Institute for Innovation and Public Purpose

2025 State of Digital Public Infrastructure Report

A Look at Measurement and Prevalence as DPI Transitions from Experiment to Scale

OCTOBER 2025

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- Govstack
- GIZ
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- Inter-American Development Bank (IADB)
- Modular Open Source Identity Platform (MOSIP)
- Nordic Institute for Interoperability Solutions (NIIS)
- Fast Payments Toolkit
- World Bank

We are deeply grateful to those who shared their experiences with us to better understand how DPI is taking shape in practice, notably Peru's Secretariat of Digital Government and Tanzania's Ministry of Information, Communications, and Information Technology for sharing their respective countries' stories.

The DPI Map Community of Practice for DPI Measurement (CoP)[1] has been central to this effort—helping us refine our measurement framework, validate findings, and connect with practitioners driving change in their own contexts.

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Finally, we would like to recognise the many contributors from Co-Develop and other organisations who assisted with review and outreach, as well as those working to build and improve DPI. This report is inspired by and dedicated to their efforts.

1 The DPI Measurement CoP brings together the diverse stakeholder community around DPI to develop a common language and shared practices for effective measurement. Explore the CoP's reflections and join at: https://dpimap.org/measurement-community/

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Executive Summary

In the past two years, digital public infrastructure (DPI) has emerged as a global priority, shaping the conversation around how governments and societies can benefit from technology and the role of the state in this journey. As more advocacy and funding for DPI increase, and more governments take an interest in this approach, a gap has emerged: it was unclear how many DPI systems exist worldwide.

The DPI Map and its associated methodology were established to address this by providing a baseline of prevalence.

This report builds on that effort to do four things:

First, it asserts a growing consensus around the definition of DPI centered around 3 societal functions and 6 common attributes.

Second, it provides a current snapshot of the prevalence of DPI. Looking at DPI's three components—digital ID, digital payments, and data exchange systems—the IIPP's DPI Map establishes the first global snapshot of DPI systems across 210 countries. As of 2025, at least **64 countries** have DPI-like digital ID systems, **97 countries** have DPI-like digital payment systems, and **103 countries** have DPI-like data exchange systems.[2]

Third, it analyses what these patterns reveal about DPI's evolution. Our findings reveal significant unevenness across global regions, with identifiable maturity clusters and income-level patterns shaping implementation. Interoperability and adoption often progress together, suggesting an interdependence between system design and real-world uptake.

Finally, we share reflections on the state of measurement of DPI, and suggest areas for further research. As many existing measurement approaches rely on proxies for understanding DPI attributes, such as technical specifications and the presence of legal frameworks, they often paint a narrow picture of how systems function in practice, and don't capture the extent to which governance is enforced. There is still much to be done to adequately assess the efficacy of DPI, and the building blocks of measurement being constructed today lay the groundwork for increasingly rigorous assessment in the years ahead.

The State of Defining DPI

Finding #1: There's a growing consensus around DPI's definition and attributes, often focusing on 3 societal functions and 6 common attributes.

What the DPI Map Data is Telling Us

Finding #2. DPI is not distributed evenly between regions across the world.

Finding #3: The map's listed attributes reveal varying pathways to developing DPI.

Finding #4: Attributes countries invest in correlate with income level.

Finding #5: Interoperability and adoption are correlated.

The Limits of Measure and The Challenges Those Pose

Finding #6: Despite progress on measuring DPI, it's unclear whether it correlates with performance.

Finding #7: Governance measurements identify the prevalence of legal frameworks and oversight bodies but cannot assess enforcement capacity.

Finding #8: Adoption metrics are diverse, and data availability is lacking.

2 DPI Map (2025-09-30). Institute for Innovation and Public Purpose, UCL. https://dpimap.org/data

Methodology

This report draws on a combination of desk research, quantitative benchmarking and correlational analysis. The research was guided by questions on DPI's significance, what and how it should be measured, what current measurements reveal, and what lessons can be drawn from global practice.

The primary dataset is the DPI Map, which includes 48 variables related to the presence and quality of systems across the "core" DPI foundational components: Digital ID, Digital Payments, and Data Exchange Systems. These variables are then grouped around the IIPP Measuring DPI Framework,[3] developed through round tables and interviews with DPI professionals, and led to the categorisation of DPI attributes across technological, governance, and adoption contexts. In this report, systems are benchmarked using binary variables, coded "Yes" when a publicly verifiable data source confirms the presence of a given variable.[4] Digital ID has 11 of these variables, Digital Payments have eight, and Data Exchange Systems have seven (See appendix 3-5). These data sources include official government websites, press releases, international development and multilateral institutions (e.g. World Bank, Inter-American Development Bank), and technical stakeholders (Africa Nenda, Nordic Institute for Interoperability Solutions).

Since the release of the DPI Map's first version, additional contributions have come directly from implementers and advisors, including participants in the CoP, and have been reviewed and validated before inclusion.[5] These engagements helped surface practical insights on how countries interpret and operationalise DPI concepts, which in turn informed refinements to both the dataset and analytical framework.

The benchmarking exercise builds on precedents such as the GovTech Maturity Index (GTMI), World Bank's ID4D Dataset and the Global Digital Health Monitor, all of which use feature-based variables aggregated into composite assessments. Our approach extends these methods across the foundational components of DPI, not to produce a ranking but to test measurement approaches and inform future improvements in how alignment is captured.

To explore relationships among variables, this report draws on recent analysis by one of the project's researchers, Erik Paessler (2025), which applied multiple correspondence analysis (MCA) and cluster analysis to identify empirically significant patterns across DPI components. Using the five strongest variables per domain, supplemented by region, income classification, and implementation status, the analysis helps demonstrate how legal, institutional, and operational factors interact in practice. We do not aim to establish or insinuate causality, but rather highlight potential relationships between technical design and governance elements. As measurement practices evolve, such approaches move DPI assessment beyond simple benchmarking toward a more relational and systemic understanding of maturity.

To further contextualise the data, country stories are featured in the report. These examples explore the evolution of systems in different country contexts, with attention to governance models, implementation challenges, and enabling factors. These were

3 David Eaves and Krisstina Rao, *Digital Public Infrastructure: A Framework for Conceptualisation and Measurement*, 2025, https://www.ucl.ac.uk/bartlett/publications/2025/jan/digital-public-infrastructure-framework-conceptualisation-and-measurement

4 Note: The DPI Map includes more variables than the binary ones used in this report's analysis. These can be found in our 2025 Q3 dataset, as well as the codebook: https://dpimap.org/codebook/

5 "DPI Map Methodology," DPI Map, April 9, 2025, https://dpimap.org/methodology.

Introduction

identified through a benchmarking exercise (See Section 2, “Where DPI Exists”) to determine which countries’ DPI systems had high alignment with DPI attributes.

As digital technologies permeate nearly every aspect of modern life, governments are grappling with how to manage, regulate, and govern them in the public interest. Many countries and actors are questioning the limits of market-driven systems to deliver equitable and trustworthy outcomes on their own. As a result, a number of governments are reasserting their role in shaping the digital ecosystem, seeking tools that restore state capacity and build public trust to ensure core digital services advance shared goals.

Digital Public Infrastructure (DPI) has emerged as one such tool. Comprising foundational systems for digital identity, payments, and data exchange, DPI enables governments to deliver services effectively, expand secure access to instant transactions, and share information responsibly in the digital economy. In the last few years, via projects like the 50-in-5 initiative, an increasing number of governments have committed to building national-scale digital public infrastructure in the coming years.

The absence of a reliable, publicly accessible resource limits researchers’ ability to analyse global patterns, and prevents governments and implementers from identifying peers and best practices. And, among others, it impedes civil society actors from identifying emerging trends or governance patterns.

The DPI Map addresses this gap. It offers the first global, systematically compiled dataset examining the presence and characteristics of digital identity, payment, and data exchange systems. **The goal of the DPI Map** is to measure the existence or, as we term it, *prevalence* of DPI.

To do this, we’ve drawn on the attributes that researchers, policy makers and advocates across the DPI ecosystem indicated to us are the default conditions that define DPI. These six attributes: Interoperability; oversight and transparency; privacy, safety and security; Inclusion and non-discrimination; Scale of Adoption; and Capacity and Coordination are not necessarily exhaustive, but many experts we consulted perceived them as essential. Measuring these attributes - and thus DPI - is not without challenges (explored in Section 1).

While the map creates an important baseline set of data, it also has limits. Ultimately, policymakers would benefit from research assessing where DPI has and has not fulfilled its potential. Measuring *impact* - both positive and negative - should be a shared goal. The DPI Map also offers some insights into where this will be challenging (explored in Section 3).

Our hope is that a consistent data set of DPI prevalence will make it easier to distinguish between ambition and reality, or to identify which approaches deliver meaningful public value. By observing patterns in how DPI is designed and implemented, measurement efforts can reveal both promising practices to emulate and pitfalls to avoid.

Drawing on new data from IIPP’s *DPI Map* and related research, this report provides a global snapshot of DPI implementation—mapping where these systems exist, how they function, and what institutional arrangements underpin them (explored in Section 2). It does not claim to explain causation or impact, but instead establishes a foundation on which others can build a more detailed analysis.

The report is designed to serve four primary audiences:

- **Researchers** who are building a stronger evidence base for how DPI systems function.
- **Technical implementers** who apply findings to strengthen system design, interoperability, and implementation practices.
- **Evaluators and advocates**, including civil society organisations, who can use the data to assess attributes like privacy and accountability, and to push for more equitable digital infrastructure.
- **Governments, multilateral organisations, and donors** who can use the report's findings to inform investment decisions with measurable needs, high-potential contexts, and progress toward shared global commitments.

Each section can be read independently. The *What Counts as DPI* and *Why it Matters* section introduces the conceptual foundations of the DPI Map—defining what counts as DPI, and why measurement matters. The *State of DPI: The Global Landscape of Foundational Systems* section maps where DPI exists, examines how it functions in practice, and analyses how different components align with key public-interest attributes, supported by illustrative country stories. The *State of DPI Measurement Efforts* and how technology, governance, and adoption are assessed and the challenges associated with each value. Finally, the *Future of DPI* and *How to Get Involved* sections highlight emerging directions for research, collaboration, and continued measurement.

Ultimately, measuring DPI is a practical step toward ensuring that the infrastructures shaping our digital future are effective, inclusive, and aligned with the public interest.

The IIPP's DPI Mapping project is an observational initiative that aims to advance our understanding of DPI and promote its inclusive and safe deployment.

Our ongoing objectives are to:

- Establish and maintain a baseline dataset on DPI around the world.
- Communicate the state of DPI collaboration across the ecosystem.
- Identify opportunities to support DPI deployment and develop safeguards.

1. What Counts as DPI and Why It Matters

1. What Counts as DPI and Why It Matters

Finding #1: There's a growing consensus around DPI's definition and attributes, often focusing on 3 societal functions and 6 common attributes.

At its core, DPI refers to the foundational digital systems that enable public and private services to function at scale. It encompasses baseline platforms that are required for meaningful participation in a modern digital society. This being said, different actors frame DPI through varying lenses (e.g. technical, developmental, and geopolitical)—like the Centre for Digital Public Infrastructure's protocol-oriented DPI categories[6] —with each shaping how success is defined and measured. Establishing shared measurement approaches, therefore, requires grounding in a clear and commonly interpreted definition of what constitutes DPI. It will be important to arrive at a main definition over time so people can compare and learn.

