /programmes; and efficient allocation/management of resources.
- This has been reflected in various key projects including Government Land Information System, Mining Surveillance System, GIS platform for Aspirational Districts, Water Resources, Industrial Information System and Social Benefits Management System.

Way Forward

- The NCoG platform has been working on other important projects including Government Land Information System, National Mission for Cultural Mapping, School Information System, Solid Waste Disposal and Management System, Internal Management System for Security Agencies and Rashtriya Bal Swasthya Karyakaram (RBSK) among many others.
- In addition, the govt is also working on leveraging and integrating emerging technologies such as Blockchain, AI, machine learning, internet of things (IoT), Big data analytics with GIS to give further boost to development planning, foster citizen-centric service delivery and good governance.

DIGITAL EMPOWERMENT THROUGH 'MAXIMUM GOVERNANCE, MINIMUM GOVERNMENT'

- According to the Report of the Ministry of Electronics & IT, **India's trillion dollar digital opportunity**, India has witnessed the **second fastest growth rate of digital adoption** out of 17 countries of the world over the period of 2014-17.

- The story of India's digital transformation is one of an ICT –led development by use of technology that is affordable, inclusive and transformative.
- Digital empowerment through 'Maximum Governance, Minimum Government' is not a mere slogan. Instead, it is a **conscious strategy toward ushering reforms** in governance and transforming India, making governance simple, fast, flexible and effective by application of innovation and technology. This also leads to participative governance, a key element of a responsible democracy.

Protection of Data In Era of Digital Empowerment

- In order to ensure growth of the digital economy while keeping personal data of citizens secure and protected, the government is working towards formulation of **Personal Data Protection Framework**.
- The **National Policy on Software Products** has also been formulated that envisages creation of robust Indian software product development ecosystem ,thereby enabling IP driven holistic growth of the IT industry .
- The policy aims to develop India as the global software product hub, driven by innovation, improved commercialization, sustainable intellectual property (IP), promoting technology startups and specialized skill sets.
- It also aims at alignment with other government initiatives, such as, Start-up India, Make in India and Digital India, Skill India etc. so as to create Indian software products industry of USD-70-80 billion with direct and indirect employment of ~3.5 million by 2025.
- The **National Policy on Electronics, 2019** aims to further promote domestic manufacturing promote domestic manufacturing and **export to achieve a turnover of approx. rs.26 lakh crore by 2025**.

Conclusion

Having built a strong foundation of digital infrastructure and vastly expanded digital access and outreach, India is now poised for a robust growth of digital technologies in all sectors of the economy that will lead to creation of up to \$1 trillion of economy value from the digital economy in 2025

LESS CASH INDIA: VISION TO REALITY

This dominance of cash in Indian society has been primarily due three reasons:-

1. Lack of payment acceptance infrastructure
2. Bank accounts perceived as account for saving rather than accounts for payments by a majority of the population.
3. Cash based payments seem to be zero cost and hassle-free as cost of cash is distributed and invisible.

Statistics

- Till November 2016, only 15 lakh merchants had been enabled with PoS by over 40 banks. This meant that only 2.5% of India's 6 crore merchants had an option of receiving payments through cards.
- This changed dramatically with the **advent of QR code based payments**. Today, there are over 1.2 crore merchants having QR code who give an option to their customers, to pay through their wallet or bank account. The QR code based payment have been attractive to merchants as it **does not have traditional costs associated with PoS terminals-** *cost of PoS terminal, cost of maintaining internet, maintenance of PoS terminal, high MDR* etc.
- India has over 100 crore-bank accounts with over 90 crore-debit cards. The number of customers using bank accounts for digital payments is less than 5 crore. Many people find payment through bank accounts cumbersome and/ or risky.

- The **advent of UPI** has simplified use of bank accounts for payments for people who are comfortable to pay directly from their bank accounts.

