



Compendium of Learnings

The Community of Practice (CoP)
Digital Public Infrastructure for
Development (DPI4D)



December 2025

Compendium of Learnings

Pratiksha Chaturvedi & Shailly Gupta

Authors' emails: pchaturvedi@icrier.res.in; gshailly@icrier.res.in

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Published in

December 2025

Cover, Graphics and Layout

Litmus.Ink

Recommended citation

Chaturvedi, P. & Gupta, S. (2025). Compendium of Learnings, the Community of Practice on Digital Public Infrastructure for Development (DPI4D). Indian Council for Research on International Economic Relations (ICRIER).

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Disclaimer

This is a best-faith effort to summarise the learnings from the virtual seminars held as part of the Community of Practice, as have been presented time to time. They, in no manner, represent the views of ICRIER.

Acknowledgements

This compendium is a product of the ICRIER–Gates Foundation Community of Practice (CoP) Digital Public Infrastructure for Development (DPI4D). The authors would like to thank Pranay Sinha, Sanjay Jain, and Kanwaljit Singh (Gates Foundation) for their continuous support to the CoP. Appreciations are also in order for Pramod Bhasin, Shekhar Aiyar, Payal Malik, Deepak Mishra (ICRIER), Mansi Kedia and Sruthi Vanguri. We would like to express our gratitude to Raj Kumar Shahi, Anvi Mehta, Mehak Aggarwal (ICRIER) and Chhaya Singh (ICRIER) for their support in the organisation and documentation, IT, communications and outreach efforts for the CoP seminars and for proofreading and publication of this compendium. We are also grateful to Aswathy Gopinath for copyediting this compendium. ICRIER takes this opportunity to thank each of the Community's 32 member organisations and horizontal associates for their commitment to making the CoP a success.

All errors remain our own.

Foreword



**Dr. Shekhar Aiyar, Director & CE
ICRIER**

The Indian Council for Research on International Economic Relations (ICRIER) is proud to present this Compendium of Learnings: an amalgamation of key lessons on Digital Public Infrastructure (DPI) from twelve virtual seminars of the Community of Practice (CoP), “Digital Public Infrastructure for Development (DPI4D)”.

Launched in partnership with the Gates Foundation in September 2024, this CoP aims to facilitate cross-border learning through research-based dialogue for a comprehensive understanding of DPI and its roll out. While DPIs are being increasingly adopted by countries, policy research involving the development impact of DPIs has lagged behind. To fill this gap, our thirty-two CoP member organisations from seventeen countries plus horizontal associates bring much needed economic and multi-disciplinary research, rigour, and grassroots insight to our DPI conversations.

Our CoP is uniquely positioned at the nexus of policy and practice on DPI. The DPI4D serves both peer-to-peer learning and the sharing of good practices and challenges. As the mantle of the G20 passes on from emerging market economies, our CoP aims to evaluate the challenges and opportunities for reimagining the future evolution of DPI. The DPI challenges analysed in the CoP can also be transformed into creating opportunities for furthering DPI.

On behalf of ICRIER, I would like to thank all members and horizontal associates for their extensive and invaluable contributions. We at ICRIER have planned a series of activities for the forthcoming year, and I am hopeful that we will further expand our global footprint. We look forward to inviting new members and partnering with new Global South and Global North organisations that focus on DPI issues, especially in Africa, South-East Asia, the MENA region and Europe.

Thank you to the ICRIER team for their efforts in compiling this compendium of learnings. We hope you benefit from the compendium, and we would be grateful for your feedback.

Community of Practice (CoP) DPI4D Members



Centre for Technology and Society at FGV (CTS-FGV)



Data Privacy Brasil Research



Institute for Internet and Society



Centre for European Policy Studies (CEPS)



Centre for International Governance Innovation (CIGI)



Egyptian Center for Economic Studies



Carnegie India



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Artha Global



Centre for Digital Public Goods, IIM Bangalore



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The Brookings Institution



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Digital Impact Alliance (DIAL)



Global Development Network (GDN)



Ethiopian Economics Association (EEA)



Open North



South Asian Network on Economic Modeling (SANEM)



African Center for Equitable Development (ACED)



Center for Information Technology Policy

CoP DPI4D Horizontal Associates



EkStep Foundation



Centre for India and Global Business

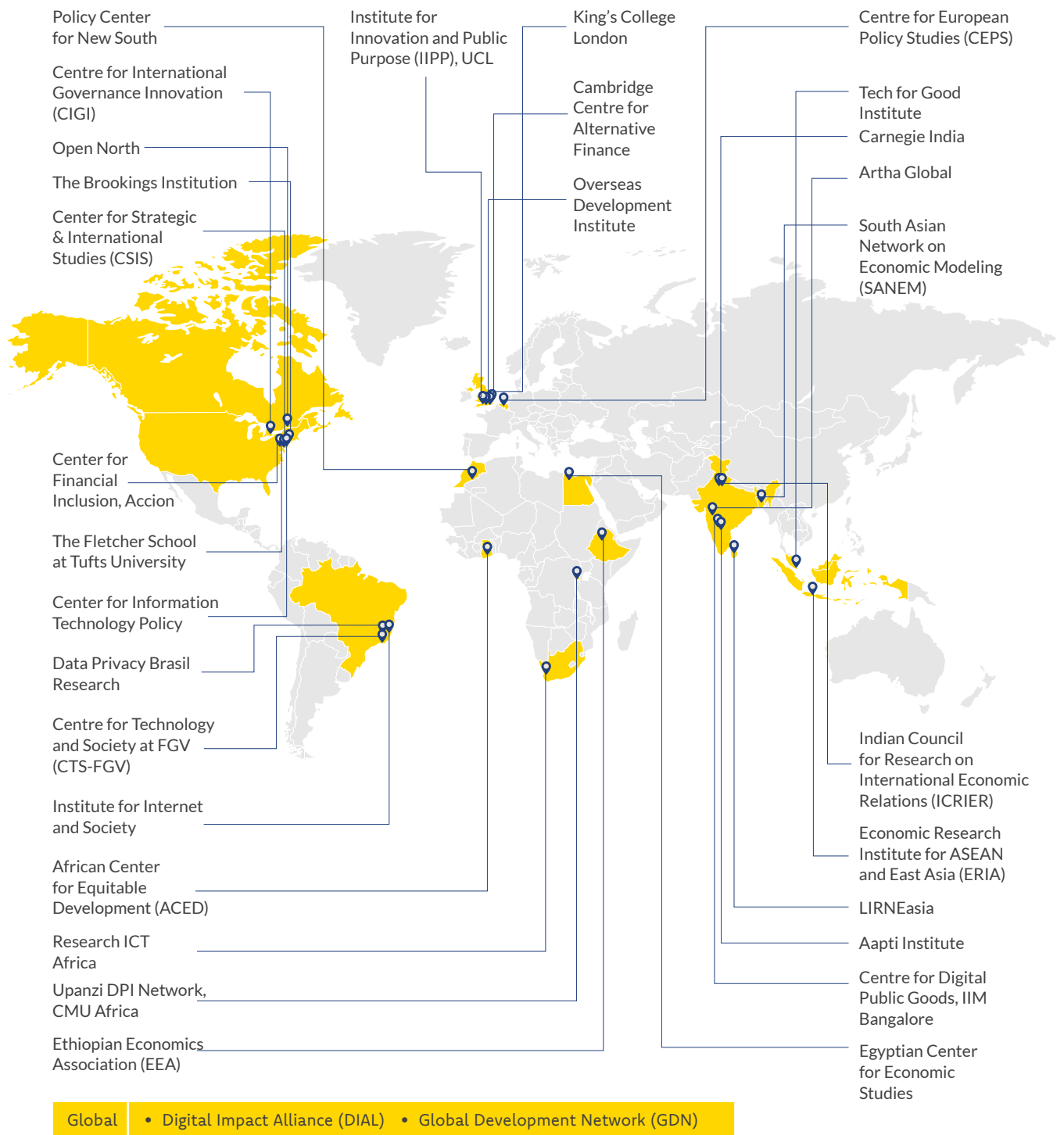


Dvara Research



Genesis Analytics

CoP DPI4D Community Landscape

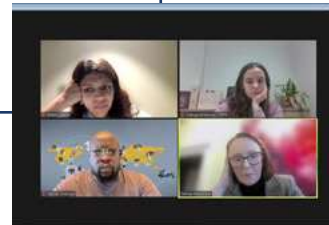
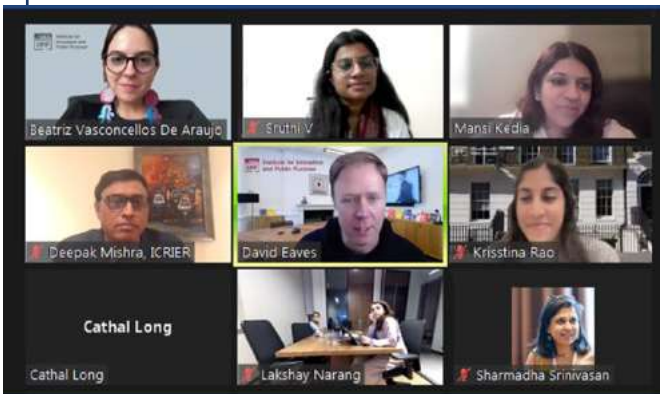


CoP Seminars

Since its inception in September 2024, the Community of Practice (CoP) has met every month virtually at seminars and roundtable discussions hosted by ICRIER and CoP members, discussing topics pertaining to their latest DPI-related research and issues for cross-country deliberations. The discussions have been on the following topics:

- 1. Digital Public Infrastructure for Sovereign AI: A View from the BRICS**
11 November 2024, *Fundação Getulio Vargas (FGV) and ICRIER*
- 2. DPI Safeguards Framework – Building Safe and Inclusive DPI**
14 November 2024, *Digital Impact Alliance (DIAL) and United Nations Office for Digital and Emerging Technologies (ODET)*
- 3. Unpacking the “Public” in DPI and Exploring Country Examples Using the DPI Map**
10 December 2024, *Institute for Innovation and Public Purpose (IIPP)*
- 4. Role of DPI in Advancing Progress Towards SDGs**
17 December 2024, *The Brookings Institution*
- 5. The DPI Academy: Building Capacity for DPI**
24 January 2025, *Artha Global*
- 6. Beyond the Tipping Point: How Climate Data can Decide our Future**
11 February 2025, *Digital Impact Alliance (DIAL)*
- 7. Building the European DPI: Rationale, Options and Roadmap**
03 April 2025, *Centre for European Policy Studies (CEPS)*
- 8. Digital Public Infrastructure & Digital Financial Services: Regulatory Considerations**
21 May 2025, *Cambridge Centre for Alternative Finance*
- 9. The State of the Digital Planet and Implications for DPI, AI Adoption and Sustainable Development**
17 June 2025, *The Fletcher School at Tufts University*
- 10. Evaluative Research on the Socioeconomic Impact of DPI**
17 July 2025, *Global Development Network (GDN) | African Center for Equitable Development (ACED) | Ethiopian Economics Association (EEA) and South Asian Network on Economic Modeling (SANEM)*
- 11. Towards an Integrated Data Governance Framework for DPI**
27 August 2025, *Research ICT Africa | ICRIER and Open North*
- 12. The Digital Public Infrastructure (DPI) Roadmap Playbook: Good Practices to Achieve Inclusive and Impactful Digital Transformation**
10 September 2025, *Digital Impact Alliance (DIAL)*

Glimpses – CoP in Action



Learnings from CoP DPI4D

At the New Delhi G20 Leaders' Summit in 2023, the Leaders recognised Digital Public Infrastructure (DPI) as being vital for financial inclusion, inclusive growth, and sustainable development.¹ Over time, DPI has developed globally through strong technical collaboration between technologists, innovators, governments, and businesses. However, rigorous, multi-disciplinary research has gaps, particularly in economic policy. This limits opportunities for cross-border learning, hindering a comprehensive understanding of the impact of DPI, the associated challenges, and the lessons from use cases.