For the purposes of this report, we take a narrower view of DPI comprising the following three functions[7] which serve as infrastructure that underpins core activities of social and economic life:

- **Authentication (Identity):** Allows individuals to securely verify who they are to access services—e.g. Aadhaar in India, mobile driver's licenses in the United States,[8] or Australia's suite of ID solutions such as mDL, AGDIS, and the Trust Exchange.[9]
- **Transactions (Payments):** Provides the rails for financial exchange, typically through interoperable payment infrastructures such as instant payment systems like Brazil's Pix, Mexico's Cobro Digital (CoDi), and other platforms that allow banks and non-bank providers to connect and transact securely.
- **Data Exchange (Information-sharing):** Enable the secure transfer of information across institutions, often starting within a single ministry or government department but increasingly connecting private and nonprofit organisations, and individuals as well. These can be more robust systems like Estonia's X-Road, or come in the form of digital wallets such as India's DigiLocker.[10]

In adopting the above definition, we also acknowledge that the uses and definitions of DPI are shaped by those who use it, and therefore, the term remains open to substantial changes over time.

We undertook a conceptual exercise to address the definitional debates around DPI in 2023. It seemed like countries were steadily progressing in adoption, but there were few objective markers of what DPI looked like. Our deductive exercise, which involved looking for DPI's attributes in definitions offered by development partners, technical experts, and policy think tanks like the World Bank,[11] CDPI, and Co-Develop helped us arrive at 1) a set of common societal functions that the term seems to serve, namely digital authentication, digital transactions and data exchange, and 2) a set of six common attributes that actors use when they talk about DPI.

Using these insights to measure the state of DPI meant looking for how the normative attributes across the technology, governance and adoption were realised separately in the cases of digital authentication, digital transactions and data exchange.

6 "DPI Overview | Centre for Digital Public Infrastructure," August 26, 2024, https://docs.cdpi.dev/the-dpi-wiki/dpi-overview.

7 David Eaves and Krisstina Rao, *Digital Public Infrastructure: A Framework for Conceptualisation and Measurement*, 2025.

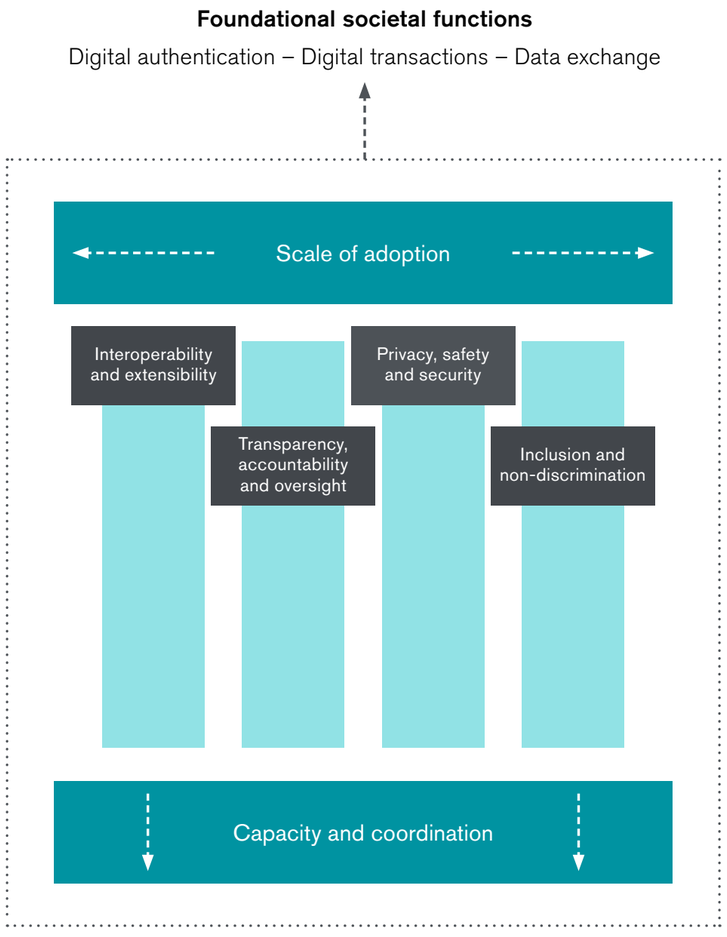
8 "REAL ID Mobile Driver's Licenses (mDLs) | Transportation Security Administration," U.S. Department of Homeland Security Transportation Security Administration, accessed August 28, 2025, https://www.tsa.gov/real-id/real-id-mobile-drivers-license-mdls.

9 Joel McConvey, "Australia's Digital ID Landscape in Danger of Becoming Siloed | Biometric Update," October 23, 2024, https://www.biometricupdate.com/202410/australias-digital-id-landscape-in-danger-of-becoming-siloed.

10 Ritul Gaur and David Eaves, "The DigiLocker Story: How India Is Digitising Its Documents," University College London Institute of Innovation and Public Purpose, October 2025.

11 Clark, J, G Marin, O.P. Ardic Alper, and G.A. Galicia Rabadan. "Digital Public Infrastructure and Development: A World Bank Group Approach." World Bank Group, March 2025. https://documents1.worldbank.org/curated/en/099031025172027713/pdf/P505739-84c5073b-9d40-4b83-a211-98b2263e87dd.pdf.

Figure 1: Attributes of DPI



Source: David Eaves and Krisstina Rao, *Digital Public Infrastructure: A Framework for Conceptualisation and Measurement*, 2025.

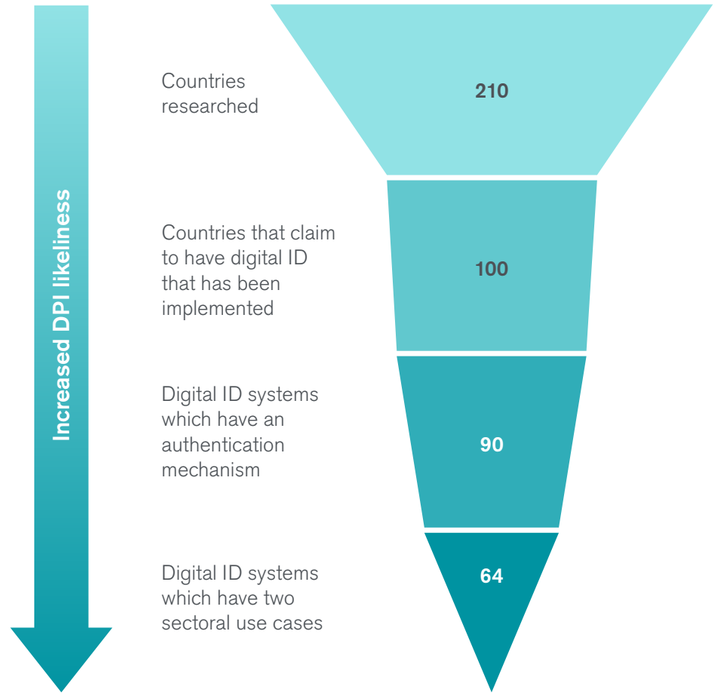
For the sake of using this conceptual framework towards measurement, each of these attributes was supplemented with outcome variables that offered a direction and benchmark for the attribute to be realised across the three functions. The DPI Map further treated these functions as components of a country's DPI architecture - digital ID systems, digital payment systems and data exchange systems. There emerged some consensus on outcomes that "make or break" digital systems as DPI.

As an example, for **digital ID systems**, this meant identifying those that:

1. Claim to have an electronic or digital ID credential that has been implemented;
2. Include an authentication mechanism (such as biometric or digital verification); and
3. Have at least two operational sectoral use cases.

64 DPI-like digital IDs met this criteria (see figure 3). Similar exercises were conducted for payment and data exchange systems (see appendix 5-6).

Figure 2: Count of DPI-Like Digital ID Systems



Note: Countries are progressively filtered based on more detailed criteria — from simply claiming a digital ID system to demonstrating implementation, authentication, and sectoral use.

Future development of the map may result in the addition of more variables, refinement of the scope of others, or a change in which are considered "DPI-like" in our count of which countries have these systems. Minor changes in variables that are included in this count (e.g. whether digital ID systems have two sectoral use cases) may significantly alter future analysis using the dataset.

2. The State of DPI: The Global Landscape of Foundational Systems

2. The State of DPI: The Global Landscape of Foundational Systems

This section presents a snapshot of DPI across its three foundational components. Among the 210 countries reviewed, we identified the following DPI-like systems:

- **64 digital ID systems**
- **97 digital payment systems**
- **103 data exchange systems**

This is an increase of seven payment systems and one data exchange system since the first DPI Map dataset was released in October 2024.

This analysis is, as far as we know, the most comprehensive assessment of DPI systems in the world. It does, however, have limits. It is the result of applying one measurement framework to publicly available information. These results might differ if an alternative framework, variables, or weights were applied. Another limit is that many governments do not yet make detailed DPI information accessible, limiting both domestic accountability and international comparability. Indeed, one goal of our work is to emphasise the value of open reporting, which helps foster trust and shared progress.

By detailing the choices and trade-offs made across current deployments, this section underscores both the promise of DPI and the complexity of measuring it. Together, these examples highlight the diversity of approaches countries are taking to build and govern DPI.

Where DPI Exists

Finding #2. DPI is not distributed evenly between regions across the world.

- **Europe** has a greater number of implemented and highly benchmarked systems, likely a result of government investment and strong policy regional frameworks, as well as of relatively mature state data and reporting practices on digital identity, digital payment and data exchange systems.
- **North America and Oceania** paint a more complex picture. Deployments of digital identity and digital payment systems, although sophisticated, show less alignment with DPI-like features, especially around interoperability and governance.
- **Africa, Asia, and Latin America and the Caribbean** have the most dynamic and rapidly evolving picture for deployments, including numerous planned and piloted DPI.

It is important to note that these regions cannot be compared directly.

