Time: 10 min   **Date: 23-11-2023**

India's Public Digital Infrastructure

Syllabus: GS2/ Government Policies & Interventions, GS3/ Inclusive Growth

In Context
- If we want our digital public infrastructure to accelerate development, we need to make sure that its benefits reach everyone in society.

Digital Public Infrastructure (DPI)
- DPI refers to digital solutions that enable basic functions essential for public and private service delivery, i.e., collaboration, commerce, and governance.
- Functionally mimicking physical infrastructures, these DPIs are digital pathways that enable a seamless provision of essential services, benefiting society.

India's DPI experiment - "India Stack"
- The remarkable transformation of India's digital landscape has been made possible by pioneering digital public infrastructure (DPI) experiments.
- The **Indian DPI ecosystem envisioned as "India Stack"** has been pivotal in unlocking the power of identity, payments, and data sharing to drive economic growth and foster a more inclusive digital economy.
- Its transformative ability lies in
  - Its potential to be used across multiple use cases,
  - Enabling the creation of novel solutions that drive innovation,
  - Inclusion and competition in the digital realm through its modular layers.

Concerns & Challenges
- **Exclusion & divide:** Among the concerns often raised in connection with the proliferation of digital public infrastructure (DPI) is the worry that nations that are reliant on digital systems for the **delivery of public services** will end up **excluding** those **incapable of accessing these digital solutions** from the benefits these systems were built to offer.
  - As digitization efforts accelerate across the globe, the divide between those who can access these systems and those who cannot is only **going to get more acute**.

- **Inadequate connectivity:** Most people associate digital capacity with connectivity. As much progress as we have made so far towards connecting people across the planet, there are **vast spaces left to cover**.
  - Even today, large segments of the world's population still lack access to our digital systems.
  - As public administration becomes increasingly digital everywhere, this will **eventually become the single biggest obstacle** to the widespread availability of public services.
- **Lack of electricity coverage:** Despite our best efforts, even a century after the invention of electricity, there are still vast areas of the globe that are not connected to an electric grid.
- **Data collection & breach:** One of the common aspects of all such platforms is them being data guzzlers where personal information is gathered from Indians that goes beyond the technical requirements.
  - This only results in multiple individual and social harms, including data breaches.
- **Lack of legislative mandate:** The weak governance processes, put into question whether they have been created with a legislative mandate.
  - Except for Aadhaar (prompted by litigation), **none of these platforms** [like Aarogya Setu, CoWIN or even Government E-Marketplace (GEM)] **has a legal definition of their functions**, **roles and responsibilities** from an Act of Parliament.

Suggestions
- **Investment in infrastructure:** To extend our connectivity infrastructure to the farthest corners of the globe.
  - This will require tremendous investment in fibre-optic cables, satellite transponders, cell phone towers and all the other paraphernalia needed to build the physical infrastructure of digital connectivity.
- **Focus on inclusivity & capabilities:** If we want our digital public infrastructure to accelerate development, we need to make sure that its **benefits reach everyone in society**, no matter whether or not they have always-on access to data connectivity.
  - To ensure no one is left behind, we will need to **upgrade people's digital capabilities** so that they not only understand all that these systems have to offer, but are also aware of the harms that could befall them if they are not careful.
  - The obvious way to do this would be to invest in training—to implement workshops, assisted learning sessions and the like—so that as many people as possible can become digitally literate.
- **Making technology 'easier to grasp':** We will need to make sure that we include appropriate design and U/X features that will make it **easier for those seeking to use these systems to intuitively grasp** what

they have to offer, regardless of whether such seekers have any prior experience with digital technology.
  - ○ Much of India's digital public infrastructure already incorporates this design philosophy. This is one of the main reasons why UPI, our fast payment system, is so widely used.
- **Enhancing 'offline' access:** Instead of just making sure that services are only accessible through a real-time online connection to the systems that deliver them, we need to ensure that **they are accessible offline as well**.
  - ○ We need to provide alternate forms of access to these services,
    - ■ Such as via QR codes that let necessary digital information be presented in a non-digital format
    - ■ A QR code lets a paper printout be 'read' by a smartphone camera.
  - ○ We need to design them so that **essential functions can be performed locally even when the system is offline** and **synced** once the device is brought to a location with network connectivity.
  - ○ Such creative solutions will improve access to these systems even as we try to deepen network penetration.

Learning from India's DPI experiment
- **Aadhaar enrolment:** It can be done offline, as demographic and biometric information is first captured locally before it is uploaded to servers of the Unique Identification Authority of India (UIDAI) when the enrolment agent gets connectivity.
  - ○ **Offline QR-code-based authentication** allows identity verification without needing a live link to the Central Information Data Repository.
- **UPI:** Innovations such as **USSD-based payment and Hello UPI** mean that our fast payment system can be extended to those with feature phones as well.

Way Ahead
- The benefits of DPI need to be widely and equitably disseminated, regardless of people's familiarity (or lack thereof) with technology systems.
- Indian DPIs hold the promise to bridge the wealth gaps and build an efficient and resilient digital economy that supports citizens and organisations.

Daily Mains Question
[Q] Analyse the significance of India's digital public infrastructure (DPI) experiment. What are the Concerns and challenges? Suggest ways to make DPI more inclusive & efficient.