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Task Force 05

INCLUSIVE DIGITAL TRANSFORMATION

A Framework for Digital Public Infrastructure to Scale Transformation

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Abstract

Research[1] shows that the growth of Digital Public Infrastructure (DPI) needed to accelerate digital transformation and achieve the SDGs is hampered by the siloed nature of legacy infrastructure. A common framework is required in order to understand the enabling ecosystem necessary to build, adopt, and implement DPIs, which the G20 must address to support inclusive and sustainable economic growth. This policy brief details how the DPI approach emerged as a focus area from the India G20, which encouraged the G20 to leverage its strategic forum to build a common framework for DPI, particularly the ecosystem needed to support it. When supported by a common framework, DPIs, coupled with Digital Public Goods (DPGs), can help advance equity and inclusion in the digitalization of public services critical to sustainable growth.

A public infrastructure approach requires a long-term public financing strategy; clear regulatory, institutional, and digital architecture that allows the 'regulators to regulate and the innovators to innovate'; and a clear/common understanding of the specific data governance features, institutional capacities, key data assets and conditions that enable data access and use. The authors draw from the use of DPIs and DPGs to advance SDGs 2, 6, and 9 in India, Zambia, and Ethiopia, assessing the critical elements of a data ecosystem maturity framework to understand the preparedness and compatibility of a data ecosystem to adopt a public infrastructure approach to digital transformation. Recommendations include the G20's explicit recognition and endorsement of a DPI approach to digital transformation; developing workstreams to devise common standards and guidance for DPI/DPGs, building on lessons learned from member states, the private sector, and civil society; and the need to pilot/test guidance and standards within industries, for example in WASH and agriculture.

Keywords: Digital transformation; digital public infrastructure; digital public goods; Data maturity; Zambia; Ethiopia; India.

[1] See e.g. Chakravorti, Bhaskar, "The Case for Investing in Digital Public Infrastructure," Harvard Business Review, accessed May 13, 2024, https://hbr.org/2023/05/the-case-for-investing-in-digital-public-infrastructure

Diagnosis of the Issue

Digital Public Infrastructure is a set of shared digital systems that should be secure and interoperable that can be built on open standards and specifications to deliver equitable services at a societal scale and are governed by legal frameworks[2]. The India G20 presented, for the first time, the recognition of the importance of DPIs from a multilateral forum, including principles and approaches to guide the global design of DPIs. This was followed by an announcement from the Indian Prime Minister on the creation of a Global Digital Public Infrastructure Repository and a Social Impact Fund to advance Digital Public Infrastructure (DPI) in the Global South[3]. Development and consensus around DPIs continue to be central to the G20 agenda, particularly as the Covid-19 pandemic has accelerated the trajectory of government digital transformation[4].

The focus on DPI during the India G20 brought global attention to this concept. The Digital Economy Working Group (DEWG) provided a forum for consensus and to identify some of the principles and ideas for a common understanding, design, and deployment of DPIs. The global resonance of the DPI approach suggests that continued focus on this concept in the Brazilian presidency will be important.

Examples from India, Estonia, and other countries show that DPI can be effective in creating inclusive opportunities and growth, combatting digital divides based on gender,

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[2] "G20: digital ministers met in India to discuss digital innovation and inclusion," European Commission, accessed March 30, 2024, https://digital-strategy.ec.europa.eu/en/news/g20-digital-ministers-met-india-discuss-digital-innovation-and-inclusion#:~:text=22%20August%202023-,G20%3A%20digital%20ministers%20met%20in%20India%20to%20discuss%20digital%20innovation,digital%20economy%20in%20Bangalore%2C%20India.

[3] "Prime Minister announces completion of Global Digital Public Infrastructure Repository and creation of a Social Impact Fund to advance Digital Public Infrastructure in Global South," Government of India Press Bureau, accessed March 30, 2024, https://pib.gov.in/PressReleseDetailm.aspx?PRID=1979113.

[4] "New Research Shows COVID-19 Drives Government Digital Transformation," Granicus, accessed March 30, 2024, https://granicus.com/blog/new-research-shows-covid-19-drives-government-digital-transformation/#:~:text=61%25%20of%20officials%20believe%20COVID%2D19%20accelerated%20their%20digital%20transformation,toward%20providing%20more%20services%20online.

class, geography, marginalized identities, and other factors, particularly when further supported by DPGs, open-source resources used to create or improve a country's DPI that help ensure best practices are incorporated, cost-effective rapid deployment and scale are achieved and dependency or lock-ins are avoided[5].

