



UNLOCKING THE POTENTIAL OF DIGITAL PUBLIC INFRASTRUCTURE (DPI) IN LATIN AMERICA AND THE CARIBBEAN (LAC): A REGION- SPECIFIC PERSPECTIVE

A WORLD BANK-IADB
TECHNICAL NOTE



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ABOUT ID4D

The World Bank Group's Identification for Development (ID4D) Initiative harnesses global and cross-sectoral knowledge, World Bank financing instruments, and partnerships to help countries realize the transformational potential of identification (ID) systems, including civil registration (CR). The aim is to enable all people to exercise their rights and access better services and economic opportunities in line with the Sustainable Development Goals. This is especially important as countries transition to digital economies, digital governments, and digital societies, where inclusive and trusted means of verifying identity are essential to ensure accessibility and data protection.

ID4D operates across the World Bank Group with global practices and units working on digital development, social protection, health, financial inclusion, governance, gender, and data protection, among others. To ensure alignment with international good practices for maximizing development benefits and minimizing risks, ID4D is guided by the 10 Principles on Identification for Sustainable Development, which have been jointly developed and endorsed by the World Bank Group and over 30 global and regional organizations (see <http://idprinciples.org>).

ID4D makes this happen through its three pillars of work:

1. Thought leadership, research, and analytics to generate evidence and fill knowledge gaps
2. Global public goods and convening to develop and amplify good practices, foster collaboration across regional and global stakeholders, and support knowledge exchange
3. Country and regional action through financial and technical assistance to realize inclusive and trusted ID and CR systems

The work of ID4D is made possible through support from the Bill & Melinda Gates Foundation, the UK Government, The French Government, The Norwegian Agency for Development Cooperation (Norad), and the Omidyar Network.

To find out more about ID4D and access our other publications, visit www.id4d.worldbank.org.



EXECUTIVE SUMMARY

- 1. “Digital Public Infrastructure” (DPI) is a new term referring to the basic capabilities that are building blocks for developing digital services at a societal scale.** DPI constitutes an intermediate layer between the physical digital infrastructure of connectivity and storage solutions, and applications built on top of the DPI layer. The most common types of DPI are platforms and systems for digital identification, digital payments, and data sharing. This report was produced under a joint Memorandum of Understanding between the World Bank Group (WBG) and the Inter-American Development Bank (IDB) to drive stronger results for people in Latin America and the Caribbean supported by digital infrastructure and connectivity.
- 2. International understanding of what is and what is not DPI is still evolving; but the general understanding among LAC digital government agencies converges to current international norms.** International examples of the implementation of different types of DPI show benefits show greater efficiencies resulting in savings of cost and time for governments, businesses and citizens. The incremental benefits of full implementation of a “whole of DPI” approach across the categories have yet to be seen and measured, though there is reason to believe that they may be substantial.
- 3. The “public” aspect of DPI highlights their goal of advancing public welfare and inclusion.** While DPIs can be developed by either the public or private sector, they focus on achieving public policy objectives. These objectives often include promoting economic welfare and financial inclusion, ensuring equal, fair, and transparent access to all relevant users, and providing foundational and cross-cutting support for various economic and social interactions. This emphasis on serving public policy goals differentiates DPIs from other digital and financial infrastructures.
- 4. Although DPI is a relatively new term in Latin America and the Caribbean (LAC), many countries in the region have been actively building the foundations for some time.** Most senior officials in digital government agencies from across LAC who were surveyed for this report have already had some exposure to the term “DPI”, albeit recently. In larger and higher income LAC countries, there are already forms of DPI in existence in all the major categories of digital payments, digital identity (including forms of advanced electronic signature) and data sharing although they operate at different levels of functionality and usage.
 - Some LAC countries have implemented DPI solutions based on the use of open- source software recognized as digital public goods like X-Road for data exchange. LAC has sizable developer communities supporting these applications, although their usage in practice remains limited in most cases.
 - LAC has seen progress towards wider implementation of DPI building blocks in the case of social transfer payments. In this area, LAC countries have traditionally been leaders in innovating sectoral approaches; and in several countries, data is now exchanged across sectors to confirm eligibility.
 - Regional groupings of countries within LAC have also made progress towards enabling cross border authentication and recognizing digital signatures, which can support trade initiatives. These efforts are at an early stage, however, and require further political commitment and increased public awareness.
 - Open finance schemes as a form of DPI which enable authorized client data sharing in the financial sector are also at a nascent stage in most LAC countries. However, Brazil’s Open Finance scheme which started in 2021 already exceeds the breadth of usage levels of longer established schemes elsewhere in the world.

5. **While a majority of LAC countries already has a national digital strategy, as a new concept, DPI does not yet feature explicitly in these strategies.** However, newer digital government strategies reference the need for greater interoperability and enhanced data infrastructure, both key elements of DPI. A majority of people surveyed believe the DPI approach brings potential benefits through providing a unified lens through which to rationalize core digital systems.
6. **While much of LAC has both the connectivity foundations and at least some of the main DPI building blocks in place, DPIs are often not yet widely used.** However, there are significant emerging exceptions, such as the PIX payment system and the federal digital authentication scheme in Brazil. These examples show that rapid adoption is possible and can be self-reinforcing when core elements of DPI design are in place and well executed.
7. **Despite progress in some countries, the rollout of effective DPI schemes faces a range of challenges in LAC.** Most respondents cited the lack of capacity within government agencies to design and implement DPI as the biggest barrier. This lack represents a specific manifestation of the general shortages in most LAC countries of the range of digital skills needed for DPI. Constrained government budgets limit new hiring and the absence of competitive pay relative to the private sector reduces retention. Over time, DPI can help address these limitations by eliminating wasteful duplication of spend and by achieving scale, thereby reducing digital service

costs overall for both governments and citizens. However, to get to that point will require rationalized approaches to government procurement and budgeting. Other barriers cited include low citizen trust in using digital services, and uneven access to reliable and affordable digital connectivity.

8. **The report recommends the application of good practices for the building out DPI in LAC, including:**
 - a. Don't lose sight of building out the connectivity and data infrastructure layers which enable DPI
 - b. Review government procurement rules and budgeting approaches to ensure that they don't rule out DPI
 - c. Consider the use of open-source software where available and appropriate
 - d. Engage in knowledge sharing at regional and national levels
 - e. Identify and develop the capacities needed in government agencies to support DPI
 - f. Recognize a modular, reusable approach to digital infrastructure in digital government policies
 - g. Benchmark the "DPI-ness" of existing systems and assess how this can be advanced
 - h. Remember to harness private sector incentives and capacities to use DPI systems.

GLOSSARY AND ABBREVIATIONS

DPI	A set of shared digital systems that are interoperable, built on open standards and specifications and provide access to public and private services at societal scale (source: derived from G20 Declaration)	G20	An intergovernmental forum comprising 19 sovereign countries (including three from LAC—Mexico, Brazil and Argentina), the European Union (EU), and the African Union (AU)
DPG	Open-source software, open data, open artificial intelligence (AI) models, open standards and open content that adhere to privacy and other applicable laws and best practices, and help attain the SDGs (source: Digital Public Goods Alliance)	Govtech	Specific digital systems used by governments (solutions) to provide services to citizens, as well as “a whole of government approach to public sector modernization”
DE4LAC	Digital Economy for LAC: a World Bank Group (WBG) diagnostic approach for the digital economy applied to LAC countries	ID4D	Identification for Development, a WBG program
FICP	Financial Inclusion and Consumer Protection, a WBG survey of policies, laws, and supervisory approaches in jurisdictions around the world	IADB	Inter-American Development Bank
		LAC	Latin America and the Caribbean
		LMIC	Low and middle-income country
		RedGEALC	Inter-government network in LAC for agencies promoting digital transformation.
		WBG	World Bank Group



1 INTRODUCTION

Digital Public Infrastructure (DPI) first came to wider public attention at a [session on the future of digital cooperation during the UN General Assembly in 2022](#). During 2023, international interest in DPI grew during India's Presidency of the G20. Following discussions in various G20-related workstreams, DPI was explicitly mentioned in the resulting [New Delhi Leaders' Declaration](#). The Declaration hailed DPI as a significant evolutionary concept with the potential that: "... safe, secure, trusted, accountable and inclusive digital public infrastructure, respectful of human rights, personal data, privacy and intellectual property rights can foster resilience, and enable service delivery and innovation."¹

The World Bank defines DPI as foundational and re-usable digital platforms and building blocks—such as digital ID, digital payments, and data sharing—that underpin the development and delivery of trusted, digitally-enabled services across the public and private sectors. While DPI is not intended to replace sector-specific digital infrastructure, it eliminates the need for individual sectors and systems to "reinvent the wheel" each time for common functions. Although India has been one of the countries most closely associated with DPI to date, the small European nation of Estonia, at the opposite end of the population size spectrum, is also a recognized DPI leader. Estonia developed a key much-admired applied

component: its [X-Road](#) software for secure data exchange among government departments and citizens which has been deployed in Latin America and the Caribbean (LAC).

Although India and Estonia are the most often cited country examples of DPI in practice², digital public platforms are also emerging in LAC. This more general term was used in the 2023 World Bank Latin American and Caribbean (LAC) Review entitled [Wired: Digital Connectivity for Inclusion and Growth](#) to describe digital platforms that promote inclusion and growth through "delivering more and better services to individuals" and "supporting the efficiency, transparency and accountability" of the government.³ DPI can be considered a particular category of digital public platforms that provide foundational services across a range of sectoral public platforms, thereby scaffolding the potential of these platforms to provide developmental benefits for society.

Although a new term, DPI is therefore already present in many LAC nations in different forms, and with different levels of usage and outcomes. Definitions of DPI are not yet standardized though defining characteristics (see Box 1.1) are increasingly widely accepted. This report adds to the emerging understanding of how the term is understood and being used in the LAC region today and how it may be useful in promoting approaches to societal digital transformation.

1 Clause 56, pg. 22

2 This was also the case in the LAC survey when respondents were asked to name leading examples of DPI.

3 This language originates in the World Bank's Digital Economy for All Assessments which started in Africa but have been more recently completed also for several LAC countries (e.g., Colombia, Ecuador, El Salvador and Jamaica).

Box 1.1: Defining Characteristics of DPI

The term DPI can refer both to: (i) the particular instance of an operational digital platform with these characteristics and/or (ii) to an approach to building and designing digital platforms that embodies the following characteristics.

- *Problem-solving and purpose-driven*—DPI is not an end goal, but the means to an end to achieve interoperable services that work seamlessly within and across sectors.
- *Modular & minimalist*—it provides a discrete function needed for many types of transactions and interactions; makes digitally-enabled services within sectors feasible and efficient.
- *Interoperability & open design*—it is designed to be extensible and reusable across applications, sectors, and use cases and can be built on open standards; that is, the same plumbing can be used by all.
- *Complementary*—it still requires sector-specific digital infrastructure (for example, sector interoperability frameworks, standards, registries, management information systems, etc.) to build end-to-end digitally-enabled services.
- *Public benefit*—DPIs have been designed for public benefit to allow equal, nondiscriminatory access in accordance with specified governance rules.
- *Data privacy by design*—it is designed so as to comply with laws and best practice of handling personally identifiable information.
- *User-centric*—it is designed to enable inclusion, user choice and control, transparency, data privacy and consent.

STRUCTURE AND METHODOLOGY OF THIS REPORT

This report produced under a joint Memorandum of Understanding between the World Bank Group (WBG) and the Inter-American Development Bank (IADB) aims to help improve digital infrastructure and connectivity to drive stronger results for people living in LAC.⁴ Its objective is to highlight the state of the potential for DPI across the LAC region, including understanding policymaker's awareness and acceptance of DPI, and the maturity of DPI building blocks across the region. It aims to connect a long-standing discussion in LAC around effective digital transformation with emerging global DPI discourse, and at the same time the report explores specifically how, and where, DPI manifests in LAC and how it can be helpful in future.

The research tested two main hypotheses:

- DPI is already present in LAC even if the term itself is not yet in widespread use.
- DPI provides a useful focus to inform the next phase of digital development in LAC.

To test these hypotheses, the WBG-IADB research team distributed online surveys to policy makers and leaders especially in the agencies of government responsible for digital policy in LAC countries. Box 2.1 describes the sample coverage. Follow-up in-person interviews with a range of people active in digital government in LAC helped extend survey insights and further investigate interesting applications of DPI. In addition, this report draws on extensive WBG and IADB published and unpublished research on different types of DPI such as the World Bank initiatives on Identification for Development (ID4D), digitalizing government-to-person payments (G2Px) and Project [FASTT Payments Project](#).

The report is structured as follows: the next Section provides an overview of the emerging understanding of DPI, together with the general evidence of its benefits so far, to provide an introduction especially for readers less familiar with the topic. Section 3 sets the LAC context of connectivity and data storage, the foundations of the status and maturity of different types of DPI in LAC considered in Section 4. Section 5 extracts some particular themes of how DPI is already being applied in LAC, highlighting key characteristics in LAC. Finally, Section 6 lists some needs and challenges for DPI advancement in LAC.

