

## Digital Public Goods for an Inclusive Digital Future: A Roadmap Towards 2030

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### 1. Overview

The UN Secretary-General's Roadmap for Digital Cooperation<sup>i</sup> defines digital public goods (DPGs) as “open source software, open data, open artificial intelligence models, open standards, and open content that adhere to privacy and other applicable international and domestic laws, standards and best practices, and do no harm”. As “adaptable” and “re-usable” technological building blocks that can be “re-programmed” and “re-combined” in myriad ways,<sup>ii</sup> DPGs become indispensable for building public digital infrastructure in critical socio-economic sectors. In addition to serving as the common rails of innovation that give impetus to the growth of the economy, they also undergird an efficient transition to digitalised governance, mitigating prohibitive costs and vendor lock-in challenges of proprietary e-governance solutions, especially for developing countries.<sup>iii</sup>

The crucial role of DPGs in harnessing science, technology, and innovation (STI) pathways for the realisation of Agenda 2030 was first underscored by the UN Secretary-General's High-level Panel on Digital Cooperation, – co-chaired by Melinda Gates and Jack Ma – in its report, *The Age of Digital Interdependence*.<sup>iv</sup> In order to actionise the recommendations of the Panel, the Digital Public Goods Alliance (DPGA) was set up in 2019 by the governments of Norway and Sierra Leone, the Indian Software Product Industry Roundtable (iSPIRT), and UNICEF.<sup>v</sup><sup>vi</sup>

The DPGA has been set up as a multi-stakeholder initiative bringing together “a diverse set of stakeholders that unite around a common vision, strategic objectives, definition, and standard for DPGs”.<sup>vii</sup>

In 2021, the DPGA announced a five-year strategy<sup>viii</sup> for effectively promoting and supporting the adoption of DPGs to address critical development needs in low- and middle-income countries (LMICs). The key elements of the strategy are as follows:

1. **Financing:** Mobilisation of funding and resource support for the development and promotion of DPGs through strategic engagement of the private sector, going beyond the conventional financing and institutional collaboration modalities of traditional development cooperation.

2. **DPG Standard and Registry:** adoption of an international standard that lists the baseline requirement for a technological product to qualify as a DPG, and encouraging the discoverability of public/private/civil society-led technological products that meet this standard by listing them in a global registry.
3. **Multi-stakeholder Networking for Championing DPGs:** building an international leadership coalition of heads of States and high-level executives in the private sector,<sup>ix</sup> and catalysing multi-stakeholder communities of practice for rapidly advancing high-impact DPG solutions in developing countries.

This policy brief takes stock of the DPGA's strategic approach, and provides critical reflections, chalking out some future directions for global and national-level actions, in line with the vision of inclusive development in Agenda 2030.

### 2. A Stock-taking of the DPGA's Strategic Approach

The effective and equitable use of DPGs requires that their “discovery, development, use and investment”<sup>x</sup> are anchored in appropriate and adequate techno-institutional governance frameworks. As discussed below, the DPGA's current approach falls short in this regard.

#### 2.1. Performative Openness, Free-riding, and Foul-dealing in Open Access Governance of DPGs

The DPGA champions open-source governance of DPGs, underscoring the need for non-excludability, unrestricted access, and interoperability. Open licensing of software, standards, platforms, data pools, and artificial intelligence (AI) models is the mandated norm for the development of successful DPGs.<sup>xi</sup> For example, DPGA member, UN Global Pulse, has set up a global multi-stakeholder platform for privacy-compliant data exchange and data pooling – the Global Data Access Framework (GDAF) – by connecting governments and development institutions with technology provider firms. Co-led by the Artificial Intelligence initiative of The Future Society and the Noble Intelligence initiative of McKinsey, the GDAF has set up a partnership ecosystem of over 70 stakeholders, including major technology firms, academic

institutions, non-governmental organisations, and United Nations agencies, in order to achieve demand- and supply-side scaling of the open data commons it is building.<sup>xii</sup>