India has emerged as an early leader in inclusive and accessible digital infrastructure, which can help improve daily services for citizens. India's core digital public infrastructure includes: Aadhaar (the digital identity infrastructure that currently covers 1.3 billion issued cards), the Unified Payments Interface (a real-time payment system that facilitates bank transactions through mobile phones), and an account aggregator framework that enables consent-based data sharing[6]. Together, this infrastructure is commonly referred to as IndiaStack. This core infrastructure allows the creation of sector-specific applications such as in health, finance, and e-commerce. The use of IndiaStack to facilitate social payments from the government, the push to digital transactions, and the creation of anchor institutions such as the National Payments Corporation of India have greatly helped the adoption of the framework[7]. However, a drawback must be recognized: critics have pointed to several instances of exclusion from social services for those who could not access digital IDs and payments, especially amongst the most vulnerable populations[8].

India's approach can be termed as one of the more 'comprehensive' ones and includes:

1. The domestic technical ability to build and maintain core DPIs;

[5] "DPG and DPI," Centre for Digital Public Infrastructure, accessed March 30, 2024, https://docs.cdpi.dev/the-dpi-wikipedia/dpg-and-dpi.
[6] The DPI Approach: A playbook, UNDP, accessed March 30, 2024, https://www.undp.org/publications/dpi-approach-playbook.
[7] "Stacking up the Benefits: Lessons from India's Digital Journey," IMF Working Paper, accessed March 30, 2024, https://www.imf.org/en/Publications/WP/Issues/2023/03/31/Stacking-up-the-Benefits-Lessons-from-Indias-Digital-Journey-531692.
[8] Death by digital exclusion, 2019. https://www.thehindu.com/news/national/other-states/death-by-digital-exclusion/article28414768.ece

2. A policy framework that actively encourages and incentivizes the adoption of DPIs such as a digital identity and UPIs;
3. A simultaneous digital and analog process that allows onboarding onto the DPIs; and
4. An active private sector that seeks to create financially viable products that can build from the existing DPIs.

While the India example includes the elements of a broader DPI ecosystem, an approach this comprehensive may not be feasible or necessary in new geographies. The authors in their work in Zambia and Ethiopia have attempted to discover cost-effective entry points for accelerating affordable digitalization of core government functions and strengthening data production and data use, using a DPG approach. A key approach here is to start with a common data and digital maturity assessment framework (deployed as a simple self-assessment system for public sector representatives) that could be deployed in any sector.

The authors' work in Zambia, to strengthen the generation and use of data on SDG 6.2, uses a powerful framework that is scalable beyond SDG 6. This framework consists of two levels of assessment:

1. **Organization–level maturity** is the internal framework that shapes how an organization/entity handles data. It includes elements such as data policy, governance, internal capacities, data assets, and data use.
2. **Ecosystem Maturity** is the external landscape of interconnected data systems and flows between organisations/entities. It requires common standards, value chains, and incentive structures.

This framework when used helps generate Data & Digital Improvement Plans and a clear list of interventions that could be taken up under the social impact fund.

The maturity of the data ecosystem is the product of effective data governance and collaboration between all stakeholders in the ecosystem. In Zambia, Athena is working with the Ministry of Water Development and Sanitation (MWDS) to address critical data challenges such as the fragmentation of existing data systems, lack of standardized definitions and indicators, and insufficient data on safely managed sanitation. These issues have historically hindered effective service delivery and policy formulation in the WASH domain and severely inhibited utilities' ability to build on digital transformation initiatives such as DPGs. The authors' work[9] with the MWDS to assess the data maturity of WASH institutions, their preparedness to leverage data systems and digital tools, and to build both digital and financial infrastructure required to deploy digital public goods, which can be leveraged by WASH sector institutions.

The four key pillars of measuring data maturity, as the authors suggest, are:

- Data governance;
- Data capacity;
- Data assets; and
- Data use.

The other example draws from the authors' ongoing work on livestock data interoperability in Ethiopia with the Ministry of Agriculture (MoA)[10]. A four-year program that approaches transforming the country's livestock productivity by

[9] This is based on Athena Infonomics' ongoing work in Zambia, the outputs of which are not yet publicly published.