4 <https://www.worldbank.org/en/news/press-release/2023/08/31/world-bank-and-idb-join-forces-to-maximize-development-impact>

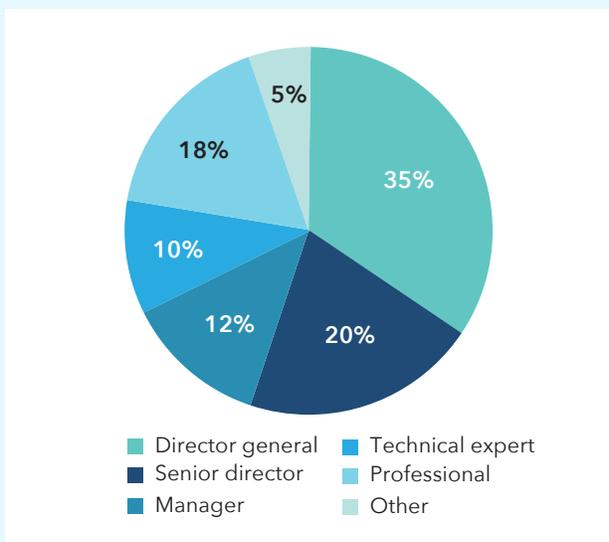
Box 2.1: DPI in LAC online survey

40 people from 18 LAC countries and one regional organization, the Organization of Eastern Caribbean States (OECS) (Figure 2.1) completed an online survey of their awareness, understanding and attitudes towards DPI. A total of 87 per cent of respondents were from government agencies, mainly from agencies or ministries promoting digital transformation. Figure 2.2 shows the type of respondents by role. Over half of respondents were directors general or senior directors of their agencies.

Figure 2.1: Number of respondents to survey



Figure 2.2: Profile of respondents



Methodology: An online survey was compiled in Spanish and English to test respondents' awareness and understanding of DPI and their attitudes towards its current and potential applications in their countries. Drawing from WBG and IADB contacts and from RedGEALC working groups, the research team compiled a list of 80 names and contacts of people who are currently working in national departments or agencies relevant to digital government, or who were recently in relevant roles or who were close to those roles. The aim was to get sufficient coverage of LAC countries, with multiple respondents in a number of countries as shown in Figure 2.1. During January and February 2024, each person was sent an email inviting a response to the online survey.

Based on interview responses and on the need to follow up on particular topics identified, the research team compiled a second list of people who were requested to have a remote meeting with members of the team. 18 meetings took place during February and March 2024 with people across the region



2 THE AI VALUE CHAIN

2.1 DEFINING DPI

Despite the focus and attention on DPI in the past two years, important questions remain about exactly what it is and is not. Various organizations around the globe have proposed recent definitions (summarized in Box 3.1). While there remain differences of emphasis, the main elements are converging: DPIs are the open interoperable digital systems that provide a foundation for the delivery of important digital services at large scale. But it is also clear that concepts like these—open, interoperable, important, and even large scale—are quite general and can be hard to apply in a specific case.⁵

DPI is a layer of systems on top of data infrastructure provided by cloud and data centers, which itself depends on connectivity. Figure 2.1 illustrates this widely accepted understanding of where DPI fits in the wider digital society.⁶ Above the DPI layer, sit a range of innovations and applications for sectoral solutions which draw on DPIs to provide services to a range of beneficiaries.

In LAC, 88 percent of survey respondents had already heard the term “DPI” but for a sizable minority this was only in 2023, emphasizing its newness to the region. Respondents to the Spanish speaking survey were more likely than the English survey to have heard the term recently. Most respondents self-assessed their level of familiarity with the term DPI to be in the middle of the scale from “very familiar” to “totally unfamiliar”, with a wide range on either side. When offered a choice of different definitions for DPI (drawn partly from the Box 2.1 list), most respondents opted for one close to the G20 definition above, with the Govstack definition the next most common choice.

Different types of DPI are widely recognized as core building blocks for a variety of services across sectors that involve transacting with individuals, making or receiving payments, and sharing trusted data (Figure 2.1). However, the term is not restricted to these categories alone. For one thing, it is possible to create more specific categories based on function—for example to separate the broad category of digital ID into two: (i) systems that support the online authentication of users (i.e., providing confidence that the person presenting an identity credential is the same person to which it was issued); and (ii) trust services which include e-signature and consent mechanisms. In its classification, the [Center for DPI](#), a think tank and technical assistance provider based in India, recognizes yet another category of DPI: discovery and transactions, which refers to the “capability to avail of any service or purchase any good across multiple apps in an interoperable manner” with specific reference to an e-commerce environment, such as the Open Network for Digital Commerce (ONDC)⁷ in India. Since DPI is an emergent concept, it must remain open to further evolution of categories over time. For this paper, however, we focus on the three core DPI categories described above: digital ID, digital payments, and data sharing. However, areas such as verifiable credentials built on decentralized identifiers that provide a digitally-signed, tamper-proof credentials that individuals or entities can present to verify their identity as well as digital wallets to store and manage credentials are beginning to be brought into the DPI fold.

DPI definitions remain blurred but DPI must aim to provide society-wide outreach and serve public purposes. Some blurring of definition is often useful to leave space for evolution with a new concept,⁸ but this risks framing DPI so broadly that it becomes meaningless. DPI cannot apply

5 Porteous et al “Understanding DPI”, *Next Billion* blog 1 October 2023 available [here](#). In 2024, specialized DPI technical assistance agency CoDevelop [announced](#) a research project which seeks to provide clearer definition and guidance to the “state of DPI”.

6 Drawn from the World Bank (2022) paper on Digital Stacks, a previous term for DPI.

7 See <https://ondc.org/>

8 David Porteous “Is DPI a useful category or a shiny new distraction?” 2023 available [here](#)

Box 3.1: Some Current Definitions of DPI

G20 New Delhi Leaders' Declaration (2023): "A set of digital building blocks which are interoperable, built on open standards and specifications providing access to public and private services at societal scale and are governed by enabling rules to drive innovation, inclusion, and competition in the digital economy."

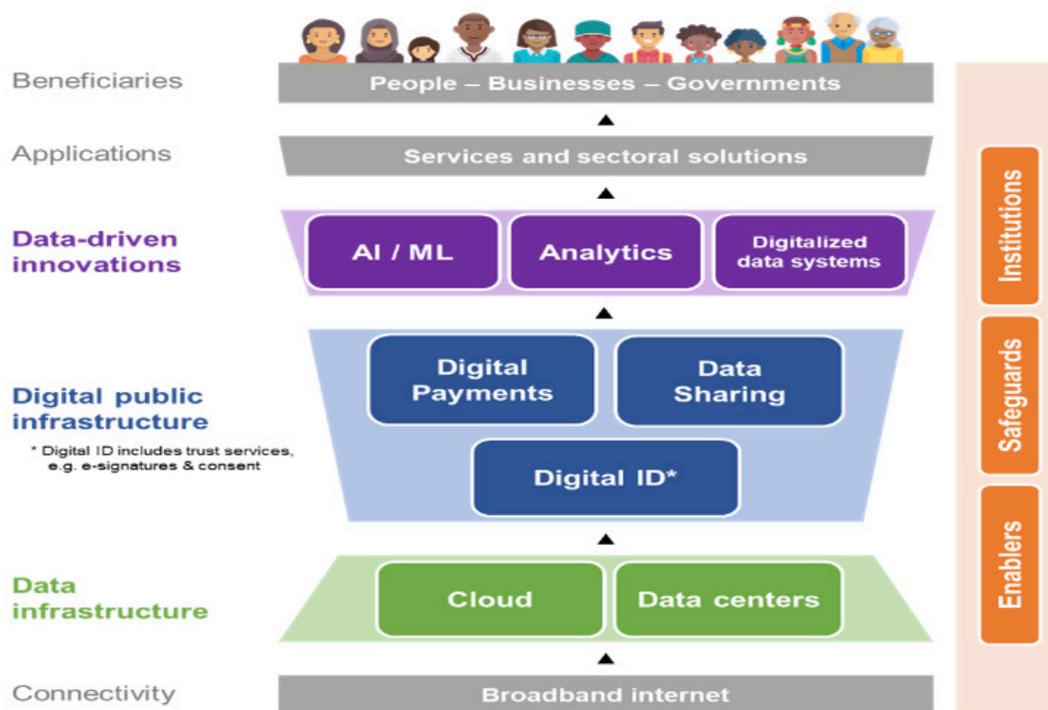
Govstack Community of Practice, a network of multilateral and bilateral government agencies: DPI are "...solutions and systems that enable the effective provision of essential society-wide functions and services in the public and private sectors."

OECD: Digital public infrastructure (DPI) refers to platforms such as identification (ID), payment and data exchange systems that help countries deliver vital services to their people.

UNDP: The DPI approach is about "shaping and ensuring good governance of digital building blocks to unleash an ecosystem of public and private actors that deliver digital services at the largest scale." in [The DPI Approach: A Playbook](#) (2023)

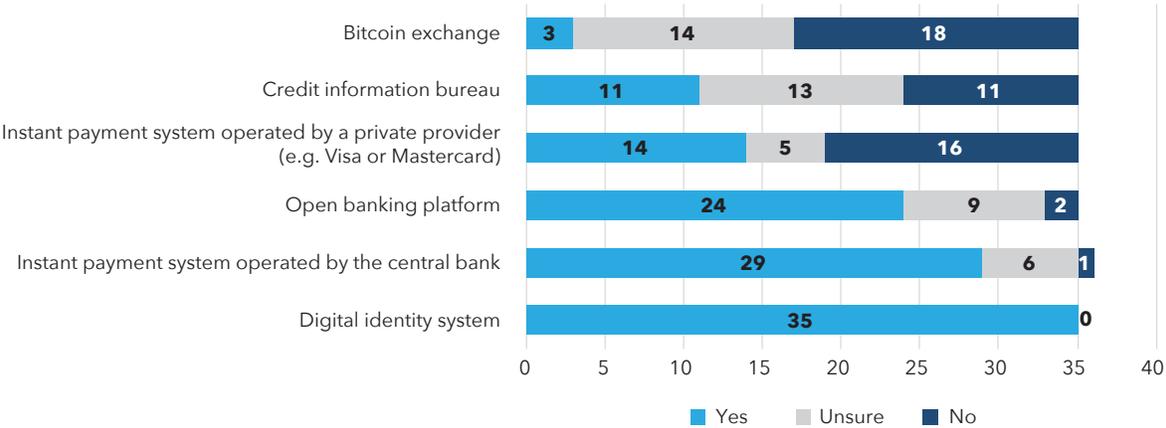
World Bank: "DPI is the foundational and re-usable digital platforms and building blocks—such as digital ID, digital payments and data sharing—that underpin the development and delivery of trusted, digitally-enabled services across public and private sectors."

Figure 2.1: Conceptualizing DPI



Source: [A Digital Stack for Transforming Service Delivery](#) (2022)

Figure 2.2: LAC respondent views on what qualifies as a DPI



Source: DPI in LAC survey (2024)

to any and all forms of digital infrastructure, platforms, or services. For example, almost all payment systems today are digital; and payment systems are considered a category of DPI; however, not all digital payment systems are DPIs. The authors of the 2023 GPF report on [Policy Recommendations for Advancing Financial Inclusion and Productivity Gains through DPI](#) wrestled with the distinction between (i) the types of payment system highlighted as DPIs and (ii) other financial infrastructure that was not. The differences, they concluded, lay in “the cross-sectoral nature and use of DPIs across a wide range of economic and social interactions, and their attributes of being designed for the digital context, being more widely accessible, and an emphasis on serving public policy objectives.” In other words, to be considered a DPI requires explicit broader reach in intent and usage and clear alignment with public purpose. However, these distinctions are more a matter of degree than category differences. Further points of distinction are the differences between DPI and “digital public goods” and between DPI and “GovTech” (discussed further in the Annex).

Although each LAC country defines its own DPI—including the specific functionalities and layers needed, and the architecture behind them—three systems are commonly accepted: digital payments, digital identity, and expressions of data sharing such as Open Finance. The LAC DPI survey probed for regional understanding of DPI, asking respondents

which of a given set of options they considered to be DPIs (Figure 2.2). Views were evenly divided about whether credit bureaus were also a form of DPI.

The survey also uncovers some difference of opinion as to whether the public sector must own or operate a DPI system, shown in equal responses about whether a privately operated payment system could qualify. All the main emerging international definitions are clear on this aspect: the mention of “public” in DPI does not restrict the mode of ownership to government owned systems, but rather refers to the public interest in and public oversight of the systems, regardless of who owns or operates them.⁹ The ‘P’ can also refer to the aspiration to achieve society-wide scale of operations, even though it may take time to reach that. Advancing public interest is a rather vague goal, however. David Eaves and colleagues (Eaves et al 2024) have observed that in practice, the ‘P’ is usually understood as expressing public values around the attributes and functions of DPI: for example, that it is interoperable and built on open standards (Box 1.1); or that it advances important economic and social goals like increased efficiency and inclusion. Eaves et al propose setting a higher bar for defining the ‘P’ which they call ‘public value maximization.’ In this approach, it is not only important that public value is created but that the process by which it is created follows the norms of common good.¹⁰

9 This usage is also consistent with the definition of digital public platforms in the LAC Wired Review: “[digital public platforms] may be developed for the public sector or as a public good—either by government agencies, in partnership with private companies, or through a hybrid model.”

10 See Eaves, Mazzucato and Vasconcellos (2024)

While the definitional discussion will continue to evolve, it seems clear that the emerging LAC understanding of DPI generally converges with that of the rest of the world. The concept seems increasingly clear at a conceptual level but still requires greater clarity and understanding when it comes to application in practice.

2.2 ADVANTAGES OF DPI

To appreciate the advantages of deploying DPI, it is helpful first to understand what changes. Figure 2.3 below contrasts the “before” situation with the “after” a DPI approach is fully deployed at a whole of society level. Before, a proliferation and duplication of proprietary systems provide siloed solutions for each needed service. After deployment, DPIs function as horizontal layers supporting a range of use cases rather than one sectoral solution only. This change brings efficiencies through economies of scale and enables greater effectiveness in the delivery of important digital services. The “whole of DPI” vision offers additional societal benefits beyond those created by implementing one DPI layer only. While it is yet to be fully realized anywhere, this wider vision should be borne in mind while building out incrementally the individual layers of DPI. However, there are still benefits to be had from incremental improvements in each of the layers.

