

## DPG REPORT STATE OF THE DIGITAL PUBLIC GOODS ECOSYSTEM | 2023 SDG GOAL

Digital  
Public  
Goods  
Alliance



## A C R O N Y M S

**AI** ARTIFICIAL  
INTELLIGENCE

**API** APPLICATION  
PROGRAMMING  
INTERFACES

**BMZ** GERMAN  
FEDERAL MINISTRY  
FOR ECONOMIC  
COOPERATION AND  
DEVELOPMENT

**CDPI** CENTRE FOR  
DIGITAL PUBLIC  
INFRASTRUCTURE

**CoPs** COMMUNITIES  
OF PRACTICE

**CRVS** CIVIL  
REGISTRATION AND  
VITAL STATISTIC

**DIAL** DIGITAL IMPACT  
ALLIANCE

**DIVOC** DIGITAL  
INFRASTRUCTURE FOR  
VACCINATION OPEN  
CREDENTIALING

**DPGA** DIGITAL PUBLIC  
GOODS ALLIANCE

**DPG** DIGITAL PUBLIC  
GOOD

**DPGs4DPI** DIGITAL  
PUBLIC GOODS FOR  
DIGITAL PUBLIC  
INFRASTRUCTURE

**DPI** DIGITAL PUBLIC  
INFRASTRUCTURE

**DTI** SIERRA LEONE'S  
DIRECTORATE OF  
SCIENCE, TECHNOLOGY  
AND INNOVATION

**FAO** FOOD AND  
AGRICULTURE  
ORGANIZATION OF THE  
UNITED NATIONS

**FCDO** UK'S FOREIGN,  
COMMONWEALTH &  
DEVELOPMENT OFFICE

**FHIR** FAST HEALTHCARE  
INTEROPERABILITY  
RESOURCES

**G2P** GOVERNMENT TO  
PERSON

**GIZ** DEUTSCHE  
GESELLSCHAFT FÜR  
INTERNATIONALE  
ZUSAMMENARBEIT  
/ GERMAN AGENCY  
FOR INTERNATIONAL  
COOPERATION

**IDB** INTER-AMERICAN  
DEVELOPMENT BANK

**ITU** INTERNATIONAL  
TELECOMMUNICATIONS  
UNION

**MOSIP** MODULAR OPEN-  
SOURCE IDENTITY  
PLATFORM

**NORAD** NORWEGIAN  
AGENCY FOR  
DEVELOPMENT  
COOPERATION

**OICT** UN OFFICE OF  
INFORMATION AND  
COMMUNICATIONS  
TECHNOLOGY

**OKFN** OPEN KNOWLEDGE  
FOUNDATION

**OSI** OPEN SOURCE  
INITIATIVE

**OSS** OPEN SOURCE  
SOFTWARE

**OSET** UN OFFICE OF THE  
SECRETARY-GENERAL'S  
ENVOY ON TECHNOLOGY

**OSPO** OPEN SOURCE  
PROGRAMME OFFICE

**SDG** SUSTAINABLE  
DEVELOPMENT GOAL

**UN** UNITED NATIONS

**UNDP** UNITED NATIONS  
DEVELOPMENT  
PROGRAMME

**UNICEF** UNITED NATIONS  
CHILDREN'S FUND

**WHO** WORLD HEALTH  
ORGANIZATION



# DPGA MISSION AND MEMBERS

The DPGA is a multi-stakeholder initiative that accelerates the attainment of the SDGs by facilitating the discovery, development, use of, and investment in DPGs.

The DPGA Secretariat is a neutral and independent team that leads the creation and maintenance of foundational components vital to the DPG ecosystem, like the DPG Standard and DPG Registry, and facilitate alignment among a community of like-minded organisations in order to advance DPGs.

The DPGA Secretariat is overseen by the DPGA Governing Board, which functions as a strategic decision-making body. The Board consists of member-organisations who demonstrate a strong commitment to DPGs and supporting the DPGA's mission. Current DPGA Governing Board members include BMZ, EkStep Foundation, the Government of Sierra Leone, Norad, UNDP, and UNICEF.

Finally, DPGA members are aligned around a shared vision for digital cooperation and a commitment to working collaboratively to advance DPGs. Our members consist of governments including their agencies; multilateral organisations including UN entities; philanthropic foundations, funders, and think tanks; and technology companies.

This report captures the DPG-related work and contributions of DPGA member entities.

# LETTER FROM THE DPGA CO-LEADS

**2023 was a significant year for the DPGA.** Membership has expanded significantly; and the digitalisation community has evolved, bringing new attention and focus on DPGs and their importance in the world.

**This year was also significant for us as Co-Leads, both personally and professionally.** Lucy took time away to welcome her first child, and Liv stepped temporarily into solo leadership. These big changes, which happened alongside an expansion of the DPGA Secretariat, shed new light on why we're here and what we will need to operate at the next level as a Secretariat. Together with the DPGA Governing Board we have evolved DPGA governance significantly, with core operating functions of the DPGA Secretariat now hosted by a fiscal sponsor. This has allowed the DPGA Secretariat to secure core and project-based financing for the next five years, which will deepen our ability to work with members and help strengthen the DPG ecosystem.

**We also revisited our strategy and realised that much of the understanding and vision that was articulated in its first publication in 2021 remains true.** This includes that the SDGs will not be attained by 2030 without the transformative use of digital technologies. However, recognising the impact these technologies have on people and the planet means how they are designed and developed matters. Open-source solutions are increasingly used as an antidote to many of the concerns associated with digitisation, and DPGs are emerging as a critical part of building and maintaining equitable digital ecosystems.

**Recognising this potential, this year we decided it was time to develop strategic targets to help drive sharper alignment and coordination** towards high-priority development needs and global challenges that align with our members' priorities. Through a consultation process, the DPGA Secretariat generated a set of four, 5-year targets. The target themes are: taking climate action, fighting information pollution, and making the use of DPGs the norm for preventing and responding to urgent global challenges. These build on our existing strategic goals, but provide more focus to energise and align the DPGA membership around. We feel the revised strategy is a true reflection of the focus and operating priorities of the DPGA and captures both how and why the DPGA exists.

**The process of developing the targets has already created a backdrop against which we can showcase several of our highlights of the year.** For example, the 50-in-5 campaign was launched by 11 First Mover countries in November with the DPGA Secretariat as a key coordinating partner alongside the Bill & Melinda Gates Foundation, Centre for Digital Public Infrastructure, Co-Develop, and the UNDP. The DPGA Secretariat also partnered with UNDP to issue a global call for solutions in response to information pollution's impact on fragile and conflict-prone contexts. Nine innovative solutions were selected to receive funding and were showcased at the Nobel Prize Summit in Washington, DC.

**Coming off an energising meeting with DPGA members in Addis Ababa, Ethiopia in November, we feel we are entering the new year ready to succeed.** With the strength of new members, a more focused approach, and a more receptive environment, we are confident in the DPGA's ability to unlock the transformative potential of DPGs for a more equitable world in the year ahead.

LIV MARTE NORDHAUG AND LUCY HARRIS

CO-LEADS OF THE DPGA SECRETARIAT

# DIGITAL PUBLIC GOODS IN 2023

Throughout 2023, DPGs continued to gain prominence. Globally, governments are increasingly sharing and adopting DPGs and recognising them as a crucial element that enables access to technologies within the digital transformation agenda. For example, DPGs were a prominent part of several discussions at the 78th UN General Assembly. DPGs were also a core component of India's G20 Presidency, building on a central theme: facilitating countries' efforts to establish secure, trustworthy, and inclusive DPI while maintaining and strengthening digital sovereignty. At the very core of the 50-in-5 campaign, which was launched with 11 First Mover countries on 8 November, is the belief that DPGs can enable countries to shorten each other's learning and adoption journeys in building safe and inclusive DPI.

This year also concluded the DPG Charter process, a movement to improve government services and spur innovation using DPGs, which was co-led by the DPGA and DIAL with support from USAID, FCDO, UNDP, and UNICEF. The DPG Charter was endorsed by over 20 entities.

DPGs4DPI played a significant role in reinforcing the concept of digital sovereignty this year, where countries maintain control over decision-making and service implementation. DPGs emerged as tools enabling countries to access, adopt, adapt, and scale technology while preserving their flexibility for future needs. This theme carried through the Transform Africa Summit, the Tallinn Digital Summit, IGF, and more.

DPGs were also highlighted as powerful tools for addressing the urgent global challenge of information pollution, in a campaign that culminated at the 2023 Nobel Prize Summit in May.

**This past year underscored the DPGA's commitment to ensuring DPGs are safe, secure, and serve the public good.** This is reflected in the DPGA Secretariat's CoPs on open AI and data. Both emphasise responsible and ethical use, advocating for transparency, fairness, privacy, and security in the development and deployment of digital resources. They highlight the importance of community and stakeholder involvement, ensuring that diverse perspectives are considered in governance and decision-making processes of DPGs. This aligns with the DPGA's focus on inclusivity and equity in technology development. These CoPs illustrate a need to ensure DPGs are not only technologically advanced but also responsible and holistically beneficial.

**The DPGA Secretariat further explored and supported efforts to ensure the sustainability of DPGs,** acknowledging that their success goes beyond code development and implementation alone. Key discussions at the DPGA Annual Members' Meeting highlighted the importance of capacity building, nurturing a vibrant community of contributors, and developing a clear product roadmap as essential for the long-term viability of DPGs. The DPGA Secretariat continues to invest in building a strong community of DPG product owners with a newsletter and community calls that provide a space for the technologists behind DPGs to meet and share insights, opportunities, and collaborations.

**This shift recognises the need for strategic frameworks to effectively scale DPGs,** balancing cost-effectiveness with the reality that they are not cost-free, and that successful implementation of DPGs requires human and financial resources. Sustainability approaches involving the local commercial ecosystem, including training and certification programs, are being explored. These models not only

generate sustainable revenue but also empower local vendors to contribute as implementers, thus reducing dependency on traditional funding sources.

**Recognising the importance of sharing implementations and best practices, the DPGA emphasises that adopting existing DPGs is as crucial as developing new ones.** Acting as a catalyst for DPGA members, the DPGA Secretariat fosters connections and performs core functions to maximise the impact of members' activities in line with the shared mission and vision outlined in the DPGA strategy.

**Looking ahead to 2024, the DPGA remains committed to advocating for the adoption of DPGs and the implementation of open-source technologies in countries' DPI efforts.** This approach serves as a means to promote digital sovereignty, foster a just digital transformation, stimulate innovation, collaboration and country ownership, and expedite progress towards the SDGs. The DPGA will continue to encourage the DPG ecosystem to fund, advocate for, support, and elevate DPGs and their developers and implementers, with a heightened focus on our thematic targets and flexibility to address emerging urgent global challenges. In particular, the DPGA will ramp up climate related work in 2024, both on the adaptation and mitigation side.



# THE DPGA STRATEGY UPDATE 2023 – 2028

Through the DPGA Secretariat's engagement with more than 30 members, an expanded Governing Board, hundreds of experts in CoPs, and participation in numerous conferences and events, some aspects of how we conceive of the role of DPGs and the DPGA have shifted in the last year. In particular, we have developed more tangible targets to complement our strategic objectives. Through a consultation process starting in early 2023, open to all DPGA members and other key stakeholders, the DPGA Secretariat generated a set of four targets that build on the existing objectives but provide more focus to energise and align the DPGA membership. The strategy is an increasingly important tool for guiding and monitoring the progress of the DPGA.

## THE FIVE YEAR OBJECTIVES OF THE DPGA

1

DPGs with high-potential for addressing critical development needs and urgent global challenges are discoverable, sustainably managed, and accessible for government institutions and other relevant implementing organisations.

2

UN-institutions, multilateral development banks and other public and private institutions that are of high relevance for supporting implementation of digital technologies have the knowledge, capacity, and incentives to effectively promote and support adoption of DPGs.

3

Government institutions have the information, motivation, and capacity to effectively implement DPGs that address country needs, including to plan, deploy, maintain, and evolve their digital public infrastructure.

4

Countries have public sector capacity and vibrant commercial ecosystems in place to create, maintain, implement, and incubate DPGs locally.

## OPERATIONAL TARGETS 2023 – 2028

In support of the DPGA vision and objectives, the following operational targets were developed in 2023 to prioritise, coordinate, and align DPGA member and stakeholder efforts.

### TARGET 1

#### 50-in-5

By the end of 2028,  
50 countries have:

- leveraged DPGs to design, launch and scale at least one component of their DPI stack, in a manner that is safe and inclusive, and enables one or more priority use cases.

### TARGET 2

#### Fighting climate change

By the end of 2028,  
sustainably maintained  
and highly relevant DPGs:

- have enabled diverse groups of stakeholders to take action and improve collaboration to fight and adapt to climate change; and
- are enabling long-term action and collaboration to fight and adapt to climate change.

### TARGET 3

#### Fighting information pollution and restoring trust

By the end of 2028,  
sustainably maintained  
and highly relevant DPGs:

- have enabled diverse groups of stakeholders to take action and improve collaboration to fight information pollution and enhance information integrity; and
- have enabled new norm-shaping technologies to scale that help restore trust and protect and advance human rights.

### TARGET 4

#### Making DPGs the norm for preventing and responding to urgent global challenges

By the end of 2028,  
DPGs are part of the  
international community's  
default approach for rapidly  
empowering relevant  
stakeholders to prevent and  
respond to urgent global  
challenges, including through:

- a globally recognised and scalable methodology for rapidly establishing CoPs to align on priority topics and help identify relevant DPGs for preventing and responding to urgent global challenges; and
- the establishment of one or more financing instruments to fund DPGs of high-relevance for preventing and responding to urgent global challenges.

# MEMBERSHIP AND STAKEHOLDER ENGAGEMENT



Membership to the DPGA grew substantially in 2023. We added 11 additional members, 4 of which are countries, nearly doubling our membership compared to 2022. We also introduced a series of virtual monthly member community meetings. These gatherings provided a platform for thought leaders and members to showcase their DPG-related work, share learnings, and forge connections with one another. We engaged our members in a consultation process that led to the incorporation of the four strategic targets that will guide the DPGA's work over the next five years.

11

NEW MEMBERS JOINED  
THE DPGA IN 2023,  
NEARLY DOUBLING  
MEMBERSHIP

The overall impact of our work fostered a more interactive and collaborative environment, while we actively facilitated connections and collaborations. We took pivotal steps towards a more inclusive, open, and interactive membership which culminated at the DPGA Annual Members' Meeting in Addis Ababa in

November. At the Members' Meeting, nearly 150 people came together to connect as a community of change-makers dedicated to discussing a range of DPG topics, and identify new opportunities for synchronicity and collaboration. There were 63 organisations present, including multilaterals,

**2nd**  
DPGA ANNUAL MEMBERS'  
MEETING CONVENED AT  
ADDIS ABABA, ETHIOPIA

**150**  
PARTICIPANTS

**60**  
ORGANISATIONS

**15**  
COUNTRIES

funders, think tanks, civil society organisations, and product owners alongside delegates from 15 countries. In total, the DPGA Secretariat coordinated 36 hours of programming over 3 days which included networking, workshops, presentations, panels and, of course, karaoke.

### LOOKING AHEAD AT 2024

Next year, we plan to explore new ways to digitally showcase our members' work and their overall DPGA impact within the ecosystem, with the aim to provide greater transparency and capacities for members and stakeholders to learn from each other. We will continue to foster uniquely informal but powerful spaces for people who work on DPGs to connect as a community and collaborate. We plan to explore fostering use case specific matchmaking and other convening formats to allow for deeper connections and partnerships to be brokered and new work streams to be generated. This includes giving more visibility to the impactful collaborations between our members and DPGs, but also working towards streamlining the efforts of our ecosystem towards the achievement of our strategic targets in DPI, climate, information pollution, and urgent global challenges.

### ACKNOWLEDGEMENTS

Reflecting on the instrumental contributors of our members in 2023, we would like to acknowledge the support of the Government of Ethiopia, particularly their Information Network Security Agency, for co-hosting the DPGA Annual Members' Meeting and for being an exemplar of the DPGs4DPI approach. The IDB played a crucial role in accelerating our



DPGA Co-Lead Lucy Harris opens the 2023 DPGA Annual Members' Meeting, Addis Ababa SOURCE / FLAWLESS / DPGA ANNUAL MEMBERS' MEETING 2023

footprint in Latin America, while UNICEF and OICT were pivotal in advocating for DPGs across all levels of the UN ecosystem, including the 78th UN General Assembly.

Our commitment to our membership and stakeholder community reflects our mission to cultivate a shared vision for DPGs globally.

## COUNTRY MEMBERSHIP

In 2023, the DPGA welcomed and onboarded new country members. We increased DPGA country membership with the additions of Ethiopia, Guatemala, Moldova, and Sri Lanka. This highlights the increasing importance that countries are placing on utilising DPGs as part of their digital transformation journeys while safeguarding digital sovereignty.

Country membership is particularly important because they are at the forefront of creating public value, thereby making a positive impact at a society-wide scale. When it comes to DPGs, it is particularly valuable to take a global approach. Countries around the world are making significant contributions to the DPG ecosystem as builders, developers, implementers, and funders. As a part of our country membership strategy, we will actively seek diverse sources to obtain the most comprehensive and accurate perspectives.

This year, we supported countries in showcasing their progress—helping others learn and get inspired, connecting countries over shared challenges, and providing learning opportunities on key technologies and approaches. For example, we introduced countries to the X-Road<sup>DPG</sup> team, facilitated a forum on data exchange, and showcased countries' achievements at the Tallinn Digital Summit, IGF 2023, the 50-in-5 launch, and the DPGA Annual Members' Meeting.

4

MORE COUNTRIES JOINED  
THE DPGA IN 2023

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### LOOKING AHEAD AT 2024

In 2024, efforts will be focused on delivering value tailored to countries' needs. This includes roundtables, knowledge products, case studies, and more addressing topics such as vendor ecosystem development, safeguards, laws, regulations, and strategies for overcoming coordination challenges.

### ACKNOWLEDGEMENTS

In acknowledging instrumental contributions, we extend gratitude to UNDP, CDPI, and the World Bank for their pivotal roles in country outreach. Additionally, we recognise the invaluable efforts of Co-Develop for their groundwork, such as the development of the DPI tracker. Their support has been crucial in advancing our mission and achieving the milestones we celebrate this year.

## ADVOCATING FOR DPGs

### DPGs4DPI: From the DPG Charter to the 50-in-5 Campaign

The DPGA's advocacy work galvanizes the global DPG community. In 2023, this work has prioritised DPGs4DPI, which included the culmination of the DPG Charter process which began in 2022, and the launch of the 50-in-5 campaign.

#### CULMINATION OF THE DPG CHARTER

The DPG Charter, co-led by the DPGA and DIAL, wrapped up at the end of June. It marked a significant milestone in the journey towards embracing DPGs as part of DPI. The Charter brought together a diverse and dedicated community, showcasing unity and alignment on the use of OSS at events like the Transform Africa Summit in Victoria Falls. Here, leaders from various sectors congregated to discuss the impactful role of DPGs in technology leadership, societal transformation, capacity building, and progressing towards the SDGs. The DPG Charter, now a guiding document, continues to steer efforts towards ensuring DPGs remain a sustainable, secure, and inclusive foundation for DPI. We extend our gratitude to all endorsers of the DPG Charter and to DIAL for their leadership.

#### GLOBAL COOPERATION FOR IMPACT

The 50-in-5 campaign formally launched on 8 November. This country-led campaign signifies a commitment to implementing DPI in a safe, inclusive, and interoperable manner. By the end of 2028, the goal is for 50 countries to have successfully designed, launched, and scaled at least one DPI component.