An unrestricted open access approach that misgoverns DPGs as “pure” public goods,<sup>xiii</sup> fails to acknowledge and respond adequately to the risks of monopolistic capture of the value of such innovations by a few powerful actors.<sup>xiv</sup> The absence of access-and-use conditions to regulate such goods renders their openness merely performative, eroding their publicness.<sup>xv xvi</sup> Evidence suggests that in open source innovation communities (based on licensing regimes that valorise open access to underlying software, data, content, AI, standards, etc.), there are risks not just of “free-riding” – some actors in the community of innovators freely taking benefits from the common pool, without making any contribution; but also of “foul-dealing” – more powerful actors benefiting at the expense of less powerful contributors to the common pool.<sup>xvii xviii</sup>

The idealised imaginary of openness in DPG governance, in and of itself, cannot maximise their social value. For instance, digital behemoths exploit the software commons ruthlessly by building proprietary software-as-service offerings on the top of such resource pools. Locking-in customers, they are known to “strip-mine open innovation ecosystems”,<sup>xix</sup> For example, in October 2015, Amazon copied the open-source data search and analysis tool, Elastic, bundled it with other offerings, and made it available as a service on its cloud service AWS, thereby enclosing a previously open-source tool.<sup>xx xxi</sup>

The risk of such foul-dealing in open-source innovation models for data and AI is heightened due to a cross-sectoral, whole-of-economy consolidation of the platform business model.<sup>xxii</sup> The revenue model of platform firms is based on the “intelligence premium” from data-network effects. First-mover platform firms acquire monopoly control over the critical infrastructures upon which social and economic life are predicated, by enclosing the social commons of data.<sup>xxiii</sup>  
<sup>xxiv</sup> This creates a winner-take-all scenario that extends into vertical and horizontal markets, effectively preventing late entrants from gaining a foothold, and entrenching the market power of dominant platform companies (see the case of the GPT-3 language model in Box 1).

What this means is that an openness approach to governing DPGs, including the data and AI pools – without commensurate access-and-use conditions to rein in free-riders and foul dealers – would not create the desired conditions for equalising the opportunity

for innovation. Rather, it would only undermine the affordance of these ecosystems for distributive integrity.

*Box 1. The GPT-3 Language Model: Risk of Foul-dealing in Open Data and AI Innovations*

In 2020, OpenAI, a San Francisco-based AI research laboratory, announced the launch of GPT-3, a language model that holds the record for being the largest neural network ever created with 175 billion parameters.<sup>xxv</sup> The model was trained using the data commons of English language content on the open Internet – from repositories such as Common Crawl, websites such as Wikipedia, and a corpus of e-books.<sup>xxvi</sup> In the same year, OpenAI received a \$1 billion investment from Microsoft, in return for which it granted the technology giant exclusive licensing to GPT-3 use. Though OpenAI could continue to offer its public-facing API – which allows select users to send text to GPT-3 or OpenAI’s other models, and receive output – [only Microsoft](#) would have access to GPT-3’s underlying code, allowing the company “to embed, repurpose, and modify the model as it pleases”.<sup>xxvii</sup> Also, by tying GPT-3 to Azure cloud services, Microsoft will potentially be able to analyse how different companies use the language model, tailoring its offerings accordingly and cementing its position as a leader in cloud intelligence. Further, the 'OpenAI Startup Fund' launched by Microsoft gives beneficiary start-ups early access to future OpenAI systems and credits on Azure, making OpenAI a 'marketing proxy'.<sup>xxviii</sup> The strategic appropriation of open source resources and co-option of open source innovators is a tried and tested ploy of Big Tech companies to entrench their competitive advantage in the AI domain, one that effectively privatises the common pool, and forecloses the possibility for other firms to benefit from commoning.<sup>xxix</sup>

## 2.2. Multi-stakeholder Norm Development and Risks to Human Rights and Public Interest

Setting up multi-stakeholder communities of practice to further the uptake of DPGs is a core strategy of the DPGA, as evidenced by its commitment to the expansion of its global DPG registry. However, the DPGA has not evolved the necessary guidelines on the duties, rights, privileges, and obligations of the various actors to safeguard human rights and public interest in the partnership/collaboration ecosystems that are shaped around the DPGs for downstream innovations. The hope seems to be that soft norm development processes in multi-stakeholder communities will achieve this through emphasis on shared values and principles. Unfortunately, as in the case of the Modular Open Source Identity Platform (MOSIP), a celebrated digital public good exemplar from the DPGA’s registry, demonstrates, privatised governance arrangements in multi-stakeholder communities may be toothless, and unable to provide a binding framework for the

enforcement of foundational human rights/public interest norms (see Box 2). Public agencies, who are the beneficiaries of DPG deployment through such multi-stakeholderist approaches, may also have to relinquish sovereign control over such platforms.

