

Digital Assam: Reshaping Governance for Efficiency and Transparency

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Abstract

E-governance leverages technology to enhance government services, simplify communication, and integrate systems between the government and citizens. Building on the foundation of Digital India, the Assam government is actively working to enhance 'Digital Assam'. The National e-Governance Service Delivery Assessment (NeSDA) initiative, in collaboration with the National Informatics Centre (NIC) Assam State Centre, has been instrumental in driving digital transformation. NIC Assam has served as the Information and Communication Technologies (ICT) backbone of the state, connecting government offices through NICNET and enabling seamless communication and e-governance services. Assam has made major improvements in establishing digital governance, but challenges remain. Poverty, geographical barriers, infrastructure gaps, digital illiteracy, and funding constraints continue to hinder the full-scale implementation of e-governance initiatives in the state. This paper aims to examine the journey of Digital Assam, highlighting its achievements, challenges, and prospects in e-governance. The study is descriptive and relies on secondary data collected from government reports, policy documents, research studies, books, newspaper reports, etc. The finding shows that the state has successfully launched 100 per cent e-services through its unified portal, Sewa Setu, offering uninterrupted public service access. Key initiatives like Mission Bhumiputra (digital caste certificates), Mission Basundhara 2.0 (land record updates), e-district (Sugam), Direct Benefit Transfer (Arunodoi Scheme), Kritagyata Pension Seva Kendras, and e-Prastuti are driving socio-economic transformation in Assam. The study highlights that the successful implementation of e-governance in Assam requires an effective telecommunications network, skilled IT professionals, a stable electricity supply and government officials' digital competence. The authors have acknowledged the role of NIC in launching several innovative digital initiatives, ensuring that governance becomes more accessible, transparent, and efficient for all citizens.

Keywords: *E-governance, Digitalization, Digital Assam, Digital Divide, Empowerment.*

Introduction

In recent decades, countries around the world have implemented large-scale public sector reforms to prioritize digitalization to improve the effectiveness of public services. As a result, they have built online service platforms shared by various public sector organizations to streamline administrative operations and increase interactions with citizens (OECD, 2019). Even in India the thrust of administrative reforms has been to bring the government and citizens closer together through digital technology, with the policy goal of '*Maximum Governance - Minimal Government*' (Srinivas, 2022). According to the World Bank, e-governance is a technology-driven approach to delivering government services, facilitating information exchange, and integrating systems between the government and citizens. Advancements in ICT

have paved the way for good governance, leading to the growth of e-governance as a progressive concept. The United Nations Sustainable Development Goals (SDGs) framework recognizes the development of ICTs and global interconnection as having tremendous potential to accelerate human progress, close the digital divide, and build knowledge societies. People have been empowered by digital tools and social media due to extensive access to information and worldwide connections. Technology is being used by citizens to hold governments accountable and to exercise their civic rights. Technology is being used by governments to make government more transparent, accountable, and inclusive.

Objectives & Methodology of the Paper

This paper aims to examine the journey of Digital Assam, highlighting its achievements, challenges, and prospects in e-governance. The primary objectives are:

1. To analyse the digital reforms and initiatives undertaken by the Assam government.
2. To identify key challenges hindering digital transformation in the state.
3. To provide recommendations for strengthening Assam's digital governance framework.

The study is descriptive and relies on secondary data collected from government reports, policy documents, research studies, books, newspaper reports, etc. Key sources include reports from the Government of Assam and India, the United Nations Development Programme (UNDP), the United Nations Educational, Scientific and Cultural Organization (UNESCO), Organisation for Economic Co-operation and Development (OECD), the National Institution for Transforming India (NITI Aayog), and the Department of Administrative Reforms and Public Grievances (DARPG).

E-Governance- A Conceptual Framework

In the year 2005, UNDP defined, "*e-Governance as ICT to improve information and service delivery, encouraging citizen participation in the decision-making process, and making government more accountable, transparent, and effective.*"

According to UNESCO, the goal of implementing e-governance is to improve good governance. Recent improvements in communication technologies and the internet offer chances to reshape the interaction between governments and citizens in novel ways, thereby contributing to the attainment of good governance objectives.

UNESCO identifies the fields of implementation of e-governance as follows:

E-Administration focuses on using technology to enhance government processes and how the public sector operates internally.

E-Services aims to improve public service delivery to citizens, like providing access to documents, certificates, and permits online.