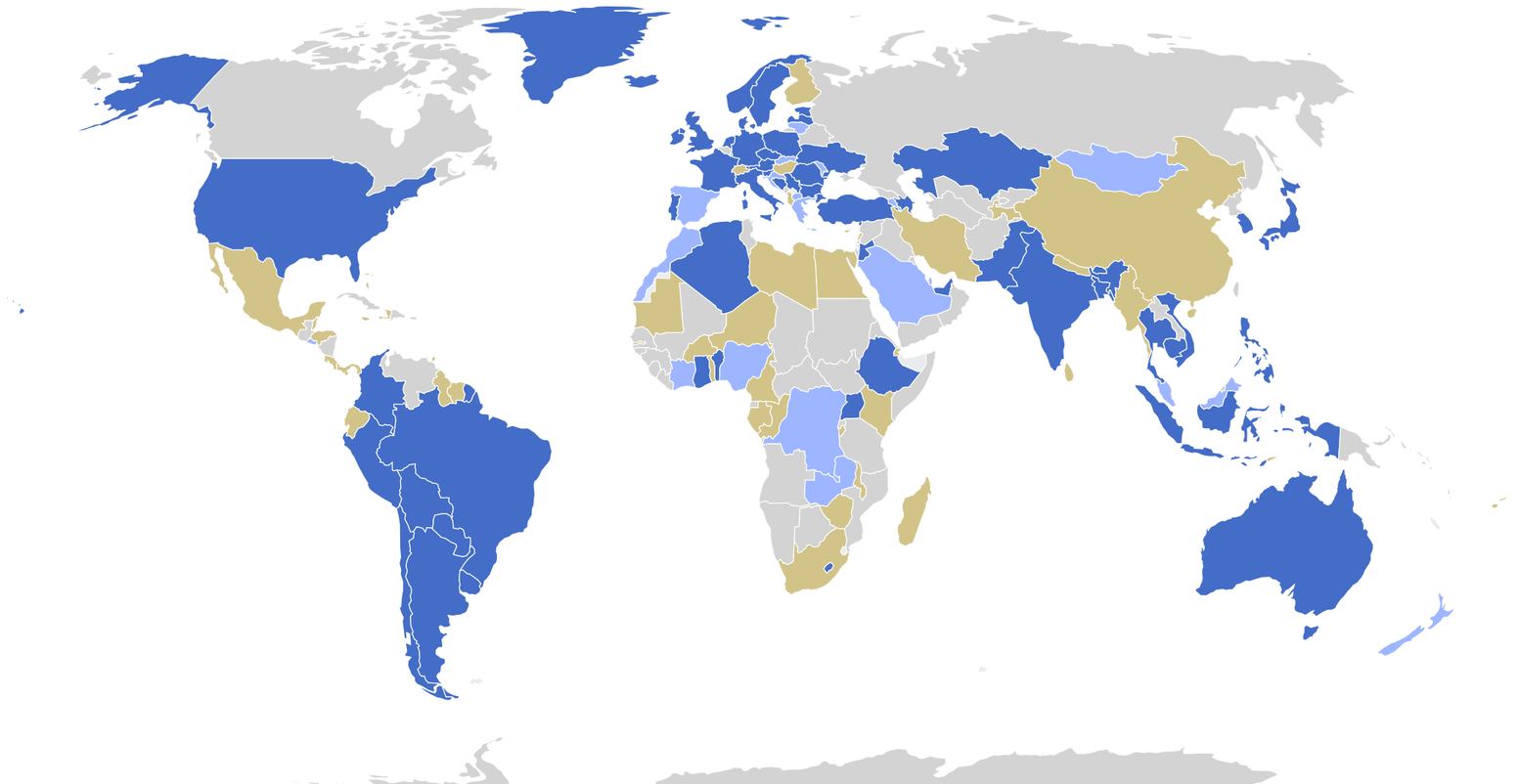
Their contexts differ in fundamental ways: the number and size of countries in the region, and the existence (or absence) of regional policies and systems. The European Union, for example, benefits from binding regulations such as the General Data Protection Regulation (GDPR) and initiatives such as the Single Euro Payments Area (SEPA), both of which reinforce alignment across member states. Africa, meanwhile, has a continent-wide digital transformation strategy under the African Union,[12] but actual deployments vary, likely as a result of resource constraints and differences in national capacity. By observing regional and national differences, the DPI Map hopes to enable a broader community of researchers and officials to make sense of the global picture.

We've attempted to break down deployments by high and low alignment to DPI attributes. Tables 1-3 **illustrate the unequal distribution of DPI around the world** by listing systems that highly align with DPI attributes. These include those commonly associated with DPI: interoperability and extensibility; transparency, accountability, and oversight; privacy, safety and security; inclusion and non-discrimination; scale of adoption (see methodology section and appendix 1-3). Those reflected scored among the highest in their respective regions on these variables, suggesting that they most closely reflect DPI-like design principles in practice. Of those included, what counts as a "high score" varies widely by region, with Europe having outsized representation and regions like North America and Oceania tending to have "low-scoring" systems.

12 "The Digital Transformation Strategy for Africa," African Union, 2020, https://au.int/sites/default/files/documents/38507-doc-DTS_for_Africa_2020-2030_English.pdf.

Figure 3: Global Presence of DPI-Like Digital ID Systems, and Digital IDs in the Planned/Rollout Stage

Note: Darker blue countries have DPI-like digital ID systems, light blue countries meet a partial definition, and yellow countries have systems that are planned or in rollout. The map on the left counts "DPI-like" to mean that countries 1) claim to have a digital ID that has been implemented, 2) Digital ID systems have an authentication mechanism, and 3) Digital ID systems have two sectoral use cases. The map on the right removes the last criteria (Digital ID systems have two sectoral use cases) from its count. There are 64 total DPI-like IDs in the map on the left, and 89 on the right. Both maps include 53 systems in the planned/piloted stage.



Digital ID systems show regional variation: **Europe** reflects the majority of systems with high-alignment to DPI features, underpinned by legislation like GDPR and Electronic Identification, Authentication, and Trust Services (eIDAS), which establishes robust rights protections and accessibility standards;[13] and **Africa, Asia, and Latin America and the Caribbean** are expanding DPI presence, but these systems currently have less consistent alignment to DPI features.

13 "European Digital Identity - European Commission," accessed October 19, 2025, https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-digital-identity_en.

Table 1: Digital ID Systems by Region with High-Alignment to DPI Features

Region	Country and System Name
Africa	Ethiopia's Fayda ID
Asia	Philippines' PhilSys/ PhilID
Europe	Austria's ID Austria Bosnia and Herzegovina's Digital Representation Bulgaria's Evrotrust Czech Republic's eDoklady Denmark's MitID Estonia's Digi-ID/ e-Residency Digi-ID/ Mobiil-ID/ Smart ID France's France Identité + FranceConnect+ Germany's Online-Ausweis Italy's SPID – Public Digital Identity System Latvia's eID karte/eParaksts Liechtenstein's eID.li Netherlands' DigiID Norway's MinID/ BankID/ Buypass/ Commfides Portugal's Cartão de Cidadão, Chave Móvel Digital Romania's ROeID Slovenia's Electronic ID + eOsebna Ukraine's Diia + ISEI
Latin America and the Caribbean	Peru's DNIe (electronic national ID)
Middle East	United Arab Emirates' UAE Pass
North America	Greenland's MitID
Oceania	Australia's Trust Exchange (TEx), myGovID

Note: Out of the 11 binary variables included in the benchmarking exercise, Africa's system with the highest alignment to DPI-like features system has 8 "yeses"; Asia's has 11; Europe's have 11; Latin America and the Caribbean's have 10; the Middle East's has 7; North America's has 11, with Greenland using Denmark's digital ID; and Oceania's has 10.

In digital payments, regional coordination remains the clearest differentiator: **Europe** has achieved high cross-border interoperability through SEPA and TIPS; **Latin America** is witnessing a fast-payments surge via systems like Brazil's Pix;[14] while in **Asia** and **Africa**, countries are strengthening national systems and pilot or implementing regional integration through initiatives like Project Nexus between Eurosystem, Malaysia and Singapore,[15] and the Pan-African Payment and Settlement System (PAPSS) between central banks in Africa.[16]

Table 2: Payment Systems by Region with High-Alignment to DPI Features

Region	Country and System Name
Africa	Zambia's National Financial Switch (NFS)
Asia	China's Interbank Payment System
Europe	Target Instant Payment Settlement (TIPS) in Andorra, Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Liechtenstein, Lithuania, Malta, Monaco, Norway, Poland, Portugal, Romania, San Marino, Slovakia, Slovenia, Spain, United Kingdom
	Switzerland's SIC5
Latin America and the Caribbean	Brazil's Pix
	Mexico's CoDI[17]
Middle East	Azerbaijan's Anipay
North America	United States' FedNow
Oceania	Fiji's Interbank Payment System

Note: Out of the 8 binary variables included in the benchmarking exercise, Africa's payment systems with the highest alignment to DPI features have 6 "yeses"; Asia's have 4; Europe's have 6; Latin America and the Caribbean have 8; the Middle East's have 7; North America's have 4; and Oceania's have 4.

14 Douglas Randall et al., "A Fast Payments Revolution in Latin America," World Bank Blogs, June 26, 2024, https://blogs.worldbank.org/en/latinamerica/fast-payments-revolution-latin-america.

15 "Project Nexus: Enabling Instant Cross-Border Payments," BIS, August 27, 2025, https://www.bis.org/about/bisih/topics/fmis/nexus.htm.

16 "PAPSS - Make Instant and Secure Cross-Border Payments in Local Currencies across Africa," PAPSS, accessed October 9, 2025, https://papss.com/.

17 Note – Mexico's CoDi had 7 variables. This was included due to the digital payment system being one of only two reaching 7 globally (Azerbaijan's Anipay being the second).

In data exchanges, **Europe** leads with mature, embedded interoperability layers (e.g. X-Road and EU interoperability policy[18]); in **Asia** and **Africa**, governments are piloting and have implemented varying interoperability systems like South Korea's National Data Sharing Platform pilot[19] and Kenya's effort to develop an interoperability framework[20]; meanwhile, **Latin America and the Caribbean** are increasingly embedding data exchange platforms into digital government reforms to link ministries and service programs.[21]

18 "Interoperable Europe Act," accessed October 20, 2025, https://interoperable-europe.ec.europa.eu/interoperable-europe/interoperable-europe-act.

19 Jong-Sung Hwang, *New Journey to Digital Platform Government*, March 22, 2023, https://thedocs.worldbank.org/en/doc/61714f214ed04bcd6e9623ad0e215897-0400012021/related/S2-Korea-s-Digital-Platform-Government.pdf

20 Cybernetica to Develop Interoperability Framework in Kenya," ESTDEV, April 30, 2024, https://estdev.ee/en/articles/cybernetica-develop-interoperability-framework-kenya

21 "Latin America and the Caribbean-Africa Peer Exchange on Administrative Data," Global Partnership for Sustainable Development Data and Cepei, 2019, https://www.data4sdgs.org/sites/default/files/services_files/Peer%20Exchange%20on%20Admin%20Data_Report_0.pdf.

Table 3: Data Exchange Systems by Region with High-Alignment to DPI Features

Region	Country and System Name
Africa	Benin's X-Road BJ
	Nigeria's NGEA (Nigeria Government Enterprise Architecture)
	South Africa's State Information Technology Agency (SITA)
	Tanzania's Jamii X-Change
Asia	Cambodia's CamDX
	Japan's Government Interoperability Framework
	Kyrgyzstan's Tunduk
	Malaysia's Malaysian Government Central Data Exchange (MyGDX)
	Singapore's APEX Cloud
	Thailand's Government Data Exchange (GDX)
Europe	Belgium's Federal Service Bus (FSB)
	Bosnia and Herzegovina's National Interoperability Framework
	Czech Republic's eGovernment Service Bus
	Denmark's Central Data Distribution Platform
	Estonia's X-Road
	Faroe Islands' Heldin
	Finland's Suomi.fi Exchange Layer (Palveluväylä)
	France's Interministerial Network of the State (Réseau Interministériel de l'État, RIE)
	Germany's Federal Information Management (FIM)
	Greece's Govhub
	Hungary's Központi Kormányzati Szolgáltatás Busz (KKSZB)
	Iceland's Straumurinn
	Italy's Piattaforma Digitale Nazionale Dati - PDND
	Latvia's Latvian State Information System Integrator (VISS)
	Moldova's MConnect
	Netherlands' Diginetwerk
	Russian Federation's Unified Digital Platform GovTech
	Slovakia's GovNet
	Spain's Plataforma de Intermediación de Datos (PID)
	Sweden's Ena
	Switzerland's I14Y Interoperability Platform, Sedex
	Ukraine's Trembita
Latin America and the Caribbean	Brazil's conecta.gov.br
	Chile's PISEE 2.0
	Colombia's Data Exchange System
	El Salvador's Tenoli
	Paraguay's Sistema de Intercambio de Información
	Peru's Plataforma Nacional de Interoperabilidad
	Uruguay's Plataforma de Interoperabilidad
Middle East	Cyprus' Government Gateway Ariadni
	Saudi Arabia's Government Service Bus
North America	Canada's Canadian Digital Exchange Platform
Oceania	Fiji's Data Exchange Platform (DXP)

Note: Out of the 7 binary variables included in the benchmarking exercise, data exchange systems in Africa, Asia, Europe, Latin America and the Caribbean, the Middle East, and North America with the highest alignment to DPI features have all have 7 "yeses", and Oceania's highest-aligned system has has 1 "yes." These variables can be found in Appendix 6.

