Democratising Technology: Empowering the Last Person

India today stands at a moment where technology is no longer merely a tool of convenience, but a means of advancing social justice, transparency, and inclusive development. Digital Public Infrastructure, artificial intelligence, data-driven governance, and multilingual technology platforms are reshaping governance into a more citizen-centric system. Initiatives such as the JAM Trinity, UPI, BHASHINI, SVAMITVA, and the Agri Stack demonstrate how the democratisation of technology can expand access to services and opportunities for the last person in the queue.

Dr. Arvind C Ranade

When Mahatma Gandhi articulated the doctrine of Sarvodaya (welfare for all) in 1908, he was not only proposing a socio-economic welfare paradigm but also advancing a civilisational truth that no society can declare itself just so long as the last person in the queue remains deprived. Unlike the utilitarian calculus of aggregate welfare, which can mask the condition of the most marginalised, the spirit of Sarvodaya emanates from the ancient Arthashastra tradition itself. Kautilya, writing in the fourth century BCE, put it with characteristic precision: 'प्रजासुखे सुखं राज्ञः प्रजानां च हिते हितम्'

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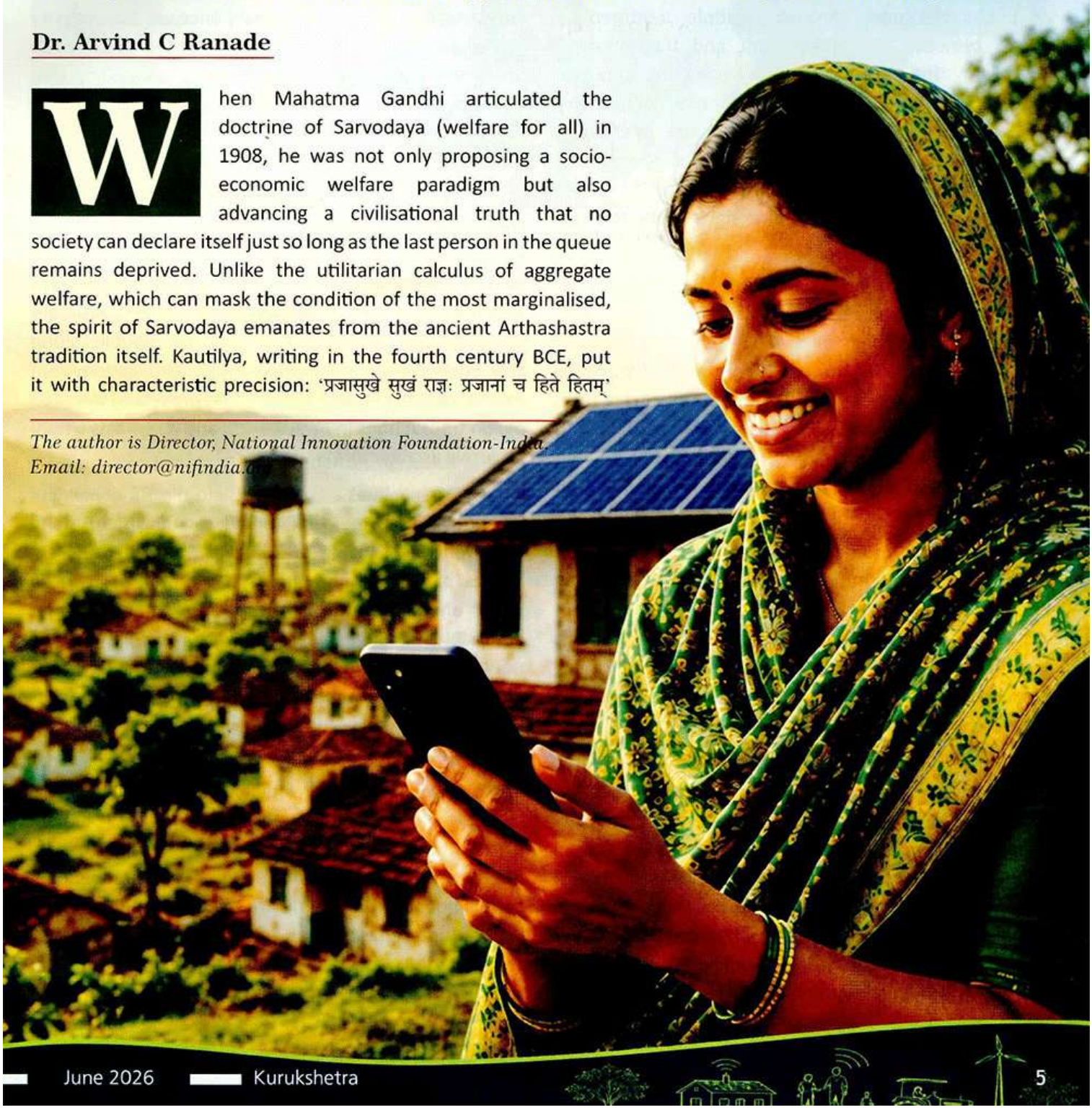