E-Democracy promotes greater citizen participation in decision-making using technology. Some key principles that are significant for digital development, as explained by the Organisation for Economic Co-operation and Development (OECD), 2018 report, have been discussed in Table 1.

Table 1: Principles for Digital Development

Principle	Description
Design with the user	Focus on the users by understanding their needs through conversations, observation, and collaboration.
Understand the existing ecosystem.	Consider the local structures and needs when designing initiatives and digital tools.
Design for scale	Plan for expansion beyond the initial group, often by securing resources to reach more communities.
Build for sustainability	Create long-lasting programs and tools that continue to engage users and stakeholders.
Be data-driven	Use accurate data to inform decisions, ensuring the right people have the right information.
Use open standards, data, and sources.	Promote collaboration by sharing digital solutions, reducing redundant efforts.
Reuse and improve	Build on existing work to enhance what others have already developed.
Address privacy and security.	Ensure proper handling of data, focusing on how it's collected, used, stored, and shared.
Be collaborative	Share knowledge, strategies, and resources across projects to increase impact and efficiency.

Source: *OECD, Principles for Digital Development, 2018*

Digitization in India

In order to enable the general public to benefit from a variety of services and to promote digital inclusion, India has taken the lead in developing creative digital projects and extensive programs (GOI, 2022). The establishment of the *Department of Electronics* in 1970 was the first significant step towards e-governance in India since it focused attention on "information" and how it is communicated. The *District Information System* initiative was started by the *National Informatics Center (NIC)*, which was founded in 1977, to computerize every district office nationwide. The primary impetus for e-governance in India was the establishment of

NICNET, the National Satellite-Based Computer Network, in 1987 (Mondal, 2019). The National e-Government Plan (NeGP) was rolled out in 2006. The mission of this plan was to 'make all government services available to the common citizen in his locality through common service delivery outlets, and assure efficiency, transparency, and reliability of such services at affordable costs to realize the basic needs of the average person' is a significant step.

India has the potential to become the world's fastest-growing digital economy with the help of public-private partnerships, supportive policies, and a startup ecosystem (IBEF, 2022). The Indian government's digital campaign and its follow-up initiatives, including the e-governance platform *UMANG*, *the accessible India campaign*, *Bharat Net*, *Digital Locker*, *the Agri Market app*, *the My Gov platform*, *the CPGRAMS* (online public grievance platform), *DIKSHA Portal* (*PM e-Vidya*), *e-SHRAM* (a national database for unorganized workers), *Jeevan Praman* (biometric enabled digital service for pensioners) and many more, attempt to close the digital divide among the Indian population. E-governance in India is evolving rapidly, particularly in the agricultural sector through initiatives like the *National E-governance Plan for Agriculture and Digital AgriStack* (Balkrishna et al., 2024). To promote e-government initiatives and improve digital government excellence, the *National e-Governance Service Delivery Assessment (NeSDA)* was established by the Department of Administrative Reforms and Public Grievances (DARPG) in 2019. So, governments across the country have placed a higher emphasis on integrated service delivery, increasing the number of e-services delivered through centralized portals. These portals also offer uniform access to services, which improves accessibility and usability (PIB, 2022).

The growth of digital governance in India has been driven by significant advancements in information technology, especially since the launch of the *Digital India* campaign in 2015. *Digital India* aims to strengthen nine key growth pillars, which include:

- a) Broadband Highways**
- b) Universal Access to Mobile Connectivity**
- c) Public Internet Access Program**
- d) e-Governance: Using Technology to Transform Government**
- e) e-Kranti - Electronic Service Delivery**
- f) Information for Everyone**
- g) Electronics Manufacturing**
- h) Information Technology for Jobs**
- i) Early Harvest Programmes**

Under the *Digital India* Initiative, the Ministry of Electronics, and Information Technology (MeitY) has established a network of *Common Services Centres (CSC)*. With one CSC in each of the country's 2.50 lakh Gram Panchayats (GPs) for the delivery of various Government-to-Citizen (G2C) and other citizen-centric e-services to citizens. It is a self-sustaining business concept run by Village Level Entrepreneurs (VLEs) (PIB, 2022).

