



**DIGITAL PUBLIC
INFRASTRUCTURE**

Universal Safeguards



United Nations
Office of the Secretary-General's
Envoy on Technology



Safeguards in Action

Session agenda

- **Context Setting**
- **DPI Prevalence and Measurement of Public Value**
- **Success of ID enrollment and usage lies in trusted systems: Building with Safeguards**
- **Panel: Improving DPI outcomes with Safeguards Mindset: Country Approaches**
- **Fireside chat: How are organizations adopting Safeguards?**
- **Adoption is Key: Making Universal Safeguards User centric**

Measuring prevalence and public value of DPI

Krisstina Rao

Research Fellow and Manager –

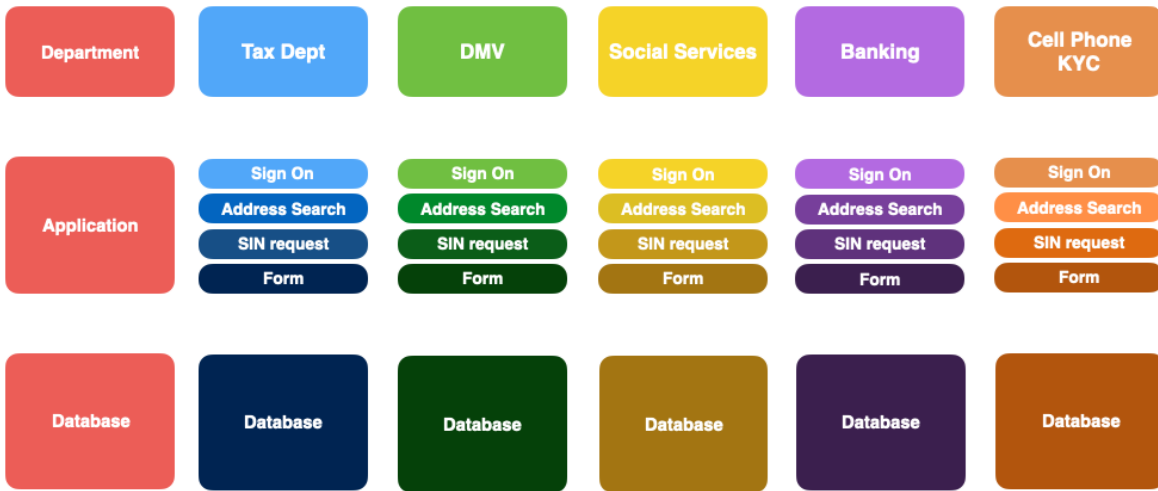
dpimap.org

Consultant, Co-Develop



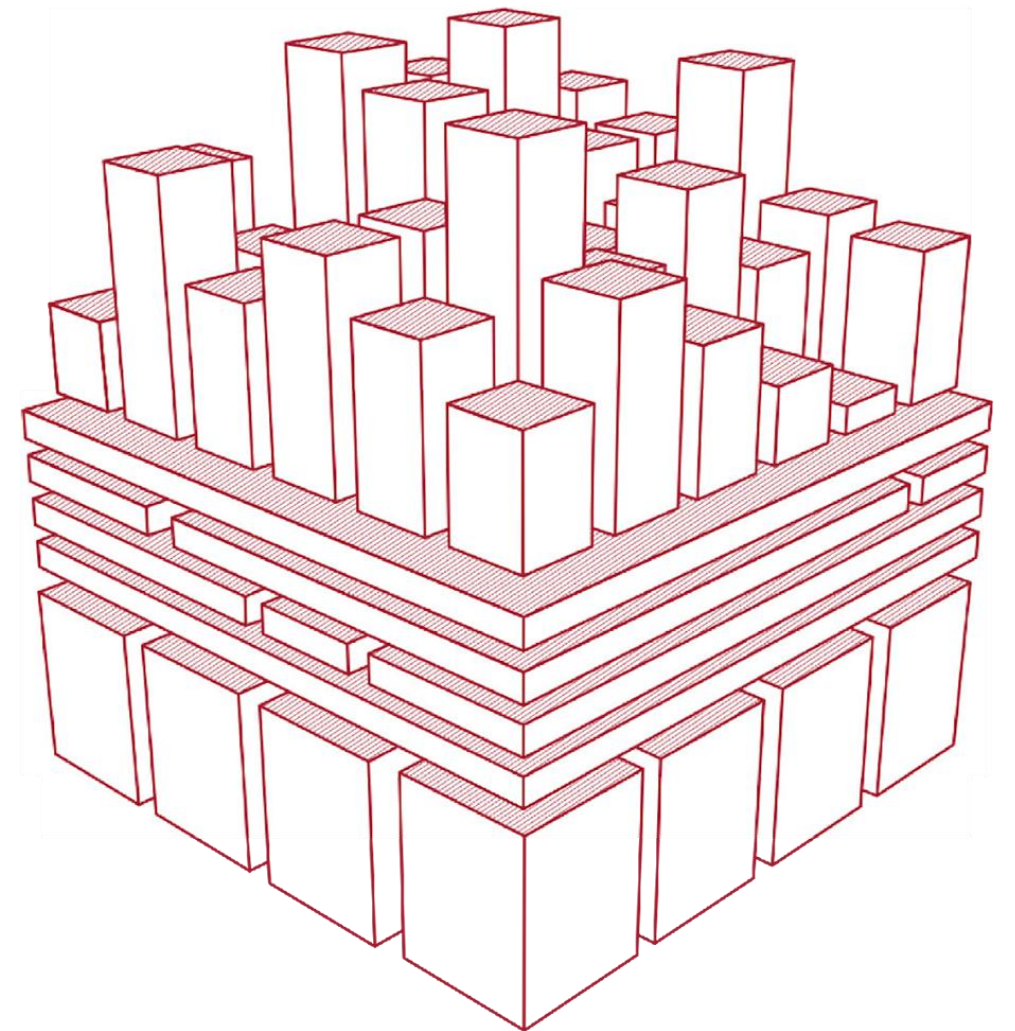
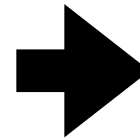
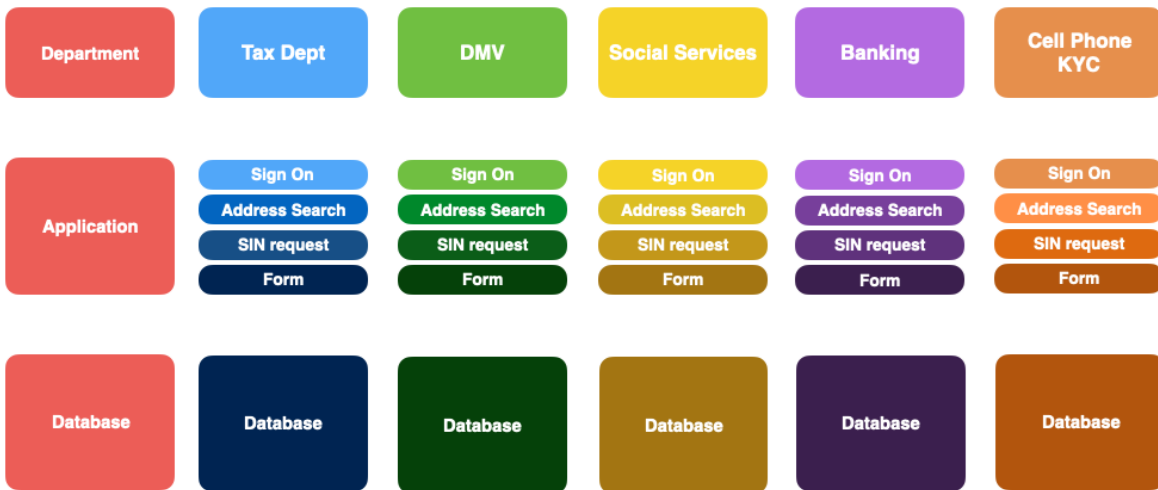
A big shift is happening!

Silo



Silo

Infrastructure



An aerial photograph of a coastal region, showing a road, water, and some buildings. The image is dimmed and serves as a background for the text.

We're calling these – **digital public infrastructure**. But what exactly is it?

How do we know, by looking at a digital system, that it is **infrastructure and not a siloed digital system**?

Do governments **adopt DPI in the same way** across the globe?

What makes a digital system, a DPI?



What makes a digital system, a DPI?



- Technology
- Safeguards
- Capacity
- Adoption
- Societal value!