(in the happiness of his subjects lies the king's happiness; in their welfare, his welfare). Governance, in the Kautilyan framework, is not merely an exercise in administration but a moral engagement between the state and the most vulnerable citizen. Two and a half millennia separate these two thinkers, yet the underlying principle remains unchanged, and it is within this framework that India's contemporary technology-led governance must be understood.

The JAM Trinity and Socio-Economy

For decades after independence, the central problem of welfare delivery in India was not the absence of intent, but the structural intermediation that allowed leakage of public resources through multiple intermediary chains between the government and the intended beneficiary. The JAM trinity of Jan Dhan bank accounts, Aadhaar biometric identity, and Mobile connectivity fundamentally reimagined this architecture. By creating a biometrically authenticated chain from government disbursement to the individual beneficiary, the Direct Benefit Transfer (DBT) programme significantly reduced the role of intermediaries.

The numbers are significant. By April 2026, cumulative DBT transfers had crossed Rs 50 lakh crore, with estimated savings of Rs 4.31 lakh crore between 2015 and March 2024 through the removal of duplicate and ghost beneficiaries. Jan Dhan accounts grew from 14.72 crore in 2015 to 57.71 crore by March 2026, with aggregate deposits of Rs 2.94 lakh crore, representing the rapid formalisation of a largely unbanked population in modern economic history.

It is at this moment that Dr. Ambedkar's vision acquires fresh institutional relevance. His enduring counsel, expressed to the Constituent Assembly in November 1949, was that "political democracy cannot last unless there lies at the base of it social democracy." According to him, formal rights are only as meaningful as the substantive access they enable.

The JAM architecture takes this counsel seriously, not merely by creating accounts and identities, but also by continuously investing in making them operationally meaningful for those who remain outside the formal economy. This is why the government's approach to JAM has been one of iterative refinement. Face authentication has been introduced alongside fingerprint biometrics to address authentication variability among elderly citizens and manual workers. Banking Correspondents and Common Service Centres have been expanded to ensure that the last-mile interface remains human, trusted, and locally embedded. The government is also actively investing in financial literacy through the Jan Dhan Darshak app, Pradhan Mantri Jan Dhan Yojana helplines, and panchayat-level outreach programmes to decentralise access to banking services.