Kicked off by a group of 11 First Mover countries—Bangladesh, Estonia, Ethiopia, Guatemala, Moldova, Norway, Senegal, Sierra Leone, Singapore, Sri Lanka, and Togo—this country-led advocacy campaign aims to have countries come together to commit to sharing learnings, best practices, and technologies that can ultimately reduce costs, build local capacity, maximise impact, and help radically shorten the implementation journeys for digital public

13

COUNTRIES JOINED  
50-IN-5 IN 2023

50-in5 is a country-led campaign that signifies a commitment to implementing DPI in a safe, inclusive, and interoperable manner

infrastructure. Shortly following the November launch, both the Dominican Republic and Malawi joined the campaign.

### LOOKING AHEAD AT 2024

In the coming year, 50-in-5 will focus on expanding its reach and inviting more countries to join the campaign, regardless of geography, income level, or their digital maturity. Through networking and convenings, the campaign will address potential risks of digital monopolies and disjointed ecosystems, advocating for a harmonised approach to DPI with safety, inclusiveness, and interoperability at the centre. Countries will be defining what success looks like in each of their contexts, and will be working together on similar use cases to help speed up each other's adoption journeys. By prioritising the implementation of DPGs and sharing best practices, 50-in-5 aims to reduce inequalities and build resilient economies, setting a path for a future where digital transformation is not just a vision but a tangible, globally inclusive reality.

This campaign has the potential to transform the lives of billions of people and stimulate regional cooperation, placing DPGs at the forefront. The launch of 50-in-5 aligns with the DPI draft target in the DPGA five year strategy, and can serve as a blueprint for future cross-organisation and country-led collaborations.

### ACKNOWLEDGEMENTS

Instrumental contributors to our work this year also included all the 50-in-5 First Mover countries, the IDB, and UNDP for their assistance in onboarding countries. Special appreciation goes

**50-in-5 has the potential to transform the lives of billions of people and stimulate regional cooperation, placing DPGs at the forefront**



**Yodahe Zemichael, Executive Director of National ID Ethiopia**

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to Sierra Leone for soft launching 50-in-5 at SDG Digital Day during the 78th UN General Assembly high-level week.

Many thanks to partners including the Bill & Melinda Gates Foundation, CDPI, Co-Develop, and UNDP, in addition to supporting entities including GovStack Initiative, the IDB, and UNICEF.

## Information Pollution

**OSS can play a critical role in the fight against mis- and disinformation, particularly in countries with weak governance systems, or those experiencing conflict or crisis where information pollution can have catastrophic effects.**

The DPGA and UNDP teamed up in late 2022 and early 2023 to promote the transformative power of technology by surfacing OSS that can help strengthen information integrity. Well designed, open-source tools can not only be adapted to meet context-specific needs but also offer the distinct advantage of easy adoption, making them suitable for diverse environments.

The DPGA and UNDP issued a global call for OSS, receiving 99 submissions. From them, nine innovative solutions were selected to receive funding up to US\$ 10,000 and were showcased at the Nobel Prize Summit, "Truth, Trust, and Hope" in Washington, DC. The Summit offered a platform for potential partners and funders to engage with and support the solutions, and underscored the collaborative spirit of stakeholders and technologies needed to address the challenges of information pollution.

These solutions were selected by a group of mis- and disinformation practitioners for their novel approaches to addressing information pollution and focused on areas like combating deep fakes, providing transparency on big tech policies, verifying crowdsourced data, and improving access to reliable information, which are instrumental in fostering a trustworthy digital experience and strengthening information integrity.

**Well designed, open-source tools can not only be adapted to meet context-specific needs but also offer the distinct advantage of easy adoption, making them suitable for diverse environments**



Individuals from UC Berkeley, DPGA Secretariat, Media Cloud, Open Knowledge Brasil, Tattle, UNDP, and Ushahidi alongside campaign co-chair Nicole Tisdale at the Nobel Prize Summit, Washington DC

SOURCE / UNDP

## Congratulations to the following selected projects

### Ad Observatory

Developed at NYU, this tool enhances transparency in digital political advertising on Facebook, crucial for combating disinformation in elections. It has been instrumental for reporters and researchers in analysing advertising practices, and plans are underway for expansion to European elections.

### Media Cloud

This system offers a vast repository of online news media content, enabling users to study and mitigate information pollution across the global media landscape. Media Cloud's expansion into social media platforms enhances its research capabilities, aiding journalists and academics.

### Querido Diario <sup>DPG</sup>

By Open Knowledge Brazil, this project democratises access to official decision-making acts across Brazil's cities. It tackles the challenge of unstructured information in official gazettes, promoting transparency and informed analysis.

### Deep Fake Fingerprint

A UC Berkeley-led concept, this project aims to create unique identity fingerprints for voice authentication, countering the spread of convincing fake audio content. It's a significant step towards protecting public figures and general internet users from misinformation.

### Open Terms Archive <sup>DPG</sup>

This digital common archive online service terms in multiple languages, promoting transparency, and empowering users to challenge unfair practices. It is a critical resource for understanding and influencing the rules of online services.

### RegretsReporter

A Mozilla Foundation initiative, this browser extension enables crowdsourced investigation into YouTube's recommendation algorithm. It brings transparency to content recommendations, aiding in reducing information pollution.

### Feluda <sup>DPG</sup>

Created by Tattle, this engine addresses misinformation on image and video-heavy social media platforms, especially in Indian languages. The multimodal analysis capabilities of Feluda make it a vital tool for researchers and fact-checkers working with diverse, regional content.

### Phoenix

Developed by Build Up and datavaluepeople, Phoenix aids peace builders in understanding digital conflicts by scraping and organising digital content. This tool bridges online and offline divides, fostering constructive dialogue in conflict settings.

### Ushahidi <sup>DPG</sup>

This platform empowers citizens to generate ground-level data, crucial in areas like elections and humanitarian crises. Ushahidi's crowdsourcing and mapping tools play a vital role in ensuring information integrity and driving systemic change.

## ACKNOWLEDGEMENTS

An extended thank you to Omidyar Network, the Government of Norway, and Craig Newmark Philanthropies for their generous support of this initiative. Additionally,

we are grateful to our panel of experts who helped assess the submissions; Alex Krasodomski, Alice Munyua, Alicia Wanless, Linda Bonyo, Marci Harris, Nicole Tisdale, Nien-hê Hsieh, R. Marie Santini, and Ryan Merkley.

## Community of Practice on AI Systems as DPGs

**Throughout the year, the AI CoP, co-hosted by the DPGA Secretariat and UNICEF, engaged a diverse group of 40+ stakeholders from various backgrounds and geographies to explore the intersection of responsible and open-source AI systems.**

Together, the CoP developed a gradient approach to the openness of AI system components, which was well-received in the community. This approach informed related processes, such as the Open Source Initiative's work on defining open-source AI and OKFN's work on redefining openness in the 21st century. Additionally, the team compiled a comprehensive list of frameworks and tools for responsible, inclusive, and safe AI development, proposing their inclusion in the DPG Standard to enhance the review of AI systems as DPGs.

### KEY LEARNINGS INCLUDE ACTIVELY INVOLVING DIFFERENT GEOGRAPHIES

The AI CoP ultimately overcame challenges related to the overwhelming volume of AI policy papers, articles, and

frameworks and the need for diverse representation in the CoP. Key learnings from these challenges emphasise the importance of navigating through the information overload and actively involving individuals from different geographies and under-resourced contexts.

The result of this work is a refined understanding of AI systems as DPGs and helpful insights on how to capture this in the DPG Standard. The development of the gradient approach to openness in particular sheds light on the nuances between strictly proprietary and strictly open AI systems, contributing to a more nuanced debate beyond licensing. This nuanced understanding is crucial to safeguarding the benefits of open source in AI systems while protecting fundamental rights and ensuring the development of safe systems.

A nuanced understanding is crucial to safeguarding the benefits of open source in AI systems while protecting fundamental rights and ensuring the development of safe systems

## LOOKING AHEAD AT 2024

Next year, the AI CoP will continue monitoring the open-source AI governance debate, and a new process and expert group will be introduced to ensure that these developments are adequately reflected in the DPG Standard. We are also planning a discoverability campaign for AI DPGs, further work on generative AI and DPGs, and to explore the intersection of AI and digital public infrastructure.

## ACKNOWLEDGEMENTS

Thank you to UNICEF, Open Future, UNESCO, GIZ, and Tattle for their instrumental contributions and continuous support of the AI CoP. Their engagement, comments on papers, participation in brainstorming calls, and thought leadership have been essential to mapping out the field and advancing the goals of the AI CoP.



Lea Gimpel, Senior Policy Manager, Countries, Resource Mobilization, and AI presents at the DPGA Annual Members' Meeting, Addis Ababa

SOURCE / FLAWLESS / DPGA ANNUAL MEMBERS' MEETING 2023

## DPG REGISTRY, STANDARD, AND COMMUNITY

### DPG Standard and Technical Integration

In 2023 the DPGA onboarded new team members, enhancing our technical capabilities and leadership. We prioritised documentation efforts, systematically detailing the system architecture for DPGA products and the deployment process.

#### DEPLOYING NEW FEATURES FOR THE TECHNICAL INTEGRATION OF DPGs

In 2023, the team introduced a new test site for the Review Portal, updated and upgraded the Amazon Web Server, and focused on improving user experience by fixing DPGA product bugs and deploying new features on GitHub. We also drafted a new structure for the Registry API, designed a new platform structure for the entire DPGA product portfolio, and collaborated with the DPGA Members Advisory Committee to develop a new digital Roadmap product.

This work was substantial. The results are streamlined development processes, improved documentation, and a comprehensive roadmap for the development of the DPGA product portfolio over the next 15 months. It also facilitated the assessment of new technologies for integration with DPGA products.

The process of understanding a new ecosystem highlighted the critical importance of well-documented processes for the

success and maintenance of open source and multi-stakeholder projects. By collaborating as a team, we brainstormed practical processes and tech solutions, initiating our journey with a roadmap that positions us to develop a safe, empowering, and enabling platform for our members, product owners, and DPG end users.

#### ADVANCING THE USE AND MANAGEMENT OF THE DPG STANDARD

Over the course of 2023, the DPGA made significant advancements in our use and management of the DPG Standard, including building a broader community around the DPG Standard through expert groups on specific issues faced by prospective DPG applicants. Expert groups include subject matter experts from various industries including technical, business operations, and legal sectors who will advise on ways to improve specific aspects of the DPG Standard.

We drafted a new structure for the Registry API, designed a new platform structure for the entire DPGA product portfolio, and collaborated with the DPGA Members Advisory Committee to develop a new digital Roadmap product

Recommended changes will be taken up by the DPG Standard Council, an impartial body, who will decide on any final improvements. During the DPGA Annual Members' Meeting, we launched a call for nominations for co-convenors for expert groups on three topics: Indicator 7: Privacy and applicable laws; Indicator 9(a): Data Privacy & Security; and Indicator 9 (b&c) Do no harm by design.

### LOOKING AHEAD AT 2024

Next year, in addition to launching the DPG Standard expert groups, we plan to rollout features and capabilities on the new DPGA digital platform, and upgrade the Registry API, which will serve as a foundation for the DPG and open-source community to build upon.

### ACKNOWLEDGEMENTS

Thank you to the members of our Advisory Committee. Their invaluable contributions helped validate our hypotheses regarding user insights and provided crucial advice on developing features to assist both members and the DPGA Secretariat in the membership onboarding and management process, and in identifying changes to the DPG Standard. We extend our gratitude to Maurice Rwamigabo, Elena Findley-de Regt, Sergio Bogazzi, Thao Hong, Christopher Szymczak, Cheryl Ng, and Pamod Amarakoon for their dedication and insights.



Members and product owners learn how to use the DPG Standard to become recognised as a DPG SOURCE / FLAWLESS / DPGA ANNUAL MEMBERS' MEETING 2023

# DPG Registry, Product Owners and Community Engagement

**Throughout 2023, we identified and recognised new DPGs in key areas such as DPI, climate change, information pollution, and AI. We also developed a comprehensive DPG community strategy, engagement process, and launched the DPG Community Center.**

The DPG Community Center serves as a centralised repository for all documentation and a hub where DPG maintainers, product owners, contributors, and others can find opportunities, collaborate, and share with fellow community members. Furthermore, we fostered DPG collaborations and programs with DPGA members, contributing to DPG development, and establishing partnerships with strategic stakeholders to promote DPGs globally. We consolidated DPG resources and knowledge hubs around topics such as maturity, open standards, AI systems, and platform independence, all related to the DPG Standard and open source development.

## ADVANCING THE DPG ECOSYSTEM THROUGH COMMUNITY COLLABORATION AND NEW INITIATIVES

We added 80+ new DPGs to the DPG Registry, spanning categories like open data, open content, and open AI. Introducing the DPG Product Owner community forums, discussions, meetups, calls, newsletters, and office hours proved highly successful, with participants collectively sharing numerous

funding and advocacy opportunities, events, awards, and prizes. Collaborations on programs such as Hactoberfest 2023 and the GitHub DPG Open Source Community Manager Program showcased extensive engagement with DPGs and strategic initiatives. Our participation in events like the Nobel Prize Summit, IGF, FOSDEM, the Creative Commons Summit, and showcasing DPGs with IDB further strengthened our presence and impact.

## NAVIGATING CHALLENGES AND FOCUSING ON ADVOCACY

Despite our successes, we still encounter challenges related to adoption and use of DPGs, particularly when open-source and procurement processes are unfamiliar. Successful advocacy and outreach efforts will continue to help dispel misconceptions and promote the benefits of DPGs. Additionally, managing relationships and ensuring the effective operation of projects, which often rely on community contributors and support from donors, pose ongoing challenges.

80+

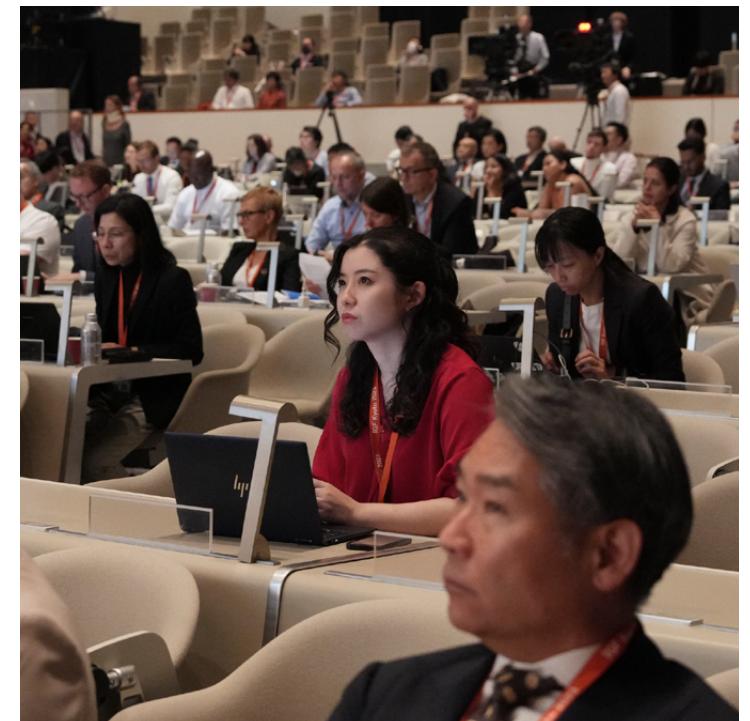
NEW DPGs ADDED TO THE  
DPG REGISTRY IN 2023

## LOOKING AHEAD AT 2024

Next year, the DPG community can anticipate improvements to the DPG nomination and renewal experience, along with more useful resources and streamlined paths for DPGs to enhance their projects within the focus areas of the DPG Standard. We will also launch more engagement opportunities for DPGs by sectoral and regional relevance, fostering collaboration among DPGs addressing similar problems and working in the same geographies.

## ACKNOWLEDGEMENTS

Instrumental contributors to our work this year included DPGA members such as IDB, GitHub, UNICEF, UNDP, Foundation for Public Code, OKFN, OSI, and Thoughtworks. Additionally, key DPGs like [Ushahidi](#)<sup>DPG</sup>, [Decidim](#)<sup>DPG</sup>, [ODK](#)<sup>DPG</sup>, [KoboToolbox](#)<sup>DPG</sup>, [Consul Democracy](#)<sup>DPG</sup>, [DHIS2](#)<sup>DPG</sup>, [OpenSPP](#)<sup>DPG</sup>, [OpenCRVS](#)<sup>DPG</sup>, [NotesMaster](#)<sup>DPG</sup>, [OpenFn](#)<sup>DPG</sup>, [MOSIP](#)<sup>DPG</sup>, [X-Road](#)<sup>DPG</sup>, and [Sunbird](#)<sup>DPG</sup> played essential roles in advancing our initiatives and goals.



DPGs were prominent at key international forums this year, including at the Internet Governance Forum, Kyoto SOURCE / IGF FLICKR

Q U A L I T Y E D U C A T I O N S D G 5 G E N D E R E Q U A L I T Y S D G 1 0 R E D U C E D I N E Q U A L I T I E S

S D G 1 1 S U S T A I N A B L E C I T I E S A N D C O M M U N I T I E S S G D 1 7 P A R T N E R S H I P S F O R T H E

G O A L S W E B S I T E N O T E S M A S T E R . C O M A L I G N I N G D I G I T A L L E S S O N S W I T H L O C A L

## C U R R I C U L A

NotesMaster is an eLearning platform that offers training and support to teachers, enabling them to create digital lessons aligned with local curricula. It facilitates a collaborative and adaptable educational environment where these digital lessons can be accessed, modified, and peer-reviewed by teachers from various countries, fostering a sustainable development of new digital educational content.

### **Strengthening Education in the Caribbean and Africa**

In 2021 NotesMaster spearheaded a DPG pilot in the Caribbean, which included six countries: Dominica, Antigua and Barbuda, Trinidad and Tobago, Grenada, Barbados, and the Turks and Caicos Islands. NotesMaster collaborated with their respective Ministries of Education with the core

aim of improving existing ICT capabilities, through the creation of a suite of locally authored digital learning resources for the primary and secondary levels of the school system. Each collaborating ministry of education is now implementing these resources with a unique apparatus that matches their local civic and cultural values. Given the easily replicable nature of digital assets, other Caribbean countries can share information across borders and readily reproduce the created resources to meet their demands. Presently, 10 million students have benefited from the DPG pilot, with an ambitious objective of reaching 30 million students by 2030.

NotesMaster is proud to support DPGs in Sub-Saharan Africa to enable wider access to locally. Throughout 2023, NotesMaster teams have collaborated with the ministries of

education in Namibia, Zambia, Malawi, and Eswatini, to broaden their digital reach and bring new educators and learners on board. They presented workshops to educators to guide and instruct them on how to use AI effectively in content creation. The sharing of this content as a DPG can foster a sustainable multiplier effect that can lead to systemic changes in education that are rooted at a local level. The NotesMaster's DPI model is currently providing free and open access to over 7 million primary, secondary, and adult learners in Africa. Empowering educators to remix existing content has led to growth in capacity amongst key persons, as highlighted in the NotesMaster partnership with Zambia's Ministry of Education, where the benefits of introducing open educational resources during COVID-19 are having a lasting impact.

### **Addressing Gender Abuse: Advancing the European Union Spotlight Initiative**

NotesMaster has been supporting the Spotlight Initiative since 2021 in its mission to eradicate all forms of abuse against women and girls, with an emphasis on developing pupils who are well-rounded and have a high regard for themselves and their peers. This initiative helps to mould children's attitudes, values, and behaviours using a variety of digital games, virtual manipulatives, and other differentiated learning activities that also assist teachers in bringing knowledge across creatively and innovatively to learners.