Global State of DPI

57

countries with Digital
ID- DPI

93

countries with Digital
payments- DPI

103

countries with
data exchange- DPI

Global State of DPI

57

countries with Digital
ID- DPI

- Active and in operation
- Facilitate digital authentication
- Operational across 2 use cases

93

countries with Digital
payments- DPI

- Active and in operation
- Facilitate real-time transactions
- Have at least one payment system operated by the central bank

103

countries with
data exchange- DPI

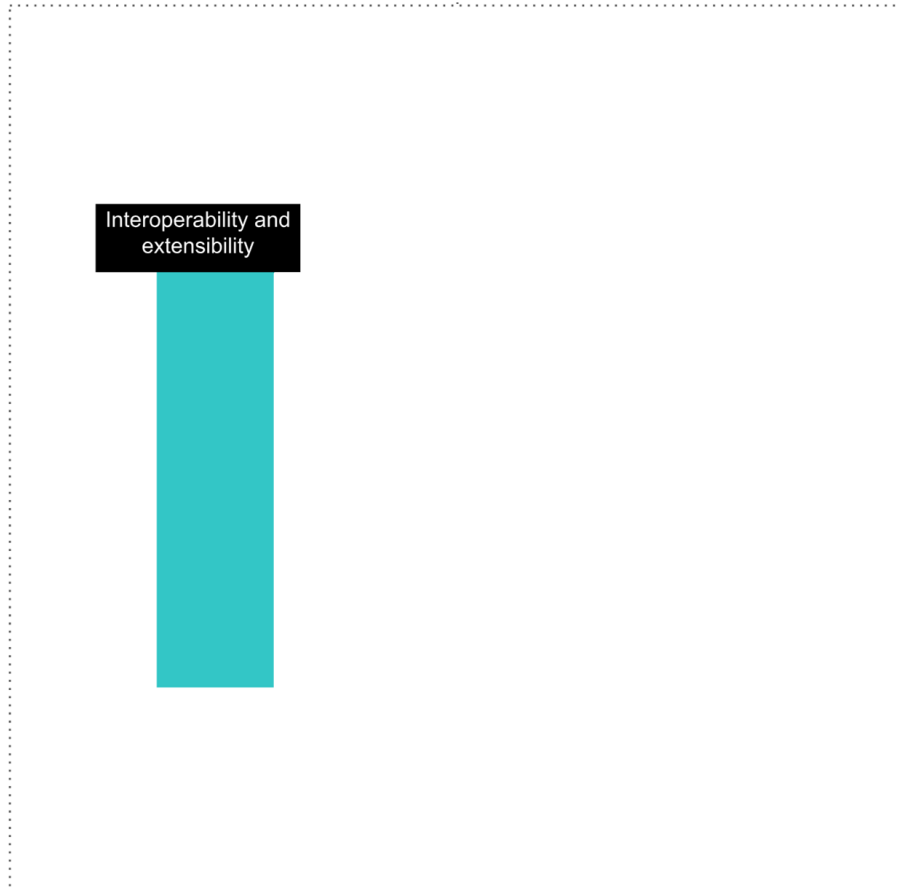
- Active and in operation
- Operates across-sectors

Six attributes of DPI

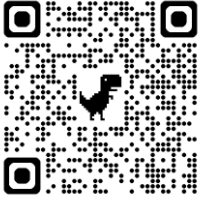


Technology and safeguards attributes:

1. Interoperability and extensibility

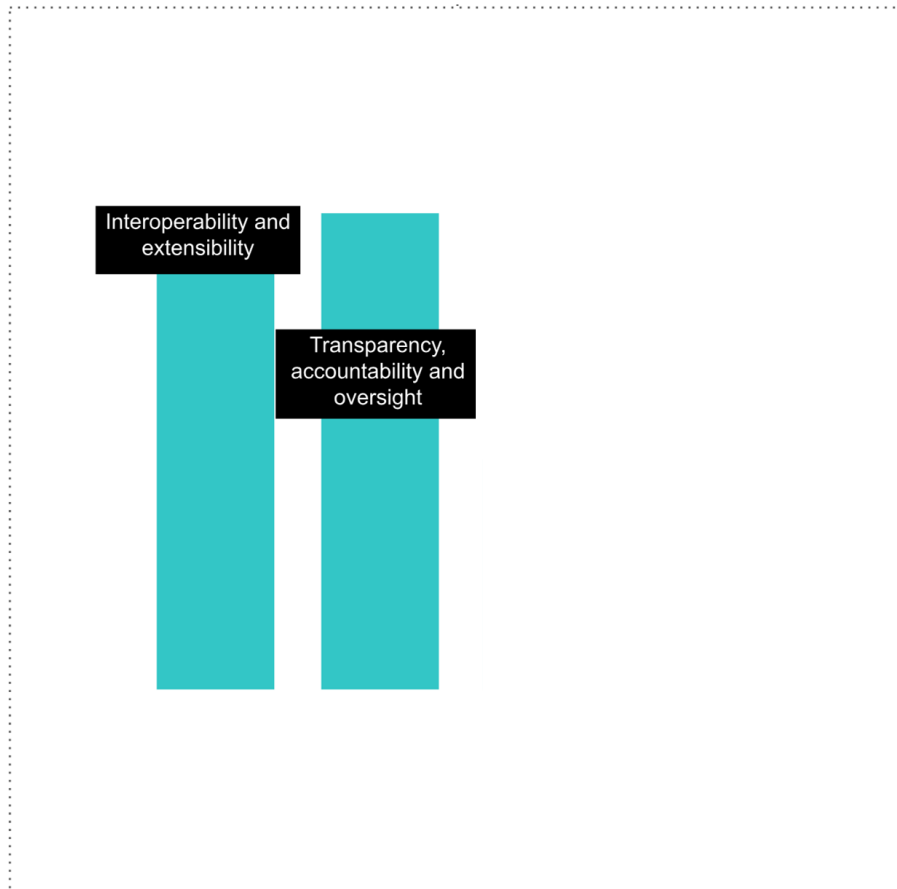


Six attributes of DPI



Technology and safeguards attributes:

1. Interoperability and extensibility
2. Transparency, accountability, oversight

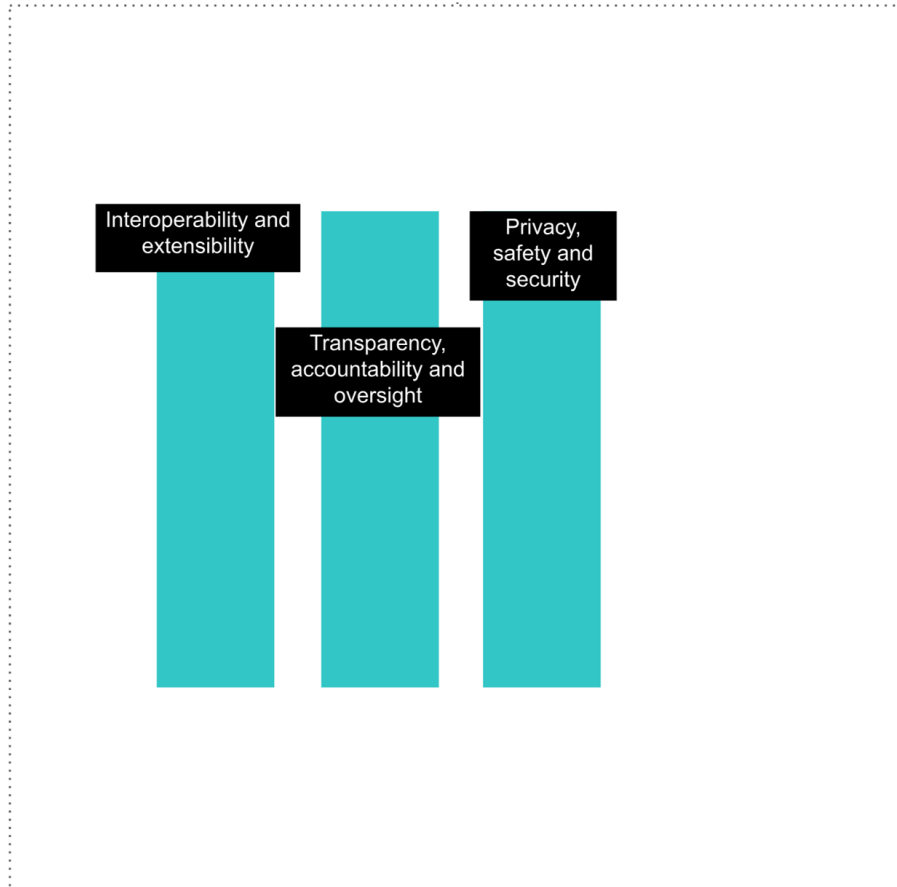


Six attributes of DPI

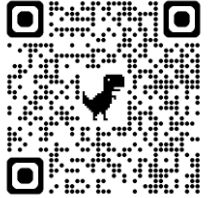


Technology and safeguards attributes:

1. Interoperability and extensibility
2. Transparency, accountability, oversight
3. Privacy, protection and safety

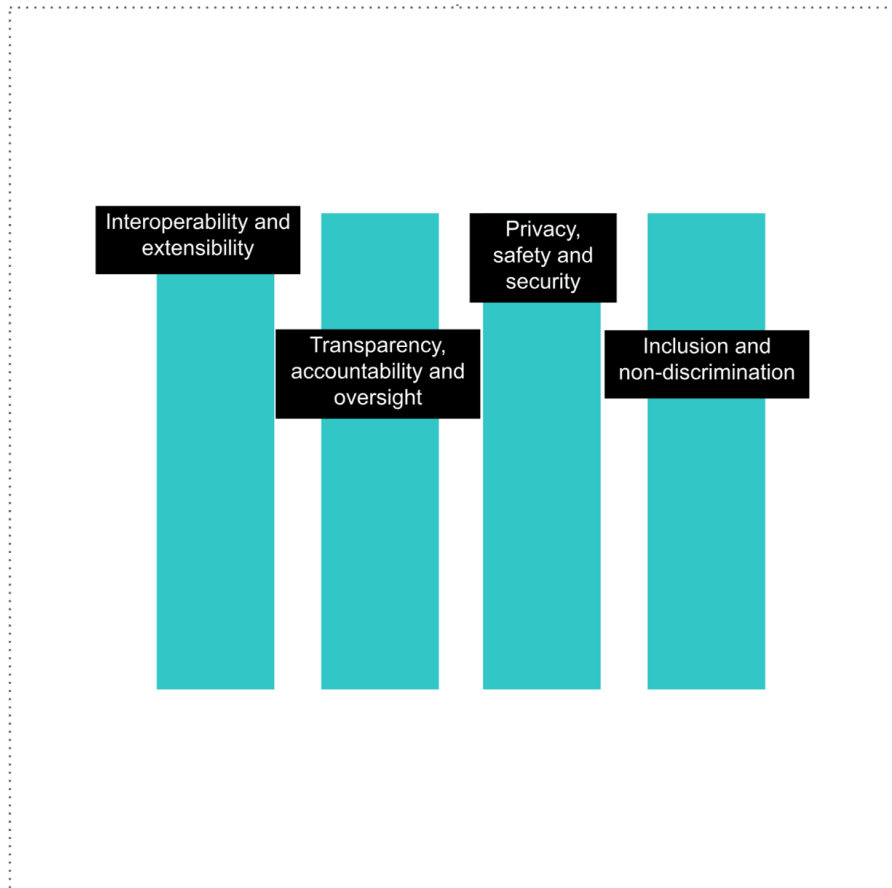


Six attributes of DPI

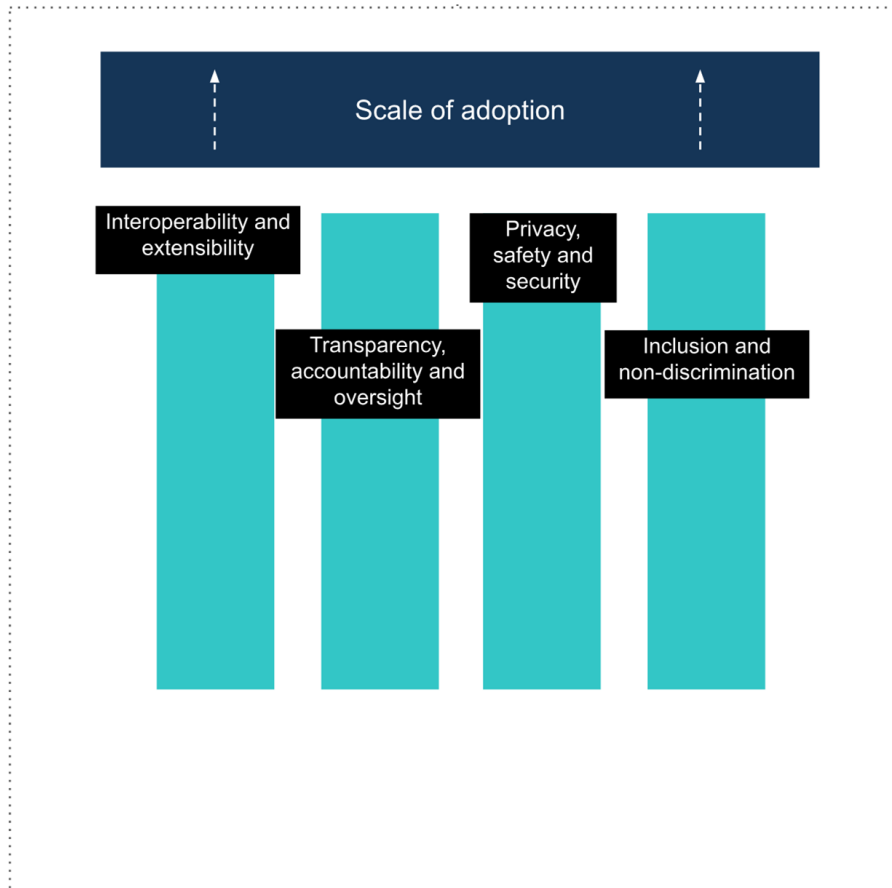
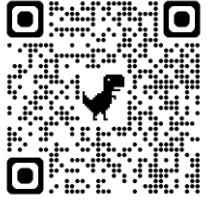


Technology and safeguards attributes:

1. Interoperability and extensibility
2. Transparency, accountability, oversight
3. Privacy, protection and safety
4. Inclusion and non-discrimination



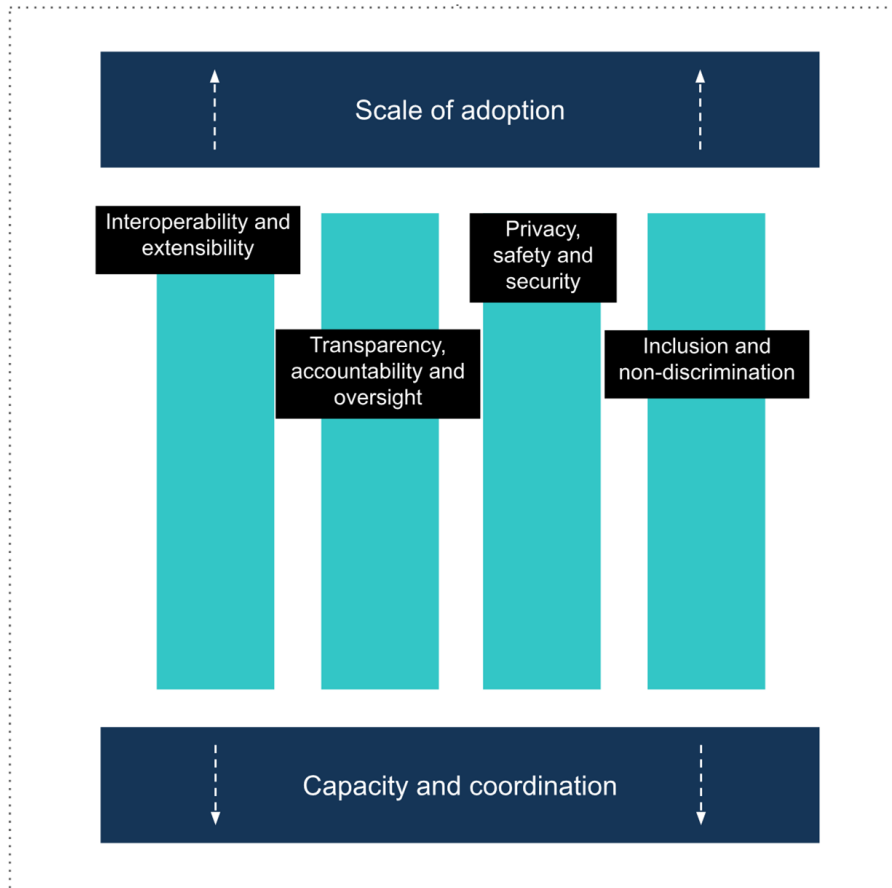
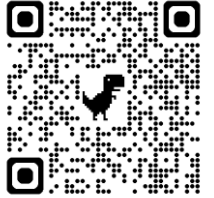
Six attributes of DPI



Operational attributes:

Scale of adoption
which actors use the DPI as infrastructure? Which type, across which sectors?

Six attributes of DPI

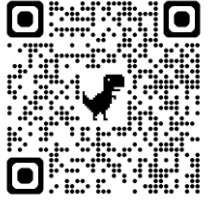


Operational attributes:

Scale of adoption
which actors use the DPI as infrastructure? Which type, across which sectors?