Cash vs Digital Payment

- Cash has an inherent benefit of being universally accepted and instantly usable. However there is a **cost of cash in the form of expensive cash management infrastructure**.
- Transitioning to digital payments will lead to significant reduction in costs due to inefficiencies associated with cash. Further **cash is anonymous** and leaves no trace visible in the system. On the other hand, Digital payment leaves a footprints across the ecosystem and is traceable.
- In P2M (person to merchants) digital payments there is a **central neutral party** which **facilitates arbitration** and provides a **channel for dispute resolution** with merchants. On the other hand, cash is a **bilateral transaction between a customer and a merchant**.
- In addition while on-boarding merchants on digital payment platform **due diligence is undertaken** as per the requirements of the Indian Government. This greatly removes fraud /spurious merchants.

Towards Financial Inclusion

- Government of India envisions financial inclusion of all sections of the society.
- The **four key elements** of financial inclusion are: **payments, credit, investments and insurance**; and technology (Jan dhan, aadhaar, mobile) has ushered a digital revolution ensuring that marginalized sections of the society are also brought into financial mainstream.
- In order to promote security of online transaction Indian Government has mandated use of *2 factor authentication* for all payment methods. The 2 factors authentication essential involves a customer to "know something" like his username and password as well as "have something" like OTP received on mobile phone.
- With regard to security of digital transaction there are two aspects: one is the **technology aspect** and the other is **financial literacy** of users. With emerging technologies such as Artificial Intelligence and Machine Learning it has become safer to do digital payments.
- With regard to financial literacy, the Indian Government has undertaken several campaigns in this regard.

Way Forward

- While discussing digital payments, **user privacy** is of paramount importance. The banking and financial services industry is eagerly awaiting the passage of **Personal Data Protection Bill**.
- This Bill sets out how the personal data of individuals is processed by the Government and private entities incorporated in India and abroad.
- The Supreme Court of India while delivering its judgement on the constitutional validity of Aadhaar on 26th September 2018, also asked the Government of India to bring in a robust law for data protection at the earliest.
- The Indian Government should encourage innovation in digital payments. There should be a push for increasing digital payments acceptance infrastructure.
- The entities in the digital payments space should be given freedom to enable merchants to accept digital payments in whatever way they deem fit.

Conclusion

- The key to propagating digital payments is to ensure trust in the system both from the customer as well as the merchant.

- The banking and financial services industry under the guidance of the Indian Government has taken several measures to build trust and a lot more needs to be done.

LEVERAGING TECHNOLOGY FOR TRANSFORMING EDUCATION

- An integral pillar of growth is leveraging technology to leapfrog development by focusing on three pillars: **improved connectivity and access, focused skilling and capacity building and sustainable innovation.**
- With the country strategically investing in digital transforming, building a strong demographics dividend that reaches the remotest corners of our vast country is an important pivot.

Achievement In Education

- India has made stride in **universalizing primary education** - ensuring improvement in both enrolment and completion rates of primary and elementary school. Along with budgetary commitments to education, Path-breaking initiatives such as **NITI Aayog's Atal Innovation Mission** have made a dent on the learning culture.
- **Tinkering labs** have not only put inquisitiveness at the heart of the learning process but have also **democratized access to technology** for the larger good.
- From directing CSR funds to supporting diverse initiatives focused on developing future ready workforce, education is perhaps the sector with maximum multi-modal investment. A lot has been done- but there still are many miles to traverse.

- Following are the instances where Technology can help:

1. providing Access and Bridging the Divide

- Well-meaning revolutions in form of content, videos, MOOCs have proliferated the education segment regardless of social construct. However, while **providing content on fingertips is the first step** and it alone **cannot be an effective and sustainable** solution.
- To become a knowledge economy, we must embrace creation of knowledge and content, and not just consume it passively. It is important or both students and teachers to play a active role in creating ingenious content.
- ICT is also helping classrooms to evolve from being isolated block by expanding the scope for collaboration and communication between students, teachers and administration from different geographies.
- Digital pedagogies are also injecting values necessary for developing emotional and intelligence by building skills and competencies,

2. Capacity Building of Teachers

- It is important to not just equip teachers with ICT device and knowledge but also to handhold she/he through the journey of being productive in an ICT enabled classroom. Initiative like upskilling of teachers through common service centers are strategically well aligned with this vision.
- Teachers with the help of technology are discovering more efficient and innovative ways of teaching. They also get empowered with tailored assessment tool for enhanced monitoring and evaluation.

