

## Digital Public Infrastructure in India

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### Abstract

Digital Public Infrastructure (DPI) refers to platforms such as Identification (ID), payment and data exchange systems that help countries deliver vital services to their people. It has transformed the way governments operate, and India is no exception. India has undergone a new wave of digital public infrastructure developments that have significant implications for its economic and social development. This paper examines the impact of digital public infrastructure in India from the perspective of public administration.

**Keywords:** Digital; Public; Administration; Infrastructure

### Introduction

Public administration plays a crucial role in the development and implementation of digital public infrastructure. Effective public administration is necessary to ensure the successful implementation of digital public infrastructure initiatives [1]. It plays a critical role in ensuring transparency and accountability in the implementation of digital public infrastructure initiatives. Public administrators need to ensure that the implementation of digital public infrastructure is done in a fair and transparent manner, with a focus on promoting public interest.

Digital public infrastructure initiatives need to be implemented efficiently and effectively. This includes ensuring that the technology used is reliable and secure, and the implementation process is free from technical glitches and errors [2]. It also need to ensure that digital public infrastructure initiatives are inclusive and promote social equity. This requires public administrators to be aware of the digital divide and take measures to ensure that marginalized communities have access to digital infrastructure. Digital public infrastructure initiatives should be sustainable and scalable. This requires a focus on long-term planning, including the development of a roadmap for the implementation and expansion of digital public infrastructure. These initiatives are to be designed with scalability in mind, allowing for future growth and expansion [3].

### Literature Review

#### Overview of digital public infrastructure in India

India has made significant investments in digital public infrastructure under the digital India initiative, aimed at leveraging technology to improve governance, services and infrastructure. The key components of India's digital public infrastructure include Aadhaar, Unified Payments Interface (UPI), Goods and Services Tax Network (GSTN), and the National Knowledge Network (NKN) [4].

#### Aadhaar

Aadhaar is a biometric identification system that assigns a unique identification number to Indian residents. Aadhaar aims to provide a unique digital identity to citizens and enable access to government services and benefits. Aadhaar has been transformative in India's public administration by promoting transparency, reducing corruption, and eliminating duplicate beneficiaries. Proof that this is work in progress is that Aadhaar authentications have shot up to 2.2 billion per month, and the cumulative number over the past 12 years has crossed 100 billion [5].

#### Unified Payments Interface (UPI)

UPI is a real-time payment system developed by the National Payments Corporation of India (NPCI) that allows users to transfer money between bank accounts instantly using a mobile phone. UPI has transformed the way public administration operates by providing a cashless, contactless system for the disbursement of government benefits and subsidies. It has now crossed eight billion transactions per month and transacts a value of \$180 billion a month, or about a staggering 65% of India's GDP per annum. The use of UPI has reduced the cost of cash handling and improved financial inclusion [6].

#### Goods and Services Tax Network (GSTN)

GSTN is a digital platform for the administration of the Goods and Services Tax (GST) in India. GSTN provides a single interface for taxpayers to register, file returns, and make payments. GSTN has streamlined the tax administration process, reducing compliance costs for businesses and promoting transparency in tax administration [7].

## National Knowledge Network (NKN)

NKN is a high-speed network infrastructure connecting academic and research institutions across India. NKN facilitates collaboration, knowledge sharing, and resource-sharing among academic and research institutions without the boundaries. NKN has been transformative in India's public administration by promoting innovation and enabling access to information [8].

## Digi locker and Digi yatra

Digi locker is a digital platform that has managed to accumulate 150 million users and store six billion documents over seven years, all within a modest budget of RS 50 crore. Users can digitize and store various documents like insurance, medical reports, PAN card, passport, marriage certificate, school certificate, and more [9]. Digi yatra is Biometric Enabled Seamless Travel (BEST), utilizes a Facial Recognition System (FRS) to offer a seamless travel experience. In the financial year 2022, India saw an air passenger traffic of more than 188 million in airports, with over 22 million being international passengers [10].

During COVID 19 pandemic, some educational platforms like DIKSHA: A national platform for school education, an initiative of National Council for Educational Research and Training (NCERT), under the aegis of the Ministry of Education (MoE), GoI [11]. NISHTHA: The national initiative for school heads' and teachers' holistic advancement is a capacity building programme for improving quality of school education through integrated teacher training [12].

## Discussion

### Impact of digital public infrastructure on India

Digital public infrastructure has had a significant impact on India's economy and society. The impact can be seen in the following areas:

**Financial inclusion:** UPI has played a significant role in promoting financial inclusion in India. UPI has made it easier for the unbanked population to access digital financial services, reducing the cost of cash handling and promoting financial literacy [13].

