DIGITAL INFRASTRUCTURE DEVELOPMENT IN INDIA FOR CITIZEN EMPOWERMENT

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Abstract: Digital infrastructure delivers the physical and software resources that are required to enable the use of data, processes and computerized devices etc. The Government of India (GOI) has mainly focused on transforming India into a digitally empowered citizen. This paper mainly focuses on digital Infrastructure development in India like high-speed internet, Unique Identity of citizens, mobile banking, Common Service Center (CSC), cloud space for citizens, government e- Marketplace, open forge project and digital currency etc. The barriers in digital infrastructure development such as digital illiteracy and less awareness about innovations in new technologies are also mentioned. It is concluded that digital infrastructure development in India enables citizens to have effective, transparent and accountable government services.

Index Terms - Digital, Infrastructure, Citizen, Empowerment, Government, Governance

1. Introduction

Digital describes electronic technology that generates, stores, and processes data, where Infrastructure describes the physical and organizational structures and facilities. Digital infrastructure refers to the digital technologies that provide the foundation for an organization's information technology. The Government of India with a vision to transform India into a digitally empowered civilization. The Government of India is the governing authority of the union of 28 states and 8 union territories. Many functions of the government are involved in delivery of information and services to its citizens. The intent of Digital India is to Power to Empower and also provide services 24*7 or without any holiday on Sunday or a Government holiday. The main objectives of Digital India initiatives are digital infrastructure as a Core Utilityto every citizen, governance and services on demand and digital empowerment of citizens. The major components of Digital infrastructure are high-speed internet, mobile banking, Common Service Center (CSC), Cloud Space for Citizens, Safe and Secure Internet Connectivity, SMART life, digital currency, online business like MSME, digital learning like shodhganga, e-pathshala, e- PG Pathshala, NPTEL. The current study is based on review of digital infrastructure. It focuses on the infrastructure that is required for the development of e-Government in any country. The key benefits of governance and services on demand are online availability of services, integration of different department services and cashless transactions etc. The main focus of digital empowerment is on digital literacy, digital resources, and collaborative digital platforms etc. This paper aims to describe the digital infrastructure development in India for Citizen Empowerment.

2. REVIEW OF LITERATURE

The literature survey is achieved by undergoing a number of journals, government reports, blogs,and articles. The literature is reviewed under digital infrastructure, e-Governance services and technologies. In [1] the author's purpose of this research is to develop a broad view of challenges faced by government sectors in the process of releasing their data in the open platforms. Database can help citizens understand impurity near their home, crimes in their neighborhood, public works, natural disasters and political. In [3] the authors describe the rapid growth of the learning trend in today's era of e-education as digital learning. It also discusses the online tools and learning management systems. In [4] the authors describe opportunities available with India after going cashless and also discuss the threats with going cashless. After the study was conducted it was seen that the Government of India should consider many more steps in digitalization. In [5] the authors aim to further understand how open government data

is usedto develop commercial products and services. It provides an overview of the main concepts and challenges regarding the commercial re-use of open government data. In [6] the author focused on e-Governance services such as government-to-government, government-to-citizens, government-to-business. This paper discussions about the e-Governance services, infrastructure and technologies on the implementation of electronic governance in India. In [7] the authors are concerned on the impact of digitalization on the economy, society and environment challenges in the path of making digital and economic growth. In [8] author review the research on the digitalpillar and especially focus on the nine pillar of the Digital India and also focused on the challenges of the Digital India. In [10] the authors talk about digital India key areas and major enterprises taken by the government. The paper also considers the effect of digitization on specific sectors such as education, health, agriculture, financial services, and retailing, as well as government.

3. DIGITAL INFRASTRUCTURE DEVELOPMENT IN INDIA

Digital infrastructure refers to the hardware and software resources that are required to enable theuse of data, computerized devices, methods, systems and processes. The Government of India (GOI) has taken a number of digital infrastructure development initiatives. There are a number ofcategories for digital infrastructure: Government-to-Citizen (G2C), Government-to-Government (G2G), Government-to-Business (G2B) and Government-to-Education (G2E). G2G supportsonline communication between government agencies.G2C implies that citizens are allowed to retrieve government information and perform government transactions online. G2B allows businesses to retrieve government information and complete transactions with government agencies online. G2E refers to the retrieval of research and learning material online.

3.1. Government to Government (G2G)

It is an interaction in which it deals with government to government foundation that helps ininner government. This interaction includes high speed internet, open forge projects etc.

High Speed Internet : High Speed Internet generally means super high speed internet. People spend so much time on the Internet, even 12 hours a Day. So many people are still working from home that number is steadily increasing. Before we start thinking about faster the internet, the easier the connection, here's one clarification: faster internet just means that your device responds faster to your commands. In India 825 million people are able to access the Internet. The government has provided 157,383 gram panchayats with high-speed internet infrastructure. The government said that over 302 million people were able to access the internet in rural India while over 502 million people accessed the internet in urban India.