What DPI Looks Like In Practice

This section takes an observational look at how DPI is unfolding globally. By documenting what exists and looking for patterns based on real-world examples, we can begin to see the diverse pathways countries are taking to operationalize DPI and the institutional arrangements that sustain them.

Finding #3: The map's listed attributes reveal varying pathways to developing DPI.

DPI systems cluster into identifiable stages of advancement.[22] Some are technically sophisticated but lack robust governance; others are legally codified but remain limited in adoption.

For example, in digital identity systems, one grouping of countries in Africa, Latin America, and the Middle East was characterized by foundational regulatory elements—identity acts and data protection laws—but with few accountability or digital ID-specific regulation mechanisms.[23] These systems tended to be at the planned or piloted stage, representing an early phase of institutional development.

The other grouping, primarily reflected in high-income countries, had high rates of implementation and near-universal presence of accountability, digital regulation, and data protection.

22 Erik Paessler, "Digital Public Infrastructure - Exploring Implementation Approaches through Cluster Analysis" (Unpublished Paper, based on March 2025 DPI Map dataset), 2025.

23 Erik Paessler, "Digital Public Infrastructure - Exploring Implementation Approaches through Cluster Analysis" (Unpublished Paper, based on March 2025 DPI Map dataset), 2025.

This suggests that such legal and institutional safeguards are strongly correlated with mature, operational systems.

While "maturity" can be multi-dimensional rather than linear, our findings suggest that there are common pathways by which countries progress in their DPI journeys.

Finding #4: Attributes countries invest in correlate with income level.

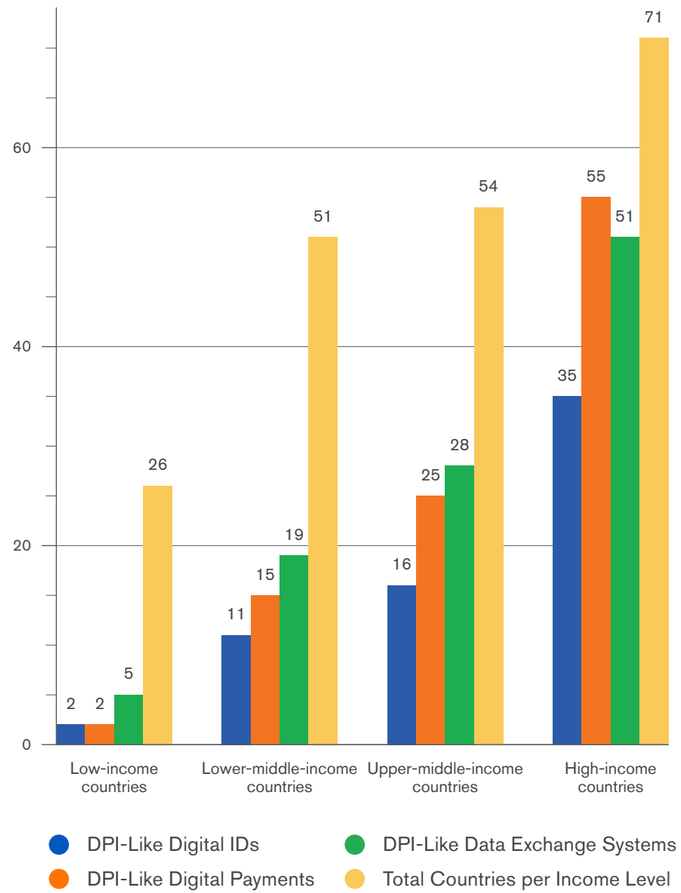
High-income countries lead in implemented systems, reflecting resources and established policy frameworks (See Figure 4). Lower-middle income countries stand out for high numbers of planned or piloted systems, signalling ambition but also capacity constraints. Upper-middle-income countries are the most balanced, suggesting they may be the most dynamic adopters over the next decade.

Despite this pattern, some lower-income countries stand out as being higher performers regardless of resource constraints—like Ethiopia's Fayda ID, Madagascar's Data Exchange System,[24] and Rwanda's Government of Rwanda Enterprise Architecture Framework (RGEA)[25] — suggesting that there are factors beyond income that can influence a state of maturity.

24 Administrateur. "Couche sécurisée d'interopérabilité - XROAD." Unité de Gouvernance Digitale, July 31, 2021. https://digital.gov.mg/2021/07/31/couche-securisee-dinteroperabilite/.

25 "Rwanda Digital Government Strategy and Governance." Rwanda Information Society Authority, June 2018. https://www.risa.gov.rw/index.php?eID=dumpFile&t=f&f=65363&token=5adceb3b3e4c1e51069d1ab3335e3a6fbe2f4845.

Figure 4: Total Number of DPI-Like Systems, By Country Income Level



Note: The above chart shows the number of DPI-like digital IDs, digital payments, and data exchange systems, broken down by their country's income level. Each income level includes a bar showing the number of total countries associated with each income level, excluding 8 with an 'Unclassified' income level and 10 marked "NA" as not having an income level. This totals 202 countries in the bar chart, with 64 DPI-like digital IDs, 97 digital payments (excluding the Vatican and Europe's TIPS, and 103 data exchange systems.

Finding #5: Interoperability and adoption are correlated.

Correlational analysis shows that where interoperability features are present — especially authentication in ID and cross-domain participation in digital payments — adoption is higher. While this is correlation and not causation, this suggests that interoperability may not just be a technical aspiration, but could be a driver of scale (or vice versa). This could be an area ripe for more research.

How DPI Components Align with Key Attributes

The following sections examine each DPI component in turn, highlighting their distinctive alignment to or divergence from different attributes.

Digital ID Systems have mid- to high- alignment to most DPI attributes, particularly those related to privacy, inclusion, and adoption.

As shown in Table 4, 80% of digital ID systems meet all privacy-related variables, including the existence of a national data protection act, an identity act or secondary policy that sets up procedural rules for digital ID, and established processes to notify individuals of data breaches. Similarly, 73% demonstrate inclusion and non-discrimination features such as ID handling terms and an identity act clarifying the relationship with feeder documents. Together, these patterns may indicate that the governance foundations of digital ID are comparatively robust.

By contrast, interoperability remains more uneven. Only 50% of systems meet all associated variables—such as having a digital authentication function, enabling authentication through a government portal, and supporting know-your-customer packet collection for service provision. This limits the potential of ID systems to function as shared infrastructure across public and private sectors. The presence of transparency, accountability and oversight variables are also moderate, with 55% of systems meeting all variables.

Table 4: Percentage of Digital ID Systems with Attribute-Related Variables

Attribute	Number of Associated Variables	Percentage of DPI-Like Systems with All Variables
Interoperability and extensibility	3	50%
Transparency, accountability, and oversight	2	55%
Privacy, safety and security	3	80%
Inclusion and non-discrimination	2	73%
Scale of adoption	1	100%

Payment Systems, on the other hand, demonstrate at least partial alignment with key DPI attributes—particularly interoperability and extensibility; and transparency, accountability and oversight, where roughly half meet all associated variables (see table 5). These include the presence of interoperability policies, bank and non-bank participation, and clearly defined participation conditions and rules.

Likewise, the payment landscape is diverse, with 96 interbank systems, 46 cross-domain platforms and 26 mobile money systems in operation. While interbank platforms remain the most common, the growing number of cross-domain and mobile money systems shows how countries are expanding payment capabilities beyond the traditional banking sector.

Despite this potential for expanded access, such inclusivity is not yet reflected in our data. Payment systems lag considerably on privacy and inclusion: only 3% of systems meet all privacy-related variables (covering data-handling rules, reporting forums, and anti-money laundering laws), and just 12% reflect the inclusion or non-discrimination feature (QR code-based transactions). This imbalance indicates that while interoperability and oversight attributes are strongly reflected, these systems may underemphasise privacy and inclusion.

Table 5: Percentage of Payment Systems with Attribute-Related Variables

Attribute	Number of Associated Variables	Percentage of DPI-Like Systems with All Variables
Interoperability and extensibility	3	52%
Transparency, accountability, and oversight	1	54%
Privacy, safety and security	3	3%
Inclusion and non-discrimination	1	12%

Data Exchange Systems show the strongest alignment on interoperability variables of all DPI components. 63% of DPI-like data exchanges meet all interoperability and extensibility variables—including semantic interoperability, real-time sharing, and scalable technology architecture—higher than for digital ID or payments (50% and 49%, respectively). This suggests that where these platforms exist, interoperability may be a priority in their design and implementation. Likewise, 90% of systems are used by more than one public entity, reflecting high alignment with the capacity and coordination attribute.

Despite these technical strengths, only 44% of systems meet all transparency, accountability, and oversight variables (including enrolment and participation information, and an audit mechanism), and just 59% meet the single privacy variable (procedural rules for data management).

Table 6: Percentage of Payment Systems with Attribute-Related Variables

Attribute	Number of Associated Variables	Percentage of DPI-Like Systems with All Variables
Interoperability and extensibility	3	63%
Transparency, accountability, and oversight	2	44%
Privacy, safety and security	1	59%
Capacity and coordination	1	90%

Country Stories

While many countries are experimenting with DPI, a few deployments illustrate particularly distinctive approaches, challenges, and outcomes. The following case studies, drawn from our list of high scorers in the benchmarking exercise (see previous tables 5–7), highlight how context shapes design choices and governance arrangements, and what lessons emerge from their successes and setbacks. Together, they illustrate the diversity of regional and income contexts in how DPI is being built and governed in practice.

🇵🇪 Peru's Data Exchange and Digital Identity

Peru's DPI has advanced along two complementary tracks: data exchange through the Interoperability Platform (PIDE) under the Secretariat of Digital Government and Transformation of the Presidency of the Council of Ministers (PCM), and digital identity through the National Registry of Identification and Civil Status (RENIEC). Together, these systems show how technical platforms, legal reforms, and institutional trust can reinforce one another to modernize state functions and expand access to digital services.