3. Need to adapt to varying needs

- The size of the school, existing infrastructure, and rural urban divide create a perceptible difference in a school's maturity and ICT readiness. We need to be cognizant of varying needs of these types of schools and many more in the middle of this spectrum.

- MAIT, an apex industry body, proposed an **EduVision Maturity Model** to suit needs of schools across five levels, where level 1 schools need the most basic tech-enabled infrastructure and level 5 schools that are already ICT matured but need to invest on applications and use of emerging technologies.

Conclusion:

- Fostering innovation and the **spirit to unlearn and relearn** is at the **heart of the digital transformation** that should be aimed for. For this, the entire ecosystem of education will have to be considered: students, teachers, administrations, and policy makers are all important parts of this equation.
- Also, to embrace the change, investing in **building critical thinking ability and capacity** will be most important.

Ready Employability skilling Program for ITI Student

- Student across all the ITIs in India can **access the digital learning module** via the **Bharat skills portal**.
- Directorate General of Training (DGT), under the aegis of the Ministry of Skill Development and Entrepreneurship, has joined hands with two big private sector companies- Cisco and Accenture, to **skill youth for the digital economy through its Industrial Training Institutes (ITIs)**.
- The program includes tailor-made curriculum with modules for digital literacy, career readiness, employability skills and advanced technology skills such as data analytics, and a blended model enabled by a combination of online self-learning via the Bharat Skills portal and in-classroom modules.

E-SERVICES FOR THE DIFFERENT ABLED

- Digital transformation has facilitated ease of accessing products and services for all citizens whereas **citizens with disability are empowered** to access various products/services with ease.
- World is home to billion people with disability and more than 100million citizens with disability reside in India.

Assistive Technology

- Citizens with disability use assistive technology to access various mode of ICT channels. Blind or visually impaired citizen would use **screen reader** which would provide audio output of operating system.
- Non-visual display access (NVDA), an open source screen reading software, is now available in 7 India languages.
- **Avaz, another invention from India**, is an **alternative and augmentative communication device**.
- It works by generating speech from limited muscle movements like that from the head or by the hand, and is used by people with speech disorders such as cerebral palsy, autism, intellectual disability, and aphasia.
- **Kabi**, is an app for **speech impaired children** which assists them for quick communication with the external world by selecting pictograph image on their hand held Android devices.
- Blee watch is a smart watch especially designed for the needs of hearing impaired citizens.

Government Initiatives

- Government of India has launched an **accessible India campaign** with an objective of achieving complete accessible physical infrastructure, transport system and ICT echo system.
- **DAISY Forum of India** is a consortium of Not for Profit organizations from India who are involved in production and distribution of books and reading material in accessible formats for persons who cannot read normal print.
- DAISY forum of India (DFI) in collaboration with Government of India has launched **Sugamya Pustakalaya**, an online library of digital books in accessible format for print impaired citizens.
- **Marrakesh VIP Treaty** facilitate **Access to Published Worked to Visually Impaired Persons** and persons with Print Disabilities. The Treaty permits for copyright exceptions to facilitate the creation of accessible versions of books and other copyrighted worked for visually impaired persons and those with print disabilities. India was the **first country to ratify the treaty** on 24 July 2014.
- **Ministry of Urban Development** has issued a notification mandating that all cities within Smart City Mission project have to ensure that **their ICT is digitally accessible**, enabling citizens with disability to avail Government services with ease.
- **Dial 112 mobile app**, initiative undertaken by Government of Chhattisgarh, enabling citizens of Chhattisgarh to report emergency by dialing 112.
- Recent passage of the revised **Person With Disability Act (RPWD) 2016** further stresses on **digital inclusion within digital India** mandate conformance to international accessible standard for all international accessible standard for all government e-Services.
- **Section 42 of this Act** requires the appropriate government to ensure that all content in audio, print and electronic formats are accessible.

Conclusion:

- Access to web, mobile apps etc. are the basic rights of every citizen and inclusive e-Services facilitate citizens with disability to avail these rights and bridge the growing digital divide.
- Instead of creating dedicated solutions for citizens with disability within the cyber space, the **aim should be to create a Universal Design offering access to all**, including citizens with disability.
- The design of products should be made user friendly for all regardless of sex, age, situation or disability and to the greatest extent possible, without the need for adaption or specialized design.

