



Digitisation & e-Governance in India: Transforming Society Through Technology

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Abstract

India's digitisation journey represents one of the most ambitious exercises in technology-led governance reform undertaken by any large democracy. Over the past decade, the Government of India has deployed an interlocking architecture of digital public infrastructure — biometric identity, real-time payments, cloud document storage, and unified data exchange layers — to reshape the relationship between the citizen and the state. This paper examines the evolution of Digital India and its associated e-governance programmes, analyses their measurable impact on financial inclusion, service delivery, transparency and accountability, and evaluates the structural challenges that continue to constrain the full realisation of digital governance, including the digital divide, cybersecurity vulnerabilities and data privacy concerns. Drawing on programme-level evidence from Aadhaar, the Unified Payments Interface (UPI), DigiLocker, the e-Courts Mission Mode Project and the Government e-Marketplace, among others, the paper argues that India's approach — often described as the 'India Stack' or Digital Public Infrastructure (DPI) model — offers a distinctive template of population-scale, interoperable, low-cost digital rails that other developing economies are now studying. The paper concludes with a set of policy recommendations aimed at deepening digital inclusion, strengthening data protection and ensuring that the benefits of digitisation are distributed equitably across geography, gender and income.

1. Introduction

Governance in the twenty-first century is increasingly mediated by digital infrastructure. For a country the vastness and variety of India – more than 1.4 billion people, twenty-two scheduled languages and huge differences in poverty, literacy and connection – the promise of digital governance is particularly meaningful. Digitization is the process of converting manual, paper-based processes into electronic format, while e-governance is the broader use of Information and Communication Technology (ICT) to

provide government services, exchange information and allow citizens to participate in public administration. Taken together, these processes have become crucial to the Indian state's imagination of its own modernisation.

The justification for digitalization in the Indian setting is threefold. It first tackles the problem of last-mile service delivery in a country where physical government offices are often far, under-staffed or under the influence of corruption. Second, it allows the state to more accurately identify and target benefit recipients thereby preventing the leakages that have previously sabotaged subsidy and welfare systems. Third, it paves the way for economic formalisation, bringing millions of citizens and small enterprises into the formal financial and regulatory system for the first time. This paper is organized as follows. Section 2 tracks the growth of the digital governance policy in India from the early computerisation attempts to the current Digital Public Infrastructure model. Section 3 reviews the most important flagship programmes and their logic of design. Section 4 discusses the societal effect of these projects across a range of domains. Section 5 discusses the issues that endure. Section 6 gives a collection of forward-looking policy proposals. Section 7 ends.

2. Evolution of India's Digital Governance Policy

2.1 Early Computerisation (1970s–1990s)

India's engagement with computers in governance had a humble beginning with the setting up of the National Informatics Centre (NIC) in 1976, which was entrusted with the mission of delivering IT infrastructure and services to government agencies. The first attempts were mostly centred on computerisation of train reservation, banking operations and census data processing. The economic liberalization of 1991 led to the expansion of India's domestic IT industry, but the government's use of technology for citizen-facing services was minimal during the 1990s.

2.2 The e-Governance Decade (2000–2014)

The formal policy architecture for e-governance was born with the National e-Governance Plan (NeGP), sanctioned in 2006, which identified a set of Mission Mode Projects across central, state and integrated services — including land records, transport, treasury computerisation and the e-Courts project. Also at this time, Common Services Centres (CSCs) were launched as a physical entry point to digital services in rural and semi-urban India. The government recognized that the access to the internet and digital literacy could not be presumed to be uniform across the population.

2.3 The Digital India Era (2015–Present)

The Digital India plan was initiated in 2015 to move away from siloed e-governance projects to an integrated Digital Public Infrastructure (DPI) strategy. The approach was not to build bespoke systems for each welfare scheme or service but to build common, interoperable digital layers – identity

(Aadhaar), payments (UPI) and data exchange (consent-based frameworks like the Account Aggregator system) – on which any government department, bank or private enterprise could build. This layered concept is also globally referred to as the “India Stack” and has been referenced by multilateral institutions as a model for digital public infrastructure in poor countries.

3. Flagship Programmes: Design and Objectives

The table below outlines the key digitization and e-governance programs that collectively compose India's digital public infrastructure ecosystem.