Peru's Interoperability Platform (PIDE)

Peru's Interoperability Platform (PIDE) was formally launched in October 2011[26] through Supreme Decree No. 083-2011-PCM, building on earlier technical pilots. Its goal was to simplify administrative procedures, reduce bureaucratic inefficiencies, and enable secure information exchange among public institutions. PIDE emerged during a period of state modernization and decentralization in Peru, when economic growth allowed for investment in public sector reform, and citizens were demanding faster, more transparent digital services. From its first use case—reducing company registration from 40 days to 72 hours, and today to just 24 hours—the platform has scaled into a central piece of the country's digital government strategy.

PIDE was established on the basis of Peru's 2008 interoperability standards, which required secure and encrypted communication channels for data exchange between state entities.[27] Its design criteria included security, standardization, scalability, monitoring, and accessibility. Information is exchanged through open protocols (SOAP, REST), with data ownership retained by the originating agency. The platform's scalability is demonstrated by its ability to manage both low-volume exchanges and nationwide, high-volume operations. By 2025, PIDE has facilitated over 409 million transactions, supporting 201 public services and enabling 562 consuming government services across ministries, agencies, and local governments.

From a governance perspective, PIDE illustrates how technical solutions preceded and shaped regulation, but were reinforced by a robust legal framework. Initial development began in 2010, with legislation following soon after to make interoperability mandatory. The 2016 Legislative Decree No. 1246[28] prohibited institutions from requesting documents already available through PIDE, embedding interoperability in administrative simplification. Additional decrees between 2017 and 2021 progressively expanded the categories of data that must be exchanged. As Peru's Secretariat of Digital Government and Transformation described, "The solution emerged first, followed and reinforced by the specific legislation to ensure this function of their functionality, security and mandatory use, both technical and legal actors actively participate, creating feedback loops that warranted sustainability and effective operation of the platform".[29]

26 Government of Peru. "Plataforma de Interoperabilidad del Estado (PIDE)." 2025. https://www.gob.pe/741-plataforma-de-interoperabilidad-del-estado-pide.

27 "Estándares y Especificaciones de Interoperabilidad Del Estado Peruano," Presidencia Del Consejo Ministros, 2008, https://spij.minjus.gob.pe/Graficos/Peru/2008/noviembre/19/RM-381-2008-PCM_19-11-08.pdf.

28 "Decreto Legislativo N.° 1246," Government of Peru, November 10, 2016, https://www.gob.pe/institucion/pcm/normas-legales/118073-1246.

29 Interview with Peru's Secretariat of Digital Government and Transformation, Online. August 22, 2025.

In terms of adoption, PIDE is now used by more than 500 entities across the executive branch, regional, and local governments. It has become the backbone for services that citizens interact with daily—such as business registration, licensing, and social services—demonstrating how interoperability can reduce transaction times and costs. Yet, PIDE's continued impact depends on ongoing capacity-building within institutions, as well as robust governance of data quality, consent, and privacy in practice.

The Peruvian case illustrates how interoperability platforms, when paired with progressive regulation and anchored in modernization goals, can deliver tangible service improvements. PIDE's trajectory underscores the importance of balancing technical flexibility and legislative mandates, ensuring that both evolve together to sustain adoption and citizen trust.

SNAPSHOT:

- **Launch Timeframe:** 2011 (Supreme Decree No. 083-2011-PCM)
- **Core Function:** Secure electronic data exchange among state entities
- **Technology Base:** Uses SOAP/REST protocols and encrypted channels.
- **Legal Framework:** Legislative Decree No. 1246 (2016) and subsequent decrees (2017–2021) making data exchange mandatory.
- **Adoption & Usage:** 409M+ transactions completed; 201 services hosted; 562 consuming services connected
- **Design Principles:** Security, standardization, scalability, traceability, accessibility, data ownership
- **Key Outcomes:** Reduced company registration from 40 days to 24 hours; enabled nationwide administrative efficiency; supported state modernization and anti-corruption reforms

Peru's Registry of Identification and Civil Status (RENIEC)

Peru's National Registry of Identification and Civil Status illustrates the country's evolution from a hardware-based identity card to a more accessible, open-source digital identity infrastructure. The National Registry of Identification and Civil Status (RENIEC), a constitutionally autonomous body, has overseen this transition. Building on the *Documento Nacional de Identidad Electrónico* (DNIe),[30] launched in 2013 with polycarbonate cards and cryptographic chips, RENIEC began piloting a MOSIP-based digital ID in 2025[31]—marking a shift toward interoperable and scalable identity as DPI.

The early DNIe improved security with X509 digital certificates but required smartcard readers, limiting usability and adoption. The move to a smartphone-based digital ID through the app ID Peru removes this barrier, enabling citizens to authenticate directly via mobile devices. RENIEC's updated platform, now incorporating facial biometrics, is designed for integration across government and private-sector services.

The 2008 Law of Digital Signatures and Certificates provided the initial mandate for the ID, followed by the 2018 Digital Government Law[32] and its 2021 regulations, which placed digital identity at the centre of e-government strategy. "There are a lot of factors that, in this period, came together: the digital leadership, the economic development of Peru during

30 Registry of Identification and Civil Status (RENIEC). "DNI Electrónico." Accessed October 28, 2025. https://identidad.reniec.gob.pe/dni-electronico.

31 Ayang Macdonald, "MOSIP Signs Peru Agreement, Commits to Inclusive Digital ID Pursuits in LATAM | Biometric Update," March 25, 2024, https://www.biometricupdate.com/202403/mosip-signs-peru-agreement-commits-to-inclusive-digital-id-pursuits-in-latam.

32 "Decreto Legislativo N.° 1412," Government of Peru, September 13, 2018, https://www.gob.pe/institucion/pcm/normas-legales/289706-1412.

this period of time, and the digital signature and certificate law was enacted," said Peru's Department of Certification and Digital Services of Peru's National Registry of Identification and Civil Status (RENIEC).[33] RENIEC's high levels of citizen trust and constitutional autonomy have helped sustain progress. Partnerships with the Inter-American Development Bank (IDB) provided financial and technical support, while adopting MOSIP's open-source model aims to consolidate these gains to ensure cost-effectiveness; long-term sustainability will be achieved through the resources allocated by the Ministry of Economy and Finance for the Peruvian government's digital transformation project.

The physical DNIe remains in circulation to ensure access where connectivity challenges exist, though uptake has been constrained by hardware requirements. The digital ID, based on verifiable credentials, is expected to significantly expand usage by reducing costs and supporting new applications. RENIEC has piloted early use cases of digital ID issuance with the national bank and scholarship programmes, and is coordinating with other institutions to extend digital authentication across more public entities. While coverage is still limited, Peru's experience shows how legal mandates, institutional trust, and open-source technologies can be leveraged to modernise identity systems and broaden access.

SNAPSHOT:

- **Launch Timeframe:** RENIEC DNIe introduced in 2013; MOSIP-based digital ID pilot started in 2025
- **Core Functions:** Identity, credential and authentication for citizens, evolving from smartcard to mobile with verifiable credentials
- **Technology Base:** Transition from smartcard with cryptographic chip (DNIe) to MOSIP-based smartphone authentication with facial biometrics and live verification
- **Legal Framework:** Law of Digital Signatures and Certificates; Digital Government Law (2018) and regulations (2021)
- **Adoption & Usage:** DNIe is still active but constrained by hardware; mobile digital ID piloted with banks and scholarship programs; expansion is planned across public services
- **Design Principles:** Security, cost reduction, wider accessibility, and alignment with DPI principles through open-source MOSIP
- **Key Outcomes:** RENIEC expanded citizen authentication options, removing hardware barriers and strengthening trust

Tanzania's Jamii X-Change

Tanzania's Jamii X-Change was launched in 2024 as part of the country's ten-year National Digital Economy Framework (to 2034), which aims to build enabling digital infrastructure, strengthen governance capacity, and foster inclusive economic growth. The system is built as a three-layer "Jamii Stack" composed of the Jamii Namba (digital identity), Jamii X-Change (data exchange), and Jamii Pay (digital payments). Together, these layers provide a foundation for identifying citizens, enabling seamless data sharing, and facilitating secure transactions. By mid-2025, more than 25 million Tanzanians had been issued a Jamii Number,[34] with Jamii X-Change supporting 14 operational data exchange gateways.

Jamii X-Change was designed around the core criteria of privacy, consent, interoperability, resilience, and reliability. Mohamad Mashaka, Director of Information Systems and Services Development at the Ministry of Information, Communications, and Information Technology, said: "When the President came into power back in 2021, the first instruction to us was to make sure the systems talk to one another; we have to share data".[35] By 2025, 898 systems were exchanging data through the platform with 14 from public institutions and the remainder from private entities. This architecture avoids one-off integrations by letting institutions connect once through a gateway, after which their data can flow securely across multiple agencies. The system incorporates redundancy and secure data localisation, with a once-only principle ensuring that information collected by one government body can be reused across others.

33 Interview with Peru's Department of Certification and Digital Services of Peru's National Registry of Identification and Civil Status (RENIEC), Online. August 18, 2025.

34 Jamii Wallet: Tanzania's New Digital Gateway - IDEA, March 30, 2025, https://idea.co.tz/jamii-wallet-tanzania/.

35 Interview with Mohamad Mashaka and Daniel Sarungi, Online. August 14, 2025.

A distinctive feature of Jamii X-Change is its distributed design. Unlike a traditional central "bus" model, each institution maintains its own connection path for transactions. This ensures that the exchange remains resilient even when individual systems or servers fail. As Engineer Daniel Sarungi described, even if the central server is offline for up to 72 hours, the gateways continue to communicate seamlessly without users noticing disruption.[36] This architecture was built with Tanzania's context in mind, where power fluctuations and network instability can be common, and reflects an emphasis on resilience as a design priority.

Tanzania has also gradually built the legal and standards environment to support the stack: the 2016 e-Government Interoperability Framework[37] established initial technical standards; the 2022 Personal Data Protection Act[38] and its regulations provided safeguards for privacy and security; and the 2024 National Digital Economy Framework[39] positioned the exchange within a unified governance model. This approach shows how legal reforms and infrastructure were advanced in parallel rather than sequentially.

With nearly 900 systems already connected, Jamii X-Change is beginning to demonstrate tangible outcomes. Sectoral use cases include improved access to healthcare and education through interoperable databases, as well as stronger fiscal resilience through streamlined tax administration and reduced leakages.

Its traction depends not only on the technology but also on complementary investments in digital skills, policy alignment, and institutional capacity-building, which remain ongoing.

The Tanzanian case shows how a holistic stack approach can serve as the backbone for an inclusive digital economy when coupled with sustained attention to governance, enabling infrastructure, and trust safeguards.

SNAPSHOT:

- **Launch Timeframe:** 2024 (under the National Digital Economy Framework 2024–2034)
- **Core Function:** Integrated "JamiiStack" linking digital identity (Jamii Number), data exchange (Jamii X-Change), and digital payments (Jamii Pay)
- **Technology Base:** 14 live interoperability sectoral gateways connecting systems through DPI, redundancy, and secure data localisation
- **Legal Framework:** e-Government Interoperability Framework (2016); Personal Data Protection Act (2022); National Digital Economy Framework (2024), plus subsequent compliance and technical guidelines
- **Adoption & Usage:** 14 data exchange gateways live; 898 connected systems (514 public sector, ~384 private/semi-public) actively sharing information
- **Design Principles:** People-centred design, once-only principle, privacy by design, consent mechanism, interoperability, resilience, reliability
- **Key Outcomes:** Strengthened service delivery; interoperable databases improving access to health and education; robust foundation for future cross-border data sharing

36 Interview with Mohamad Mashaka and Daniel Sarungi, Online. August 14, 2025.

37 "E-Government Interoperability Framework – Standards and Technical Guidelines," Tanzania's e-Government Agency, February 2016, https://www.ega.go.tz/uploads/standards/sw-1574945623-inter.pdf.