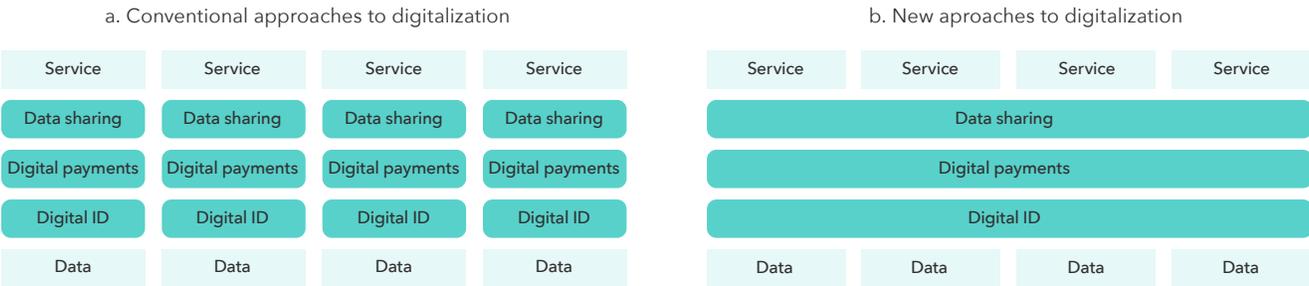
In practice, the advantages of DPI are often cited using examples from countries such as India or Estonia where deployment has gone furthest, even if DPI is not yet fully

applied or used even there. In India, for example DPI “has been used as a platform to foster innovation and competition; expand markets; close gaps in financial inclusion; boost government revenue collection; and improve public expenditure efficiency” (Alonso et al. 2023).¹¹ Similarly, the X-TEE (also known as X-Road) shared data infrastructure saves 2 percent of GDP each year¹² and an estimated 820 years of working time of Estonian citizens.¹³

In general, studies usually highlight findings from the use of particular DPI systems or from particular sectors such as financial. It is often not easy to separate out the effect of a digital infrastructure from the wider ecosystem in which it is operating, or from the processes of digitalization in general. The need for more research on these issues is recognized. However, the commonly recognized channels of DPI benefits are:

- Increased financial inclusion and access to essential services:** GPF (2023) has made the case for increased financial inclusion from the application of DPI in areas like payments, by making payments easier, faster, cheaper and more convenient. Open finance, which may be offered through a DPI-type structure, enables the secure sharing of information that can expand access to credit and other financial services like insurance and provide the right type of products for those that have access. In Niger, households where women received digital social assistance payments had 16 percent higher diet diversity than those who received cash benefits (Aker et al. 2016). In Mozambique, beneficiaries spent less than 30 minutes waiting for mobile money payments versus more

Figure 2.3: What is different about DPI?



Source: World Bank Digital Progress and Trends Report 2024

11 Alonso et al available here: <https://www.imf.org/en/Publications/WP/Issues/2023/03/31/Stacking-up-the-Benefits-Lessons-from-Indias-Digital-Journey-531692>

12 Case study 8 in OECD *Digital Opportunities for Better Agricultural Policies 2019* available here: <https://doi.org/10.1787/571a0812-en>

13 Heiko Vainsalu, “How do Estonians save annually 820 years of work without much effort?” 12 December 2017 available here: <https://e-estonia.com/how-save-annually-820-years-of-work/>

than one hour waiting for cash payments (World Bank, forthcoming). Similarly, digital authentication allows more people to prove who they are online, enabling them to access new public and private services. Cash transfers linked to digital identification in Pakistan increased women's reported control over cash.¹⁴ The Government of Türkiye was able to expedite the delivery of social benefits by using a common identifier and interoperable data bases, reducing the time to apply for social benefits from days to minutes, and the time to deliver benefits from months to days.¹⁵

- **Enhanced efficiency and reduced friction:** DPIs bring efficiency benefits at multiple levels. First, as a result of the use of appropriate DPIs, citizens and firms can access documents through one portal and reduce the need to file the same information multiple times. The implementation of the “once only” principle for the provision of documentation to the state has been clearly demonstrated in Estonia and has become a basic principle of DPI. India's eKYC system reduced the cost of compliance for financial providers in new account opening from US\$12 to 6 cents.¹⁶ Second, governments can reduce the cost of operating duplicated siloed systems by relying on reusable components. In Singapore, eKYC, facilitated by the Singpass consented data-sharing service, reduced the time to complete digital transactions by 80 percent (OECD 2022). In Zambia, financial service providers saved up to US\$50 to acquire each customer online using the Singpass digital ID (Cooper, Marskell, and Chan 2022).¹⁷
- **Accelerated innovation and disaster response:** Sharing infrastructure can support innovation in the design of new products and services in the public and private sectors. In India, private third-party application providers such as Google Pay and Amazon Pay offer services built on top of the Unified Payments Interface (UPI). There is evidence mounting in the UK and Brazil of how open finance schemes (which are examples of DPIs in the category of data exchange) enable new entrants and new products to be developed.¹⁸ This can enhance the competitive landscape and provide better products at better prices to

consumers. Analysis using data from 85 countries showed that, during the COVID-19 pandemic, countries that had elements of DPI in place (such as digital databases or ID records and data-sharing platforms) reached more than three times more beneficiaries than countries that had to collect new information (World Bank 2022b).

- **Greater transparency:** The wider provision of reliable and relevant information enables citizens to hold public bodies and agencies accountable; it also reduces the potential for corruption leading to leakage and waste.

Foundational DPI can also create benefits within social sectors like education. For example, India has seen how robust digital authentication can help monitor teacher presence and reduce fraud arising from salary payments to “ghost” teachers who fail to show up. Digital authentication can help to reduce exam fraud for online learning as well as. The ability to store and share the secure verifiable credential resulting from completing a training course provided by DigiLocker benefit both employees and employers during hiring, removing the need to send or verify paper credentials that can be easily faked or lost.

DPI benefits are likely to show up at the macroeconomic level, especially when a ‘whole of DPI’ approach is adopted. For now, these benefits can only be measured at certain layers. For example, McKinsey has argued that increased access to digital identification will unlock as much as 6 per cent more GDP in 2030 for emerging economies. Dalberg and the UNDP (2023) extrapolate the macro benefits of applying DPIs relative to a set of next-best technologies across 70 low and middle-income countries (LMICs). They estimate that applying DPI in the finance sector could accelerate economic growth in these countries by 33 per cent by 2030. In the justice sector, bringing efficiencies to current systems would significantly increase the number of people with access to the formal system. And in climate, DPI could mitigate CO2 emissions and accelerate emission control efforts by enabling “carbon offsets and trading, land mapping, and weather information and monitoring – founded on building and sharing open datasets and coordinating cross-border efforts.”

14 Clark et al “Using Biometrics to deliver cash payments to women: early results from impact assessment in Pakistan” ID4D Evidence Note 2022, available here: <http://documents.worldbank.org/curated/en/099155004142238180/P1763410d1e1af00108e170e5754d04fed9>.

15 World Bank 2023

16 Siddarth Dixit “India’s digital transformation could be a game changer for economic development” June 20, 2023 available here: <https://blogs.worldbank.org/en/developmenttalk/indias-digital-transformation-could-be-game-changer-economic-development>

17 OECD 2022 “Singapore’s National Digital Identity–Singpass.” Observatory of Public Sector Innovation (blog), November 16, 2022 cited in 2023 Digital Trends Report

18 A summary of the 2023 Open Banking (UK) Impact Report is available [here](https://www.openbanking.org.uk/2023-08-01-open-banking-uk-impact-report); this [CGAP Blog](https://www.cgap.org/en/publications/cgap-blog) in October 2023 summarizes research on the adoption and impact so far of Open Finance in Brazil.

Although most widely cited DPI examples come from outside LAC, most respondents in the LAC survey acknowledged that developing DPI was likely to produce benefits. In response to the statement, “I think that there are benefits to taking a

DPI approach”, their answers averaged 1.6 on a scale where 1 signaled full agreement and 5 complete disagreement. No one fully disagreed with this statement, and only a small

minority (12.5%) were unsure or leaning negative. There is little disagreement therefore about the potential advantages of DPI in LAC or elsewhere. However, the LAC region faces barriers to unlocking these benefits (addressed in Section 6).

DPI depends on underlying physical infrastructure providing digital connectivity and data hosting. The extent and functionality of this infrastructure will affect the nature, reach and spread of DPIs. Figure 2.1 depicted how DPI is built on



3 THE LAC CONTEXT FOR INFRASTRUCTURE SUPPORTING DPI

top of a connectivity layer and a data infrastructure layer. Connectivity is a prerequisite condition for wide-spread, far-reaching digital services of any kind, while data hosting infrastructure is an important enabler for services like DPI that require data computing and hosting.

LAC has many of the foundational elements in place for effective DPI though there is wide diversity across countries.

In both of key layers—connectivity and data infrastructure—the LAC region overall has a relatively strong position compared with other emerging and developing regions. But there remain unserved and underserved regions that need to be addressed, particularly in rural, low income, highly dispersed, sparsely inhabited areas, where commercial service providers cannot justify the investment. Universal connectivity requires five main elements:

- Backbone networks
- Backhaul networks
- Last mile networks
- User devices
- Affordability

Most plans, policies, projects, and regulations focus on the first three of these elements. However, to reach universal coverage, connectivity must also include the availability of end-user devices and the affordability of these and of the services themselves, particularly for the less privileged. For DPIs and end-to-end digital services to become universal within each country or region, the five main elements of connectivity must be universal.

3.1 BACKBONE NETWORKS

A backbone network connects the different regions within a country. These networks typically employ high-capacity fiber-optic cables to facilitate rapid exchange of digital information

over long distances. However, deploying backbone networks can be complex. Firstly, laying down fiber optic cables often involves significant investment and planning, especially when crossing diverse terrains such as urban areas, mountains, remote regions, or protected areas. Additionally, securing rights-of-way, obtaining permits, navigating regulatory frameworks, and traversing complicated geographies can pose challenges during deployment. Figure 3.1 below shows the presence of fiber optic networks in the world.

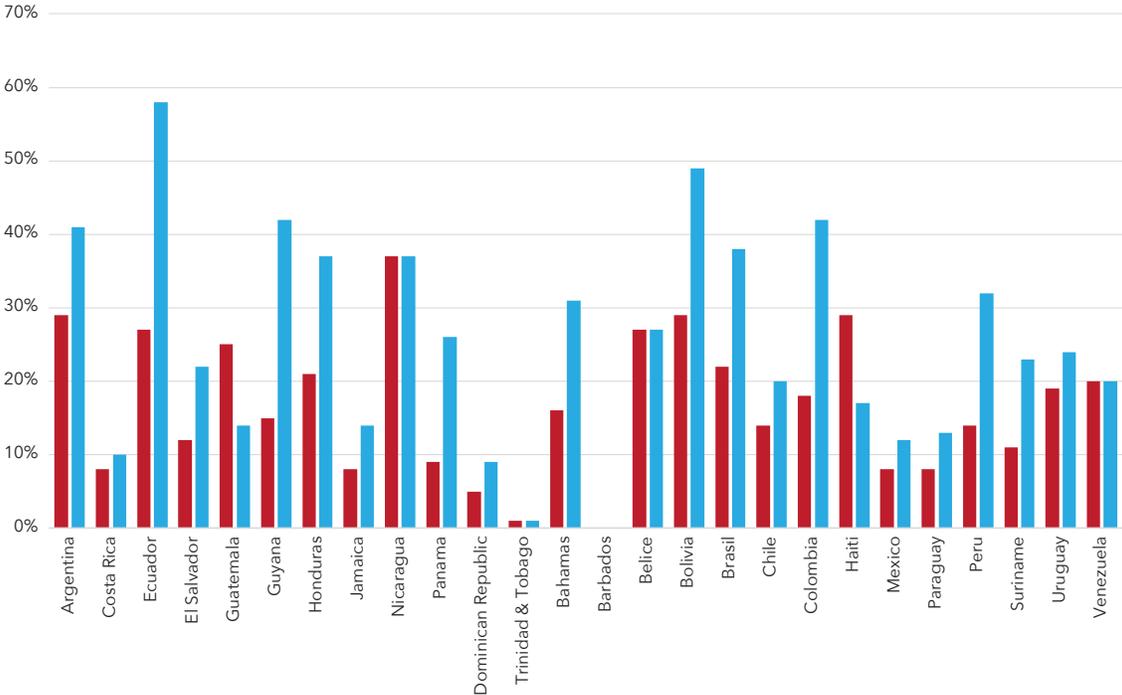
Figure 3.1 maps the large quantity of fiber cable infrastructure deployed in populated areas of LAC, showing its relatively strong position compared with other emerging and developing regions. However, parts of this infrastructure now need replacement and upgrading to avoid obsolescence and to accommodate growing needs. In addition, difficult LAC geographies (such as the Amazon Basin, the Andes and desert regions) have hindered deployment, leaving sparsely inhabited areas unserved or underserved. Figure 3.2 below identifies the percentage of households and public institutions such as schools or clinics located farther than 10 kilometers from a fiber backbone network. On average, 17% of LAC households (although as high as 37% in Nicaragua) and 25% of public institutions (58% in Ecuador) are located farther than 10 km from a fiber network, making the provision of broadband connectivity difficult, costly and unprofitable and thus uninteresting to commercial service providers. Public involvement and investment are required, either directly or through Public Private Partnerships (PPPs).

