

From UPI to ONDC: The role of centralised orchestration in DPI success

By Balakrishnan M and Srinivasan R| Jun 26, 2025

India's digital public infrastructure has delivered mixed results. What separates runaway successes like Aadhaar and UPI from under-leveraged platforms? The answer lies in purposeful design, centralised orchestration, and a clear reason to use it



In both Aadhaar and UPI, centralised orchestration met a pressing need. Scale followed, not as an accident, but by design. Image: Shutterstock

India has emerged as a global pioneer in building Digital Public Infrastructure (DPI). Aadhaar, Unified Payments Interface (UPI), DigiLocker, Account Aggregator (AA), Open Network for Digital Commerce (ONDC), and Digital Infrastructure for Knowledge Sharing (DIKSHA) are bold initiatives designed to create population-scale digital systems to solve complex public problems. Yet, their outcomes have been mixed. While Aadhaar and UPI have seen widespread adoption and impact, others like DigiLocker, AA, ONDC, and DIKSHA

are still in various stages of evolution.

What explains this divergence? The core hypothesis is this: centralised orchestration, combined with a compelling use case, is the primary driver of successful DPI adoption. In contrast, infrastructures that rely on ecosystem-driven, ground-up adoption tend to require longer timelines and more coordination to scale effectively.

Centralised Orchestration and Popular Mandate: Aadhaar and UPI

Take Aadhaar. Launched as a centrally designed identity layer with government backing, Aadhaar's success stemmed not only from the robustness of its biometric system or the scale of enrollment (137 crores or 1.37 billion IDs issued) but also from its clear and immediate utility. Linked early to welfare services, subsidies, and KYC processes, Aadhaar now sees over 200 crore authentications monthly—including more than 15 crore face authentications and 45 crore e-KYC transactions—with daily usage exceeding nine crore authentications.

Similarly, UPI began as a top-down initiative of the Reserve Bank of India and NPCI. Its success was driven by government backing, regulatory alignment, and a highly relatable use case—instant, mobile-friendly payments. The growth of merchant payments was further enabled by a ubiquitous, QR code-based, asset-lite acceptance infrastructure. UPI also benefitted from favourable timing: demonetisation, rapid smartphone adoption, low mobile data costs, and private sector innovation from players like Google Pay, PhonePe, and Paytm. The result: over 185 billion transactions worth ₹280 trillion in FY 2024–25.

Crucially, UPI was built as a neutral public rail—equally accessible to banks, fintechs, big tech platforms, and even small merchants seeking to accept digital payments. It represents a combinatorial innovation, seamlessly stitching together four core elements: instant payments, APIs and SDKs, third-party payment initiation, and QR codes. Its API-based architecture enabled rapid innovation while maintaining trust, security, and consistency. The low-cost, QR-based acceptance infrastructure further democratised access. This purposeful orchestration ensured scale, inclusiveness, and resilience across the digital payment ecosystem.

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Infrastructure, Institutions, and Governance: DIGIT

The eGov Foundation's Digital Infrastructure for Governance, Impact & Transformation (DIGIT) platform offers another compelling example of urban governance. DIGIT is a digital infrastructure for municipal administration, offering 13 applications for property tax, sanitation, building permissions, birth and death registration, finance management, and grievance redressal.

By 2024, DIGIT had reached over 3,500 urban local bodies across 16+ states, impacting

more than 150 million citizens. However, adoption and usage vary widely by state and municipality. The variance is not technological but institutional: staff training, digital literacy, and administrative incentives are often lacking.

DIGIT's experience underscores a broader insight—technology cannot substitute for institutional capacity. Even a well-built DPI needs alignment across infrastructure, governance capacity, and use-case relevance. Where states invested in training and incentivised usage, results improved. In others, usage remained shallow.

This illustrates that DPI's success in governance depends on aligning digital infrastructure with institutional readiness and governance processes. Orchestration here is top-down and needs lateral and vertical alignment across institutions.