**Box 2. Modular Open Source Identity Platform (MOSIP)**

MOSIP is an open source, open standards-based identity platform that seeks to support the creation of a range of digital identity-linked products and services by both public and private organisations. It was set up in 2018 by the International Institute of Information Technology, Bangalore (IIT-B), with support from the Bill & Melinda Gates Foundation, Tata Trust, and Omidyar Network. The initiative's everyday operations are overseen by a Technology and Executive Committee, and an international multi-stakeholder advisory group has been constituted to guide its overall goals and strategic directions.

To effectively catalyse the development of customised digital ID innovations in different country contexts, a community of private sector 'system integrators' has been forged, bringing on board leading firms in the biometrics and digital identity solutions market such as Idemia, Thales and HID Global.<sup>xxx</sup> <sup>xxxi</sup> Two system integrators – Thales and Idemia – have launched a complementary multi-stakeholder initiative – the Secure Identity Alliance – that seeks to expand access for private sector players to government clientele, especially in regions such as Africa, where there is a growing demand for customised services that can be built on top of MOSIP.<sup>xxxii</sup> Even as market-led innovations have emerged through the partnership ecosystem forged around MOSIP, questions of how to ensure privacy and personal data protection, data security, meaningful inclusion, and human rights compliance, have come up in all instances of the platform's deployment.<sup>xxxiii</sup> Currently, MOSIP has attempted to allay these concerns through a set of *Principles of Engagement* that innovation partners deploying the platform must commit to upholding.<sup>xxxiv</sup> But since these principles – issued by non-state actors backing the initiative – are not a binding institutional framework, compliance is difficult to enforce.

### 3. Conclusions: Designing a Digital Public Goods Roadmap for an Inclusive Digital Future

In September 2019, the UN Secretary-General called for a "decade of action" for accelerated progress on Agenda 2030, emphasising technological innovation as a critical site for engagement.<sup>xxxv</sup> A year later, the UN General Assembly (UNGA) Declaration commemorating the 75th anniversary of the UN, specifically highlighted the

indispensable role of digital technologies to usher in a prosperous digital economy and society.<sup>xxxvi</sup> In the same year, the UN Secretary-General also came out with a roadmap for future global digital cooperation that underscores the development of DPGs as a core intervention arena.<sup>xxxvii</sup> STI discourses in regional political blocs such as the Organisation for Economic Co-operation and Development (OECD) and G-20 have also begun to recognise digital public goods as critical in achieving effective technology transfer to LMICs.<sup>xxxviii</sup>  
<sup>xxxix</sup>

As the discussion so far reveals, the DPGA's approach of relying on multi-stakeholder models for the promotion of DPGs presents irreconcilable dilemmas with respect to their social value, equitable distribution of benefits, protection of human rights and public interest, and sovereign control of public agencies over their deployment. The concerns with respect to effective governance of DPGs cannot be addressed by an institutional modality like the DPGA. Rather, it requires a concerted and coordinated, whole-of-UN approach, complemented by appropriate actions of national governments, private sector actors, technical community members, and civil society organisations, in their respective roles and responsibilities, to build resilient, adaptive, and enabling DPG ecosystems for inclusive innovation, along the lines detailed below.

#### 3.1. Whole-of-UN Actions Through the Technology Facilitation Mechanism

Set up in September 2015 with a mandate derived from the Addis Ababa Action Agenda, the UN Technology Facilitation Mechanism (TFM) is the appropriate institutional coordination channel for whole-of-UN actions to further the STI agenda for the SDGs.<sup>xl</sup> The TFM has 4 components: the Multi-Stakeholder Forum on Science, Technology and Innovation for the SDGs (STI Forum); the UN Interagency Task Team on Science, Technology and Innovation for the SDGs (IATT); the 10-Member Group of High-level Representatives of Science, Civil Society, and Business; as well as the 2030 Connect Online Platform to enable the exchange of ideas and technology, and build networks, towards advancing Agenda 2030.

