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DIGITAL PUBLIC GOODS

DRIVING THE DEVELOPMENT OF DIGITAL PUBLIC INFRASTRUCTURE IN THE CARIBBEAN

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ABOUT ECLAC/CDCC

The Economic Commission for Latin America and the Caribbean (ECLAC) is one of five regional commissions of the United Nations Economic and Social Council (ECOSOC). It was established in 1948 to support Latin American governments in the economic and social development of that region. Subsequently, in 1966, the Commission (ECLA, at that time) established the subregional headquarters for the Caribbean in Port of Spain to serve all countries of the insular Caribbean, as well as Belize, Guyana and Suriname, making it the largest United Nations body in the subregion.

At its sixteenth session in 1975, the Commission agreed to create the Caribbean Development and Cooperation Committee (CDCC) as a permanent subsidiary body, which would function within the ECLA structure to promote development cooperation among Caribbean countries. Secretariat services to the CDCC would be provided by the subregional headquarters for the Caribbean. Nine years later, the Commission's widened role was officially acknowledged when the Economic Commission for Latin America (ECLA) modified its title to the Economic Commission for Latin America and the Caribbean (ECLAC).

Key Areas of Activity

The ECLAC subregional headquarters for the Caribbean (ECLAC/CDCC secretariat) functions as a subregional think-tank and facilitates increased contact and cooperation among its membership. Complementing the ECLAC/CDCC work programme framework, are the broader directives issued by the United Nations General Assembly when in session, which constitute the Organisation's mandate. At present, the overarching articulation of this mandate is the Millenium Declaration, which outlines the Millenium Development Goals.

Towards meeting these objectives, the Secretariat conducts research; provides technical advice to governments, upon request; organizes intergovernmental and expert group meetings; helps to formulate and articulate a regional perspective within global forums; and introduces global concerns at the regional and subregional levels.

Areas of specialization include trade, statistics, social development, science and technology, and sustainable development, while actual operational activities extend to economic and development planning, demography, economic surveys, assessment of the socio-economic impacts of natural disasters, climate change, data collection and analysis, training, and assistance with the management of national economies.

The ECLAC subregional headquarters for the Caribbean also functions as the Secretariat for coordinating the implementation of the Programme of Action for the Sustainable Development of Small Island Developing States. The scope of ECLAC/CDCC activities is documented in the wide range of publications produced by the subregional headquarters in Port of Spain.

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DRIVING THE DEVELOPMENT OF DIGITAL PUBLIC INFRASTRUCTURE IN THE CARIBBEAN

Today, we stand at a critical inflection point. Notwithstanding the recent acceleration of digital transformation at all levels of society, particularly in response to the COVID-19 pandemic, the digital divide has become especially glaring, as the more vulnerable and underserved in society have been significantly excluded from the transition to the digital delivery models for education, commerce and public services. Much effort is required globally, regionally and locally to bridge the widening divide, to ensure that digital ecosystems are deployed towards inclusive and sustainable development..

It is this sense of urgency that prompted United Nations Secretary-General, António Guterres, in 2020, to convene a High-level Panel on Digital Cooperation, to advance proposals for strengthening collaboration in the digital space towards achieving the Sustainable Development Goals (SDGs). One of the key recommendations to emerge was the adoption and use of Digital Public Goods (DPGs) as a means of helping to close the gap in digital inequality, and the core platform upon which to build inclusive digital public infrastructure. This call has positioned DPGs as an increasingly important aspect of the dialogue about how to ensure that digital transformation delivers on development outcomes that will help to achieve the SDGs, in particular, for low- and middle-income countries.

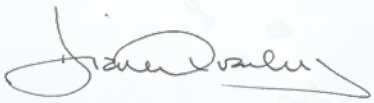
To this end, and in keeping with the United Nations Digital Public Goods Roundtable Workplan, an important first step is to establish a general understanding of digital public goods among policymakers and other key regional stakeholders, and articulate the role that DPGs can play in accelerating the pace at which inclusive digital public infrastructure can be established at a societal scale.

A primary and underlying feature of DPGs is that they are freely and openly available, with minimal restrictions on how they can be distributed, adapted and reused. In that regard, there is great diversity among the products and services which are categorized as DPGs. Some examples include Digital Identification Systems, which allow governments and organizations to implement digital ID systems; health information management systems used for data collection, management and analysis, as well as tracking apps which assist in rapid crisis response and management; and open-source software for offering financial services to the world's more than 2 billion underbanked and unbanked.

In this issue of FOCUS, we introduce digital public goods; discuss the role of DPGs as an element of digital transformation; and explore the work of the Caribbean Telecommunications Union (CTU) in promoting and advocating the principles of 21st Century Government throughout the Caribbean, and in particular, the adoption of an enabling national digital identity system and its beneficial effects on national development.

Finally, we present a roadmap to implementing digital public goods, which discusses the critical roles of governments, private sector, civil society, academia and international development agencies in a "whole of society" approach for successful deployment to advance sustainable development in the Caribbean.

Yours in Focus



Diane Quarless

WHAT ARE DIGITAL PUBLIC GOODS?