The massive wave of digitization, increased smartphone penetration, and technological acceptance have offered openings for both traditional and new-age sectors. The rollout of 5G services has the potential to open new economic opportunities and help the country overcome traditional development barriers, promote innovation by start-ups and business enterprises, and advance the '*Digital India*' vision. A few of the many success stories include the *Aadhar program*, *Co-WIN portal*, *Digi Locker*, *Open Network for Digital Commerce (ONDC)*, *Open Credit Enablement Network (OCEN)*, *Goods and Services Tax (GST)*, *Direct Benefit Transfer (DBT)* and *Government e-Marketplace (GeM) Sahay*, etc (Economic Survey, 2021-22). *Ayushman Bharat Health Account (ABHA)* centralized health information repository designed to improve healthcare access and support telehealth initiatives (ABDM, 2024). The Indian government deployed digital technology to control the flow of corruption in social welfare programmes. Government welfare programmes use biometric identification to link beneficiaries' bank accounts, which citizens receive services, subsidized food rations, pensions, and so on (Rao, 2023). In terms of land records, *Svamitva Yojana* provides digitized land records to legitimate owners by leveraging the power of drones and GIS technologies, and about 2.14 crore land have been digitized in India (GOI, 2021).

Digitization in Assam

Assam is the most developed state in Northeast India and is rapidly becoming a key economic and commercial hub for future business with Southeast Asian countries. With the Indian government's emphasis on the '*Act East Policy*,' the state's significance in business and trade is expected to grow even more. A large portion of the population in the age group of 15 to 30 years in the major towns of Assam are IT literate and skilled with good command of the English language (GOA, 2017). To fasten the digitization process in the State in 2017, Assam introduced a new IT and Electronics Policy to support 'SMART' governance through digital systems. This policy aimed to establish Assam as a leading ICT hub, make 25 lakh rural citizens digitally literate by 2022, and provide computer education in all government schools (GOA, 2017). Google collaborates with the Assam Government's *Skill, Employment, and Entrepreneurship Department (SEED)* to strengthen its school digitization efforts to drive digital-led learning and skill development for students and youth in the state (TOI, 2022).

Another remarkable project of the state government towards digitization is the implementation of an *e-district* (*The Sugam*) project in 2016. Before the launch of the Assam *e-district* project, citizens had to travel to block offices or tahsil offices and district headquarters to obtain basic services such as income, caste, birth and death certificates, and domicile certificates. But, with the execution of the *e-district* project, it becomes feasible to get e-delivery of the services and eliminates the necessity for an applicant to visit a public office. The Government of Assam's IT Department carried out *e- e-district* project. In Assam, a total of 53 citizen-centric services have been identified for service delivery via *e-district*.

The IT Department of the Government of Assam has introduced an initiative called *e-Prastuti*, aimed at standardizing websites. This project has been successful and received second place in the CM Awards for Excellence in Public Administration, 2017. At the introduction of the *Sadhbhavana* portal in Guwahati on February 1, 2022, Assam took a big step closer to digitization. The *Sadhbhavana* portal attempts to get rid of outdated documents that have been sitting at the Assam secretariat for a few decades, some dating back as far as the 1990s. The *Kritagyata* portal has been introduced to pensioners to enable pensioners to digitally apply for pensions, track sanctions, and monitor payments. Under the *Kritagyata* portal in 2022, Assam inaugurated 27 *Kritagyata Pension Seva Kendras (PSKs)* as facilitation centers to provide support to pensioners across the state. Assam's 'Darpan', developed by the provides a visual representation of data on Key Performance Indicators (KPIs) for the state's flagship schemes and projects. This helps in tracking progress, enhancing transparency, and improving decision-making. Another significant initiative is the *Smart Performance Appraisal Report Recording Online Window (SPARROW)*. This system has been adopted by the Assam Government to digitize and streamline the performance appraisal process for government employees, making it more efficient, transparent, and accessible.

The NIC has conceptualized, designed, and developed many other ICT-based applications for the State Government including digital platforms like *e-courts*, *e-Vahan*, *Sarathi*, *e-panchayat*, *e-counselling*, *e-prison*, *e-hospital*, *e-procurement*, *Solid Health Card*, *e-Gras*, *Swachh Bharat*, *e-Vidhan*, *Rural Employment*, *Jeevan Pranam*, *Scholarship*, *MyGov*, *e-Land Records*, etc which has been discussed in detail in next section.