Figure 3.1: Fiber-optic networks worldwide



Source: <https://bbmaps.itu.int/bbmaps/>

Figure 3.2: Percentage of households and public institutions more than 10 km away from fiber backbone networks



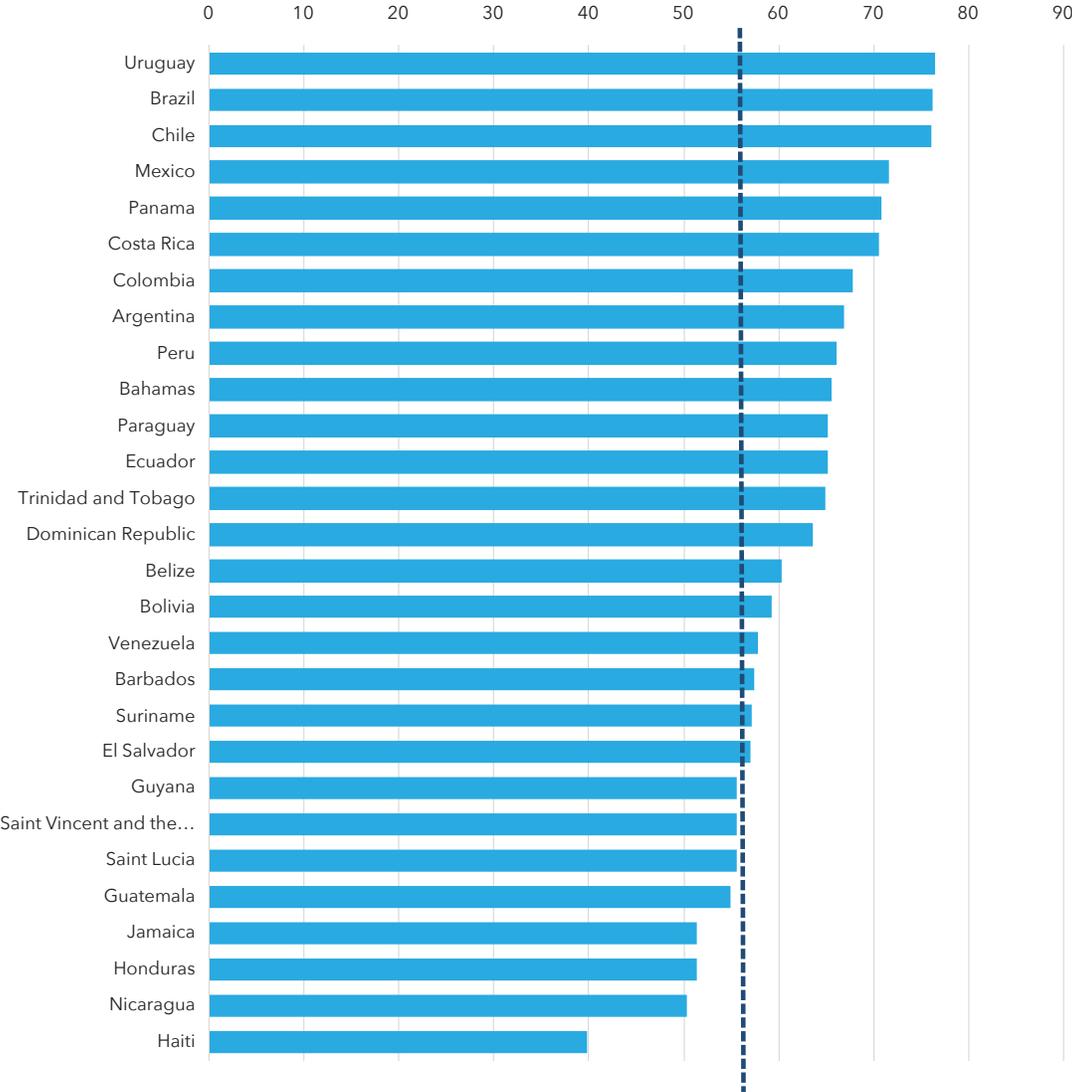
Source: Prepared by IDB
 Key: percentage of households (red) and public institutions (blue)

3.2 BACKHAUL AND LAST MILE NETWORKS

Mobile data is the dominant mode for last mile connection to data across the LAC region, as is the case in most regions around the world. Mobile data networks require backhaul networks that connect them to the fiber backbone network. The GSMA's Mobile Connectivity Index includes indicators measuring the state of infrastructure, affordability and consumer readiness in countries around the world. According to this Index, the LAC average is close to that of East Asia and

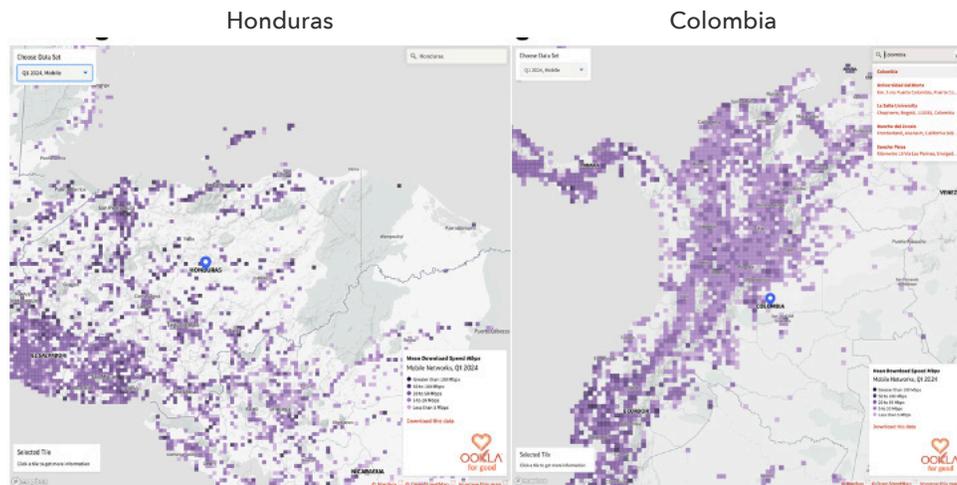
Pacific (EAP) (which includes China, Japan and South Korea), again reinforcing LAC's relatively strong position compared with other emerging and developing regions. However, there is great variation among LAC countries as shown in Figure 3.3 below. The great variation in mobile connectivity across LAC countries is even more apparent within countries. For example, Figure 3.4 compares mobile network coverage across Honduras with that across Colombia. However, even in countries like Colombia in the top ranks of connectivity in the region as shown in Figure 3.3, there is a shortage of backhaul and last mile infrastructure in rural, low income, topographically challenging and sparsely inhabited areas.

Figure 3.3: Mobile Connectivity Index for LAC countries 2022



Source: GSMA Mobile Connectivity Index 2022; LAC average=61.8; global average=55.45

Figure 3.4: Mobile network coverage in Honduras and Colombia



Source: <https://www.ookla.com/ookla-for-good/open-data#interactive-map>

3.3 AVAILABILITY AND AFFORDABILITY OF END-USER DEVICES AND SERVICES

Making end-user devices and broadband services available and affordable, particularly to the poor, is an integral part of connectivity. No purpose is served if broadband connectivity is available but unaffordable to the wider population. The Broadband Commission’s 2025 Advocacy Target 02 recommends that “By 2025, entry-level broadband services should be made affordable in low- and middle-income countries at less than 2 per cent of monthly Gross National Income (GNI) per capita”.¹⁹ Likewise, without affordable access devices, potential users cannot benefit from digital services. While smartphones are the most convenient way to access online services in general, access to DPIs can be designed to allow users to have feature phones or other indirect means of access which increase their inclusivity. In Bangladesh, for example,

digital centers operated by local entrepreneurs provide last mile access across the country to citizens unable to access government services directly.²⁰

But telecommunications services remain too expensive in LAC. To achieve universal connectivity and increase access to digital services and DPIs, greater affordability of both devices and internet access are vital. With LAC, the average basic fixed and mobile broadband subscriptions represent 18.7 per cent and 3.8 per cent of GNI per capita respectively²¹, much more costly than the recommended target. As an example, the National Survey on Availability and Use of Information Technologies in Homes (ENDUTIH) in Mexico shows that 32.5 per cent of respondents that are non-users of the internet lack the economic resources to purchase a device or to pay for internet service, or both.²² The situation is likely similar all across LAC.²³ Furthermore, even in those households with access to a device and to internet service, commonly only one child at a time could attend their on-line classes during the COVID pandemic because their parents could not afford additional devices.

19 <https://www.broadbandcommission.org/advocacy-targets/>

20 Recognizing the blend of digital and physical at these touchpoints, this has been dubbed “Phygital Public Infrastructure”—see the article by Anir Chowdhury: <https://govinsider.asia/intl-en/article/bangladeshs-phygital-public-infrastructure-bridges-dpi-theory-and-practice;>

21 <https://publications.iadb.org/publications/spanish/document/Informe-anual-del-Indice-de-Desarrollo-de-la-Banda-Ancha-brecha-digital-en-América-Latina-y-el-Caribe-IDBA-2021.pdf> (page 50)

22 <https://www.inegi.org.mx/programas/dutih/2022>

23 Other interesting results from ENDUTIH are that 17.5% are not interested or don’t need Internet, 17.0% don’t know how to use it and 17.8% are not allowed to use Internet, results that highlight another important issue: lack digital literacy and skills, an issue that is as important as the five elements of connectivity.

3.4 DATA STORAGE INFRASTRUCTURE

Like other digital services, DPIs require real time processing and storage of large quantities of data and exchanging the data among many different public and private entities. In addition, DPIs typically require high levels of information security because of the sensitive nature of data such as biometric, demographic, and financial being processed and of the essential nature of operations.

Data centers which can meet these requirements are therefore important enablers of DPIs. The data center infrastructure across LAC is now developing fast. LAC countries hosted 521 connected data centers in 2022, 10.5 per cent of the global total, which reflects a many fold increase from 2010 when LAC hosted only 0.5 per cent of the world's centers.²⁴

DPI operators have an increasing range of choices regarding their data hosting needs. Typically, today they own or lease their own dedicated data centers. While having control of facilities may appear to offer greater security, it also requires having specialized capacity to manage them. Another option is to co-locate dedicated servers in shared data center facilities managed by specialist firms. As their need for data storage and processing grows, DPI operators face further decisions. They may choose to build their own new data centers but this requires large initial investments and a lead time of several years to achieve full operational status. Using public cloud hosting services operated by national, regional or 'hyperscale' global companies offers another route to scale up capacity in a short time frame.

Using public cloud services raises additional considerations for public agencies especially. Paying ongoing fees for usage of these services rather than incurring the capital expenditure of building dedicated data centers can be attractive for cash flow reasons for private users. However, governments in some countries prioritize allocating funds for capital investment over current spending, making paying for public cloud services seem less attractive.

The location of data hosting and cross-border data flows raises legal issues and policy concerns in a number of LAC countries. While in some LAC countries like Colombia²⁵ government promotes the use of public cloud services, in other countries data privacy or data residency laws impose limitations or restrictions on the use of public cloud, especially if these services are hosted beyond the country's borders.²⁶ Addressing these concerns requires a clear approach to classify different types of data based on risk and sensitivity with proportionate location and transfer rules. Concerns about data security in the public cloud also constrain adoption for mission critical applications: 65 per cent of respondents to a recent survey of data center owners and operators said that this is why they do not host mission critical applications in the public cloud.²⁷

Another option for DPI data needs is a hybrid cloud solution. Hybrid cloud *"is a mixed computing environment where applications are run using a combination of computing, storage, and services in ... public clouds and private clouds, including on-premises data centers"*.²⁸ This approach overcomes the limitations of private data center while addressing the real and perceived risks of public cloud services. Enabling the growth and expansion of DPIs will likely require a full range of cloud storage solutions--private, hybrid and public.

24 Source: calculated for LAC countries based on data provided in the PeeringDB database <https://www.peeringdb.com/>

25 <https://www.mintic.gov.co/portal/inicio/Sala-de-prensa/Noticias/103896:Se-amplian-y-facilitan-las-opciones-para-que-entidades-del-Estado-se-suban-a-la-nube> - <https://www.colombiacompra.gov.co/tienda-virtual-del-estado-colombiano/tecnologia/servicios-de-nube-publica-iv>

26 Brasil: Lei Geral de Proteção de Dados (Lei N° 13.709/2018); Argentina: Ley 25.326 de Protección de Datos Personales; Mexico: Ley Federal de Protección de Datos Personales; Uruguay: Ley N° 18.331 de Protección de Datos Personales.

27 <https://uptimeinstitute.com/resources/research-and-reports/uptime-institute-global-data-center-survey-results-2023> The survey was conducted online from February 2023 to April 2023 and collected responses from more than 850 data center owners and operators, as well as nearly 700 vendors and consultants

28 <https://cloud.google.com/learn/what-is-hybrid-cloud>



4 MATURITY OF DPI ACROSS LAC

This section explores how far the DPI concept has taken hold in the LAC region.

4.1 HOW DPI FITS IN WITH CURRENT LAC GOVERNMENT PRIORITIES

DPI momentum in LAC is clearly accelerating. Although DPI is not yet reflected explicitly as such in national digital strategies, respondents from almost two-thirds of surveyed countries indicated that they already had government policies to encourage some forms of DPI, while another quarter indicated that such policies were expected soon. Respondents from the remaining countries indicated that while there were no such policies, there should be.

