

POLICY BRIEF



Scaling Digital Public Infrastructure for Transformative Development

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02

Digital
Transformation



Abstract

This policy brief investigates the role of digital public infrastructure in driving equitable and inclusive digital transformation. As digital technologies increasingly shape global economic landscapes, the G20 must prioritise and support investment in digital public infrastructure to support digital trade, payments, green transition, and public registries. However, fragmented digital systems, limited connectivity, and regulatory deficiencies continue to pose significant barriers to harnessing the full potential of digital transformation, particularly in low- and middle-income countries (LMICs).

The research will explore innovative approaches such as scaling digital public infrastructure (DPI) by strengthening public-private partnerships for digital innovation hubs and integrating decentralised technologies like blockchain to enhance data governance, financial inclusion, and cross-border trade. It will examine case studies from G20 economies and the Global South – highlighting successful policies, investments, and technology-driven initiatives – that can serve as models for fostering digital inclusion, resilient economic systems, and sustainable development.

Additionally, the policy brief will propose governance frameworks for scalable and interoperable digital public infrastructure, aligning with the G20's Digital Economy Working Group (DEWG) priorities on digital trade, cross-border data flows, and regulatory harmonisation, as well as regional frameworks such as the AU Digital Transformation Strategy. It will explore how emerging AI regulations, cybersecurity strategies, and responsible digital governance models can be adapted to ensure equitable access to digital public technologies while upholding sovereignty and privacy concerns.

A key component of this research will be policy recommendations that promote inclusive, sustainable, and resilient digital ecosystems. These will include strategies for closing the digital divide, enhancing investment in connectivity infrastructure, and developing robust data-sharing frameworks to facilitate global cooperation. Ultimately, this paper will provide G20 policymakers with actionable insights to improve digital infrastructure, strengthen innovation ecosystems, and position digital transformation as a catalyst for equitable global economic growth in an era of rapid technological advancement.

Diagnosis

Introduction: Why scaling digital public infrastructure matters

Digital technology is the lifeblood of inclusive transformation, offering equitable access to services and opportunities. As digitalisation accelerates, the demand for robust, inclusive, and scalable digital infrastructure has become urgent. For LMICs, it offers a powerful means to improve service delivery, expand financial inclusion, and unlock economic participation. However, digital progress risks deepening inequality and fragmentation without strong digital foundations. Despite ongoing efforts to expand digital access, the pace and inclusiveness of digital transformation in LMICs remain limited by structural constraints. Gaps in connectivity, affordability, device access, and digital capabilities exclude large segments of the population from the benefits of the digital economy.

According to the GSMA *State of Mobile Internet Connectivity 2024*, while 95% of the global population is now covered by mobile broadband, only 57% use mobile internet, leaving 3.4 billion people offline – 94% of whom live in LMICs.¹ The urban-rural divide is especially stark. In sub-Saharan Africa, mobile internet adoption stands at 45% in urban areas but drops to 25% in rural regions.² Similar patterns are observed in South Asia and parts of Latin America, where digital infrastructure remains underdeveloped in remote areas. Beyond access, digital skills and financial literacy limit meaningful use. In sub-Saharan Africa,

¹ GSMA. *State of Mobile Internet Connectivity 2024*. London: GSMA, 2024. <https://www.gsma.com/r/state-of-mobile-internet-connectivity-report-2024/>.

² International Telecommunication Union (ITU). *Measuring Digital Development: Facts and Figures 2024*. Geneva: ITU, 2024. <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/FactsFigures2024.pdf>.

only 31% of adults reported being able to use a mobile phone for financial transactions.³ Women, people with disabilities, and people in rural areas are disproportionately affected, reinforcing existing patterns of exclusion.