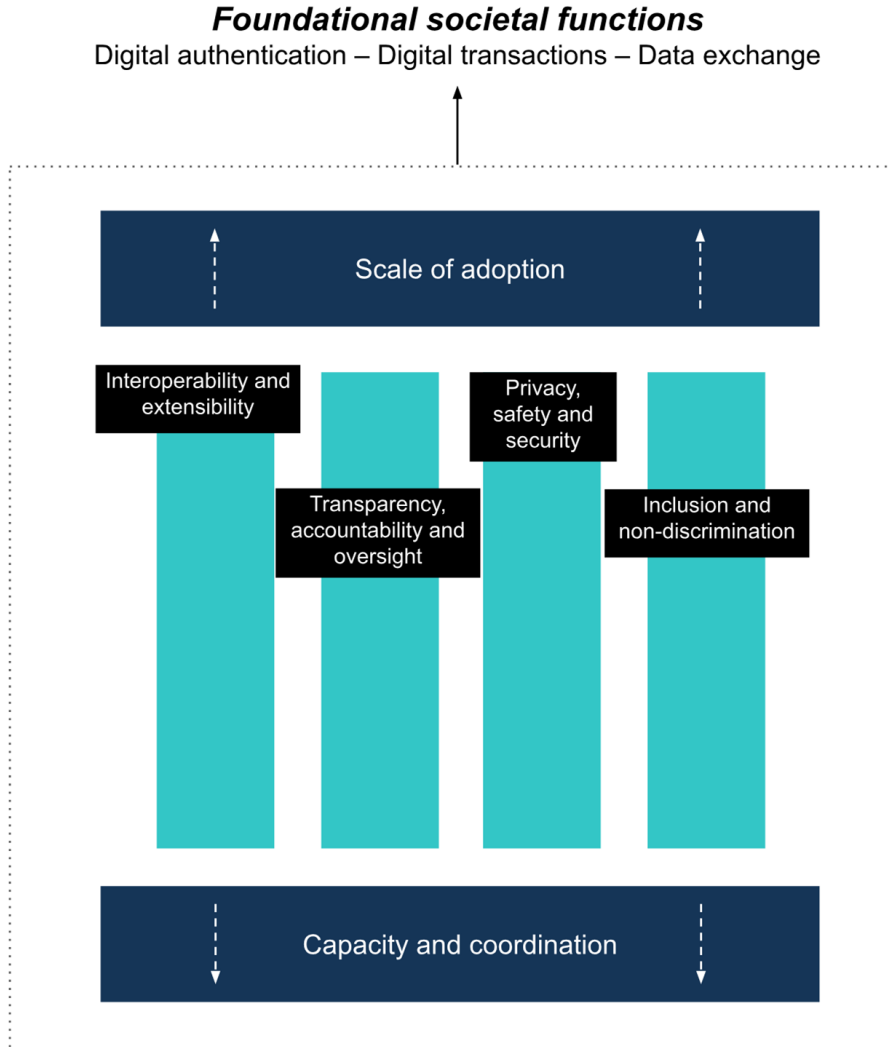
Capacity and coordination
is there state capacity to build out the infrastructure value of DPI, in terms of budgets and HR?

Six attributes of DPI



Technology and safeguards attributes:

1. Interoperability and extensibility
2. Transparency, accountability, oversight
3. Privacy, protection and safety
4. Inclusion and non-discrimination



Operational attributes:

Scale of adoption
which actors use the DPI as infrastructure? Which type, across which sectors?

Capacity and coordination
is there state capacity to build out the infrastructure value of DPI, in terms of budgets and HR?

Six attributes of DPI



6 attributes



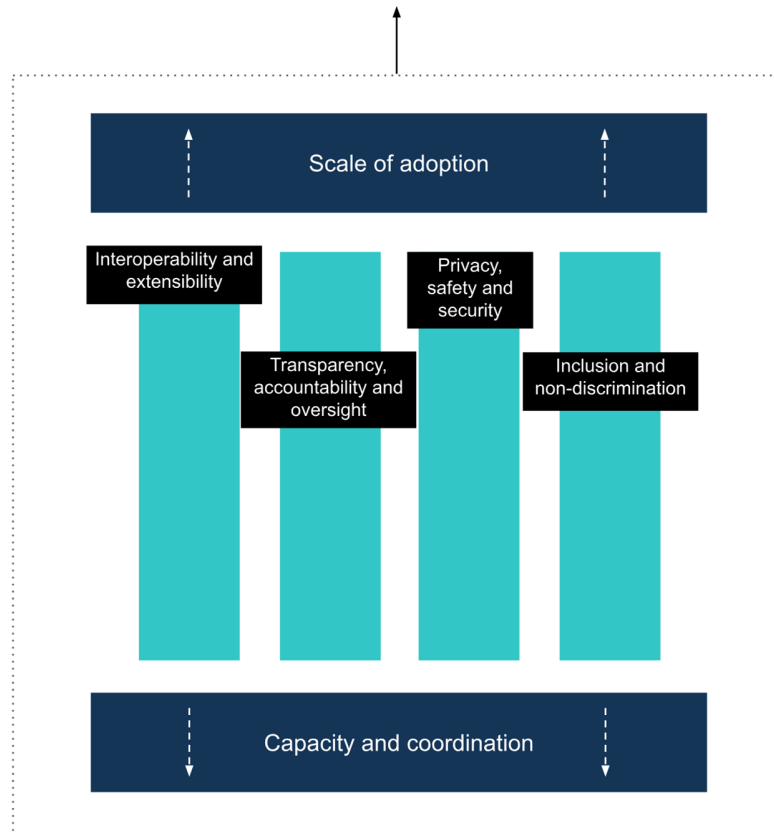
85 indicators
(40 measurable)



210 countries

- ID systems
- Payment systems
- Data exchange systems

Foundational societal functions
Digital authentication – Digital transactions – Data exchange



[Eaves and Rao \(2025\),
Digital Public Infrastructure: a framework for conceptualisation and measurement](#)

**What do we know
about the state of ID systems
in Africa?**

Digital ID Systems

DPI Database
210
countries

Digital ID
57



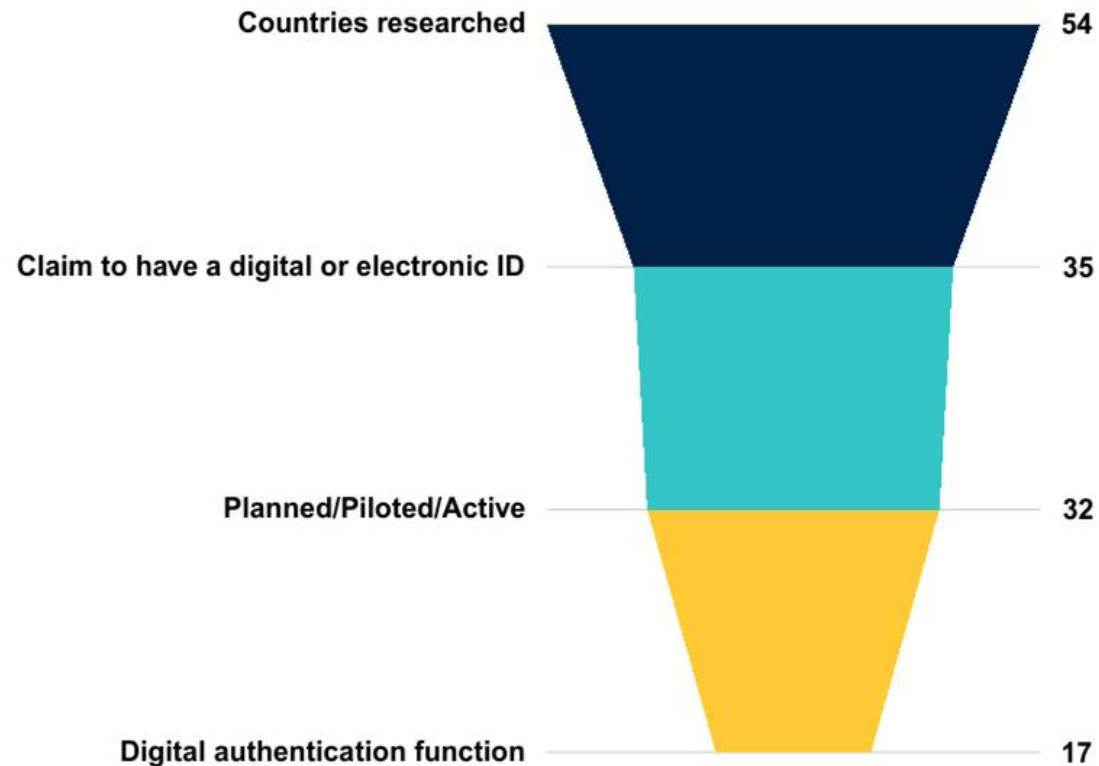
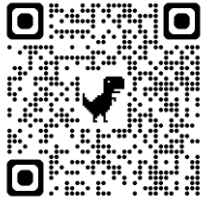
Ethiopia



Digital ID System

Digital ID name	Fayda ID
Status of implementation	Rollout
URL	View
Claim of digital (or electronic) ID	Yes
ID/ Civil Register Act	Yes
Digital authentication function	Yes
Governing entity	National ID Program
Institutional governance structure	ID or Registration Authority
Data handling terms	Unknown
Two or more sectoral use cases enabled	Yes

State of digital identity systems in Africa



Out of **54 countries** researched, 35 claim to have a digital or electronic ID system.