10mn

STUDENTS BENEFITED  
BY NOTESMASTER

30mn

STUDENTS TARGETED  
BY 2030





**GIZ works on behalf of the German government, on activities in the areas of economic development, environmental sustainability, health, education, governance, and more. GIZ's goal is to contribute to improving living conditions in partner countries and fostering global cooperation for sustainable development.**

#### ENHANCING LEARNING AND EDUCATION

In 2023, GIZ has been actively engaged in implementing DPGs and open source, in the field of education. First, through [atingi](#), a free online learning platform and open educational resource for use and re-use. The aim is to promote the creation of open educational resources as part of digital learning and capacity development activities in international cooperation projects. This project is currently being scaled, with the objective of incubating DPGs.

Second, GIZ has been managing and promoting open educational resources catalogues that allow for seamless use and re-use of quality-approved courses for localization and adaptations for project-specific situations. The focus is on managing and promoting a catalogue of open educational resources that facilitates easy use and adaptation of quality-approved courses for specific project needs.

This year GIZ successfully published numerous eLearning courses for use and re-use on publicly available and managed

distribution channels including eLearning courses managed by atinigi by various global projects and organisations. This is in contrast to many larger international organisations that tend to copyright their eLearning courses, potentially blocking collaborations and limiting access to high-impact courses. This situation results in fewer people in the Global South in particular who are able to benefit from valuable educational resources. The key learning from this challenge is the importance of fostering open access and collaboration in the development and sharing of educational content in order to maximise its positive impact, particularly in regions with limited access to such resources.

#### VALIDATING STANDARDS ON CRVS AND SOCIAL PROTECTION INFORMATION SYSTEMS

GIZ funds the development of digital standards for social protection to connect DPGs with social protection systems. Exchange formats like "Talking Interoperability" and

“Interoperability in Action” were conducted to focus on the challenges and solutions in countries and find potential interoperability scenarios for standard development.

A significant achievement was the kickoff of Digital Convergence Initiative’s (DCI) first standards committee in June, which contributed to standardising the interoperability between CRVS systems and social protection management information systems. This was followed by a public review phase, where a global call for feedback led to the collaborative development and subsequent publication of the first version for the standard of the CRVS with social protection management information systems interface.

After the successful consensus building effort with the first standards committee on CRVS and social protection information systems, GIZ is now setting up standards committees for the social protection information system interaction with the integrated beneficiary registry, as well as the social registry.

#### **HOSTING “INTEROPERABILITY IN ACTION” WORKSHOPS**

DCI hosted five “Interoperability in Action” workshops, showcasing practical interoperability use cases, technical demonstrations and discussions on how to effectively integrate various system like integrated beneficiary, social, disability registries, ID systems, and farmer registries. These workshops were crucial in demonstrating the practical applications of interoperability in SP systems, providing participants with tangible insights and strategies to implement in their respective domains.

**GIZ funds the development of digital standards for social protection to connect DPGs with social protection systems**

#### **GOVSTACK: DEVELOP BUILDING BLOCKS SPECIFICATIONS, SANDBOX, USE CASES PROTOTYPES AND COUNTRY ENGAGEMENT**

GovStack aims to break down the barriers to building sustainable digital infrastructure and help governments create human-centered digital services that empower individuals and improve well-being.

GovStack has published: the next version of the GovStack technical specifications; four reference use cases; and three e-learning courses, making digital skills more accessible. Additionally, the digital testing environment sandbox launched as well as the GovStack Women in GovTech Challenge. GovStack is now, through various partners, present in 19 countries, building strongly on regional collaboration.

#### **LOOKING AHEAD AT 2024**

Looking ahead, GIZ’s DPG and open source related work in the education sector will continue, with a focus on open educational resource principals and the management of growing quality assured catalogues of resources.



# EkStep

**EkStep Foundation is a non-profit based in India that focuses on education and learning initiatives. It was co-founded by Nandan Nilekani, the co-founder of Infosys, and Rohini Nilekani with the aim to address education system challenges and promote learning opportunities for all, especially in the context of digital technologies. EkStep Foundation joined the DPGA Governing Board in November.**

In 2023, EkStep Foundation's DPG-related activities reflect a commitment to harnessing human capital for inclusive growth, including:

#### HARNESSING HUMAN CAPITAL FOR INCLUSIVE GROWTH

**Sunbird** <sup>DPG</sup> provides a toolbox of building blocks and an approach that has led to impactful transformations in various sectors and geographies. It powers initiatives like DIKSHA, the flagship school education program of the Government of India, and SUVAS, an initiative by the Supreme Court of India.

#### PEOPLE CENTRIC DIGITAL TRANSFORMATION

PeoplePlus aims to spark conversations and partnerships that drive people-centric transformations using DPI. The initiative has brought together diverse communities, including civil society, government, and businesses.

#### ACCELERATING EDUCATION AND SKILLING TRANSFORMATION

Launched in 2023, ONEST aims to provide equitable access to learning experiences and livelihood opportunities. The network is live with financial support initiatives for specific groups, such as children of auto-drivers and delivery agents.

#### CELEBRATING CHILDHOOD, KEEP GROWING

*Bachpan Manao Badhte Jao*'s objective is to incubate DPGs that generate a societal-level narrative for early childhood and foundational years. It involves creating, curating, and sharing resources, knowledge, and tools as public goods.

#### USING AI IN DPG / DPI FOR EDUCATION

This inclusive AI initiative aims to evolve or adapt DPGs for new contexts. It focuses on removing language and literacy

barriers and enabling the dissemination of information about policies and benefits.

This year, EkStep Foundation's work on DPGs enabled access to quality education for rural students, empowered stakeholders with performance data, and launched initiatives like SUVAS for improved access to justice. They also collaborated with **MOSIP** <sup>DPG</sup> for enhanced observability, launched the Digital Credential Stack, used **Sunbird** <sup>DPG</sup> for **OpenG2P**'s <sup>DPG</sup> financial mapper system, and collaborated with **DIGIT** <sup>DPG</sup> for healthcare and governance programs.

This year, India assumed the G20 presidency and showcased DIKSHA as a crucial DPI, catalysing transformative changes in the country's education sector.

#### LOOKING AHEAD AT 2024

Next year, EkStep Foundation will continue to promote DPI, facilitating the creation of a DPG tech enabler ecosystem, onboarding AI advances to **Sunbird** <sup>DPG</sup>, and scaling ONEST. They will also scale key initiatives like ONEST and *Bachpan Manao Badhte Jao*, accelerating the adoption of DPGs for verifiable digital credentials, and enhance AI-based DPGs for removing language and literacy barriers.

**EkStep Foundation** collaborated with **MOSIP** for enhanced observability, launched the Digital Credential Stack, used **Sunbird** for **OpenG2P**'s financial mapper system, and collaborated with **DIGIT** for healthcare and governance programs



The ONEST network is live with financial support initiatives for specific groups, such as children of auto-drivers and delivery agents SOURCE / ALEXIS RODRIGUEZ / UNSPLASH



**Norad is the governmental agency responsible for coordinating and implementing Norway's international development policy, operating under the Norwegian Ministry of Foreign Affairs. Norad is a founding member of the DPGA, and supports, creates, and shares DPGs as part of their efforts to support the SDGs.**

Throughout 2023, Norad has continued financial support to both core teams and DPG implementations, including through partnerships with other DPGA members. Norway has also joined the 50-in-5 campaign as a First Mover country, and continue to demonstrate their leadership in the area of climate change adaptation.

#### ADVOCATING FOR CORE FUNDING IMPLEMENTATION

One of the foremost ways that Norway supports the DPG ecosystem is via core funding—unrestricted financial support provided to a central project to cover basic operational and administrative costs. A lack of core funding has been identified by the DPG product owner community as a fundamental sustainability challenge. Norway provides core funding to DPGs including **MOSIP<sup>DPG</sup>**, **OpenCRVS<sup>DPG</sup>**, **DHIS2<sup>DPG</sup>** in addition to the open-source project, Global Digital Library.

- **MOSIP<sup>DPG</sup>** offers countries modular and open-source technology to build and own their national identity systems.

It is used in 11 countries and by more than 75 commercial partners.

- **OpenCRVS<sup>DPG</sup>** is designed to integrate data from multiple government systems, such as health information systems and population registers. It aims to address challenges like the nearly 25% of children that remain unregistered at birth.
- **DHIS2<sup>DPG</sup>** is an open source, web-based platform, and is widely known as the world's largest health information system, in use by 80 countries.
- The Global Digital Library provides free, high-quality educational resources for anyone, anywhere, with a vision to create an individual learning environment for each child.

In addition to core funding, Norway provides additional funding support to organisations who support countries implementing DPGs. This includes UNDP, UNICEF and the World Bank in addition to DPGs and their teams like IIIT-B/**MOSIP<sup>DPG</sup>**, **OpenCRVS<sup>DPG</sup>**, and HISP/**DHIS2<sup>DPG</sup>**; and the World Bank.

## BUILDING AND SHARING DPGs FOR GLOBAL IMPACT

Norway is a builder of DPGs, sharing their learnings with others. As a First Mover country in the 50-in-5 campaign, Norway has committed to this effort over the next five years to develop their DPI and share the experience along the way.

Norway is currently developing the 3rd generation of **Altinn<sup>DPG</sup>**, a platform for dialogue between businesses, citizens, and the government, as a DPG. Part of Norway's commitment to 50-in-5 is based on making **Altinn<sup>DPG</sup>** available for other countries, and a commitment to create a global community for DPG-powered DPI. The decision has already led to improved collaboration within the government, prompting increased coordination of domestic and international work.

## OPEN EARTH PLATFORM INITIATIVE: HARNESSING DIGITAL TECHNOLOGIES AND CLIMATE ACTION

At the DPGA Annual Members' Meeting, Norad, alongside Knowit, Capto, Open Futures, and Creative Commons, launched the Open Earth Platform Initiative ([OpenEPI](#)). OpenEPI is an open, global digital platform that will help kick-start the creation of innovative solutions for climate and nature resilience. Their mission is to support local innovation fuelled by a global platform of open data, technology, and AI. This is a pre-project for the creation of secure, long-term storage of high-value datasets related to nature and climate, and an open, global digital innovation platform for climate and nature.

## LOOKING AHEAD AT 2024

In 2024, Norad will continue to support DPGs and DPG implementations, and provide broader support throughout the

**OpenEPI** is an open, global digital platform that will help support and kickstart the creation of innovative solutions for climate and nature resilience



Christer Gundersen announces OpenEPI at the DPGA Annual Members' Meeting, Addis Ababa SOURCE /

DPG ecosystem. Norad will complete the OpenEPI pilot which kicked off in November. They will also undertake an exploration of what DPGs or digital architecture means in a humanitarian or peace-building context, with more details to come next year. Finally, Norad will continue to push for cross-sectoral investments, which are not the norm in the sector, and will collaborate with other DPG members in this pursuit.



## DIRECTORATE OF SCIENCE TECHNOLOGY & INNOVATION

**Sierra Leone's DSTI delivers on its national development plan to transform into an innovation and entrepreneurship hub. In 2023, DSTI became a 50-in-5 First Mover country, advocated for DPGs at local universities, and ran digital training events.**

### LEADERSHIP IN LAUNCHING 50-IN-5 CAMPAIGN

The launch and workshop event was a 3 in 1 event witnessed by 50 young Sierra Leonean Innovators and tech enthusiasts to see and learn how best they can contribute to the DPI efforts in Sierra Leone, learn about the importance of country collaboration, and learn from each other. The focus was on adoption and sharing of DPGs, looking at locally driven innovation and value creation, and of empowering young people as creators of today and tomorrow's DPIs and DPGs.

### ADVOCATING FOR DPGs ACROSS THE NATION

This year, DSTI advocated for DPGs at a series of universities nationwide. Emphasis was placed on engaging universities and Digital Learning Hubs, thus building on the foundation of previous advocacy efforts. The events garnered attention from university students and local tech enthusiasts, signalling a strong demand for such knowledge. The goal of this work is to inspire more DPG enthusiasts to pursue and develop tools based on the DPG Standard.

### LEADING TRAINING EVENTS AND HACKATHONS AT DIGITAL LEARNING HUBS

The goal of these events was to develop and deploy a small-scale enabling environment to engender the growth of all DPG activities. This enabling environment is accomplished by integrating digital fabrication tools and techniques into the existing Digital Learning Hubs in Sierra Leone. There were 3d printing hackathons to provide participants with the opportunity to acquire first-hand knowledge of the technology before utilisation.

### LOOKING AHEAD AT 2024

Next year, DSTI will continue to advocate for DPGs and aims to make additional contributions to the DPG Registry. DSTI has several solutions that would like to open source as DPGs as well.

UNICEF is DSTI's local partner and another DPGA member. Most of DSTI's DPG activities are done collaboratively, including raining and advocacy activities.



**UNDP continues to champion DPGs as open and interoperable solutions, which countries can safely and effectively adopt to address pressing global challenges. This includes how countries design and implement DPI, where DPGs are increasingly being used to lower implementation costs and expand access to ensure no one is left behind.**

#### STRENGTHENING THE VALUE PROPOSITION OF DPGs

Building on 2022's gathering of world leaders at the 77th UN General Assembly, UNDP committed to strengthening the value proposition of DPGs. One avenue was through India's G20 Presidency, where UNDP served as the Government's official knowledge partner on DPI. The discussions amongst countries culminated in an internationally-agreed language on DPI that underscored the importance of open standards and specifications.

DPGs also took centre stage at this year's SDG Digital event, co-sponsored by ITU and UNDP. Representatives across governments, the private sector, and civil society shared success stories and emerging opportunities to better leverage DPGs during the high-impact initiative session on DPI. This

saw the mobilisation of an initial tranche of US\$ 400 million to empower countries with people-centred DPI solutions.

#### STREAMLINING DPGs ACROSS UNDP'S DEVELOPMENT WORK

UNDP has been streamlining the DPG approach through its development work across 130 countries. Ranging from distinct CoPs to a network of more than 200 digital advocates, UNDP has explored various means to facilitate the discovery of DPGs for sustainable development. In particular, DPGs' common principle of openness is embedded in UNDP's Digital Standards, which provide guidance for UNDP teams around the world on best practices to consider when creating digital solutions for development.

**UNDP has been offering direct country support and advocating for responsive governance and safeguards that put people at the centre**

UNDP acknowledges that successful implementations of DPGs require local digital ecosystems that are both robust and resilient. For instance, where local partners can tap into the global DPG ecosystem to enhance their knowledge about existing solutions, contribute local solutions, and use their contextual local knowledge to assess what solutions are appropriate for replication.

UNDP has been offering direct country support and advocating for responsive governance and safeguards that put people at the centre. At the 78th UN General Assembly, UNDP launched the [Model Governance Framework for Legal Digital ID](#) (a public good that was built with 30 experts and more than 80 ID governance best practices, and made accessible for the first time through a chatbot) and the [Universal Safeguards for DPI](#)—a joint initiative with the OSET aimed at ensuring global protection of fundamental rights with respect to DPI design and implementations worldwide.

UNDP continues to support the mission and strategic direction of the DPGA, for instance in working with partners to amplify the recently launched 50-in-5 campaign, a country-led advocacy endeavour aimed at helping 50 countries design, launch, and scale at least one component of their DPI by 2028.

UNDP continues to demonstrate its commitment to the development and implementation of DPGs to address global challenges.

#### iVERIFY TACKLES MISINFORMATION IN 5+ COUNTRIES

An automated fact-checking tool using AI and human fact checking to combat the spread of false narratives during



The high impact initiative session on DPI kicked off efforts to secure financing and technology for DPI design, development and implementation at scale, including through the use of DPGs SOURCE / UNDP

election periods. Scaled to Kenya, Liberia, Honduras, Zambia, and Sierra Leone.

- In 2023, it was modelled as an exemplar during the Nobel Prize Summit sponsored campaign focused on sourcing DPGs that can help combat information pollution and restore information integrity.
- In 2023, it was launched in Sierra Leone and has successfully fact-checked 170 stories to date, including 40 during

election week, and played a widely recognised role during the 2023 election campaign.

### OPENG2P COMPLETES SOCIAL WELFARE DIGITAL PAYMENTS PILOT

An open-source platform that enables governments and humanitarian organisations to deliver critical benefits directly to those who need them. Scaling in Sierra Leone, Iraq, Sri Lanka, Afghanistan, The Philippines, and Malawi.

- In 2023, **OpenG2P** <sup>DPG</sup> successfully completed a social welfare digital payments pilot for Filipinos using the Philippines Identification System (PhilSys) digital ID.

### DiCRA ADOPTED BY INDIA'S NATIONAL BANK FOR AGRICULTURE AND RURAL DEVELOPMENT

A platform providing intelligence on climate resilience at the farm level to strengthen food systems and security. Implemented in Telangana province in India.

- In 2023, it was adopted by India's National Bank for Agriculture and Rural Development where it will be further enhanced, disseminated, and used for policy-making and research.

### UN BIODIVERSITY LAB ENGAGES 140+ COUNTRIES

**UN Biodiversity Lab** <sup>DPG</sup> is a mapping platform facilitating open access to spatial data and analytics that can inform evidence-based decisions for nature, climate, and sustainable development. In use by around 2,500 registered users across 153 countries who can create secure workspaces to upload and manage national data.

- In 2023, the platform was updated to align with the milestone Global Biodiversity Framework of the UN Biodiversity Convention, including new data and features to support governments to plan, monitor, and report on global targets to put nature on a path to recovery by 2030.

### NATIONAL CARBON REGISTRY ESTABLISHES CoP

The **National Carbon Registry** <sup>DPG</sup> is a software allowing countries to effectively manage national data and processes for trading carbon credits. Piloted in Namibia and Ghana.

- In 2023, a dedicated CoP was established to further its development. The community is composed of more than 100 members that meet regularly to discuss climate transparency systems and the implementation of the system in countries.
- Namibia's prototype of the registry was showcased this year at COP28.

140+

COUNTRIES ENGAGED ON  
THE UN BIODIVERSITY  
LAB'S SECURE WORKSPACE



**UNICEF is a leader in DPGs, particularly in the areas of innovation, youth engagement, and AI. They are advocates for children and young people—the future generation to whom DPGs and DPI will cater—to be recognised and resourced as co-designers, maintainers, and owners of the future DPG and DPI ecosystem.**

This year, UNICEF reframed their DPG strategy under three workstreams: DPG X Youth; DPG4DPI for Children; and WEB3 for DPGs. They are leading the DPG-ecosystem in investing in young innovators to create sustainable DPGs and directly provide development support for 4-5 products which aim to become DPGs in 2024. UNICEF is continuing to support and scale up existing DPGs **RapidPro<sup>DPG</sup>**, **Oky<sup>DPG</sup>**, and **Primero<sup>DPG</sup>**, and are developing Djenga, a new DPG maturity-assessment tool. In 2023, UNICEF supported young DPG owners and entrepreneurs at events, championing their work and lifting their voices. This included a 78th UN General Assembly high-level side event at UNICEF headquarters: “Youth, the Innovation Architects of our Digital Future”; an event in Kazakhstan for startups and students on DPG monetization business models; a session called, “Youth-Led Innovation: Driving Digital Public Goods in Ghana” at Ghana Digital Innovation Week in November; and many more.