38 "The Personal Data Protection Act, 2022," The United Republic of Tanzania - Office of The Attorney General, 2022, https://oagmis.oag.go.tz/portal/acts/237.

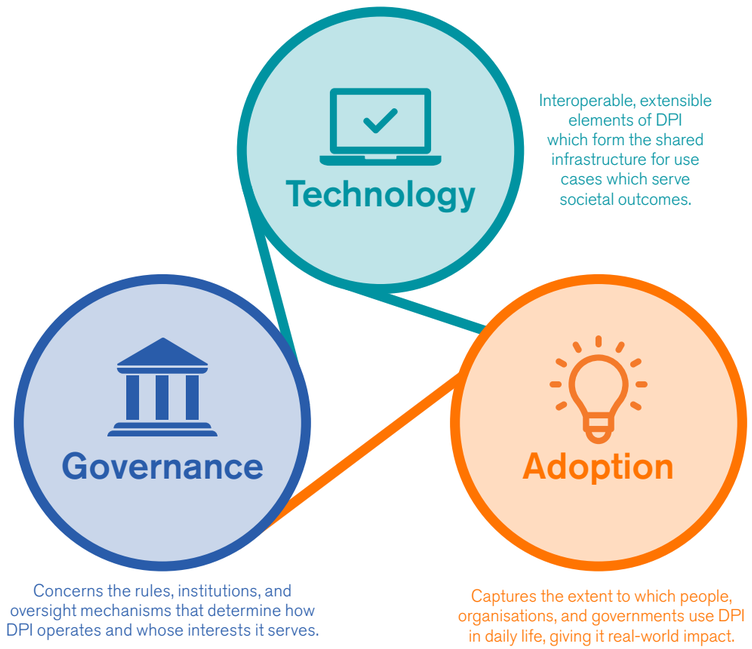
39 "Tanzania Digital Economy Strategic Framework 2024-2034," United Republic of Tanzania, 2024, https://ictc.go.tz/storage/44/01J5TJNDHDVTA3AHVQN9CR6BV7.pdf.

3. The State of DPI Measurement

3. The State of DPI Measurement

At its core, the global picture of DPI can be understood and assessed through three interlinked values which encompass all attributes and features: technology, governance, and adoption (see figure 4). Taken together, these values provide a lens for assessing not only the mechanics of DPI but also what evidence for effective systems could look like.

Figure 5: DPI Measurement Values



Finding #6: Despite progress on measuring DPI, it's unclear whether it correlates with performance.

At first glance, attributes such as interoperability and extensibility lend themselves well to mapping exercises because many associated features can be expressed as binary or categorical variables — for example, whether a digital ID enables know-your-customer information collection or if a data exchange system has real-time sharing.

But while these measures are straightforward to collect, they risk being one-dimensional: a "yes/no" can capture presence, but isn't as clearly tied to performance. Many approaches to measurement — like the UN E-Government Survey[40] — rely on similar proxies to assess outcomes and impacts. The DPI Map approaches this by capturing technical features such as digital authentication using biometric data or facial recognition, interoperability policies which outline diverse service providers as a goal, and types of participants (e.g. bank and non-bank for payments).

As Daniel Abadie noted in the CoP, the real value of interoperability lies in what it delivers: continuity of services, faster data transfer, portability of credentials, cross-sector and cross-border sharing, and improved data flows that enable new technologies.[41] Robin Berjon highlighted that true effectiveness requires institutional mechanisms that continuously test interoperability in real-world conditions rather than merely documenting technical specifications or policy intentions.[42]

As seen in our CoP sessions, these broader frames are often harder to measure or encapsulate in simple metrics (e.g. the messy and anecdotal accounts of user experience; the frictions and exclusions that can emerge from imperfect implementations), and are therefore frequently pushed aside or deprioritised.

Finding #7: Governance measurements identify the prevalence of legal frameworks and oversight bodies but cannot assess enforcement capacity.

Governance attributes such as oversight, privacy, and inclusion are conceptually and empirically difficult to measure. They bundle formal structures (laws, institutions) with informal norms (trust, political independence) that are rarely measured consistently. It's straightforward to identify whether a country has a data protection law, oversight body, or grievance mechanism, but rarely assess *how well* these mechanisms function. Even where strong regulatory scaffolds exist, their enforcement, scope, and independence are likely to vary enormously.

Additionally, while DPI can foster economic activity, safeguard rights, and improve quality of life,[43] tensions between different interventions inevitably arise: open access to information can clash with intellectual property protections, and privacy may

40 "UN E-Government Survey 2024." Accessed October 23, 2025. https://publicadministration.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2024.

41 "Session 2: Measuring DPI Interoperability," 2025, https://dpimap.org/measurement-community/session-2/.

42 "Session 2: Measuring DPI Interoperability," 2025, https://dpimap.org/measurement-community/session-2/.

43 Mazzucato, M., Eaves, D., & Vasconcellos, B. (2024). Digital public infrastructure and public value. *UCL IIPP.*

require trade-offs with security. This makes it challenging to place a value judgement on elements of governance which vary in different contexts.

The DPI Map treats governance as an "enabling environment" for effective DPI that operates in the public interest, coding for the existence of such laws and institutions while acknowledging that quality and compliance can be uneven. Demonstrating the prevalence of these elements through the Map is a critical step that will feed well into further research into what other aspects of a law or the surrounding environment strengthen DPI and its outcomes.

Finding #8: Adoption metrics are diverse, and data availability is lacking.

Adoption indicators like uptake and usage are often the most intuitive to track, but don't necessarily translate to reliable proxies for *impact*. Many national sources report impressive registration rates or transaction volumes, yet these figures can conceal exclusion and inequality, which are often exacerbated by existing inequalities. Adoption data, especially in identity systems, is often self-reported or aggregated in ways that obscure who is left out.

Dual-level metrics, such as those identified during the CoP sessions, highlight the importance of both:[44]

1. Participant adoption: The number and diversity of government agencies, private firms, or NGOs using DPI for service delivery.
2. Population adoption: The proportion of individuals accessing DPI systems and DPI-enabled services, especially among vulnerable or hard-to-reach groups.

This is an underdeveloped area of the DPI Map, which primarily captures whether multiple sectoral use cases are enabled for Digital IDs, and which types of transactions are supported for payment systems.

44 "Session 1: Measuring DPI Inclusion," 2025, https://dpimap.org/measurement-community/session-1/

4. Future of DPI

4. Future of DPI

As DPI adoption grows, the research is shifting from defining and designing baseline systems to developing frameworks that assess how these infrastructures mature, expand across sectors, and demonstrate impact over time.

Towards a Maturity Model

Maturity models have long helped digital teams chart progress from early capacity-building to fully institutionalised, innovative platforms. Models like the Canadian Digital Service's Product Maturity Model[45] and the United Arab Emirates' Digital Government Maturity Model[46] show the value of structured stages that capture not only technical capability but also governance and user outcomes. Applied to DPI, such a model could trace systems from pilot phases through rollout to sustained operation with built-in mechanisms for feedback and iteration.[47] Such thinking provides a shared language for benchmarking progress and identifying gaps.

Rise of Sectoral Adoption

Within countries, sectoral adoption varies: health, education, and social protection services may integrate DPI at different speeds depending on policy priorities, institutional capacity and resource availability. Mapping sectoral uptake will therefore be critical to understanding not just national progress, but also the extent of DPI's reach and how well it enables service delivery.

Advancing Impact Measurement

While many DPI efforts are still in their early stages, a growing number are moving toward large-scale deployment. Developing shared tools—like the IIPP's Economics of Shared Digital Infrastructure framework[48] and the UN's Universal Safeguards for DPI Assessment Framework[49]—for understanding what constitutes effectiveness will be essential to guiding investments, informing governance choices, and ensuring digital infrastructure serves the public interest.

45 Dan Monafu and Nisa Malli, "Measuring Progress: A Product Maturity Model for Digital Government - Canadian Digital Service," November 5, 2024, https://digital.canada.ca/2024/11/05/measuring-progress-a-product-maturity-model-for-digital-government/

46 "United Arab Emirates Digital Government Maturity Model (UAEDGMM)," Telecommunications and Digital Government Regulatory Authority, 2012, https://dgov.tdra.gov.ae/-/media/dgov/pdfs/publications/uae-digital-government-maturity-model-en.pdf

47 Airan, A., Hodigere, S., Sridharan, S., & Natarajan, S. (2024). The Governance of Digital Public Infrastructure. Aapti Institute. https://aapti.in/wp-content/uploads/2024/06/Aapti-x-ONI-India-Paper_compressed.pdf

48 David Eaves et al., "The Economics of Shared Digital Infrastructures," UCL Institute for Innovation and Public Purpose, March 31, 2025, https://www.ucl.ac.uk/bartlett/public-purpose/publications/2025/mar/economics-shared-digital-infrastructures.

49 UN Universal Safeguards for Inclusive Digital Public Infrastructure." September 2024, https://www.dpi-safeguards.org/

5. How to Get Involved

5. How to Get Involved

To support continued learning and evolution of DPI measurement practices, we invite members of the community to engage with us according to their interests. DPI's long-term success depends on the collective contributions of people in a variety of roles.

Below are five ways to contribute to furthering this work.

1. Join the IIPP Community of Practice

We invite all who are interested to join the IIPP Community of Practice on DPI Measurement (dpimap.org/measurement-community). Participants can join virtual sessions in this open forum and propose new topics for exploration via a short session proposal form. Topics range from ways to measure interoperability to inclusivity, often featuring presentations from experts in their respective fields. Insights from sessions are published on our blog, helping to share lessons across contexts.

Participants are encouraged to subscribe to the DPI Map newsletter to receive updates on upcoming sessions, new dataset releases, and the latest analysis from the IIPP digital team and our collaborators.

2. Engage with the data

There are multiple ways to engage directly with the dataset, whether by integrating it into your work, identifying new correlations, or surfacing critical gaps:

- **Researchers** are welcome to leverage the statistical version of the DPI dataset, which offers a more granular view for deeper analysis.
- **Technical implementers** are encouraged to apply findings to strengthen systems design and improve implementation practices.
- **Evaluators and advocates,** including civil society organisations, can draw on the data to identify opportunities to push for more equitable and impactful infrastructure.
- **Governments, multilateral organisations and donors** can use the dataset to identify opportunities for technical assistance, target resources to countries with high potential, or track progress toward regional and global commitments.

To support your use of the data, we also provide methodology briefs, codebooks, and visualisations to aid interpretation.

3. Put evaluation frameworks into practice

Evaluation frameworks offer a structured way to assess whether systems are actively serving the public interest by examining whether they uphold values such as equity, accountability, inclusion, and trust. These tools help governments critically assess trade-offs from early-stage design to long-term implementation, and better align infrastructure investments with long-term societal outcomes.