ICT ENABLED FARM CENTRIC AGRICULTURE SERVICES

- Many national level programmes, viz Digital India, Make in India, Skill India, Startup India and Stand-Up India have faced operational difficulties for its impact at farm level and farmer level, and that too at small and marginal farmers level.
- The Indian agriculture system is confronted with its own sheer complexity, *inadequate factors of production, weather uncertainties, multiplicity of schemes and multiplicity of institutions*, at farm level, and hence there is no size neutral solution possible.
- **Digital network for farmers** (DNF) - AGRISNET, AGMAKNET, FISHNET, APHNET, FETNET etc. was viewed as a strength, wealth and prosperity of farming household in India.

Bridging the Gaps in Human Resources Development

- In India, there are about 263 million people (54.6 percent) engaged in the agriculture sector and over 50 per cent of them are agriculture labourers.

- 90 per cent of current jobs in agriculture are **skill based** where only about **6 per cent of work force has received vocational training**. There is thus a pronounced **"skill gap" both in terms of quality and quantity**.
- The existing farm extension system needs to be broad-based problem oriented, to help farmers overcome their **"point of no return" difficulties**.
- **ATMA and KVK** are the two eyes of the present extension system which further require a **"third eye"** for problem resolution, may be **ICT enabled Agriculture polytechnics** for bridging the emerging gaps in development of human resources for farm level functionaries.
- **E-Governance and agriculture informatics** is the pathway for development 2.0 in food and agriculture in India. This requires an institutional approach by creating **National Centre for IT in Agriculture (NCITA)**, State Centres for IT in agriculture (SCITAs), District Centres of IT in Agriculture (DCITs), and Block Centres for IT in agriculture (BCITA) to convert **"agricultural information" into a "commodity" for use**.
- The **National Digital Communication Policy 2018**, under its mission 2022, has envisaged (a) **Connect India**- BharatNet, GramNet, NagarNet and Jan WiFi infrastructure (b) **Propel India** through services based on 5G, AI, Blockchain, IOT, Cloud Computing and big data analytics, and (c) **Secure India** ensuring sovereignty, safety and security of digital communications.

Digitalized Farm Centric Services: e-agriculture

- Various studies have brought out challenges faced by the farming community with respect to :-
 - (a) citizen charter,
 - (b) Investment & Risk management,
 - (c) Technology solution - Authentication, Accessibility, availability and affordability,
 - (d) Capacity building & competency development, and
 - (e) Information security issues.
- It was also highlighted the need for Agri StartUps in
 - (a) Farm management services,
 - (b) e-commerce services, and
 - (c) Government Schemes O & M which are spread across the entire Agri value system.
- In order to boost farmer's income, India requires to adopt strategic intervention of ICT in Farming System Life Cycle, through a robust **National Level Farmers Database**. Digitalization in Farming system aims at **farm as 'economic unit', household (farmer) as "social unit," and land as "environmental unit"**.
- The convergence of various sectoral programmes / schemes of agricultural and rural development is essential at village level.
- Both agricultural and rural development officers, working at block level, are not yet professionally trained to operationalise **"Integrated Landuse Planning for Sustainable Agricultural and Rural Development"** at grassroots level.
- the ministry of finance has made the mandatory use of **Public Finance Management System (PFMS)** for all center sector schemes, so as to ensure that the benefits of the various government schemes reach to the last mile, and also to know the actual status of utilization of funds by the multiple implementing agencies of the central and the state governments.

Way Forward

- a) Setting up of a National Centre for IT in Agriculture (NCITA).
- b) Operationalisation of the DFI-2022 (**Doubling Farmers' Income by 2022**) Digital Technology Mission Mode project,
- c) Creation of **National Database** on 13 crore farmers.
- d) Strengthening the operational Digital Network for Farmers (DNF) - AGRISNET, AGMARKNET, HORTNET, APHNET, FISHNET, FERTNET etc.
- e) Steps to operationalize NeGP-AMMP projects which have been in cold storage for a long time.
- f) Steps to dedicate BharatNet for farmers.
- g) Creation of a farmer welfare portal in 22 constitutionally recognized language, for proactively dealing with their grievances redressed.
- h) Agricultural informatics programme at M.TECH, B.TECH and P.G. Level to attract rural youth into S&T based farming methods.