Open Forge Project: Open Forge Project is an Open Source platform for open collaborative development of e-governance applications by the Department of Electronics & IT, Government of India. They want to promote the use of open-source software and promote sharing and reuseof e-governance related source code. In 2015 Government of India implemented the "Policy on Collaborative Application Development by Opening the Source Code of Government Applications" It delivers a framework for archiving government custom developed source code in repositories and opening these repositories for promoting reuse, sharing, remixing and modifying the repositories. The Government wants to encourage collaborative developmentbetween Government departments / agencies and private organizations, citizens, and developers to encourage the creation of innovative e-governance applications and services.Open ForgeProject used by OpenSource Developers, Governments, Startups, Academia/Students, Corporations, Industries, Scientific Institutions. Total 1775 Projects, 8633 Users, 20681 Airfacts,242850 Git Push contribute to the Open Forge Project. Some of the e-Governance projects suchas National Center of GEO-Informatics , Government e-Marketplace, Digi-Locker, UMANG andSmart-City etc. are available on Open Forge.

3.2. Government to Citizen (G2C)

It is an interaction in which it deals with government to citizens that delivers online information and services to citizens. This interaction includes unique identification of Citizens, Mobilebanking, Common Service Center, Cloud space for citizens, smart life etc.

Unique Identification of Citizen: Aadhaar is a unique identity of an Indian Citizen also a Biometric Identity Infrastructure. This system built on a sound strategy and a strong technology backbone and evolved into a crucial digital identity infrastructure. It is a powerful platform for authenticating a resident anytime and anywhere which is in line with the vision of the UIDAI. The purpose of Authentication is to enable residents to prove their e-identity providers to confirm that the residents are who they say they are in order to supply services and give access to benefits.

Mobile Banking: It is a facility delivered by a bank or other financial institution that authorizes its customers to regulate financial transactions remotely using a mobile device such as a smartphone or tablet. BHIM (Bharat Interface for Money) is an Indian mobile payment App developed by the National Payments Corporation of India (NPCI), based on the Unified Payments Interface (UPI). The number of transactions done through the Bharat Interface for Money (BHIM) app amounted to over 22 million as of June 2021. Maximum of Rs. 10,000 per transaction and Rs. 20,000 within 24 hours. The limit for USSD has currently been set at ₹5,000 per day. The main purpose of BHIM App is to provide a uniform experience of UPI and also to support those banks who have not developed any UPI app for their customers as yet. It is a one- digital payment app for all bank accounts and also money remains in your bank accounts, so you can earn interest.

Common Service Center: Common Service Center or Common Suvidha Center in short CSC.It is a Public Internet Access Programme where it provides the multi-electronic services to the village in India. It is an enterprise by the Ministry of Electronics & IT (MeitY), Government of India in 2009. The Common Services Centre scheme in rural as well as urban areas of India reached 4.3 million. These centres are present across the country in all 28 States and 8 UTs. It covers 2,50,000 villages. It provides a multi endpoint for service delivery. CSC centers provide 50 Central Government Services and 20-300 State Govt. Services.

Cloud Space for Citizen : The Government of India provides cloud space for every Indian Citizen who holds the Aadhaar i.e. DigiLocker. DigiLocker is a digitization online service. It wasdelivered by the Ministry of Electronics and Information Technology (MeitY), Government of India. This app is used to authenticate documents/certificates like Driving License, vehicleregistration, Academic Marksheet ..etc in digital composition. DigiLocker also delivers the 1GB storage to each account to upload scanned copies of legacy documents. The main goal of this appis to minimize the dependence on physical documents and also to verify the documents DigiLocker involves digitization of data and records on a large scale in the country to make easy and quick access possible. It is very safe and secure. It delivers access to over 372+ crore authentic documents from 149 issuers. Above 3.3 crore users are registered on DigiLocker.

Smart Life : National Strategy for Artificial Intelligence #AIforAll originated a national policy on Artificial Intelligence by the Government of India in June 2018.The Government of India expanded the expenditure for Digital India upto $477 million to amplify the AI, Big Data, Cyber Security, Machine Learning, Robotics. Government wants to make the internet more reachable, encouraging e-governance, e-banking, e-education, and e-health. AI-based start-ups in Bengaluru, Hyderabad, Pune, Mumbai, and New Delhi to attract customers accurately and productively have been accepted by the Government of India. In India AI-based start-ups are expected to hit 100 by 2025. Smart cities, AI managing busy traffics, violations, healthcare, facial recognition and hotspot analysis, biometric identification, criminal investigation, trafficand crowd management, wearables to empower women safety, optimizing revenues in the forest, cleaning river, tiger protection, digital agriculture, student progress monitoring and many more will be experienced by Indian citizens. The country needs AI talent and a sufficient budget from the Government for the future of Artificial Intelligence to be viable.

3.3. Government to Business (G2B)

It is an interaction in which it deals with government to business organisations in a commercial manner. This includes government e-marketplace, digital currency, online business for startups etc.

