



Task Force 2:  
Our Common Digital Future: Affordable, Accessible  
and Inclusive Digital Public Infrastructure



# EXPLORING DIFFERENT FINANCING MODELS FOR DIGITAL PUBLIC INFRASTRUCTURE AND WHY THEY MATTER

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# Abstract



**D**espite the increasing instances of digital public infrastructure (DPI) deployment, there is little public information on how different DPIs are financed and practically no publicly available estimates on how much it costs to implement a DPI. Financing of DPIs is a complex issue involving decision-making on public policy objectives, operations, stakeholder management, and governance.

This policy brief proposes understanding the financing of DPIs using the strategic triangle framework that weaves together three key elements of any policy priority: (i) public value, (ii) operational feasibility, and (iii) support


or political feasibility. It is important for the G20 to build an understanding of different financing models and their context to help navigate implications on aid programmes, trade policy, and global governance frameworks. This brief proposes key considerations on financing of DPIs, which includes both capital and the operational costs of a DPI. Financing models are not only important to kick-off a DPI, but are integral to its sustainable use and successful realisation of objectives. Accordingly, this brief recommends that the G20 build knowhow on financing models for DPIs, focus on financing DPIs for low-income countries, and encourage the acceptance of different financing choices adopted by countries.



# **The Challenge**



# **1**




**D**igital public infrastructure (DPI) is a new conceptual model for services—such as identity, monetary transactions, credential management, and data exchange—that are essential to participating in society and markets in the digital era.<sup>1</sup> With the right governance and financing, DPIs can improve ‘know your customer’ provisions, facilitating access to private and public services, and improve access to banking and financial services. During the COVID-19 pandemic, countries with DPIs were able to deposit money directly into the bank accounts of target populations quickly, efficiently, and with reduced risk of leakage.<sup>2</sup> There is significant and growing interest by countries around the world in DPI. How its components are adopted and financed carries both risks and opportunities.

DPIs have two key conceptual elements. As infrastructure, they cut through the siloed approach of designing and implementing digital solutions with interoperable, society-scale programmes that shift innovation and competition to activities that take place atop it. For example, a single electrical grid, by standardising voltage and amperage, eliminates competition

around delivery of power, but creates vast competitive markets around items (like appliances) that use power. As public infrastructure, DPIs prioritise access and inclusion over profits, similar to how electricity and water are provisioned in much of the world.

Because DPIs are a combination of software, standards, and policy they can be replicated and adopted by countries more quickly than their physical infrastructure counterparts. For example, the Modular Open-Source Identity Platform, a digital public good<sup>3</sup> born out of Aadhaar, India’s homegrown digital identity programme (one of the world’s leading DPIs), is being implemented in several other countries, including Sri Lanka, Ethiopia, Morocco, the Philippines, Guinea, and Togo.<sup>4</sup>

Given the rapid spread of this new type of infrastructure, how DPIs are financed is quickly becoming a complex issue that encompasses questions of objectives, operations, stakeholder management, and governance. Importantly, financing does not relate only to the initial capital, but recurring costs related to maintenance and upgrading the system. The lifetime investment is much more critical



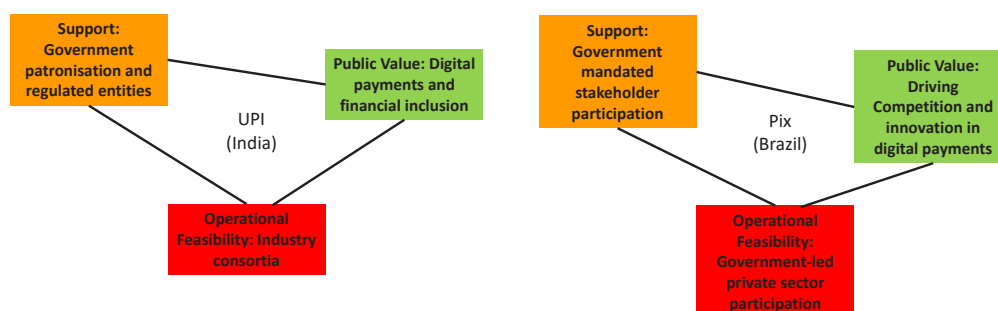
than funding required for setting up a DPI, made readily available by governments, multilateral organisations, and philanthropic institutions. Indeed, while there are important lessons that can be drawn from physical infrastructure projects, there may also be limits. Software does not always adhere to the principle of high upfront capital cost and (relatively) low ongoing operational expenses. Quite the opposite, ensuring ongoing interoperability, addressing cyber threats, and managing increased adoption and scale can cause operational costs to exceed capital costs.