However, as a new concept, DPI is not yet reflected explicitly in stated digital priorities of LAC governments. These are typically set out in national digital strategies which most (24

of 33) LAC countries had in 2022. These strategies typically cover themes like connectivity, open data, and interoperability. Some countries have since refreshed their digital strategies such as Colombia in early 2024 and Brazil plans to do so during 2024. It is increasingly common for newer strategies also to prioritize greater data use for public services and innovation through promoting national data infrastructure, as is the case in Argentina, Brazil, Chile, Colombia, and Peru. Data exchange infrastructure is not only a major category of DPI, but it lies at the heart of the ability for different DPIs to be combined and to interoperate. Colombia's National Data Infrastructure Plan (PNID) (see Box 4.1) provides for the Presidential appointment of a National Data Coordinator, as well as for explicit monitoring and evaluation of progress under the plan.

The Network for Latin American Digital Government Agencies (RedGEALC) working groups demonstrate how national digital priorities relate to DPI. The RedGEALC was established in 2003 under the auspices of a secretariat housed at the Organization of American States and has been

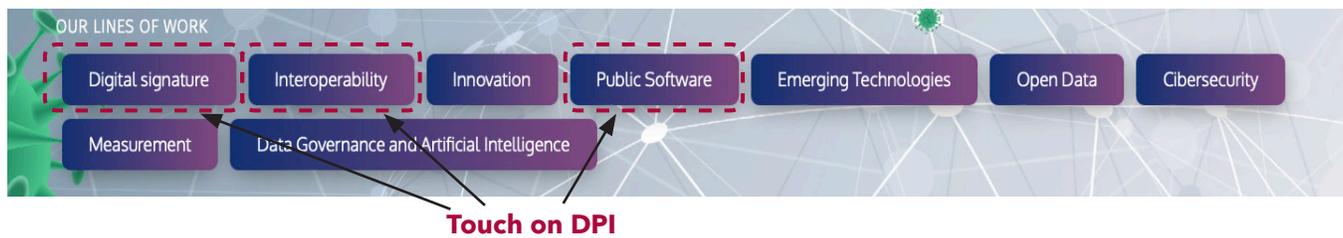
Box 4.1: Colombia's National Data Infrastructure Plan

The National Data Infrastructure Plan (PNID) is a national data strategy that defines the public data infrastructure and the actions necessary for its management, implementation and sustainability. The National Plan was developed by three national Government structures—the Ministry of Information and Communications Technologies, the National Planning Department and the Administrative Department of the Presidency of the Republic—and involves ongoing coordination between the private sector, academia and civil society.

A Presidential Decree (1389 of 2022) established a clear model for public data governance at three levels: (i) strategic (through Presidential appointment of a National Data Coordinator), (ii) tactical (with Chief Data Officers, technical groups and technical support); and (iii) operational.

A Presidential advisor with substantial private sector experience was appointed in 2023 as the first National Data Coordinator. The Coordinator's role is to monitor, encourage and guide implementation of the plan. In addition, a list of quantitative and qualitative indicators for monitoring implementation are made publicly available and updated through <https://infraestructuradatos.gov.co/798/w3-channel.html>.

Figure 4.1: RedGEALC working groups



Source: <https://www.redgealc.org/>

funded by the IADB, among other organizations. RedGEALC provides a capacity building and knowledge exchange platform for its member states. Much of the work of the network is undertaken through working groups in areas of shared interest that develop annual work plans. While DPI is not explicitly referenced yet, the DPI agenda touches as a cross-cutting theme in at least three of the current working groups—interoperability, digital signature (as a category of DPI) and public software which promotes digital public goods (DPGs) which may be building blocks in DPIs (see Annex for more on the relationship between DPGs and DPI).

In addition to this continental view, individual countries have signaled interest in DPI in different ways:

- The Digital Economy Working Group of the G20 under the Brazilian Presidency in 2024. Brazil has signaled its intent to focus especially on digital identity and data interoperability.²⁹
- LAC G20 members Brazil and Argentina have both cataloged certain of their systems as DPIs in the Global DPI Repository established under the Indian G20 presidency alongside other G20 DPI projects.
- From LAC, Guatemala and the Dominican Republic have so far signed on to the [50 in 5 DPI initiative](#) launched in late 2023 which commits signatories to launching DPI within five years. Other countries have signaled interest in signing.

4.2 CURRENT DPIS IN LAC

Section 2 made clear that the definitions of DPI do not yet provide complete clarity over when a particular digital system or platform is in fact a DPI. In many ways, it would be more helpful to assess candidate DPIs on a spectrum of characteristics of ‘DPIness’, rather than in a binary “is it or is

it not” fashion. Having a spectrum allows for evolution and change over time. However, the information base does not yet exist in LAC which allows for this to be done.

In the absence of a comprehensive accepted definition or definitive listing, existing approaches rely on self-identification.

In the [Global DPI Repository](#), for example, G20 countries are able to self-identify and list those systems which they believe qualify. In the LAC DPI survey, we asked respondents to self-identify whether DPIs existed in each of the categories provided in their countries. Although the survey question provided the definitions for each stated in the Box 4.2 below, respondents’ answers depend on their level of knowledge and understanding. Wherever possible, responses were probed in interviews. In addition, WBG ID4D assessments and WBG Digital Economy for LAC (DE4LAC) are available to provide external validation in some of these countries. Where this is

Box 4.2 Definitions provided in the LAC DPI survey as guidance to respondents

Payments: An operating payment scheme which is available 24/7, open to different categories of PSP, and enables instant transfers to any account holder

Digital ID: An operating ID scheme which enables any user in the country to authenticate their identity on-line across multiple applications.

Signature and consent (trust services): An operating Public Key Infrastructure (PKI) scheme which enables users to provide advanced digital signatures which are enforceable and equivalent.

Data exchange: An operating scheme which enables the secure sharing of data for re-use across multiple agencies or parties.

29 See Wilson Center blog, 24 February 2024, available [here](#)

Table 4.1: LAC DPI systems identified

Country	Payment	Digital ID		Data exchange
	Instant payments	Online authentication	Advanced digital signature#	
Argentina ^a		*		
Bolivia		*		
Brazil ^b		*		
Chile		*		
Colombia ^c		*		
Costa Rica				
Dominica		**		
Dominican Republic				
Ecuador		**		
El Salvador ^d				
Guatemala ^e		**		
Honduras ^f				
México		**		
OECS (Organization of Eastern Caribbean States) ^g				
Panamá		*		
Paraguay		*		
Peru ^h		*		
Saint Lucia		**		
St Vincent & Grenadines				
Trinidad and Tobago		*		
Uruguay		*		

KEY:

	Operational (self-asserted)		Operational (confirmed by follow up or 3rd party source cited where published)		No data
	Not yet but planned (self-asserted)		No (self-asserted)		

Source: LAC DPI survey responses and own analysis.

Note: *: online digital identity exists according to ID4D Global Dataset 2021;

** : online digital identity did not exist in 2021 (Metz et al 2024)

: for more country specific data, see col I.42 in WBG GovTech Maturity Index Dataset

a https://www.dpi.global/globaldpi/argentina_list

b https://www.dpi.global/globaldpi/brazil_list

c <https://openknowledge.worldbank.org/entities/publication/88948415-77f6-41fb-a8c0-5d8d415134b5>

d <https://openknowledge.worldbank.org/server/api/core/bitstreams/e3900631-86aa-533a-b8ad-36e1faec9e21/content>

e <https://www.usaid.gov/digital-development/guatemala-deca>

f <https://www.usaid.gov/digital-development/honduras-deca>

g <https://www.usaid.gov/digital-development/eastern-and-southern-caribbean-digital-ecosystem-country-assessment>

h <https://www.usaid.gov/digital-development/peru-digital-ecosystem-country-assessment>

possible, a darker green shade is shown in Table 4.1 below. Note also that the question was about existence of a DPI in each category, not about how widely it is used.

Our survey and analysis show that a wide range of potential DPI systems are likely available across LAC (from the predominance of green in the Table above). The tan-colored cells show that in most of the remaining cases, plans are underway to fill the gap. As expected, the presence of a full suite of DPI instances correlates strongly with country size and income level, with smaller Caribbean and central American countries less likely to have the suite operational today.

However, more detailed analysis is needed. Not all ID, payments, and data sharing systems are created equal. A more detailed evaluation is required to determine the degree to which the above meet key criteria of a DPI, including openness, interoperability, modularity and availability to public and private sectors.

In addition, good governance is crucial for DPIs to achieve their purposes and comply with societal laws and norms. DPI governance includes both external elements of national policy objectives and mandates, as well as internal governance arrangements. These arrangements define how DPI operators and schemes are owned, managed, and make decisions. Effective governance ensures that DPIs operate efficiently and fairly, aligning with the principles of transparency and accountability. Consideration of governance is needed not only at the design phase but throughout the DPI lifecycle if DPIs are to be effective and efficient.

The governance models used in DPI around the world and in LAC vary widely. The Interim Report of the UN DPI Safeguards Initiative³⁰ identified 6 different DPI governance models, ranging from government-led to private sector-led and community-based, and may include multi-stakeholder and public-private partnership approaches. There is certainly “no-one-size-fits-all blueprint” for DPIs.³¹ Rather, the governance approach has to be intentionally designed and maintained to fit the local context as well as the nature of each DPI especially in diverse regions like LAC: the governance of payment systems which rely on payment providers as direct

participants will differ from digital identity provided directly by a public agency, even if common norms like transparency of decision making apply.

Sound data governance measures are essential for the secure and effective operation of DPIs. Data governance involves defining rules for processing and using data, which is a key aspect shaped by national laws and internal protocols. DPIs must incorporate robust data governance frameworks that ensure the privacy and security of personal data through technical, operational, and legal measures. In the LAC region, where data protection laws and practices may vary, implementing comprehensive data governance is vital to building trust and ensuring compliance with regional and international standards.

Multi-stakeholder involvement is critical for the success of DPIs. Effective governance of DPIs requires the inclusion of various stakeholders in the decision-making process. This includes ensuring access and representation within the governance structure, fostering public-private partnerships, and engaging community-based approaches. In LAC, diverse stakeholder engagement can help tailor DPIs to meet local needs and contexts, ensuring broader acceptance and utilization. By involving multiple stakeholders, DPIs can better align with public interest objectives and enhance their relevance and impact across different sectors. The scope of this report does not allow the issue of governance to be addressed in any depth across the variety of types of DPI and LAC countries, but the importance of the issue suggests that it be prioritized for further analysis in LAC.

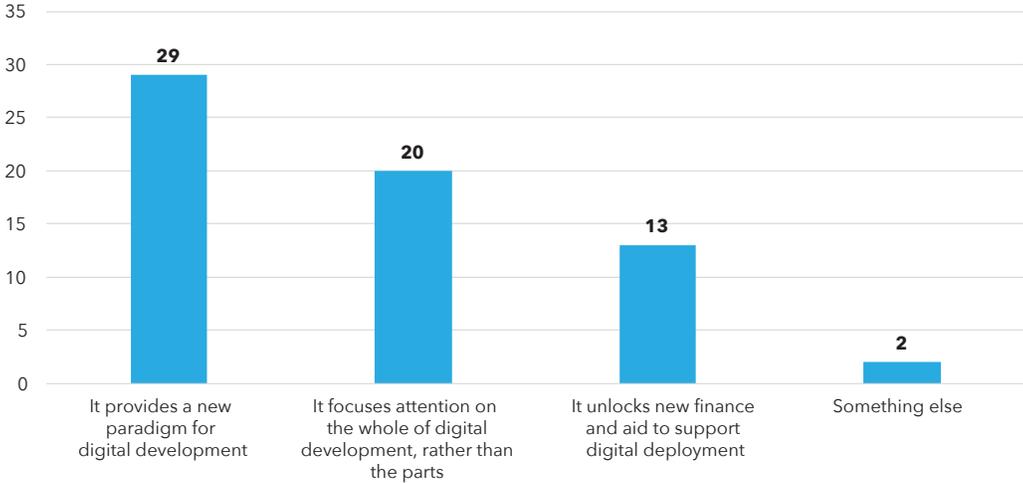
4.3 VALUE OF USING THE TERM DPI

The spread of the term “DPI” appears to be welcomed in LAC. Given that DPI is already present in LAC even without extensive use of the term DPI, how useful is it to introduce the new term? In the DPI survey, respondents generally answered “useful”. Their average response of 2.1 on a scale where 1=very useful; 3=not sure/not proven; 5=very little useful suggests

30 Interim Report April 2024 available here: https://1945836565-files.gitbook.io/~files/v0/b/gitbook-x-prod.appspot.com/o/spaces%2Fc06RXQuE2L2kkyKRy5qr%2Fuploads%2FJ0ITERIMuhGml4MFyctp%2F24.04.27_Leveraging%20DPI%20for%20Safe%20and%20Inclusive%20Societies_V2.pdf?alt=media&token=3468859c-7067-4918-aecf-5d1d313d9336

31 This is one of the conclusions specifically from a general review of governance in retail payments systems published by WBG in 2021 available here: <https://documents1.worldbank.org/curated/en/539601630306074694/pdf/Governance-of-Retail-Payment-Systems-Keeping-Pace-with-Changing-Markets.pdf>

Figure 4.2: How the DPI approach is seen as helpful



Source: LAC DPI survey; multiple choice possible

general openness to using the new term.³² When probed where respondents saw value in the term, the highest number of respondents chose “provides a new paradigm for digital development” (see Figure 4.2). A significant number also acknowledged that DPI emphasizes “the need to consider

the whole rather than the individual parts”. This expectation anticipates substantial benefits from applying a ‘whole of DPI’ approach, not only from improving individual layers. The few who opted for “something else” and supplemented their answers emphasized the importance of DPI in delivering basic essential services.