Digital public infrastructure (DPI), which includes digital identity systems, digital payments, and data-sharing frameworks, offers an important opportunity for LMICs to build inclusive, efficient, and accountable digital systems.⁴ Though a relatively new concept, DPI is now widely accepted and refers to secure, interoperable, replicable, and open systems designed to operate at scale. DPI acts as the “rails” that enable digital solutions deployed by both public and private sectors and supports interoperable systems across national, regional, and global levels. Countries such as India, Ethiopia, and Kenya illustrate emerging or mature models. India’s Aadhaar, UPI, and DEPA have enabled scale and interoperability. Ethiopia is developing its Fayda digital ID and expanding mobile money through Telebirr. Kenya, with its Huduma Namba ID initiative and widespread use of M-PESA, shows how DPI elements can be integrated into everyday life. Just as roads and railways enable physical access to essential services, DPIs serve as the digital backbone that expands access to digital services and public programmes, helping governments reach all segments of the population more efficiently and equitably. The current digital infrastructure landscape is often exclusionary and fragmented, hindering the development of scalable, interoperable systems that drive innovation and ensure equitable access to digital services for all. Strategic investments in DPIs are essential to close existing digital divides and build open, inclusive systems that reduce centralised control and foster equitable access to digital services.

³ GSMA. *State of Mobile Internet Connectivity 2024*. London: GSMA, 2024. <https://www.gsma.com/r/state-of-mobile-internet-connectivity-report-2024/>.

⁴ World Bank, *Creating Digital Public Infrastructure for Empowerment, Inclusion, and Resilience* (Washington, DC: World Bank, 2023), <https://www.worldbank.org/en/results/2023/10/12/creating-digital-public-infrastructure-for-empowerment-inclusion-and-resilience>.

The last three G20 presidencies have prioritised and championed DPIs as a cornerstone of digital transformation. The G20 could play a pivotal role in supporting the uptake and deployment of DPIs in LMICs that are partners with the G20 in trade, climate change and financial inclusion, among others. Together, the G20 and its allies can lead in co-creating DPI systems that are open but community centred. Local innovators should be part of the conversation in building local solutions, such as local language translation, on top of DPIs such as AI and large data service exchanges.

Why is it important? DPI momentum across G20 presidencies

Over the past three years, G20 Digital Economy Working Groups have increasingly focused on DPI as a vehicle for inclusive transformation. India's G20 presidency positioned DPI as a global public good. India promoted an open-source, interoperable model adaptable for developing countries through the India Stack. During the Brazilian presidency of the G20, the Digital Economy Working Group (DEWG) placed strong emphasis on advancing DPI as a foundation for inclusive, secure, and human-centric digital transformation. The DEWG reaffirmed the importance of digital government services built on DPI to enhance transparency, efficiency, and public trust. Key initiatives included the endorsement of the G20 Framework on Systems of DPI, the adoption of General Principles on the Governance of Digital Identity (developed with the OECD), and the introduction of the G20 Compendium on Data Access and Sharing. These efforts promoted secure, interoperable, and privacy-preserving digital ID systems and highlighted the role of open standards and APIs in enabling data-driven innovation.

South Africa’s 2025 G20 presidency continues this focus by exploring policy, regulatory, and governance frameworks to scale DPI effectively. To achieve its DPI goals, the presidency plans to promote phased investments in core DPI layers – digital identity, trusted data exchange, digital payments, and wallets – focusing on universal access. It also seeks to address digital inequality through institutional and financial capacity building and regulatory reforms. South Africa emphasises data justice, fair DPI procurement, innovation, and promoting open standards and blueprints for various sectoral DPI applications. Notably, the South African presidency intends to highlight emerging DPI tools such as e-wallets and sector-specific blueprints as pathways to achieve inclusive growth and digital empowerment.