Throughout 2023, UNICEF’s DPG work has included:

#### **DPG X YOUTH**

DPG X Youth promotes, incubates, and funds DPGs developed by the next generation of DPI designers, users, maintainers, and owners. This workstream raises digital sovereignty and open-source awareness among youth by adding the DPG concept to local digital upskilling curricula. The goal is to build youth’s capacity to become today’s designers and tomorrow’s maintainers and owners of DPGs and DPI. By providing equity-free funding through the UNICEF Venture Fund to youth-led startups that build open-source social impact products, UNICEF is supporting the development of DPGs by youth in Ghana, Kazakhstan, Sierra Leone, Brazil, Jordan, Lebanon, and more.

The [UNICEF StartUp Lab in Ghana](#) has graduated 4 DPGs by youth, and there are more in the pipeline. The lab provides young entrepreneurs with the chance to learn about how to

become a DPG, how to convert your product to open source, open source business models, and open source licenses. At Ghana Digital Innovation Week in November, UNICEF led a session called, "Youth-Led Innovation: Driving Digital Public Goods in Ghana" highlighting this work.

### DPG4DPI FOR CHILDREN

This workstream ensures DPGs for DPI with high impact (and risks) for children are maintained, continuously evolved, and supported, and that the opportunities and challenges of DPI and DPG4DPI for child rights are well understood and considered in design and implementation phases. DPG4DPI for Children provides guidance on priority topics, including CRVS systems. In addition, in 2023 UNICEF sent and received over 1 billion messages using **RapidPro** <sup>DPG</sup> for education, health, and child protection; further scaled up **Primero** <sup>DPG</sup> to 55 countries, supporting over 10,000 frontline services workers for vulnerable children; and continued to empower girls through the **Oky** <sup>DPG</sup> App, now deployed in 14 countries and 17 languages, and is used by over 500,000 girls.

### DJENGA: DPG MATURITY ASSESSMENT TOOL

In order to support innovators across the world in designing, continuously evolving, and maintaining DPGs that lead to impact at scale, including for children, UNICEF developed the Djenga Software Maturity Assessment. This global assessment framework analyses DPG maturity, supporting product owners in developing mature and sustainable DPGs, and implementers in identifying mature DPGs that are ready for deployment at scale. The self-assessment tool for product owners aims

**1bn+**  
MESSAGES SENT AND  
RECEIVED USING  
RAPIDPRO

**10k**  
FRONTLINE SERVICES  
WORKERS SUPPORTED  
BY PRIMERO



Young entrepreneurs exploring the communication module at the UNICEF StartUp Lab in Accra SOURCE / UNICEF STARTUP LAB

to provide a snapshot of the maturity of a DPG and provide improvement recommendations. With Djenga, UNICEF aims to support the entire DPG ecosystem in analysing and improving DPG maturity, thereby enabling more DPGs to reach scale and sustainability.

### WEB3 FOR DPG

WEB3 for DPG is a workstream being developed to explore decentralised models of funding for DPGs. The focus is an exploration of blockchain-based "funding for features"

modalities. The aim is to establish a firm technological and knowledge foundation to expand the scale of this exploration in 2024.

#### DPG X GLOBAL DIGITAL COMPACT

UNICEF submitted a set of DPG-related recommendations into the preparatory phase of the Global Digital Compact process, including provisions for recognition that DPI must be built on DPGs to ensure free, open, and inclusive DPI. It was also recommended to both recognise and strengthen youth's capacity as future owners and maintainers of DPI and DPGs; and to redirect capital flows towards social-impact oriented entrepreneurship in emerging and developing markets, including for open source upskilling and DPG capacity building.

The goal of this work is to ensure that the Summit of the Future outcomes recognise DPGs' foundational role to achieve

a free, open, and inclusive DPI, and that the capacity of youth as future designers, maintainers, and owners of DPGs and DPI is both recognised and resourced.

#### LOOKING AHEAD AT 2024

In 2024, UNICEF will continue to advance work under all three workstreams, including by creating a new value proposition narrative package for each.

UNICEF collaborated extensively with other DPGA members and DPGs in various capacities, aiming to connect and collaborate further in the future. This includes the members of the DPGA Governing Board of which UNICEF is a part; and partnership and collaboration with many DPGA member organisations and countries.

R E L E V A N C E   S D G 3   G O O D   H E A L T H   A N D   W E L L - B E I N G   S D G 4   Q U A L I T Y   E D U C A T I O N  
S D G 5   G E N D E R   E Q U A L I T Y   S D G 6   C L E A N   W A T E R   A N D   S A N I T A T I O N   S G D 1 6   P E A C E ,  
J U S T I C E   A N D   S T R O N G   I N S T I T U T I O N S   W E B S I T E   O K Y A P P . I N F O   E M P O W E R I N G   G I R L S  
T O   C O N F I D E N T L Y   N A V I G A T E   A D O L E S C E N C E

Oky is a girl-centered DPG, co-created with and for adolescent girls in low-and-middle income countries and is the first open-source mobile menstruation and reproductive health education app and period tracker for girls. Oky illustrates innovative tech design that tackles both the taboo, stigma, misconceptions, and lack of quality information on menstruation and reproductive health—and the gender digital divide. Oky was built together with girls to meet their digital realities in terms of connectivity, devices, literacy, online safety, and gatekeepers. As a result, Oky is gamified and easy to navigate by design, digitally inclusive for girls with disabilities, fully functions offline, takes little storage space on the mostly low-end devices that girls have access to, is compatible with older software and accommodates phone sharing, has high data protection and privacy by design,

engages communities, governments and gatekeepers to support girls' use of Oky, and is entirely free, without advertisements. By using Oky, adolescent girls learn about their body, puberty, reproductive health, and many more topics relevant to their lives, in positive and empowering ways, while improving their digital literacy.

#### Scaling for Global Reach

Since Oky launched in two pilot markets in Indonesia and Mongolia in 2020, thirteen new countries have joined to adapt Oky code, content, and design, together with girls and collaborators, to their local context. Localized Oky versions are already live in Burundi, Indonesia, India (West Bengal), Kenya, Kyrgyzstan, Mexico, Mongolia, Nepal, Philippines, Tanzania, and Ukraine. More than 550,000 girls are using Oky online,

with many more offline users. Initial impact data from in-app surveys and qualitative research in three markets indicate that Oky has positive impacts on girls' wellbeing and empowerment.

Dynamic Oky ecosystems are emerging in deployment countries, with stakeholders from all sectors of society contributing to Oky and its reach. In addition to building vibrant communities and partnerships, Oky uses an innovative business model for scaling via social franchising. As Oky scales across countries and regions, local franchise partners drive and iterate Oky with girls and contributors, supported by UNICEF, and supplement Oky with (low-tech or frontier tech) products or features where relevant. Through this approach, Oky facilitates local capacity and ownership; leverages diversity, creativity, and

different expertise; allows multiple simultaneous deployments around the world; facilitates faster and cost-efficient product build-out through peer and consumer co-production; and sparks learning, digital South-South collaboration, and GenderTech community development, to transform restrictive gender norms and foster inclusive societies.

Exciting Oky endeavors for 2024 include AI for generating Oky easy read versions for users with intellectual disabilities; rich content feature; integrating Oky activation with girls' digital skilling sessions; roll-out of Oky peer-to-peer approach to reach unconnected girls; supporting teachers to use Oky for delivering health and sexuality education in the classroom; accelerating user reach; and Oky deployments in new markets, depending on available investment.

550k+

GIRLS USING  
OKY ONLINE

13

COUNTRIES ADAPTING  
OKY TO LOCAL CONTEXTS

17

LANGUAGES  
AVAILABLE





# Bangladesh

In 2023, Bangladesh received DPG recognition for three of their products—[Grievance Redress System](#)<sup>DPG</sup>, [NISE-3 Skill and Certification](#)<sup>DPG</sup>, and [ekShop Marketplace](#)<sup>DPG</sup>. They also strengthened collaborations with organisations working on DPGs to help further adoption.

There were challenges as well as complex technical specification updates needed for meeting DPG compliance and use of DPGs themselves. This included insufficient funding across the DPG ecosystem, and hesitancy among partners and industries to adopt OSS. Despite these challenges, Bangladesh was able to make three products DPGs and expand the use and awareness of DPGs4DPI and have joined 50-in-5 as a First Mover country.

## EXECUTING PIPELINE ACTIVITIES FOR DPG GROWTH

The Government of Bangladesh developed a series of pipeline activities to create new DPG initiatives and extend support for existing ones. Notably, two of their DPGs have been replicated in Somalia, Jordan, Turkey, Yemen, and South Sudan. The objective is to further extend DPG accreditation to additional existing products and introduce new products as DPGs which will help strengthen global cooperation.

2

DPGs FROM BANGLADESH  
REPLICATED IN SOMALIA,  
JORDAN, TURKEY, YEMEN,  
AND SOUTH SUDAN

## DEVELOPING DPI BY USING EXISTING DPGs

Bangladesh is planning to develop their DPI by leveraging and implementing existing DPGs such as [X-Road](#)<sup>DPG</sup> and [Sunbird RC](#)<sup>DPG</sup>. The goal is to elevate their DPI and government services, to ensure efficiency, accessibility, and sustainability.

## FOSTERING A DPG ECOSYSTEM AMONG INDUSTRY, ACADEMIA, AND GOVERNMENT

This initiative is aimed at fostering awareness of DPGs and DPI among industry, academia, and government. The focus is on informing and engaging stakeholders and raising awareness for the optimum usage of DPGs.

Moving ahead, there are plans to explore new collaborations and integrate DPG products with a2i offerings such as e-Signet, [Sunbird RC](#)<sup>DPG</sup>, and other innovative solutions to enhance interoperability and optimise synergies between DPGs and a2i products for more comprehensive and efficient digital governance solutions.

# Estonia

**A pioneer in the DPG ecosystem, Estonia's membership in the DPGA underscores a commitment to sharing learnings from their DPG implementations.**

## DEMONSTRATING THE POWER OF DPGs WITH X-ROAD

Estonia uses X-Tee, based on **X-Road<sup>DPG</sup>**. The number of **X-Road<sup>DPG</sup>** users, and its community continued to grow in 2023. Currently, 145 countries are part of the **X-Road<sup>DPG</sup>** community and 22 ecosystems have been deployed by governments or other organisations, totalling 373 million end users worldwide. Estonia continues to develop and maintain **X-Road<sup>DPG</sup>** and contributes financially to the Nordic Institute for Interoperability Solutions who maintains the product.

## PUBLISHING BUILDING BLOCK SPECIFICATIONS

As a founding member of the GovStack Initiative, Estonia together with partners DIAL, BMZ/GIZ, and ITU amplified the importance of DPGs4DPI. Nine building block specifications have been published including digital registries, information mediator, payments, identification and authentication, registration and security, and new ones such as e-marketplace, e-signature, GIS and UI/UE guidelines are on the way. Many countries are enhancing public sector service delivery through reusable, interoperable, open-source building blocks using the GovStack approach. This includes Somalia, Kenya, and Djibouti within the Horn of Africa project, Egypt, and Ukraine.

## E-PARTICIPATION SPECIFICATIONS

The Estonian Ministry of Foreign Affairs, together with e-participation partners and community, has initiated the development of e-participation specifications. These specifications are being developed for the Summit of the Future, and will link to the specifications of the GovStack Initiative.

## OPEN DATA PORTAL

Estonia has been actively promoting the use of open data to enhance transparency, innovation, and public services. Estonia's [Open Data Portal](#), which serves as a central platform for sharing various datasets, provides access to more than 1,700 datasets that are available for everyone to use, reuse and share, to launch commercial and non-profit ventures, conduct research and make data-driven decisions. Open data in Estonia is utilised in various sectors, including transport, environment, and education. The availability of open data encourages innovation, research and the development of new services by both the public and the private sectors. Estonia's legal framework also supports open data initiatives by encouraging government agencies to make non-classified information publicly available, fostering a culture of transparency.

145

COUNTRIES PART OF THE  
X-ROAD COMMUNITY

22

X-ROAD ECOSYSTEMS  
DEPLOYED BY  
GOVERNMENTS AND  
ORGANISATIONS

373mn

X-ROAD END USERS  
WORLDWIDE



## INTEGRATING AI INTO PUBLIC SECTOR SERVICES

During the last 5 years, more than 120 AI projects have been carried out involving more than 60 public sector organisations. Estonia integrates AI into its e-government services to streamline processes and improve citizen interactions. AI is mainly used to automate routine tasks and processes to reduce administrative burdens and allow government officials to focus on more complex tasks. For example, speech technology solutions are used to automatically transcribe court hearings and parliament sessions, machine vision algorithms analyse satellite imagery to distance monitor forests and crops. Also, the Bürokratt network, an interoperable network of virtual assistants on the websites of different government agencies is being developed that will allow people to obtain information from these authorities through a chat window. However, the development and practical implementation of AI solutions is far from simple and the amount of knowledge needed to select the right technologies, assess risks and address ethical considerations is considerable. To boost the implementation of AI across the Estonian private and public sector, a dedicated knowledge sharing and hands-on support centre—[AI Support Toolbox](#) has been made available to everyone, free of charge.

## EMBRACING DIGITAL SKILLS AND ADVANCING TRANSPARENCY

A digital country can only flourish when its public and experts have suitable skills and competencies to use and implement its technologies. To support widespread digital literacy, upskilling and reskilling, Estonia created a central e-learning

platform—the [Digital State Academy](#)—that is freely available to all Estonian citizens and offers simple and attractive lessons.

Going digital and being data driven does also come with its fair share of risks, including in the areas ethical, fair, and transparent use of citizens data. While raising the level of overall digital literacy is a key factor in achieving a human-centered digital state, Estonia has also taken practical steps by developing and implementing tools that allow citizens to see how the government is [using their data](#) and to control who and when [their personal data can be resused](#). In addition, initial research has concluded on the secure release of sensitive data by the use of Privacy Enhancing Technologies (PETs) and first implementations of these are being implemented in multiple domains.

In December 2020, Estonia, Belgium, Luxembourg, Germany, and France established the Digital for Development Hub (D4D), which aims to boost the digital revolution worldwide. The D4D flagship project ‘African Union and European Union D4D Hub’ was launched at the same time. The EU-funded project aims to support African countries in achieving their digital goals. In 2021, regional branches of Africa and Latin America were established under the D4D Global Hub, in which Estonia also actively participates. In the African branch, Estonia is co-leading the issue of e-governance with Germany and is actively participating in the working group on connectivity and closing the digital gender gap.

# Ethiopia

Ethiopia joined the DPGA in early 2023 and, in their first year as members, stepped up as the co-host of the 2nd Annual DPGA Members' Meeting which was held in Addis Ababa in November.

## APPLYING G2P BASED SERVICE FOR THE PRODUCTIVE SAFETY NET PROGRAMME BY USING DPGs

The aim is to transform the Productive SafetyNet Program (PSNP) by enabling digital ID and incorporating at least one DPG, such as [OpenG2P](#)<sup>DPG</sup>, into the existing information systems.

## USING MOSIP FOR DIGITAL ID

In 2023, Ethiopia achieved a milestone by successfully launching Fayda, a digital ID platform based on the [MOSIP](#)<sup>DPG</sup>. This platform, poised for broader application, showcased the feasibility of establishing a national-scale digital ID system using a DPG and helped educate local stakeholders about DPGs4DPI. The initiative, which is integral to Ethiopia's strategy of leveraging local capacities—both technical and administrative—through DPG adoption, has significantly advanced inclusive identification and service delivery, with plans for further expansion.

In 2023, Ethiopia achieved a milestone by successfully launching Fayda, a digital ID platform based on the [MOSIP](#)

## BUILDING A DPI SANDBOX

Ethiopia is planning to create a DPI Sandbox composed of integrated technologies, including both DPGs and proprietary solutions, to showcase the value of taking a DPI approach and demonstrate the practical utilisation of DPGs. The goal is to test at least one basic social sector use case.

## DEVELOPING A DPI BASED REFERENCE ARCHITECTURE FOR ETHIOPIA

A DPI based reference architecture for the Ethiopian public service will support the government's objective of sustainable digital transformation across the public service sector.

Looking ahead, Ethiopia will continue to scale Fayda and will also explore DPG options for establishing a sustainable data sharing platform such as [X-Road](#)<sup>DPG</sup>. The government also plans to explore [OpenG2P](#)<sup>DPG</sup> for integration with PSNP and [Sunbird RC](#)<sup>DPG</sup>.

● D P G S P O T L I G H T M O S I P <sup>D P G</sup> L I C E N S E M P L - 2 . 0 S D G R E L E V A N C E S D G 1 E N D P O V E R T Y  
S D G 2 Z E R O H U N G E R S D G 3 G O O D H E A L T H S D G 4 Q U A L I T Y E D U C A T I O N S D G 5  
G E N D E R E Q U I T Y S D G 8 D E C E N T W O R K A N D E C O N O M I C G R O W T H S D G 9 I N D U S T R Y  
I N N O V A T I O N A N D I N F R A S T R U C T U R E S D G 1 0 R E D U C E D I N E Q U A L I T I E S S D G 1 6 P E A C E  
J U S T I C E A N D S T R O N G I N S T I T U T I O N S S D G 1 7 P A R T N E R S H I P S F O R T H E G O A L S  
W E B S I T E M O S I P . I O S C A L I N G D I G I T A L I D S Y S T E M S F O R S A F E A N D I N C L U S I V E D P I

Incubated at the International Institute of Information Technology, Bangalore (IIIT-B), the MOSIP project was set up with the vision of providing inclusive, trustworthy digital ID systems that would enable countries to customise, scale, and own core components of their DPI.

Since its inception in 2018, MOSIP has grown in response to the rapidly-evolving needs of adopting countries and the global landscape of digital ID.

This year marked a major milestone in MOSIP's journey. As of November, adopting countries have cumulatively registered 100 million residents on MOSIP-based ID systems.

Three countries—Morocco, the Philippines, and Ethiopia—are rolling out MOSIP at a national scale, while Togo, Uganda, and Sri Lanka are preparing for rollouts. MOSIP is also being piloted in 5 more countries, with several exploratory conversations underway.

Acknowledging the need for building architecture for the stages beyond the provision of digital ID, MOSIP has developed and released new features and technologies aimed at enabling residents to leverage their digital ID for equitable delivery of rights and services. Specifically, Inji—a digital wallet mobile application, and e-Signet—an Identity Provider (IdP) module, will expand the usage of ID for access to healthcare, food rations,

and financial services, while enhancing privacy and security.

The project has also continued to nurture an ecosystem of technology partners and worked concordantly towards contributing to global standards. MOSIP's standards and certification initiatives have resulted in establishing compliance with 80+ biometric device manufacturers, ABIS vendors, and system integrators around the world, giving countries the choice to seamlessly integrate a variety of technologies with MOSIP.

The project's efforts towards community-building and knowledge-sharing also came to fruition in Country Conversations 2023, a

two-day event held in IIIT Bangalore. Over 200 members of MOSIP's country, technology, and research ecosystems shared their experiences and learned from each other, paving the way for more such events in the future.

MOSIP's vision is rooted in the belief that the exclusion of individuals from being seen and served by their countries is a complex and nuanced problem, requiring holistic solutions with cutting-edge technology informed and empowered by policy, legislature, standards, and academic research. The project remains committed to supporting the coming together of many experts united by a common goal, bringing us closer to an equitable world, where no one is left behind.

11

COUNTRIES ADOPTED  
MOSIP-BASED SYSTEMS

100mn

RESIDENTS  
REGISTERED



# Guatemala

This year, Guatemala joined the DPGA and started exploring and understanding how DPGs could be leveraged as part of their DPI. They also joined 50-in-5 as a First Mover country. These achievements set the stage for structured and standardised progress in the country's digital transformation, supported by the knowledge and collaboration of the DPGA community.