Lika Døhl Diouf*

In 2020, following a series of multi-stakeholder roundtables, the United Nations Secretary-General issued his recommendations in the Roadmap for Digital Cooperation in 2020. The Roadmap outlines eight key areas for action, including "Promoting digital public goods to create a more equitable world".

Digital public goods are defined as "Open source software, open data, open AI models, open standards and open content that adhere to privacy and other applicable international and domestic laws, standards and best practices, and do no harm".[2] The report of the High-level Panel on Digital Cooperation notes that many types of digital technologies and content could accelerate achievement of the SDGs. It also explains that technologies can be thought of as "digital public goods" when they are freely and openly available, with minimal restrictions on how they can be distributed, adapted and reused.[3]

The Digital Public Goods Alliance, a multi-stakeholder initiative welcomed in the Roadmap, aims to accelerate the attainment of the SDGs in low- and middle-income countries by facilitating the discovery, development, use of, and investment in digital public goods. The Alliance has developed the Digital Public Goods Standard, which elaborates on the definition of digital public goods provided in the Roadmap. According to the Standard, a digital public good must:

1. Be relevant to the Sustainable Development Goals.

2. Use an approved open license, for example a Creative Commons license for open content.

3. Clearly define and document ownership of everything the project produces.

4. Demonstrate platform independence.

5. Have documentation of the source code, use cases, and/or functional requirements.

6. Include a mechanism for extracting non-personally identifiable information, if it collects such information.

7. Comply with relevant privacy laws, and all applicable international and national laws.

8. Demonstrate adherence to standards, best practices, and/or principles.

9. Demonstrate that they have taken steps to ensure the project does no harm, and that it anticipates and prevents specific harmful scenarios.

The Digital Public Goods Registry currently contains over 600 entries,[3] of which 42 have been reviewed against this Standard and recognized as digital public goods. Some examples of recognized digital public goods include Apache Fineract,[4] an open source software for financial services; the KoBo Toolbox,[5] a suite of tools for data collection in challenging environments; Project AEDES,[6] a tool to predict potential dengue fever hotspots; the Global Digital Library,[7] an open collection of educational reading resources; and the Standard for Public Code,[8] which provides guidance to public organizations on how to successfully develop open source software that can be reused by others. Currently, there are no entries in the Registry for open AI models.

There is great diversity among the products that fall within the categories of open-source software, open standards and open content. For example, some types of software aim to tackle very specific challenges, whereas other serve as platforms upon which a host of other services can be built.

Platforms that provide basic or essential services that allow for other services to be built on top of it are often referred to as "digital public infrastructure". One example is MOSIP, a modular identity platform designed to allow governments and

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[1] Roadmap for Digital Cooperation, [online] [accessed 21 June 2021] https://www.un.org/en/content/digital-cooperation-roadmap/assets/pdf/Roadmap_for_Digital_Cooperation_EN.pdf p. 23 ["Roadmap"]

[2] UN Secretary General's High-level Panel on Digital Cooperation (2019), "The Age of Digital Interdependence" [online] [accessed 21 June 2021] https://www.un.org/en/pdfs/DigitalCooperation-report-for%20web.pdf, p. 11

[3] See: https://digitalpublicgoods.net/registry/

[4] See: https://fineract.apache.org/

[5] See: https://www.kobotoolbox.org/

[6] See: https://aedesproject.org/

[7] See: https://digitallibrary.io/

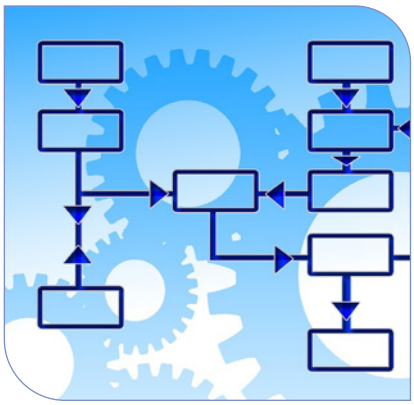
[8] See: https://standard.publiccode.net/

organizations to implement a digital ID system. By building on top of this platform, government agencies and private businesses can offer services to users, secure in the knowledge that each account relates back to one specific person. MOSIP has been recognized as a digital public good and assessed for its potential impact to drive financial inclusion.[9] In the health context, DHIS2 is a health information management system that is used for data collection, management and analysis.[10] DHIS2 is currently used by ministries of health in 73 countries, and has been used for COVID-19 surveillance since January 2020, when a COVID-19 tracking app was first developed in Sri Lanka.[11] Using DHIS2, the Sri Lankan team was able to develop this and deploy the tracking app in just two days, demonstrating the potential of digital public goods to assist in rapid crisis response and management.