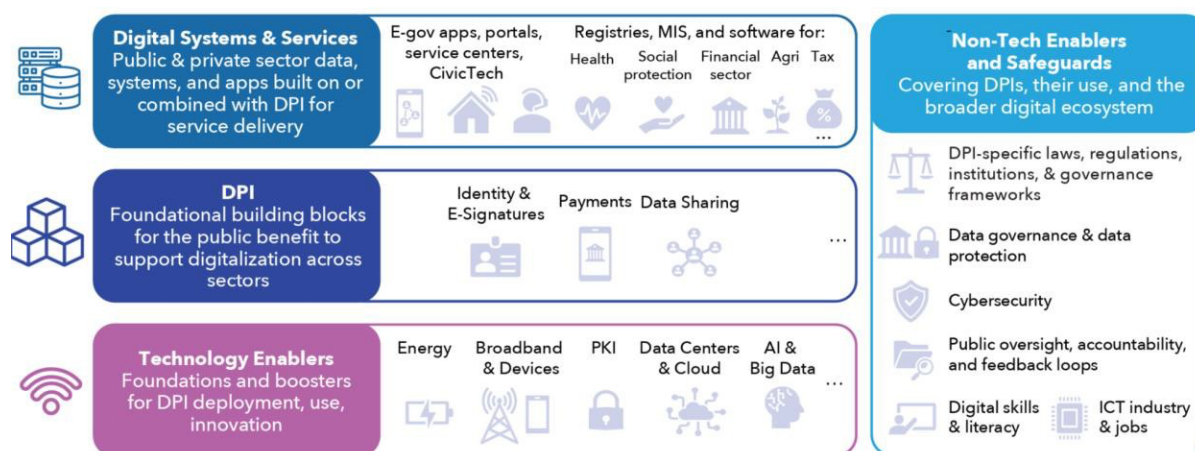


Figure 1: Pillars for Scaling Inclusive Digital Public Infrastructure

Source: World Bank Group, “Digital Public Infrastructure and Development: A World Bank Group Approach,” Digital Transformation White Paper, Volume 1, March 2025.

Achieving inclusive and scalable DPI across the Global South requires addressing challenges across three foundational layers:

- 1. Connectivity layer:** Ensuring equitable access to internet infrastructure and devices, especially for rural and marginalised populations. This layer

underpins the accessibility of DPI systems and requires targeted policies to ensure affordable, reliable, and high-speed connectivity.

- 2. Application and data layer:** Facilitating data access and interoperability through APIs and secure platforms for domestic and cross-border data sharing. Open standards, privacy protection, and trusted data exchanges form the backbone of this layer.
- 3. Use case layer:** Developing DPI use cases with tangible benefits, such as e-wallets, digital IDs, citizen registries and sector-specific blueprints tailored to government and citizen needs. Effective use cases should be demand-driven, inclusive, and aligned with national development priorities.

Recommendations

Invest in foundational enablers for DPI deployment

Connectivity, together with cloud and edge computing infrastructure, forms the foundational backbone of DPI ecosystems. Without a robust and inclusive digital infrastructure, DPI platforms cannot scale equitably or reach underserved populations, particularly in rural and remote areas where commercial investment in telecommunications remains limited. Community-centred connectivity initiatives (CCCI) represent an emerging model of locally driven network development that addresses these gaps by placing communities at the centre of network design, ownership, governance, and operation.⁵ Typically led by local cooperatives, civil society organisations, or social enterprises, CCCIs are

⁵ Association for Progressive Communications. Understanding Community-Centred Connectivity Initiatives in Asia and the Pacific. 2023. <https://www.apc.org/en/pubs/understanding-community-centred-connectivity-initiatives-asia-and-pacific>

grounded in local needs, cultural contexts, and participatory approaches. In addition to expanding last-mile connectivity, CCCIs have the potential to serve as decentralised hubs for edge computing and community-level cloud storage, thereby enhancing the resilience, efficiency, and accessibility of DPI services in areas where centralised infrastructure may not be viable. CCCIs also offer an opportunity to advance climate-resilient and energy-efficient digital infrastructure, as many rely on renewable energy solutions, such as solar-powered base stations, to ensure reliable, off-grid connectivity in remote areas.⁶

To ensure the successful deployment and long-term sustainability of CCCIs, coordinated mechanisms should be established to mobilise concessional and blended financing that is tailored to the specific needs of non-commercial, last-mile connectivity models. These financial tools should prioritise inclusive access and locally driven innovation in areas underserved by traditional telecommunications infrastructure.

At the same time, regulatory frameworks should be adapted to enable CCCIs to operate effectively. This includes facilitating equitable access to spectrum, affordable backhaul infrastructure, and universal service and access funds. Policy environments must recognise the unique characteristics of CCCIs and remove administrative and financial barriers to their growth. Finally, CCCIs should be integrated into national digital strategies, particularly those focused on the development of DPI.

