



# DIGITAL PUBLIC INFRASTRUCTURE IN AFRICA



United Nations  
Development Programme

**A leapfrog catalyst for  
inclusive growth and prosperity**

# ABOUT THIS POLICY PAPER

As the artificial intelligence (AI) revolution accelerates, it is increasingly clear that much of the world lacks the foundational data infrastructure needed to harness its benefits equitably. Data sets are fragmented across ministries. Health records cannot talk to agricultural systems. Civil registration information cannot verify financial eligibility. AI has not created these problems, but it has made their cost clear in a way that decades of e-government programming did not.

Building that foundation is precisely what digital public infrastructure (DPI) enables: shared, secure and interoperable public rails that support fiscal resilience, effective service delivery and deeper regional integration.

This infrastructure consists of three connected layers. At its core are the foundational components of DPI: digital identity, payments and data exchange. Built on these are sectoral applications, or use cases, that draw on the core to deliver services such as tax filing, health information systems and social registries. Underpinning both is enabling infrastructure — connectivity, devices and data centres — without which neither can function.

This paper focuses on the core layer and its sectoral applications,

while recognizing the enabling infrastructure as essential for both.

Intended for decision-makers shaping Africa's digital future — including national governments, regional institutions, development partners, private sector actors and civil society leaders — this paper makes a practical case for DPI as a strategic development imperative.<sup>1</sup> It also argues that DPI should be treated as a broader systems agenda.<sup>2</sup>

Specifically, the paper considers how countries can achieve more with fewer resources, promote and safeguard sovereignty in a shifting geopolitical landscape, and ensure that digital transformation strengthens rather than fragments societies.

DPI is not merely a technical stack, but should be understood as a combination of technology, governance, standards, legal frameworks, financing and institutional capacity. Designed to deliver public and private services at scale, the network effects of DPI can transform digital economies and help countries leapfrog traditional development barriers.<sup>3</sup>

The chapters that follow provide guidance in navigating the complex choices and strategic trade-offs related to digital development. While recognizing that countries are at

different stages of DPI readiness, the paper speaks to a set of common and interlinked challenges. These include:

- **Exclusion:** One in five adults in sub-Saharan Africa does not have any form of legal ID,<sup>4</sup>
- **Inefficiency:** Siloed, paper-based public service delivery leads to leakages and delays;
- **Fiscal erosion:** Unverifiable transactions and fragmented tax systems weaken fiscal foundations; and
- **Sovereignty:** Proprietary technologies and fragmented bilateral arrangements create lock-in that erodes strategic autonomy.

These barriers exhaust time and resources. They limit participation in the digital economy, undermine the scope to harness the benefits of AI, and widen existing gaps. Collectively, these challenges constrain the continent's ability to reach its full potential

— including the estimated US\$450 billion opportunity under the African Continental Free Trade Area (AfCFTA).<sup>5</sup>

Several compelling reasons stand out for engaging closely with this paper. First, the decisions made in the next few years will determine whether Africa's digital infrastructure becomes a foundation for shared prosperity — or entrenches both new and existing patterns of dependency and exclusion. Second, as momentum and adoption accelerate across the continent, it creates a dual landscape of unprecedented opportunity and systemic risk. Third, while the technical components of DPI are increasingly understood and resourced, the essential governance, coordination and ecosystem shifts required for sustained inclusive impact remain under-financed and fragmented in implementation.

Organized into five sections, this paper makes the case for countries to move from isolated pilots to cohesive, national-scale DPI.

It begins by situating DPI within Africa's current fiscal and geopolitical moment, outlining why this presents a significant leapfrog opportunity for the continent. Next, it examines early adoption trends and provides emerging evidence of impact across sectors.

The third section explores how a whole-of-society led ecosystem approach — spanning governments, regional bodies, development

organizations and the private sector — can accelerate implementation. The fourth section explores what 'DPI done right' looks like, emphasizing inclusion, accountability, safeguards and sovereignty. Finally, it concludes with a call to action for proactive, principled and African-led investment in the digital foundations that can fundamentally shape the continent's growth.

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## LEADERSHIP AND STRATEGIC GUIDANCE

The paper was produced under the leadership and strategic guidance of Ahunna Eziakonwa, UN Assistant Secretary-General, UNDP Assistant Administrator and Director of the Regional Bureau for Africa; and Robert Opp, Chief Digital Officer, UNDP. Their vision and commitment to making DPI a continental priority shaped the ambition and scope of this work.