32 The wording of the survey question was: “If the goal is to promote inclusive digital development in your country, how useful do you think it is to use the term DPI?”



5 DPI WITH LAC CHARACTERISTICS

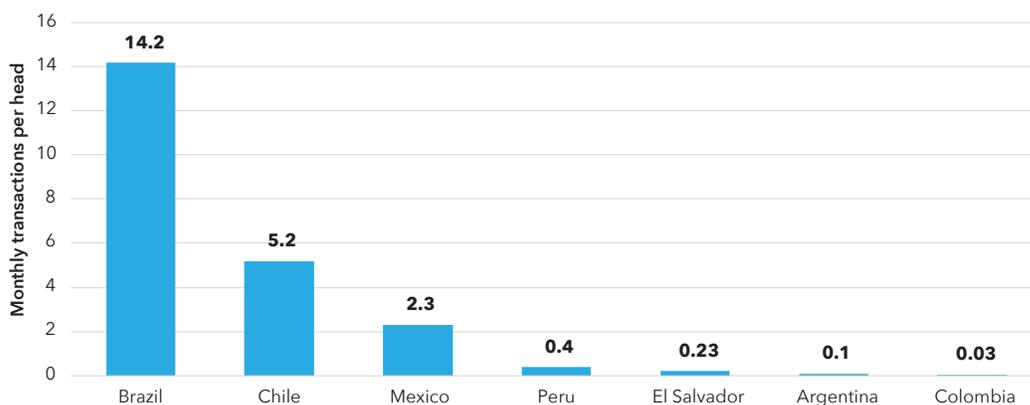
This section highlights distinct LAC DPI implementation themes and characteristics. Even though the term DPI is not yet in widespread usage, the previous sections have shown both how LAC already has the foundations in place for DPI development and substantial progress on core DPI building blocks. DPI in LAC has several distinct characteristics, each of which is further developed in a subsequent subsection.

- Fast payments are increasingly widespread although take-up is uneven.
- Global DPGs like X-Road are being widely used as building blocks in LAC.
- Cross border digital authentication is already in place between some countries.
- A DPI approach is already helpful to support social transfer schemes, an area in which LAC has long been considered a global innovator.

5.1 FAST PAYMENT SYSTEMS

Several LAC countries have had instant, or near instant, retail payment systems for a long time. Mexico’s Sistema de Pagos Electronicos Interbancarios (SPEI), for example, dates back to 2008, although it only became available 24/7 in 2015; and then in 2019 added functionality to support mobile phone payments at participating merchants, branded CoDI (Cobra Digital). Chile’s TEF Online has been available since 2010. As noted, an instant payment system by itself does not necessarily qualify as a DPI. Additional criteria are openness and inclusivity of usage. The World Bank’s FASTT Payments Project lists several criteria that qualify a system as a “fast payment system”: near instant availability of funds, 24/7 availability and openness to widespread participation. Although a number of systems across the region now share these characteristics, the rates of usage per capita vary widely (see Figure 5.1).

Figure 5.1: Transactions per head per month (2022*)



Note: El Salvador figure is for 2023, calculated using the average Transfer365 volume data reported by BCR for the year.
Source: Countries other than El Salvador: ACI Prime Time for Real Time 2023 available [here](#)

Launched in 2020, Brazil's PIX is one of the most recent instant payments systems in the region. PIX has seen rapid takeup, making it one of the fastest growing payment systems in the world at present.³³ As Figure 5.1 shows, it is the most widely used: in February 2024, PIX reported 147 million registered natural persons as users out of a total population of 217 million.³⁴ PIX is one of a new generation of retail payments systems worldwide in which the central bank plays an active role in all three capacities of overseer, scheme owner and operator. El Salvador's Transfer365 system is another example. Introduced in 2021, Transfer365 allows users to initiate transfers to other financial accounts using their mobile phones. Currently availability of funds for the recipient is within three minutes so it is yet not considered "instant", although there are plans to accelerate the speed of transfers. However, Transfer365 does already offer retail cross-border payments linking central American countries and the Dominican Republic.

The differential uptake of fast payments in LAC underlines the point that DPI usage is not automatic. For end users to adopt at scale requires clear value propositions, ubiquitous availability and trusted processes. These are necessary even if central banks mandate the participation of financial institutions to achieve critical mass, as the Central Bank of Brazil did for larger financial institutions in PIX. This all takes sustained effort and investment over time, together with clarity of vision for how a system functions as a DPI. Brazil's PIX would rank highly on a scale of 'DPI-ness' which takes into account the type and range of use cases, the openness to different categories of participants and the use of modular elements and common standards. This suggests that the more a digital system is designed to function as an DPI, with all the key characteristics, the more likely it will gain widespread usage.

Other factors, including who pays and how for the system, also affect DPI uptake and sustainability. PIX is free to use for payment initiators although merchants pay a commission on funds received but it is still cheaper than available alternatives. Transfer365 is not free but has substantially reduced the cost of making cross-border transfers in El Salvador. However, the incentives around participation and usage in digital payment

systems require careful balancing of interests: systems free to use like CoDI may not provide sufficient incentives for incumbent financial institutions to participate wholeheartedly.

5.2 DIGITAL IDENTITY SYSTEMS

Digital identification systems still lag in LAC. This is so even though many LAC countries now report that over 90% of the adult population are registered in identity databases and an equally high proportion of births certified.³⁵ Almost all (28 out of 33) LAC countries reported having a national ID system in place in 2022 and maintained the registries in digital format.³⁶ This achievement follows concerted enrolment drives in the past 10 years in a number of LAC countries. However, the number of countries with a reliable and widely-used digital ID for verification and authentication for in-person and online transactions is much lower: only seven out of 26 LAC countries reported having this available in the 2022 Global Financial Inclusion and Consumer Protection Survey.³⁷

Over the past decade, the WBG's ID4D diagnostics have deeply analyzed identity ecosystems. Diagnostics completed for six LAC countries³⁸ have uncovered some common problems: a fragmentation of ID systems across different authorities; a lack of coordination between identity agencies that control ID registers but are not responsible for how they are used; and lack of capacity in digital government agencies responsible for digital identity profiles. Most of the six countries now offer some form of online authentication for government services, although usage is generally low. Brazil is one exception where almost all state-level ID systems accept the federal authentication system for online authentication, creating a powerful foundational digital identity to access 4500 digital services from over 1000 public agencies. In 2023, the Gov. BR digital ID reported 153 million users, with 250 million authentications happening each month.³⁹

Trust services including e-signatures are often regarded as digital ID since they rely on some form of digital authentication. Almost all (29 of 33) LAC countries have passed regulations providing for e-signatures which can be equivalent to

33 More background on PIX is available in this 2023 IMF Paper: "Pix: Brazil's Successful Instant Payment System" available here <https://www.elibrary.imf.org/view/journals/002/2023/289/article-A004-en.xml>

34 BCB: <https://www.bcb.gov.br/en/financialstability/pixstatistics> for individual users

35 ID4D dataset 2021

36 Govtech Maturity Index Database 2022, columns I-40, I-41

37 Available here: <https://www.worldbank.org/en/topic/financialinclusion/brief/ficpsurvey>

38 These are: Mexico, Peru, Bolivia, Brazil, DR, Colombia

39 Source: https://www.dpi.global/globaldpi/gbr_digital_id

non-digital forms, although only 19 report having the Public Key Infrastructure (PKI) to support this; and of those, only 12 said in 2022 that both the law and infrastructure were operational.⁴⁰ Even when advanced e-signatures are operational and available, usage is typically low.

Cross-border recognition of digital signatures is growing. In 2022, 23 RedGEALC member states signed a declaration to promote cross border recognition of digital signatures among them. This [declaration](#) included the establishment of a regional list of trusted service providers from each signatory country. The list is a technical instrument that can facilitate recognition but does not replace the need for legal recognition through legislative due process.

Similarly, a next stage in the promotion of cross border digital activity involves providing for cross border authentication of citizens. The Governments of Argentina and Uruguay each have their own digital identification systems, called “Authenticar” and “ID Uruguay”. A pilot project under the auspices of RedGEALC in these two countries will enable people from one country to transact digitally in the other using the same forms of identity and with the same security. In a presentation made at the RedGEALC meetings in Santiago in November 2023, officials from each country presented the prototype of the Ciudadano Digital Rioplatense project, supported by an IADB grant under the Regional Public Goods Initiative.⁴¹ Cross border authentication enables Uruguay citizens to identify themselves on a government portal in Argentina using forms of digital identities issued in Uruguay. Other groups of LAC countries, such as the Alianza del Pacifico of countries along the Pacific coast, are also piloting cross border authentication.

While most forms of national digital authentication to date rely on checking against centralized databases of identity attributes, there is increasing interest worldwide in decentralized forms of identity. Often called self sovereign identity, these approaches allow each person, or ID subject, to store their own attributes in their own personal data stores and authorize access on request to authenticate. Cities in LAC including Bogota, Buenos Aires and Monterrey have already shown interest in applying this approach.⁴²

5.3 DATA EXCHANGE SYSTEMS

LAC governments have increasingly implemented digital systems to support secure data exchange at least among government departments. Governments have adopted different approaches: examples include a centralized platform approach in the case of Uruguay led by digital government agency AGESIC; and federated approaches in Colombia and El Salvador.⁴³ Under federated approaches, data is exchanged directly between entities which are part of the exchange scheme without going through an intermediary. The use of standardized protocols assures the integrity and confidentiality of the exchange.

Digital public good software has been deployed quite widely especially for these government data exchanges. As noted earlier, digital public goods (DPGs) can provide building blocks for DPI systems. At least four LAC countries have deployed X-Road software to support decentralized data exchange systems among participating departments in defined data ecosystems. X-Road was developed in Estonia but is now available as an open-source solution through the [Nordic Institute of Interoperability Solutions](#), a partnership platform for IT collaboration between several Nordic countries.

Among the LAC countries reporting deployments of X-Road at different levels of government are:

- **Colombia:** The Colombian National Digital Agency chose X-Road as an interoperability technology for the government in 2018, although it is used by only a few departments.
- **Argentina:** First implemented at a provincial level in Neuquen, X-Road is now considered part of the Argentinian government roadmap for Interoperability of Data and services.
- **Brazil:** Two Brazilian states, Mato Grosso and Amapa, have implemented X-Road for data interoperability although it is not used by the federal government.
- **El Salvador:** The national Secretariat of Innovation chose to deploy X-Road as part of their Tenoli platform allowing government agencies to exchange data using the internet.

40 Govtech Maturity Index Database 2022, column I-42

41 The functionality project is showcased in this informational [Youtube video](#).

42 A regional workshop on the topic was held in Bogota in December 2023-- <https://www.caf.com/es/actualidad/noticias/2023/12/caf-en-alianza-con-fundacion-joy-impulsa-la-identidad-digital-auto-soberana-como-infraestructura-publica-digital-para-la-region/>

43 RedGEALC 2021 p.9

As an open-source software solution supported by communities of developers worldwide, X-Road can be extended and applied in different contexts. Colombia, Argentina, Brazil and Mexico are four of the top six most active X-Road communities in the world by number of members according to [X-Road World Map](#). X-Road features alongside other open-source software on IDB's [Code for Development](#) (Code4Dev) catalog, a broad range of open-source software. Code4Dev also connects developers in the region willing to collaborate on the development and use of open-source software relevant to the needs of LAC societies. As Annex A explains, DPGs like these are one option to use in deploying DPIs, although as software, they are not themselves DPIs.

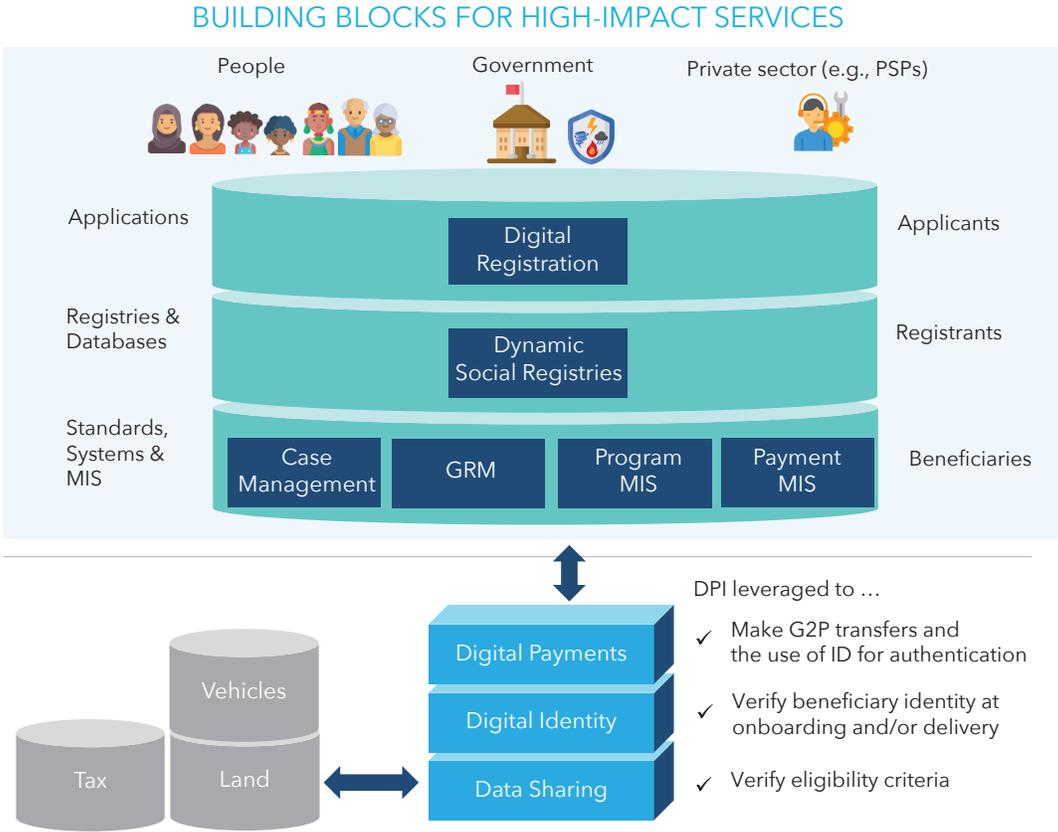
5.4 DPI USE CASES IN LAC

The LAC region is a source of innovation in the design and delivery of social assistance programs. Early conditional cash transfer programs originated in Mexico and Brazil in the late 1990's and have since been widely studied and replicated

in the LAC region and beyond. The region is also known as a pioneer in innovative delivery systems for social transfers including the use of social registries and digital payments. Social assistance applies to a considerable portion of the LAC population: according to the World Bank's [ASPIRE database of social protection](#), around one third of people were direct or indirect beneficiaries of social assistance programs in 2022.