When used consistently, these frameworks can serve as a compass for course correction and shared learning. With widespread adoption, global DPI efforts can become anchored in a vision of infrastructure that strengthens public institutions and promotes digital rights. At the same time, we recognise that public interest is not a fixed concept. We encourage adaptation of these frameworks to local contexts. Their strength lies not in prescribing a single path, but in enabling dialogue and accountability.

4. Conduct further research

There is a significant need for continued research and reflection to deepen our understanding of DPI systems, their evolution, and their social impacts. As countries move from pilot projects to scaled deployments, important questions remain:

- How might we meaningfully measure the adoption of DPI and the public value it creates?
- How might we better measure the enforcement of DPI laws and legislation?
- How might we better link proxy metrics to DPI system performance?

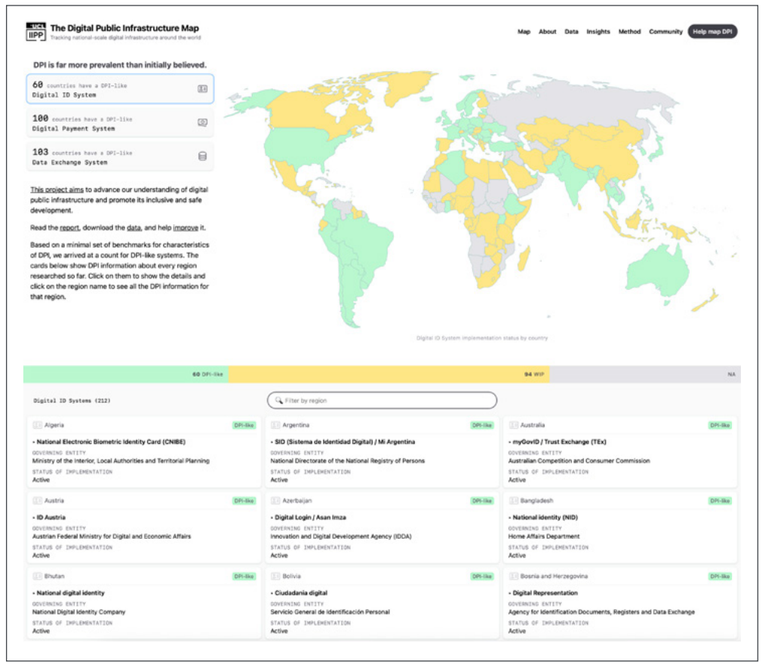
If you're conducting or planning research in this space, we invite you to reach out. We are actively seeking collaborations for data sharing and methodology refinement to improve the field's evidence base.

5. Construct a data schema

We aim to create a globally accepted data reporting framework for tracking the development, implementation, and performance of Digital Public Infrastructure (DPI) systems across countries. This schema will capture core data for each DPI domain, while remaining extensible for new variables and sub-national entries. Not only will this encourage countries to contribute data to the map, but it will also enable consistent assessment and coordination in DPI investment and policy effectiveness. We're currently looking to connect with countries that are interested in contributing to early iterations of this schema.

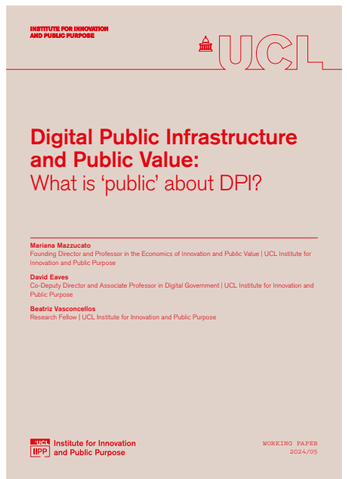
6. Want to Dive Deeper?

Check out the following reports, working papers, and other resources.



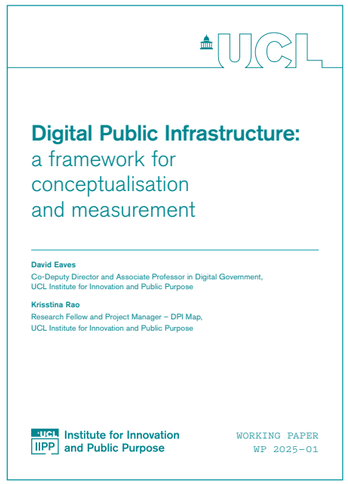
DPI Map Website

https://dpimap.org/



What is 'Public' about Digital Public Infrastructure

https://www.ucl.ac.uk/bartlett/publications/2024/mar/digital-public-infrastructure-and-public-value-what-public-about-dpi



Digital Public Infrastructure: A framework for conceptualisation and measurement

https://www.ucl.ac.uk/bartlett/publications/2025/jan/digital-public-infrastructure-framework-conceptualisation-and-measurement

Economics of Shared Digital Infrastructures: A framework for assessing societal value

https://www.ucl.ac.uk/bartlett/sites/bartlett/files/2025-04/the_economics_of_shared_digital_infrastructures.pdf

Leveraging digital public infrastructures for the common good to promote inclusive and sustainable economic development in Brazil

https://www.ucl.ac.uk/bartlett/publications/2024/nov/leveraging-digital-public-infrastructures-common-good

References

50-in-5. “50-in-5.” Accessed October 28, 2025. https://50in5.net/.

Airan, Avani, Surabhi Hodigere, Soujanya Sridharan, and Sarayu Natarajan. “The Governance of Digital Public Infrastructure.” Aapti Institute, June 15, 2024. https://aapti.in/blog/the-governance-of-digital-public-infrastructure/.

Macdonald, Ayang. “MOSIP Signs Peru Agreement, Commits to Inclusive Digital ID Pursuits in LATAM | Biometric Update.” March 25, 2024. https://www.biometricupdate.com/202403/mosip-signs-peru-agreement-commits-to-inclusive-digital-id-pursuits-in-latam.

BIS. “Project Nexus: Enabling Instant Cross-Border Payments.” August 27, 2025. https://www.bis.org/about/bisih/topics/fmis/nexus.htm.

Clark, J, G Marin, O.P. Ardic Alper, and G.A. Galicia Rabadan. “Digital Public Infrastructure and Development: A World Bank Group Approach.” World Bank Group, March 2025. https://documents1.worldbank.org/curated/en/099031025172027713/pdf/P505739-84c5073b-9d40-4b83-a211-98b2263e87dd.pdf.

Government of Peru. “Decreto Legislativo N.° 1246.” November 10, 2016. https://www.gob.pe/institucion/pcm/normas-legales/118073-1246.

Government of Peru. “Decreto Legislativo N.° 1412.” September 13, 2018. https://www.gob.pe/institucion/pcm/normas-legales/289706-1412.

Government of Peru. “Plataforma de Interoperabilidad del Estado (PIDE).” 2025. https://www.gob.pe/741-plataforma-de-interoperabilidad-del-estado-pide.

“DPI Exemplar Stories: Tanzania Stack,” Co-Develop, November 2024. https://drive.google.com/file/d/1KwOs0e8TMnIFLAH4R32-VVoPmyldflhD/.

DPI Map Methodology. “DPI Map.” April 9, 2025. https://dpimap.org/methodology.

“DPI Overview | Centre for Digital Public Infrastructure.” August 26, 2024. https://docs.cdpi.dev/the-dpi-wiki/dpi-overview.

“E-Government Interoperability Framework – Standards and Technical Guidelines,” Tanzania’s e-Government Agency, February 2016, https://www.ega.go.tz/uploads/standards/sw-1574945623-inter.pdf.

Eaves, David, Diane Coyle, Beatriz Vasconcellos, and Sumedha Deshmukh. “The Economics of Shared Digital Infrastructures.” UCL Institute for Innovation and Public Purpose, March 31, 2025. https://www.ucl.ac.uk/bartlett/public-purpose/publications/2025/mar/economics-shared-digital-infrastructures.

Eaves, David, and Krisstina Rao. *Digital Public Infrastructure: A Framework for Conceptualisation and Measurement.* 2025. https://www.ucl.ac.uk/bartlett/publications/2025/jan/digital-public-infrastructure-framework-conceptualisation-and-measurement.

Eaves, David, and Jordan Sandman. “What Is Digital Public Infrastructure?” *UCL IIPP Blog*, April 14, 2023. https://medium.com/iipp-blog/what-is-digital-public-infrastructure-6fbfa74f2f8c.

Estonian Centre for International Development (ESTDEV). “Cybernetica to Develop Interoperability Framework in Kenya.” April 30, 2024. https://estdev.ee/en/articles/cybernetica-develop-interoperability-framework-kenya.

“European Digital Identity - European Commission.” Accessed October 19, 2025. https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-digital-identity_en.

Jong-Sung Hwang, *New Journey to Digital platform Government*, March 22, 2023, https://thedocs.worldbank.org/en/doc/61714f214ed04bcd6e9623ad0e215897-0400012021/related/S2-Korea-s-Digital-Platform-Government.pdf.Hwang, Jong-Sung. New Journey to Digital Platform Government. March 22, 2023.

“ID4D Annual Report 2023.” World Bank Group, 2023. https://documents1.worldbank.org/curated/en/099647503042425828/pdf/IDU-a9d1a6be-30dc-48e6-9318-cf9d26959fb9.pdf.

“Interoperable Europe Act.” Accessed October 20, 2025. https://interoperable-europe.ec.europa.eu/interoperable-europe/interoperable-europe-act.

Jamii Wallet: Tanzania’s New Digital Gateway - IDEA. March 30, 2025. https://idea.co.tz/jamii-wallet-tanzania/.

"Latin America and the Caribbean-Africa Peer Exchange on Administrative Data." Global Partnership for Sustainable Development Data and Cepei, 2019. https://www.data4sdgs.org/sites/default/files/services_files/Peer%20Exchange%20on%20Admin%20Data_Report_0.pdf.

Mazzucato, Mariana, David Eaves, and Beatriz Vasconcellos. "Digital Public Infrastructure and Public Value." UCL IIPP, 2024. https://www.ucl.ac.uk/bartlett/publications/2024/mar/digital-public-infrastructure-and-public-value-what-public-about-dpi.

McConvey, Joel. "Australia's Digital ID Landscape in Danger of Becoming Siloed | Biometric Update." October 23, 2024. https://www.biometricupdate.com/202410/australias-digital-id-landscape-in-danger-of-becoming-siloed.

Monafu, Dan, and Nisa Malli. "Measuring Progress: A Product Maturity Model for Digital Government - Canadian Digital Service." November 5, 2024. https://digital.canada.ca/2024/11/05/measuring-progress-a-product-maturity-model-for-digital-government/.

PAPSS. "PAPSS - Make Instant and Secure Cross-Border Payments in Local Currencies across Africa." Accessed October 9, 2025. https://papss.com/.

Randall, Douglas, Maria Teresa Chimienti, Jon Frost, and Carlos Cantú. "A Fast Payments Revolution in Latin America." World Bank Blogs, June 26, 2024. https://blogs.worldbank.org/en/latinamerica/fast-payments-revolution-latin-america.

Registry of Identification and Civil Status (RENIEC). "DNI Electrónico." Accessed October 28, 2025. https://identidad.reniec.gob.pe/dni-electronico.