## DIRECTION AND OVERSIGHT

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## RESEARCH, ANALYSIS AND EDITORIAL PRODUCTION

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**This paper reflects a conviction shared by all who contributed to it: that Africa's digital transformation must be Africa-led, and that Digital Public Infrastructure — built with inclusion and trust at its core — is one of the most powerful levers available to accelerate progress toward the SDGs and Agenda 2063.**

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# ACRONYMS

|                     |                                                                                                        |                   |                                                                                             |
|---------------------|--------------------------------------------------------------------------------------------------------|-------------------|---------------------------------------------------------------------------------------------|
| <b>5Cs</b>          | Five practical shifts for accelerating DPI implementation                                              | <b>ICT</b>        | Information and communication technology / technologies                                     |
| <b>50-in-5</b>      | Global initiative aiming to help 50 countries design, implement and scale DPI components in five years | <b>ID / IDs</b>   | Identity / identification                                                                   |
| <b>AA4DPI</b>       | Africa Accelerator for Digital Public Infrastructure                                                   | <b>ID4D</b>       | Identification for Development, World Bank                                                  |
| <b>AfCFTA</b>       | African Continental Free Trade Area                                                                    | <b>ISO</b>        | International Organization for Standardization                                              |
| <b>AfDB</b>         | African Development Bank                                                                               | <b>ITU</b>        | International Telecommunication Union                                                       |
| <b>AfreximBank</b>  | African Export-Import Bank                                                                             | <b>LMICs</b>      | Low- and middle-income countries                                                            |
| <b>AI</b>           | Artificial intelligence                                                                                | <b>NIN</b>        | National Identification Number                                                              |
| <b>APIs</b>         | Application programming interfaces                                                                     | <b>ODA</b>        | Official development assistance                                                             |
| <b>AU</b>           | African Union                                                                                          | <b>OECD</b>       | Organisation for Economic Co-operation and Development                                      |
| <b>BVN</b>          | Bank Verification Number                                                                               | <b>PAPSS</b>      | Pan-African Payment and Settlement System                                                   |
| <b>C2G</b>          | Citizen-to-government payments                                                                         | <b>PARIS21</b>    | Partnership in Statistics for Development in the 21st Century; not expanded in the document |
| <b>CBDs</b>         | Central bank digital currencies                                                                        | <b>QR</b>         | Quick Response                                                                              |
| <b>COVID-19</b>     | Coronavirus disease 2019                                                                               | <b>RBA</b>        | Regional Bureau for Africa, UNDP                                                            |
| <b>DAI</b>          | Digital, AI and Innovation Hub                                                                         | <b>SADC</b>       | Southern African Development Community                                                      |
| <b>DBOT</b>         | Develop-Build-Operate-Transfer                                                                         | <b>SARS</b>       | South African Revenue Service                                                               |
| <b>DHIS2</b>        | District Health Information System (Sierra Leone)                                                      | <b>SASSA</b>      | South African Social Security Agency                                                        |
| <b>DPI</b>          | Digital public infrastructure                                                                          | <b>SATA</b>       | Smart Africa Trust Alliance                                                                 |
| <b>DPGs</b>         | Digital public goods                                                                                   | <b>SDG / SDGs</b> | Sustainable Development Goal(s)                                                             |
| <b>DR Congo</b>     | Democratic Republic of the Congo                                                                       | <b>SMEs</b>       | Small and medium enterprises                                                                |
| <b>eFiling</b>      | Electronic filing; South African Revenue Service platform                                              | <b>TIPS</b>       | Tanzania Instant Payment System                                                             |
| <b>e-government</b> | Electronic government                                                                                  | <b>TZS</b>        | Tanzanian shilling                                                                          |
| <b>e-health</b>     | Electronic health                                                                                      | <b>UN</b>         | United Nations                                                                              |
| <b>e-KYC / KYC</b>  | Electronic Know Your Customer / Know Your Customer                                                     | <b>UNDP</b>       | United Nations Development Programme                                                        |
| <b>eNaira</b>       | Nigeria's central bank digital currency                                                                | <b>UNODET</b>     | United Nations Office of Digital and Emerging Technologies                                  |
| <b>E-payments</b>   | Electronic payments                                                                                    | <b>USSD</b>       | Unstructured Supplementary Service Data                                                     |
| <b>G2C</b>          | Government-to-citizen payments                                                                         | <b>W3C</b>        | World Wide Web Consortium                                                                   |
| <b>GDP</b>          | Gross domestic product                                                                                 |                   |                                                                                             |
| <b>HMIS</b>         | Health Management Information System                                                                   |                   |                                                                                             |