## ADVANCING INTEROPERABILITY AND DATA EXCHANGE

The Government of Guatemala aims to promote the use of DPGs by advancing interoperability and data exchange. The focus is on facilitating data exchange through X-Road<sup>DPG</sup> to help address interoperability challenges in executive government institutions. Currently, this effort is in development.

## ADVANCING DPG-BASED DIGITAL PAYMENT SOLUTIONS

Awareness-raising activities are underway to encourage the implementation of DPGs for DPI within executive government institutions, specifically for digital payments. This initiative aims to avoid the use of multiple technological solutions, many of which fail to interact with each other and instead streamline digital payments. This initiative is in the planning stage, and will outline strategies for future implementation.

## BUILDING DPG CAPACITY TO STRENGTHEN NATIONWIDE DIGITAL TRANSFORMATION

In order to advance Guatemala's digital transformation, the government is planning to leverage internationally designed building blocks with tested standards. This will help close existing gaps and allow Guatemala to benefit from other country experiences.

In 2024, Guatemala will focus on transitioning from planning to implementation of both DPGs and DPI. Specifically, Guatemala plans to decide on the institution or institutions where DPGs and DPI will be implemented to help effective planning and execution.

In 2024, Guatemala will focus on transitioning from planning to implementation of both DPGs and DPI

# India

**India is a member of the DPGA via India's Ministry of Electronics and Information Technology. This year, their DPG-related activities involved building global consensus on DPI in the G20 under the Indian Presidency.**

## SUPPORTING ADOPTION OF DPGs THROUGH API SETU

This platform facilitates consent-based access to APIs for various use cases such as KYC, paperless admission processes, and employment. Emphasising ongoing support and utilisation, this initiative is aimed at fostering the adoption of DPGs by implementing API Setu.

## HOSTING THE GLOBAL DPI SUMMIT

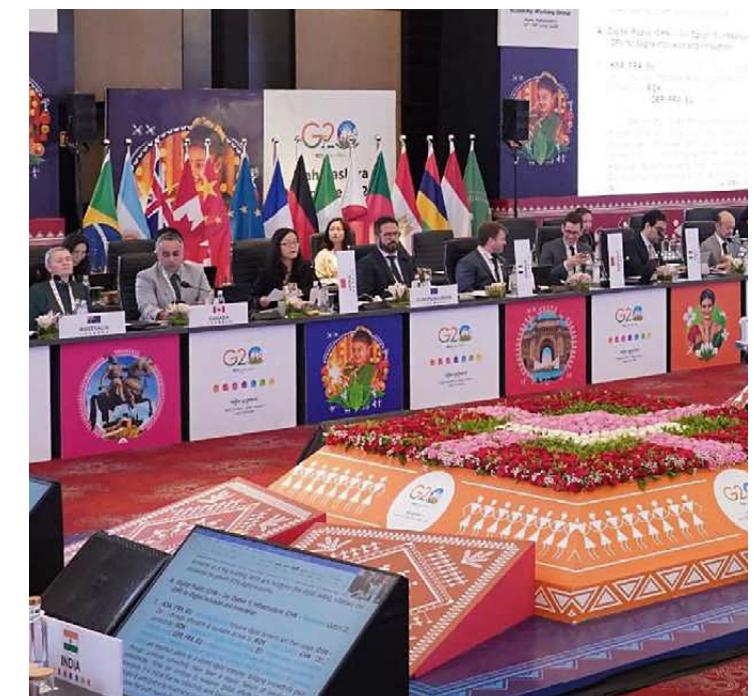
The Global DPI Summit in June, saw participation from 150 foreign delegates representing approximately 50 countries and focused on promoting the use of DPGs4DPI. Collaboration has been a key element of India's DPG-related work. During the Global DPI Summit, India engaged in meaningful collaborations with DPGA members and DPGs, fostering a collective effort to advance the adoption and promotion of DPGs.

While progressing in these initiatives, India encountered challenges related to the direct adoption of DPGs leading to high cloud hosting charges. This highlighted the importance of customisation before deploying DPGs in a production environment.

**The Global DPI Summit held in June, focused on promoting the use of DPGs for DPI**

**150**  
FOREIGN DELEGATES

**50**  
COUNTRIES



Global DPI Summit SOURCE / INDIASTACK.GLOBAL

Looking ahead, India remains committed to DPGs, with a focus on advocacy and adoption efforts.

## O P E N F N . O R G T H E D P G M O V E M E N T I S U L T I M A T E L Y A B O U T C H O I C E

OpenFn is used in more than 40 countries to automate workflows and integrate disparate systems, boosting efficiency and security, taking service delivery to scale, and freeing up time for resource-strapped teams to focus on the critical, human aspects of their work.

OpenFn can be used to integrate with any application, but more often than not the platform is used to connect DPGs, and it's played a key role in interventions across health, humanitarian, environmental protection, and education. Imagine that you're trying to sync health facility records between government and NGO partners; initiate new orders when stock levels run low in a supply chain; refer a vulnerable child for services at different agencies, standardise and share ecosystem data across countries; or make payments to community health workers when new visit data is submitted. All of these workflows involve complex technical steps and multiple systems, but they're entirely formulaic.

With OpenFn, you can not only map out these processes visually, but implement and execute them automatically, hundreds of thousands of times a day in real time. The platform has been used since 2015 and has a simple web interface that makes it possible

for non-technical users to play a key role in the design, implementation, and long-term success of data integration projects with powerful security, change management, search, debugging, and error handling features.

**Impact on social protection and health**  
To date, OpenFn has been trusted by 65 institutions to provide secure, stable, scalable automation and it processes millions of records each year. In Cambodia, OpenFn automates case referrals between government social workers using **Primero** <sup>D P G</sup>, and NGO partners to ensure coordinated care and adequate child services coverage. In Thailand, hospital social workers can click a button to request that OpenFn search the national health information system for clients' medical history to inform care plans for vulnerable children. In St. Lucia, OpenFn-automated reporting provides Ministry of Health epidemiologists with a real-time view of national progress against key immunisation indicators in DHIS2.

**Scaling with an open source strategy**  
At OpenFn, the DPG movement, and open source more broadly, is a big part of our strategy for achieving impact at scale. Since 2015, our main business has been our paid

software-as-a-service offering and the implementation and support we provide around it. We grew slowly and steadily for years and, until recently, we kept a portion of our flagship software proprietary. With this model we lacked larger-scale government adoption but were concerned that if we went fully open source we'd erode the revenue base that allowed us to sustain the very software that we felt could play such a crucial role in the world's DPI.

It seemed as though we'd reached a dilemma, but as we listened more closely to our customers we began to realise that they wanted "total solution ownership", "local deployment", and "fully open source" in addition to (not instead of!) our subscription services offering. In a way, being a certified DPG has made our customers more willing to pay because they know we're offering fair value for money. It's even helped us jump-start a channel partner program with certified local implementers in 4 different countries who can now deliver OpenFn solutions independently and still chose to use our core team for hosting and higher-level support.

For OpenFn, the DPG movement is ultimately about choice. Not only do we see it

as our mission to provide the plumbing that connects and empowers a diverse ecosystem of fit-for-purpose technologies, we see that for these technologies to enable legitimate transformation, LMICs need the substantive freedom to choose. They've got to be able to dictate what tools they need, where they should be running, and how they'd like to implement them... and ultimately develop the mechanisms to pay—whether the software is open source or not—for someone to keep them safe and operational. We see open source as a way to reduce vendor lock-in and block rent-seeking behaviours without seriously hampering the abilities of the companies that build and deliver these tools from creating sustainable solutions.

The worst kept secret in SaaS is that writing code is only the first step—most of the challenge, and most of the value, is in the "as-a-service" bit and people will always be willing to pay for service.

## Moldova

**Moldova joined the DPGA in November, via the Ministry of Economic Development and Digitalization. This decision demonstrates their strong commitment to collaborate and leverage the potential of DPGs to stimulate sustainable development.**

Moldova's DPG-related activities kicking off this year and leading into 2024 include: defining a national vision for public digital assets, data management, and the overall process of digital transformation; digitizing public services and exploring the implementation of digital IDs and instant payments.

To ensure the successful adoption of DPI and DPGs, the Government of Moldova and the Ministry of Economic

Development and Digitalization collaborate with UNDP Moldova to leverage data in governance and policies. They are working together on establishing a governance data framework. As a 50-in-5 First Mover country, they will also be collaborating with other countries to advance safe, inclusive and interoperable DPI.

**“You don't have to attain the status of a developed country before embracing digitalization. We demonstrate that even in a developing country like the Republic of Moldova, digitalization can be adopted and successfully used to generate opportunities, combat corruption, engage citizens in the decision-making process, and provide high-quality services”**

DUMITRU ALAIBA

Deputy Prime Minister and Minister of Economic Development and Digitalization, Moldova

## Rwanda

**Rwanda is a member of the DPGA via the Ministry of ICT and Innovation. This year their DPG-related activities relate to digital ID, data sharing, and bridging the digital divide.**

### CREATING A LEGAL FRAMEWORK FOR DIGITAL IDs

After conducting a feasibility study on digital ID in Rwanda, the government proceeded with its full development and

adoption. The first step involved establishing a legal framework, resulting in the enactment of a bill by Parliament earlier this year to govern population registration within the national

Single Digital Identity (SDID) system. Following the adoption, Rwanda began the implementation of the SDID project in phases through the National Identification Agency.

#### CREATING A NATIONAL DATA SHARING POLICY

Rwanda is currently working towards adopting a data sharing policy to ensure secure and well-governed sharing of data among agencies. This initiative aims to improve decision-making, foster collaboration, and serve as the foundation for achieving national policy objectives that benefit the citizens of Rwanda. The intention is to facilitate the smooth flow of information without imposing unnecessary obstacles, all

while addressing concerns related to data protection and privacy.

#### BRIDGING THE DIGITAL DIVIDE

In order to unlock the potential of DPGs for end users, Rwanda is aiming to narrow the digital divide in their country. After the adoption of the New Broadband Policy, which is aimed at narrowing the digital divide among other outcomes, the Government of Rwanda, in collaboration with its partners, has launched the “Connect Rwanda 2.0” program, to distribute 1.2 million smartphones nationwide to connect previously unconnected individuals.

## Sri Lanka

**In 2023, Sri Lanka used DHIS2<sup>DPG</sup> for various education-related use cases, initiated the procurement process for MOSIP<sup>DPG</sup>, and commenced a pilot evaluation of X-Road<sup>DPG</sup> for data interoperability within the government.**

#### ADOPTING MOSIP FOR SLUDI

The Government of Sri Lanka adopted MOSIP<sup>DPG</sup> as the foundational identity platform for the Sri Lanka Unique Digital Identity (SLUDI) project. SLUDI aims to utilise MOSIP<sup>DPG</sup> to emphasise the government’s commitment to open source by

contributing its modified MOSIP<sup>DPG</sup> code and insights back to the global community.

#### ADOPTING AND SCALING DHIS2 FOR EDUCATION

Sri Lanka’s Ministry of Education is actively working to adopt DHIS2<sup>DPG</sup> as an Education Management Information System,

facilitating and accelerating its adoption for education-related use cases.

### EXPLORING AND EVALUATING NEW DPGs FOR ADOPTION

In an effort to advance the adoption of DPGs, the Government of Sri Lanka is exploring and evaluating existing DPGs to fast-track the digital transformation process in their country. The goal is to identify suitable DPGs for evolving the country's foundational and sector-specific DPI.

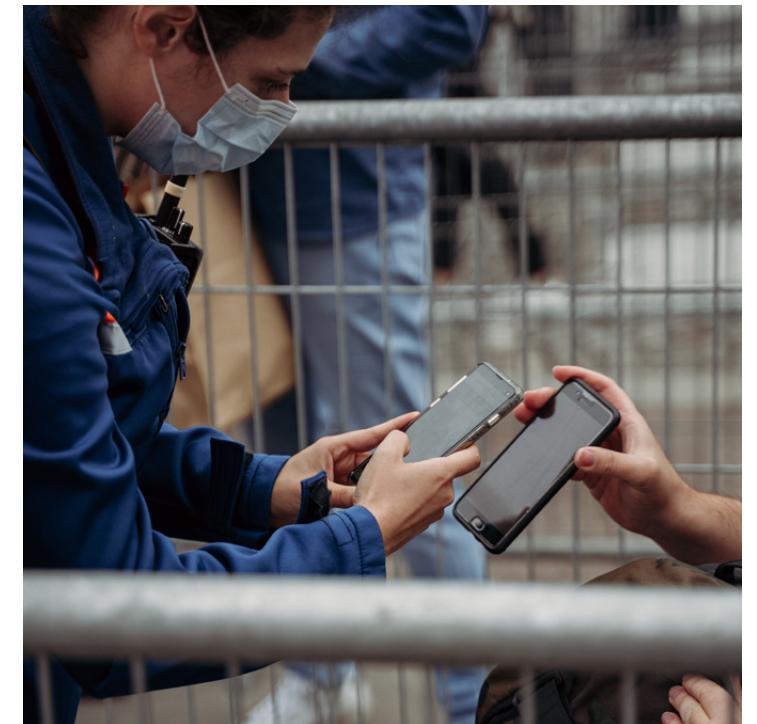
### SUPPORTING, MAINTAINING, AND UPKEEPING THE COVID-19 SMART VACCINATION CERTIFICATE

Sri Lanka's COVID-19 Smart Vaccination Certificate, developed using DHIS2<sup>DPG</sup> and DIVOC<sup>DPG</sup>, has seen over 1 million issuances. The Ministry of Technology aims to upkeep, maintain, and support this information system now and in the future.

### USING OPEN SOURCE AND DPGs-FIRST APPROACH IN THE SRI LANKA DIGITAL GOVERNMENT POLICY

Sri Lanka's draft Digital Government Policy advocates for an open source, DPGs-first strategy to guide the shift to digital governance, promoting interoperable and fair DPI. The country is collaborating with the DPGA for global insights and plans to share its policy outcomes, which also underscores their commitment collaboration which they have solidified as a 50-in-5 First Mover country.

Looking ahead, Sri Lanka will continue the implementation of SLUDI using MOSIP<sup>DPG</sup>, the evaluation of X-Road<sup>DPG</sup> for data



Sri Lanka's COVID-19 Smart Vaccination Certificate, developed using DHIS2 and DIVOC, has seen over 1 million issuances SOURCE / MAT NAPO / UNSPLASH

interoperability, awareness sessions for the local ICT vendor ecosystem, and exploration and evaluation of new DPGs for adoption. Sri Lanka has also identified and planned to address pain points, including the need to build awareness among state leadership on DPGs and DPI and the importance of proper orchestration and cooperation among international agencies in the DPG space for greater synergies when working with member countries and agencies. These insights will guide any future endeavours in the DPG landscape.

## ● DPG SPOTLIGHT IASO<sup>DPG</sup> LICENSE MIT SDG RELEVANCE SDG2 ZERO HUNGER

SDG3 GOOD HEALTH AND WELL-BEING SDG4 QUALITY EDUCATION WEBSITE WWW.

[BLUESQUAREHUB.COM/IASO](http://BLUESQUAREHUB.COM/IASO) ENHANCING CAMEROON'S MEASLES VACCINATION

CAMPAGN THROUGH AN ADVANCED GEOREGISTRY AND MICRO PLANNING

IASO was selected as the best-fit solution in support of the 2023 Cameroon Measles Vaccination Campaign in part due to its cutting edge georegistry and micro planning features. To ensure that vaccination campaigns in the field run to plan, a reliable geo-enabled micro planning solution is critical. With IASO, requirements can be communicated to each team and field agent with clarity. This information tells field actors who should go where, how many children require vaccination, and what equipment is available in order to be prepared to a level of precision unattainable by manual processes before heading to the field.

The Cameroon georegistry was updated collaboratively via the IASO web and mobile apps, inclusive of all essential information such as: target population, available materials, etc. With a validated plan in place, Cameroon's Expanded Programme on Immunization specialists could generate up

to date digital maps that in turn replaced the hand-drawn—and non-validated—preceding versions. All information was then available in a central repository with data entered for each team and location. This allowed decision makers to monitor the vaccination and geographical coverage of each community ensuring no child had been left behind.

Afterwards, the Cameroon EPI supervisory team visualised the data sent by 900 IASO end users in real-time on tailor-made dashboards, allowing ad-hoc troubleshooting wherever needed. Well-informed teams and real-time monitoring of the vaccination campaign led to an overall coverage rate of 93%, meaning 4.9 million children were vaccinated by 9,000 teams in the field.

This use case shows us that digital precision of geographic information is a game-changer and leads to successful vaccination and/or distribution of health campaigns (medicines, mosquito nets, etc.).

9,000

VACCINATION TEAMS  
IN THE FIELD

4.9mn

CHILDREN VACCINATED  
ACROSS CAMEROON



# Uganda

**In 2023, Uganda has been working on a digital ID system, developing an eGovernment Procurement System, and partnering to provide digital skills for communities.**

## IMPLEMENTING DIGITAL ID USING MOSIP

Uganda conducted a mass national ID registration and issuance campaign from 2014 to 2015. As these IDs approach expiration, the government aims to transform them into digital IDs using the **MOSIP<sup>DPG</sup>** platform. An MoU has been signed with **MOSIP<sup>DPG</sup>**, and technical support is underway for the customisation and implementation of the national ID system.

## DEPLOYING eGOVERNMENT PROCUREMENT SYSTEM

The Government of Uganda has crafted an eProcurement system, currently undergoing deployment in 36 entities as a pilot. Valuable lessons have been learned for enhancements in the process. Once fully developed, they intend to offer this solution as a DPG, particularly considering the interest it has generated in other African countries.

## SUPPORTING DIGITAL SKILLS FOR COMMUNITIES

In collaboration with Huawei, the Ministry of ICT is providing digital skills training to citizens in the informal sector, including market vendors and bike riders. This training enables them to effectively consume digital services, including DPGs. There has been an observed increase in the use of electronic

Uganda has crafted an eProcurement system, currently undergoing deployment as a pilot in

36

ENTITIES



A converted shipping container on wheels, DigiTruck helps increase the use of electronic services SOURCE / ©2023 HUAWEI TECHNOLOGIES CO., LTD.

services within the informal communities where digital skills training has been provided.

# USAID

**In 2023, USAID expanded DPG activities to lead to wide scale applications, including support for investments in Global Goods through Digital Square, and the DPG Charter.**

## FUNDING DIGITAL REACH THROUGH DIGITAL SQUARE

Through Digital Square, USAID provided funding to The Digital Regional East African Community Health (Digital REACH) Initiative. Digital REACH will be a new, groundbreaking initiative within the East African Community that will implement ICT across all dimensions of the health sector in East Africa. It has the power to transform health outcomes for millions of people.

This funding included strategic regional and cross-border implementations including telemedicine networks, the establishment of a regional health data cloud and associated architecture and support team, and an early detection surveillance system to identify potential disease outbreaks.

## CONTRIBUTING TO OPENSTREETMAP

YouthMappers cultivates a generation of young leaders to create resilient communities and to define their world by mapping it. Since its inception, YouthMappers have contributed more than 20 million edits to [OpenStreetMap<sup>DPG</sup>](#), an open geospatial platform which provides critical service for modern digital economy, governance, and health.

20m n

EDITS CONTRIBUTED  
BY YOUTHMAPPERS  
TO OPENSTREETMAP

## EVALUATING GENDER BIAS IN AI APPLICATIONS

### USING SURVEY DATA IN GHANA

The project leverages AidData's expertise in AI, geospatial data, household surveys, and CDD-Ghana's knowledge of the local context and environments to produce a novel public good that will elevate equitability discussions surrounding the growing use of AI in development.