### **A framework for financing of DPIs**

Financing DPIs can be explored through a conceptual framework based on the strategic triangle proposed by scholar Mark Moore for policy design and analysis.<sup>5</sup> The framework suggests three key components for any successful policy: (i) public value; (ii) operational feasibility including financial, legal, technical, and managerial; and (iii) support or political feasibility. Therefore, financing as a core component of operational feasibility

cannot be separated from public value or the primary objective of a DPI. Importantly, even similar DPIs need not necessarily be conceived for the same objectives or public value. For instance, two comparable digital payment DPIs, India's Unified Payment Interface (UPI) and Brazil's Pix, were conceptualised for two different primary objectives. For UPI, it was to accelerate the adoption of digital payments and address the problem of financial exclusion, while for Pix, it was to catalyse market competition and innovation in digital payments. Operationally, UPI is funded and supported by a consortium of banks, while Pix is funded and supported by Banco Central do Brasil (Brazil's central bank). While UPI is currently free of cost for all categories of users, Pix charges a transaction fee for merchant transactions. These are two distinct financing models that align with specific stated goals—one led by an industry consortium that enables private-sector participation to improve financial inclusion and the other mandated by the government to enhance market participation and competition using a transaction fee model (see Figure 1).

**Figure 1: Strategic Alignment for Digital Payment DPs**



Source: Adapted from Mark H. Moore.<sup>6</sup>

There is a third model of financing that is government-led for the initial capital as well as through the lifecycle of the DPI. For example, Aadhaar has been entirely funded by the government since its launch in 2009. ‘Government funding’ can include multilateral loans or bilateral aid. Many digital identity DPs that are driven by the core value of inclusive growth and improving public service delivery, both in terms of access and efficiency, fall within this category of funding. The digital identity DPs for Togo and Morocco have been funded by the World Bank, while India has extended financing support to Sri Lanka’s digital identity programme. Philanthropic organisations are also a source of funding. Muddying the waters are divergent sources of funds, many of which are non-sustainable.

True to the strategic alignment framework, objectives define financing choices (or, more concerning, finance

choices can redefine objectives), which in turn inform the governance framework that help build support and political will. Government financing will be much more focused on the goal of inclusion even if it involves a preliminary fiscal trade-off or market efficiency. The transaction-fee model, on the other hand, will focus much more on building the strength of markets. These alternate financing models need to be understood in the context of the objectives and the expected trade-offs. Financing models of all kinds require governing frameworks to guard against rent extraction, anti-competitive conduct, monopolisation, and consumer protection, very much like other interoperable networks. Appropriate regulatory oversight is necessary for models involving private sector participation and industry coalitions. For government programmes, regular impact assessments can create a feedback loop to strengthen the system.




# **The G20's Role**

# **2**







**A**t present, the dominant model for enabling digital infrastructure among mature economies centres wholly on private provisioning. The concept of DPI, which has been pioneered in emerging markets, represents a new model of service provisioning in the digital era that is guided by the overarching theme of inclusive growth. As discussed in the strategic alignment framework, the operational feasibility of DPis, including financing, are guided by a range of objectives. This has also led to a variety of funding sources and models that are best suited to meet the stated objective and align with the resource availability and institutional capacity at the local level. It is important for the G20 to build an understanding of different financing models and their context to help navigate implications on aid programmes, trade policy, and global governance frameworks.

**Global governance:** There are already examples of cross-border linking of DPis. For instance, Thailand's Prompt Pay is now linked to cross-border payments in six countries<sup>7</sup>, and the linking of India's UPI and Singapore's Pay Now.<sup>8</sup> Interoperability of digital

identities are also being considered, such as the European Union's Digital Identity Wallets and the African Union's Digital ID Framework, and bilateral agreements between Australia and Singapore, and Australia and the UK.<sup>9</sup> This will require coordination beyond the technical layers of the system to include legal frameworks for privacy and data sharing, financial sector regulation, and, most importantly, the models for cost-sharing between the governments and private sector entities in different countries.

**Trade policy:** With respect to trade policy, it is important to recognise what models of finance for DPis will be understood as legitimate state activity and what will be perceived as interventions into areas that impact trade and commerce among the G20 countries or violate existing international trade norms.

**Aid:** As more countries implement DPis, best practices around financing will serve as inputs that G20 aid agencies can use to design funding programmes that support the operational sustainability of a DPI and recipient countries' policy objectives.