The Roadmap on Digital Cooperation emphasizes that digital public goods are essential in unlocking the full potential of digital technologies and data to attain the Sustainable Development Goals, in particular for low- and middle-income countries. Outlining several challenges related to access to digital solutions, it further notes that a concerted global effort to create digital public goods would be key to achieving the Sustainable Development Goals.[12]

In some areas, efforts to create open digital solutions are already well underway. These solutions may or may not be defined as digital public goods, as the frameworks under which they were developed were largely developed prior to the adoption of the Roadmap and the definition it uses. For example, in the health context, the term "global goods" is often used, defined as "digital health software tools that are adaptable to different countries and contexts to help address key health system challenges."[13] The work to better understand the relationship between these terms,[14] and to align the definitions and processes for approval of global goods and digital public goods in the health context is underway.[15] Similar efforts may be required in other areas where open digital solutions that could contribute to the achievement of the SDGs have been developed. ■

[9] Digital Public Goods Alliance (2021), "Financial Inclusion DPGs: Digital Public Infrastructures", available at: https://drive.google.com/file/d/1e7nYeAnGwX0lFTCMKZcfK8To9Hr_R5f3/view?usp=sharing [retrieved 10 August 2021]
[10] See: https://dhis2.org/about/
[11] DHIS2, "Innovating DHIS2 Tracker and Apps for COVID-19 Surveillance in Sri Lanka", available at https://dhis2.org/sri-lanka-covid-surveillance/ [retrieved 10 August 2021]
[12] Roadmap, pp. 8-9
[13] Digital Square (2021), "Global Goods Guidebook", [online] [accessed 21 June 2021] https://static1.squarespace.com/static/59bc3457ccc5c5890fe7cacd/t/6061f423e9c30f0939b94873/1617032231588/Global+Goods+Guidebook+V2_update+29+Mar+2021.pdf p. 6
[14] Digital Public Goods Alliance et al. (2021), "Understanding the relationship between digital public goods and global goods in the context of digital health" [online] [accessed 21 June 2021] https://digitalpublicgoods.net/DPG-GlobalGoods.pdf
[15] Global Goods Guidebook, p. 7



DIGITAL PUBLIC GOODS AS AN ELEMENT OF DIGITAL TRANSFORMATION

Dale Alexander, Maurice McNaughton, and Suzana Russell*

This article discusses the relevance and importance of digital public goods (DPGs) as enablers of digital transformation. It examines the recent acceleration of digital transformation at all levels of society, particularly in response to the COVID-19 pandemic, and discusses how DPGs could become a key foundational element of the national digital public infrastructure that is needed to enable effective digital transformation, within the Caribbean context.

Governments of Latin America and the Caribbean have begun to recognize the pivotal role that digital transformation plays in national development. At its core, digital transformation refers to the use of digital technologies to change the way societies, governments, businesses and citizens operate. It is a process that aims to improve the performance of various societal entities by triggering significant changes to their capabilities through combinations of information, computing, communication and connectivity technologies (Vial, 2019). Particularly as a result of the COVID-19 pandemic, digital transformation is now an imperative. Governments, organizations and individuals are forced to find new ways of conducting social, economic and commercial activities online. However, one critical challenge has been that the deployment of closed digital systems typically carry high initial fixed costs, as compared with open digital systems, where the costs for their deployment are greatly reduced.

DIGITAL PUBLIC GOODS

Within that context, the urgent call of the United Nations Secretary-General for proposals on strengthening cooperation in the digital space among governments, the private sector, civil society, international organizations, academic institutions, the technical community and other relevant stakeholders, towards the achievement of the Sustainable Development Goals (SDGs), and the subsequent recommendation for the adoption and use of Digital Public Goods (DPGs) to help close the gap in digital inequality is instructive (United Nations, 2020).

The deliberate role of digital public goods in the digital transformation of countries, and the contribution of that transformation to the attainment of the SDGs indicates that DPGs and open solutions are gaining mainstream and critical prominence in all sectors of society. Ultimately, DPGs are being positioned as the core platform upon which to build inclusive digital public infrastructure (Sæbø, Nicholson, Nielsen & Sahay, 2021).

As defined by the Secretary-General, digital public goods are 'open-source software, open data, open AI models, open standards and open content, that adhere to privacy and other applicable laws and best practices that do no harm and help attain the SDGs' (United Nations, 2020, p. 30). This definition emphasizes the technology artifacts from which DPGs are developed and is useful for the specification and operationalization of standards and practical mechanisms for the design, development and sharing of DPGs.[1]

Further, it is also useful to consider DPGs from the perspective of their common characteristics and their foundational utility as building blocks of digital public infrastructure. Aside from the essential public goods characteristics, other key attributes of DPGs[2] include:

- **Open-Source**: the open nature of DPG artifacts (software, data and content), as explicit in the definition, make them amenable to adoption and adaptation to local contexts which can also help build long-term ownership and agency of implementing countries. Openness also lends itself to transparency and accountability and makes it easier for their code base or source design to be independently scrutinized and audited.

- **Interoperability**: the use of Open Standards helps DPGs to create interoperable and vendor-neutral building blocks that can be integrated with other components through openly specified protocols and interfaces to develop a country's foundational digital public infrastructure.

- **Scalability**: adopting DPGs that have been successfully implemented at scale elsewhere can save countries and institutions resources and enable lower risk experimentation, piloting, and roll-out.

The use of open solutions and the full consumption of digital public goods to advance digital transformation has, over the years, seen increasing adoption levels due to maturing product offerings, which are especially responsive to changing global dynamics.