To address this, a Community of Practice (CoP) on DPI for Development (DPI4D) was launched in September 2024 by ICRIER, in partnership with the Gates Foundation. This CoP, currently comprising 32 member organisations from 17 countries and horizontal associates, fosters a research-based dialogue among global think tanks and academia. Between September 2024 and September 2025, DPI4D convened 12 global virtual seminars, moving beyond definitions of DPI to the realities of designing, governing, and evaluating DPI for development. The following are some core insights that emerged from monthly discussions, highlighting critical tensions, consensus points, and the evolving future agenda for DPI.

1. The “Public” in DPI is the Defining Challenge: The Role of the State

Defining and operationalising the “publicness” of DPI is not a semantic debate but a foundational governance issue.

- **Beyond Technicality:** Infrastructure is never neutral.² The values embedded in DPI, from its architectural choices to its governance models, directly shape societal outcomes. The prevailing techno-utopian narrative must be supplemented with a robust, normative framework focused on the common good.
- **The Governance Imperative:** The principles of a human-centric DPI based on guaranteed access, public management, grievance redressal, and enhanced public participation are essential.³ The [UN Universal DPI Safeguards Framework](#)⁴ provides

¹ G20 Bharat 2023 India. (2023). G20 New Delhi Leaders' Declaration. G20. Available at: https://www.g20.in/content/dam/gtwenty/gtwenty_new/document/G20-New-Delhi-Leaders-Declaration.pdf

² Seminar #3: Unpacking the “Public” in DPI and Exploring Country Examples Using the DPI Map | Institute for Innovation and Public Purpose (IIPP)

³ Seminar #1: Digital Public Infrastructure for Sovereign AI: A View from the BRICS | Fundação Getulio Vargas (FGV) and ICRIER

⁴ Seminar #2: DPI Safeguards Framework – Building Safe and Inclusive DPI | Digital Impact Alliance (DIAL) and United Nations Office for Digital and Emerging Technologies (ODET)

a crucial lifecycle approach to embed these principles, though its actionability remains a key challenge.

- **State as Orchestrator:** The state must play a renewed role as a guarantor of public value, orchestrating multi-stakeholder ecosystems rather than merely outsourcing digital transformation to the private sector. The state also has a role to play to fulfil the promise of ‘open data’.⁵

2. DPI as an Instrument for Sovereignty

The connection between DPI and Artificial Intelligence (AI) has emerged as a powerful combination for sustainable development and sovereignty, particularly in the Global South.

- **Mutual Reinforcement:** AI can enhance DPI by strengthening state capacity and enabling the automation of public services. DPI’s core architecture of data governance, interoperability, and secure sharing provides states with the foundation to build indigenous AI capabilities. By doing so, DPI and AI can reinforce each other,⁶ allowing countries to reduce their dependence on foreign platforms and proprietary models, anchoring digital sovereignty in their own institutional frameworks.
- **Geopolitical Dimension:** The BRICS perspective on DPIs⁷ is different from the European “Eurostack” vision.⁸ Initiatives such as Brazil’s Pix demonstrate how DPI can reclaim digital sovereignty and reshape market dynamics. The key point is to avoid new dependencies on single providers, which is a vital lesson for fragile states.⁹ Further, data governance cannot be divorced from its geopolitical context.¹⁰

3. Implementation in Country Contexts: The Whole-of-Government Approach

Digital transformation requires structured, country-specific roadmaps built on readiness assessments, political will, and clear objectives.¹¹ Examples from India, South Africa, Kenya, Rwanda, and Ghana highlight different approaches, such as the value of collaborative, incremental, and human-centred approaches, in making DPI truly transformative for societies.

⁵ Seminar #11: Towards an Integrated Data Governance Framework for DPI | Research ICT Africa, ICRIER and Open North

⁶ Seminar #1: Digital Public Infrastructure for Sovereign AI: A View from the BRICS | Fundação Getulio Vargas (FGV) and ICRIER

⁷ Seminar #1: Digital Public Infrastructure for Sovereign AI: A View from the BRICS | Fundação Getulio Vargas (FGV) and ICRIER

⁸ Seminar #7: Building the European DPI: Rationale, Options and Roadmap | Centre for European Policy Studies (CEPS)

⁹ Seminar #4: Role of DPI in Advancing Progress Towards SDGs | The Brookings Institution

¹⁰ Seminar #11: Towards an Integrated Data Governance Framework for DPI | Research ICT Africa, ICRIER and Open North

¹¹ Seminar #12: The Digital Public Infrastructure (DPI) Roadmap Playbook: Good Practices to Achieve Inclusive and Impactful Digital Transformation | Digital Impact Alliance (DIAL) and ICRIER

- **Country-Specific Roadmaps:** The DPI Roadmap Playbook provides a step-by-step, evolving guide for countries to build and implement DPI systems. No country is a true “greenfield” in digital transformation. Before developing a roadmap, countries must assess existing plans, resource availability, and policy fragmentation.
- **Whole-of-Government Implementation Approach:** Success depends on inclusive design, interoperability, sustainability, and an iterative implementation of DPI, supported by adequate resources, monitoring, and accountability across government. Trust-building, transparency, and grievance-redressal mechanisms are critical. The engagement of courts, civil society, and media enables a “whole-of-society” approach.

4. From Implementation to Impact: The Measurement Gap

A significant evolution in the discourse has been the shift.

- **The Need for Metrics:** DPI must be evaluated through defined socioeconomic metrics, i.e., citizen satisfaction, market competitiveness, revenue gains, time savings, and inclusive growth, rather than just adoption rates.¹²
- **Emerging Evidence of Impact:** Pilot studies in Bangladesh, Benin, and Ethiopia¹³ have begun quantifying the impact of DPI in terms of billions of dollars and working days saved. However, such evidence has also revealed persistent challenges: digital divides (which have seen slower convergence post-pandemic¹⁴) influenced by gender and location, connectivity issues, lack of infrastructure, and the critical role of digital literacy.
- **Climate Data Frontier:** DPI-like models can enable open, trusted, and inclusive data systems for climate action.¹⁵ The imperative is to develop “tailored social licences” to build community participation and trust, which can help governments and communities in planning resilient, sovereign climate solutions.

¹² Seminar #1: Digital Public Infrastructure for Sovereign AI: A View from the BRICS | Fundação Getulio Vargas (FGV) and ICRIER; Seminar #2: DPI Safeguards Framework – Building Safe and Inclusive DPI | Digital Impact Alliance (DIAL) and United Nations Office for Digital and Emerging Technologies (ODET)

¹³ Seminar #10: Evaluative Research on the Socioeconomic Impact of DPI | Global Development Network (GDN), African Center for Equitable Development (ACED), Ethiopian Economics Association (EEA) and South Asian Network on Economic Modeling (SANEM)

¹⁴ Seminar #9: The State of the Digital Planet and Implications for DPI, AI Adoption and Sustainable Development | The Fletcher School at Tufts University

¹⁵ Seminar #6: Beyond the Tipping Point: How Climate Data can Decide Our Future | Digital Impact Alliance (DIAL)

5. Regulatory Systems are Struggling to Keep Pace

The convergence of digital identity, payments, and data exchanges is breaking down traditional sectoral silos, creating a regulatory crisis.

- **Silos are Obsolete:** As digital financial services converge with DPI,¹⁶ traditional regulatory models are becoming insufficient. The call is for integrated, adaptive, and cross-sectoral governance frameworks that can handle the complexities of interoperable systems.
- **The Capacity Bottleneck:** The need for massive capacity building is acute. The DPI Academy model¹⁷ addresses a critical gap in both technical and strategic governance skills for civil servants, which is a prerequisite for effective regulation and implementation.

6. Modernising Data Governance

DPI alone is not a substitute for robust governance. Without careful regulation, risks can reinforce existing inequalities and lead to data extractivism.¹⁸

- **Risks of Monopoly and Extractivism:** Digital platforms dominate value creation in major economies.¹⁹ A major concern is that private actors could control and monetise public data, recreating the same market concentration and data extraction problems that DPI is meant to solve.
- **The Unfulfilled Promise of Open Data:** For data to create true public value, it must be both technologically and legally open to everyone and not just for a few public-private partners. Past open-data initiatives have struggled with legal barriers and technical challenges in implementing this.
- **Evolving the Role of Data Protection Authorities (DPAs):** DPAs need to evolve from reactive enforcers to proactive and technically adept bodies that can provide counsel on DPI architecture and ensure user-centric and participatory governance. A significant challenge is making data rights meaningful and accessible for all, especially considering language and literacy barriers.
- **Rethinking Data Frameworks:** The current focus on protecting only personally identifiable information is insufficient. The conversation needs to move to a broader “right to data,” considering data as an extension of the self and ensuring user consultation on how users’ data is used.

¹⁶ Seminar #8: Digital Public Infrastructure & Digital Financial Services: Regulatory Considerations | Cambridge Centre for Alternative Finance

¹⁷ Seminar #5: The DPI Academy: Building Capacity for DPI | Artha Global

¹⁸ Seminar #11: Towards an Integrated Data Governance Framework for DPI | Research ICT Africa, ICRIER and Open North

¹⁹ Seminar #9: The State of the Digital Planet and Implications for DPI, AI Adoption and Sustainable Development | The Fletcher School at Tufts University

A Community for the Future

The Road Ahead

In the CoP's first year, it has successfully framed the core challenges in the realm of DPI: defining public value, ensuring sovereign innovation, measuring real-world impact, and mitigating data extractivism. Moving from theory to practice requires country-specific roadmaps, whole-of-government approaches, credible impact metrics, effective regulation, and data governance. These insights provide a compass for ensuring that implementation leads to equitable and sustainable development for all. DPI4D will continue to bridge research and policy gaps, generating evidence-based insights to guide governments, multilateral institutions, and communities towards safe, inclusive, and sovereign digital futures.