## Key considerations for financing DPs

Despite the increasing instances of DPI deployment, publicly available estimates on the costs to implement a DPI for identities, payments, or data exchange are difficult to locate. According to stakeholder estimates, the average cost of a digital identity programme is understood to be about US\$1 per person.<sup>10</sup> Costs, however, vary depending on the size of the population, with countries with larger population benefiting from economies of scale that allow fixed costs to be distributed, lowering average cost. Critically, where funding estimates can be located, they often exclude operational aspects such as the cost of human resources, which can be significant. Cost differences can also arise between new programmes designed from the ground-up and those built atop the existing system. For instance, in some Latin American countries, some projects are building out only the authentication aspects for identities by leveraging existing civil registry systems, whereas in India, the Aadhaar project was a greenfield project.<sup>11</sup> This mirrors what is happening in many African countries, which are also likely to be greenfield. These nuances impact financing models.

The cost of DPs that enable digital payment is reportedly much lower. Many countries, including India, Brazil, and Thailand, built their interoperable digital payments system on existing instant payment infrastructure.<sup>12</sup> According to stakeholders interviewed, the capital cost of setting up Pix was only about US\$2 million, excluding the cost of several supporting operations. In contrast, Prompt Pay is estimated to have cost US\$100 million for creating an initial capacity of 200 transactions per second. The costs of upgrading and maintenance were not available.<sup>13</sup>

Any effort to document the cost of DPI financing should emphasise the lifetime costs as opposed of one-time capital costs. This will make it easier to understand the full costs and facilitate benchmarking between countries. Moreover, countries have different policy objectives for their DPs, which will result in different financing models and tolerances for costs. In addition, countries' goals for DPI may evolve and shift. Financing models will play a very important role in adapting DPs to new and changing objectives.

Finally, while driven by public values, financing models also have implications



on governance models and regulatory oversight that help build trust and support. Often, government-led financing of DPIs is not administratively independent, impacting budget allocations and performance. Similarly for private-sector or industry-led models, regulatory oversight is necessary to prevent vendor lock-ins, reduced competition, and harm to consumers. In the knowledge repository on financing models, related discussion on governance frameworks is important.

Accordingly, guidelines on DPI financing can consider:


- a. Applying the strategic framework to identify the most suitable source/s of financing. All DPIs need not be similarly financed or funded.
- b. Linking sources of finances and financing models of DPIs to governance frameworks and the role of government.
- c. Emphasising financing of both initial capital and operations and maintenance costs.
- d. Exploring possibilities of monetisation and financial viability of DPIs, where possible.



# **Recommendations to the G20**

# **3**





**F**inancing models are not only important to kick-off a DPI, but they are also integral to its sustainable use and successful realisation of objectives. Our recommendations to the G20 centre around the need for more information and transparency in the financing of DPIs and establishing its linkage with governance and good practices, both at the domestic and global level.

### **Building a repository, both on the quantum of finance and financing models for DPIs**


Developing a database on the quantum of financing required for different DPIs will help countries, especially low-income ones, plan better for the deployment of a DPI. The quantum of financing will also determine if this capital risk can be borne by the private sector or must be provided by the government. Along with the quantum of funding, information on types of financing models and the costs of different types of financing must also be collected and made available in a knowledge repository. This should also include examples for fee-based models, if any, and the possibility of DPIs becoming self-sustainable at scale. Countries can learn from existing deployments and adapt it to their local contexts.

### **Focusing on financing of DPIs for low-income countries**

Smaller and low-income countries may not be able to afford investments into a DPI. Assistance can be provided through a repository of financing models that provides a framework of capabilities and access to technological building blocks. Some countries will also need explicit financial support, as is currently being provided by multilateral institutions and philanthropic organisations. Many low-income countries also have smaller populations, making DPIs less viable. In the East Caribbean, the Southern Common Market (also known as Mercosur) and the South African Development Community, shared infrastructure models might be a better way forward to permit scaling and distribute costs. The financing of shared DPI deployment must also form a part of the repository.

### **Respecting country difference in financing models linked to their public objectives**

It is important for countries to recognise differences in the policy objectives and financing choices made by each country. DPIs may be private sector-led in one country, government-subsidised in another, and completely government-driven in a third. These choices are likely



to be driven by reasons of domestic resilience, and must be accepted and dealt with in global discussions and negotiations with a sense of equity. Bringing together examples of financing models along with the context within

which they have been deployed will create better understanding and acceptance for a variety of financing models, and prevent polarisation of preferences towards one extreme.

Attribution: David Eaves and Mansi Kedia, “Exploring Different Financing Models for Digital Public Infrastructure and Why They Matter,” *T20 Policy Brief*, June 2023.

## Endnotes

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