# FOREWORD

**There are moments in history when a quiet idea reshapes the trajectory of a continent. Not because it was loudly announced; but because it answered a real need, in real lives.**

Across Africa, we have seen this before. We saw it when a market trader in East Africa could, for the first time, send money safely across distances without stepping into a bank. What began as a simple workaround became a global transformation: mobile money redefined financial inclusion, not just for Africa, but for the world.

**Today, we stand at the edge of another such moment.**

Digital public infrastructure (DPI) is not simply a technological shift. It is about whether a young entrepreneur in Lagos can access credit because her transactions are trusted and portable. Whether a farmer in rural Senegal can insure her crops because her identity is recognized across systems. Whether a mother in Kigali can be automatically enrolled in health services because institutions finally “speak” to one another.

These are not distant possibilities. They are already taking shape across the continent. The cases of Rwanda, Nigeria and South Africa offer early signals of what becomes possible when identity, payments and data exchange are built as shared public

goods. In Rwanda, millions of citizens use the Irembo platform to access public services that once required long journeys and waiting times. In Nigeria, more than 100 million people are now part of a growing digital identity ecosystem that is opening doors to services, finance and opportunity. In Tanzania, interoperable payment systems are connecting people, markets and economies in ways that were unimaginable just a decade ago.

**These stories carry a powerful message: when systems are built well, they change lives.**

But this transformation will not happen by accident. DPI does not emerge organically. It must be designed deliberately, with inclusion, trust and public value at its core. The decisions made now in ministries, in parliaments, in partners’ headquarters, will determine whether these systems empower or exclude, connect or fragment, unlock opportunity or deepen divides.

**This is what makes this moment so consequential.**

The promise before us is extraordinary. DPI can expand financial inclusion, improve how governments serve their people, enable African entrepreneurs to scale without prohibitive costs, and lay the foundation for participation in a rapidly evolving digital and AI-driven economy.

But the stakes are just as real. Because at its core, DPI is about power: over data, over systems, over who is seen and who remains invisible. If designed without safeguards and an unwavering commitment to inclusion, it risks reinforcing the very inequalities it seeks to address.

This policy paper is UNDP's contribution to that conversation. We have the conviction that our role is shaped by two enduring convictions.

First, Africa's digital transformation must be African led, rooted in local realities, strengthened by global learning, and driven by the aspirations of its people. Our contribution will be measured by the systems we build, by the institutions we help strengthen and the capacity that remains long after we are gone.

Second, this moment calls for a new model of partnership. Not fragmented projects, but connected systems. Not isolated pilots, but coordinated national efforts capable of delivering impact at scale. Across the continent, we see commitment. We see resources. We see innovation. What has too often been missing is coordination, bringing

these elements together into something greater than the sum of their parts.

That is where UNDP is stepping forward: as a partner in helping countries design, finance and implement systems that endure, connecting national efforts to continental ambitions, including those under the African Continental Free Trade Area.

This paper comes at a time when the global development landscape is under strain. Resources are tightening. Expectations are rising. In this context, DPI offers something fundamentally different: a smarter investment in systems that can deliver services at scale, mobilize domestic resources, and unlock private sector innovation.

**Above all, this is about people.**

Africa is home to the world's youngest population, to millions of innovators, builders and problem-solvers whose potential is unmatched.

And I believe that, if we get this right, the next great leap forward will not only happen in Africa, it will once again inspire the world.

## PREFACE: A CONTINENTAL PERSPECTIVE

Africa has always built its future on its own terms. From the mobile money revolution that reshaped financial inclusion across the continent, to off-grid solar systems that brought light to communities beyond the reach of centralized grids — our greatest advances have come from African ingenuity applied to African realities. Time and again, we have transformed constraint into opportunity and unmet need into engines of innovation.

Digital public infrastructure (DPI) presents the next frontier of that transformation. The choices we make now will determine whether this opportunity is realized fully and equitably.