This compendium synthesises key insights from our year-long CoP discussions. It is designed to be a practical resource, serving as a playbook for practitioners, a reference point for policymakers, and a launch pad for future research. The next section organises the summaries of our virtual seminars around core thematic areas, each accompanied by questions aimed at provoking further thought. We hope these insights inspire our community to deepen its engagement with DPI research.



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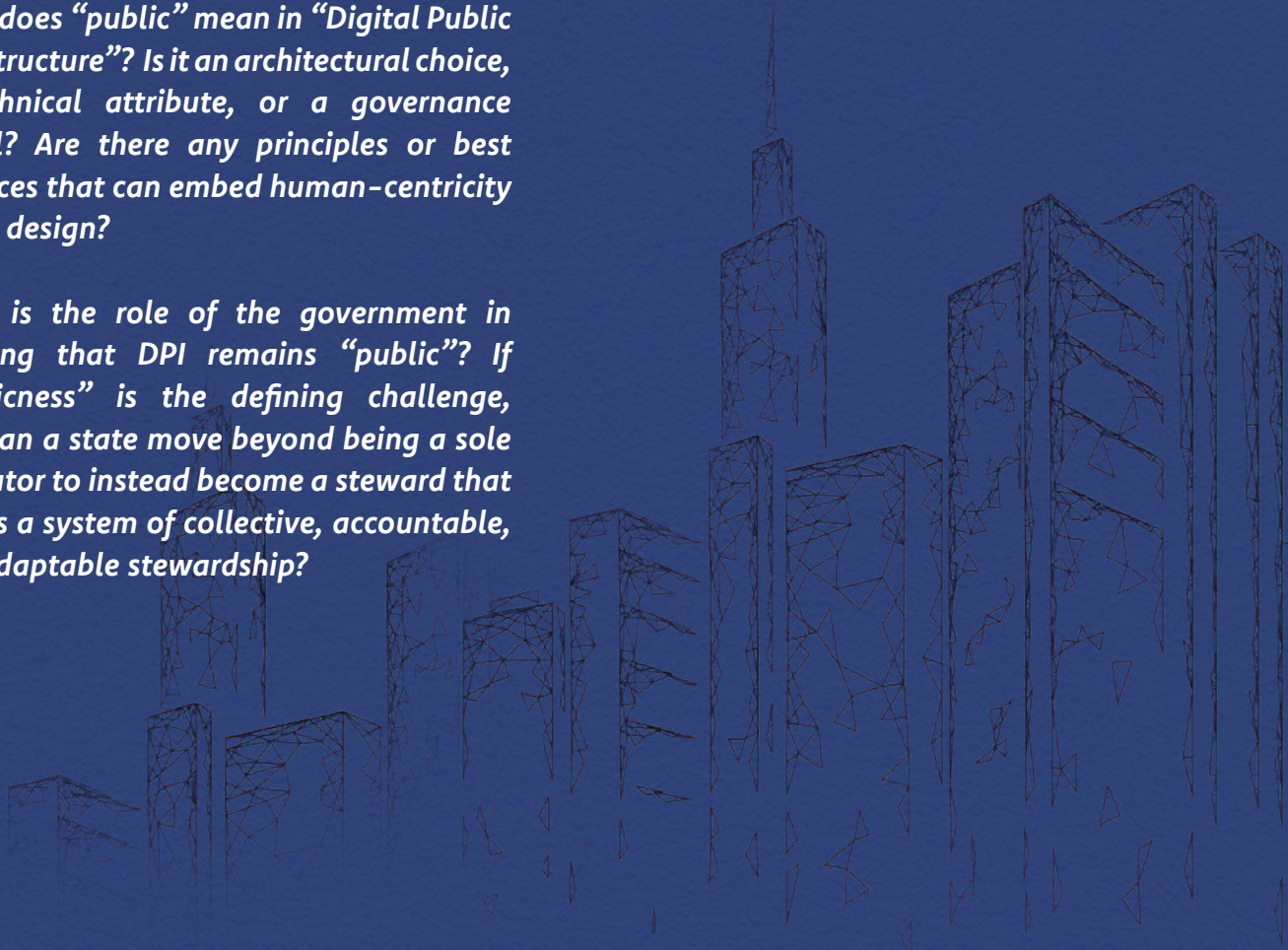
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01

The “Public” in DPI is the Defining Challenge **The Role of the State**

What does “public” mean in “Digital Public Infrastructure”? Is it an architectural choice, a technical attribute, or a governance model? Are there any principles or best practices that can embed human-centricity in DPI design?

What is the role of the government in ensuring that DPI remains “public”? If “publicness” is the defining challenge, how can a state move beyond being a sole regulator to instead become a steward that fosters a system of collective, accountable, and adaptable stewardship?



UNPACKING THE “PUBLIC” IN DPI AND EXPLORING COUNTRY EXAMPLES USING THE DPI MAP

Institute for Innovation and Public Purpose (IIPP)

“*What makes DPI public? There are two ways of framing infrastructure: through a functional (encompassing technical and economic aspects) and an attributes perspective, which are not mutually exclusive.*”

The presenters discussed the 2024 working paper titled, [“Digital Public Infrastructure and Public Value: What is ‘Public’ About DPI?”](#) authored by Mariana Mazzucato, David Eaves, and Beatriz Vasconcellos. They also presented their DPI map — a repository of digital identity, digital payments, and data-exchange systems deployed in countries across the world.

◆ *Key Takeaways from the Working Paper*

No infrastructure is neutral in directionality, and DPI is no exception. The current narratives through which different groups understand the publicness of DPI, although grounded in the broad concept of public interest, should be made explicit. One example is the framing of public benefits based on technical attributes, as opposed to a normative approach that provides functional perspectives on capabilities, economic value, and social value, among others.

Although making values explicit is an important and necessary step for public value creation, it is insufficient for public value maximisation. Public value maximisation must be a collective effort focused on outcomes and processes towards the common good. In this process, the state has a renewed role in guaranteeing and orchestrating DPI.

The ‘common good’ framework by Mazzucato (2023) and its five principles emerge as useful perspectives to strengthen DPI’s value-generation process with a focus on governance:



Source: Mazzucato, M.(2023)



◆ **Key Takeaways from the DPI Map**

The DPI map presents a view of DPI deployments, including digital identity, digital payment, and data exchange, in 210 countries. The reliability and validity of measurement and data-collection methodologies were established via peer reviews and consultations.

A clear definition of DPI is key to enhancing its measurement and unlocking its potential. However, given the current ambiguity in this area, using the funnel technique to measure DPis across three verticals can allow countries to customise the definition as they deem fit.

Countries at different income levels demonstrate unique and compelling DPI narratives. Distinct regional patterns in system deployments are undeniably shaping the global DPI landscape.

DPI SAFEGUARDS FRAMEWORK – BUILDING SAFE AND INCLUSIVE DPI

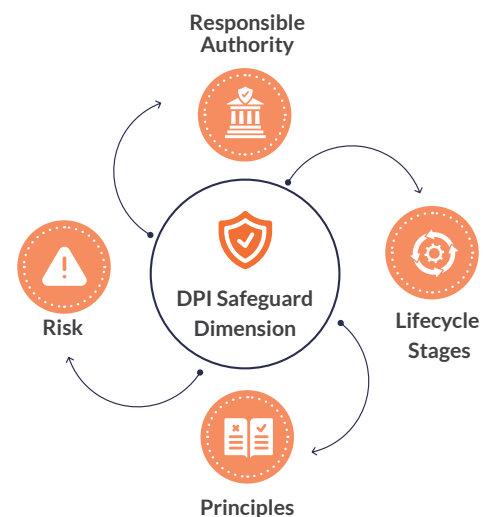
Digital Impact Alliance (DIAL) and United Nations Office for Digital and Emerging Technologies (ODET)

“ We wanted this framework to be adaptive to different country contexts. ”

The meeting discussed the development and design of the UN Universal DPI Safeguards Framework, including the approach followed by the working committees to put it together. As countries become more entrenched in the deployment of DPI, providing a reference framework to mitigate risks and ensure safe and inclusive DPIs becomes important.

◆ Highlights of the Framework

The framework adopts a multi-stakeholder co-creation process to adhere to data-protection principles, following a consensus-based approach, thus enabling the development of technical standards and the building mechanisms for cross-border governance. It is a living document that can evolve and adapt. There are challenges posed by heterogeneous views not only across stakeholders but also across countries. The framework has been built using the lifecycle approach, where risks and risk-mitigation strategies can be connected to different stages of DPI development and deployment. It focuses on the ecosystem approach, where there is a collective responsibility to ensure that DPIs are safe and inclusive. Every risk-mitigation strategy also identifies responsible stakeholders.



◆ Key Takeaways

The framework’s actionability remains a challenge; internal training and socialisation within organisations such as the United Nations Development Programme (UNDP) are necessary to ensure that the framework is effectively adopted and implemented. The focus on experiential learning orchestrated by the UNDP and the [Office of the UN Secretary-General’s Envoy on Technology](#) is aimed at testing out this framework for different DPIs. The recommendation was to use a “team of teams” structured convening process to help with the adoption of the Safeguards Framework. Regarding the identification and adoption of key metrics, successful implementation should be measured through clear metrics, such as citizen satisfaction and market competitiveness, which will guide both local and global oversight.