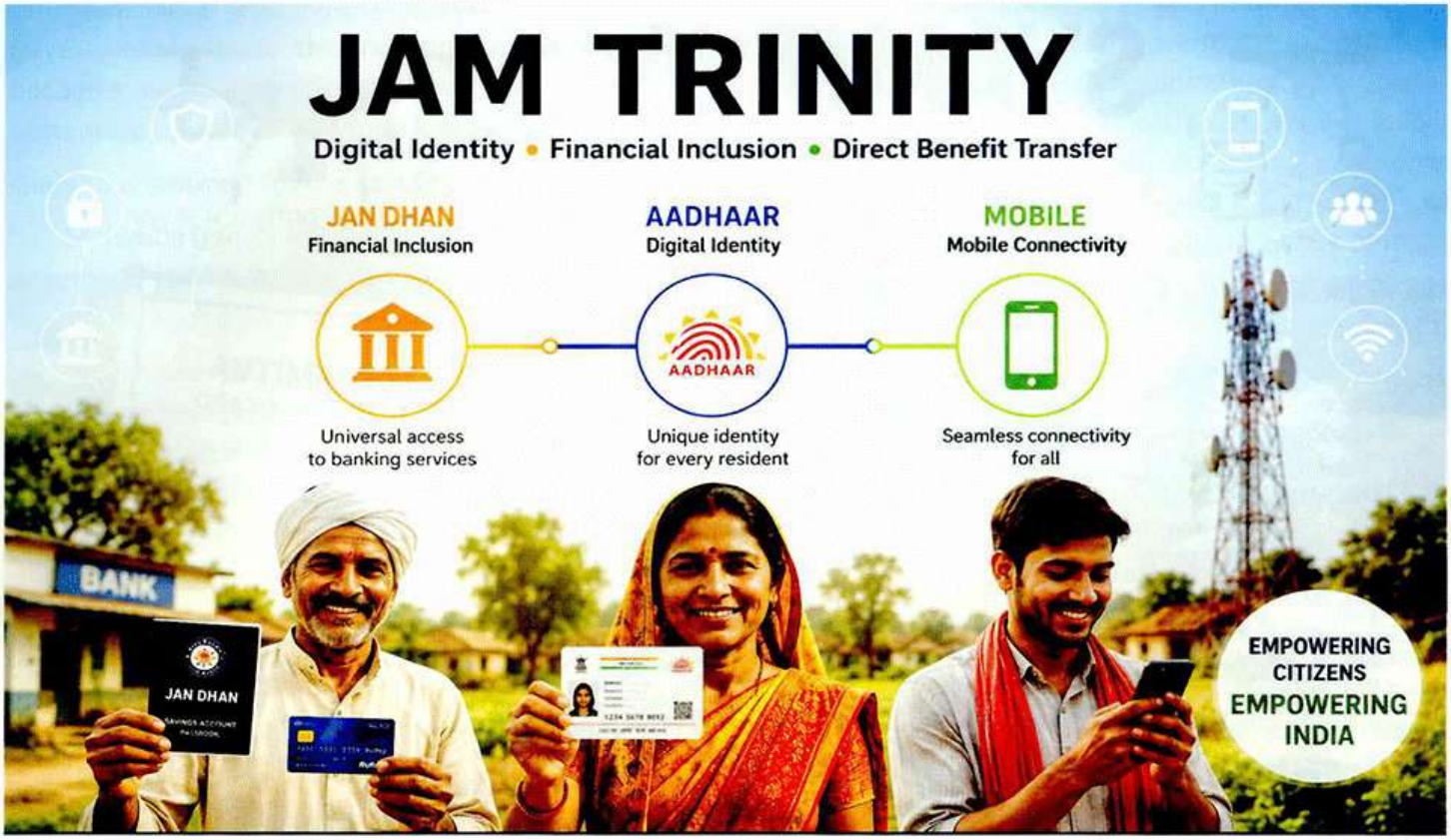
The Digital Innovation State

Globally, India's digital governance is often judged through the comparative lens of other countries. This framing misses something essential. India has not adopted another country's model; it has innovated its own. India has followed a philosophy of democratic infrastructure development that conceives connectivity not as a commodity, but as a public good to be made universally accessible. The India Stack, comprising UPI, Aadhaar, DigiLocker, Open Network for Digital Commerce (ONDC), and the emerging Agri Stack, is operationalising this vision at a national scale.

The distinctive feature of this architecture lies in the construction of a layered technological pathway. Unlike many Western economies, where private platforms have become the primary intermediaries between citizens and services, India has built its core digital infrastructure as an open, interoperable sovereign public good and invited both the private sector and government institutions to innovate within it. UPI processed over 185 billion transactions in FY 2024–25, and it remains a non-exclusive architecture.