Major Digital Reforms/Initiatives of The State

E-governance in Assam started in the late 1980s with the establishment of NIC Assam State Centre in 1986. NIC introduced ICT in government offices and connected them through NICNET for better communication and data sharing. The launch of Digital India in 2015 gave a significant boost to e-governance reforms in the state. Since then, Assam has implemented

various digital initiatives to improve service delivery, transparency, and efficiency in governance, which have been discussed below:

1. Service Delivery Initiatives: Standardization of state government websites used to convey information and services is one of the major service delivery initiatives. The e-services have been developed and connected with e-forms/applications and are made available to residents via a single portal as well as departmental portals. Integration of existing e-governance applications with the National Register of Citizens (NRC) and Aadhar is done in stages. For effective service delivery under the National e-Governance Plan, the existing *Community Information Centres (CICs) were combined with the Common Service Centers (CSC) Scheme* (PIB, 2011). The CSCs and CICs in Assam provide essential digital services, including internet access, email, computer literacy training, printing, word processing, and desktop publishing. CSCs also offer high-quality and cost-effective video, voice, and data services in areas such as e-governance, education, health, telemedicine, and entertainment. To improve government efficiency, the state has implemented the e-Office module, with *the File Management System (FMS)* as a key component, funded under the NeGP. Several initiatives have been introduced under the e-Panchayat program to enhance governance in rural Assam. The *National Panchayat Portal (NPP)* serves as a dynamic platform for Panchayats to share public information. Moreover, the Dristi web-based GIS application captures spatial data for assets created under schemes such as MGNREGA, PMAY, BRGF, and DDP. The Digital Gaon Panchayat program of the state aims to transform selected Panchayats into digital hubs by providing free Wi-Fi and digital literacy training, focusing on e-commerce and e-services. A significant step towards digital public service delivery, *Mission Bhumiputra*, launched in 2022, simplified the issuance of digital caste certificates to students. This initiative is implemented by the Tribal Affairs (Plain) and Social Justice Empowerment Departments, reinforcing the state's commitment to transparency and efficiency in governance (GOA, 2024).

2. Transparency Initiatives: As part of its transparency initiative, Assam has introduced a single unified electronic platform for procurement. The state government enacted the *Assam Public Procurement Act, 2017*, and enhanced the e-procurement system in collaboration with the *State Finance Department*. Another transparency initiative was the end-to-end computerization of the *Targeted Public Distribution System (TPDS)* which ensures system-generated food grain distribution to increase transparency up to the level of Fair Price Shops, digital records of beneficiary details, etc. To bring transparency to land records, '*Mission Basundhara 2.0*' was conceptualized to resolve issues/ disputes of land revenue services.

The mission intends to shorten the time it takes to update land records by using an online mode, which will help in the rapid disposal of services requested by residents. The following land-related services are going to be accessible through the Basundhara 2.0 portal (Khas settlement and surplus land ceiling, Occupancy Tenant Settlement, Special cultivator settlement, Tribal communities' hereditary land settlement, etc). To ensure transparency in governance, addressing public complaints is essential. The Government of Assam has taken a significant step in this direction by implementing the *Centralized Public Grievances Redressal and Monitoring System (CPGRAMS)* under the Administrative Reforms & Training Department. This initiative aims to expedite the resolution of public grievances, enhancing accountability and responsiveness in the administration. To enhance transparency in the judiciary, Assam has implemented the *E-Court Project*, which provides laptops and laser printers to judicial offices for better record-keeping and case management. An official website has also been introduced to improve accessibility to judicial information. To improve operations in the transport sector, the *"Vahan and Sarathi" Project* has been launched. This initiative, implemented in 26 out of 27 districts, aims to digitize vehicle registration and driving license issuance, making the services more efficient and accessible at District Transport Offices (DTOs) (GOA, 2024).

3. Digital Empowerment Initiatives: To empower citizens digitally, the Government of Assam has started the Digital Literacy Program in collaboration with the *National Digital Literacy Mission (NDLM) and DISHA*. The government paid particular attention to the implementation of '*PMdisha*', which aims to provide individuals in rural areas with free digital literacy instruction. To promote financial inclusion, the Government of Assam launched the *Orunodoi (Arunodoi)* Scheme on October 2, 2020. This initiative is a significant step toward socio-economic empowerment, benefiting 19.10 lakh families by providing ₹1000 per month directly into the bank accounts of the nominated woman in each household through the Direct Benefit Transfer (DBT) mode. In the healthcare sector, the *Niramay* initiative focuses on the digitalization of health services in Assam. It aims to strengthen digital infrastructure by enabling telemedicine interactions, rapid diagnostics, and digitized patient health records. The National Health Mission (NHM) has undertaken this project in collaboration with Piramal Swasthya, a non-profit health organization, and Cisco, a global IT company, to modernize and improve the state's public healthcare system (GOA, 2024).