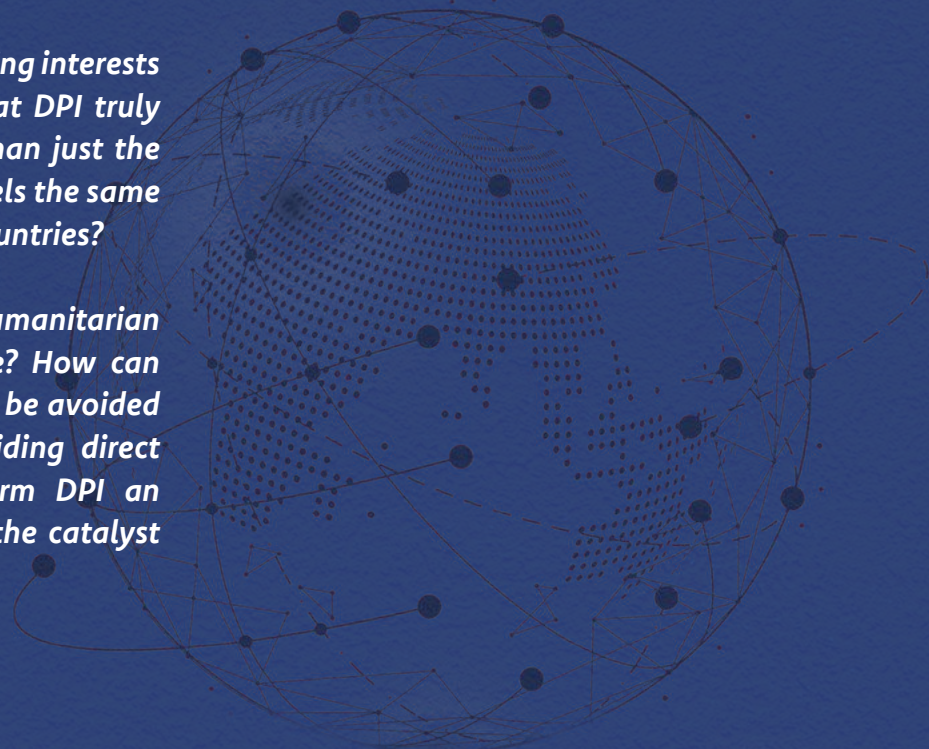
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DPI as an Instrument for Sovereignty

How can DPI promote digital sovereignty? Can a potentially sovereign DPI help countries to reclaim economic value and accelerate inclusive growth?

How do nations navigate competing interests and design choices to ensure that DPI truly empowers their citizens rather than just the state or the market? Are the models the same for developing and developed countries?

In fragile states facing humanitarian crises, what role does DPI serve? How can dependencies on single providers be avoided to ensure sovereignty? Is providing direct cash aid and building long-term DPI an either-or choice, or can one be the catalyst for the other?



THE STATE OF THE DIGITAL PLANET AND IMPLICATIONS FOR DPI, AI ADOPTION, AND SUSTAINABLE DEVELOPMENT

The Fletcher School at Tufts University

“One of the biggest growth engines, across economies, is the digital economy. And the growth multiplier of the digital economy increases as a country gets richer. So we have to think what are the different levers to push to grow the digital economy.”

A comprehensive overview of the global digital landscape was presented, and the research efforts at the Digital Planet research programme for tracking the evolution of the digital economy were discussed. The presentation covered various aspects of the digital economy, including growth rates across income levels, challenges in measurement, and the impact of the pandemic on digital progress. A new “Burn-to-Earn” Index, measuring carbon emissions per dollar of digital GDP across countries, was also discussed, highlighting efficiency differences and policy implications.

◆ Key Takeaways

The “Digital Gross Domestic Product (GDP)” across 125 countries is about US\$ 11 trillion, with the US and China accounting for 51% of that value.¹

The digital economy grows at different rates across income levels. Over ten years, digital economies in high-income and upper-middle-income countries grew 3.56 and 3.4 times faster than their overall GDP, respectively. In contrast, the corresponding figures for low-income and lower-middle-income countries were 1.65 and 2.62, respectively. Under the current course and speed, the digital economy will be around US\$ 15 trillion in the next three years. By some estimates, the adoption of digital payments and digital IDs can unlock 3% and 6% of the GDP of emerging economies, respectively.² DPI can increase the GDP of low- and middle-income countries by 1–1.4% by 2030.

¹ Chakravorti, B., Chaturvedi, R.S., Filipovic, C. and Adisa, A. (2025). *The Burn-to-Earn Index, The global digital economy’s economic and environmental impact and trade-offs*. Available at: <https://digitalplanet.tufts.edu/the-burn-to-earn-index/>

² Chakravorti, B. (2023). The Case for Investing in Digital Public Infrastructure. Business and Society. *Harvard Business Review*. Available at: <https://hbr.org/2023/05/the-case-for-investing-in-digital-public-infrastructure>

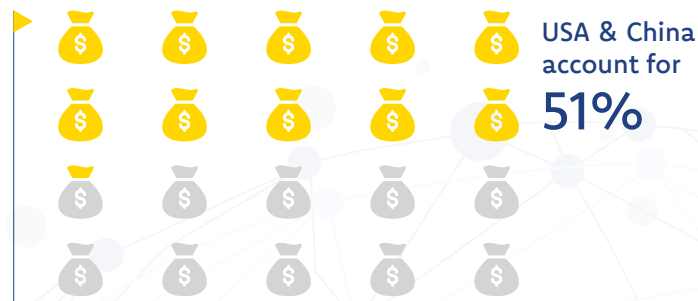
³ Chakravorti, B., Chaturvedi, R.S., Filipovic, C. and Niu, X. (2025). *Digital Planet 2025, From the COVID Shock to the AI Surge: How 125 Digital Economies Around the World Are Evolving and Changing*. Digital Evolution Index Available at: <https://digitalplanet.tufts.edu/digitalevolutionindex2025/>

While the global digital divide has narrowed over the years, the pace of closure has slowed since the pandemic. The study³ on global digital evolution introduced a graphical analysis showing 125 economies distributed across four zones based on their digital maturity and momentum. The zones are: “Watch Out”, “Break Out”, “Stall Out”, and “Stand Out” economies.

In terms of the biggest value generators in digital economies, digital platforms were the largest contributor in 26 economies (including the US and China), while value-added services contributed the most to the largest number of economies (77 economies). Fintech is the fastest-growing sector, followed by e-services, with hardware and enabling infrastructure experiencing a decline.

US\$ 11 TRILLION

Global Digital Gross Domestic Product (GDP) across 125 countries



DPI ADOPTION

Increase GDP of Low & Middle Income countries by 1-1.4%



BY 2028

Digital economy will be around

US\$15 TRILLION





Source: Shutterstock

DIGITAL PUBLIC INFRASTRUCTURE FOR SOVEREIGN AI: A VIEW FROM THE BRICS

Fundação Getulio Vargas (FGV)

“ The introduction of DPI has been instrumental in reclaiming digital sovereignty. It has been very beneficial in terms of introducing competition against monopolies. There are many positive externalities that may not have been evident before the introduction of DPI. ”

In this seminar, the presenters discussed the role of DPI in the development of sovereign AI capabilities, with a focus on governance, implementation, and collaboration within BRICS nations. The importance of DPI in enabling data governance, fostering innovation, and addressing systemic social challenges was highlighted.

◆ Key Highlights

The various global perspectives and definitions of DPI were discussed, with an emphasis on the role of DPI in supporting sovereign AI and digital governance. A conflict of interest arises between stakeholders in the realm of DPI policy and regulation, complicating governance structures.

A comparison of institutional architectures and governance models for DPI in India and Brazil was made in the seminar, noting the contrasting approaches in managing DPI; the Global South has a unique perspective on DPI compared to Western-dominated models, resulting in geopolitical implications. DPI is positioned as being essential for the development of sovereign AI, providing crucial components for data governance, storage, and sharing systems.

The role of DPI sandboxes was highlighted as a key mechanism for fostering experimentation and collaboration among stakeholders while mitigating the risks associated with DPI and AI.

◆ Key Takeaways

When assessing AI for DPI, it is evident that AI can strengthen state capacity, scale service delivery, and automate repetitive tasks requiring high accuracy and low contextual variability.

A robust DPI infrastructure enables key features for AI, including data interoperability, portability, and accessibility, thereby supporting digital self-determination.

Brazil’s online payment system Pix was showcased as a successful example of DPI reclaiming digital sovereignty, challenging the dominance of Visa and Mastercard. In this context, the discussion raised the question of whether there are other DPIs that are reclaiming digital sovereignty.

There are four principles of a human-centric DPI approach being implemented: guaranteed equal access and digital literacy; public management to address imbalances between consumers, companies, and the state; grievance-redressal mechanisms; and enhanced public participation in DPI governance.

Successful and sustainable DPIs need to be evaluated through defined metrics to assess their effectiveness and their impact on market competition. Further, DPI development should be accompanied by collaborative governance frameworks for accountability. Additionally, DPI creators should focus on educating both consumers and businesses.



Source: Shutterstock

ROLE OF DPI IN ADVANCING PROGRESS TOWARDS SDGs

The Brookings Institution

“ Part of the issue with DPI is the lack of understanding of whether the poor have access to digital infrastructure. A granular picture at a country-by-country basis could help empower global policy effort to find the financing needed for such DPI programmes. ”

The presenters discussed the highlights and key takeaways from two roundtables organised by Brookings in partnership with Co-Develop. The discussions focused on the approach to digital transformation as an enabler for sustainable development outcomes.

◆ **Key Takeaways from the Roundtable on DPI in Fragile Environments**

Ethiopia, Afghanistan, and Sudan were presented as case studies of digital transformation in countries with multiple sources of fragility (e.g., economic, political, and social). For most countries, creating digital infrastructure for a single intervention is very expensive yet efficient when a comprehensive national system approach is adopted. The proof that cash is effective in meeting humanitarian needs can present a huge opportunity for DPI-led transformation in such countries.

Crises in fragile countries provide an opportunity to address long-term infrastructure needs. However, countries should avoid being dependent on a single foreign provider. The DPI approach can encourage the development of a digital system that is open-source, interoperable, and transferable to other use cases.

In building payment systems, national switches primarily serve the needs of large international finance institutions as opposed to local institutions, such as microfinance and credit unions. Access to the internet is the starting point for rolling out these solutions. The key strategy is to merge and integrate legacy systems with digital systems and harness the true power of it — speed, accountability, cost-effectiveness, and autonomy.

◆ **Key Takeaways from the Roundtable on Unconditional Digital Cash Transfers for Alleviating Extreme Poverty**

The effective scale up of cash transfers at the country level will depend on efficient infrastructure for identifying target recipients, ensuring accurate transactions, minimising leakages, and supporting ongoing livelihoods.

Questions that were addressed during the discussion included the following: How should global DPI efforts think of DPI in this context? How much DPI is needed at the country level to scale up cash transfers? What is the sequence to be followed; should countries prioritise building DPI, then roll out cash transfers? In the absence of full-fledged DPI, what kind of minimal digital infrastructure preconditions help initiate the process?

Information is lacking on the number of people living in extreme poverty who have access to digital infrastructure, which is a precondition for cash transfers. Therefore, a more granular perspective is needed to empower global policy efforts to find necessary financing. Additionally, more groundwork on technical and governance preconditions is necessary. There is general consensus on four key requirements for digital cash transfers: a digital ID, a dynamic social registry, an enrolment programme, and a payment system.

Some of the governance preconditions include political leadership at the national level to bring whole-of-government and whole-of-society approaches for interoperable and inclusive digital systems. Partnerships with private players as well as international alliances are critical, as is innovation in the design and delivery of governance schemes, such as the new household targeting method employed in Togo.

The next steps discussed in terms of collective global efforts included working towards the Global Alliance Against Hunger and Poverty, the 4th International Conference for Financing for Development in Spain in 2025, and working in alignment with the momentum around the UN Global Digital Compact.

