Policy Brief: Governing Digital Public Infrastructure as a Commons

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Abstract and Keywords

Building upon the G20 New Delhi Leaders' Declaration commitment to improving access to digital services through digital public infrastructure (DPI), this policy brief discusses the potential of governing DPI as a commons, drawing from the governance of data/digital ecosystems and practices of commoning and co-creation from the open movement.

A commons approach to governing DPI can help scale and localise DPI exchanges, increase transparency and accountability, accelerate their impact, reduce governance complexities, data and localisation frictions, and secure community engagement beyond the governments and companies involved. Important public goods as diverse as Wikipedia and Linux constituted and governed as digital commons, offer valuable lessons in digital governance. Rigorous research on Knowledge Commons, building on the Nobel prize-winning work of Elinor Ostrom, provides conceptual and practical resources to ensure that DPI increases equality as it addresses marginalisation.

The G20 Summit in Brazil promises to address transversal issues related to citizen participation, democratic governance, and urgent action to reduce poverty and tackle the climate crisis. The Commons-based governance structure proposed for DPI, enables cooperation by multiple actors, including the public sector, commercial providers and civil society, even across borders. The brief recommends developing and adopting a digital commons governance model for DPI to accelerate its adoption and increase the public benefits of technology deployed at scale while safeguarding the rights and digital sovereignty of countries and communities within them.

Keywords: digital governance, digital public goods, digital commons, cooperation, digital public infrastructure, data governance, democratic participation.

Governing Digital Public Infrastructure as a Commons

The New Delhi Leader's Declaration identified Digital Public Infrastructure (DPI) as an essential technological basis for delivering public services and for more inclusive and sustainable development. The Declaration emphasises that DPI should be "safe, secure, trusted, accountable and inclusive digital public infrastructure, respectful of human rights, personal data, privacy". To this end, the Declaration recognises that DPI should be "built on open standards and specifications, as well as opensource software". In the G20 Framework for Systems of Digital Public Infrastructure governance must ensure public trust and transparency through systems that are "safe, secure, trusted and

transparently governed, and also promote competition, and inclusion, and adhere to principles of data protection and privacy".

Brazil has pledged to use its presidency of the G20 to elevate democracy as a cornerstone for addressing a range of global challenges, including inequality, poverty, hunger, climate change, and the transition to sustainable energy sources. In this regard, participative governance of DPIs is crucial, especially given Brazil G20's proposed focus on social inclusion and reform of global multilateral institutions. While the design, development, and deployment of many DPIs are currently in process, there is little apparent effort to discuss in parallel a governance model that would guarantee that the technologies being deployed will be rights-preserving and people-centric, locally adapted to the needs and preferences of the communities DPI intends to serve. One of the focus areas of the G20's Digital Economy Working Group is secure, reliable and inclusive DPI – to strengthen the relationship between governments and citizens. We believe that commons-based governance of DPIs is central to this objective to address shared decision-making, inclusivity and sustainability.

Current global initiatives oriented towards the promotion, funding, and adoption of DPIs lack governance mechanisms that would empower all actors in society to participate actively and shape the technologies that will mediate their most basic digital interactions with the State, the market and other actors in society.

There are not many successful models for governing large-scale technological projects serving a considerable number of people. Until now, most technology governance models have led to concentration of power and democratic deficits. Creating and deploying DPIs intended to serve millions is an ideal opportunity to shape a new form of digital governance.

In the past, government platforms provided by the private sector have led to serious privacy violations, algorithmic discrimination, overpricing, data security breaches, and inadequacies for the local context in which they were deployed. These issues have remained mostly unresolved because of transnational companies' protected position, based on vast trade secret protections, non-disclosure agreements, and confidentiality clauses. Too often, the relationship between a digital provider and the State has been merely transactional, even if procurement could be publicly scrutinised.

Investment in digital public infrastructure for the next five years is forecast to be millions (of any currency), driven by multilateral and multi-stakeholder alliances to secure several countries' commitment to deploying DPIs. India and a group of influential philanthropic organisations from the US are leading the effort. Massive digital projects are underway in Africa and Asia to deliver platforms for digital IDs, payments, and data exchange using models of DPIs, transferred from mature digital economies to emerging countries. For example, India has signed a Memorandum of Understanding with several countries to adopt their India Stack.

New configurations of responsibility between the state and corporations are necessary to ensure the development of at-scale DPIs, which account for local context-specific factors and are co-governed with the communities sought to be empowered through DPIs. This is why this contribution proposes to draw from commons-based and digital commons governance principles to better address and represent the needs of citizens and communities regarding DPIs in contexts where communications depend on monopolies.