4. Business Initiatives: To prosper business, the *Ease of Doing Business (EODB)* in Assam is designed to create a conducive business environment for both new and existing enterprises,

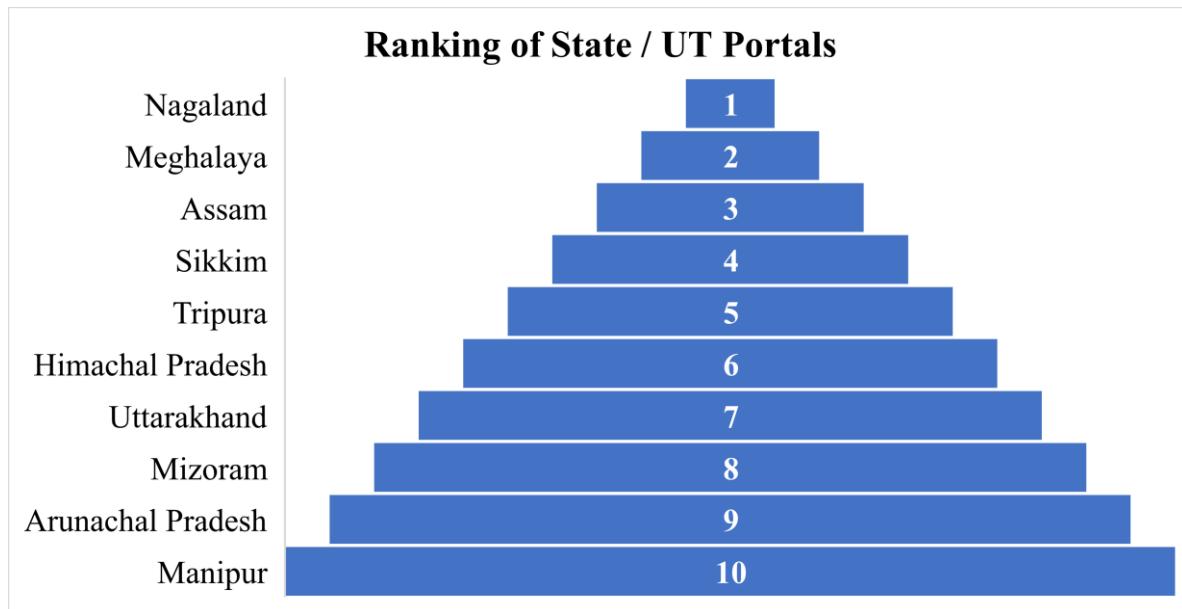
creating economic growth through technology, innovation, inclusivity, and sustainability. This initiative provides an objective assessment of business regulations, particularly for small and medium-sized enterprises (SMEs), by evaluating the regulatory challenges they encounter throughout their lifecycle. To implement the *Assam Ease of Doing Business Act, of 2016*, the *EODB Portal* was established, thereby enhancing transparency. The *Office of the Development Commissioner, MSME*, introduced *My MSME* (a web-based and mobile application that enables entrepreneurs to apply for various schemes, track application statuses, and access business support services directly from their smartphones).

5. The New Technology Initiatives: As a new technology initiative, the Assam government has developed a *100-acre IT park* near Lokpriya Gopinath Bordoloi International Airport, attracting significant investor interest and boosting the state's IT sector. To improve public service delivery and resource optimization, Assam is embracing advanced technologies such as IoT, AI, machine learning, cybersecurity, big data, virtual reality, and 5G communication. The *Assam Wide Area Network (ASWAN)* has strengthened communication by linking district, sub-divisional, circle, and block offices across the state. In disaster management, the *Jal Tarangini scheme* leverages IoT technology for automated river water level monitoring, replacing manual data collection with a scientific and energy-efficient system. This initiative enhances flood prediction, water resource management, and disaster preparedness, enabling Assam to respond more effectively to water-related challenges (NIC,2024).