"Session 0: Launch." Accessed August 3, 2025. https://3cbb796c.dpi-map.pages.dev/measurement-community/session-0/.

"Session 1: Measuring Inclusion." 2025. https://3cbb796c.dpi-map.pages.dev/measurement-community/session-1/.

"Session 2: Measuring DPI Interoperability." 2025. https://dpimap.org/measurement-community/session-2/.

"Tanzania Digital Economy Strategic Framework 2024-2034," United Republic of Tanzania, 2024, https://ictc.go.tz/storage/44/01J5TJNDHDVTA3AHVQN9CR6BV7.pdf.

The United Republic of Tanzania - Office of The Attorney General. "The Personal Data Protection Act, 2022." 2022. https://oagmis.oag.go.tz/portal/acts/237.

"UN Universal Safeguards for Inclusive Digital Public Infrastructure." September 2024. https://www.dpi-safeguards.org/.

"United Arab Emirates Digital Government Maturity Model (UAEDGMM)." Telecommunications and Digital Government Regulatory Authority, 2012. https://dgov.tdra.gov.ae/-/media/dgov/pdfs/publications/uae-digital-government-maturity-model-en.pdf.

U.S. Department of Homeland Security Transportation Security Administration. "REAL ID Mobile Driver's Licenses (mDLs) | Transportation Security Administration." Accessed August 28, 2025. https://www.tsa.gov/real-id/real-id-mobile-drivers-license-mdls.

Vasconellos, Beatriz, and David Eaves. "Digital Public Infrastructure Is the New Global Tech Bet—But Everyone's Betting on Something Different." Tech Policy Press, April 1, 2025. https://techpolicy.press/digital-public-infrastructure-is-the-new-global-tech-bet-but-everyones-betting-on-something-different.

World Bank. "A Digital Stack for Transforming Service Delivery ID, Payments, and Data Sharing." February 22, 2022. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/en/099755004072288910.

World Bank. "GovTech Maturity Index (GTMI)." Accessed October 28, 2025. https://www.worldbank.org/en/programs/govtech/gtmi.

World Health Organization. "Global Digital Health Monitor." Accessed October 28, 2025. https://data.who.int/dashboards/gdhm/overview.

Appendix

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Appendix 2: Synthesis of Attributes of DPI

Category	Attribute
Functions	**Foundational societal functions** Designed to serve foundational functions for society, DPI is designed towards certain commonly understood functions of a digital society. This includes three functions in particular: 1) digital authentication, 2) digital transactions and 3) data exchange. These societal functions are understood to be achieved through three interconnected systems respectively – digital identity, digital payment and data exchange systems. The fundamental functions of DPI may be leveraged to generate economic value for its adopters and implementers, which speaks to the realised potential of digital economies.
Technology	**Interoperability and extensibility** Interoperability refers to the ability of digital systems and components to communicate with each other, reflecting the 'infrastructure' nature of the technology. Extensibility refers to the ability of the technology to be foundational and bare-bones, such that it can be stretched to build its functionality as needed. It reflects the relevance of the technology to a diverse set of public and private actors using it as infrastructure to serve societal outcomes. DPI can also favour modularity, reflecting its composition of a set of building blocks that can be put together or broken apart as necessary. It can also be federated and decentralised, to allow an amalgamated set of services to serve one function. Technology with both open as well as closed (or proprietary) source code can be interoperable and extensible. However, the norm of interoperability favours open standards so as to facilitate higher adoption among more actors in a consensus-driven way.
Public-interest values (in no specific order)	**Transparency, accountability and oversight** Transparency reflects the quality of DPI being open and accessible regarding its processes and outputs throughout the design and adoption process. Accountability and oversight reflect the role of system operators and governors in ensuring that the digital technology, now essential to the functions of society, can be trusted by its users and by society at large. It implies accountable design through technology's design features, as well as external accountability as ensured through oversight by legal actors in society.
	Privacy, safety and security Given the inherent access that DPI has to personal information and data, protecting this information against threats to the privacy, safety and security of individuals is a necessary norm for DPI to be trusted by its users.
	Non-discrimination and inclusion DPI can exacerbate existing issues around individual access to basic services, curtailing human rights. For DPI to be inclusively designed, it needs to not only accommodate peripheral access but also keep inclusive design at the centre of its philosophy.
Adoption context	**Capacity and coordination** Reflects the institutional arrangement within which the implementation of DPI is housed. For states, this refers to the novel and existing capacity that needs to be developed to respond to the DPI mandate. This capacity could house the DPI itself or be tasked with coordinating with nonstate actors to implement the DPI.
	Scale of adoption The adoption of DPI by multiple agencies for public service delivery is an intrinsic DPI norm because it reflects the success of its 'infrastructure' potential. This attribute also hints at the interoperability, reflecting whether agencies (state or non-state) other than the one where the DPI is housed can communicate with this piece of infrastructure.

Source: Eaves and Rao, 2025, p. 18

Appendix 3:
Variables to Measure Digital ID Systems as DPI

Attribute Category	Attribute	Variable	Variable from Codebook
Technology	Interoperability and extensibility	1.1	**Digital authentication function**
		1.2	**Enables KYC packet collection for service provision**
		1.3	**Authentication is possible through a government portal**
Public Interest Values	Transparency, accountability, and oversight	1.1	**ID Act codifies digital ID legal status**
		1.2	Governing entity
		1.2	Institutional governance structure
		1.3	Court oversight of digital ID system
		1.4	**Accountability of ID executors to authority**
		1.5	Legally binding redress mechanism
		1.6	**Personal data collection, storage and sharing terms are publicly available**
	Privacy, safety and security	3.1	**National Data Protection Act exists**
		3.2	**ID Act or secondary policy sets up procedural rules for digital ID**
		3.3	**Processes to notify individuals about personal data leaks are in place**
	Inclusion and non-discrimination	4.1	**Data handling terms**
Adoption Context	Capacity and coordination	NA	NA
	Scale of Adoption	6.2	**Two or more sectoral use cases enabled**

Note: The eleven bold variables are binary and are included in our report analysis referenced in the methodology section.

Appendix 4:
Variables to Measure Payment Systems as DPI

Attribute Category	Attribute	Variable	Variable from Codebook
Technology	Interoperability and extensibility	1.1	**Interoperability policy**
		1.2	**1. Bank participation** **2. Non-bank participation** 3. "No. of participants* (PSPs) *For regional payment systems > countries" 4. Annual value of transactions (USD) 5. Annual volume of transactions
		1.3	Type of settlement system
Public Interest Values	Transparency, accountability, and oversight	2.1	Operator
		2.2	**Participation conditions and rules**
	Privacy, safety and security	3.1	**Data-handling rules for payment system**
		3.2	**Reporting forum**
		3.3	**AML Law**
	Inclusion and non-discrimination	4.1	Types of transactions supported
		4.2	**QR code based transactions**
		4.3	Cost of transactions
Adoption Context	Capacity and coordination	NA	NA
	Scale of Adoption	6.1	Types of transactions supported

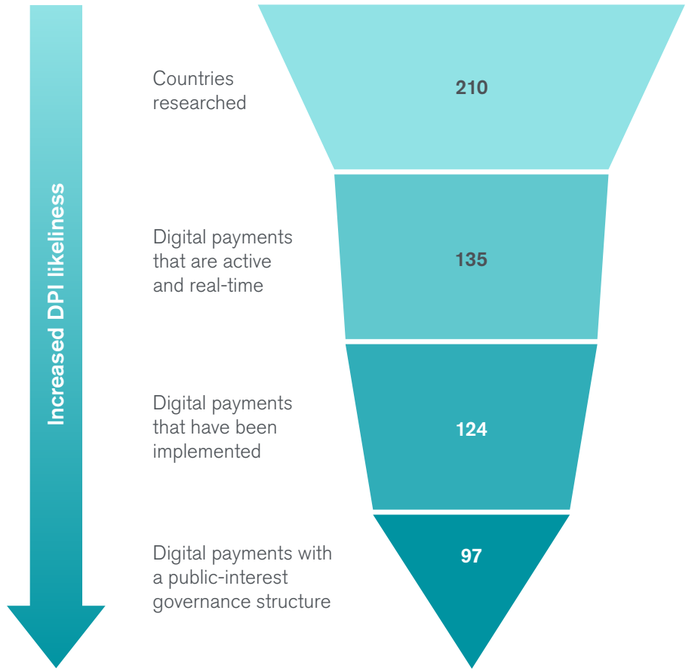
Note: The eight bold variables are binary and are included in our report analysis referenced in the methodology section.

Appendix 5:
Variables to Measure Data Exchange Systems as DPI

Attribute Category	Attribute	Variable	Variable from Codebook
Technology	Interoperability and extensibility	1.1	**Semantic interoperability within the DES is facilitated through either policy or technical means**
		1.2	**Data is shared in real-time through the DES**
		1.3	**The technology architecture of the DES is scalable**
Public Interest Values	Transparency, accountability, and oversight	2.1	1. Governing entity 2. Ownership
		2.2	**1. Enrolment and participation information** 2. Permitted participants
		2.3	**Audit mechanism**
	Privacy, safety and security	3.1	**Procedural rules for data management**
	Inclusion and non-discrimination	4.1	Coordination unit
Adoption Context	Capacity and coordination	5.1	**Used by more than one public entity**
	Scale of Adoption	NA	NA

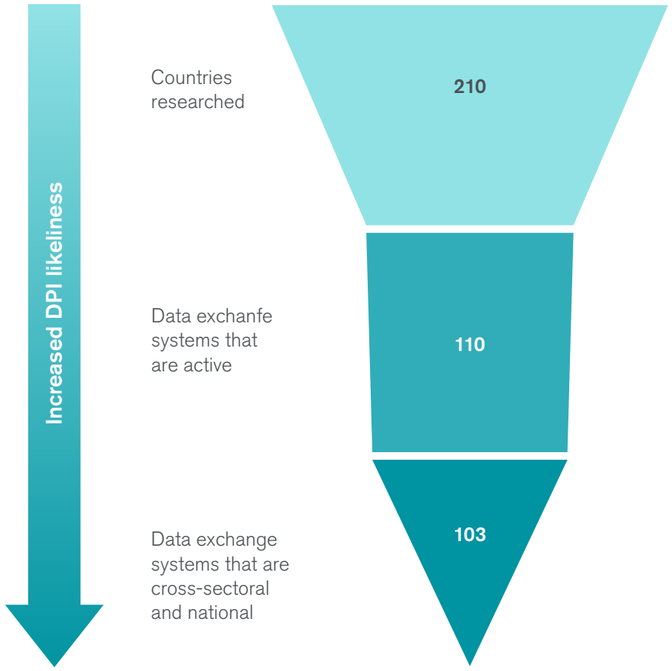
Note: The seven bold variables are binary and are included in our report analysis referenced in the methodology section.

Appendix 6:
Count of DPI-Like Payment Systems



Note: To identify DPI-like digital payment systems, we used the following criteria: 1) Include at least one digital payment platform in the 'implemented' stage that facilitates real-time; and 2) Are operated or overseen by a public interest entity (such as a central bank).

Appendix 7:
Count of DPI-Like Data Exchange Systems



Note: To identify DPI-like data exchange systems, we used the following criteria: 1) Are in the implementation phase; and 2) Are cross-sectoral and national.

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