Of which, **32** seem to be active (59% of all countries) – in pilot or rollout stages.

Finally, just **17** (31% of all countries) seem to have an active digital authentication function – either through a government portal, or through KYC packet collection.

The big shift is not only technical,
but also economic!

There's a gap in how we understand DPI's potential economic role



Increase *fiscal resilience* by improving targeting and tax administration



Enable *better public services*, and faster responses in crises



Enable *economic development*



Shift *competition* and unlock *innovation* in both public services and private sectors




Reinforce *sovereignty* by reducing dependency on foreign platforms

DPI's value is dynamic — and standard measurement tools fall short

Ex: DPI's potential impact on fraud and leakage





Effect	Example
Direct 	Immediately prevents unauthorised access to government benefit programmes

DPI's value is dynamic — and standard measurement tools fall short






Ex: DPI's potential impact on fraud and leakage

Effect	Example
Direct 	Immediately prevents unauthorised access to government benefit programmes
Dynamic 	If scaled across sectors, may reduce fraud or improve access to financial institutions, who can verify identities more reliably

DPI's value is dynamic — and standard measurement tools fall short



Ex: DPI's potential impact on fraud and leakage

Effect	Example
Direct 	Immediately prevents unauthorised access to government benefit programmes
Dynamic 	If scaled across sectors, may reduce fraud or improve access to financial institutions, who can verify identities more reliably
Market Shaping 	May change the costs of inputs in ways that might reshape markets. (ex: lower cost and universal KYC facilitated by DPI may expand access to credit for underserved populations, drawing in new competitors or enabling new business models)

Doing digital, missing infrastructure



- The real shift isn't digital... it's *economic*.
- Measurement is not just a technical challenge.

DPI as shared infrastructure requires changing how we design, govern, finance and measure it.

Thank you

Krisstina Rao

Research Fellow and Manager - dpimap.org

[**krisstina.rao@ucl.ac.uk**](mailto:krisstina.rao@ucl.ac.uk)





**DIGITAL PUBLIC
INFRASTRUCTURE**

Universal Safeguards



United Nations
Office of the Secretary-General's
Envoy on Technology



Success of ID enrollment and usage lies in trusted systems: Building with Safeguards



Digital transformation must be **inclusive, rights-based and centred on people**. DPI, which is made up of building blocks (called digital public goods), is an enabler of this transformative movement.

Implemented well, it can accelerate the Sustainable Development Goals and ensure no one is left behind.

Creating a world in which digital is an empowering force for people and the planet.



Without Safeguards, DPI enabled SDG acceleration is at risk



SDG 3: Good Health and Wellbeing

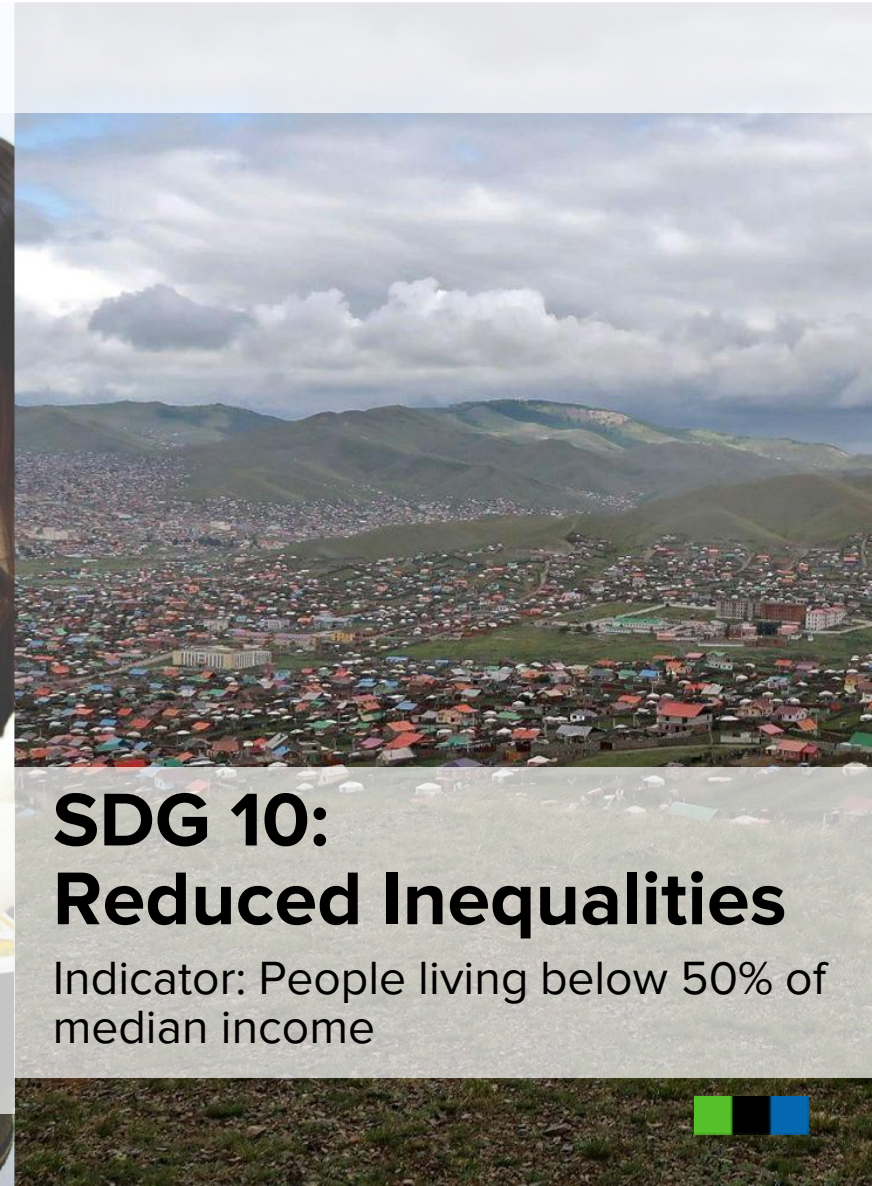
Indicator: Coverage of essential health services



Examples

SDG 4: Quality Education

Indicator: Proportion of youth and adults with ICT skills



SDG 10: Reduced Inequalities

Indicator: People living below 50% of median income





**DIGITAL PUBLIC
INFRASTRUCTURE**

Universal Safeguards



United Nations
Office of the Secretary-General's
Envoy on Technology



Building Trusted Systems

Universal DPI Safeguards - What does it recommend?

Video

UN DPI Safeguards Initiative: DPI has to be built with Safeguards



Demonstrates commitment to including and protecting people everywhere while accelerating the achievement of SDGs;

Unifies and builds upon work done by the ecosystem of experts and institutions globally.

DPI adoption and safeguards must go side by side to generate positive societal outcomes in a sustainable manner.

Safeguards Initiative has identified a broad spectrum of risks from poor planning, design and execution of DPI

<https://www.dpi-safeguards.org/>

Risks to Individuals: **Safety**

- Privacy vulnerability
- Digital insecurity
- Physical insecurity
- Lack of recourse