Overall, the conclusion was that it is vital to embed the DPI and infrastructure approach in efforts to turbocharge global efforts to achieve the Sustainable Development Goals (SDGs).

BUILDING THE EUROPEAN DPI: RATIONALE, OPTIONS AND ROADMAP

Centre for European Policy Studies (CEPS)

“ Not everything is open. There are very good reasons. Do we centralise architectures? ”

The presenters discussed their recent report titled [“Building the European DPI: Rationale, Options and Roadmap”](#), co-authored by Camille Ford, Marta Dell’Aquila, Olesya Grabova, Iris Muñoz, and Andrea Renda. The discussion included an overview of international initiatives on DPI and a comparative analysis of DPI initiatives in Estonia, Germany, the Netherlands, Italy, Ukraine, and the European Union in efforts to create a pan-European DPI within a broader “EuroStack” framework.

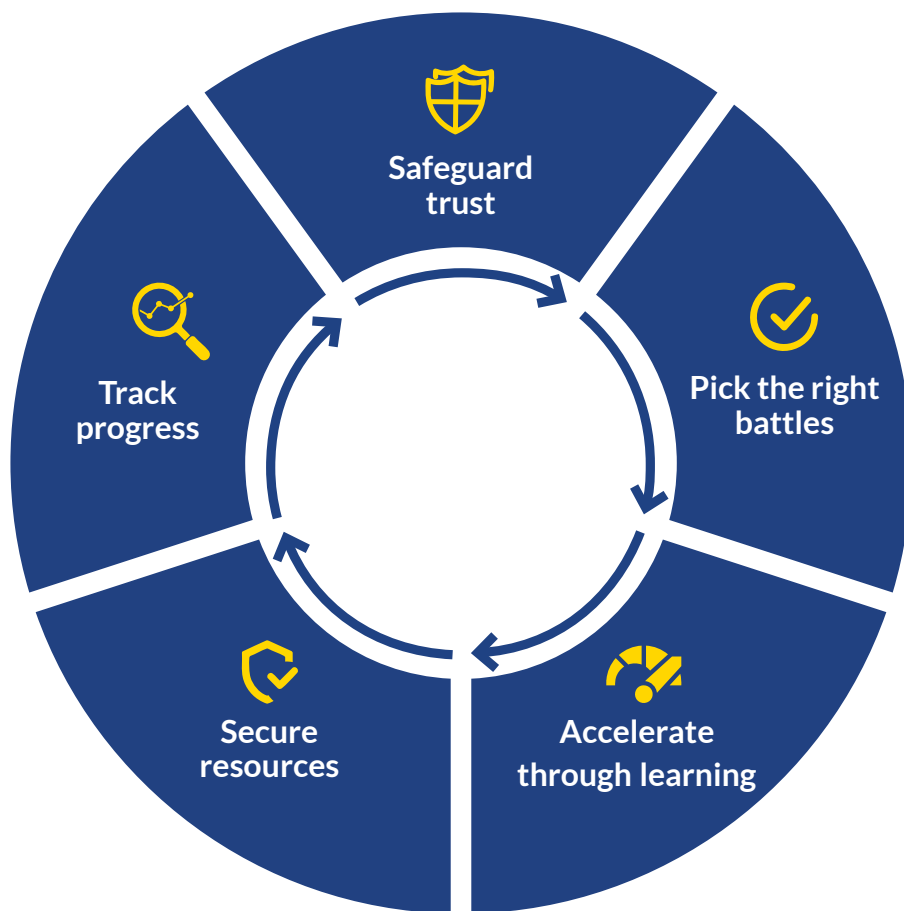
◆ Key Takeaways

Europe’s DPI ambitions are closely tied to principles of openness, trustworthiness, and privacy preservation. Currently, approaches to DPI vary significantly among European countries, with a marked divergence in scope, commitment to open-source software, and approaches to data storage and collection, security, and uptake. Recent initiatives, such as the EU Digital Identity (EUDI) Wallet, the Interoperable Europe Act, the ComPAct programme, and the data strategy, have the potential to ramp up Europe’s progress towards a pan-European DPI.

Key recommendations for the EU include facilitating a concrete, multi-stakeholder effort at standardisation to create more legal certainty on data quality and management and data standards. A specific initiative on data stewardship should be launched, aimed at fostering the required skills and competencies for collecting, storing, reusing, and protecting data. Europe’s commitment to secure, user-centric, open-source solutions must be reiterated. The European federated cloud should be consolidated and upgraded.

The implementation of key EU legislations, including the Data Act, Data Governance Act, and Data Spaces, should be expedited to ensure the emergence of intermediaries and regulatory certainty on data exchanges. DPI should be embedded in Europe’s global digital offer. An ambitious investment plan for the EuroStack should be launched to test the interplay of digital identity and the wallet, data governance and intermediaries, self-sovereignty, and data-space interoperability across a multitude of layers in the technology stack.

A few areas need to be addressed in future research and discussion. First, given the limited state capacities on infrastructure and applications, the inevitable dependence on the private sector to scale services needs to be explored. Second, the possibility, feasibility, and desirability of an integrated EuroStack must be investigated. Third, equitable value distribution across layers of EuroStack should be considered.



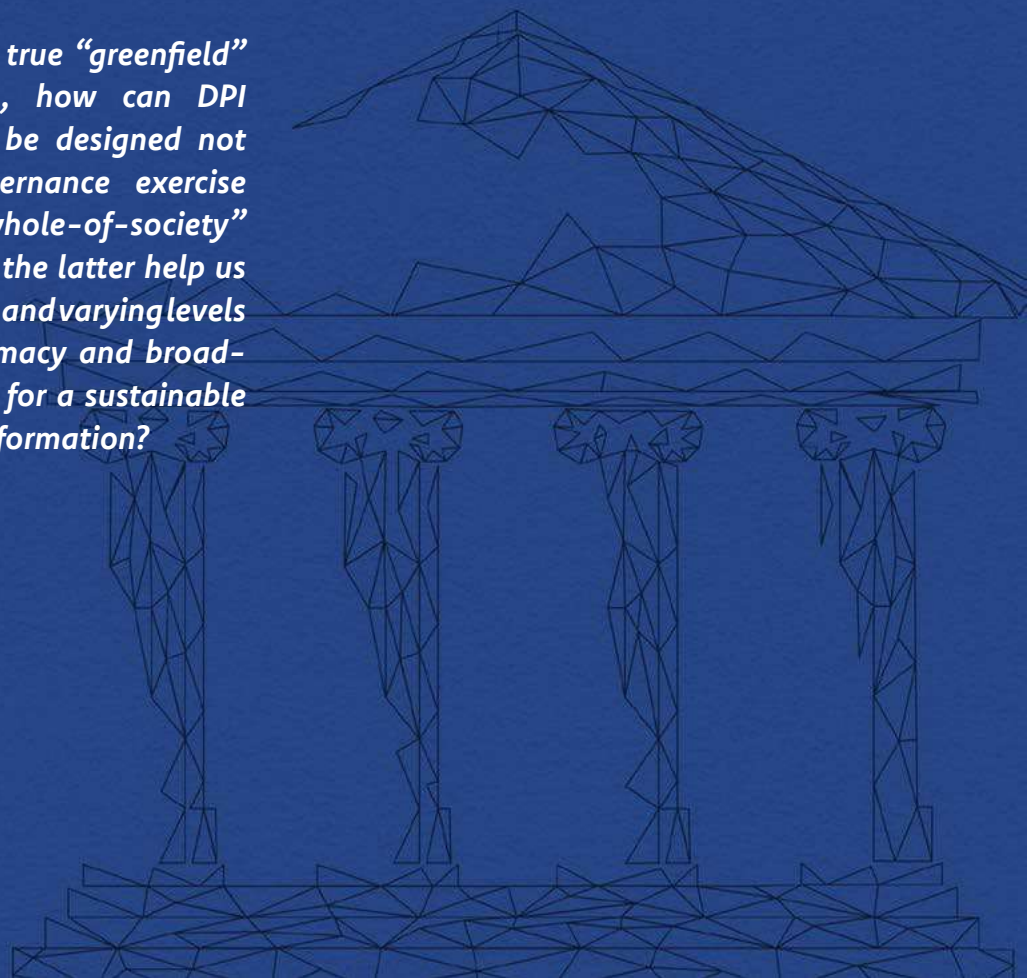
Source: Digital Impact Alliance (2025)

03

Implementation in Country Contexts

The Whole-of-Government Approach

Given that no country is a true “greenfield” in digital transformation, how can DPI roadmap implementation be designed not just as a technical governance exercise but as a continuous “whole-of-society” development process? Can the latter help us navigate the legacy systems and varying levels of trust for building legitimacy and broad-based coalitions necessary for a sustainable and equitable digital transformation?



THE DPI ROADMAP PLAYBOOK

GOOD PRACTICES TO ACHIEVE INCLUSIVE AND IMPACTFUL DIGITAL TRANSFORMATION

Digital Impact Alliance (DIAL)

“ One word each for the future of DPI: Customisation. Iteration. Localisation. ”

In this virtual seminar, the beta version of the DPI Roadmap Playbook developed by DIAL for South Africa’s G20 Presidency was presented and discussed. The playbook launched at the Global DPI Summit 2025 draws on country pilots, lessons from India’s DPI development experience, and the Digital Transformation Roadmap for South Africa. Genesis Analytics joined DIAL in the discussion, moderated by ICRIER, on adopting a whole-of-government approach for digital transformation.

◆ Key Takeaways

The DPI Roadmap Playbook has been designed to be used as a step-by-step, evolving guide for countries to build and implement DPI systems. It brings together practices from India, the United Kingdom (UK), South Africa, Kenya, Rwanda, and Ghana. The playbook aligns with intragovernmental strategies, sets milestones, and fosters political buy-in through a shared vision and transparent processes.

No nation starts its digital transformation from true “greenfield” conditions. Therefore, before developing a roadmap, countries must assess existing plans, resource availability, and policy fragmentation. This will help identify any areas of strong alignment with existing structures and whether political will exists, in which case introducing and developing a roadmap may be less critical for countries.

A Roadmap design requires clarity on objectives, timeframes, governance, resources, risks, and approval mechanisms. The steps for designing a Roadmap include team formation, landscape mapping, risk assessment, governance design, priority setting, and communication strategies. Implementation demands iteration, adequate financing, real-time monitoring, and public accountability systems.

Several principles have been identified in the successful implementation and use of a roadmap. For example, greater emphasis on interoperability, scalability, sustainability, and inclusivity has led to more success. Public participation, transparency, grievance redressal, and trust-building are vital, particularly in contexts with surveillance

concerns. Courts, civil society, and media play crucial roles, acting as checks, “soft regulators”, and partners in extending a whole-of-government approach to a whole-of-society one. The UNDP’s Safeguards Initiative provides a useful reference framework. Consensus, transparency, and civil society involvement strengthen trust and widen adoption. The playbook also highlights how DPI can serve women, youth, Micro, Small and Medium Enterprises (MSMEs), persons with disabilities, and rural populations.