Programme	Primary Objective	Launch Year
Digital India	Umbrella programme to transform India into a digitally empowered society and knowledge economy	2015
Aadhaar	Unique 12-digit biometric identity for every resident, foundation for direct benefit delivery	2009
Unified Payments Interface (UPI)	Real-time interoperable digital payments infrastructure	2016
DigiLocker	Cloud-based repository for verified digital documents and certificates	2015
e-Courts Mission Mode Project	ICT-enabled judiciary, case tracking and virtual hearings	2007 (Phase III ongoing)
Common Services Centres (CSC)	Last-mile delivery points for e-governance services in rural areas	2006
PM-WANI / BharatNet	Rural broadband connectivity and public Wi-Fi expansion	2011 / 2020
MyGov	Citizen engagement platform for participatory governance	2014
GeM (Government e-Marketplace)	Transparent online procurement platform for government departments	2016

Programme	Primary Objective	Launch Year
Ayushman Bharat Digital Mission	Unified digital health ecosystem with health IDs and interoperable records	2021

Table 1: Major Digital India and e-Governance Programmes

3.1 Aadhaar and Digital Identity

Aadhaar is a 12-digit biometric identifying number issued to people by the Unique Identification Authority of India (UIDAI) based on their fingerprints, iris scans and demographic data. Aadhaar has become the identity backbone for direct benefit transfers (DBT), pension disbursement, subsidised food grain distribution under the public distribution system and bank account opening under financial inclusion schemes with enrolment covering the vast majority of the adult population. The key is not so much to verify identities, but to allow de-duplication – making sure that welfare funds go to a single, verified person and are not siphoned off through duplicate or phantom recipients.

3.2 Unified Payments Interface (UPI)

UPI, developed by the National Payments Corporation of India (NPCI), enables immediate transfer between banks using a smartphone and a virtual payment address, without the sender having to know the recipient's bank account credentials. Unlike the walled garden approach of many other digital payment ecosystems, the open design of UPI enables numerous private apps to run on a common rail governed by the central bank. It is now the most popular means of digital payment for retail in India and has started to be expanded to select global markets through bilateral interoperability deals.

3.3 DigiLocker and Document Digitisation

DigiLocker provides citizens a secure cloud based storage space to save and share verified government issued documents - academic certificates, vehicle registration, driving licences and insurance policies. It reduces the need for paper documents and enables third parties such as employers, educational institutions and law enforcement agencies to verify them instantly.

3.4 e-Courts and Judicial Digitisation

The e-Courts Mission Mode Project has digitized case filing, cause lists and decisions across hundreds of district and subordinate courts, and enables virtual hearings – a feature that was vital amid pandemic-related limitations. The National court Data Grid has a searchable database of the case status which adds to openness in an otherwise opaque and clogged court system.

3.5 Government e-Marketplace (GeM) and Procurement

GeM digitizes public procurement and provides an online marketplace for government departments, public sector undertakings and cooperatives to purchase goods and services with visible pricing, seller ratings and audit trails, thus decreasing the discretion and opacity that was the hallmark of earlier tender-based procurement.

4. Societal Impact of Digitisation

4.1 Financial Inclusion

Aadhaar-linked bank accounts opened under the Pradhan Mantri Jan Dhan Yojana have converged with mobile connectivity and UPI-based payments – sometimes referred to as the ‘JAM trinity’ (Jan Dhan–Aadhaar–Mobile). Tens of millions of citizens previously outside the formal financial system have been brought into it. Direct benefit transfer of subsidies, pensions and earnings straight into bank accounts has decreased dependency on cash middlemen and plugged leakage in various social systems, according to government audits. Small retailers, street sellers, and gig workers are now privy to low-cost digital payment acceptance without the requirement for specific card-payment infrastructure.

4.2 Transparency and Reduced Corruption

The digitisation has decreased the scope of rent-seeking in activities which once needed a face-to-face meeting with authorities, such land record mutation, vehicle registration, ration card issuing and tax filing. Applications are followed up online. Eligibility is automatically checked. Everything is digitized. All this reduces the discretionary power of intermediaries, but the degree of the gain varies widely depending on the state and the quality of local implementation.

4.3 Ease of Doing Business and Economic Formalisation

Reforms such as the Goods and Services Tax Network (GSTN), company incorporation portals and single-window clearance systems have made compliance easier for small and medium enterprises and India’s ranking in the international ease-of-doing-business indices improved in the years that these reforms were introduced. GeM has also improved market access for the small vendor who lacked the network to bid for government contracts.