Government e-Marketplace : Electronic procurement refers to the process of purchase and sale of goods or services through electronic methods, primarily the Internet. The Government of India(GOI) launched a Government e-Marketplace (GeM) portal in 2016 with the objective of creating an open, transparent and efficient procurement platform for government. GeM offers an online solution for all procurement needs of Central and State Government departments, Public Sector Undertakings (PSUs), autonomous institutions and local bodies. The benefits for sellerand buyer are described in Table 1. Procurement on GeM has been authorized by General Financial Rules by making necessary changes in government rules. Presently more than 7400 products in about 150 product categories and hiring of transport service are available on GeM POC portal. Transactions for more than Rs. 140 Crore have already been processed throughGeM. GeM is a completely paperless, cashless and system driven e-market place that enables procurement of common use goods and services with minimal human interface.

Table 1: Government e-Marketplace Advantages

For buyers	For seller
Rich Listing of Products for individual categories of Goodsand Services	Seller Friendly Dashboard forSelling
Search, compare, Select and Buy facility	Direct access government to all the
Transparent and ease of buying	One stop for bids
Continuous vendor rating system	Dynamic Pricing
Easy Return Policy	Consistent and UniformPurchase

Digital Currency: Digital Currency or a Digital Money that means payment entirely exists in electronic form. Digital currency is not physically touchable like a dollar bill or a coin. It is transferred to accounts using online systems. Its well-known form of digital currency is the cryptocurrency Bitcoin. This currency can also represent fiduciary currency, such as dollars or euros and also barter using technologies such as smartphones, credit cards, and online cryptocurrency exchanges. It can be transfigured into physical cash via the use of an ATM in some cases. Around 111 countries from its 159 member countries are researching or planning to introduce digital currency in the near future.

Udyog Aadhaar: Udyog Aadhaar is an online business for startups which is a 12-digit Government identification number delivered by the Minister of MSME for small and medium enterprises. The Government of India helps the sole traders by providing a unique identity and official registration that certify existence of his business. Udyog aadhar are very helpful for building up a small business. It protects against delay in payment and also reduces the rate of interest from banks. In India more than 48 lakhs are registered under the Udyog Aadhar.

3.4 GOVERNMENT TO EDUCATION (G2E)

The Government of India had initiated the Indian Education Plan by Dr. Manmohan Singh in December 2007. The main purpose of this program is to achieve fast growth in Indian Society (Digital Learning 2008). The Indian Government took some wide steps for ICT based e-learning such as Shodganga, NPTEL, e-Pathshala and e-PGPathshala etc.

Shodhganga: Shodganga is an open source platform of research work where unique sources of information are present in the form of a thesis. It stands for the waterbody of Indian conceptual output stored in a repository hosted. It was maintained by the INFLIBNET Centre. This deliversa platform for research scholars to deposit their Ph.D. thesis. Total 327636, 8358 synopses, 18 MRPs, 19 PDFs, 5 Fellowships are present there.

NPTEL: NPTEL (National Programme on Technology Enhanced Learning) is a study platform which was launched by seven institutes of IITs where India will reshape into a powerful and vitalknowledge economy. Total 2300+ courses are available on NPTEL for self study. NPTEL has been focused on higher education, professional education, Open and distance learning.

e-Pathshala: e-pathshala is a resource where mainly NCERT books are available for primary, secondary and higher secondary students. It was launched by INFLIBNET. Total 3886 e- Resources, 504 eTextbooks are available there.

e-PGPathshala: e-PGPathshala is a learning resource for graduates, postgraduates, academicians, and research scholars. It is an open access educational portal. e-PGPathshala was started by the INFLIBNET library. 18,000+ e-texts, 17,000+ learning videos, 3200+ experts, 30,000+ quizzes , around 70 subjects and 723 papers are available there.

4. BARRIERS IN DIGITAL INFRASTRUCTURE

- Biggest Challenge of the Digital India programme is the high level of digital illiteracy. In India urban and rural areas had a wide digital gap. The cost of infrastructure in rural areashas not met yet because funds have not been established effectively.

- For digital technology to be accessible to every citizen, significant efforts are needed to customize apps and utilities to cater to local needs.

- Lack of infrastructures, handful number of AI researchers and scientists, less awareness regarding upcoming innovations, digital divide, resistance to change are the summons in conducting AI projects efficiently and effectively in India.

- Digital Money can understand user privacy and is susceptible to hacks and also can volatile in value.

5. CONCLUSION

This paper reviews the digital infrastructure and technologies for the empowerment of citizen. These services lead to increased output, better employment, cost savings, enhanced productivity and literacy etc. A digitally empowered society develops much faster, effectively and efficiently due to better utilization of its human resources. We have seen a lot of improvements in digital infrastructure, but digital illiteracy, cybercrime, fear of technology, insufficient time to learn new techniques and environment compatibility overcome the benefit ofdigital governance.

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