ONDC separates e-commerce into three independent functions—discovery, fulfilment and payment—with each function capable of being provided by different service providers operating on a common protocol. A seller onboarded through one application becomes accessible to buyers across all applications on the network, without any single platform intermediating the entire transaction. This structural decoupling reduces the leverage that vertically integrated platforms often use to impose high commission rates on merchants.

Moreover, 5G connectivity has now reached a substantial majority of Indian districts, with 85 per cent of the population having access to high-speed mobile internet. Smartphone penetration has reached 85.5 per cent of households. The UMANG platform offers a single-window interface to over 2,400 government services. DigiLocker has issued authenticated documents to over 67.63 crore active users.



SVAMITVA and the Question of Land

Kautilya devoted considerable attention in the Arthashastra to land measurement and record-keeping, understanding them as foundational instruments of both revenue administration and rural justice. A king who does not know the land his subjects occupy cannot protect their rights over that land.

For decades after independence, agricultural land was systematically mapped and recorded, but residential land in villages remained legally invisible. People lived on land whose ownership they could not formally prove and, as a result, they could not access institutional credit against their homes. They also remained perpetually vulnerable to boundary disputes, with little documentary basis for legal redressal.

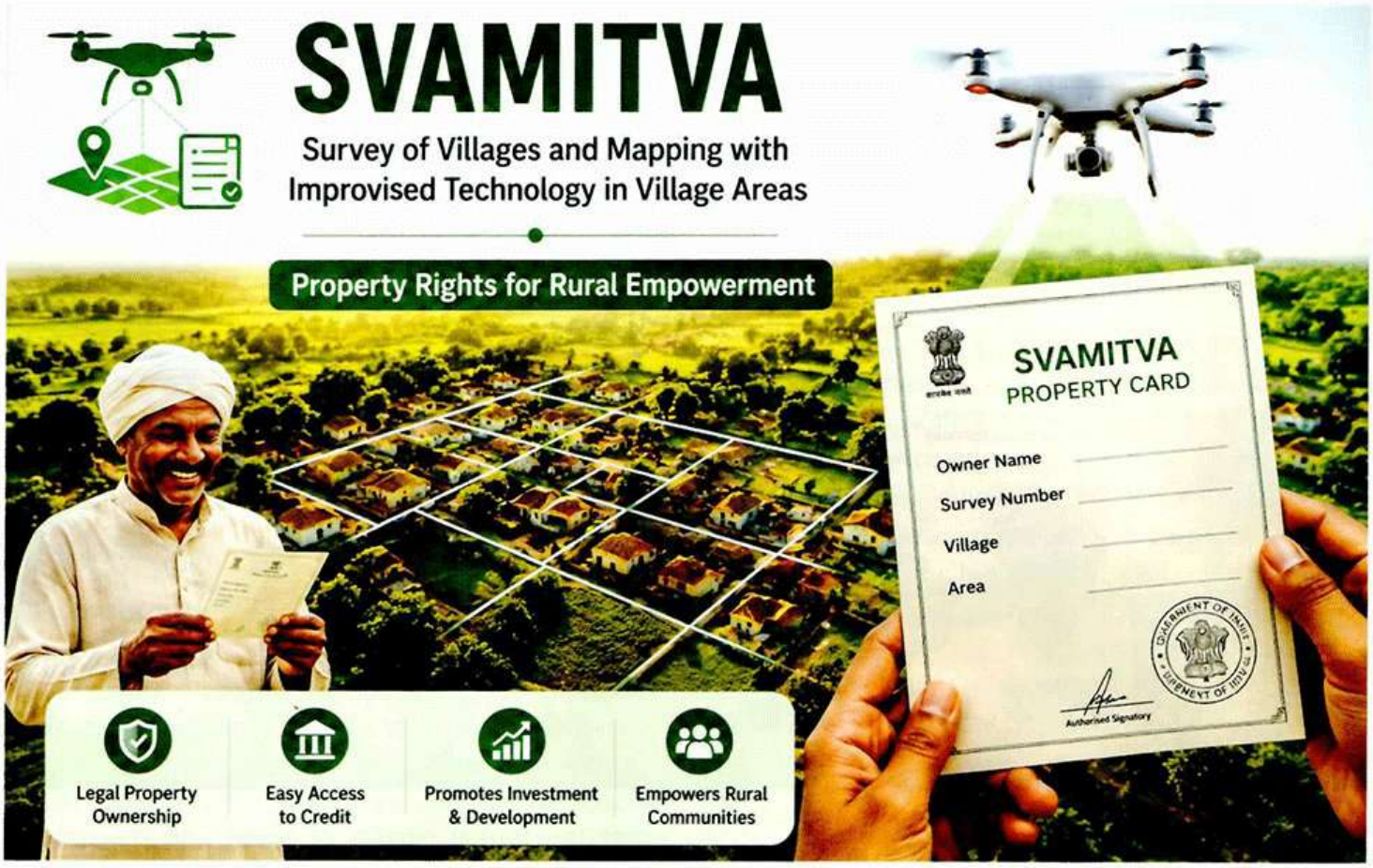
The SVAMITVA (Survey of Villages Abadi and Mapping with Improvised Technology in Village Areas) scheme addresses this challenge through precision technology. Drone-based surveys combined with Continuously Operating Reference Stations (CORS) deliver geo-referencing accuracy within five centimetres, generating property records that are both legally valid and judicially defensible.

