DIGITAL PUBLIC INFRASTRUCTURE - GS II AND III MAINS

Q. India continues on its path towards digital transformation, the development of a robust DPI ecosystem will be crucial for enabling inclusive and sustainable growth. Elucidate (15 marks, 250 words)

News: *Digital public infrastructure could help India become an $8-trillion economy by 2030: Report*

What's in the news?
- Digital public infrastructure (DPI) could help India become an $8-trillion economy by 2030, according to a report by the National Association of Software and Service Companies (Nasscom) and Boston-based management consulting firm Arthur D Little International.

Key takeaways:
- Digital public infrastructure refers to digital networks that help provide citizens with social services. Well-known examples include Aadhaar, the United Payments Interface (UPI), and Fastag.

Digital Public Infrastructure (DPI):
- DPI is a set of technology building blocks that drive innovation, inclusion, and competition at scale, operating under open, transparent and participatory governance.
- Digital public infrastructure (DPI) is a shared means to many ends. It is a critical enabler of digital transformation and is helping to improve public service delivery at scale.

Features:
DPI is an evolving concept, but there is growing consensus on it being a combination of
- Networked open technology standards built for public interest
- Enabling governance
- A community of innovative and competitive market players working to drive innovation, especially across public programmes.

Foundation of DPI:
DPIs mediate the flow of people, money and information.
- The flow of people through a digital ID System.
- The flow of money through a real-time fast payment system.
- The flow of personal information through a consent-based data sharing system to actualize the benefits of DPIs and to empower the citizen with a real ability to control data.

Key Components of DPI in India:

- India, through India Stack, became the first country to develop all three foundational DPIs, Digital identity (Aadhar), Real-time fast payment (UPI) and Account Aggregator built on the Data Empowerment Protection Architecture (DEPA).
- DEPA creates a digital framework that allows users to share their data on their own terms through a third-party entity, who are known as Consent Managers.

1. Digital Identity:

- The Unique Identification Authority of India (UIDAI) has developed Aadhaar, a unique identification system that provides every Indian citizen with a unique identification number based on their biometric data.
- Aadhaar is used for a variety of purposes, including as a digital identity proof for availing government services.

2. Unified Payment Interface:

- UPI enables anyone with a bank account to make real-time digital payments using a mobile device.
- UPI is a payments system that runs on a central server operated by the National Payments Corporation of India (NPCI), a non-profit organisation that is responsible for its management.

3. DigiYatra and DigiLocker:

- DigiYatra is a Biometric Enabled Seamless Travel (BEST) experience based on a facial recognition system (FRS), again through a partnership between industry and government, which ensures seamless identification of passengers at key checkpoints such as airport entry, security check and boarding gate clearance.
- The United States CLEAR programme (an expedited airport security/airport identity verification process) is now active at 51 airports with about 15 million members at a cost of $369 per annum for a family of four.

4. Cybersecurity:

- The government has established the Indian Computer Emergency Response Team (CERT-In), which is responsible for responding to cybersecurity incidents and ensuring the security of India's digital infrastructure.

Overall, the growth and development of India's DPI ecosystem in the past decade have been impressive, and there are significant opportunities for further growth and development in the coming years. As India continues on its path towards digital transformation, the development of a robust DPI ecosystem will be crucial for enabling inclusive and sustainable growth.

Significance of Digital Public Infrastructure (DPI):

1. Efficiency:

- DPI can improve the efficiency and transparency of public service delivery, such as health, education, social protection and governance.

2. Empowerment:
- DPI can enable digital inclusion and empowerment of citizens, especially the poor and marginalized, by providing them access to information, opportunities and rights.

3. Innovation:
- DPI can foster innovation and collaboration across sectors and countries, by creating a common platform for data exchange, interoperability and reuse.

4. SDGs:
- DPI can support the achievement of the Sustainable Development Goals, by addressing urgent challenges such as poverty reduction, climate resilience, and digital transformation.

Challenges in DPI:

1. 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 incapables 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.

2. 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.

3. 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.

4. 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.

5. 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.

6. Funding:
- DPI requires continuous investment and innovation that can keep pace with the changing needs and expectations of the users, address the gaps and challenges in the existing infrastructure, and leverage the emerging technologies and opportunities.

WAY FORWARD:

- **Strengthening cybersecurity framework** to protect digital assets and prevent cyber attacks on important information like Aadhaar and banking data.
- **Invest in the right technologies** that can meet the needs and expectations of the users, ensure interoperability and scalability of the systems and leverage the emerging opportunities and innovations.
- **Demonstrate business agility** that can adapt to the changing contexts and demands of the users, respond to the feedback and challenges in the systems, and foster a culture of learning and experimentation.

- **Achieve operational excellence** that can optimize the performance and quality of the systems, ensure the reliability and security of the data and services, and manage the risks and costs effectively.
- **Enable innovation** that can create new solutions and products that add value to the users, collaborate with different actors and sectors in the ecosystem and reuse the existing infrastructure and data.
- **Establish a robust legal and regulatory framework** that can balance the interests of various stakeholders, protect the privacy and security of data, ensure accountability and compliance, and resolve disputes and grievances.
- **Create a strong institutional capacity and governance structure** that can manage the complexity and scale of the digital infrastructure, coordinate among different actors and agencies, and engage with the users and communities.
- **Secure continuous investment and innovation** that can keep pace with the changing needs and expectations of the users, address the gaps and challenges in the existing infrastructure, and leverage the emerging technologies and opportunities.
- **Improve digital literacy in India** to enable citizens to fully utilize digital services and platforms, as many are unaware of their benefits or lack the necessary skills to access and use them.