Digitizing these schemes has become a priority for many reasons: to better identify eligible people and reduce leakage, improve efficiency and reduce the cost of delivery, and enable quick responses to shocks. Figure 5.2 below depicts the delivery systems which typically support social assistance, including the registration processes, dynamic social registries and a range of management information systems (MIS) with case management tools. Underneath this layer of sectoral solutions, DPIs provide foundational building blocks. DPIs bolster what the World Bank has called "next generation G2P" services through ensuring that social protection schemes do not need to create and maintain new systems for enrolment, authentication and payments but can rely on what is already available. In addition to delivering

Figure 5.2: DPIs as building blocks in the social transfer sector



Source: World Bank 2024

Box 5.1 Examples of DPIs enabling LAC social assistance schemes

Data sharing: To target beneficiaries of the *Ingreso Solidario* program, which provided emergency cash transfers during Covid, the National Planning Department of Colombia cross checked the data from the social registry (known as SISBEN). Cross checking took place against a set of administrative databases, including beneficiaries of other programs and data from outside the social protection agency, such as data on who was banked and who was not, as well as data from mobile network operators. Costa Rica has also been improving efficiency of social assistance delivery, implementing a mechanism where the Treasury delivers directly into the beneficiaries' bank account of their choice. Brazil's Emergency Aid (*Auxílio Emergencial*) program was established under the Ministry of Citizenship during Covid-19 and assisted over half the population in a short period. To achieve this, data from 17 different databases were cross checked, including company salary reports and prison registers, to target initial eligibility, and thereafter to maintain monthly verification checks. Brazil's Ministry also created databases to track fraud and also shared data with the Internal Revenue Agency for income tax declarations. In a G2PX webinar reporting on learning from this experience, Brazilian authorities specifically identified the process of data sharing and integration as important ingredients for success.

Digital identity: Chile already has a single sign-on system to government services enabling civil servants to authenticate themselves to access all program information about beneficiaries, including health records where relevant. Brazil has used a digital authentication system to cross-check against Cadastro Unico, co-managed by the Caixa (the front end) and the Ministry of Citizenship (the backend). Remote digital authentication also allowed the rapid opening of basic bank accounts for beneficiaries in various places, including Colombia.

Digital payments: Brazil's Emergency Aid payments were made directly into virtual debit card accounts set up by the Caixa, a state-owned bank. Known as Digital Social Savings (PSD), these accounts gave recipients mobile access to Brazil's fast payment system PIX, mitigating the lack of having a physical debit card for point-of-sale transactions. This functionality through a DPI enabled them to make payments and transfer money quickly and at no cost from the accounts without needing first to withdraw cash, which would have placed great pressure on cash handling systems.

While some countries like Brazil and Chile use a state bank as an efficient and scale payment provider for the cash transfers, in other countries, digital payment schemes open the possibility of allowing beneficiaries to choose their financial provider. For example, in 2022, Colombia piloted a customer choice scheme in which 40,000 *Jóvenes en Acción* beneficiaries could elect into which financial account to be paid through the payment system.

Notes:

a *Brazil's Auxilio Emergencial: How digitization supported the response to COVID-19*, G2Px webinar December 2021 available here: <https://www.worldbank.org/en/events/2021/12/15/Brazils-Auxilio-Emergencial>

b This process has been fully described in Lara De Arruda, Pedro; Lazarotto De Andrade, Marina; Falcao Silva, Tiago; Teixeira Barbosa, Diana; Morgandi, Matteo. The payment system used by Auxílio Emergencial, the introduction of the digital social account, and the banking of more than 100 million people in 9 months. World Bank Latin American and Caribbean Studies. Washington, DC: World Bank. available [here](#).

social transfers, DPIs can also support related needs—for example, digital authentication enables the remote opening of payment accounts for beneficiaries who lack accounts to receive transfers. Also, data sharing schemes allow eligibility cross checking against other databases which can both identify eligible missing beneficiaries and eliminate ineligible claimants. Some of these elements are already present in LAC today (see Box 5.1).

DPI systems can inter-operate to create additional value for their users. A leading example is the connection between open finance schemes, an application of data exchange in the financial data space, and fast payment systems. As a recent World Bank Focus Note states: "Fast payments and

open banking services are natural complements, and their integration generates synergies that can enable the more rapid adoption of both.”⁴⁴

Open finance seeks to enable users to share their financial data with third parties more securely and efficiently. But as part of encouraging competition and innovation in the financial sector, open finance often also provides for payment initiation services. These services allow a user to initiate and authorize a payment transaction from their account using a third-party service specialized in providing a convenient and user-friendly interface especially for merchant payments. As a result, users can initiate fast payments from other sites, increasing the convenience and usability of these payments as substitutes for cards or cash. Also, payment initiation services help secure the user interface since sensitive data is not shared with the merchant to not subject it to the data breach risk.

Despite increasing interest, open finance schemes are still rare in LAC,⁴⁵ in most cases existing as a regulation or proposed policy rather than yet as active practice. The exception is the Central Bank of Brazil’s [Open Finance scheme](#) initiated in 2021

through a decree initially mandating only information sharing by financial institutions. The scheme progressed rapidly to introduce payment initiation as a next phase between late 2021 and early 2023. The Central Bank has mandated a standardized Application Programming Interface (API) for payment initiation using PIX.

The Brazilian Open Finance scheme has experienced very rapid adoption: two years after its start, 16 per cent of Brazilian adults had used open finance as of September 2023. Half of all adults were already aware of the scheme according to a nationally representative survey in 2023.⁴⁶ By comparison, the UK’s Open Banking scheme, considered one of the world’s most successful, reached 11 per cent of the British population within four years from its start.⁴⁷ The Open Finance Brazil Annual Report for 2022 reported 16 institutions already active in payment initiation, although 91 were registered to play this role (of a total of 886 participating institutions in Open Finance). API calls for payment initiation averaged around 2 million per week during the last quarter of 2023. This number is small relative to API calls for information which average around 2 billion per week but is growing.

44 *Open Banking in the context of Fast Payments*. World Bank Payment Systems Development Group, Focus Note August 2023, available [here](#). p.2

45 Only three (Ecuador, Mexico and Paraguay) of 13 LAC jurisdictions reporting to the Global FCIP database in 2022 reported having adopted Open Banking which is the more sector-specific form of Open Finance applying to bank-held data only

46 Open Finance: Lessons from Brazil, CGAP webinar November 2023 available [here](#)

47 OBIE Impact Report 2023 available [here](#)



6 BARRIERS AND APPROACHES TO SCALING DPI IN LAC

While DPI systems already exist in many LAC countries, not all are yet widely used. This is in part because many systems are relatively new, although this is not necessarily a reason for low usage. The examples of usage of both the PIX payment system and open finance scheme in Brazil show that digital adoption can indeed be very rapid with appropriate design and a usage enabling ecosystem. However, apart from the relative immaturity of DPI in much of the LAC region, there are other barriers which impede adoption and usage.

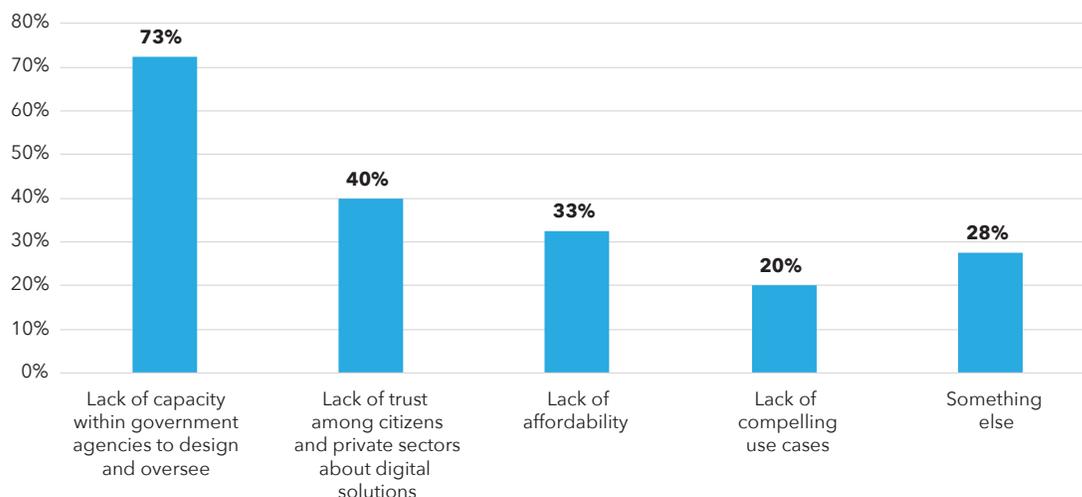
The LAC DPI survey asked about the greatest barriers to DPI deployment and adoption (Figure 6.1).

Lack of government capacity represents a significant obstacle. Three out of every four respondents cited “lack of capacity within government agencies to design and oversee” DPI. In follow-up interviews, numerous dimensions to the capacity issue became apparent. The first is a general shortage of

digital skills, where LAC countries are no exception to the general skills constraint faced around the world. The blend of skills and experience required to manage data and digital services on a large scale is quite specific and in high demand in both private and public sectors. However, the general digital skills shortage is exacerbated in the public sector where pay scales cannot match rising private remuneration. A second dimension is the importance of having adequate and sustained implementation capacity when government takes responsibility for building and operating DPI, beyond a role in design or oversight only.

Overcoming lack of human capacity will require concerted efforts on various levels. International sharing of experience will help, and respondents almost universally indicated an interest in obtaining more information about DPI through a range of channels. However, survey respondents tended to agree that lack of skill to execute was a bigger barrier than

Figure 6.1: Most cited barriers to the deployment of DPI in LAC



Source: DPI in LAC Survey 2024

lack of knowledge.⁴⁸ At a country level, work has started to define competences and develop the training and support to meet them. In late 2023, Colombia published a profile for Chief Data Officers in public sector agencies to define competencies required in this role, laying the groundwork for skills building.⁴⁹ Implementing this approach will take time; and will depend on the flow of digital skills into government agencies and the ability to retain them.

For some agencies, lack of capacity was a financial as much as a human constraint. Governments across the region are fiscally constrained.⁵⁰ While fiscal constraints limit government spending overall, Finance Ministries tend to underfund DPI-like investments because they do not fully appreciate their potential return. Digital government agencies expressed the hope that the rising profile of DPI will lead to more understanding and support from Finance Ministries. A few interviewees also suggested that government budgeting practices create incentives which may exacerbate the problem; that is, for some line departments, using DPIs reduces their capital expenditure (associated with their own software and hardware purchases) while increasing their operating expenditure. Where DPIs are made available to line departments without charge, this may reduce their budget allocation overall. Digital government agencies promoting DPI need to work with Finance Ministries to ensure that they understand the return on investment; and that existing budgeting procedures do not constrain adoption.

The costs to build and operate DPIs may be recoverable through imposing participant fees, user charges or levies. Survey respondents indicated some ambivalence over whether DPIs should operate on the basis of cost recovery or not.⁵¹ Whether and how DPIs charge, or allow participants to charge, end users will affect the extent to which end user affordability, the third most cited barrier category, becomes a barrier to adoption. For DPIs that perform core public and social functions (for example, delivery of social benefits), ensuring that such costs are not passed on to the end users is essential for digital inclusion.⁵²

Overcoming coordination failure is linked to government capacity. Since DPIs, by definition, provide solutions across government departments, coordinating and prioritizing requires strong leadership. In some countries, recognition of the importance of high-level coordination has led to appointment of senior advisors who combine experience with political access. Colombia, for example, appointed an experienced businessperson in the Presidency to fill the role of the first National Data Coordinator through a 2022 Presidential decree.

The second most cited set of barriers relate to absence of citizen trust in digital services. Digital trust is not easy to measure, let alone to maintain and build in the face of the rising threats of online scams and cyberthreats. In common with instant payment systems elsewhere, Brazil's PIX has experienced rising fraud, for example.⁵³ A 2022 representative survey of consumer experience worldwide including two countries in LAC (Brazil and Mexico) found that 33 per cent of people had been a victim of a data breach, with 82 per cent of those experiencing a negative consequence.⁵⁴ The same survey reported relatively high levels of digital trust in these two countries compared with others in the sample. However, this finding is somewhat different from what would be expected from the country rankings in Digital Planet's Digital Trust Index 2020. The parties involved in relying on or providing digital trust in Brazil and Mexico (two of the four LAC countries covered by this index) showed a lower-than-average level of trust.⁵⁵

Whatever the general levels of trust across countries, the Thales Consumer Digital Index found that government was generally among the least trusted sectors for digital exchange, while the financial sector was among the highest. In the LAC DPI survey, respondents split evenly over whether their citizens would trust privately-operated DPIs. A low trust environment clearly creates headwinds for DPI adoption and usage. However, through consistent application and enforcement of security and privacy.⁵⁶ DPIs can also play a role in building awareness and trust. This has clearly been the

48 From responses tending to agree with the attitudinal statement: "In this country, the biggest challenge with a DPI approach is in the execution, not the understanding".

