

# DEMOCRATIZING TECH – HOW DIGITAL PUBLIC GOODS



# CAN BENEFIT CITIZENS, GOVERNMENTS, AND BUSINESS

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**Digitizing government services and processes is crucial to delivering greater efficiency and increased economic competitiveness, bridging equality gaps, and meeting the changing needs of citizens. Yet many government solutions failed the stress test of the pandemic, wasting scarce resources and adding to suffering.**

This is accelerating the adoption of Digital Public Goods (DPGs) – open technology solutions and platforms that transform the delivery of services in areas as diverse as financial services, healthcare, digital identity, education, and climate action. DPGs reduce potential dependence on large, global tech giants, empowering countries to adopt digital infrastructure solutions that they control themselves.

The OECD defines Digital Public Goods as “types of open-source software, AI models, and standards that countries can use to operationalize their Digital Public Infrastructure (DPI), such as payment and data exchange systems.”

Over 80 countries have launched DPG GovTech initiatives since 2014, and while the majority of these are low- to middle-income countries, such as India and Singapore, they also include Estonia, France (Data Gouv), the UK (GDS), and the US (with the health insurance exchanges created through the Affordable Care Act).

As governments take a bigger role in the lives of their citizens, DPGs help create a more open, participatory, trustworthy, and inclusive social ecosystem, while contributing to meeting the UN’s Sustainable Development Goals, particularly around poverty and healthcare.

DPGs also provide enormous transformative opportunities, opening up new markets for organizations as suppliers and participants. This article focuses on the opportunities that DPGs bring for both governments and businesses.

## THE CHANGING FACE OF DIGITAL PUBLIC GOODS

Digital public infrastructure (DPIs) and DPGs have existed since 2001, with Estonia a European pioneer in developing and managing distributed data exchanges between public and private organizations. Other countries have adopted DPGs to enable contactless payments, manage citizen health, provide digital identity, and improve the distribution of benefits. Digital public infrastructure has become as vital to the 21st century as railways, roads, and bridges were in the 19th and 20th centuries.

Demonstrating the scale of DPIs, in January 2023 India carried out 8 billion digital payment transactions worth USD200 billion through its Unified Payments Interface DPG, which involved 300 million people and 50 million merchants.

### THREE FACTORS HAVE ACCELERATED INTEREST IN DPGS

#### 1. Pandemic disruption found existing solutions wanting

Many countries struggled with outdated legacy tech during the pandemic, resulting in inefficiencies in the delivery of public services. However, countries such as India, which had the entire technology stack ready, with DPGs covering digital payments, e-Health systems, national identity, and e-Know Your Customer (KYC) (Figure 1), were able to outperform those that relied on closed legacy systems.



FIGURE 1: THE INDIAN TECH STACK

## 2. A desire for digital sovereignty

When choosing core technology, vendor lock-in is a key concern for many governments, particularly if suppliers are global, rather than locally based. As solutions hold increasing volumes of sensitive data about citizens, data sovereignty is also moving to the top of government requirements. Countries need to know where information is stored, who has access to it, and how it is controlled. As DPGs are open, they can be adopted and adapted across countries – for example, Estonia’s X-Road data exchange platform has also been rolled out in Japan, Finland, Iceland, and the Faroe Islands.

## 3. Greater funding and international focus

The 2022 UN Future of Digital Co-operation saw greater focus and funding for DPGs from a wide range of NGOs. Major donors, including the Bill & Melinda Gates Foundation, UNICEF Ventures, USAID, and the Omidyar Network, committed around USD300 million in total to DPG/DPI initiatives during the 77th United Nations General Assembly in 2022.

### **Box 1: Digital Infrastructure for Verifiable Open Credentialing (DIVOC)**

During the COVID-19 pandemic, India wanted to protect its over 1.5 billion citizens through the fast rollout of mass vaccination programs. While last-mile logistics were in place, India needed a digital platform to manage vaccine distribution, and to issue secure and tamper-proof digital vaccination certificates at scale.

To overcome this challenge, it developed the Digital Infrastructure for Verifiable Open Credentialing (DIVOC). DIVOC is an open-source digital platform that issues WHO-compliant digital vaccine certificates at scale through phone, web, and even WhatsApp. It integrates with private healthcare wallets and is interoperable with international travel formats.