The DPI Roadmap Playbook is a critical enabler for countries seeking a structured, inclusive, and adaptive digital transformation. By combining strong governance, iterative implementation, and active engagement of all stakeholders, it helps bridge political vision with citizen needs. South Africa’s experience, alongside India’s long journey, reinforces the value of collaborative, incremental, and human-centred approaches in making DPI truly transformative. India’s and South Africa’s experiences, as discussed in the virtual seminar, are presented below.

◆ **Country Experiences**

India is in the process of both vertical and horizontal expansion of DPI. India’s journey in setting up DPI began 15 years ago, in 2010, with three factors: philosophy, people, and policy. This philosophy prioritises providing people with employment opportunities, access to credit and financial services, and ease of transactions. The innovation in this approach is the ‘open API’ component. Additionally, the DPI stack in India was the combined effort of supportive government policies and open-source enthusiasts, as seen in the National Data Sharing and Access Policy, OpenAPI policy, Data Empowerment and Protection Architecture (DEPA), and National Open Digital Ecosystems (NODE).

For South Africa, a middle-income country, an Inter-Departmental Working Group (IDWG) and National Treasury were set up to explore a participatory, iterative, and incremental process for the Digital Transformation Roadmap. Technical work was supported by an international group of expert advisers.

The roadmap process started with a diagnostic analysis of DPI in specific South African public sectors, such as social protection and employment, to map the technologies being used by the government. Documents focusing on e-governance from the past 10–15 years were identified even before the term DPI was known. However, the policy and strategy framework was complex and overlapping, with no strong lead and no convening power and buy-in, which resulted in duplication and fragmentation. This challenge persists across the world.



Source: Shutterstock

South Africa has had a free and open-source software policy since 2006. However, the structure of the government has changed over time, and decision-making has become increasingly consensus-based. For example, the development of the South Africa Digital Transformation of the Government Roadmap was led by an Implementation Coordination Unit and taken to the Cabinet for approval, after which it was adopted as a central planning document. A human-centred “design-thinking approach” was adopted by mapping a “user journey” for participating in the DPI system. This creates a compelling storytelling mechanism, facilitating buy-in both from within and outside government, and guiding prioritisation.

The roadmap was the result of extensive coordination and regulatory efforts, including direct engagements with the information regulator and the State Security Agency to provide them with clear visibility into the key factors emerging from the roadmap. A role for civil society actors was also found in the case of South Africa.

Other cases that were discussed include Ethiopia’s Digital 2030 Strategy, which aligns with the Playbook, and Jamaica’s whole-of-society approach to foster stakeholder ownership.

04

From Implementation to Impact **The Measurement Gap**

Governments are investing heavily in building DPI, but how do we truly know if it is delivering real-world impact for citizens and the economy? What are the challenges to measuring the impact of DPI?

Can the DPI model that is open, trusted, and inclusive help navigate measurement challenges in other domains? Can DPI aid fast-paced climate action by providing a technical blueprint for climate data systems?

EVALUATIVE RESEARCH ON THE SOCIOECONOMIC IMPACT OF DPI Global Development Network (GDN) | African Center for Equitable Development (ACED) | Ethiopian Economics Association (EEA) | South Asian Network on Economic Modeling (SANEM)

“ *What is the added value from digital inclusion, digital ID, demand-side data? Implications from a policy perspective include institutional failures around ICT access and use. It is a data and policy question.* ”

This session presented research findings from pilot studies on DPI in Benin, Ethiopia, and Bangladesh, examining its socioeconomic impact and potential for development. Presentations highlighted the current state of digital transformation in these countries, challenges faced in implementing DPI, and its correlation with various socioeconomic indicators. The discussions laid emphasis on the need for improved coordination, infrastructure expansion, and addressing digital divides to maximise the benefits of DPI for inclusive growth and governance.

◆ **Key Takeaways**

Investigating the Ex-Post Impact of X-Road, with Insights from the Use Case of SECURROUTE, Benin

Analysis of Benin’s DPI revealed different levels of maturity and impact. National Interoperability Infrastructure (X-Road) and National Register of Natural Persons (RNPP) are the most advanced DPIs, with a high degree of inclusion and maturity.



SECURROUTE is a web-based platform leveraging X-Road to streamline, digitise, and simplify how vehicles are registered, taxed, and regulated in the country. By enabling real-time coordination across tax collection, insurance verification, and technical inspection, SECURROUTE contributes to enhanced transparency and administrative efficiency. However, along with gains in compliance, revenue, and safety, challenges remain in connectivity, digital literacy, affordability, trust, and dispute resolution.

Development and Governance Impacts of DPI, Ethiopia

Ethiopia plans to deliver 1,000 e-government services by 2030. However, major concerns persist regarding institutional capacity and infrastructural readiness. A comprehensive effort to enhance digital skills and literacy was launched, which aims to reach ten million individuals by 2025. The year 2030 was further set as a deadline to complete the digital registration of citizens aged 18+ years. While digitisation was shown to substantially improve governance and public service delivery, socioeconomic progress and structural change have been deteriorating since 2017, despite visible progress made by DPI. The presentation also included discussions on the impact of DPI on private-sector development, micro-level impact on firm productivity and innovations, and sectoral applications.

The Impact of DPI on Socioeconomic Outcomes, Bangladesh

Bangladesh witnessed substantial growth in internet (44.5%) and mobile phone (114.36%) usage by 2023, alongside a rise in its E-Government Development Index (EGDI) from 0.18 (2004) to 0.66 (2024), exceeding the global average. Secondary and higher-secondary graduates make up nearly half of all DPI users, pointing to education as a gateway to digital inclusion. DPI initiatives have been shown to have a significant impact, saving citizens US\$ 22 billion, 19 billion working days, and 13 billion visits. Propensity score matching analysis highlighted location and gender as significant predictors of DPI access and usage, while household size was shown to have no significant impact. Data challenges, lack of centralised repositories, bureaucratic hurdles, weak governance structure, institutional capacity gaps, and limited cross-sector coordination were discussed.

BEYOND THE TIPPING POINT: HOW CLIMATE DATA CAN DECIDE OUR FUTURE

Digital Impact Alliance

“ The matter is trust. Data could be outdated, inconsistent, or have missing values. The capacity is limited as well. ”

The work carried out under the Joint Learning Network to Unlock Data for Climate Action (Climate Data JLN) was presented in this virtual seminar. The JLN was set up with the objective of enabling climate data to become more accessible and useful for frontline governments and communities. Four types of data models were discussed: data trusts, open transaction networks, data spaces, and open data.

◆ Key Takeaways

Data is critical to overcoming climate threats, but climate-relevant data is often inaccessible. Data models have to fit different needs. Governance is the key challenge for all models.

Innovative financing is needed, as are intermediaries to drive data for decision-making. Key recommendations for funders, data aggregators, data owners, and frontline governments include setting up a climate-oriented data-sharing innovation fund, better governance, community participation, and capacity building.

Looking forward, it was stated that the work plan for 2025 was built around partnering with selected cities to address data gaps in climate action and deep dives into climate use cases. The island nation of Tuvalu was discussed as an example of how data collection involving AI, Machine Learning (ML), and feature detection can be used to assess the impact of climate change and inform decisions on water and solar capacity. The geopolitical implications of sea level rise and the potential for data to aid in retaining sovereignty were also discussed.

The discussion also included a case study mapping energy use and carbon footprint in the Tana River Delta, Kenya, with recommendations on scaling up efforts to plan for low connectivity and accessibility barriers. Scaling up data validation is also necessary to counter increased misinformation. Amplifying underrepresented voices (e.g., indigenous groups, people from rural areas) was also suggested. Further, there is a need for tailored social licences that allow communities to manage consent and benefit from sharing their opinions to avoid data extraction.

05

Regulatory Systems are Struggling to Keep Pace

As digital identity, payments, and data converge into a new public infrastructure, are our traditional, siloed regulatory systems becoming obsolete?

With the evolution of DPI and challenges in regulating it, is the primary challenge a lack of rules or a more fundamental gap in the knowledge and capacity of those who govern and manage it?

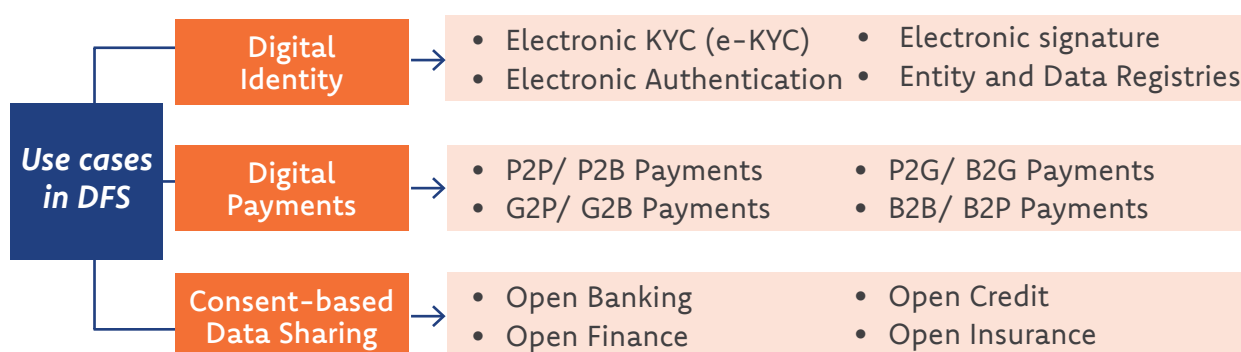


DIGITAL PUBLIC INFRASTRUCTURE & DIGITAL FINANCIAL SERVICES: REGULATORY CONSIDERATIONS

Cambridge Centre for Alternative Finance

“ There is difficulty in reaching a consensus on what DPI is. There are different opinions — is it more of a technical issue or a governance reform? ”

The presenters discussed the global landscape of DPI, its relationship with financial inclusion outcomes, and emerging trends in digital financial services (DFS). The discussion also covered regulatory challenges and governance issues in implementing DPI, highlighting the need for improved coordination and consideration of market-shaping effects.



Source: Cambridge Centre for Alternative Finance (2025)

◆ Key Takeaways

DPI and Digital Financial Services (DFS) are converging, but the definitional scope of DPI remains ambiguous, especially within financial ecosystems. While 70% of regulators surveyed were aware of DPI, their understanding was lower, and traditional banks were less engaged in the non-payment aspects of DPI.