In many developing economies, informal property rights have remained a form of 'dead capital'—physically present, yet legally invisible and unable to enter the formal circuits of credit and investment. SVAMITVA is precisely aimed at converting the informal into the formal. A rural household holding a SVAMITVA property card can now approach a scheduled bank for institutional credit. The difference between a bank's lending rate and an informal moneylender's rate is often the difference between manageable debt and a debt trap.

The significance of SVAMITVA extends beyond individual access to credit. The high-resolution spatial data being generated across villages provides the basis for accurate Gram Panchayat property tax assessment, thereby creating a stronger local fiscal base. It also supports the development of Digital Twin models for disaster resilience planning in flood-prone and geographically vulnerable communities. Land records, therefore, are instruments of both individual justice and state capacity.

The Agri Stack and the Kisan

India's transition towards Agriculture 4.0—the integration of AI, IoT, satellite remote sensing, and data analytics into farming—is being pursued through an integrated framework. The Comprehensive Agriculture Management System (CAMS), under the national Agri Stack, connects land records, weather data, subsidies, yield patterns, and crop insurance through a unified digital platform.



Post-harvest losses in India account for nearly 15 per cent of production value, while information asymmetries continue to allow middlemen to extract disproportionate value between the farm gate and the consumer. To address this, satellite-based crop monitoring, AI-enabled pest prediction, and soil moisture sensors are increasingly being deployed.

However, to enable farm households to effectively utilise the data they generate, there is an urgent need to modernise and strengthen agricultural extension services. This would ensure that the informational value created through farmers' participation in the digital ecosystem translates into better advisory services, improved credit access, and more efficient price discovery.

This represents an important opportunity to develop the Agri Stack into one of the world's most farmer-centric agricultural data infrastructure.

BHASHINI

Language is not merely a medium of communication, but also a bearer of civilisational consciousness. BHASHINI, India's National Language Translation Mission, has evolved into the country's first shared digital public infrastructure for language AI. As of early 2026, the platform hosts over 350 optimised AI models delivering real-time translation, speech recognition, and text-to-speech services across 22 scheduled languages and 14 additional tribal and regional languages.

Its open APIs (Application Programming Interfaces) now power numerous government platforms, including PM-Kisan, UIDAI, eSanjeevani telemedicine services, grievance redressal portals, and Indian Railways passenger services. This represents a profound demonstration of substantive citizenship.

Likewise, SabhaSaar, an AI-enabled tool built on BHASHINI, strengthens grassroots citizenship. Panchayat officials upload audio or video recordings of Gram Sabha meetings through their e-GramSwaraj login, and the tool transcribes, translates (currently in 13 Indian languages), and summarises the proceedings in a structured manner. Since its rollout, SabhaSaar has recorded more than five lakh engagements daily across India's 2.55 lakh village panchayats.