49 Available here: https://infraestructuradatos.gov.co/798/articles-210402_recurso_1.pdf

50 Wired Review, World Bank 2023

51 Responses averaged 2.6, almost at the neutral middle, of the five-point opinion scale offered to them.

52 See Principles on Identification for Sustainable Development: <http://documents.worldbank.org/curated/en/213581486378184357/Principles-on-Identification-for-Sustainable-Development-Toward-the-Digital-Age>.

53 FASTT (2023) Fraud Risks in Fast Payments available here

54 Thales Consumer Digital Trust Index 2022 available here: <https://cpl.thalesgroup.com/data-trust-index>

55 Digital Planet 2020 available [here](#)

56 23 of 33 LAC countries had implemented data protection laws in 2022 (GTMI 2022). However, the proportion of LAC countries with operational agencies is lower: only 15 had a functioning data protection agency, while 4 said in 2022 that they were working on setting one up.

case in general with Brazil's fast growing digital payments and open finance schemes, despite the surge in incidents. The flip side of this is the concern that, if not well implemented and if compromised, large centralized DPIs could undermine citizen trust. Survey respondents indicated some concern about this risk, but not at acute levels.⁵⁷

Some survey respondents mentioned affordability as a barrier to DPI deployment. Affordability concerns could refer to the DPI service, when a charge is levied for use; or more likely, to the lack of affordability for smart phones and broadband internet access required for DPI usage as we saw in Section 3. In either case, affordability clearly needs to be taken into account in DPI design.

Finally, a number of respondents mentioned that political swings could undermine long-term commitment to execute.

It is notable that some, though not all, of the most active DPI deployments in LAC to date stem from central bank initiatives. Central banks are often better equipped to take a longer-term view of building infrastructure than allowed by typical electoral cycles. Because of autonomous staffing policies, they may also be better able to attract and retain core skills than government departments. This is not to suggest that central banks are always well suited to building and operating retail infrastructure; but it does point to the need to have realistic understanding of the time frames to sustain consistent efforts to build and operate it. Some interviewees expressed the hope that greater political understanding and acceptance of the increasingly widely accepted merits of DPI could help to insulate the implementation of a DPI approach from political turbulence.

57 Responses averaged 2.4 on the scale of 1 to 5, tending slightly towards concern, where 3 would be neutral.



7 CONCLUSIONS

Interest in DPI is high within LAC countries; and the LAC understanding of the term “DPI” is converging with that in the rest of the world. The evidence gathered supports the two initial hypotheses with which this research started, namely:

- Individual DPI systems are widely though unevenly available in LAC even if the term DPI itself is not yet in widespread use.
- DPI is considered likely to provide a useful focus to inform the next phase of digital development in LAC.

However, in LAC—as in the rest of the world—DPI schemes often exist more on paper than in practice; regulation alone does not create a well functioning DPI. Even where DPI schemes do exist, usage often remains low relative to expectations and to the size of population. Many barriers need to be addressed to enable substantial uptake. Successful

DPI implementation will require new skills, structures and capacities in many LAC governments. It will also require sustained attention and resources over time. Building trust in digital services and DPI will require better research, more advocacy and, most important of all, good citizen-centric solutions. Accumulating evidence from around the world suggests some good practices which can advance DPI in LAC (Box 6.1)

Ultimately, DPI will see increased adoption when citizens feel that the technology will work for them, and if it fails, that they will be protected by adequate guardrails. Early indications from successful DPI schemes in LAC and beyond create the realistic promise that pursuing a DPI approach can unlock substantial benefits for governments, citizens, businesses and societies as a whole.

Box 6.1 Good practice principles for building effective and trusted DPI in LAC

- **Don’t lose focus on building out the connectivity and data infrastructure layers:** Reliable, accessible and affordable broadband access is an essential pre-condition for the benefits of DPI to be widely experienced; moreover, increased cloud storage infrastructure—whether private, hybrid or public—will be required to handle increasing volumes of data generated by DPIs, so cloud policies should be carefully reviewed.
- **Review procurement rules and budgeting approaches to ensure that they don’t rule out options for DPI:** Alternative implementation models such as DPI-as-a-service should not be ruled out because budgeting approaches favor capital expenditure (over operating expenditure) or procurement rules that restrict use of open source solutions.
- **Consider open source software where available and appropriate:** While open source software in the form of digital public goods is not available or appropriate in all cases, as open source options grow in their range and robustness, they should not be ruled out when selecting software for DPI systems.
- **Engage in knowledge sharing at multiple levels:** DPI is a fast evolving area globally, as well as within LAC. Existing networks like RedGEALC for digital government agencies in LAC offer ways of exchanging information at a continental level. At country level, promoting wider discussion and understanding of plans for DPIs can help businesses and citizens appreciate their benefits; and as a result, adopt them more fully.

- **Identify and build the capacities needed in government agencies to support DPI:** Government roles in DPI range from catalyst and overseer to builder and operator. These roles require staff with new soft and hard skills. Competency profiles like the one Colombia developed for Chief Data Officers can lay the groundwork for building these skills.
- **Recognize a modular, reusable approach to digital infrastructure in digital government policies:** most LAC digital government policies already name interoperability as a key goal; increasingly, they also include enhanced data exchange and sharing but should recognize the benefits of a modular, reusable DPI approach to get there. Updating and revising digital government strategies offers an opportunity to create consensus around prioritized use cases which would benefit from an infrastructure approach. A “Whole of DPI” approach may carry additional benefits but should not detract from making incremental progress on DPI layers.
- **Benchmark the “DPI-ness” of existing systems and assess how they can be enhanced:** since DPI is not a binary concept but rather a spectrum of desired attributes, consider an inventory of existing DPI systems for their degree of “DPI-ness” in order to assess how they can evolve by intentionally taking on more attributes over time.
- **Remember to harness private sector incentives and capacities to use DPI systems:** Align incentives with the private sector for uptake and usage of DPI systems. This includes encouraging private sector participation and innovation in the digital economy. Additionally, ensure that the private sector can build on top of DPI, leveraging the foundational infrastructure to develop new services and applications that drive further digital transformation.

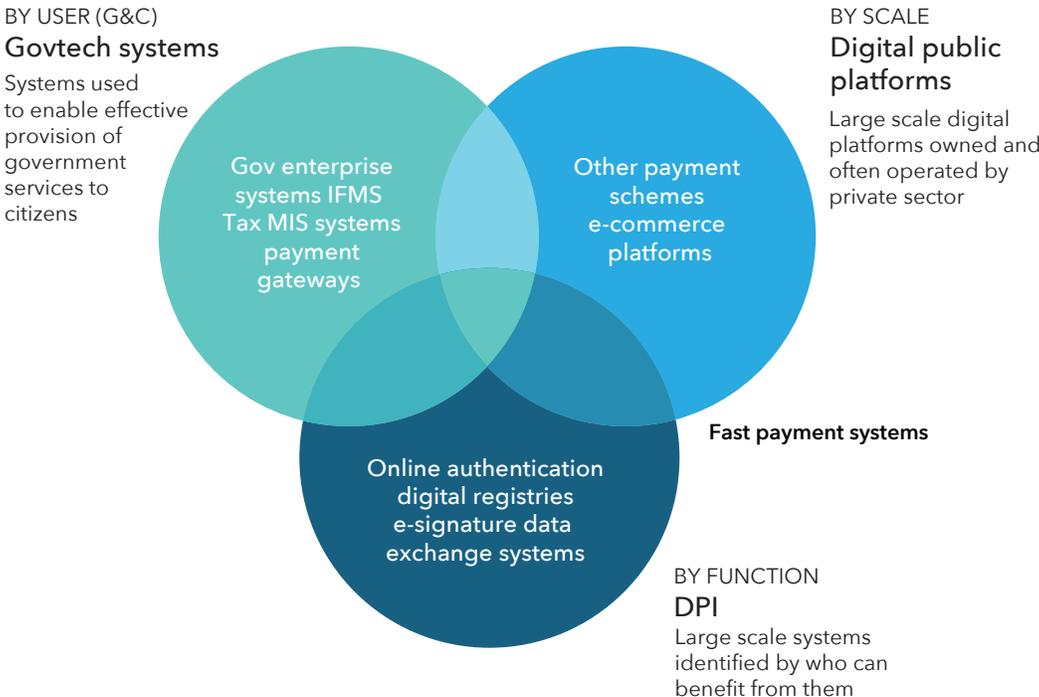
ANNEX A: THE BOUNDARIES OF DPI-ADDITIONAL DEFINITIONAL CLARITY

Section 2 described the main elements of the evolving understanding of DPI worldwide. This Annex builds on this by clarifying further the relationship between DPI and two pre-existing terms—digital public goods and govtech—to avoid confusion with them.

Digital Public Goods (DPGs) are to DPIs as bricks are to houses. As defined by the UN-hosted DPG [Alliance](#), DPGs refer to “open source software, open data, open AI models, open standards and open content that adhere to privacy and other applicable laws and best practices, do no harm, and help attain the SDGs.” The relationship between DPGs and DPIs is therefore that open software and open standards can be used to build DPIs; but DPIs can also involve the use of proprietary solutions.

DPI is not a subcategory of govtech but rather a related but broader concept. Govtech refers both to specific digital systems used by governments to provide services to citizens, as well as more broadly to “a whole of government approach to public sector modernization”.⁵⁸ There is clearly overlap of the approaches in that some govtech systems may qualify as DPIs. But the difference comes at the level of the approaches: while govtech is about the “whole of government”, DPI is about the “whole of society” with the intent to support solutions which are not only about government services to citizens. While DPIs may provide services to citizens, they therefore have a broader mandate and purpose than digitizing government services. A boundary test is whether a system provides only services between a government and its citizens. If so, it is likely a govtech system; if it also allows for use cases for 3rd

Figure A1: DPI and associated terms ‘govtech’ and ‘digital public platforms’



58 As defined in the World Bank Govtech program available [here](#)

parties, it is likely DPI. This test opens the possibility that a system which starts as a govtech solution could evolve to become a DPI over time. However, govtech solutions that remain limited and focused on point solutions may not be inferior solutions. DPI is not simply a grown-up version of govtech, but more of a sibling in the suite of approaches to digital transformation.

Figure A1 shows the areas of overlap between DPI and govtech solutions and digital public platforms, a term already used in the region which was introduced earlier, together with a main distinguishing characteristic: for govtech solutions, this is the nature of the user (that is, governments and citizens/

businesses); for digital public platforms, it is their scale regardless of what they deliver and to whom; and for DPI, their public function and benefit.

While the meaning of the term DPI is becoming clearer over time, a sharply binary approach to definition—which implies the ability to demarcate cleanly and clearly between what is and is not DPI—is certainly beyond current understandings. Rather, it seems more fruitful to view DPI as positions on a spectrum of choices regarding digital infrastructures. This is the approach taken in this report when considering different candidate systems in LAC.

REFERENCES

- Alonso, C. T. Bhojwani, E. Hanedar, D. Prihardini, G. Una and K. Zhabska. 2023. "Stacking up the Benefits: Lessons from India's digital journey" *IMF Working Paper* No. 23/78, International Monetary Fund, Washington DC.
- Beylis, Guillermo, William Maloney, Guillermo Vuletin, and Jorge Andres Zambrano Riveros. 2023. *Wired: Digital Connectivity for Inclusion and Growth. Latin America and the Caribbean Economic Review* (October 2023). Washington, DC: World Bank. doi: 10.1596/978-1-4648-2038-0
- Chakravorti, Bhaskar. 2023. "The Case for Investing in Digital Public Infrastructure" Harvard Business Review Blog May 22 available [here](#)
- Eaves, D., Mazzucato, M. and Vasconcellos, B. 2024. Digital public infrastructure and public value: What is 'public' about DPI? UCL Institute for Innovation and Public Purpose, Working Paper Series (IIPP WP 2024-05). Available at: [here](#)
- Ingram, George, John McArthur and Pria Vora. 2022. "How can digital public technologies accelerate progress on the Sustainable Development Goals?" *Bookings Global Working Paper* #174 available [here](#)
- G2Px. 2022. "Next generation G2P Payments: Building Blocks of a Modern G2P Architecture" World Bank Group available [here](#)
- McKinsey & Company. 2018. *Digital identification: a key to inclusive growth* available [here](#)
- Metz, A., Casher, C and Clark, J. *ID4D Global Dataset 2021 : Volume 2 - Digital Identification Progress & Gaps (English)*. World Bank Group available [here](#)
- Metz, Anna, Georgina Marin, Jonathan Marskell, Julia Clark and Karol Karpinski. 2022. "A Digital Stack for Transforming Service Delivery", World Bank Practitioner's Note available [here](#)
- RedGEALC. 2021. "Cross Border Digital Services". Report (in Spanish) available [here](#).
- UNDP & Dalberg Advisors. 2023. "The Human and Economic Impact of Digital Public Infrastructure" available [here](#)
- World Bank FIGI. 2022. "Technical Note on Open Banking Comparative Study on Regulatory Approaches" available [here](#)
- World Bank. 2024. *Digital Progress and Trends Report 2023* available [here](#)