An example from the public domain that illustrates these attributes is the Global Positioning System (GPS). Comprising a network of satellites in orbit, it enables hundreds of millions of users with GPS devices (including smartphones) to freely use this system (non-excludable) without interfering with each other (non-rivalrous), in order to accurately determine their location from any point of the Earth's surface. Digital mapping navigation systems are architected using this GPS digital public good and provide a key component of digital public infrastructure for travel, navigation and other location-based services.

The DBS Bank, the largest bank in Southeast Asia, by market capitalization, represents an example of how the private sector has been leveraging open solutions, which are viewed as pivotal to its data transformation journey. The Bank

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[1] The Digital Public Goods Alliance (DPGA), established in 2019, maintains the DPG Standard and a Registry of DPGs (https://digitalpublicgoods.net/registry/)

[2] See: https://digitalpublicgoods.net/digital-public-goods/

has both been tapping enterprise-grade open-source products, experimenting with open-source projects and algorithms in key aspects of its operations, as well as leveraging open-source technologies to support its data analytics initiatives. Moreover, DBS is participating in a number of open-source projects, with the intention of contributing software tooling, artificial intelligence models and projects focused on data.

Altogether, these features, characteristics and multi-sector use-cases, make DPGs an attractive and critical element in building the digital public infrastructure that is required to support digital transformation in developing economies. The important take away is that DPGs be viewed beyond open-source models, recognizing that it is the standards, rather than the platforms, that determine whether a platform is a public good.

DIGITAL PUBLIC GOODS AS THE BUILDING BLOCKS FOR DIGITAL PUBLIC INFRASTRUCTURE

The COVID-19 pandemic has highlighted the importance and urgency of establishing digital public infrastructure (DPI) - digital mechanisms and processes that accomplish basic but widely useful functions at a societal scale - which has played a vital role in supporting life and livelihoods.

The most commonly cited examples of digital public infrastructure are digital identification, digital payments systems and health data exchanges, which have become critical enablers of the public health, social protection, and economic responses by governments, businesses, organizations, and individuals (O'Neil & Rasul, 2021). While DPI can be thought of in the same way as conventional public infrastructure, such as roads, telecom networks, and currency, and are typically applications or platforms which offer a specific, ready-to-use service, digital public goods (DPGs) are being positioned as the foundational components – standards, specifications, protocols, models and software code – upon which to build these digital services or solutions.

WHAT ARE THE IMPLICATIONS?

While connectivity, for example, represents the first step to facilitating access to the digital commons, inclusive deployment of digital public goods necessitates that the diversity of the public who will be using the services, along with their capabilities and needs, must be taken into consideration from the outset.

An integrated approach to information and communications technologies is needed, with digital public goods as an element of the strategy that can foster whole-of-government and regionally coordinated approaches.

The conventional approach to creating the public ICT infrastructure that enables digital transformation includes outdated government procurement processes which create specific solutions to specific problems that work in specific contexts only. This approach fosters redundancies and complexities that are difficult to scale (Mukherjee & Maruwada, 2021). DPGs, however, provide an alternative approach, known as "digital building blocks" which operate at scale and be customized for multiple cases and contexts, while offering both economies of scale and scope. DPGs are therefore considered to play an essential role in unlocking the full potential of digital technologies and data, by accelerating the pace at which inclusive digital public infrastructure can be established at a societal scale.

Ultimately, it is therefore critical that digital public goods be designed for inclusion and deployed in an inclusive manner.

AN INTEGRATED APPROACH TO INCLUSIVE DIGITAL TRANSFORMATION IN THE CARIBBEAN

In keeping with the Secretary-General's Roadmap for Digital Cooperation (United Nations, 2020), an integrated approach to building an inclusive Digital Economy and Society should adopt regionally coordinated approaches that must incorporate the following components:

- Connectivity and Affordability of access and equipment: Digital transformation can only be fully realized if high quality access to communication networks and services is made available at affordable prices for all people and firms notwithstanding who they are or where they live (OECD, 2019). Significant disparities remain within the Caribbean. In a recent study conducted by CAPRI (CAPRI, 2021) of the 442 households who were surveyed across 4 countries, 44 per cent of the Jamaican respondents had no access to the Internet, 14 per cent for Trinidad and Tobago, 5 per cent for Antigua and Barbuda and 2 per cent for Barbados. The coordinated implementation of national and regional robust broadband infrastructure, as advocated in the Roadmap for a CARICOM Single ICT Space (CTU, 2017), remains a critical enabler.

- Digital Public Goods: By enabling developing countries to freely access state-of-the-art and adaptable core technologies;[3] drive their own digital transformation processes; and grow their local ecosystems to derive value, DPGs are seen as one of the most powerful ways for Latin-America and the Caribbean (LAC) to leapfrog into the future through accelerated and inclusive digital transformation. There has been some reference to DPGs in the Caribbean as some regional bodies have begun to integrate them into their policy agendas. For example, the Pan American Health Organization (PAHO, 2021) highlights DPGs as one of the eight guiding principles for digital transformation of the health sectors of countries in the region. Similarly, the Organization of Eastern Caribbean States (OECS), in collaboration with UNICEF and the International Telecommunications Union, is actively engaged in promoting DPGs as a major part of the digital transformation strategy of its member states with much of this effort focused on DPGs for use in education (UNICEF, 2020).