Gram Sabha proceedings contain some of the richest repositories of local knowledge in Indian governance, including land tenure practices, ecological wisdom, and community dispute resolution norms, much of which has historically remained undocumented. When these deliberations are captured in a structured and

searchable form and integrated into Gram Panchayat Development Plans, the resulting knowledge base becomes significantly more robust. This represents a bottom-up preservation of local knowledge.

Gandhian Talisman for the Last Person

Mahatma Gandhi left behind a talisman that belongs as much to the vocabulary of public administration as to moral philosophy:

"Whenever you are in doubt, recall the face of the poorest and weakest man whom you may have seen, and ask yourself if the step you contemplate is going to be of any use to him. Will it restore him control over his own life and destiny?"

This remains the ultimate test of Antyodaya and perhaps the most rigorous evaluative framework for any welfare programme.

So far, nearly 58 crore Jan Dhan bank accounts, 271 billion digital transactions in FY 2025–26, tap water connections in nearly 85 per cent of rural households under the Jal Jeevan Mission, and over 67 crore DigiLocker users together represent a substantial advancement in the condition of ordinary citizens.

The governance challenge now is to ensure that this momentum reaches the remotest tribal and rural regions of the country. Atal Tinkering Labs in schools, which engage students in design thinking, Atal Incubation Centres in Tier-2 and Tier-3 cities, and startups, including women-led enterprises, represent India's long-term investments in critical skill development and innovation capacity.

India's DPI as a Global Contribution

The ancient Indian concept of *Vasudhaiva Kutumbakam* (the world is one family) has found a concrete institutional expression in India's active sharing of its Digital Public Infrastructure (DPI) architecture with the global community. Through the G20 DPI framework, India has helped establish a multilateral foundation for open and interoperable digital governance as a global norm.

The Modular Open-Source Identity Platform (MOSIP), developed drawing upon lessons from the Indian experience, is now deployed in Ethiopia, Morocco, the Philippines, Sri Lanka, and more than a dozen other countries. Similarly, UPI is interoperable with payment systems in Singapore, the UAE, Mauritius, Nepal, and France, with further expansion underway.

This reflects a form of development statecraft rooted in the Indian tradition, where governance knowledge is shared not as an instrument of cultural imposition, but as a voluntarily offered global public good. Ancient India's contributions to mathematics, medicine, astronomy, and statecraft were never framed as instruments of leverage. They were shared in the spirit of "बहुजन सुखाय, बहुजन हिताय" — for the happiness and welfare of the larger community.

Next Frontier of Ambition

Every governance project of civilisational ambition carries within its achievements the blueprint for its next phase. India's technology-led development architecture is no exception, and the challenges ahead are best conceived as the coordinates of the next stage of development.

The task of deepening last-mile digital access in low-connectivity and geographically remote regions is becoming a catalyst for developing ever-improving governance solutions. India's investments in satellite broadband, community Wi-Fi networks, and multipurpose AI systems capable of functioning even without continuous internet connectivity are precisely the kind of frontier innovations that will define the next generation of inclusive digital infrastructure.

The investments required in human capital, particularly in enhancing the digital capacities of elected Panchayat representatives, frontline health and nutrition workers, and rural entrepreneurs, present an opportunity to redefine the meaning of local governance in the 21st century. Programmes that equip Sarpanches to use spatial data for village planning, train ASHA workers to interpret AI-generated health advisories, and help Farmer Producer Organisations participate in ONDC-enabled markets represent investments in a new category of public service.

In this light, the path to *Viksit Bharat 2047* runs through these very challenges. The Bhagavad Gita's concept of *Lokasamgraha*, meaning action undertaken for the welfare and coherence of the world, offers perhaps the most appropriate philosophical framework for the developmental enterprise India is undertaking.

It represents governance in its deepest sense: the creation of infrastructure through which millions of citizens can realise their capabilities, exercise their rights, and participate in the economy and polity in a dignified manner. ❑