# UNDERSTANDING THE PUBLIC AND PRIVATE SECTOR BENEFITS OF DPGS

## BENEFITS FOR CITIZENS AND GOVERNMENTS

DPGs either replace proprietary technology solutions or digitize previously paper-based processes. For nations and their citizens, they:

- Improve the delivery of public services
- Enable digital inclusion and support the achievement of Sustainable Development Goals, even for those at the bottom of the pyramid
- Enhance transparency and accountability
- Increase efficiency by making processes faster, digital, and secure, as well as cutting fraud and eliminating paperwork
- Improve cybersecurity and data protection

The public benefits of DPGs are clear. For example, Estonia's digital signature-based e-ID system has resulted in savings of approximately 2 percent of GDP for the government. The IMF estimates that India saved USD34 billion (1.1 percent of GDP) between 2013 and March 2021 by reducing welfare payment fraud through its Aadhaar payment DPG.

### **Box 2: Improving health insurance coverage with a customer-first approach in the US**

Introduced in 2010, the Affordable Care Act (ACA), better known as Obamacare, aimed to provide affordable health insurance coverage for all Americans. One of its underlying principles is the creation of Healthcare Exchanges (marketplaces) at a state and federal level. These DPGs enable individuals to compare and buy insurance plans from ACA-compliant private players, as well as receive income-based government subsidies.

As well as the federal government-run HealthCare.gov exchange, which serves citizens in 33 states, 18 states run their own platforms. Overall, 16 million individuals have enrolled on exchanges, leading to a decrease in the annual uninsured rate from 17 percent in 2013 to 8 percent in 2022.

## BENEFITS FOR BUSINESSES

The benefits for the private sector can be less well-understood. DPGs help to drive innovation, increase efficiency, and improve customer satisfaction in four key ways:

### 1. By providing a level playing field for start-ups and SMEs

By making their platforms open and accessible to all, DPGs open up opportunities for all businesses. For example, India's Unified Payment Interface (UPI) enables everyone to make and accept digital financial transactions. This means even street vendors can accept digital transactions cost-effectively, without requiring sophisticated, expensive point-of-sale solutions.

### 2. By fostering innovation and entrepreneurship

Companies can leverage the technology stack/open-source framework created by DPGs to build their own innovative products on top more quickly and efficiently. For example, Walmart-owned PhonePe, Google, Amazon, WhatsApp, and Paytm are building platforms based on the Indian UPI framework.

### 3. By reducing operational costs and required investment

As DPGs are freely available open-source software and platforms, businesses can easily incorporate them into their products or services. This reduces technology costs, allowing businesses to focus

investment in other areas. Indian banks and telcos use DPGs such as Aadhaar-based digital ID and consent-dependent data exchange systems to perform new customer verification checks electronically. This has brought down the cost of verification from USD 6–9 per person to just 40 cents.

**COMPANIES CAN LEVERAGE THE TECHNOLOGY STACK/ OPEN-SOURCE FRAMEWORK CREATED BY DPGS TO BUILD THEIR OWN INNOVATIVE PRODUCTS ON TOP MORE QUICKLY AND EFFICIENTLY.**

### 4. By providing a more secure and trustworthy environment

DPGs provide secure digital infrastructure for businesses, enabling them to securely store and manage sensitive data, as well as comply with data privacy regulations and standards such as GDPR and ISO 27001. For example, Singapore's OpenAttestation, a DPG for document verification using blockchain, ensures the authenticity and integrity of digital documents, making legal compliance easier for businesses, particularly around trade finance.

# THE CHALLENGES TO DELIVERING A SUCCESSFUL DPG

Given their scale, potential complexity, and use of personal information, creating a DPG/DPI is not straightforward, as Figure 2 explains. Five main challenges must be overcome:

## FROM IDEA TO SCALE, SUCCESS STORY?

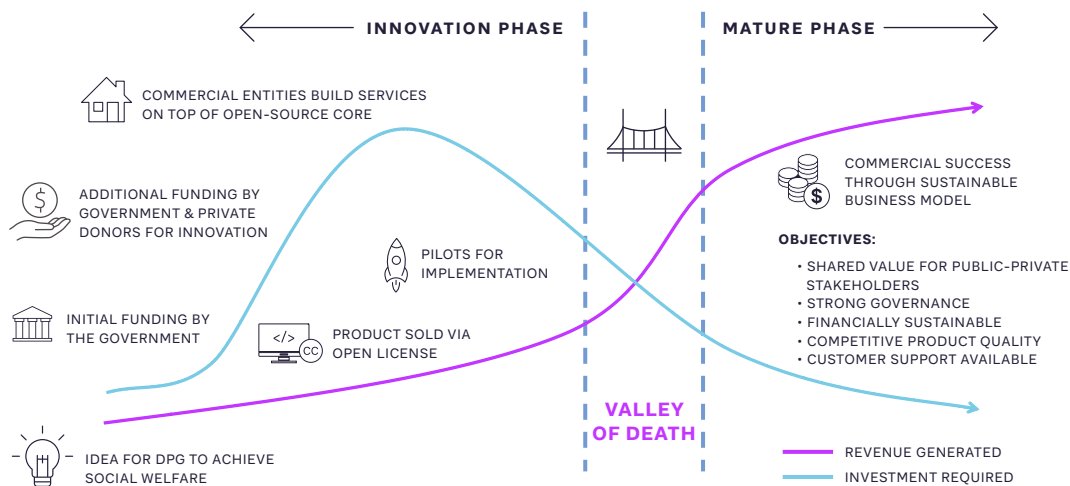


FIGURE 2: THE DPG JOURNEY

## 1. FINANCE

Developing and maintaining a DPG requires large upfront investment. Owners have to finance development and build a sustainable business model, independent of government budgetary support. Changes in government priorities, especially in the early phases of projects, can also have a negative effect on DPG development.

## 2. PRIVACY AND SECURITY

With the increasing use of technology to collect, store, and share personal data, governments must ensure that appropriate data privacy and security measures are in place. DPIs, especially national identity databases (such as e-ID in Estonia), contain sensitive biometric information that needs extra layers of security protection. APIs linked to this data must be carefully designed to prevent the misuse of sensitive personal information.

## 3. DIGITAL INCLUSION

DPGs require citizens to have a combination of internet access, digital literacy, and digital devices. Governments need to ensure basic internet infrastructure is in place across their entire population, as well as ensure that DPGs can be accessed at slow internet speeds

and without requiring any additional devices. Rwanda has rolled out infrastructure to provide 96 percent 4G coverage, while Tanzania has adapted digital health services so they work on its low-bandwidth 2G/3G networks.

#### 4. GOVERNANCE

DPGs are non-rivalrous resources managed by sovereign entities, making strong, transparent governance vital. Governments need to ensure that platforms are equitable, secure, effective, usable, and cost-effective. Owners need to balance the competing needs of different stakeholders with their finite capacity and resources to maximize benefits for all.

#### 5. TECHNOLOGY

DPGs and DPs are major technology projects. Even if they are based on existing open-source DPGs from other countries, these will need to be adapted and customized to the specific needs of the local population. Managing this scale and complexity is a major challenge that needs to be addressed through investment in resources and skills.

#### **Box 3: Ayushman Bharat Digital Mission (ABDM)**

Launched in September 2021, India's Ayushman Bharat Digital Mission (ABDM) aims to foster a digital health ecosystem in the country, leveraging open, interoperable, standards-based digital systems, and ensuring security, confidentiality, and privacy of health-related personal information.

It covers three areas, enabling:

- Interoperable health services via a Unified Health Interface (UHI), allowing consumers to access any participating healthcare provider
- Interoperable health data via Health Information Exchanges (such as personal health records, public health data, and anonymized datasets for machine learning)
- Interoperable health claims via Health Claim Exchanges, standardizing information interchange between payers and providers

Over the past 18 months, the ABDM program has significantly scaled up, creating over 400 million Health IDs and registering 200,000+ health facilities and 180,000+ healthcare professionals.



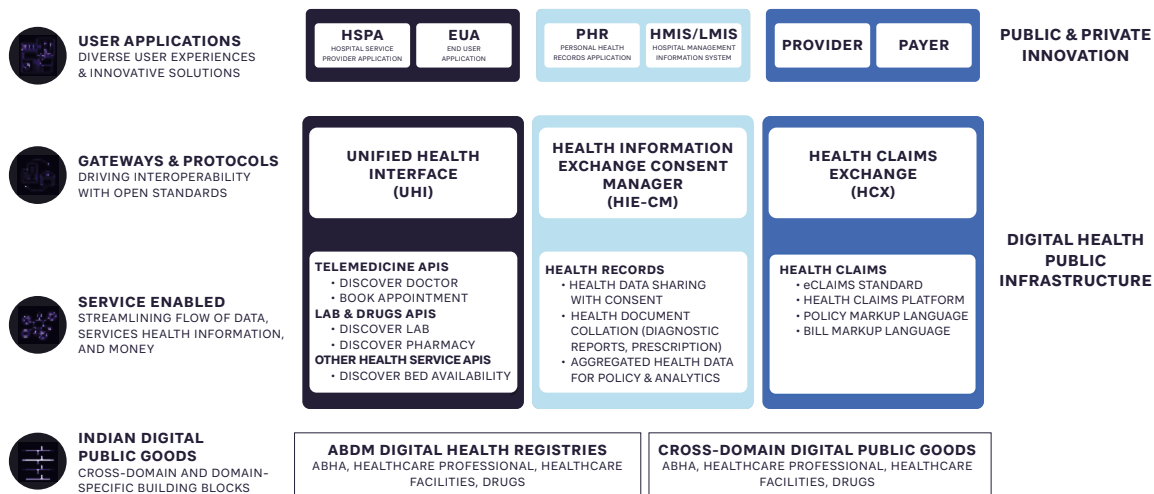


FIGURE 3: AYUSHMAN BHARAT DIGITAL MISSION STRUCTURE

## ACHIEVING SUCCESS FOR THE PUBLIC AND PRIVATE SECTOR

### GOVERNMENT

Based on global experience, governments need to focus on four key dimensions while building DPGs:

#### 1. Build it as an ecosystem

While governments fund the initial development of DPGs, they often lack the incentives to scale solutions. To overcome this, DPGs require a self-sustaining business model, delivered through the creation of an open marketplace or ecosystem. This provides the opportunity to drive scale and revenues. The India Stack (Figure 1) typifies this approach, working with private players to build a sustainable, financially viable solution.

#### 2. Scalable, interoperable infrastructure with minimal blocks

DPGs should be built using open-source and modular technologies, facilitating the exchange of information between the public and private sector, and be adaptable across countries. South Africa’s District Health Information Software 2 (DHIS2) is a prime example of this trend. Overseen by Norway’s University of Oslo, it is presently the largest global platform for health management information and has been adopted in 73 countries, accounting for 30 percent of the global population.

#### 3. Partner with private players

Private sector players can bring new ideas and technologies that can lead to better functionality and scaling of DPG initiatives. For example, the government of Singapore has partnered with players such as IBM and Microsoft to develop and implement blockchain-based solutions for document verification and supply chain

management. Private players helped design and implement the technology, while the government provided the necessary regulatory framework and support.

#### **4. Leverage global cooperation**

Digital public goods are available to be freely adopted and adapted by governments across the world. Instead of reinventing the wheel, governments should try to leverage existing DPG initiatives, enabling savings on resources and faster implementation. The mass rollout of the DIVOC system beyond India to Sri Lanka, Jamaica, Indonesia, and the Philippines demonstrates the strength of this approach.

## **PRIVATE SECTOR**

The rise of DPGs provides private sector organizations with opportunities to innovate and create new use cases in four key areas:

### **1. Enable new business opportunities**

Private players can grow their business and generate additional revenue streams, whatever their size. DPG initiatives often target underserved populations, providing an opportunity for the private sector to tap into new markets. For example, India's Open Network for Digital Commerce (ONDC) aims to create an interoperable network for digital commerce and includes participants such as Amazon and Flipkart (owned by Walmart).

***INSTEAD OF REINVENTING THE WHEEL, GOVERNMENTS SHOULD TRY TO LEVERAGE EXISTING DPG INITIATIVES, ENABLING SAVINGS ON RESOURCES AND FASTER IMPLEMENTATION.***

### **2. Leverage DPGs to improve customer choice and build trust**

DPGs transform industries and provide access to greater consumer choice, while creating deeper trust. Obamacare's Healthcare Exchanges have allowed private sector insurers

to offer competitive healthcare plans, while consumers have been empowered to make better buying decisions.

### **3. Improve business efficiency and reduce costs**

DPGs enable private sector players to improve business efficiency by streamlining operations and automating processes. For example, Estonia's X-Road allows for secure data exchange between government agencies and with private sector businesses. Businesses can submit regulatory documents online, reducing paperwork, improving transparency, and decreasing corruption risks.

### **4. Innovate**

Companies can build applications on top of DPIs/DPGs, which enables them to innovate cost-effectively. Google developed its Google Pay app running on India's UPI DPI, differentiating it by adding its own innovative features, such as rewarding customers for using the app to make payments. This has enabled Google to acquire new customers and create revenues from channels such as advertising.

## **INSIGHTS FOR THE EXECUTIVE**

### **FOR GOVERNMENTS**

- Understand that DPGs deliver benefits for all countries – they are not solely the province of low-/middle-income countries.
- Be ambitious and look at where DPGs and DPIs can transform efficiency, relationships with citizens, and overall effectiveness and create a bold vision for national adoption.
- Understand currently available DPGs and see if they can be adapted to particular needs.
- Create industry-wide specific roadmaps for DPG and DPI rollouts, and explore innovative institutional mechanisms to drive scale-up and adoption.

### **FOR CEOs**

- Build knowledge of current and planned DPGs in existing and potential markets – how can they create new opportunities?
- Understand and plan for any competitive threats from the adoption of DPGs.
- Partner with governments/DPGs where possible to maximize ecosystem benefits.
- Innovate around DPG ecosystems and use them to build new products, solutions, and revenues.

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