[10] "aLIVE Program Reaches Milestone: Livestock Data Standards Endorsed by Ethiopia's Ministry of Agriculture," Development Gateway: An IREX Venture, accessed March 30, 2024, https://developmentgateway.org/blog/alive-program-reaches-milestone-livestock-data-standards-endorsed-by-ethiopias-ministry-of-agriculture/.

overhauling the technical, human, and governance structures underpinning the data used for the Ministry's policymaking. Instead of starting with the digital platform first, the program has paid particular attention to developing data standards and foundational data governance policies for data sharing and access over eighteen months with over four dozen partners and half a dozen systems. This provides the foundation for strengthening local buy-in, management, and capacity building, while open-source technology development of a data lake, analytics and business intelligence, and user-friendly dashboards is being built[11].

Building on the country examples laid out above, the following recommendations provide a simple framework that the Brazil G20 can use to analyze the preparedness of policymakers and implementing organizations (both public and private entities). This foundational approach can serve as a crucial starting point for the development of common standards and frameworks to institutionalize this public goods approach among the G20 and other states.

[11] Ibid.

Recommendations

1. Institute a dedicated working group/task force to strengthen a common data and digital maturity assessment framework, applicable across sectors, to serve as a reference point to map DPI entry points and interventions that work for the country context.
2. Develop standard appraisal and review protocols for enabling countries to effectively engage and access the social impact fund for the development of DPI/DPGs, based on the results of their self-assessments.
3. Build and grow a community of learning and practice linked to the fund to help countries collaborate on common solutions.
4. Create templates and tools and a global digital repository of Maturity assessments and DPG actions.
5. The G20 should explicitly recognize and endorse a DPI approach towards digital transformation, affirming the benefits of open digital infrastructure for economic growth and innovation, as well as facilitating greater legal interoperability on data protection and safety standards, and data-level interoperability.
6. Building on the above, the G20 should institute dedicated workstreams focused on devising common standards and guidance for DPGs within the bloc building on lessons learned from member states, the private sector, and civil society.
7. Under the established workstreams, guidance and standards should be piloted/tested within a handful of sectors, for example, testing the standards for practicality and sense, for example via the nexus between climate change, agriculture and economic growth etc.

8. Critical to successful piloting within sectors will require the G20 and its partners to build off lessons learned from member states, private sector and civil society to provide guidance and frameworks for DPI prioritization and localization at the national level - further establishing digital sovereignty at the national level. This could be approached by utilizing new or existing working group or community of practice structures to meaningfully engage a cross-section of stakeholders to provide input and improvements to the standards and guidance as it develops (rather than at the end).

Scenario of Outcomes

While DPI models can (and do) contribute greatly to public policy objectives around financial inclusion, legal identity, and other goals, they also replicate the norms, relationships, and power dynamics of the contexts in which they are implemented. Moreover, in the absence of international coordination around key decisions relating to DPI components - especially at the data layer -, there is a risk that significant new data silos across globally significant datasets may emerge unless preventative design steps are taken now. In this brief, we contend that by implementing our recommended actions, G20 countries can mitigate against some of these distortive effects of DPI in their national contexts.

By committing to an open-source, reusable approach to DPI, G20 countries can ensure that key DPI components within their stack are more easily adaptable and customizable, lowering the risks of vendor lock-in, reinforcing agile and adaptive design principles, creating a more inclusive technical ecosystem, and reducing the risk of technology redundancy over time. Moreover, using open-source tools to build their stack reinforces

the good governance principles of transparency and integrity. It facilitates the independent auditing and inspection of DPI components by civil society and others. The most significant trade-off of implementing this recommendation is the capacity and knowledge needed to maintain core DPI components as open-source. A further trade-off relates to the need to ensure effective and open coordination of stakeholders involved in the DPG/DPI ecosystem.

Moreover, explicit recognition and endorsement of the benefits of a DPG approach to DPI development and implementation by the G20 would send a strong signal recognizing the relationship between democratic governance and digital transformation. It would also pave the way for the G20 to establish workstreams to explore the development of common standards for DPG/DPI component/module interoperability between member states in key areas - ranging from sectoral technical standards to common DPI regulatory standards governing data protection and sharing[12]. These are challenging areas of international cooperation, requiring Member States to consider the balance between their digital and data sovereignty and multilateral cooperation. However, the benefits of international standards to international regulatory coherence, trade, and crucial public interest data sharing could be enormous. Integral to this work will be peer learning and knowledge-sharing exercises that can surface good practices and real-world experiences from a range of stakeholders.

[12] Much preparatory work has begun at the regional level in Africa, Asia, and Europe to develop the cybersecurity, data protection, and overall digital transformation frameworks that shape DPI. These should be drawn upon as a source for the G20 as it develops DPI workstreams.

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