An Analysis of Progress of Digital Assam

The *National e-Governance Service Delivery Assessment (NeSDA) 2021* evaluated State and Union Territory (UT) portals based on their effectiveness in delivering digital services to citizens. This assessment aimed to enhance governance by ensuring seamless and accessible service delivery. Among the northeastern states, Nagaland secured the top rank, followed by Meghalaya and Assam in third place (See Figure 1). Assam's strong performance highlights effective e-governance reforms in the state. The state has made significant progress in improving online service delivery through initiatives like *Mission Bhumiputra* (digital caste certificates), *Mission Basundhara 2.0* (land record updates), and DBT schemes like the *Arunodoi Scheme*.

Figure 1: National e-Governance Service Delivery Assessment 2021



Source: Department of Administrative Reforms and Public Grievances, 2021

The NeSDA ‘Way Forward Report’ 2024, published by the Department of Administrative Reforms and Public Grievances, highlights Assam's significant progress in e-governance. The key objective of the ‘NeSDA Way Forward Report’ was to promote the adoption of e-service delivery through a ‘Single Unified Portal’ across States and UTs. Leading this initiative, Kerala, Assam, Odisha, and Jammu & Kashmir have successfully implemented 100% e-services through their respective unified portals. Jammu & Kashmir's e-UNNAT (1164 services), Kerala's e-Sevanam (938 services), Assam's Sewa Setu (725 services), and Odisha's Odisha One (404 services) are ensuring seamless digital service delivery (DARPG, 2024).

Table 2 indicates tremendous progress made by the State of Assam in terms of successfully implementing e-projects in the State. Initiatives like *eOffice* and *Project Sadbhavana* have facilitated the shift to paperless administration, ensuring quick file movement and eliminating bureaucratic delays. Platforms like *Assam Right to Public Services (ARTPS)* and *Ease of Doing Business (EoDB) Portal* provide citizen-centric service delivery, reducing manual intervention and improving turnaround times. *Jal Tarangini* and *eRupantor* ensure data-driven governance, helping policymakers monitor development projects and disaster management effectively. These initiatives collectively encourage a more accountable and responsive government.

Table 2: Assam's e-Projects Reports Till 2023

Initiative	Objective	Key Features & Achievements
Mission Basundhara	Digitization and integration of maps and land records. Secure land rights for indigenous and disadvantaged populations.	Phase 1 (2021-22): 672 non-cadastral villages surveyed, 18,789 cadastral villages resurveyed, 8,13,981 applications received, 5,82,688 successfully processed.
Project Sadbhavana	Disposal of pending cases before May 10, 2021, and transition to e-Office.	Citizens submitted cases via the Sadbhavana Portal, closure of physical files, complete migration to e-Office.
e-Office	Digital file management system.	Fully implemented in Assam Secretariat (Oct 2, 2022) and Deputy Commissioner Offices (Jan 1, 2023), 100% electronic file movement targeted.
CM-TRANS (CM-Transport Randomized Allocation Networked System)	Online random allocation of transport services to prevent corruption.	Workload-based allocation across 35 District Transport Offices, eliminates local influence and manual intervention.
Kritagyata (Pension Management System)	Simplify pension disbursement.	10,348 pension cases processed, 7,166 Pension Payment Orders (PPOs) generated, integrated with Jeevan Pramaan till 2023.
Assam CM Dashboard	Real-time governance data monitoring.	Fetches data from 50 e-governance projects (22 more schemes in the pipeline).
Assam Right to Public Services (ARTPS) Platform	Time-bound citizen service delivery.	128 services across 20 departments, 3 autonomous councils, and 1 municipal

		corporation onboarded; to be renamed "Sewa Setu."
e-Rupantor	Monitoring state-funded projects.	₹1615.47 crores were sanctioned at the state level and ₹897.64 crores at the district level till 2022.
Public Distribution System (PDS) Assam	Transparent food grain distribution.	56 lakh ration cards benefiting 2.02 crore people, 98.68% transactions via ePoS, Aadhaar seeding at 98.6%, ONORC implemented.
Jal Tarangini	IoT-based flood monitoring.	Tested in Chirang (Aie River), deployed in Brahmaputra (Dibrugarh), funded by Assam State Disaster Management Authority (ASDMA).
e-Transport (Vahan & Sarathi, eChallan, e-Detailed Accident Report e-DAR)	Digitized transport services.	45 contactless services, the first state to implement e-DAR.
Integrated Land Revenue Management System (ILRMS)	Improve land revenue management.	Dharitree for land records, NOC for property transfers, and e-Panjeeyan for digital registration.
e-Prastuti	Website standardization framework.	212 departmental and 29 district websites standardized till 2023.
e-GRAS	Digital government revenue collection.	₹35,640 crore revenue collected via 48.56 lakh e-Challans till 2023.
National Data Centre – NER	Cloud infrastructure for governance.	Laid foundation in Feb 2021 by PM Modi, Tier-III Green Data Centre.