4.4 Healthcare and Education

The Ayushman Bharat Digital Mission also intends to build interoperable digital health records and unique health IDs with a long-term goal of facilitating continuity of care across providers. In the education space, DIKSHA and SWAYAM have scaled up access to curated learning content, which was especially useful during school closures during the COVID-19 epidemic. But access is still hampered by access to devices and connection at the home level.

4.5 Citizen Participation

Although quality and consistency of responses may vary from department to department, platforms like MyGov and various grievance redressal systems (including the Centralised Public Grievance Redress and Monitoring System) have created formal mechanisms through which citizens can petition government bodies, comment on draft policy and track resolution timelines, encouraging a more participative governance model.

5. Challenges and Structural Constraints

5.1 The Digital Divide

The access to digital governance services is still inconsistent. Despite the progress made, rural-urban divides in internet penetration, smartphone ownership and technological literacy exist and are exacerbated by gender inequities in access to and use of devices. People who don't have dependable access to the internet or aren't comfortable with digital interfaces risk being excluded from services that are increasingly being provided online by default. This creates what experts call a "digital divide" that can repeat or exacerbate existing socioeconomic disparities rather than address them.

5.2 Data Privacy and Protection

The centralisation of biometric and demographic data under Aadhaar and the interlinking of Aadhaar with a growing range of services has been a cause of concern for privacy advocates time and again and was under major judicial review in previous years before the Supreme Court declared privacy a fundamental right and placed some restrictions on mandatory Aadhaar linkage. The passage of the Digital Personal Data Protection Act is a major step towards a complete data protection regime, albeit the implementation regulations and enforcement mechanisms have still to mature.

5.3 Cybersecurity Vulnerabilities

Moving government services online will create a bigger target for fraud, phishing and data breaches. Denial of service attacks on public portals, UPI related fraud targeting less digitally literate users and incidents of unauthorised access to government databases highlight the need for constant investment in security infrastructure, incident response capability and public awareness campaigns.

5.4 Digital Literacy and Trust

Even where connectivity is available, many citizens, particularly older adults and first-generation technology users, lack the confidence or skills to navigate digital interfaces on their own, and often rely on intermediaries such as Common Service Centre operators or family members, which can reintroduce the very dependency and potential for exploitation that digitisation aimed to remove.

5.5 Interoperability and Fragmentation

While the stated goal is a unified digital stack, many state government portals and central schemes are still working with little interoperability, forcing citizens to register separately on multiple platforms with different user interfaces and data requirements, defeating the seamlessness the DPI architecture is meant to achieve.

6. Policy Recommendations

- Invest more in BharatNet and public Wi-Fi to scale last-mile digital infrastructure and bridge rural-urban connection disparities.
- Strengthen the implementation and enforcement structure of the Digital Personal Data Protection Act, including an independent and well-resourced Data Protection Board.
- Online literacy instruction should be institutionalised and scaled out, particularly for women, elderly people and first generation internet users through Common Service Centres and local self-government entities.
- Standardise common design and interoperability standards across state and central digital platforms to decrease citizen-facing fragmentation.
- Invest more on cybersecurity infrastructure and create swift public awareness response mechanisms for digital payment fraud.
- Ensure digitization is additive, not exclusive, by maintaining and reinforcing offline and aided access routes along side digital ones.
- Regularly carry out independent audits to check for welfare leakage and exclusion mistakes due to biometric authentication failures, so that efficiency benefits do not come at the cost of denying entitlements to eligible claimants.

7. Conclusion

India's experience of digitisation and e-governance over the last two decades exemplifies the revolutionary potential as well as the structural constraints of technology-led public administration change. The construction of digital public infrastructure at population scale – for identity, payments and data exchange – has demonstrably improved the efficiency, reach and transparency of many government functions and made India a global benchmark for the design of digital public infrastructure. However, the presence of digital divides, unsolved issues of privacy and security, and the unequal implementation among governments means that the advantages of digitisation are not yet universal and equitable. The next phase of India's digital governance journey will not be about building new digital rails, but the

quality, inclusiveness and accountability of their implementation — ensuring digitisation becomes a tool to expand citizenship rights, rather than a new axis of exclusion.

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