This policy paper arrives at a moment of profound consequence. Across our 55 Member States, more than 500 million citizens still lack a verifiable digital identity. The majority of our workforce remains in informal economies; excluded from credit, social protection, and the formal systems that can strengthen livelihoods and resilience. At the same time, global flows of official development assistance are tightening. This reality compels us to invest in systems that are not only effective, but resilient, sustainable, and rooted in our own context.

The fiscal pressures are clear, and this paper is candid about them. Yet Africa's history offers a powerful perspective. It reminds us of our capacity for sovereign agency, for building more by building smarter, and for turning constraints into the foundation of progress.

DPI — anchored in digital identity, payments and data exchange — offers such a pathway. When built and designed for inclusion, it redefines the relationship between people and the state, between entrepreneurs and markets, and between African economies themselves. It converts the daily frictions of trust, coordination and access into shared public goods that enable participation, productivity and growth. Imagine the possibilities that emerge when such trust is the foundation for artificial intelligence (AI) on the continent. The multiplier effect of getting DPI right is ever more critical.

The evidence presented in this paper is both compelling and instructive. It highlights the promise of DPI through examples such as Rwanda's Irembo platform, which has processed millions of service requests, and Nigeria's national identity system, which continues to expand its reach. At the same time, it underscores the cost of delay. In a rapidly digitizing



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global economy, countries that invest early and strategically in foundational systems will accelerate their development. Those that do not, risk falling further behind. The consequences will be measured in lost opportunity, weakened institutions and diminished trust. And as AI accelerates across every sector, the stakes compound: without DPI foundations, today's fragmentation and silos risk being replicated and amplified at scale, creating intelligence divides that will be far harder to reverse.

One central message must guide our actions. DPI carries the full weight of national infrastructure and public interest. The systems we build today will shape how our citizens are identified, served and protected for decades to come. Progress must therefore be deliberate. Speed must be matched with integrity. Without robust data protection, interoperability and inclusive design, digital systems risk reinforcing exclusion rather than overcoming it.

Africa must design its own digital future. It must draw on global experience, yet be firmly grounded in African realities and governed by African institutions. This requires embedding data protection, accountability and inclusivity at the

core of system design. It requires that Africa not only participates in, but helps shape global norms on digital governance. It demands that our diversity — in language, connectivity and economic structure — is reflected in the systems we build so that every African, from a market trader in Ouagadougou to a software developer in Maseru, can benefit meaningfully.

Encouragingly, momentum is building. The African Continental Free Trade Area Protocol on Digital Trade signals a clear continental ambition to participate competitively in the global digital economy. Across the continent, governments are demonstrating what is possible when political will aligns with institutional coherence.

The task ahead is execution at scale and in coordination. Governments, regional institutions, development partners, the private sector and civil society must act together; with African leadership at the centre and the welfare of our citizens as the ultimate measure of success.

**This paper is a call to that shared responsibility. It is an invitation to act with urgency, with discipline and with a long-term vision equal to the magnitude of this moment.**



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# WHY DPI, WHY NOW?



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# Seizing the digital moment

Across the globe, the current moment is marked by tightening public budgets, reduced official development assistance (ODA) and extraordinary geopolitical shifts.<sup>6</sup> For Africa's development context, the implications can be stark. The continent faces a tremendous investment need, precisely at this moment of fiscal constraint.

This fiscal challenge also coincides with a digital inflection point. Phone subscriptions have skyrocketed from 25 million in 2001 to at least a billion by 2023.<sup>7</sup> Internet penetration and mobile broadband coverage have also expanded rapidly over the past decade, while smartphone adoption continues to rise across both urban and rural markets.

Mobile money, pioneered in East Africa, brought financial services to hundreds of millions of people who had never held a bank account. Similarly, off-grid solar energy systems, now reaching millions across sub-Saharan Africa,<sup>8</sup> provided electricity to communities that centralized power grids had failed to reach for decades.

These breakthroughs have created new markets, introduced alternative business models and fostered fresh forms of civic participation. They also offer an important lesson: some of Africa's most powerful advances have not come from

technology alone, but from systems designed around real constraints, unmet needs and local realities.