The commons have proven to be a viable alternative to both purely commercial and purely state-dominated provision of public goods as varied as water (Ostrom, 1991), knowledge goods (Hess and Ostrom, 2007), and digital goods (Dulong de Rosnay and Stalder, 2020). Contrary to erroneous accounts from the mid-20th century (Hardin's Tragedy of the Commons), commons are not open to appropriation, leading to depletion. On the contrary, commons are subject to governance that includes rules to ensure their sustainability.

The open movement has successfully provided large-scale public goods for decades. The Linux operating system has been supplied through commons-based peer production and is critical to many web servers' infrastructures. Crucial to its success were the technical, social, and institutional factors that organised the collaboration (Schweik and English, 2012). DPI efforts should be informed by such experiences to find an adequate governance model to fulfil their purposes and mission.

Exploring a new commons-based governance paradigm for DPIs

This policy brief invites G20 leaders to take active steps to test a commons-based approach to governing DPIs. This approach could start an era of citizen participation in the design, deployment, implementation, and evaluation of DPIs, distributing power and public benefits of DPIs and increasing their viability and sustainability in the long term. This citizen participation is important for various aspects of DPIs - data, digital infrastructures and proposed use cases.

To fulfil this purpose, the authors recommend a series of steps that should be taken during the Brazilian leadership of the G20 process:

1. Understanding the complexities of digital governance and DPIs. The G20 members should understand the complexities of governing digital infrastructures that are public. In the digital world, infrastructure choices and design, have policy consequences, as they co-shape digital sovereignty and autonomy through, for instance, data hosting, exploitation, and protection (Musiani, 2022). Infrastructure, like most goods, services, and resources, can be designed, provided, governed, exploited, and maintained either by private actors, by public actors, through public-private partnerships (this can be the case for roads or water), by communities themselves, or by a mix of private-commons or public-commons initiatives. Mazzucato and Frischmann (2012) analysed how infrastructure built with public funds has a broad social value for the private sector and citizens. Internet infrastructure is primarily public-private but can also be commons-based, engineered, and governed by communities (Dulong de Rosnay and Tréguer, 2021). Adopting the default mode of governance for DPIs would be a missed opportunity for developing new institutional models to govern, maintain, and update public benefit digital technologies.

   The purpose of infrastructure is to produce society-wide benefits. Many of these are economic; however, the benefits are diffused through the economy. Capture of such benefits by a single economic actor that can impose monopoly pricing is both economically inefficient and, because it reduces the incentives to extend the benefits to all of society, unjust. Profit-motivated corporations can bring capital, expertise, and a focus on efficiency; however, they tend toward profit extraction and even monopoly if unchecked. State provision of infrastructure is focused on public benefits, at least initially. Still, it can be bureaucratic, slow

to react to new technological developments, and, in some cases, subject to capture by private interests. In many developing countries, states cannot provide public digital infrastructure alone. DPIs present additional challenges when technology providers are outside the country where they are deployed, citizens of the recipient countries will have little to no influence in shaping such technologies unless an intentional governance mechanism is created for that purpose.

Further, commons-based governance of shared digital resources brings to the fore the different simultaneous roles that need to be discharged by the state to support and ensure the sustainability of the digital commons - such as the role of the state as a funder, a convenor, a collaborator, a regulator, an enforcer and a consumer (among others) (Contreras, 2017). For that purpose, we recommend that the G20 leaders take active steps to open the conversation about DPI governance and the possible impacts of adopting different models through mapping, research, and public outreach.

2. Identifying commons governance principles applicable to DPIs in general and specific DPIs, for example, digital identity. For that purpose, G20 leaders could be guided by Elinor Ostrom's work, which identifies several essential factors for a commons to be successful. (Hess and Ostrom, 2006) These are clear boundaries for participants, clear responsibilities, shared responsibilities, monitoring, graduated sanctions, dispute resolution processes, shared goals, shared leadership, and nested enterprises. These are closely linked to many of the principles in the G20 Framework including inclusivity, interoperability, collaboration, trust and transparency and grievance redress.

The Brazil G20 process should establish a set of principles for the governance of digital public infrastructure elaborating the framework that transposes institutional commons principles to DPI governance:

- DPI Governance should be transparent and accountable. Regular audits of DPIs' social, economic, and environmental impacts should be undertaken and made public.

- All software required for or involved in digital public infrastructure should be open-source.

- All technical standards used in DPI should be open and accessible, royalty-free, and maintained by open standards bodies.

- Personal data used by or produced in DPIs must only be used in accordance with high data protection standards.
- Digital identity and cybersecurity are ensured by using digital commons/internet commons applications.