## STUDYING FARMER-CENTRIC DATA GOVERNANCE

This was a [comprehensive study](#) examining different models for farmer-centric data governance, resulting in the publication of a report, case studies, and deep dives. While it is not exclusively focused on DPGs, it does include promoting the use of DPGs in some contexts.

## SUPPORTING FINANCIAL LITERACY

USAID supports "Hey Sister, Show me the Mobile Money", a digital financial literacy campaign available for use and adaptation by anyone, anywhere. Learning resources have been tailored and made available for learning and facilitation in Ghana, Kenya, Malawi, Rwanda, Tanzania, and Uganda containing 26 voice lessons.

● D P G S P O T L I G H T R I G H T S T R A C K E R D P G L I C E N S E C C - B Y - 4 . 0 , C C - B Y - N C - 4 . 0 S D G

R E L E V A N C E   S D G 1   E N D   P O V E R T Y   S D G 2   Z E R O   H U N G E R   S D G 3   G O O D   H E A L T H   A N D  
W E L L - B E I N G   S D G 4   Q U A L I T Y   E D U C A T I O N   S D G 6   C L E A N   W A T E R   A N D   S A N I T A T I O N  
S D G 8   D E C E N T   W O R K   A N D   E C O N O M I C   G R O W T H   S D G 1 0   R E D U C E D   I N E Q U A L I T I E S  
S D G 1 6   P E A C E ,   J U S T I C E   A N D   S T R O N G   I N S T I T U T I O N S   W E B S I T E   R I G H T S T R A C K E R .

O R G   T A K I N G   A N   I N N O V A T I V E   A P P R O A C H   T O   H U M A N   R I G H T S   T R A C K I N G

A team from Aotearoa, New Zealand is taking a global leadership role in human rights measurement by sharing its model and findings with the world.

The Human Rights Measurement Initiative's ground-breaking Rights Tracker is a unique, free, online platform, tracking the human rights progress of nearly every country in the world.

The Human Rights Measurement Initiative's Rights Tracker makes it easy for anyone to see how well countries are treating their people. Human Rights Measurement Initiative uses sophisticated, peer-reviewed methodologies to track each country's human rights performance, and publishes the data on the Rights Tracker. All the information on the Rights Tracker is freely available for non-commercial use.

The Rights Tracker helps all kinds of people and organisations—such as journalists, human rights defenders, investors, and governments—to access high-quality analysis to drive their work forward, and create a more equitable world.

The Human Rights Measurement Initiative believes that what gets measured, gets improved. The Rights Tracker is used by the New Zealand Chief Ombudsman as an official benchmark to track the country's compliance with torture and democracy rules. Journalists have reported on poor Rights Tracker scores in countries all over the world, with headlines in [The Guardian](#), [Al Jazeera](#), and more. Civil society organisations regularly include Rights Tracker data in their reports, including in UN processes such as the Universal Periodic Review.

"The Rights Tracker makes it easy for everyone in the world to see how well their country is keeping people safe and allowing them to flourish—which is what human rights promote. Having this information freely accessible means people have an accurate, reliable resource they can draw on, to help suggest improvements in their countries. Since the data allow for valid comparisons over time and across countries, it also means they can learn from other countries' experiences. The data on the Rights Tracker has always been open to the public, but receiving this [DPG] certification is important because it provides an additional layer of assurance to users that the Rights Tracker meets open content standards."

ANNE-MARIE BROOK

Human Rights Measurement Initiative co-founder





# Bill & Melinda Gates Foundation

**The Bill & Melinda Gates Foundation is committed to fighting the greatest inequalities. Their mission is to create a world where every person has the opportunity to live a healthy, productive life.**

This year, the foundation helped scale up **MOSIP<sup>DPG</sup>** adoption in several countries, and supported the 50-in-5 campaign, and country adoption of the national payment and ID systems through AfircaNenda and the World Bank's ID4D.

## INVESTING IN DPGs

The foundation continues to invest in several DPGs, including **DIVOC<sup>DPG</sup>**, **DHIS2<sup>DPG</sup>**, **CommCare<sup>DPG</sup>**, **Mojaloop<sup>DPG</sup>**, and **MOSIP<sup>DPG</sup>**, as well as iFIX, a part of eGov Foundation's **DIGIT<sup>DPG</sup>**.

## SUPPORTING DPI TECHNICAL ASSISTANCE FACILITIES

The foundation invests in several DPI technical assistance facilities in the areas of payments, identity, and digital health. This is through support to organisations and initiatives including AfricaNenda, the World Bank ID4D, G2PX, Faster Payments, and Cybersecurity Trust Fund Initiatives, the Data Use Partnership, and the Carnegie Mellon University Upanzi Initiative, among others. The impacts of this work is far reaching, including leveraging DPI to deliver gender-intentional G2P payments and expanding DPI research networks in Africa.

The Bill & Melinda Gates Foundation continues to invest in several DPGs, including DIVOC, DHIS2, CommCare, Mojaloop, MOSIP, and iFix (DIGIT)

## POOLING FINANCING FOR DPI

The foundation continues to invest in Co-Develop, which aims to mobilise funding to help countries build DPI that is secure, inclusive, and interoperable and help unlock more donor funding for DPI globally.

## CONDUCTING RESEARCH ON THE IMPACT OF DPI AND DESIGN BEST PRACTICES

The foundation allocates funding to a variety of DPI research efforts. This includes support for DIAL, the Carnegie Mellon Cybersecurity Initiative, the J-PAL Africa Digital Financial Inclusion & Identification Initiative, which focuses on randomized control trials exploring the impact of DPI, and the Alan Turing Institute's research on safe ID.

## SDG3 GOOD HEALTH AND WELL-BEING WEBSITE DEVELOPERS.GOOGLE.COM/

### OPEN-HEALTH-STACK REVOLUTIONISING HEALTHCARE THROUGH OPEN-SOURCE

#### TOOLS

Open Health Stack is a suite of open-source tools and developer resources designed to help accelerate the development of next-gen digital health solutions that enable equitable access to high quality, person-centered care.

By using Open Health Stack components and features, developers everywhere can focus on building standards based, secure digital health solutions that are data driven, promote interoperability, and enable future AI powered applications. Open Health Stack is designed to meet the specific needs of developers and implementers developing FHIR based solutions for deployment in resource constrained settings.

#### With Open Health Stack, developers can:

- Build faster: Build FHIR-native Android apps that are secure, offline-capable, and configurable
- Enhance privacy: Control access to sensitive data, enhancing privacy for patients and healthcare workers

- Unlock insights: Transform data to make it easier to generate trusted insights faster, enabling more effective decision making across healthcare programs.

#### Impact through collaboration

We are community oriented and impact driven. Open Health Stack has been developed in collaboration with WHO and a community of developers with a shared vision for how standards-based, interoperable digital health tools, in the hands of frontline community health workers, can help expand access to quality healthcare everywhere. Today there is a growing community of developers who are building and deploying new FHIR based solutions across Sub-Saharan Africa, South, and SouthEast Asia. Open Health Stack is a key technical enabler of the WHO Smart Guidelines initiative making it possible for developers everywhere to easily deploy and run authoritative evidence based decision support content produced by the WHO on Android.

#### Value of DPGs

We believe that everyone, everywhere deserves access to high quality evidence based care. With Open Health Stack, we want to unlock local innovation so that countries are able to accelerate progress towards the 2030 SDGs. Being a DPG is recognition of our commitment to the SDGs and aligns with our goals of addressing health equity gaps through technology.

# data.org

**Democratising data, for good. data.org is a platform for partnerships to build the field of data for social impact. They work with organisations from all over the world to increase the use of data in order to improve the lives of millions of people.**

In 2023, data.org worked with partners to lead to more effective and equitable public health solutions globally. They are building pandemic intelligence collaboration, expanding pandemic analytics tools, and supporting climate and health data practitioners.

## DEVELOPING THE PANDEMIC AND EPIDEMIC INTELLIGENCE COLLABORATORY

As of 2023, data.org is partnering with WHO to increase the uptake of Epiverse DPGs in low- to middle-income countries. This partnership builds on data.org's ongoing work with Epiverse-TRACE partners—The London School of Hygiene & Tropical Medicine, The Medical Research Council Unit The Gambia, Universidad de los Andes, and Pontificia Universidad Javeriana—who develop tools locally and via human-centered design processes to lead to more effective and equitable public health solutions.

By leveraging the Epiverse network, data.org will support the WHO Pandemic Hub in developing the “Pandemic and Epidemic Intelligence (PEI) Collaboratory.” The PEI Collaboratory will be tailored for pandemic intelligence

professionals and make DPGs more accessible for WHO country members and partners. The PEI Collaboratory will serve as a space that fosters collaboration, sharing of ideas and best practices, and joint problem-solving for better public health results.

## ADDING FINALSIZE TO THE EPIVERSE SUITE OF TOOLS

data.org and the Epiverse-TRACE partners have continuously expanded their suite of data analytics software tools for pandemic preparedness and response. A new addition to the Epiverse suite of tools is **finalsize** DPG, an R package designed to calculate the final size of a SIR epidemic in heterogeneous populations and infection susceptibility. **finalsize** DPG marks data.org's second product that formally recognised as a DPG, following **linelist**. These tools have gone through additional maintenance releases this year. **linelist** has received a major update (version 1.0.0) improving its interoperability with other open-source scientific software.

This year there are other releases in the pipeline to become certified DPGs. These include:

**finalsize is data.org's second DPG, following linelist**

- Serofoi, an R package that estimates the Force-of-Infection of a given pathogen based on population sero-prevalence studies
- Bpmmodels, which provides methods for simulation.

Beyond Epiverse-TRACE, data.org's Capacity Accelerator Network (CAN) has partners spanning the African continent as well as the United States and India. CAN is dedicated to developing open curriculum, resources, and interdisciplinary

experiential learning programs for data practitioners specialising in the intersection of climate and health. In early 2024, data.org, in collaboration with its US partners, will release an open Playbook aimed at assisting institutions in creating their own data science courses for social impact. Additionally, data.org sponsored a "Gender Data 101" course that equips individuals in the social impact sector with the knowledge and capacity to address development needs through a gender lens.

## eGov Foundation

This past year, eGov Foundation concentrated its efforts on expanding its presence in the Global South. It also broadened its scope by incorporating new use cases, such as legal case management, sustainable energy, education, and industry.

### FACILITATING DATA EXCHANGES AND PROMOTING SCALABILITY

eGov Foundation facilitated data exchange between **DHIS2** <sup>DPG</sup> and the **DIGIT** <sup>DPG</sup> health campaign management platform in Mozambique, integrated **DIGIT** <sup>DPG</sup> with **Sunbird** <sup>DPG</sup> and Beckn to develop the AgriStack in Bihar, India, and connected the **DIGIT** <sup>DPG</sup> with Reveal and **OpenLMIS** <sup>DPG</sup> for efficient data exchange and reuse in Liberia.

In addition, eGov Foundation worked to expand the scope of **DIGIT** <sup>DPG</sup> to promote scalability and the adoption of DPI for effective governance in emerging economies beyond India. A noteworthy addition to **DIGIT's** <sup>DPG</sup> capabilities was the integration of Public Health Campaigns Management. This enhancement enables multiple countries and disease programs to utilise the platform to improve equitable coverage and efficiency in coordinating efforts among various government agencies involved in public health campaigns. Notably,



eGov Foundation collaborated with the Ministry of Health in Mozambique to deploy **DIGIT<sup>DPG</sup>** for a malaria bednet campaign, which went live in August and successfully distributed 1.7 million bednets to 3 million people. The success of this deployment prompted Mozambique to extend and reuse **DIGIT<sup>DPG</sup>**. Partnerships with the Ministry of Health of Liberia and CHAI in Nigeria have been established, helping **DIGIT<sup>DPG</sup>** reach an additional population of 7.5 million people.

In 2023, eGov Foundation engaged with 20 countries who expressed an interest in deploying DPI for governance. In line with eGov Foundation's objective of catalysing DPGs in 30 countries by 2030, and the larger ecosystem's collective ambition of 50-in-5, in 2024 eGov Foundation will:

- transform country demands into implementation by extending support to a diverse ecosystem of partners to leverage **DIGIT<sup>DPG</sup>** for a variety of use cases in new geographies.
- build local capacities and strengthen implementation ecosystems by establishing regional Centres of Excellence. These Centres of Excellence will work towards strengthening capacities of government officials and practitioners of digital governance through open knowledge products, workshops, and trainings, and by building CoPs.

2024 will also provide eGov Foundation the opportunity to focus on co-creating standards-based, user-friendly, and interoperable DPI. eGov Foundation plans to develop tools such as sandboxes and workbenches, aimed at simplifying the process of building on and deploying **DIGIT<sup>DPG</sup>** across varying technical skill levels. To ensure sustainability, eGov Foundation aims to build a coalition of local partners and establish regional



Field visits to understand real challenges on ground and incorporate user centricity in program and product design SOURCE / EGOV FOUNDATION

Centres of Excellence which will play a crucial role in fostering local capacity and ecosystem development. Moreover, eGov Foundation will provide advisory support for privacy risk assessments associated with deployments.

# Food and Agriculture Organization

In the past year, FAO has become a leader in the development and utilisation of DPGs as tools and knowledge products, making them more accessible and transforming agricultural practices to empower rural households, young farmers, and entrepreneurs.

## DOUBLING THE NOMINATED AND CERTIFIED DPGs OWNED BY FAO

In 2023, four new DPGs were nominated for certification including FAO eLearning Academy, Agris, Agrovoc, and the Agricultural Market Information System (AMIS), and more are currently in the pipeline for DPG recognition.

## GREATER UTILISATION OF THE HAND-IN-HAND GEOSPATIAL PLATFORM

Compared to last year, Hand-In-Hand Geospatial Platform's (**HIHGP**) use increased by 21%; the use of analytics capabilities tripled through the year, with data use increasing 450%, and total map data requests increasing by 367% or 14.6 billion requests.

FAO has also invested in increased training and capacity building for **HIHGP** in various locations including Rwanda, Kenya, Pakistan, Paraguay, Nicaragua, and Tanzania. In addition, the **HIHGP** interface was translated to French, Spanish, Chinese, and Russian, available now in the six official UN languages except for Arabic, which is underway, ensuring access for a broader audience and leaving no one behind.

21%  
INCREASE IN THE  
USE OF HIHGP

450%  
INCREASE IN THE  
USAGE OF DATA

14.6bn  
MAP DATA REQUESTS

The new FAO Agroinformatics Platform builds on top of the **HIHGP**, providing more data-driven solutions for the FAO four Betters and SDGs achievement. This underscores FAO's commitment to the development and championing of DPGs and making digital tools and knowledge products more accessible to farmers, transforming agricultural practices to empower rural households, young farmers, and entrepreneurs.

The solutions that are already on FAO Agroinformatics platform include **HIHGP**, **WaPOR** (which won the GEO SDG Award, Custodian Agency Prize in recognition of its groundbreaking contribution to the SDGs in 2023), and other tools such as the Rift Valley Fever (RVF) Early Warning Decision Support Tool (RVF DST), the FAO crop calendar, and the **FAO Digital Services Portfolio**.

## UPSCALING THE FAO DIGITAL SERVICES PORTFOLIO TO SRI LANKA AND KAZAKHSTAN

In Sri Lanka, FAO developed a comprehensive e-extension pilot platform based on the **FAO Digital Services Portfolio**. It includes a mobile application that is reaching

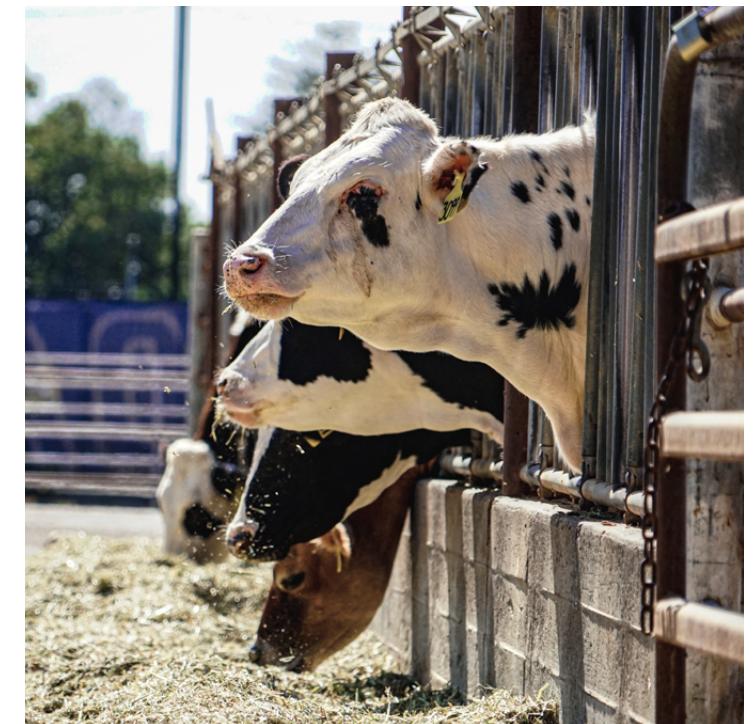
110 farmer organisations. In Kazakhstan, the European Bank for Reconstruction and Development (EBRD) and FAO partnered with livestock industry associations to create a free app, Agrokomek, providing practical knowledge to rural communities—from localised market information on animal feed, veterinary pharmacies and clinics to climate-smart practices, and a farmer-to-farmer forum.

FAO also actively utilises the following DPGs in support of its field programme: **HIHGP** <sup>DPG</sup>; **FAO Digital Services Portfolio** <sup>DPG</sup>; **WaPOR** <sup>DPG</sup>; **Open Foris Collect** <sup>DPG</sup>; **CKAN** <sup>DPG</sup> for cataloguing FAO datasets; **DHIS2** <sup>DPG</sup> for observing good nutrition practices in countries; **MET Norway** <sup>DPG</sup> for digital advisory prototypes; **KoboToolbox** <sup>DPG</sup> for data collection activities in countries; **Moodle** <sup>DPG</sup> serves as the engine behind FAO's eLearning Academy; **ODK** <sup>DPG</sup> for data collection activities in countries.

Starting in 2024, FAO will continue evolving its DPG Framework towards a DPG-first approach that seeks to:

- rearchitect towards a common set of digital building blocks for agrifood systems transformation;
- promote the reutilization and distribution of FAO's vast portfolio of food and agriculture DPGs; and
- ensure DPG uptake helps build local skills and capacity.

The **FAO Digital Services Portfolio** <sup>DPG</sup> will benefit from a new product vision and roll out to additional countries such as Kyrgyzstan, Haiti, and Dominican Republic. The Agroinformatics platform will be better equipped to produce advanced information and data, including food security



The Agrokomek app, provides practical and localised information to rural communities in Kazakhstan SOURCE / JEREMY HUANG / UNSPLASH

indicators and agricultural statistics, helping to turn data into action for sustainable progress. In 2024, FAO will also create the FAO Digital Impact Exchange—an online, searchable catalogue of digital building blocks, products and use cases for agriculture and the DPGs that help implement them.