The mobile money solutions in East Africa worked because they addressed a fundamental exclusion: hundreds of millions of people locked out of formal financial services in economies that run largely on informal activity.<sup>9</sup> Across East and West Africa, pay-as-you-go solar scaled because centralized grids had left vast populations in the dark, made affordable by the same mobile-payment rails.<sup>10</sup> In each case, progress was driven by the depth of the challenge, not the sophistication of the tool. The modalities succeeded because they reduced the cost of participation, extended access beyond legacy infrastructure and allowed people and businesses to do what had previously been difficult, expensive or impossible.

Digital public infrastructure (DPI) represents the next frontier of this transformation. Comprising foundational digital systems — namely digital identity, digital payments and data exchange — DPI provides the shared public rails that allow people to prove who they are, transact safely, access services and exchange trusted information across institutions and borders. Approached deliberately, DPI can help make the continent's growth more sovereign, more inclusive and more resilient — turning today's digital momentum into institutional architecture for long-term development impact.

Africa's next leapfrog moment will not centre on these digital systems, but will be defined by what they unlock: a farmer in rural Senegal accessing crop insurance because she can verify her identity remotely; a young entrepreneur in Nigeria obtaining credit because his transaction history is portable across platforms; or a mother in Rwanda automatically enrolled in health insurance because civil registration, health records and social protection systems share verified data. Ultimately, the true measure of progress will lie in closing these divides.

Unlike traditional infrastructure projects that require massive capital expenditure, DPI offers lower-cost pathways to serve the public while increasing tax collection, reducing administrative costs and helping to minimize fraud.<sup>11</sup>

Emerging technologies, particularly artificial intelligence (AI), are rapidly expanding the frontier of the possible. But AI's potential in Africa depends on foundational DPI. Without reliable digital identity, there is no trusted data. Without interoperable payments, there is no scalable digital economy. Without secure data exchange, there is no basis for the intelligent systems that can transform health, agriculture, education and trade. DPI should therefore be recognized as a critical precondition for Africa to ensure its people benefit from, rather than simply witness, the AI revolution.

**It is important to distinguish Africa's leapfrog from a narrative of replication.**

African governments are not just introducing models that have succeeded elsewhere. The consultations that inform this paper made it clear that this is by design, not by default. For instance, the Pan-African Payment and Settlement System (PAPSS) gives the continent its own cross-border payment rails in local currencies. Rwanda's Irembo and Tanzania's open-sourced DPI platform demonstrate an emerging "open by design" model. At the sub-regional level, the East African Community (EAC) and the Economic Community of West African States (ECOWAS) are driving their own dialogues on interoperability — aligning members around shared standards, cross-border data flows and harmonized frameworks that reflect their specific integration ambitions.

At the continental level, the African Union's Digital Transformation Strategy and the African Continental Free Trade Area (AfCFTA) Protocol on Digital Trade provide the architectural foundation. These mechanisms establish the political direction, legal frameworks and shared principles that increasingly shape national DPI efforts. While drawing from global experience, the imperative is to build systems defined by local contexts. These include a young and rapidly urbanizing population, the prevalence of feature phones over smartphones in many markets, the centrality of informal economies and the demands of integration across all sovereign AU member states. The solutions emerging from these contexts may prove more relevant to other developing regions than the models they are often urged to replicate.

# Gain or get left behind: no neutral scenario

Africa's development landscape is defined by challenges of immense scale and urgency. Over 500 million Africans lack any form of official identification — rendering them invisible to the systems designed to serve them.<sup>12</sup> Over 80 percent of African workers are estimated to operate in the informal economy, disconnected from credit, insurance, social protection and the formal institutions that could support their livelihoods.<sup>13</sup> Surveys in several African countries show that most young people in school aspire to secure and skilled jobs. Yet only a minority manage to obtain such employment, with the majority working in low productivity, informal activities.<sup>14</sup> Meanwhile, a significant portion of highly educated African citizens who migrate choose destinations outside the continent, draining the human capital needed to drive transformation at home.<sup>15</sup>

These challenges are deeply interconnected and share an absence of foundational systems that can reliably identify people, move money and exchange verified data across institutions and borders. DPI addresses this gap by reducing the frictions of trust, coordination and knowledge that currently act as a hidden tax on everyday economic activity. When a digital

**“Africa’s digital transformation must be built on foundations that are inclusive, trusted and designed to serve the public good. By embracing open, interoperable and reusable digital systems, countries can expand access to essential services, strengthen public institutions and accelerate economic opportunity at scale. By investing in digital public goods and digital public infrastructure, Africa has an opportunity not simply to adopt technology, but to shape a digital future that reflects our values, strengthens our sovereignty and expands opportunity for all.”**

**H. E. HAJA SALIMA MONORMA BAH,**  
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identity system enables a young woman in rural Tanzania to open a bank account, that same identity can verify her qualifications for employment, enrol her in health insurance and help establish her credit history. Identity is an entry point, but the impact is systemic.