- Digital Capacity - literacy, numeracy and digital skills: For digital transformation to be effective, citizens must have the relevant digital skills and literacy to adopt new technologies and participate fully in the digital economy and society (Ram, 2021). Achieving real and sustained progress in the various dimensions of digitalization requires greater coherence and coordination in digital capacity-building efforts across the region. In particular, there should be a deliberate focus on the underserved - vulnerable/ marginalized groups, including persons with disabilities, the elderly, illiterate and indigenous peoples.

▸ (continued on page 14)

[3] See: https://www.devex.com/news/opinion-the-time-is-now-for-digital-public-goods-99833

TRANSFORMATION IN THE CARIBBEAN: A PERSPECTIVE FROM THE CTU

Nigel Cassimire*

The CTU has been promoting throughout the region the principles of 21st Century Government which, being citizen-centric and seamless, clearly demonstrate the value, in particular, of countries adopting an enabling national digital identity system and its beneficial effects on national development. This is especially true for Caribbean countries, where the digitalization of services can advance economic recovery, increase competitiveness and efficiency, and enhance functional cooperation, entrepreneurialism, innovation and citizens' welfare.

In this regard, digital identity systems are one of the demonstrably effective use-cases of digital public infrastructure,[1] and are gaining significant traction in international fora. Entities such as the United Nations and the World Bank are now promoting the use of digital identity systems, globally. Several Caribbean countries have commenced or are currently in the process of initiating projects to implement digital identity systems. The OECS Digital Transformation Project which involves Dominica, Grenada, Saint Lucia and Saint Vincent and the Grenadines, as well as initiatives in other countries such as Jamaica, Barbados and Trinidad and Tobago are good examples. However significant strengthening of institutional capacity, robust governance structures and system integration will be required to support the provisioning of planned national digital identity systems, and mutual recognition of digital identities among Caribbean countries.

The fundamental step towards adopting an effective national digital identity system, as outlined in the CTU's Handbook for the Implementation of Digital Identification Systems in the Caribbean, is the development of a clear, functional framework that is relevant to the local and regional context. This is of the utmost importance, as it provides the structure around which the entire digital identity system is planned, designed, implemented, operated and improved. The Caribbean has suffered in the past from approaches to the adoption of technology that ultimately proved ineffective, having neglected to pay sufficient attention to the analysis of its local and regional context and the relevant frameworks that would effectively guide their implementation.

Assessment of the local context should include, among others, supporting legal and regulatory frameworks and the main demography to be served. This would identify issues that may arise from gaps in existing regulations and laws that can potentially impact the adoption of a digital identity system. Effective measures for amending applicable regulations and laws to address any such gaps must be instituted prior to officially pursuing and implementing digital identities, given that a number of jurisdictions have seen legal challenges to the constitutionality of mandatory ID systems.

Appropriate legal controls for security, data protection and privacy, as well as cyber security must also be in place. Robust legal and trust frameworks are important factors in providing the adequate levels of assurance for users, and to facilitate interoperability and harmonization of common cross-border systems.

Additionally, technical system design will need to consider a number of factors, including the number of citizens expected to use the digital identity system, how often they might do so, and the total number of services provided within the digital identity system. Success will depend very much on the correct assessment of these factors.

Equally important are national multistakeholder consultations and assessments to foster acceptance and adoption of the new models by end-users, as well as various government and private-sector institutions that would rely on the digital identity systems. It is recommended that governments consult with individual stakeholder groups to understand their particular experiences and challenges with the existing identity systems. This would inform appropriate re-engineering of the digitally-enabled systems and processes, as well as identify capacity-building needs of users and other stakeholders to be addressed during implementation in order to maximize adoption. A practical step towards understanding the current identity system landscape would be to take stock of the identity ecosystem and its stakeholders.

Once a government has thoroughly assessed the local context and decided on its role, it should take measures to ensure that the digital identity system will be comprehensively adopted. Several optional measures have been recommended in CTU's Handbook for the Implementation of Digital Identification Systems in the Caribbean, each having its specific peculiarities from both the citizens and service provider perspectives. The important factor for Caribbean governments, is to clearly and precisely define the role they will play in all aspects of adoption. Government should

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[1] O'Neil, K. & Rasul, N. (2021). "Co-Develop Digital Public Infrastructure for an Equitable Recovery". <https://www.rockefellerfoundation.org/wp-content/uploads/2021/08/Co-Develop-Digital-Public-Infrastructure-for-an-Equitable-Recovery-Full-Report.pdf>

assume the lead role, and should ensure the involvement of key stakeholders from the inception, in order to successfully drive the national digital identity programme.

It is also important for government to assess its own capacity and experience in the field of digital identity nationally, and to be willing to source specific expertise that can be leveraged regionally. This would provide significant insight into the national strategic goals for digital identity, and the preferred implementation approaches.