COVID-19 has demonstrated the critical imperative for the TFM to take up a dedicated global work programme on DPGs. As has been recognised widely, investment in public digital and data infrastructure is proving to be central to post-pandemic economic recovery.<sup>xli</sup> Such a dedicated work programme on DPGs requires actions along the following fronts to bridge the prevailing financing deficits and to tackle institutional

coordination gaps in the operations of the TFM highlighted during its 2019 review:<sup>xliii</sup>

*3.1.1. Establishment of a New TFM Work Programme on DPGs.* The UN Interagency Task Team (IATT) on STI for SDGs should initiate a new global work programme, especially to equip LMICs with the capacities to evolve national roadmaps for DPGs, along the lines of the existing global pilot programme on 'STI for SDGs' roadmaps (UN 2019).<sup>xliiii</sup> A dedicated line of Official Development Assistance to support these efforts must be instituted and supplemented with assured contributions from the 40+ UN agencies who are members of the IATT, along the lines recommended by the UN Conference on Trade and Development's (UNCTAD) *Technology and Innovation Report*.<sup>xliiv</sup>

*3.1.2. Revitalised Technical Cooperation for DPG-enabled Innovation.* A multi-sector, multi-regional mechanism for technical cooperation on DPGs should be set up by the UN Department of Economic and Social Affairs (UN DESA), UN Environment Programme (UNEP), and UNCTAD – the 3 UN agencies coordinating the UN TFM,<sup>xliv</sup> since its inception – to enable synergistic resource support and agile institutional coordination between UN agencies and national governments for deployment and customisation of DPGs. Such a mechanism is non-negotiable for platforms such as 2030 Connect to truly function as an effective and vibrant common pool of foundational digital building blocks for inclusive innovation.

*3.1.3. Inter-governmental Assessments and Analysis of Frontier Data and AI Governance Challenges.* As highlighted by the IATT Report for the STI 2021 Forum,<sup>xlvi</sup> major knowledge and assessment gaps exist with regard to digitalisation and other related frontier technologies. Relevant assessments across disciplinary lines – especially to address the concentration of data-based intelligence in the hands of a few Big Tech companies and socio-economic divides arising from unequal AI ownership<sup>xlvii</sup> – are urgently needed for synergies and high-impact actions. The Report's recommendation for the TFM to set up an intergovernmental panel for policy assessment of digitalisation akin to the Intergovernmental Panel on Climate Change (IPCC) is an important way forward. This needs to be dovetailed with the ongoing initiatives of the UN Secretary-General's office to evolve a future roadmap for global digital cooperation, and also inform the standards development conversations around DPGs at the global level.

## 3.2. Governments

As development trends for connectivity infrastructure indicate, market-led provisioning cannot be relied upon

to build digital public infrastructure in cases where future revenue models are uncertain or hazy.<sup>xlviii</sup> Applying this lesson to building innovation ecosystems around DPGs, a laissez-faire approach that relies on private sector initiative is not going to produce effective outcomes. National governments will need to play a more interventionist role with respect to providing the resource support and institutional scaffolding for developing DPGs and encouraging public interest innovation. Some specific measures that can be undertaken in this regard are outlined below:

*3.2.1. Strategic Vision and Roadmap for Deployment of DPGs Towards Inclusive and Rights-based Development.* Governments should build and promote DPGs – software, standards, data, cloud architecture backbones and AI – based on a vision of inclusive development. DPG-based innovations must – at all times – adhere to constitutional guarantees for human rights, and desist from data-based profiling that violates privacy and the rights to equality and non-discrimination. Policies to catalyse vibrant innovation ecosystems around such DPGs through seed funding, tax breaks, and institutional support for business development are crucial to incentivise domestic start-ups, MSMEs, cooperative organisations and social enterprises. Public institutional capacities are also key to leveraging DPGs for appropriate development and diffusion of digital ecosystems in SDG priority areas.<sup>xlix</sup>

*3.2.2. Guard-rails for DPG Ecosystems to Prevent Capture of Public Value.* Governments should evolve suitable guidelines for contribution to and participation in DPG ecosystems in order to prevent free-riding and foul-dealing practices. In specific, access-and-use conditions must be developed to prevent platform lead firms with significant market power from cannibalising the value of DPGs. Unified Payment Interface (UPI) is an interoperable real-time payments platform in India designed to enable transactions on digital wallets and financial payment solutions, with the end goal of universal digital financial inclusion. In March 2021, India's financial regulator for digital payments came out with new guidelines capping the share of digital payment apps in the overall volume of transactions on the UPI at 30%, in order to break the duopoly of two key players, Google and Walmart, in the Indian mobile payments market.<sup>1</sup> Similar market-share based ceilings would be useful to govern participation in the open data commons.