# Foundation for Public Code

**The Foundation for Public Code is a non-profit association whose mission is to enable public-purpose software and policy that is open and collaborative. In 2023, Foundation for Public Code has focused on the evolution and adaptation of DPGs for new contexts.**

This year, Foundation for Public Code co-hosted the DPG and Public Code devroom at FOSDEM. The Foundation also engaged in ad hoc consultations with DPGs including [OpenFisca](#)<sup>DPG</sup> and [Decidim](#)<sup>DPG</sup> and began supporting [OpenFn](#)<sup>DPG</sup> in their compliance with the Standard for Public Code in addition to releasing four iterations of the Standard for Public Code. Notably, they assisted GOV.UK Notify in progressing towards becoming a DPG by establishing a CoP and formulating a plan to meet the Standard for Public Code. They also transitioned from a member-based organisation to a chapter-based one to better serve their members.

## PROVIDING CODEBASE STEWARDSHIP TO DPGs

The Foundation aims to facilitate the sustainability, marketability, support, and quality of open-source codebases, allowing them to be successfully reused and community-developed.

Throughout 2023, their collaboration efforts provided ongoing advice to Estonia, a DPG member, on growing communities and establishing stewardship organisations for DIIA and other codebases.

## MAINTAINING THE STANDARD FOR PUBLIC CODE

The Foundation acts as a steward, evolving or adapting DPGs by providing a model for building open-source solutions within public organisations. This model enables successful collaborations and future reuse by similar public organisations elsewhere.

In 2024, Foundation for Public Code will support GOV.UK Notify in meeting the DPG Standard, provide consultations with other DPGs like [Decidim](#)<sup>DPG</sup>, [OpenFisca](#)<sup>DPG</sup>, [OpenFn](#)<sup>DPG</sup>, and [X-Road](#)<sup>DPG</sup>, assess OpenRefine against the Standard for Public Code, collaborate with other members to include their tools in DPG capacity-building materials, and maintain the Standard for Public Code.

Foundation for Public Code will also co-host the DPG and Public Code devroom at FOSDEM 2024, offer training on the DPG Standard to Digital Square, support new DPGs in meeting the Standard for Public Code, and bring together public ministries working on DPGs for international development and domestic digital transformation.

**The Foundation for Public Code acts as a steward, evolving or adapting DPGs by providing a model for building open-source solutions within public organisations**

## R E D U C E D I N E Q U A L I T I E S S D G 1 6 P E A C E , J U S T I C E A N D S T R O N G I N S T I T U T I O N S

### W E B S I T E D E C I D I M . O R G S T R E N G T H E N I N G C I V I C P A R T I C I P A T I O N F O R

#### D E C I S I O N M A K I N G

Founded in 2017, Decidim is a digital platform for citizen participation. It's a free/libre and open-source web-based software, written in Ruby on Rails and maintained by an extensive and active community. It enables community organisers to design their own participative processes by providing a mix-and-match framework with participatory components such as a voting system to run consultations, a participatory budgeting system, modules to receive citizen proposals, and much more.

Decidim is used by a wide array of people and organisations to enable collective decision-making and participation; from the European Union (read the use case) or the city of New York, to small cooperatives, Decidim has reached over 3 million people in over 30 countries and has been translated by the community to 55 languages.

#### **Decidim adoption in Brazil**

Recently Decidim was adopted by the government of Brazil (read the use case in Spanish).

Thanks to Brazil's digital ID, [conta.gov.br](#), and to Brazil's high index of democratic participation, 1.4 million Brazilians quickly signed up to participate in Brazil's first country level participatory budget. Brazil also quickly built a software community by founding Decidim Brazil, a community encompassing several universities, including the University of Brasilia, as well as tech communities and Ruby communities as they plan to implement Decidim instances around the country to mimic the federal participation strategy.

#### **Leveraging Open Source to Scale**

Decidim was built by the municipality of Barcelona, but since the beginning, its

objective was to build a product that could be re-used by other cities, governments, or teams, so its software architecture is replicable. An NGO was set up for the software and the code donated to it so that it can maintain its autonomy from the government.

It is not an easy case to have taxpayers invest in software that will be used outside of its borders. However, we strongly believe that software built by governments and for the public should be built this way. In time, this has largely paid off. Not only does this model of building software set Barcelona as an example of technopolitics and digital democracy in the world, but the large community that now uses and contributes to Decidim helps maintain and grow the software, ultimately making it stronger.

We identify closely with the DPGA mission because we see software, good software with good governance and built for replicability, can serve millions of people. We see that smaller organisations, smaller governments or local governments can take advantage of good software that's already proven and for which there is already a good community so that they can focus on their important missions. This culture of sharing also enables justice which is something we want to contribute to.

3mn

PEOPLE REACHED  
VIA DECIDIM

30+

PARTICIPATING  
COUNTRIES

55

LANGUAGES AVAILABLE,  
TRANSLATED BY THE COMMUNITY



# Github

**GitHub is a platform for software development and version control that supports communities and projects that address societal challenges. Their Social Impact Team is dedicated to leveraging technology and collaboration for positive social change.**

## ACTIVATING DEVELOPERS PROGRAM

GitHub has introduced “For Good First Issue,” a curated list of DPGs that require assistance from developers. This tool is designed to facilitate non-profits in leveraging the open-source community. The next steps involve promoting wider adoption through a marketing campaign, All in Africa, which connects open-source software developers to curriculum, and helps establish unified data labelling.

## OPEN SOURCE IN THE SOCIAL SECTOR TRAINING

GitHub’s training program for community managers in the social sector has provided over 70 training hours. This program aims to support DPGs by identifying and training community managers to foster external contributor communities, ensuring the long-term sustainability of DPGs.

## EASIER ACCESS TO GITHUB TOOLS FOR DPGs

GitHub is developing a guide on open source in the social sector to showcase best practices and help social sector organisations explore and implement open source within their operations.

## DEVELOPING STANDARDISED METRICS WITH GITHUB DATA

GitHub’s research on standardised metrics in the social sector has led to the creation of the Innovation Graph, providing longitudinal metrics on software development for world economies as a valuable data resource.

## DPG ADVOCACY AND AWARENESS

GitHub’s Social Impact Team is actively engaged in conferences and talks, such as RightsCon and the Internet Governance Forum, to raise awareness about DPGs and encourage open-source developers to explore and contribute to DPGs.

Looking ahead, the “For Good First Issue” site will continue to grow. Additionally, the guide on “Easier access to GitHub tools for DPGs” will be published, and more training content will be created. In 2024, GitHub plans to collaborate with the DPGA to establish a funnel for new projects to become DPGs and explore ways to streamline the application process for DPG status.

**GitHub provides training for community managers to foster external contributor communities, ensuring the long-term sustainability of DPGs**

**70+**

TRAINING HOURS PROVIDED

## UN Global Pulse

**UN Global Pulse is the Secretary-General's initiative on big data and AI for development, humanitarian action, and peace. UN Global Pulse activities are implemented through various partnerships, including through UNOPS and UNDP.**

### DECISION SUPPORT TOOLS FOR SOCIAL AND HUMANITARIAN ACTION

The Data Insights for Social and Humanitarian Action (Disha) initiative, is a UN-led partnership that brings together various organisations spanning the humanitarian, data, technology, and development sectors. The primary objectives of Disha are centered around the development of decision support tools that utilise high-frequency data to inform disaster preparedness and response efforts for humanitarian organisations both within and outside the UN system. Additionally, Disha is focused on creating practical blueprints for deploying these tools in new contexts and geographies while assessing and mitigating associated risks.

This year, UN Global Pulse has piloted tools within Disha that leverage mobile network data, including call patterns and top-up information, to predict poverty incidence at a granular level. These tools also help identify major population movements, assisting in locating vulnerable populations throughout the climate adaptation process, spanning emergency preparation, response, and recovery. The solution is currently being tested and validated by three humanitarian organisations in



Disha provides high-frequency data to inform disaster preparedness, response, and recovery efforts for humanitarian organisations

SOURCE / SAIKIRAN KESARI / UNSPLASH

the Philippines, with plans to replicate it for more countries in 2024.

Looking ahead, Disha plans to initiate testing for an aid targeting decision support tool. This tool will utilise high-resolution satellite imagery to identify damaged buildings following

a disaster or conflict. The tool combines the UN's PulseSatellite with the SKAI model developed by Google in partnership with WFP. The aim is to further enhance decision-making processes in humanitarian actions by leveraging advanced technologies and data insights.

## UN Office of Information and Communications Technology

**OICT is a specialised office within the UN that plays a crucial role in coordinating and facilitating the effective use of technology across various UN entities. Three key activities have been initiated to advance the adoption and utilisation of DPGs in 2023.**

### EQUIPPING UN STAFF WITH OPEN SOURCE KNOWLEDGE

Mind the Open Source Gap, hosted by OICT and OSET, brings together UN staff quarterly for discussions on the opportunities and challenges of OSS, with the goal of empowering the UN to fulfill its mandate. These sessions facilitate the exchange of best practices, the creation of collaboration networks, and the generation of concrete recommendations.

### ESTABLISHING OSS CoP

At the UN system level, OICT aims to establish a CoP consisting of technologists from all UN system entities. This

subgroup, co-chaired by OICT and UNFPA, operates under the Digital Technology Network and ensures collaboration, coordination, and contribution to various OSS initiatives within the UN system to avoid duplication and ensure synergies, cooperation, and alignment.

### ORGANISING OSPOs FOR GOOD

OICT, OSET, OSPO++, and OpenForum Europe, organised a symposium in June, on "OSPOs for Good". This event explored the role of OSPOs in digital infrastructure, emphasising the UN SDGs. It highlighted OSPOs as catalysts for open

This year, OICT undertook a Digital Technology Network survey of UN system OSS apps, creating a comprehensive list of DPGs in use

source adoption and cross-border collaboration, setting the stage for a yearly “OSPOs for Good” initiative.

This year, OICT undertook a Digital Technology Network survey of UN system OSS apps, creating a comprehensive list

of DPGs in use. Looking ahead, OICT will organise “OSPOs for Good 2024,” ensuring continued emphasis on the promotion and adoption of DPGs within the UN system.

## ITS Rio

**ITS Rio aims at strengthening Brazil, Latin America, and Global South voices in international debates on technology, internet, and their regulation. This year, ITS Rio raised awareness of the relationship between DPI and DPGs in Brazil, particularly for the G20 discussions. They joined the DPGA in October.**

### PROMOTING DPGs AND DPI IN BRAZIL

In order to better understand available technologies, ITS Rio is creating a report that maps key potential DPI tools developed in Brazil, such as Pix, gov.br, and Drex. The report will detail which components of Brazil’s existing DPI are open source or certified as DPGs. Additionally, webinars will be conducted for both national and international audiences to present the findings from the report.

### PROVIDING AN OPEN DPI COURSE

This course will be a live and online, free course for public servants and relevant stakeholders in Brazil. It aims to educate

participants about the concept of DPI and its applicability in the Brazilian context, emphasising OSS, alternatives to infrastructure, and available resources in Brazil for initiating new projects.

In 2024, ITS Rio will focus on reporting on DPGs in Brazil, capacity building for both private and public actors, and raising awareness as part of Brazil’s G20 presidency in addition to undertaking new DPG-related work involving both reporting and capacity building.

## ● DPG SPOTLIGHT OPENHEXA<sup>DPG</sup> LICENSE MIT SDG RELEVANCE SDG2 ZERO

HUNGER SDG3 GOOD HEALTH AND WELL-BEING SDG4 QUALITY EDUCATION SDG17

PARTNERSHIPS FOR THE GOALS WEBSITE [WWW.BLUESQUAREHUB.COM/OPENHEXA](http://WWW.BLUESQUAREHUB.COM/OPENHEXA)

## TRANSFORMING PUBLIC HEALTH DATA MANAGEMENT IN IVORY COAST

Health system managers often need to access and analyse a variety of datasets to better understand complex situations and to design public health policies. This data typically comes from routine data systems such as DHIS2<sup>DPG</sup>, but can also be collected through other specialised pipelines such as logistics management or campaign monitoring. Additionally, data generated outside of the health system, such as rainfall intensities or population movements, can be extremely important.

To facilitate the implementation of advanced data solutions for decision makers, Bluesquare developed OpenHexa, a data integration platform tailored for public health programs. OpenHexa is an open source ETL designed specifically for low resource settings. By keeping the end user (i.e. Ministries of Health) in mind, emphasised focus has

been placed on keeping features both simple and relevant.

In Ivory Coast, the Direction Générale of the Ministry of Health (DGSHP) has rapidly understood how OpenHexa can be used to facilitate the monitoring of different sectors of its activities. Through an implementation, the DGS (alongside various services and partners) integrated data flows into a single consolidated dashboard (using PowerBI) which covered the availability of drugs, infectious disease surveillance, maternal and child health, availability of services, and patient satisfaction. This dashboard has since been expanded to cover key programs such as COVID-19 vaccination and Universal Health Coverage.

To achieve this outcome, eight different data sources (including DHIS2<sup>DPG</sup>, eSIGL,

MAGPI, and IASO<sup>DPG</sup>) were integrated via OpenHexa. Any integration of new data is easily automated to ensure the dashboard is seamlessly kept up to date.

At present, Bluesquare is working with various Ministry of Health services to add additional data sources, as well as build supplementary tools for other users within the organisation, using the same infrastructure for data integration. Understanding—and listening—to our end users needs has allowed Bluesquare to develop an open-source solution that will soon be hosted on premises and that is easily transferable to our partners—an essential step to building any sustainable data integration infrastructure.

# Inter-American Development Bank

The IDB is the main source of development financing for Latin America and the Caribbean. They joined the DPGA in 2023 and support the 50-in-5 campaign. They actively support 100+ implementation processes of open-source solutions and advocate for the strategy of open-source first digital transformation processes in countries in the region.

## MAINTAINING THE CODE FOR DEVELOPMENT REPOSITORY FOR OSS

With the goal of facilitating the dissemination of open-source solutions within governments of Latin America and the Caribbean, the Code for Development repository has more than 215 curated tools, which were developed by the IDB itself, as well as governments, academia, and various other organisations. The repository works as a one-stop-shop for public managers and contains tools and internal digital infrastructure which promotes the use of DPGs.

## OPERATING THE CODE4DEV NETWORK

The network, focused on developers working in public administration, is an open and free community. Anyone interested in learning and/or implementing open source solutions can exchange ideas with more than 2,000 developers, access monthly events that show and teach how to implement these tools, as well as get in touch with a team that can guide the

application of open-source in the public sector. The network has had 18 meetings, with an average of 340 participants per meeting in 2023.

## DEVELOPING OSS

Recognising code as a public good, the IDB and all its sectors have opened the source code of more than 60 digital solutions owned by the bank, and each year dozens of new tools are added to the repository of Code for Development. In 2023, these solutions had more than 116,000 clones in GitHub and the IDB has actively supported more than a hundred adoptions by governments in Latin America and the Caribbean.

While Code for Development dissemination efforts generated a spike in the demand for open-source solutions that can be easily implemented in-house by governments, the greatest impact of this work has been through the support given to

215+

TOOLS IN THE CODE FOR  
DEVELOPMENT REPOSITORY

several governments in the region that are interested in structuring in-house governance to allow for the adoption of DPI.

#### SUPPORTING DPI IMPLEMENTATION

The IDB has joined the 50-in-5 campaign as a supporting organisation, focusing on strengthening the agenda in Latin

America and the Caribbean, as well as sharing the progress the region has already achieved. The IDB has partnered with organisations such as GitHub and the Center for Digital Public Infrastructure, which are offering pro-bono support for the development and adoption of DPGs and DPI in countries across Latin America and the Caribbean.

## International Telecommunication Union

**ITU is the UN specialised agency for information and communication technologies. This year, they conducted desk research, a literature review, and ecosystem mapping for DPG developments. ITU identified key areas to support countries, defined a open resources management program, and explored potential contributions to the DPG Registry.**

#### BUILDING DPG CAPACITY TO STRENGTHEN NATIONAL SYSTEMS

This work involves constructing an open resources management program and framework to support countries and DPGs' local ecosystems. The deployment of open-source technical facilities will contribute to building capacity and strengthening local ecosystems to support DPG developments.

#### INCREASING ADOPTION AND KNOWLEDGE OF DPGs

By leveraging ITU's network, they promote the adoption of the DPG definition and DPG Standard at international and national levels, particularly regional bureaus and their relationships with countries and governments.

Using a literature review and a series of workshops, panels, and interviews with DPGs, ITU helped to identify key open resources, such as open-source software stacks,

open-source AI models, open data, and open content, presently used in developing DPGs at the international level.

#### SUPPORTING DPGs

With the deployment of open-source technical facilities, ITU seeks a strong commitment from target countries and governments to match funds, ensuring more sustainability and building capacity for DPGs.

ITU provides continued support to countries and DPGs by facilitating awareness raising, and understanding digital government technologies through the GovStack Sandbox.

In 2023, ITU collaborated with several DPGs, including **OpenCRVS** <sup>DPG</sup>, **OpenSPP** <sup>DPG</sup>, and **MOSIP** <sup>DPG</sup>. Additionally, they partnered with UNDP as a contributor to the Open Source Ecosystem Enablement project.

In 2024, ITU will focus on developing a full framework for their open resources management program to support countries and DPGs in their developments. They also plan to deploy open-source technical facilities in two target countries and provide them with full support in education, training, and hands-on experience with pertinent open-source technologies.

## Omidyar Network

**Omidyar Network is a social change venture that reimagines critical systems, and the ideas that govern them, to build more inclusive and equitable societies—for the benefit of the many, not just the few—across the globe.**

Omidyar Network helps build the technical capacity of countries adopting DPGs, and supports initiatives like Co-Develop, MOSIP, and UNECA

#### SUPPORTING MOSIP

Omidyar Network serves on the Executive Board of **MOSIP** <sup>DPG</sup> and is actively involved in helping them scale. **MOSIP** <sup>DPG</sup>, a DPG for identity, has successfully expanded to over 14 countries, reflecting a substantial accomplishment in the DPG domain.

#### FUNDING UNITED NATIONS ECONOMIC COMMISSION FOR AFRICA

Omidyar Network is planning to support the United Nations Economic Commission for Africa (UNECA), which aligns with their commitment to foster the technical capacity of countries adopting DPGs.

## SCALING FUNDRAISING EFFORTS OF THE CO-DEVELOP FUND

In 2023, Omidyar Network supported Co-Develop to help scale with the objective of securing funding for DPGs and their adoption.

## COLLABORATING WITH THE DPGA SECRETARIAT

Omidyar Network helps convene DPGA members to collaborate and advocate for the adoption of DPGs. This year these efforts were reflected in the DPGA Annual Members' Meeting, and support for the DPGA and UNDP's campaign to highlight open-source solutions that can help tackle mis- and

disinformation at the Nobel Prize Summit. This is, in part, in recognition of the importance of raising awareness and building widespread consensus around the adoption of DPGs.

Omidyar helps build the technical capacity of countries adopting DPGs, and supports initiatives like Co-Develop, **MOSIP** <sup>DPG</sup>, and UNECA, as well as closely collaborating with the DPGA Secretariat via the AI Systems as DPGs CoP.

In 2024, Omidyar Network plans to expand the DPG toolkit to include Generative AI, reflecting on Omidyar Network's commitment to exploring new avenues and technologies in the DPG domain.

# Open Knowledge Foundation

**Since 2004, the OKFN has worked at the intersection of cutting-edge digital tools and a distributed network of communities and movements to serve the public interest with open knowledge.**

## SERVING VULNERABLE PEOPLE WITH OPEN DATABASES

**CKAN** <sup>DPG</sup> is an open-source tool held in trust by OKFN. Recognised as a DPG in 2023, **CKAN** <sup>DPG</sup> powers data portals globally, and by doing so they help to foster greater transparency. OKFN extends the impact of **CKAN** <sup>DPG</sup> to humanitarian causes through partnerships with major refugee agencies,

notably the UNHCR and their Raw Internal Data Library (RIDL) project, aiding evidence-based decision-making. In 2023, this initiative expanded to the Norwegian Refugee Council through the NRC Data Hub, streamlining data for impactful assistance to 9.8 million people worldwide.