As regards infrastructure, Caribbean countries need to ensure that a widely accessible, resilient high-speed broadband Internet is in place to support an online identity solution. This will also facilitate cross-border electronic transactions as part of the digital economy. Digital ID systems can be interoperable without the need for harmonization into a common system through adopting minimum interoperability standards, legal and trust frameworks. This would provide for levels of assurance, set baseline rules and build confidence and acceptance in respective national digital identity systems.

The operational models selected for adoption directly influences the stakeholders and actors involved in the digital identity system. For this reason, governments need to carefully evaluate their options and pursue governance, architectural, technical and adoption models that suit the country-specific approaches or needs. Government may act in the dual role of the regulator and identity provider or simply be the regulator of a separate authorized identity provider. Regardless of the governance model adopted, checks and balances must be maintained over the organizations involved. Ultimately, a robust multi-layered institutional governance structure will be eventually needed as the digital identity environment matures.

The architectural model may follow different approaches, including a centralized system with a single identity provider that collects and manages all the information and data (recommended as the logical starting point for most Caribbean countries), a distributed system with multiple identity providers (may serve as the next evolution of identity providers in the Caribbean); or a system with intermediaries between identity provider(s) and the other elements that act with specific verification or control functions (may serve as an advanced country and regional model). The selected architectural model will determine how the digital identity system will be built and evolved and inform the options to be considered for the digital identity technology solution.

Finally, the economic aspects need to be considered. For any national digital identity system to be successful, realistic and sustainable goals need to be established and pursued. Governments therefore need to plan in advance how the system will be sustained, for instance, internally by generated revenues, or externally by government subsidies.

There is no single model for a national digital identity approach that is better than another and no one-size-fits-all solution, as each country has its own distinctive characteristics, needs and goals. The CTU's Handbook provides a summary of the main elements of sufficiently mature national digital identity systems, which represent an invaluable source of information that can be referenced by Caribbean Governments, to draw lessons-learned about different approaches adopted globally, but adapted for the Caribbean context. ■

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DEVELOPING DIGITAL PUBLIC GOODS: WHERE TO START? HOW TO ADVANCE?

Dale Alexander, Maurice McNaughton and Suzana Russell*

While governments have a pivotal role given the public infrastructure nature of Digital Public Goods (DPGs), effective and sustainable implementation requires a "whole of society" approach with clearly articulated roles for governments, private sector, civil society, academia and international agencies. Each of these actors have key and complementary roles which underscore the need for regional cooperation and collaborative approaches. Ultimately, there are several overarching principles that are recommended when contemplating the next steps towards framing a regional implementation roadmap.

It is increasingly evident that the development of a nation's citizens and their ability to participate in social, economic and political activities, is becoming more dependent on access to reliable technological systems, in particular, foundational systems referred to as digital public infrastructure that enable core functions at a societal scale, such as digital identification and digital payments (Behrends, Simons, Troy, & Gupta, 2021). While developed economies have been able to build out their core public digital infrastructure by contracting with private companies, developing economies are more cautious about private sector-led approaches using traditional procurement mechanisms that create specific solutions to specific problems which work in specific contexts only. Such approaches risk compromising data sovereignty, lead to technological dependency, and the inability to up-skill local capabilities.

An alternative approach, using digital public goods (DPGs), represents a compelling opportunity for enabling developing countries to freely access state-of-the-art, adaptable core technologies;[1] drive their own digital transformation agenda; and grow their local ICT ecosystems to derive sustainable value.

To that end, the Caribbean region, through the efforts of existing regional institutions has developed well-considered and articulated plans (CTU 2017 and ECLAC, 2020) for the deployment of digital public infrastructure that can advance the region's development agenda. However, while digital transformation has gained traction in various national and regional policy spaces, there is limited evidence that Caribbean policymakers are apprised of the important role of digital public goods. It is now critical that the region starts to leverage the complementary and collaborative roles of governments, private sector (businesses, startups and developers) and development actors (international development agencies, academia and civil society), to support and facilitate these 'digital building blocks' to create robust digital infrastructure that can help to solve regional problems.

COMPLEMENTARY AND COLLABORATIVE ROLES

Digital cooperation is a multi-stakeholder effort. In this framework, governments remain at the centre, with the involvement of the private sector, technology companies, civil society, international organizations, academic institutions, and other stake-holders as essential partners and co-actors (United Nations, 2020).

These tools can be aimed generally at data controllers and processors or data subjects or, alternatively, provide specific guidance for certain sectors or complex data protection issues.

In that regard, some of the key roles which these stakeholders can play in a "whole of society" approach to the development of digital public goods and associated digital public infrastructure include:

Governments / Regional Intergovernmental Bodies

Governments and regional bodies such as CARICOM need to be the conveners, central organizers and focal points for digital cooperation, coordinating the activities of civil society and the private sector, including the technology industry towards the public interest. They must also seek collaboration with international agencies and actively seek out funders. Governments should set the priorities for digital public infrastructure, the highway, on which other digitization solutions will run.

This substantive role in advancing the development of DPGs should consider and adopt the following actions:

- Common vision: Developing a common vision, political buy-in and coordination across the whole of government or even the whole of society (O'Neil & Rasul, 2021). The development of digital public goods should start with the aspirations, priorities and plans of the state and/or region. National and regional digital strategies that specify an approach to DPGs can help set overall vision, so long as they are specific, flexible, and realistic.