DPGs also provide a stronger basis for transparency, accountability, equity and inclusion in digital and data infrastructures in public service delivery for poverty alleviation, gender equality, financial inclusion social welfare etc., and key social sectors such as health and

education. The private sector may be roped in for technical expertise in this regard to create customised solutions on top of digital public good building blocks. However, such arrangements should be based on clear rules for procurement, financing and licensing of end products, in order to prevent vendor lock-ins and promote infrastructural sovereignty, public interest, and trust.

### 3.3. Private Sector

Private sector actors are key beneficiaries of the open digital innovation ecosystems that emerge around digital public goods – open software, platforms, standards, and data pools. These ecosystems emerge in different ways. Sometimes, a market leader establishes an open source innovation ecosystem around its core offering, such as GE's Innovation Lab. There are also platform marketplace models, matching solution seekers and solution providers, such as Google-owned Kaggle, which is a community repository of data and code for data scientists. Last but not the least, technical community-led decentralised models such as GitHub also abound.<sup>ii</sup> In all these models, collaborations can lead to public interest innovation only if private actors in these systems do not engage in predatory business practices that thwart competition. This requires adherence to responsible business conduct standards and adoption of appropriate open source licenses to prevent monopolistic capture of such innovations, as detailed below:

*3.3.1 Responsible business conduct in R&D.* Chapter IX of the *OECD Guidelines for Multinational Enterprises (MNEs) on Responsible Business Conduct*<sup>iii</sup> underscores how MNEs engaged in science and technology development should contribute to local and national innovation capacity, and ensure reasonable terms of licensing to avoid imposing undue restrictions in collaborative research projects. For example, Google maintains an aggressive ban on the integration of AGPL-3 licensed software<sup>iiii</sup> with its products and services. Such barriers posed by Big Tech companies to the adoption of copyleft licensing in their software service ecosystems are hugely detrimental to open source innovation.

*3.3.2. New licensing approaches for open digital innovation ecosystems.* Appropriate licensing approaches that preserve the publicness of DPGs can go a long way in the adoption and diffusion of sustainable digital innovation cultures. The Maria DB Foundation's open source Relational Database Management System deploys a unique Business Source License (BSL). Users

have complete access to the source code and can modify, distribute, and enhance it.<sup>liv</sup> Only when a user uses more than a certain percentage of the software do they have to pay for a license. Also, after a certain number of years, the license automatically converts from BSL to General Public License (GPL).<sup>lv</sup> Pioneers in decentralised community-led open source innovation systems have models such as the Community Compact, which binds together all participants in a social contract – to ensure that rights, privileges, and duties to the community are in balance.<sup>lvi</sup> Similar approaches are also required in the open data commons and open AI licensing models.

### 3.4. Civil society organisations

Civil society organisations have a critical role to play not just in preserving the human rights and public interest bottom lines in the innovations built around DPGs, but also in spurring the use of such DPGs to address socio-economic challenges in the specific contexts they work in.

*3.4.1. Vigilance about human rights and public interest.* National civil society organisations should actively participate in policy consultations on DPGs and STI for SDGs strategies. Assuming the role of watchdogs, they need to undertake human rights and public interest audits of collaborations taking shape around the deployment of DPGs. The digitalisation and datafication of public administration systems requires that researchers and practitioners in domains such as health, education, poverty alleviation, gender equality, climate justice, social welfare, etc. are attuned to the public interest considerations enmeshed in the deployment of DPGs in their sectors. At the global level, civil society networks can play a vital role in highlighting governance deficits adversely impacting human rights, sovereignty and community control in digital infrastructure projects involving customisation and transfer of digital public goods.

*3.4.2. Catalysing context-appropriate digital innovations.* Social enterprises, non-profits, and cooperatives have a critical role to play in the uptake of DPGs for innovations that can support alternative platform models. For example, a public standard such as the UPI of the National Payments Corporation of India can be leveraged to set up a context-appropriate financial inclusion solution by a cooperative bank. Or, an interoperable platform marketplace protocol, like Beckn,<sup>lvii</sup> can be used to evolve alternative e-commerce solutions for marginal farmers and MSMEs by a social enterprise.

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