**E-Governance:** Aadhaar has enabled the government to implement various e-governance initiatives such as Direct Benefit Transfer (DBT), which has reduced corruption and leakage in welfare schemes. Aadhaar has made it possible to create a digital identity for citizens, enabling the government to provide services in a more efficient and transparent manner.

**Business efficiency:** GSTN has simplified the tax administration process, reducing compliance costs for businesses and promoting transparency in tax administration. GSTN has made it possible for taxpayers to file returns online, reducing the time and cost of compliance [14].

**Education and research:** NKN has facilitated collaboration and resource-sharing among academic and research institutions, promoting innovation and knowledge sharing. NKN has made it

possible for researchers to collaborate and share resources and data, accelerating the pace of research and development.

### Challenges and controversies

While digital public infrastructure has brought significant benefits to India, there are also challenges and controversies associated with these initiatives. Some of the key challenges and controversies include:

**Privacy concerns:** The Aadhaar initiative has faced criticism over privacy concerns. Critics argue that Aadhaar collects sensitive personal information that could be used for identity theft and other malicious activities.

**Security risks:** UPI has faced criticism over security concerns, with reports of fraudulent transactions and security breaches. UPI's security concerns have raised questions about the safety and reliability of digital payment systems.

### Implementation challenges

The implementation of digital public infrastructure has also faced challenges. For instance, the implementation of GSTN faced initial technical glitches, causing delays in the filing of returns. Similarly, the implementation of Aadhaar faced challenges in the enrolment process, with reports of errors in the biometric identification process. Another challenge is the digital divide, which refers to the gap in access to digital infrastructure between different sections of society. The digital divide could prevent the full benefits of digital public infrastructure from reaching marginalized communities, exacerbating existing inequalities.

### Overcoming the challenges

Effective administration is critical to the development and implementation of digital public infrastructure initiatives. It plays a crucial role in ensuring the successful implementation of digital public infrastructure initiatives by promoting transparency, efficiency, equity, and sustainability. While the implementation of digital public infrastructure initiatives in India has faced several challenges, there is a growing recognition of the importance of digital technologies in promoting social and economic development. The continued development and implementation of digital public infrastructure initiatives in India are likely to play a critical role in the country's future development.

To overcome the challenges faced in the implementation of digital public infrastructure initiatives, there is a need for a collaborative approach. Public administrators, private sector entities, and civil society organizations need to work together to develop and implement effective digital public infrastructure initiatives. The private sector can play a critical role in the development and implementation of digital public infrastructure initiatives. Private sector entities can leverage their technological expertise and financial resources to support the development of digital infrastructure and services. Public-private partnerships can help bridge the gap between public sector needs and private sector capabilities, leading to more effective

and sustainable digital public infrastructure initiatives. Civil society organizations can also play a crucial role in promoting digital literacy and ensuring that digital infrastructure is accessible to all. These organizations can work with public administrators and private sector entities to develop digital literacy programs and promote awareness of the benefits of digital public infrastructure.

### The new wave in India

India's new wave of digital public infrastructure initiatives includes the national health stack, the national digital education architecture and the national language translation mission. The national health stack aims to create a digital health infrastructure that enables the provision of affordable and accessible healthcare services. The initiative includes the creation of a health registry, health information exchanges, and digital health records. The implementation of the national health stack is expected to reduce healthcare costs and improve the quality of healthcare services.

The national digital education architecture aims to create a digital infrastructure for education that enables the provision of quality education to all. The initiative includes the creation of a national digital education ecosystem, digital content repositories, and a learning management system. The implementation of the national digital education architecture is expected to improve the quality of education and promote digital literacy. The national language translation mission aims to promote the use of Indian languages in digital services and content. The initiative includes the creation of a language grid, language tools, and a language data repository. The implementation of the national language translation mission is expected to promote linguistic diversity and enable access to digital services for non-English speaking individuals.

### Conclusion

Digital public infrastructure has had a significant impact on India's economy and society, promoting financial inclusion, e-governance, business efficiency and education and research. However, there are also challenges and controversies associated with digital public infrastructure, including privacy concerns, security risks and implementation challenges. Effective public administration is critical to ensuring the successful implementation of digital public infrastructure, administrators need to be aware of these potential risks and take steps to ensure that digital public infrastructure initiatives are designed in a way that promotes equity and inclusion. This includes ensuring that digital infrastructure is accessible to all, promoting digital literacy, and providing support to individuals who may not have access to digital devices or internet connectivity.

Overall, the development and implementation of digital public infrastructure initiatives in India are critical to promoting economic growth and development and improving the lives of its citizens. Effective public administration is essential to ensuring the successful implementation of these initiatives, with a focus on transparency, efficiency, equity and sustainability. Through collaboration between public administrators, private sector entities and civil society organizations, India can continue to lead the way in the development and implementation of digital public infrastructure initiatives.

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