Employment Exchange Portal	Online job registration.	Aadhaar-seeded registration for job seekers.
ICT in Elections	Digital election management.	eNirvachan for election tracking, Eletraces for EVM monitoring, and Force Deployment Software used in the 2021 Assam Elections.
Niyukti	Digital recruitment portal for government jobs.	37 recruitment drives were conducted, and 74,476 applications were received.
State Public Procurement Portal (SPPP Assam)	Transparent e-procurement system.	Integrated with Government e-Marketplace (GeM) for state-wide procurement transparency.
eHospital	Digital healthcare service management.	Implemented across 24 hospitals, expanding to 14 more districts.
eCounselling	Online admissions for ITIs and professional courses.	Managed admissions for 128 institutions covering 1,56,905 seats.
Matsya Baibhav	Fisheries asset management through geo-tagging.	Tracks pond/tank locations for the <i>Ghare Ghare Maach</i> scheme.
Drugs free Assam	Public reporting system for drug-related offenses.	Citizens can report drug-related activities directly to authorities.
Geo-Rurban	Infrastructure tracking for rural development.	Monitors the progress of the Rurban scheme through geo-tagging.
e-Courts	All pleadings, evidence, orders, and judgments are electronic.	2.4 lakh court case entries from January 2022 to November 2022.
eGranthalaya	Digitization of Libraries	Implemented in 6 institutions

Source: Viswam, 2023 (Informatics Assam State)

The transformation of Assam from a poverty-ridden state to a digitally empowered one is a significant step toward inclusive growth and governance. Historically, SC/ST populations and other marginalized communities in Assam remained disconnected from the benefits of globalization. However, technology has now emerged as a powerful tool to bridge this divide, ensuring greater access to government services, financial inclusion, and social upliftment.

The state government and local bodies have played a significant role in implementing digital initiatives that target vulnerable populations. By leveraging ICT infrastructure, initiatives like Sewa Setu, e-Office, and ARTPS have simplified service delivery, making governance efficient, transparent, and corruption-free. These efforts have ensured that citizens, irrespective of their socio-economic background, can access public services digitally.

While making strategies for 'Digital Assam', the Assam CM Himanta Biswa Sharma stated that Assam's digital transformation coincides with the national Digital India initiative. The government has taken novel measures to incorporate technology into governance, emphasizing empowerment and public accessibility. With NIC Assam playing an important role, projects like CM Dashboard and eRupantor offer real-time data monitoring, enhancing accountability and data-driven decision-making.

Digital governance initiatives in India, particularly in Assam, aim to enhance efficiency, transparency, and citizen participation. The *MyGov* platforms promote citizen engagement in policy-making and governance. E-governance in Assam has reached the transactional stage, offering basic e-services, but citizen-government interactivity remains suboptimal. The Digital India initiative has promoted e-commerce and empowered the unorganized sector in Assam. E-governance and ICT are increasingly recognized as key development parameters in the region, highlighting the need for continued research and improvement in digital governance strategies. While significant progress has been made by the State, challenges remain in rural internet penetration, digital literacy, and last-mile connectivity. Continued investment in ICT infrastructure, AI-driven services, and blockchain technology can further consolidate Assam's position as a digital leader in the Northeast as well as in India.

Challenges of Implementation of Digital Governance

Assam faces significant challenges in adopting e-governance due to a combination of factors. The Oxford Poverty and Human Development Initiative (OPHI) Report 2021 ranked Assam fifth in the country in terms of multidimensional poverty, with nearly one-third of the State's population experiencing deprivation across various indicators such as health, education, and living standards (OPHI, 2021). The high cost of ICT devices and data plans, as well as the low incomes of the people and affordability, are important issues for a large population that is

disconnected from ICT projects. Assam and the northeastern states of India are connected to the rest of the country through a narrow corridor that passes through West Bengal. Assam is a multi-hazard state that is prone to floods, earthquakes, storms, and landslides besides manmade disasters. Lack of sufficient network coverage and insufficient infrastructure development due to geographical isolation are the major obstacles to internet adoption in the state. Also, existing operators do not spend on developing infrastructure in rural areas because they do not produce enough revenue there.