DEVELOPMENT OF METRO RAILS IN INDIA**Level of Urbanization in India:**

- As per Census 2011, more than 31 per cent of the population was living in urban areas. This is expected to grow to over 40 per cent i.e. nearly 60 crore in 2031 and 50 per cent, leading to over 80 crore by 2051. At present 65 per cent of country's GDP comes from urban areas and it is likely to grow over 75 per cent by 2030.

Impact on transportation

- As a result of the rapid urbanization, the transport in urban areas has been largely **hegemonized by private motor vehicles**.
- This rapid growth of personal vehicles has **adversely impacted the share of Public Transport**. This has led to **proliferation of informal operators**, such as private minibus and microbus services in many cities.
- This has resulted into **increased congestion, pollution, road accidents, energy consumption and travel time** in our cities.
- As per a study by Boston Consulting Group (BCG), the impact of traffic congestion (in peak hour in the four metropolitan cities of Delhi, Mumbai, Kolkata and Chennai) to the economy is Rs 1.47 lakh crores annually.

National Urban Transport 2006

- Government of India formulated the **National Urban Transport Policy (NUTP) in 2006**. The vision of this policy is to recognize that people occupy center stage in our cities and all plans should be people centric.
- The focus of the policy is to **address the movement of people and goods and not the vehicles**, so as to make our cities loveable and enable them to become the "engines of economic growth" that power India's development in the 21st century.
- The **objective of this policy** is to ensure safe, affordable, quick, comfortable, reliable and sustainable access for the growing number of city residents to jobs, education, health, recreation and such other needs within cities.

Existing Metro Rail Systems in India

- In accordance with the objectives of NUTP, among other solutions, **Mass Rapid Transit Systems** have been implemented across the country.
- The first metro rail started its commercial services in Kolkata in 1984. It continued to be the only metro system in the country till Delhi Metro commenced operations.
- The success of Delhi Metro inspired other big cities to follow suit and in October 2011 Bangalore Metro started operations.
- More than 800 km of Metro Rail and 82 km of Regional Rapid Rail Transit Systems (RRTS) are under various stage of construction at present.
- The **Delhi- Meerut RRTS corridor** is being developed as fast and reliable transit system with high transportation capacity. This is being done for the first time in the country.

Challenges of Existing metro systems

1. Metro Rail is a **capital intensive** system
2. The technology available is **not standardized**, resulting in higher costs of construction and operations.
3. Lack of **last-mile connectivity**
4. **Parking lots and roads** leading to many stations poorly lit.
5. **Non-availability of demand forecasts** for metro rail projects in the country.

Addressing the Challenge

For addressing the challenges being faced by the metro system, the following initiatives have been taken by government of India:

A. Metro Rail policy, 2017

- The focus is on systematic planning and implementation of metro rail systems that act as a guide to the state governments for preparing comprehensive proposals for metro rail projects.

B. Value Capture Financing

- Mass Transit Systems across the globe are **not financially sustainable on fare box revenue** alone and are dependent on alternate sources of funding.
- The **Value Capture Finance (VCF) Policy Framework, 2017** identifies tools such as transferable development rights (TDRs), betterment levy, and fee for changing land use, vacant land tax and land pooling system etc. as sources of financing infrastructure projects.
- The Metro Rail Policy prescribes adoption of VCF and transfer of financial benefits accruing in metro influence zone to the metro company.

C. Standardization of Metro Components

- In order to promote 'Make in India', in 2017 the Department of Promotion of Industry and Internal Trade (DPIIT) issued **Public Procurement (Preference to Make in India) Order** to encourage such initiatives.
- The aim is to **increase minimum local content in rolling stock, telecom and Signaling to 50 per cent by 2023** in a phased manner. Directions have been issued to all metro rail corporations that minimum 75 per cent of the tendered quantity of rolling stock should be manufactured indigenous.
- In order to promote indigenization and reduction in cost, the specifications of various metro rail components have been standardized.

D. Transit Oriented Development (TOD)

- Government of India issued **National TOD Policy, 2017** with the objective to **integrate land use and transport planning** to develop compact and inclusive growth cities within the influence zone of 500-800m. This will promote public transport usage and achieve reduction in the private vehicle ownership.