Risks to Individuals: **Inclusion**

- Discrimination
- Unequal access
- Exclusion
- Disempowerment

Risk to Societies: **Structural Vulnerabilities**

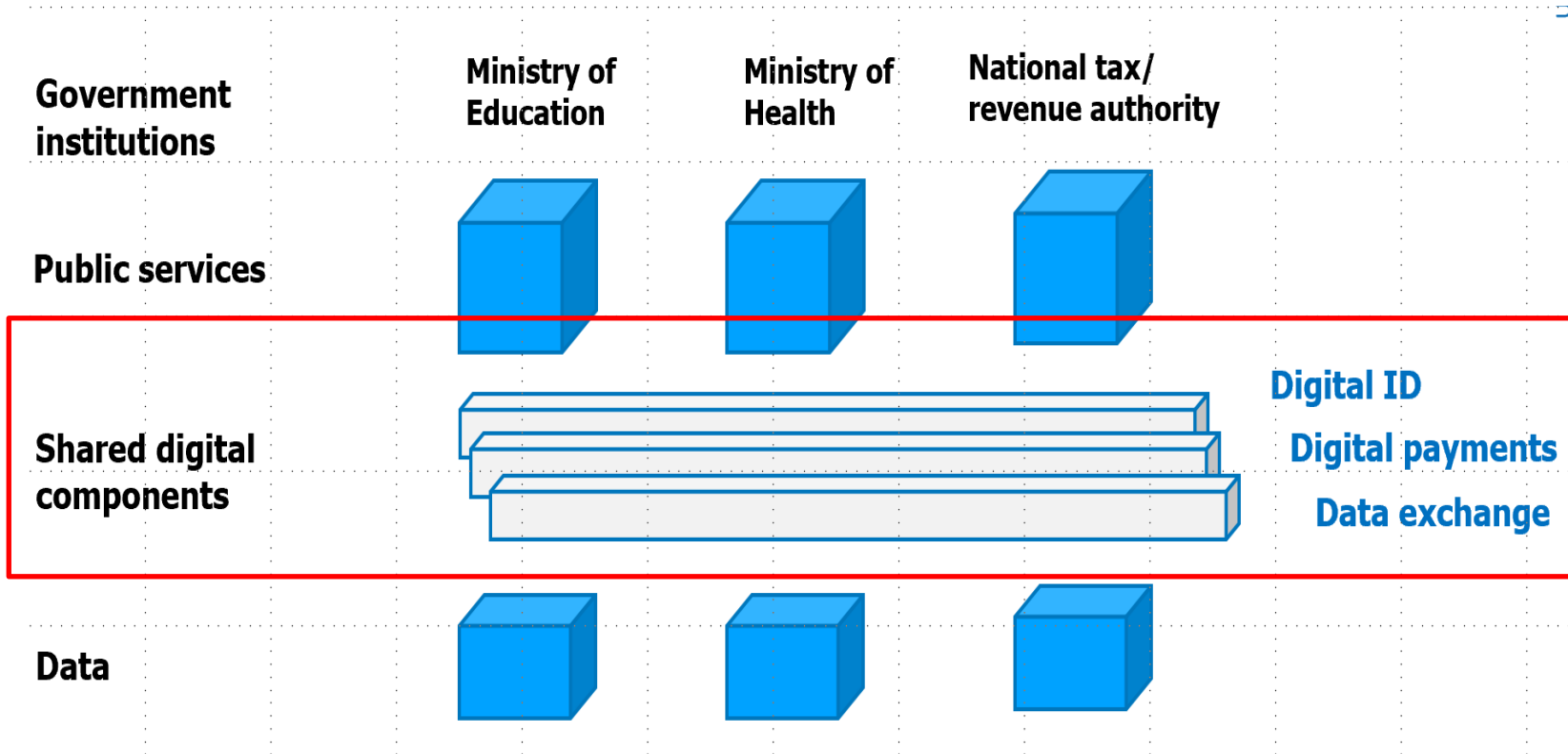
- Digital distrust
- Weak rule of law
- Weak institutions
- Technical shortcomings
- Unsustainability

Challenges/themes seen in Africa

- Structural Vulnerabilities
 - Digital Divide: Poor connectivity, Remote areas
 - Digital Literacy & Cultural issues
 - Exclusionary policy, processes or adoption framing/Weak Rule of Law
 - Low or emerging institutional capacity and capabilities
- Design and implementation
 - Unsustainable choices
 - Lack of whole-of-government approach, orientation towards developmental goals/ user centrality
 - Lack of infrastructure approach, siloed execution
 - Lack of measurement and Public value framing
 - Lack of user centrality/ participatory approaches

And more.....

DPI needs proper design of governance for trust, safety and inclusion building



Who operates and maintains?

Who pays?

How is data privacy ensured?

What steps are taken to ensure inclusion?

How is remediation handled?

Do we have enough skills to do this?

What law and institution will uphold this?

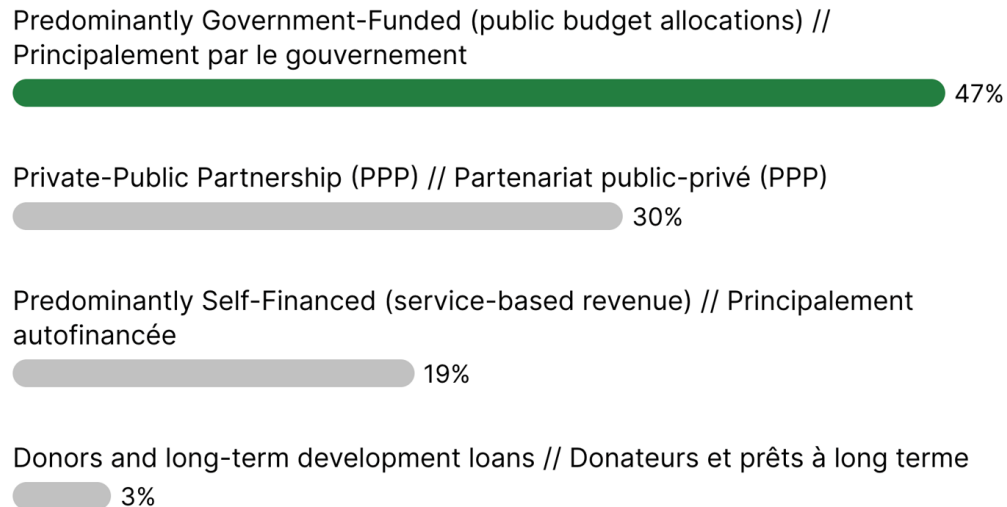
How is security handled?

Is procurement open and transparent?

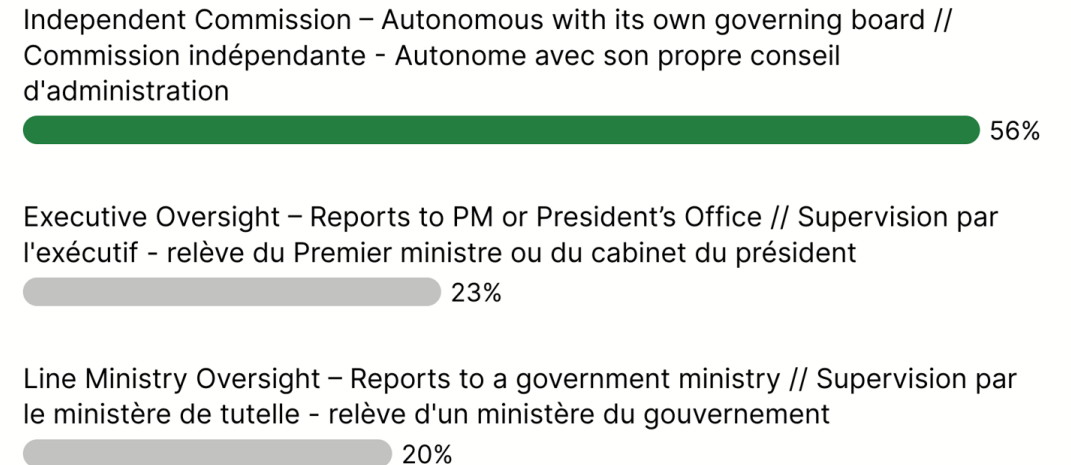
How will we sustain?

There are trade off's during design of DPI and they have real world implications on trust, equity and safety

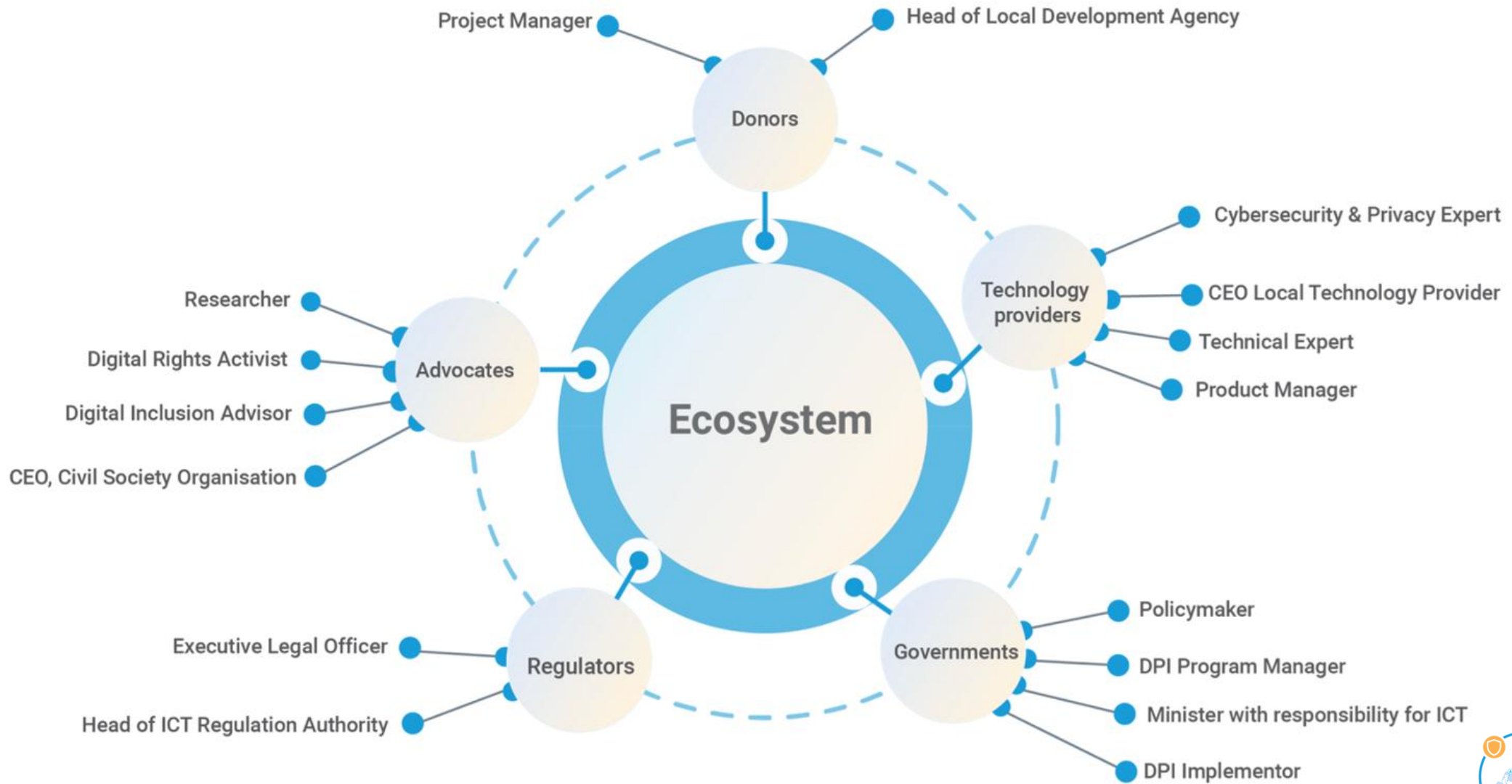
PS1: #1 How should the identity authority be financed? // Comment l'autorité d'identité devrait-elle être financée ?