- Other data generated through the use of digital public infrastructure should be used to create public value (Eaves et al., 2024) and should be available on an equitable basis (no commercial provider of DPI should receive preferred access to data).

- Disputes about using and providing digital public infrastructure should be resolved by a dispute resolution process independent of any providers or actors.

- Participation across all levels of decision-making - public consultations for laws, increased participation in standard setting.

- Users of DPI whose technology skills or access to technology are limited must have alternative channels such as in person or telephonic channels to seek redress.

- Humans in governance mechanisms must have the power both legal and technical to override automatic systems where injustice would otherwise result.

- Use commons-based licenses that apply to all types of data in a DPI, such as Benhamou and Dulong de Rosnay's Open Data Commons licenses (2023). This license has two important mandatory elements: a Share-Alike clause applicable to licensees and derivatives and a privacy pledge applicable to both the licensor and the licensee.

  The HealthStack in India is an interesting example of the potential of DPI in increasing access to public health.[1] It shows that developing common open standards for electronic health records and health metadata is crucial for ensuring interoperability between different digital health systems and enabling high-quality data for health research. The Channapatna Health Library in India is today a locally developed and locally maintained data repository for traditional knowledge, while still keeping its interoperability with other health systems[2] Other initiatives from open science and citizen science also serve as helpful case studies for designing, developing and governing health data infrastructures that have public benefit but simultaneously allow for some form of local governance.

  The G20 should convene workshops to study the current state of DPI governance and the development of a commons-based future frame to guarantee the fairness, openness, and sustainability, of DPI and democratic participation in DPI governance, building upon successful digital governance models already in place. Workshops should encompass governments and other sectors including indigenous communities, local developers, academics, and experts.

3. Supporting pilot programs for the instantiation of digital commons governance.

  The G20 should encourage commons-based governance pilots for emerging DPIs instead of accepting current governance models as a default. DPIs are unique in their potential to strengthen cooperation among countries, trust in the technologies and the people behind them and balance the usually unevenly distributed power citizens have vis-a-vis big technology companies (Avila, 2018). Commons governance changes the paradigm from one of extraction, surveillance and control to a people-centric, rights preserving, sustainable and democratic governance model for citizens to interact with the services and interactions with the public administration provided through DPIs.

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[1] *https://abdm.gov.in/*
[2] *https://llncolab.notion.site/Channapatna-Health-Library-4b72a31fea8241b79c2f75a6b9d302b6*

Experimenting with commons-based governance models: a future where public technologies meet citizen participation

With the drafting and adoption of the proposed Guiding Principles for Commons-based Governance and Accountability, all DPIs being developed should implement them through tests or pilots of such models. In parallel, the G20 member countries should invest in test governance models to be developed together with the DPIs being funded or deployed to have comparative data on their governance effectiveness and public benefit.

One aspect that could present some friction is the decentralised decision-making process (following the principle of polycentricity[3]), which is crucial to commons-based DPIs. This decision-making model can yield implementational issues, particularly in vastly heterogeneous demographics. Accounting for the incentives of various stakeholders is also essential. Commons-based modes of resource production and resource management are sometimes opposed by corporations; however, where legal rules ensure reciprocation, such as the GNU General Public License, corporations participate.

Therefore, the state's role in ensuring that corporations do not merely appropriate from the commons but also contribute back to the commons is essential. However, ensuring reciprocation cannot rely only on open licensing but extends to every facet of the legal basis of the entire DPI, and involves economic as well as political considerations.

By adopting the recommendations on commons-based governance, DPIs will break ground in the democratic governance of new technologies, developing mechanisms for adequate localisation and dynamic prevention and correction of potential harms. With commons-based governance, DPIs will uphold the commitment to sustainability, inclusion, and rights enhancement beyond the initial deployment phase of a digital solution. For efforts involving more than one country, a commons-based governance approach would result in a tested model for digital cooperation across borders, regions, and cultures, offering alternative paths to the current global cooperation frames, fulfilling the objectives of the Brazil G20 Summit and resulting in a direct improvement in the technology that is deployed and used by the majority of the World, making them actors both in shaping DPI localisation and contributing to DPIs sustainability, adaptation and growth.

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[3] Principle of polycentricity recognises the multiplicity of actors involved in decision-making, and the importance of multiple political centres of decision-making - with such centres spread across scales (local, national, regional, global) and sectors, and involving both formal and informal measures. See generally, Carolina Aguerre, Malcolm Campbell-Verduyn, Jan Aart Scholte, "Global Digital Data Governance: Polycentric Perspectives", 1st ed (Routledge, 2024).

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