E. National Common Mobility Card

- MoHUA initiated the **National Common Mobility Card (NCMC) program** to enable seamless travel by metro rails and other transport systems across the country besides retail shopping and purchases.
- NCMC is an Open Loop Card, which means customer may use the same card for travel across the country. This would allow fast development of digital payments due to standardized implementation process and will enable rapid digital penetration.
- Card was launched across the country by Prime Minister on 4th march, 2019.
- The **metro entry and exit gates** which form an important component of the metro automatic fare collection (AFC) system has been the mainstay of few foreign companies. **Baharat Electronics Ltd (BEL)** in collaboration with C-DAC has now successfully designed and manufactured metro gate indigenously.
- This breakthrough will not only bring down the cost of the AFC systems and enable interoperability in account of open loop standard but will boost India's self reliance in technology and export.
- Prime Minister had launched the indigenously developed AFC named '**Swagat**' on 4th march 2019.

F. Setting up of Unified Metropolitan Transport Authority(UMTA)

- Urban transport in cities are **managed and implemented by different agencies** who generally work independently with little synergy between them.
- There is thus a need for an umbrella organization like UMTA that monitors ,integrates and coordinates various aspects related to urban transport like route ,time tables, fare inter-modal integration etc.in this city. Draft UMTA bill have been formulated by MoHUA and shared with states UTs.

G. Multimodal Integration

- The National Urban Transport Policy, 2006, recommends **multimodal integration** as the most critical requirement in creation of seamless public transport services.

Future of Metro Systems in the Country

- Currently metro systems are governed by The Metro Railways (Construction of Works) Act, 1978 and The Metro Railways (Operation & Maintenance) Act, 2002.
- However, in view of the Metro Rail Policy, 2017 a **new Metro Rail (Construction. Operation & Maintenance) Bill** is under preparation, which combines the provisions of existing two Metro Acts.
- This unified Act will **enable Private participation** in metro rail, and delegation of **greater powers** to The State Governments and Metro Rail Administration (MRA).
- The proposed Act envisages to have an **independent permanent Metro Rail Fare Regularity Authority** for timely revision of metro rail fares.
- **I-Metros (Indian Metro Rail Organization's Society)**, an association of Indian metro rails has been launched in March 2018, as a platform to exchange ideas, pooling of knowledge and sharing of experience.

- It will enable adoption of the latest technologies and improving performance and passenger experience enhancement in future through resonance of each other's strengths.

e-Health Services

The central government has undertaken various initiatives using ICT for improving efficiency and effectiveness of the public healthcare system.

A. National health portal

- With an objective to create awareness amongst citizens about health, government programmes & services in health sector, it provides information to citizens and stakeholder in different languages.

B. e-hospital

- e-hospital @NIC a **hospital management system** is a workflow based ICT solution for hospital specifically meant for the hospitals in government sector.

C. Online registration system(ORS)

- In order to improve ease of services for citizens, Online Registration System (ORS) launched in July 2015 provides services to citizen for taking online registration, appointment etc. in various public hospitals.

D. Mera Aspataal (Patient Feedback) Application

- To empower citizens to participate in improvement of healthcare services delivery by providing feedback on service quality, facility etc.at hospital and ultimately help establish patient driven, responsive and accountable healthcare system.

E. Food Safety and Standard Authority of India (FSSAI)

- For ease of services to food sector stakeholders, FSSAI is offering services for Online License, Clearance, Product approval to the food business operators.

F. National Organ & Tissue Transplant Organization (NOTTO)

- In order to promote organ donation amongst citizen at large, NOTTO through its web –portal offers service for Online Registration for organ /tissue Transplantation or Retrieval and Online pledge registry by citizen for organ donation.

Various Mobile apps

1. Vaccine Tracker (indradhanush immunization):

- Support parents in tracking immunization status of their children and helps them in ensuring complete and timely vaccination.

2. NHP Swasthya Bharat

- MoHFW through its e-government initiatives is launching a mobile application "**NHP Swasthya Bharat**" to empower the citizens to find reliable and relevant health information. The application provides detailed information regarding healthy lifestyle, disease conditions (A-Z) symptoms, treatment options, first aid and public health alert.