An exploratory taxonomy of digital identity, payments, and data sharing can support aligned policymaking, promote interoperability, and guide inclusive digital ecosystem design. Jurisdictions with more developed DPI systems tend to have higher account ownership, improved credit access, and better delivery of government support. As identity, payments, and data converge, traditional regulatory silos are no longer sufficient. More integrated, adaptive, and cross-sectoral governance models could offer a more effective approach.

Digital identity principles could transform traditional regulatory practices, such as licensing across jurisdictions, consumer-complaint handling, and financial-crime monitoring. Embedding these principles could lead to more efficient and proactive regulatory approaches, thereby improving user trust and enabling real-time data sharing between financial institutions and regulators.

THE DPI ACADEMY: BUILDING CAPACITY FOR DPI

Artha Global

“ We need to bring the broader ecosystem of stakeholders together. We need to bridge capacity gaps. ”

The presenters discussed Artha Global and eGov Foundation’s DPI Academy, an initiative to build capacity for DPI design and implementation in India. The discussion highlighted the programme design and its different formats and laid out for discussion the opportunities to scale the Academy for global capacity building.

◆ Key Takeaways

The DPI Academy focuses on bridging critical gaps surrounding technical capacity and strategic governance in DPI using a threefold approach — knowledge, capacity, and community. ‘Knowledge’ involves creating and curating actionable research on DPI, both internal and from the larger ecosystem of researchers, experts, and practitioners. ‘Capacity’ is focused on partnering with central and state training institutes in India as well as DPI practitioners to deliver content to key decision makers on DPI. ‘Community’ emphasises drawing from and building a community of experts to create and support champions of digital transformation.

The capacity-building component of the DPI Academy is organised through three types of engagement: introductory courses, sectoral use-case approaches, and bespoke workshops. The discussion in the virtual seminar was centred around challenges to capacity building, particularly in engaging senior civil servants, making the content relevant to lower administrative levels, and incorporating a more hands-on and problem-solving approach during training.

Observations and suggestions from the participants highlighted the potential for sectoral discussions in applied learning workshops on DPI governance. This included creating an introductory module that could be embedded into courses to create awareness. Further, it will lead generation for sectoral use cases, partnering with private training institutes, and employing a mix of policy instruments to achieve the desired outcomes. The session also included a discussion on the potential for a robust alumni network for bespoke workshops, with the aim of fostering continued engagement and knowledge and experience sharing among participants.



Source: Adpated from Artha Global (2025)

06

Modernising Data Governance

As DPIs become foundational “public rails”, how can governance models evolve beyond traditional data protection to proactively prevent the re-monopolisation of data? Define a feasible and empowering “right- to -data” for citizens, and navigate the tension between data sovereignty and global interoperability while building the public trust necessary for DPI to succeed?



TOWARDS AN INTEGRATED DATA GOVERNANCE FRAMEWORK FOR DPI

Research ICT Africa | ICRIER | Open North

“ It is a multifaceted right. There is a promise, even for DPI, that if some of the data could be legally and technically open, we could have a more efficient mechanism to extract the public value from the data because we would open it up to a new set of people engaging with the data. ”

The policy brief developed for the Taskforce20 (T20) in response to the call under South Africa’s G20 Presidency was discussed. Experts from Research ICT Africa, ICRIER, and Open North explored the critical need for a robust and integrated data-governance framework for DPI. Key challenges in approaching data governance within the broader context of inclusive DPI deployment were highlighted.

◆ Key Takeaways

The right to literacy, privacy, and transparency in the use of data, objections to violations in compliance with legislation, and access to information are important issues to debate. Data Protection Authorities (DPAs) are currently focusing on regulatory governance, but their focus should expand to providing technical counsel on DPI architecture and data protocols, bridging the gap between data protection and access to information laws and user-centric governance, and strengthening digital capabilities. It is difficult to encourage people to care about their data rights, hence the need for advocacy.

Capacity-development efforts are required to develop the skills needed for a functional data ecosystem. DPI in India has provided the “public rails” to the private sector, which has resulted in private-sector collaboration and competition. The public-private-partnership model cannot serve as a substitute for governance; there is a need for more regulation.

Data privacy is not only a competition issue but also an issue of empowerment. Privacy laws focused on protecting personally identifiable information are necessary but not sufficient. The right to data is multifaceted, including both personal and non-personal data. Therefore, the use of data must be consent based. Any change in data should require consultation with the respective individuals. The question is, what is a feasible right to data?



Source: Shutterstock

A central concern is that DPI, despite its open rails, can lead to the re-concentration of market power, presenting risks of re-monopolisation or re-centralisation. It is important to democratise data to avoid monetisation by a few firms. In the case of sectoral DPIs, such as DPI for health services, data layers would become chokepoints for competitors, with whoever has the most data being able to deliver better services. Whereas earlier, gatekeeping was limited to platforms, gatekeeping may shift in the new evolving DPI ecosystem. Therefore, the role of the state needs to be reconsidered not only in the provision of infrastructure but also in the creation of data repositories and the establishment of clear guardrails for private sector participation and safeguards.

Data localisation and sovereignty policies are often at odds with the need for cross-border data flow and exchange. This balance is highly dynamic and influenced by geopolitics, trade wars, and industrial policy. For India, data localisation has re-emerged on the agenda, with a focus on sovereign infrastructure (including DPI), AI models, vernacular languages, and cloud services.

The roundtable discussion also included open data and open governance, specifically addressing whether data can be open by default. Open data can be used for decision-making. While the use of open data for open governance is a “grand ambition”, it is one that cannot be overlooked. Even if data is legally open, technological challenges could exist, such as lack of interoperability, procurement issues, and high costs. A question that emerged during the conversation was that, given that the private sector is already operating on DPI “rails” to harness data, if a gap exists, why can governments also not provide the infrastructure for data capture? Is there scope for data unions and data social workers to exist, enabling the social sector to have a role in creating data trusts and data commons? Policy tensions must be acknowledged, and a balance must be achieved for implementing effective strategies to govern data.

Epilogue



Payal Malik, Visiting Professor
Digital Economy Startups and Innovation
ICRIER

What have we aimed to achieve through this CoP DPI4D?

To learn about lessons and trends in DPI from virtual seminars, publications, and knowledge-exchange sessions. To obtain learnings that will inform policy and practice. And to collaborate towards a call for action for reimagining DPI for the world.

We hope that this compendium has helped readers identify the overlaps across the presented themes. DPI is not only about identity, payments, and data exchange but also about ethics, access, inclusion, privacy, safety, and control. DPI is more than just interoperability; it is also about human-centricity, coordination, and capacity development, as well as innovation, competition and growth. Digital literacy and capacity development initiatives and setting metrics for measuring impact are key to fostering DPI. Last but not the least, DPI is more than a technological artefact, it is a market-shaping institution. Through defining and designing a DPI roadmap, CoP members have ably collaborated to determine the optimal approach for creating public value and achieving SDGs.

DPIs are forward looking; AI for DPI can strengthen state capacity by aiding decision-making and administration. DPI for AI can democratize participation by lowering entry barriers across compute, datasets, and model access, enabling MSMEs, startups, researchers, and state entities to build and deploy AI products and reduce dependencies.

DPI enhances social outcomes through governance, safeguards, and participatory approaches via a whole-of-government and whole-of-society approach. These outcomes can be achieved when the measurement gap and digital divide — across geography, gender, and access to critical infrastructure — are bridged. What matters most to solve these challenges is reskilling and upskilling in the implementation stage of DPI.

We need to adopt a holistic and multidisciplinary approach to the evolution of DPI — an inherently iterative process.

CoP Publications

◆ CoP Joint Op-Eds

Raising the guardrails

Checks and balances to protect public interest, without hampering innovation, are needed in digital public infrastructure



PAYAL MALIK AND HARISHANKAR THAYYIL JAGADEESH

DURING ITS G20 presidency, India positioned digital public infrastructure (DPI) as a technology-enabled instrument for inclusive and sustainable development. DPI's distinguishing characteristics of openness, interoperability, and scalability underpin its criticality beyond technology to the larger goals of public and private service delivery. DPIs can be broadly grouped into two categories: foundational and sectoral.

Typically, foundational DPIs such as Aadhaar, UPI, and Data Empowerment and Protection Architecture (DEPA) are developed to create robust digital rails and span the domains of digital identity system and payment infrastructure, and data exchange platform. Sectoral DPIs provide specialised services tailored to three broad sectors. Examples include the Ayushman Bharat Digital Mission, which laid the rails for the provision of universal health coverage. A notable DPI success story is the CoWIN platform, which facilitated Aadhaar-based authentication to facilitate the administration of more than 2.2 billion Covid-19 vaccines.

The transformative impact of India's DPI initiatives is so pervasive that it is taken for granted. India has achieved over 1.1 billion Aadhaar enrolments and carries out over 10 billion UPI transactions monthly. Its continuing endeavours in this area were highlighted in the Finance Minister's budget speech, which proposed the deepening of DPI applications in the areas of "credit, e-commerce, education, health, law and justice, logistics, M2M, service delivery and urban governance". Despite their success and expansion to newer sectors, there are some issues that need to be examined.

DPIs serve a platform-like role, that is, they provide a network or gateway that enables other entities to "plug and play" by building digital applications or services on these rails. They enable rapid innovation and value creation at scale through public-private partnerships. DPIs are essentially multi-sided platforms, where the value of the platform on one side increases with the increase in the number of participants on the other side. These inherent network effects of DPIs can lead to winner-takes-all outcomes, resulting in the creation of monopolies or oligopolies. For instance, the UPI payment system has resulted in the creation of a virtual duopoly of service providers. Participants captured the zero-price markets while harvesting vast amounts of user data over time. Data is a shareable modular input that may allow these firms to expand into adjacent markets, such as retail lending, by leveraging their position in the DPI market and creating digital ecosystems. Such private ecosystems may pose a number of competition issues typical of platform-centric markets.

Given that the emergence of DPIs is a policy response intended to create meaningful competition, the risk of DPIs causing

market concentration needs to be mitigated. India's G20 Task Force on Digital Public Infrastructure (DPI) also discussed several key aspects of competition and regulation of DPIs. The report emphasises the importance of creating a level playing field for all participants in the digital ecosystem to ensure that no single entity has undue control or influence over the digital infrastructure. The task force highlighted the need for regulatory frameworks that can adapt to the evolving digital landscape in order to address issues such as data privacy, security, and interoperability and competition.

There are other significant concerns related to data usage, innovation, and intermediate rule-reward sharing frameworks. Concerns regarding the privatisation of public data, data security, and data privacy arise due to the operation of private entities in the absence of a contractual regulatory framework. An examination of the innovation trajectories evoked by these DPIs is also essential to understand whether these government-subsidised initiatives are inadvertently entrenching private entities without any guardrails. In such DPIs, the delineation of the obligations of both public and private entities is essential due to their scale, complexity, and public interest. The government can draw on its extensive experience with PPPs to create appropriate governance frameworks, similar to Model Contract Agreements that are used in the development of highways and ports.