PS1: #4 What is the most appropriate reporting structure for an identity authority? // Quelle est la structure hiérarchique la plus appropriée pour une autorité d'identité?



Who: Safeguards initiative recommends to build governance with a Whole-of-Society Approach



What: Uphold Universal DPI Safeguards Principles

Foundational principles: Principles that should serve as the basis for any DPI



1. **Do no harm**
2. **Do not discriminate**
3. **Do not exclude**
4. **Reinforce transparency and accountability**
5. **Uphold the rule of law**
6. **Promote autonomy and agency**
7. **Foster community engagement**
8. **Ensure effective remedy and redress**
9. **Focus on future sustainability**

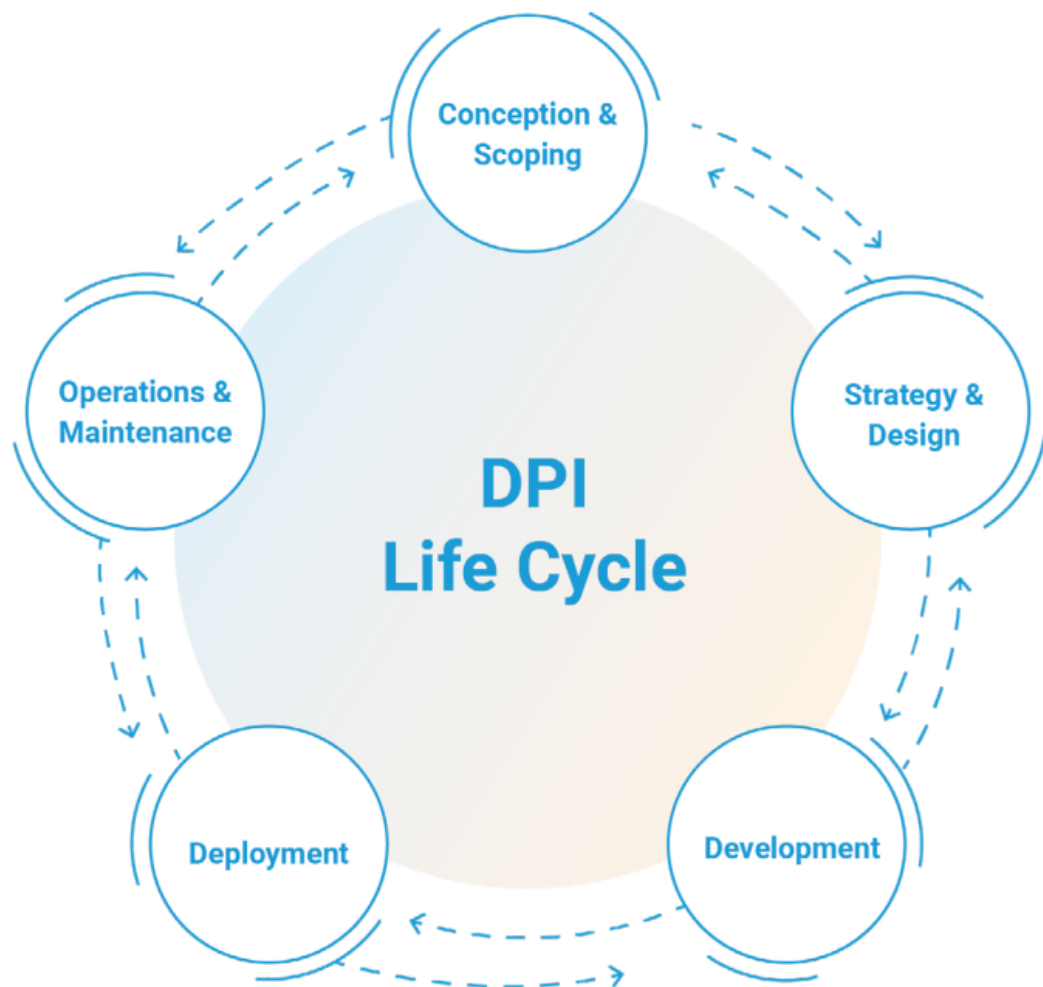
Operational principles: Principles that come into play at an operational level and may vary across contexts



1. **Leverage market dynamics**
2. **Evolve with evidence**
3. **Ensure data privacy by design**
4. **Assure data security by design**
5. **Ensure data protection during use**
6. **Respond to gender, ability or age**
7. **Practice inclusive governance**
8. **Sustain financial viability**
9. **Build and share open assets**

<https://www.dpi-safeguards.org/>

When: Build Safeguards as a continuous process throughout the DPI Lifecycle



“...Safeguards should be introduced during the process of DPI evolution and iteration at various stages of a typical DPI life cycle..”

How: Actionable Universal Safeguards Framework V1.0

Principles to Practical Operationalisation resources

Principle

Do Not
Discriminate

Reference:
[GovStack Principles](#)

Process

Informed Consent
Legal Protection
Affordable Access
Risk Assessment

Practices

Allow for opt-in/opt-out
Compliance Monitoring
Low/no fee for core
Fairness & Bias Audits