## CHAMPIONING THE DEVELOPMENT OF OPEN DPI FOR ELECTORAL PROCESSES

OKFN advocates for participatory democracy through openness, and has been leading a global alliance for a DPI for electoral processes, which started collaborating in mid-2023. Aligned with SDG 16, the initiative looks at all electoral stages, and is focusing on identifying relevant or needed standards, API, data portals, and apps. The coalition aims for relevant tools they identify to eventually be recognised as DPGs and to help promote a more inclusive democracy. This work will continue throughout 2024.

## UPDATING THE OPEN DATA COMMONS AND REVISITING THE OPEN DEFINITION

This workstream is geared towards evolving or adapting DPGs for new contexts. Over a decade ago, OKFN led collaborative initiatives defining openness in data and content. In 2023, OKFN initiated a reevaluation addressing emerging topics like data extractivism and climate justice through consultative sessions across three continents. In 2024, the focus will be on presenting updated definitions crucial for open culture ecosystems, aligning with potentially all SDGs.

In 2023, OKFN worked alongside other DPGA members including UNDP, the Bill & Melinda Gates Foundation, IDB, and the Foundation for Public Code. These collaborations involved engaging in conversations or projects related to the DPI for electoral processes work with UNDP, providing technological services for the development of an internal data exchange portal (GDx) for Bill & Melinda Gates Foundation,

**OKFN extends CKAN's impact to humanitarian causes through partnerships with major refugee agencies, notably the UNHCR and their Raw Internal Data Library project, aiding evidence-based decision-making**



OKFN collaborations involved engaging in conversations or projects, including with other DPGA members SOURCE / OKFN

delivering capacity-building workshops for the #Code4Dev network with IDB, and participating in side events at the last OGP Summit with the Foundation for Public Code.

# Open Source Initiative

**As steward of the Open Source Definition (OSD), the non-profit OSI plays a crucial role in enabling innovation, equitable access, and freedom to collaborate across all sectors of society.**

The OSD is embedded in the criteria by which software can be certified as a DPG. Most recently, OSI's role has been extended to defining open-source AI to bring similar values and shared understanding of OSS's role in this new consequential technology.

## DELIVERING A FREE OPEN SOURCE LICENSE CLINIC

The public sector has a stake in creating operational efficiencies, innovating to deliver public services. They are also called to inform policies that impact civil society leveraging OSS—but need a solid understanding of OSI-approved licenses. OSI delivered a free [Open Source License Clinic](#) in Washington, DC in the spring of 2023. General licensing and copyright law, cybersecurity, and AI were workshopped with a group of federal personnel representing twenty agencies. Plans are now underway for replicating its value and success in 2024.

## HOSTING A “DEEP DIVE AI” EDUCATION SERIES

As the relationship between OSS, open data, and open AI accelerates, a deeper understanding of how these elements

work together, who may benefit, and who may not begs a public discussion. This relationship brings promises of innovation and improvement in quality of life, while also posing challenges to personal privacy and safety of the public requires greater public discourse. In particular, concerns around transparency and openness have been raised. Throughout 2023, the OSI hosted and broadcast [Deep Dive AI](#), a series of online interviews across the spectrum of society to inform a second project, Defining Open Source AI.

## DEFINING OPEN SOURCE AI

Building on the Deep Dive AI discussions conducted in 2022–2023, OSI began an open public process to define [Open Source AI](#). The OSD has underpinned a permissionless, pragmatic, and transparent software development ecosystem for 25 years. OSI aims to ensure that the same principles may be applied to AI by running a multi-stakeholder process to co-create an agreed Open Source AI definition. Significant progress has been made in 2023 including running multiple conference workshops that included five in-person community reviews of a draft definition.

**OSI's role has been extended to defining open source AI to bring similar values and shared understanding of open source software's role in this new consequential technology**

This work includes participation in and collaboration with the DPGA's CoP on AI which advocates for responsible use of AI. An Open Source AI definition that embodies principles of transparency and clarity will be crucial to supporting wider efforts towards responsible AI. OSI and the AI CoP delivered an AI workshop to its membership at the DPGA Annual Members' Meeting.

#### PRODUCING THE STATE OF THE SOURCE EVENT

In 2019, OSI began producing their annual "State of the Source"—a virtual event serving as a broad international

platform to mark progress in the advancement of the use of open-source technologies as well as celebrating its use in new and innovative ways. In 2023 the event was co-located as a full day's track with one of the largest open-source community events—All Things Open with a focus on AI. OSI gathered non-profits, academia, and industry to discuss some of today's most crucial open topics: open source in public policy, cybersecurity, licenses, and a defining open-source AI workshop.

## Digital Square at PATH

**Digital Square at PATH works with ministries of health to align adaptable, interoperable digital technologies with local health needs and brings partners together to improve how the global community designs, uses, and pays for digital health tools and approaches.**

#### LAUNCHING THE GLOBAL GOODS GUIDEBOOK 4.0

The Global Goods Guidebook 4.0, launched in May, serves as a valuable tool to promote the use of DPGs by showcasing their value, supporting their adoption by countries, and generating sustained interest, investment, and support. Version 4.0 featured 36 global goods and introduced sections addressing

evolving needs in digital health, including standards, security, and the benefits of becoming a global good.

#### HOSTING GLOBAL GOODS INNOVATORS SUMMIT

In June, Digital Square hosted the Global Goods Innovators Summit in Dar es Salaam, Tanzania, with 115 global goods

innovators, developers, implementers, and donors. This event, aimed at incubating DPGs, provided a platform for learning, problem-solving, and testing new ideas. The summit's focus on security, data privacy, standards, interoperability, and sustainability remains integral to Digital Square's work.

### INTRODUCING AN IMPROVED TOOL FOR ESTIMATING THE COST OF DIGITAL HEALTH

Digital Square launched an updated Sustainability Calculator designed to estimate the cost of delivering sustainable digital health in a country. This tool, based on costed digital health roadmap data from 13 African countries, provides a high-level cost-per-person estimate and supports countries in planning their digital health transformation.

### NOTICE G1 LAUNCHES FIRST CALL FOR CONTENT GLOBAL GOODS

Digital Square also played a role in incubating DPGs by calling for new software and content global goods through Notices G0 and G1. The announcement of new software global goods through Notice G0 and the launch of the first call for content global goods through Notice G1 expanded the repertoire of available tools, with a significant portion being developed in Africa and Asia.

### UPDATING MATURITY MODELS

Additionally, Digital Square updated maturity models for digital health tools to help identify areas of investment for global goods. The organisation revised its maturity model for software global goods and introduced a new model for content

Digital Square has contributed to the availability of reputable, flexible, mature, and interoperable global goods in the digital health ecosystem, empowering countries to select tools that best meet their digital transformation needs across all levels of the health system



Attendees of the Global Goods Innovators Summit brainstorm discussion topics SOURCE / DIGITAL SQUARE

global goods. These updates reflect Digital Square's commitment to continuous improvement, enhancing the availability, adaptability, and maturity of digital health global goods.

Digital Square provides continued support for the development, adoption, and reuse of DPGs for health. Digital Square has contributed to the availability of reputable, flexible, mature, and interoperable global goods in the digital health ecosystem. This, in turn, empowers countries to select tools that best meet their digital transformation needs across all levels of the health system.

## Public Digital

**Public Digital recognises that digital transformation is the act of radically changing how an organisation works, so that it can survive and thrive in the internet era. Public Digital joined the DPGA in November.**

### SUCCESS CONDITIONS FOR OPEN SOURCE

Public Digital will be revisiting the report that was published in 2021 on creating the conditions for success with open source in government, publishing an update that bridges those findings with recent developments in this fast-developing field.

### HOSTING A ROUNDTABLE FOR FUNDERS

Public Digital will be following up on a roundtable on funding digital initiatives from 2020, organising a fresh convening of digital initiative funders. This convening will connect those who are struggling to make their work sustainable due to the nature of the funding they can access, with funders who are keen to find new ways to address that challenge.

Public Digital will continue to support digital teams working to transform their institutions and improve outcomes for citizens. Those teams are at the heart of digital progress, with the unique capacity to make use of tools and practices—like DPGs—and apply them to meeting outcomes.

**Open source  
in government:  
creating the  
conditions  
for success**

As part of their roadmap activities, Public Digital will be revisiting their report on governments using open source SOURCE / PUBLIC DIGITAL

# Rockefeller Foundation

The Rockefeller Foundation's mission is to promote the well-being of humanity throughout the world. The Foundation advances new frontiers of science, data, policy, and innovation to solve global challenges related to health, food, power, and economic mobility. This year, they've provided support for a [Climate DPI working group](#), and provided funding for Artha Global to advance DPI conversations with partners.

## MOBILISING AND ADVOCATING FOR DPGs

In 2023, Rockefeller Foundation provided incubation support to [Mojaloop<sup>DPG</sup>](#), a DPG that can be used for financial services companies, government regulators, and others taking on the challenges of interoperability and financial inclusion. They also provided support to Public Digital, another DPGA member, for a government convening series on digital solutions, including DPGs.

## FUNDING THE SUSTAINABLE DEVELOPMENT OF G2P CONNECT

In order to further promote the use of DPGs, Rockefeller Foundation provided funding to advance and support G2P Connect, an open source effort to support the digital delivery of G2P payments offerings. This resulted in:

- a technology architecture blueprint that is plug-and-play;
- a set of integration specifications to ensure interoperability across the systems supporting G2P delivery;

■ and an integration sandbox to support the development of solutions adhering to the blueprint and specifications.

## SETTING UP THE CO-DEVELOP FUND AND ADVANCING DPI

In order to scale DPI uptake that is focused on DPGs as building blocks, Rockefeller Foundation provided incubation funding for the launch of the Co-Develop Fund to advance DPI adoption globally.

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# Thoughtworks

**Thoughtworks is a global technology consultancy that integrates strategy, design, and software engineering to enable enterprises and maintain DPGs including Cloud Carbon Footprint<sup>DPG</sup> and Bahmni<sup>DPG</sup>.**

## UPDATING CLOUD CARBON FOOTPRINT

In the first half of 2023, the on prem version 1 of **Cloud Carbon Footprint<sup>DPG</sup>** was created and released. There were also ongoing updates to improve the cloud version of **Cloud Carbon Footprint<sup>DPG</sup>** in 2023. These improvements focused on accuracy through integration with electricity map, UX, and performance upgrades. A new cloud provider is also in beta, Alibaba Cloud, and additional support, filtering, and aggregation has been implemented.

## CREATING JUGALBANDI

Thoughtworks have worked with Agami, an organisation focused on social justice, to create a solution called Jugalbandi. It combines large language models, local language support, as well as an integration to chat tools such as WhatsApp and Telegram in order to provide information to citizens in a manner that they can understand, consume, and benefit from. Users can also upload their documents and talk to them in the language of their choice. Many NGOs have found it useful and have started their AI journey using this

open-source code. Efforts are ongoing to integrate this into Indian courts and local governments.

## WORKING IN COALITION ON BAHMNI

The **Bahmni<sup>DPG</sup>** coalition worked with SNOMED International to showcase how the **Bahmni<sup>DPG</sup>** electronic medical record integrates with SNOMED FHIR Terminology server, to leverage advantages of the SNOMED classification system, in areas of recording clinical data, reporting, CDSS, analysis, etc. This work was funded by SNOMED International and involved team members from Thoughtworks, Beehyv, and Intellisoft Consulting.

In collaboration with CURE International, Thoughtworks has been working on adding in-patient department features in **Bahmni<sup>DPG</sup>** to record and manage patient data from admission to discharge—for example, drug chart (MAR), ward view, nurse dashboard, discharge summary, etc. All this work is being done in React/Carbon UI. This work is in progress and expected to be released in March 2024.

In 2023, **Bahmni<sup>DPG</sup>** cleared security certifications for a pilot deployment with the Government of Karnataka.

Thoughtworks also worked on anonymization features related to bulk export of patient data. This year, **Bahmni DPG** also added more FHIR support. Examples are the creation of a bulk export feature for patients which has FHIR NDJson bundles and supports anonymisation. The new Lab Lite feature in Bahmni Lite has been enhanced with FHIR code extensions. As part of Thoughtworks' work with SNOMED, they also added new Clinical Decision Support functionality that has been implemented over FHIR. And, Thoughtworks has done significant work on keeping their integration with India's Ayushman Bharat Digital Mission health network for episodes of care and various out patient department use-cases.

#### CREATING AN EASY-TO-USE BAHMNI LITE

**Bahmni DPG** is an easy-to-use, open-source, electronic medical record and hospital system. Bahmni Lite, an out-of-the-box version for smaller clinics was created in 2022 and work continues to enable multiple clinics to run from one instance, reducing hardware and operational overheads for users. Bahmni Lite is targeted towards clinics and small hospitals which don't need a heavy-weight HIMS, but are looking for an easy-to-use electronic medical record and billing software. Bahmni Lite contains **Bahmni DPG** electronic medical record (backend is **OpenMRS DPG**), Crater (billing and invoicing solution) and Metabase for Analytics—and is cloud ready for quick deployment. Bahmni Lite was released in June.

#### INTEGRATING OFFLINE DATA RECORDING

As part of a pilot with the Government of Karnataka, Thoughtworks built an offline app called Bahmni outreach



The Bangladesh Government has been an early adopter of Bahmni, implemented as a pilot in 2016 and rolled out to 50 facilities by 2018  
SOURCE / BAHMNI.ORG

Bahmni Lite, an out-of-the-box version of Bahmni, was created in 2022 to enable smaller clinics to run multiple clinics from one instance, reducing hardware and operational overheads

based on the Avni Project. This will allow capture of data remotely in non-internet locations by Community Health workers.

A solution based on Bahmni Lite has been piloted in five Health and Wellness Centers in the state of Karnataka since August.

## UN Office of the Secretary-General's Envoy on Technology

**OSET is dedicated to advancing the digital cooperation agenda of the UN, ensuring that technological advancements benefit all of humanity while mitigating associated risks.**

This year, OSET launched the Universal Safeguards for DPI Initiative and the OSPOs for Good conference, they also made significant contributions as a supporter of the 50-in-5 campaign and as a workshop host at the DPGA Annual Members' Meeting.

### LAUNCHING UNIVERSAL SAFEGUARDS FOR DPI

The Universal Safeguards for DPI initiative, represents a UN High-Impact endeavour aimed at adapting and evolving DPI for new contexts. This initiative is strategically positioned to mitigate potential risks of DPI to citizens while empowering governments to leverage its potential for achieving the SDGs.

### ORGANISING OSPOs FOR GOOD CONFERENCE

Focusing on adapting DPGs for new contexts, the Open Source Program Offices (OSPOs) for Good conference fostered collaboration between OSPOs globally. Organised by the OSET and the UN OICT, this conference facilitated the connection between the broader open-source movement and the DPG ecosystem. In the future, OSPOs for Good will involve a more concentrated collaboration between OSPOs in the Global South and Global North.

In 2024 OSET plans to deepen its engagement as part of 50-in-5, demonstrating a commitment to ongoing contributions and advancements within the DPGs for DPI landscape.



# LESSONS LEARNED

This year has been a journey of growth, adaptation, alignment, and maturity for the DPGA.

It's been inspiring to see members using and creating new tools, including the experiential centres and innovation sandboxes to ensure more adoption and long term support for DPGs. These platforms are becoming hubs for hands-on experience and learning, fostering a culture of tech enablement and exploration. Such reusable testing environments are critical tools for the effective utilisation of DPGs. They allow for experimentation and learning, providing a more nuanced understanding of DPGs in use, including their relevance for meeting particular contextual needs.

This increased emphasis on creating conditions for successful adoption of DPGs is complemented by conversations around maturity and scaling that unfolded this year in many fora, including CoPs, and the DPGA Annual Members' Meeting. It became clear that for DPGs to thrive long-term, these discussions are indispensable. They are not just a matter of logistical necessity, but a cornerstone for sustainable impact.

Resistance to change is a perennial challenge, and this year was no different. The introduction of new ideas and concepts often met with inertia. However, these experiences underscored the importance of effective communication and trust building. It's not just about introducing new technology, but also about preparing people for the transition, addressing their concerns, and guiding them through the process.

**The year taught us that clear, strategic communication is essential to the DPG ecosystem**, particularly when it comes to securing funding and maintaining stakeholder trust. This goes beyond messaging, to include engaging in meaningful dialogues, understanding community needs, and responding effectively in order to increase awareness and drive change.

**We're deeply inspired by the rapidly growing community of DPGA member countries** who are embedding open source and DPGs as pillars of their national digitalisation strategies and policies. This involved both the adoption and sharing of DPGs, as well as sharing of learnings and best practices between countries.

**For organisations expanding their international reach, a set of best practices emerged.** These included the importance of co-creating with local teams, ensuring solutions were relevant and sustainable, and keeping things simple. Alongside this, there was a focus on building capacity from the outset, ensuring ownership and empowerment of local stakeholders, and maintaining a user-centric approach. Awareness and trust in DPGs were also highlighted as ongoing challenges. This is critical as decision-makers need clear, reliable sources of information alongside real-world examples to build trust and make informed decisions.

**This year the DPGA and the broader DPGs community worked together to be more than the sum of our parts.** We are aligned in the belief that these open-source technologies can be a force for cooperation, local value creation, and trust we need in the world, and the lessons we learned this year make us stronger when we share them. These lessons learned are not just a reflection of the past, but a roadmap for the future, guiding the way towards more effective, impactful, and sustainable implementation of DPGs.

THE GOVERNMENT OF BANGLADESH BILL & MELINDA GATES FOUNDATION • NBOI  
DRAFT REPORT STATEMENT ON THE DIGITAL PUBLIC GOODS ECOSYSTEM 2023 SDG GOAL  
DATA • DIGITAL IMPACT ALLIANCE • VF FOUNDATION • NEKSTEP FOUNDATION  
IN THE GOVERNMENT OF ETHIOPIA • DANAGRICULTURE • ORGANIZATION  
FOUNDATION • REPUBLIC OF GERMANY FEDERAL MINISTRY FOR RECONSTRUCTION  
AND DEVELOPMENT • OPERATION GUATEMALA  
LAUNCH GLOBAL PULSE INDIA'S MINISTRY OF ELECTRONICS AND INFORMATION  
TECHNOLOGY • KYUNG-IL OFFICE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY  
• KOREA INSTITUTE FOR TECHNOLOGY AND SOCIETY INTER-AMERICAN DEVELOPMENT  
BANK INTERNATIONAL TELECOMMUNICATION UNION • INSPIRE THE GOVERNMENT  
OF MOLDOVA • VANUATU • NORWEGIAN AGENCY FOR DEVELOPMENT COOPERATION  
• MIDYAR NETWORK • PENKNOWLEDGE FOUNDATION • THE OPEN SOURCE INITIATIVE  
DIGITAL SQUARE AT PATH PUBLIC DIGITAL THE REPUBLIC OF ESTONIA  
NIA'S MINISTRY OF FOREIGN AFFAIRS THE ROCKEFELLER FOUNDATION • RWANDA'S  
MINISTRY • FICT AND INNOVATION • THE GOVERNMENT OF SIERRA LEONE •  
THE GOVERNMENT OF SRI LANKA • COUNTRY WORKS THE UGANDA MINISTRY  
• FICTANI NATIONAL COLLABORATIVE MOMENTUM GUIDANCE CENTER  
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