- Be clear about the desired outcomes: At the outset of any decision to consider any DPGs all stakeholders must be brought together in a deliberative process to consider the functional requirements.

- Think local: Before considering any open-source modules, the local context should be considered, including how such modules might be adapted.

- Citizens as designers: The input of

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[1] See: https://www.devex.com/news/opinion-the-time-is-now-for-digital-public-goods-99833

actual users (in many cases citizens) is integral in designing DPGs that are fit-for-purpose. Government systems will gain trust among citizens, the ultimate end-users, if processes are transparent.

- Allow for deliberation and experimentation: Because of their experimental nature, and because of their infrastructural role of providing essential, ongoing support in the lives of individual users, deliberative democratic governance should be integrated as deeply as possible at all stages of the design, deployment, and stewardship of DPGs.

- Human rights implications: Conduct rigorous impact evaluations of the human rights implications of implementing DPGs at a population scale and of the different alternatives for designing DPGs

Private sector

Private sector businesses/organizations, particularly in the technology community, need to play an active role in public-private partnerships to build digital infrastructure as part of the digital cooperation agenda. The following actions should be considered:

- Participate in capacity-building and collaborative experiments to support the evaluation and adaptation of open-source DPG infrastructure to Caribbean needs.

- In building digital infrastructure for the delivery of public services, private companies should be willing to relinquish exclusive rights over data collected and processed as part of their business, where such data is assessed to be of national importance (Gurumurthy, & Chami, 2019).

- Engage in entrepreneurial and innovation opportunities to reconfigure and build on top of DPG-enabled digital building blocks (Mukherjee, & Maruwada, 2021) to provide an expanded range of digital services to consumers and businesses.

International development agencies

International agencies, including UNICEF and UNDP, are actively working to enable, support and advance the creation of DPGs. The UNICEF Office of Innovation, a founding partner in the DPGA, actively endorses "Principles for Digital Development" including "Use Open Standards, Open Data, Open Source, and Open Innovation"[2] and is seeking to build an operational toolkit for governments on implementing, sustaining and scaling DPGs. The toolkit is intended to include guidance, best practices and frameworks for implementing products at country-level, specifically on issues including: the economic value, sustainability and security of DPGs; readiness for nationwide use of DPGs; and the perceived risks for governments related to adopting open-source technologies.

Academia and Civil Society

Academia and Civil Society organizations should be active participants in the ongoing dialogue regarding the conceptualization and design of digital public infrastructure using DPGs, as part of the external governance mechanisms to be established. Academia can also play an important role in the research and discovery of emerging best practice, use-cases and open-source digital repositories being developed in the global community that can be suitable candidates for adaptation and re-use in the Caribbean digital ecosystem.

FUNDING OPPORTUNITIES FOR DPGS

In addition to the need for strategic collaboration and cooperation among the stakeholders, financing DPGs represents a critical success factor in their deployment.

Major philanthropic and development agencies play an active role in directly funding technology development, by financially and otherwise supporting partnerships between nations and technology creators. As such, they are well positioned to exert influence at multiple stages of the DPG life cycle, particularly as DPGs are rolled out in developing economies (Behrends, Simons, Troy, & Gupta, 2021). Other funding considerations include:

- Stable funding for DPGs and support for the communities that build and maintain them should be an essential first step (O'Neil & Rasul, 2021). Funding bodies need to create or expand the pool of funds available for DPGs. This can be done through both revenue and grant models (United Nations, 2021).

- In the Caribbean, the OECS partnered with the International Telecommunications Union (ITU) and the United Nations Children's Fund (UNICEF)[3] to promote DPGs in member countries. Greater investment and better coordination are required for advancing DPGs in the region, and any funding for investing in DPGs should include capacity building for governments, technology partners and civil society.

- The UNICEF Innovation Fund provides early-stage funding and support to frontier technology. The fund provides up to $100,000 equity-free funding (seed investment) to open-source frontier tech solutions showing promising results.[4]

▸ (continued on page 12)

CORE PRINCIPLES

[2] See: https://digitalprinciples.org/principle/use-open-standards-open-data-open-source-and-open-innovation/
[3] See: https://www.unicef.org/easterncaribbean/press-releases/oecs-implement-school-connectivity-initiative-towards-digital-education-vision
[4] See: https://www.unicefinnovationfund.org/funding-support#support_areas

▸ (continued from page 11)

DEVELOPING DIGITAL PUBLIC GOODS: WHERE TO START? HOW TO ADVANCE? *(CONTINUED)*

Within this context, it is imperative that the regional approach to DPGs is guided by five (5) core principles to ensure that these efforts are coherent and appropriately leverage the current national, regional and global initiatives:

Principle #1: Don't reinvent the wheel! – It is important to identify common intersections with, and leverage existing regional initiatives such as the Roadmap for the CARICOM Single ICT Space (CTU, 2017) and the eLAC2022 Digital Agenda for Latin America and the Caribbean (ECLAC, 2020). Together they represent an important consensus of major regional stakeholders with respect to policy design, capacity-building and political dialogue on the challenges and opportunities that digital transformation creates for society and the economy of the region. There is no specific mention of DPGs, but the explicit support for open standards, common platforms as digital public infrastructure, and the advocacy towards harmonized governance mechanisms for digital transformation, lend themselves well to the design and deployment of DPG infrastructure with appropriate governance mechanisms.