Governance

Legal Oversight Board

Assessment

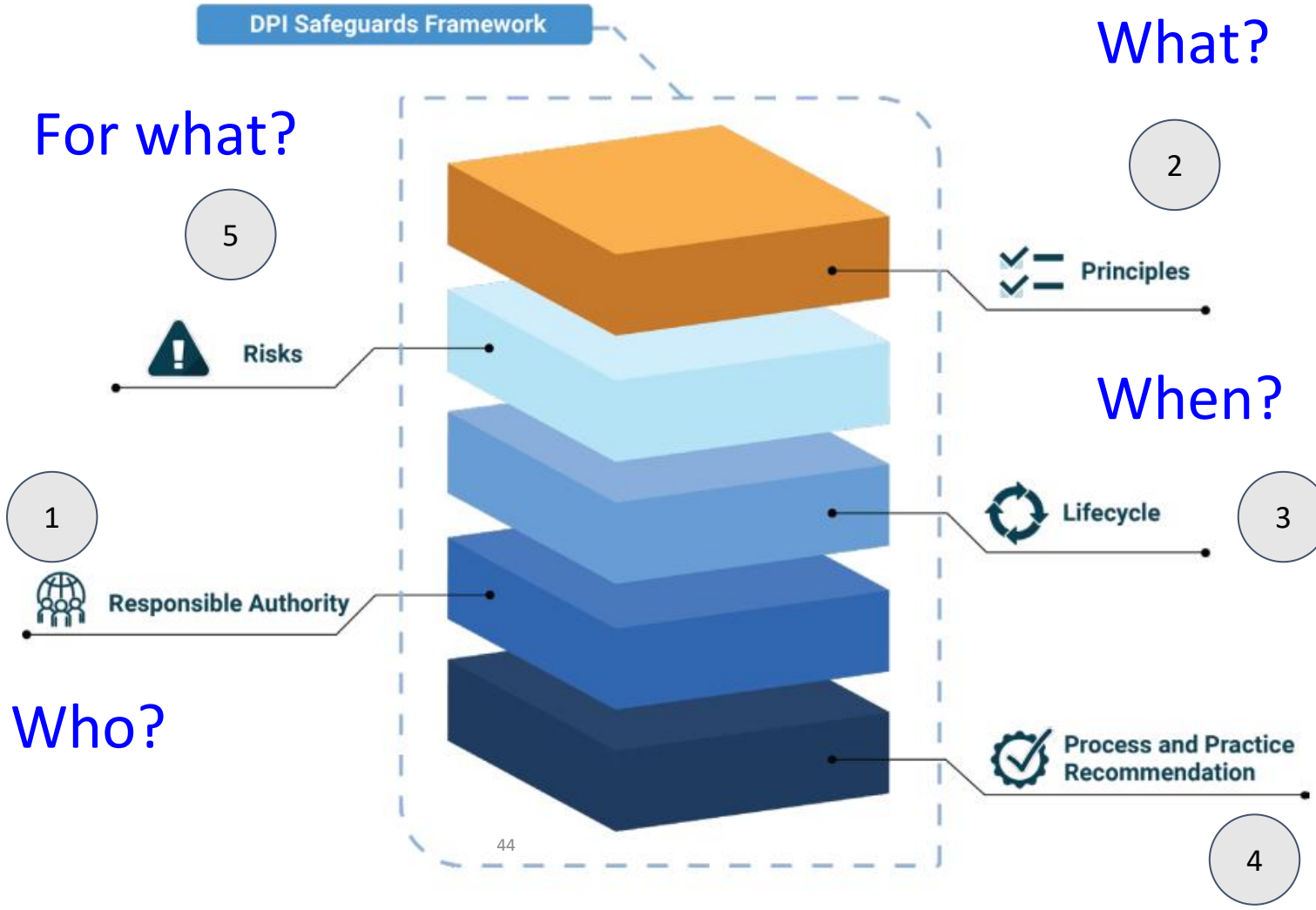
Equality and non-
discrimination
[\(\[governance4id.org\]\(http://governance4id.org\)\)](http://governance4id.org)



Get guidance from practical knowledge from the Universal DPI Safeguards Framework

The Framework

- is a living body of knowledge
- is agnostic in terms of approach and definition
- is designed to evolve and adapt to different societal contexts





**DIGITAL PUBLIC
INFRASTRUCTURE**

Universal Safeguards



United Nations
Office of the Secretary-General's
Envoy on Technology



How do you adopt?

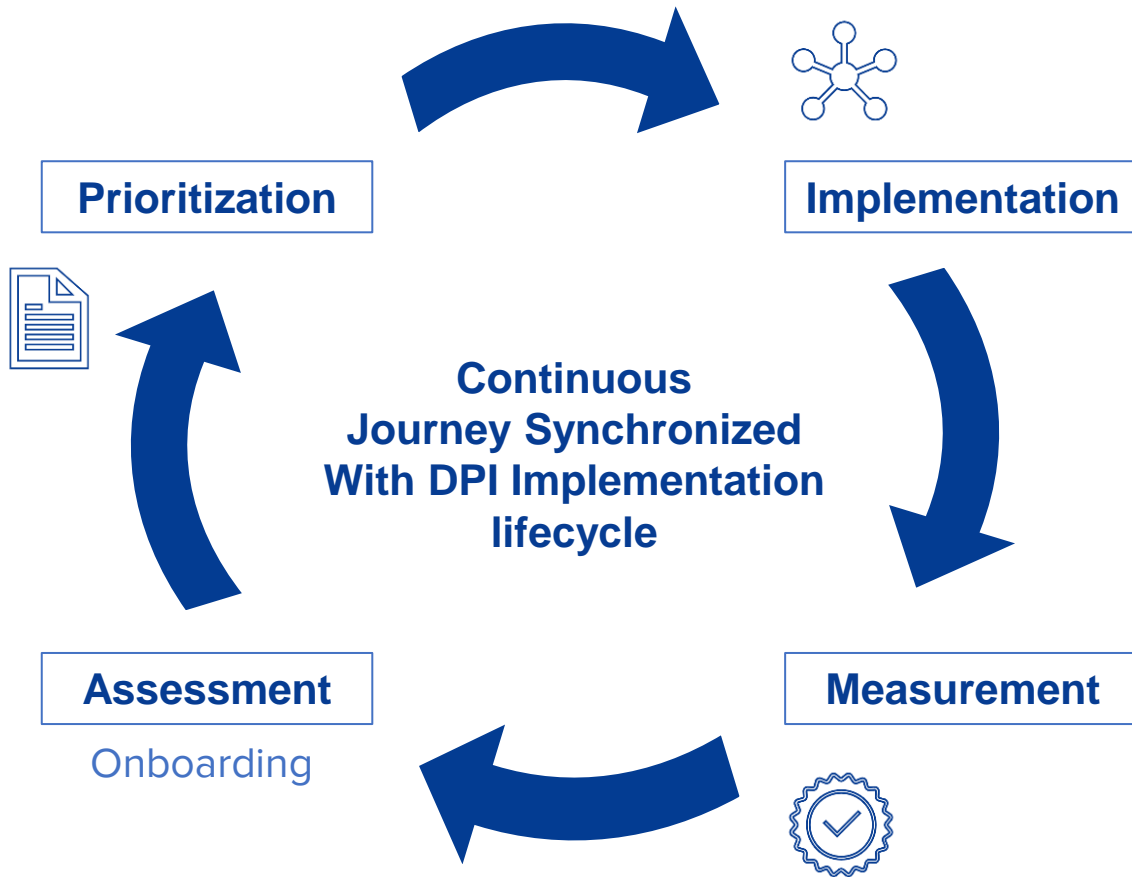
Calling Safeguards Pioneers

- Looking for countries who are on their DPI implementation and scale up journey to bake safeguards in their implementations
- Looking for countries who are just thinking of their DPI roadmap and journeys to learn and design the right way.
- Looking for ecosystem players who can take the lead to work with countries

Support from the Safeguards Initiative

1. Build capacity of Safeguards know how
2. Orchestrate Multi-stakeholder Holding Environments
3. Implementers Knowledge Sharing
4. Measure & Track Safeguards Implementation Impact

Universal DPI Safeguards: Adoption is an evergoing Journey!



DPI Safeguards

www.dpi-safeguards.org

dpi-safeguards@un.org

#SafeDPI



**DIGITAL PUBLIC
INFRASTRUCTURE**

Universal Safeguards



United Nations
Office of the Secretary-General's
Envoy on Technology





**DIGITAL PUBLIC
INFRASTRUCTURE**
Universal Safeguards



United Nations
Office of the Secretary-General's
Envoy on Technology



Panel Discussion

Panel: Improving DPI outcomes with Safeguards Mindset: Country Approaches



Mphatso SAMBO

Principal Secretary, National Registration Bureau (NRB)
ID4Africa Ambassador, Malawi



Thulani Mavuso

Deputy Director General, Operations in the
Department of Home Affairs in South Africa



Engr Lanre Yusuf

Director - Information Technology
& Identity Database Department,
National Identity Management Commission, Nigeria



**DIGITAL PUBLIC
INFRASTRUCTURE**

Universal Safeguards



United Nations
Office of the Secretary-General's
Envoy on Technology



Fireside chat: How are organizations adopting Safeguards ?



**DIGITAL PUBLIC
INFRASTRUCTURE**
Universal Safeguards



United Nations
Office of the Secretary-General's
Envoy on Technology



CSO adopting Safeguards: A case by ISER



Elizabeth ATORI, Legal Officer,
Initiative for Social and Economic
Rights (ISER), Uganda - Confirmed



**DIGITAL PUBLIC
INFRASTRUCTURE**
Universal Safeguards



United Nations
Office of the Secretary-General's
Envoy on Technology



Multilateral adopting Safeguards: UNICEF



Bhaskar Mishra

Civil Registration and Vital Statistics and
Legal Identity Specialist with UNICEF



**DIGITAL PUBLIC
INFRASTRUCTURE**

Universal Safeguards



United Nations
Office of the Secretary-General's
Envoy on Technology



DPG adopting Safeguards: MOSIP



Arun Kumar Gurumurthy
Chief Strategy Officer, MOSIP & OpenG2P



**DIGITAL PUBLIC
INFRASTRUCTURE**
Universal Safeguards



United Nations
Office of the Secretary-General's
Envoy on Technology



Adoption is Key: Making Universal Safeguards User centric

2025 DPI Safeguards Working Group Members



Elizabeth Garber, Founder of Humanitech



Kristina Rao, UCL and Co-Developer



**DIGITAL PUBLIC
INFRASTRUCTURE**

Universal Safeguards



United Nations
Office of the Secretary-General's
Envoy on Technology



Write to dpi-safeguards@un.org



DPI Safeguards

www.dpi-safeguards.org

#SafeDPI