Incentives and Use Cases Drive Broader Ecosystem Participation

Unlike Aadhaar or UPI, bottom-up DPI models like Account Aggregator require greater effort to gain traction. Despite a strong policy framework and 81 financial institutions onboarded as of 2024, AA's user adoption remains low. Banks hesitate to invest in integration, consumers lack awareness, and Fintechs face usage hurdles.

AA's core promise—consumer control over financial data—is futuristic but indirect in its value. Without a pressing use case, users don't flock to it. Future growth depends on its integration into visible applications like loan eligibility, personal finance, or insurance. Until then, the scale will be elusive.

DigiLocker, similarly, has 43.5 crore users and has issued 9.4 billion documents. Yet daily active usage is modest, confined largely to select government departments. The utility is real but sporadic. Without a compelling reason to use it frequently, DigiLocker remains under-leveraged.

ONDC (Open Network for Digital Commerce) was launched in 2022 to enable decentralised, interoperable e-commerce. By late 2024, it had spanned 600+ cities and 775,000+ sellers, with 14.4 million orders in November alone. Still, much of the traffic is concentrated in limited domains like food and mobility, and buyer experience remains inconsistent across platforms.

ONDC shows that user-side stickiness and consistent quality take time, even with public investment and institutional support. Network effects do not emerge automatically—they must be earned through design, reliability, and perceived value.

India's education sector features DIKSHA as a standout example of a Digital Public Infrastructure. Built on the open-source Sunbird platform, DIKSHA adopts a hybrid model—combining centralised infrastructure with federated execution by individual states. It supports over 200 million students and 7 million teachers and delivers content in 36 languages, with more than 5.8 billion learning sessions recorded. Its agility during the COVID-19 pandemic—especially through innovations like QR-coded textbooks and scalable teacher training—demonstrates how local adaptation, daily utility, and institutional

embedding can drive both reach and impact in education delivery.

These examples—from identity to payments, governance, education, and commerce—underscore a critical insight: every DPI, regardless of domain or design, requires some form of orchestration. Centralised models like Aadhaar and UPI succeeded through mandates and immediate utility. Federated or ecosystem-driven platforms like DIGIT, ONDC, and DIKSHA show that success also hinges on aligning infrastructure with institutional capacity, localised relevance, and clear user incentives. Even technically sound DPIs like AA and DigiLocker struggle without visible daily value. Ultimately, centralised or distributed orchestration must include standards, incentives, and persistent feedback loops. DPI adoption is not automatic; it must be earned through purposeful design, aligned governance, and real-world impact.

When to Orchestrate and How

India's DPI story shows that success is not about choosing between top-down and bottom-up models but knowing when to use which. Centralised orchestration works best when scale and urgency are critical. Ecosystem orchestration is better when innovation, decentralisation, and iterative development are needed.

Domains like finance or identity benefit from standardisation and strong oversight—hence, Aadhaar and UPI thrived. In contrast, sectors like urban governance and commerce may require more adaptive models, combining government stewardship with active ecosystem roles.

In each case, orchestration must be matched by a clear value proposition. Adoption depends on how tangibly the DPI improves lives or operations, whether centralised or distributed. Timely utility, not just theoretical potential, drives participation.

Building a DPI Strategy for the Future

As India expands DPI to new domains—Education, health, agriculture, justice, and others—the lessons become clearer. Success demands:

- A strong architectural backbone that enables interoperability and security
- Alignment between infrastructure, institutional capacity, and governance
- Ecosystem incentives—both immediate and sustained
- Feedback loops to continuously evolve the DPI based on real-world use

Policymakers must ask: What pressing problem does this DPI solve? Who will benefit immediately? What nudges will accelerate adoption?

India has already demonstrated that DPI can transform public service delivery. The next wave of success will depend on bold designs and whether those designs are tied to purpose, people, and results.

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