The COVID-19 pandemic highlighted the digital divide, as students in rural communities of Assam faced exclusion from online learning. Many schools lack basic infrastructure, computers, and internet access, making it difficult for students to attend online classes. Additionally, many teachers lack the digital skills needed to prepare lessons and effectively use technology in classrooms. Poor network connections further disconnect students from online education, especially in areas like Karunabri block, where villages suffer from persistent internet and voice network issues (Pegu, 2019). In Assam, many government offices lack proper ICT infrastructure, making it hard to provide online services, especially in villages where internet connectivity and electricity remain unreliable. Digital skill gaps further widen the divide, as many people lack the knowledge to use online platforms, and most digital content is not available in local languages, making access difficult for non-English speakers. Funding shortages also slow down progress, as the government does not allocate enough resources for e-governance initiatives, often treating technology as an operational cost rather than a strategic investment (Gupta, 2022). The inefficiency of government offices leads to delays in online services due to poor inter-departmental coordination and a lack of computer skills among officials, especially in rural areas. Government websites are another issue, as many are outdated, inconsistent, and difficult to use, lacking essential citizen-centric information (GOA, 2018). A traditional mindset also slows progress, as many organizations resist automation and struggle to adapt to new technologies.

In Assam, there are around 4348 Common Service Centres (CSC) that are operational and enhance rural living through technology (PIB, 2019). They are the most vocal supporters of those who are not digitally empowered or aware of government e-governance initiatives. In Assam, several CSCs are charged hefty fees from the citizens for online services as well as lack accountability. Even if a citizen decides to make a complaint against a CSC, there is no clear-cut official framework in place to ensure a fast response. Assam needs to improve its infrastructure, along with well-planned training programs, to enhance the accountability of the system if it wishes to succeed in implementing e-governance.

Recommendations

Major recommendations of the study may be listed as follows:

- 1. Better Access to Technology:** To reduce the gap between cities and villages, the government should build more telecom and IT infrastructure in rural areas. A special budget should be set aside to improve digital access. Private companies and NGOs should also be encouraged to bring technology to remote areas. Women should get special support to overcome social barriers and access the internet and digital devices.
- 2. Digital Education for Everyone:** To achieve the Digital India as well as Assam goal, everyone must learn how to use digital tools. Schools and colleges should focus on digital education. The National Digital Literacy Mission should introduce basic digital skills in government schools and advanced lessons in higher classes. State governments should also create online content in local languages for easy access to government services.
- 3. Encouraging Public Participation:** Government websites and online services should be made easy to use and transparent so that more people can participate in governance. When citizens are aware of digital services and how to use them, e-governance can be more successful.
- 4. Dedicated Government Officials:** Government employees should be more committed to using digital tools for faster and better service delivery. This will also help in the development of rural areas.
- 5. Public-Private Partnerships:** The government should work with private companies to build ICT businesses and bring digital reforms to Assam. This partnership can help speed up the implementation of e-governance projects and improve rural development.
- 6. Strong Cybersecurity:** The government must create a strong system to protect people's data and privacy to ensure trust and safety. The *Ministry of Electronics and IT (MeitY)* should set high standards for security, digital transactions, and complaint handling. Regular security checks should be done for all e-governance projects.

Conclusion

The progress of Digital Assam reflects a commitment to inclusive governance, transparency, and efficiency. Through technology-driven policies, the State is breaking historical barriers and ensuring that even the most marginalized communities have access to opportunities in the digital era. The government's proactive role, strong leadership, and partnership with NIC Assam can continue to shape a good future for digital Assam. By eliminating the digital access gap between rural and urban populations in Assam, the state can achieve progress more efficiently. However, for these digital initiatives to be fully effective, the government must

ensure proper onboarding, training, and technical support for both government employees and citizens. The digital access of services has empowered citizens by enhancing their awareness of rights and entitlements, thereby reducing their dependence on intermediaries and curtailing corruption. Assam's e-Governance initiatives, such as Sewa Setu, ARTPS, and Mission Basundhara, have played a crucial role in making government services more transparent and accessible. Locally developed cloud-based services in regional language, cybersecurity solutions, and AI-driven applications can enhance digital infrastructure without dependency on expensive foreign technologies. With these measures, Assam can bridge the digital divide, empower its people, and establish itself as a model for efficient and inclusive digital governance in India.

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