⁶ Pickard, Sarah, and Leandro Navarro. Greening Community Networks: The Transition to Renewable Energy. In *Global Information Society Watch 2022: Digital Futures for a Post-COVID World*, edited by Alan Finlay, 61–68. APC and IDRC, 2022. <https://giswatch.org/node/6238>

Build data sharing infrastructure to support rapid DPI deployment and community-centred connectivity initiatives

Data sharing infrastructure (DSI) is essential for the effective deployment and scalability of DPI, particularly across African countries and within community networks that function as localised DPIs. DSIs provide the backbone for safe, interoperable, and efficient data exchange across borders, enabling tools like e-wallets, digital ID systems, and public registries to function seamlessly. In many parts of Africa, where community networks often serve as primary access points to digital services, DSIs can ensure that data flows between sectors and networks are consistent, secure, and inclusive. However, current data access remains fragmented and inconsistent, limiting the potential of both national DPIs and grassroots networks to operate efficiently and foster innovation. There is an urgent need to manage the trade-offs between open data ecosystems and community network infrastructure (CNI), and to harmonise standards for interoperability. By integrating DSI into DPI governance, G20 countries can empower African nations and community-based initiatives to unlock the full potential of digital transformation, reduce development costs for innovators, and build robust, citizen-centric digital economies.

Promote co-creation of DPI solutions with the private sector

Governments should co-design DPI tools with private stakeholders to build trust, capacity, and relevance. This approach can reduce the cost and time to deploy DPIs while ensuring their sustainability. Also, the G20 can support governments in building state capacity in developing DPI to attract private sector financing and expertise before deployment to ensure ecosystem adoption. Test beds for innovation, public repositories, and open collaboration platforms can create feedback loops that improve public service delivery and private sector engagement. Local solution providers must be supported through procurement incentives and public-private partnerships.

Promote technology neutrality and prevent lock-ins

DPI should be designed like public transport systems – open and accessible across multiple technologies and service providers. To achieve this, DPIs must be built on modular, interoperable, and open data platforms that support multi-vendor participation. Examples such as Ghana’s mobile number portability and mobile payment interoperability illustrate how technology neutrality empowers users to switch providers and access services seamlessly. At the regional level, the Pan-African Payment and Settlement System (PAPSS) is a cross-border DPI, enabling financial transactions across banks in different African countries and demonstrating how inclusive design supports wider adoption and integration. To sustain these efforts, DPI coalitions should be established to co-create tools and standards that enable cross-sector and cross-border DPI design. Additionally, legislation must be future-proof and technology-neutral, focusing on principles such as privacy and data protection, regardless of the technological medium. Avoiding proprietary lock-ins reduces long-term costs, fosters innovation, and ensures that DPIs remain relevant, scalable, and aligned with evolving digital ecosystems.

Design DPI to be socially inclusive and commercially viable

While DPI is a public good, it must also be attractive to private investors. Procurement systems should create demand for aligned solutions. Regulatory reforms should de-risk startup investments and harmonise legal frameworks to support sustainable DPI ecosystems. Governments should identify priority sectors and create investment roadmaps to attract public and private funding.

Establish regional governance based on digital zones

LMICs may struggle to develop robust digital governance independently. Regional digital blocs can create shared legal and regulatory frameworks, promote interoperability, and strengthen bargaining power. Digital zones with common standards can drive inclusion, sovereignty, and innovation. Harmonising standards and digital codes regionally will enhance cross-border trade and build regional innovation ecosystems. Also, it is key to building the state capacity of LMICs to leverage some of the frameworks and tools designed under the India and South Africa G20 presidencies for DPI development.

Conclusion

G20 countries stand at a pivotal moment to coalesce around a shared agenda for DPI. With clear momentum from recent G20 presidencies, DPI offers a transformative pathway for inclusive digital development, economic resilience, and democratic renewal. Through coordinated investment, inclusive governance, and strategic partnerships, G20 members can help scale DPI to unlock the full promise of the digital age for all.

T20 South Africa Convenors



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