3. Mother and Child Tracking System(MCTS)

- It is an individual –based tracking system to facilitate timely delivery of antenatal and postnatal care services and immunization to children with an objective of improving IMR, MMR,& Morbidity; providing alerts to health service providers about the services due list and service delivery gaps; appropriate health promotion messages to beneficiaries.

4. Kilkari

- It delivers free, weekly, time-appropriate 72 audio messages about pregnancy, child birth and child care delivery to families' mobile phones.

5. TB patient Monitoring system “NIKSHAY”

- For tracking of individuals for treatment-adherence has been implemented across all state for monitoring of tb patients.

6. Tobacco Cessation Programme

- It is a mobile based interventional initiative for counselling and helping people to quit tobacco.

7. Hospital information system(HIS)

- His is being implemented in hospitals for **automation of hospital processes** to achieve better efficiency and service delivery in public health facilities upto CHC level.
- Targeted impact includes facilitation in hospital workflow management leading to better delivery of services to patients and improvement in efficiency of processes at hospitals.

TOWARDS A NATIONAL DIGITAL HEALTH ECOSYSTEM

- The national health policy 2017 had defined the vision of **health and well-being for all at ages. Continuum of Care** is a concept strongly advocated by the policy.
- Citizen –centricity qualities of care, better access, universal health coverage, and inclusiveness are some of the key principle on which the policy is founded the realization of all these aspiration can be facilitated by leveraging the power of the digital technologies.

Ecosystem not System!

- A committee constituted by the Ministry of Health and Family Welfare, in November 2018, to take forward the concept of **National Health Stack** designed under the aegis of NITI Aayog, recognized the need for creating a framework for the evolution of a National Digital Health Ecosystem (NDHE).
- The result is the **National Digital Health Blueprint (NDHB)**, which is more than an architecture document, as it provides specific guidance in its implementation as well.

The objectives of NDHB are aligned to the vision of NHP 2017 and the SDG's relating to the health sector. These include:

1. Establishing and managing the **core digital health data** and the infrastructure required for its seamless exchange,
2. Promoting the adoption of open standard by all the actors in the National Digital Health Ecosystem for developing several digital health systems that span across the sector from **wellness to disease management**,
3. Creating a **system of personal health records**, based on international standard, and easily accessible to the citizen and to the service providers based on citizen –consent.
4. Following the **best principle of co-operative federalism** while working with the state and union territories for the realization of the vision;
5. Promoting Health **Data Analytic and Medical Research** ;
6. Enhancing the efficiency and effectiveness of governance at all levels
7. Ensuring Quality of Healthcare.
8. Leveraging the information system already existing in health sector.

Realizing outcomes

- Digital health is but a small lever in the evolution of the overall national health ecosystem. A substantial impact in the health sector is possible only through a posse of reforms and enhancements in the sectors.
- These include **improving the ratios like** Doctor: Pollution, Specialist: Doctor, Bed: Population; enhancing the spread and quality of health infrastructure and improving knowledge and skills among the health professional and workers.

Payment And Settlement System-RBI Vision Document

RBI, under power from the Payment and Settlement System Act ,2007,has endeavoured to ensure that India has **state of the art payment and settlement system** that are not just sage and secure but are also efficient fast and affordable. RBI Vision document outlines the road map for the three-year period spanning from 2019 to 2021.

Highlight of payment system vision-2021

- Empower every Indian with access to a bouquet of e-payment option that is safe, convenient quick and affordable.
- While the pursuit towards a less cash society continues ,accompanied by the ambition to have a less-card India as well, the endeavor is to also ensure increased efficiency, uninterrupted availability of safe, and affordable payment system as also to serve segment of the population which are hitherto untouched by the payment system.
- The decade to follow will witness a revolutionary shift in the way Indian citizen use digital payment option and will also empower them with an e-payment experience that will be exceptionally safe, secure and truly world class.
- The vision **envisages four goal-posts** (4 Cs) - Competition, Cost Convince and Confidence.
- For enhancement of competition in the payments system landscape, specific area like creating regulatory sandbox, authorizing new player etc. have been incorporated.