Principle #2: Build on international efforts and resources – The Digital Public Goods Alliance has launched DPG Resources,[5] an emerging collection of resources to support projects to become digital public goods. A regional coalition of government, academia and private sector partners should be setup to research and harness these emerging collections of DPG resources, to support projects towards adaptation of digital public goods for common Caribbean priorities.

Principle #3: Build in external governance – Establish the mechanisms and processes to deliberately incorporate a wide range of regional stakeholders – civil society, political, economic, and legal actors - in the conceptualization and design of digital public infrastructure using DPGs

Principle #4: Harmonization of adaptive governance mechanisms – In keeping with the explicit commitments in the Roadmap for the CARICOM Single ICT Space (CTU, 2017) and the eLAC2022 Digital Agenda for Latin America and the Caribbean (Goal 31) (ECLAC, 2020), promote digital regulatory coherence at the regional level to respond to the key risks and human rights implications associated with the implementation of DPGs.

Principle #5 Value-adding private sector engagement and experimentation – Mobilize and actively engage a consortium of private sector actors including regional telecommunication operators (e.g., FLOW, Digicel), ICT providers (e.g., Fujitsu-ICL, IBM) and the Civic Tech community, to participate in capacity-building and experimentation to evaluate pieces of DPG infrastructure to understand their benefits, identify risks, and explore the most effective ways to adapt these to Caribbean realities.

Support for DPGs

By Sarah Watson, Communications Co-Lead, Digital Public Goods Alliance

DPGs represent an unprecedented opportunity to shake up digital power imbalances and change the relationship between countries and digital technologies. However, even those that are in wide demand and have proven their potential to address development needs sometimes struggle to attract the contributions and financing required not only to be maintained, but to evolve over time. Implementing digital public goods requires support and attention throughout the lifecycle of the technology from development, implementation, governance, maintenance, and oversight. To overcome this, there is a need for alignment on a common global approach to resource mobilization and coordination which will further unlock the potential of DPGs.

Coordinated and sustainable grant funding which is long-term and focused on the ongoing maintenance of digital solutions is crucial. This is a departure from funding exclusively focused on the development of new solutions and can ensure that fundraised dollars are used wisely while fostering collaboration across multiple donors. Efforts to redefine methods of collaboration, and support digital public goods, are already underway in the bilateral and philanthropic donor community. For example, The Rockefeller Foundation, in partnership with the Norwegian Ministry of Foreign Affairs and the Digital Public Goods Alliance, convened key government representatives and philanthropist leaders in August 2021 to highlight elements needed for stronger international cooperation to support digital public goods. These include looking at government policies and procurement practices to make sure they are conducive to open-source adoption, co-development models that ensure cross-sectoral collaboration with local academia and public and private institutions to ensure local lenses are applied when creating local customization, further financing strong DPGs, and silo-busting that disrupts the current approaches to development support.

CONCLUSION/NEXT STEPS

[5] See: https://resources.digitalpublicgoods.net/

Digital public goods represent a compelling opportunity for enabling the Caribbean to drive the development of digital public infrastructure.

As the countries of the region seek to accelerate progress towards achieving the SDGs, DPGs have a vital role to play, and there is a clear need for a coordinated approach, that is integrated with existing regional institutions and strategic plans across the entire digital development ecosystem. Ultimately, it is imperative that they embrace the roles and guiding principles to inform the kind of digital cooperation and multi-stakeholder effort, that is required to accelerate the pace at which inclusive digital public infrastructure can be established at a societal scale. ■

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▸ (continued from page 7)

DIGITAL PUBLIC GOODS AS AN ELEMENT OF DIGITAL TRANSFORMATION *(CONTINUED)*

CONCLUSION

While digital transformation has gained traction in some national and regional policy spaces, there is limited evidence that policymakers are apprised of the important role of Digital Public Goods.

It is now critical that the region starts to think in terms of 'digital building blocks' that can help governments, businesses, startups and developers create robust digital infrastructure that can help to solve regional problems. Regional governments need to acknowledge a pivotal role in deploying DPGs, which arguably is not dissimilar to the role it plays in the provision of public infrastructure like roads and highways.

As the countries of the region seek to accelerate progress towards achieving the SDGs, DPGs have a vital role to play, and it is clear that the Caribbean needs a coordinated approach, consistent with the CARICOM Single ICT Space (CTU, 2017), not only to focus and fund broadband infrastructure and digital literacy across the entire digital development ecosystem; DPGs should be included as an important element in these deliberations. Moreover, it is necessary that regional governments take ownership of this effort, and ensure that the deployment of DPGs as well as the supporting human rights and governance frameworks, are in place to enable the robust digital infrastructure that can accelerate the 'leave no one behind' agenda. ■

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