India stands at the crossroads of innovation and regulation in the implementation of DPIs. Private firms bring innovation and deep pockets of expertise to their autonomy, but they may be operating in a regulatory vacuum. A robust framework of checks and balances, which protects public interest without hampering private innovation, is essential. This demands an effective techno-legal governance framework through a coordination effort between technology developers and policymakers.

Digital infrastructure should be seen as basic infrastructure, where the state has a critical role to play, and an instrument of industrial policy akin to roads, airports, and electricity. Given DPIs are a recent development and that their full potential has not been realised, controlling them fully through a rigid legal framework might hamper their growth. Soft law instruments which involve guidelines encouraging industry best practices and rely on broad principles rather than prescriptive rules would be better suited. Some of the key guardrails contained in soft law, such as data encryption, access restrictions, and mandating user consent for data usage, can safeguard the interests of the public.

The unbundled operations of such a critical pillar of the digital economy outside the limits of sovereign control may have undesirable economic and social consequences. One approach would be segregating the key aspects of DPIs into those that are best governed through statutory or contractual frameworks and those governable through soft law. A more considered and clearly defined approach to govern the private actors riding on the infrastructure component of DPIs would significantly aid in fully realising their transformative potential without creating disruptive risks to society.

Mahesh Vaidya, professor and Jagadeesh, is fellow (consultant), ICRIER

The Indian Express

Wed, 11 September 2024
<https://paper.indianexpress.com>

The Indian Express: "India's Digital Public Infrastructure: How to Ensure Healthy Competition," Payal Malik and Harishankar T. Jagadeesh (ICRIER), September 2024.



RITUL GAUR AND MANSI KEDIA

The right price

It is necessary for digital public infrastructure to be viable and sustainable

THIS YEAR'S BUDGET announcements reaffirm the government's continued focus on a Digital Public Infrastructure (DPI)-led approach for digital transformation, with continued allocations for Aadhaar and other ongoing digital missions for health and urbanisation. Many of these DPIs are now several years old, especially Aadhaar and UPI, which have scaled to serve millions across the country. Linked to 1,206 schemes, not only has Aadhaar benefited millions, government estimates also project fiscal savings of over 3 lakh crore (until March 2023). Despite this success, the government shifts away from appropriate pricing of DPI services. Is scaling and diffusion of DPI the concern?

DPI's advocates have often likened its purpose and application to physical infrastructure such as roads. When governments invest in building highways, they trigger spillover gains through growth and employment opportunities in adjoining areas. Similarly, DPIs such as Aadhaar have delivered beyond their immediate purpose. The recently announced Aadhaar Authentication for Good Governance Rules, 2025 expand the scope and utility of authentication to include private-sector services.

Aadhaar-based authentication was launched in 2009, but was kept free of cost until December 2019. The fee structures were revised downwards in 2023, and cur-

rently vary by user type—telecom service providers pay Rs 1 for e-KYC and other private entities pay Rs 3, while it's free for government entities. Revenues from authentication services and self-service updates accounted for less than 40 per cent of expenditure in 2022-23. This explains the continued fund allocation to Aadhaar, not only for capital upgradation, but also for operations and maintenance.

UPI still mandates zero-cost services for basic peer-to-peer and merchant transactions, but has a nuanced fee structure for advanced services. For prepaid wallet instruments, merchants pay interchange fees on transactions above Rs 2,000, with rates varying by sector from 0.5 per cent to 1.1 per cent. Wallet loading also incurs service charges for transactions exceeding Rs 2,000. This approach may have contributed to UPI's adoption across the economy, but it comes with substantial operational costs—Rs 781 crore in marketing and a 188 per cent increase in product incentives, amounting to Rs 367 crore. The Open Network for Digital Commerce (ONDC) presents a similar case. Despite massive growth, the latest financials show a deficit of Rs 19,561.70 lakh, against total expenditure of Rs 21,027.33 lakh in 2023-24. DigitLocker (budgeted at Rs 4,071 crore for FY 2025-26), is completely subsidised at the moment. With over 47 crore users, it offers free services despite the IT Rules, 2016 (Rule 15) allowing

for service charges. The sobering story of poor financial viability is adoption at zero prices has left the government with a sticky situation that risks eroding high-value common goods. In 1968, Garrett Hardin, an American ecologist, argued that individuals acting in their own self-interest can deplete shared resources—popularly known as the tragedy of the commons. Free services may eventually lead to overuse and, perhaps, misuse of the common infrastructure. Since UPI is free of charge, users don't hesitate to make multiple micro transactions. This places technical pressure on the infrastructure, leading to performance issues. Additionally, free prohibitions hurt competition. In UPI's case, two tech giants now control 80 per cent of transactions, because larger companies can afford zero-fee models that are cross-subsidised through adjacent services. This undermines DPI's purpose as open infrastructure by creating de facto gatekeepers.

International experiences demonstrate that thoughtful pricing models not only prevent resource depletion but also create sustainable digital ecosystems. Singapore's PayNow adopted a flexible merchant fee approach that provides incentives for small vendors. Jordan's CliQ applies a 1 per cent merchant fee to ensure efficient utilisation of infrastructure.

The government is not blind to these concerns. The RBI's discussion paper (2022) on payment system charges indicates that merchant fees may be under consideration. The expanded scope of authentication under the 2025 Aadhaar Rules also raises expectations of a rethink at pricing authentication services. The launch of Entity Locker, the enterprise equivalent of DigitLocker, may also find more people favouring the "ability to pay" for a service. This may eventually nudge DigitLocker services to be priced, too.

Borrowing from the theory of multi-sided markets, DPIs, like other platform markets, allow for price levels to be strategically chosen for different groups of users—suppliers and consumers. Given the strong direct and indirect network effects that DPIs such as Aadhaar, UPI, DigitLocker and ONDC have created, participation can continue to increase by setting prices that balance the needs of different groups. Public value maximisation may require some subsidisation, as already provided in building the infrastructure, but they need to be operationally viable. Let us be misunderstood, the objective is not to deprecise inclusion but to seek efficiency, by using appropriate pricing principles.

Gaur is policy advisor, Digital Impact Alliance and Kedia is senior fellow, ICRIER. Views are personal

The Indian Express

Thu, 24 April 2025
<https://paper.indianexpress.com/c/77236585>

The Indian Express: "Making DPI Sustainable," Ritul Gaur (Digital Impact Alliance) and Mansi Kedia (ICRIER), examining the government's role in subsidising digital public infrastructure (DPI) and unpacking its rationale and long-term implications, April 2025.



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CoP Joint Publications



Contribution to the [Implementation Roadmap document](#) (pages 143-156) of the T20 Summit 2024 held in Brazil: “Building a Trusted and Enabling Governance Framework for Equitable, Inclusive and Just Digital Public Infrastructure” by Alison Gillwald (Research ICT Africa), Harishankar T. Jagadeesh (ICRIER) and Payal Malik (ICRIER):

“Develop a non-binding common set of principles for DPis, especially concerning data justice, interoperability, and openness, backed by a permanent research fund to encourage the implementation of G20’s policy recommendations for effective participatory governance, accountability, sustainability, and inclusive digital development” (page 143).

Image Source: [T20 Implementation Roadmap Document](#)



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A [joint publication](#) for the T20 by Prita Chetty (Research ICT Africa), Thomas Linder (Open North), Payal Malik (ICRIER), and Krisstina Rao (IIPP), prepared in response to the G20’s call for an integrated governance framework for DPI.



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Publications by Our CoP Community

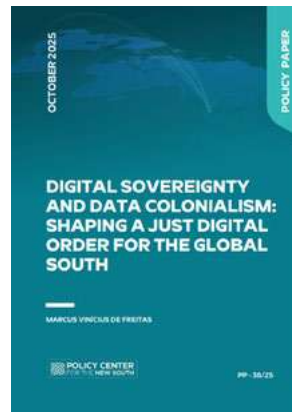
- ◆ Prof. Nicolo Zingales from our member organisation, **Fundação Getulio Vargas (FGV)** Direito Rio, Brazil, has shared two special issues on DPI. Link: <https://shorturl.at/fD4aw>
- ◆ Following the 11th Virtual Seminar, Jamie Fuller from our member organisation, **Research ICT Africa**, captured and shared the discussion in a blog, “Rethinking data governance for truly public DPI”. Link: <https://shorturl.at/3PRsp>
- ◆ Trev Harmon, from our member organisation, **Digital Impact Alliance (DIAL)**, shared their publications below.
 - Trev Harmon and Ibrahim Hussein’s paper on supporting a continuous journey of learning and improvement based on insights and recommendations from Ethiopia’s use of the Digital ID Assessment
Link: <https://dial.global/research/digital-id-assessment-continuous-learning-ethiopia/>
 - The importance of systematic DPI metrics
Link: <https://dial.global/dpi-metrics-for-meaningful-impact/>
 - DPI Roadmap Playbook
Link: <https://dial.global/research/the-dpi-roadmap-playbook/>
 - DIAL and Co-Develop - Exploring the economics of digital public infrastructure
Link: <https://dial.global/research/economics-of-digital-public-infrastructure/>
 - Risper Onyango’s paper on civil society organizations in digital public infrastructure development in Africa
Link: <https://dial.global/research/civil-society-dpi-africa/>
 - Arjun Gargeyas paper on the role of digital enablers in the clean energy transition
Link: <https://dial.global/research/digital-enablers-for-clean-energy/>
 - Kassim Vera’s paper on design systems as the translation layer for digital government
Link: <https://dial.global/research/design-systems-for-digital-government/>
 - Sarah Farooqi on bridging digital strategies and real-world impact based on a use-case driven approach
Link: <https://dial.global/use-cases-bridge-strategy-impact-dpi/>
 - Ibrahim Hussein on Ethiopia’s approach to their National Data Strategy offering

lessons for Africa's digital future

Link: <https://dial.global/lessons-from-ethiopia-data-strategy-approach/>

- DIAL and ODR - Experts on online dispute resolution and digital public infrastructure. Links:
<https://dial.global/online-dispute-resolution-and-digital-public-infrastructure-connection/>
<https://dial.global/indias-approach-to-odr-and-dpi/>
<https://dial.global/online-dispute-resolution-pathways-to-scale/>

◆ Policy Center for the New South (PCNS)



◆ Global Development Network (GDN)



[Link to Report](#)

◆ CCAF



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 [DPI4D Event Tracker.xlsx](#)



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✉ info@icrier.res.in
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Centre, Lodhi Road, New
Delhi-110003](#)

[The Isher Building, Plot No. 16-17, Pushp
Vihar, Institutional Area, Sector 6, New
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