When built with purpose and inclusion at its core, DPI accelerates progress across multiple priorities simultaneously. Countries that embrace this approach can catalyse transformative development gains; while those that don't face paying a steep price. Some countries have partial systems in place, but these remain fragmented. Without deliberate investment, such governments will leak value, constrain growth and fall exponentially behind in an increasingly digital global economy.

## Box 1: Global DPI initiatives

### THE 50-IN-5 INITIATIVE

Launched in November 2023, the **50-in-5** Initiative is a global campaign that aims to help 50 countries design, implement and scale at least one foundational component of DPI in 5 years by 2028. Catalysed by UNDP and partners and first championed by 11 “early mover” governments, it was designed to fast-track countries on their DPI journeys through shared learnings and experiences. By promoting open technologies, shared standards and peer-to-peer learning, 50-in-5 aims to shorten the DPI learning curve, reduce duplication and costs and embed safety, inclusion and interoperability from the outset — demonstrating how coordinated investment in digital public goods can accelerate economic transformation and SDG progress.

### THE DPI SAFEGUARDS INITIATIVE

Stewarded by the United Nations Office of Digital and Emerging Technologies (UNODET) and UNDP, this high-impact initiative has produced a comprehensive, rights-based universal framework to ensure that as digital systems scale, they remain safe, inclusive and trusted by all. Safeguards are essential for building the public trust needed to achieve adoption at population scale. The initiative offers practical guidance to embed trust and inclusion as core decision-making criteria across every phase of DPI design, development and national rollout. By integrating these safeguards from the outset, governments can reduce the risks of exclusion or misuse while establishing a strong trust architecture that empowers citizens and protects national sovereignty.

The key challenge is less about absence and more about integration, interoperability and governance.

Stagnation also carries a political and security risk, as a hyper-connected youth demands greater economic opportunity. Poorly designed DPI exacerbates risks around exclusion, data misuse and weak institutional capacity. Conversely, DPI ‘done right’ (see *Section 4*) offers opportunities for concretely addressing employment — for example, by enabling participation in digital markets, skills ecosystems and entrepreneurship opportunities.

## Sovereignty and geostrategic positioning

Africa's digital sovereignty is a practical imperative, with direct consequences for economic independence and public trust. Realizing it requires confronting widely diverse and complex realities. Electricity access ranges drastically across countries, digital literacy gaps remain significant and infrastructure constraints vary enormously. DPI

strategies must be designed for this range of contexts — not built for the average and assumed to trickle down.

Digital sovereignty is also affected by external pressures. As noted earlier, ODA to Africa has declined significantly in recent years.<sup>16</sup> Additionally, global powers and major tech giants have been competing for influence over Africa's digital infrastructure. Reliance on proprietary cloud and data infrastructure also presents the challenge of regulatory arbitrage, where external firms exploit legislative gaps to bypass privacy or tax obligations and avoid rules they find restrictive.

With the right safeguards, DPI can be transformative — allowing African states to shape and govern their digital infrastructure and data flows through open standards that enable cross-border interoperability and regional coordination. This is not digital isolationism, but interoperability on African terms, strengthening agency over infrastructure, data and economic futures.

These aspirations are articulated in several national strategies. For instance, Kenya's Digital Economy Blueprint (2019) and National Digital Master Plan (2022–2032), Rwanda's ICT Sector Strategic Plan (2024–2029) and Ghana's Digital Economy Policy Strategy (2024) all position digital infrastructure as foundational to economic transformation. This vision is increasingly mirrored by global initiatives designed to accelerate adoption while ensuring systemic

safety. Programmes such as 50-in-5 and the DPI Safeguards initiatives provide the collective momentum, as well as safe and inclusive guardrails necessary for Africa to leapfrog into a digital future. The demographic dividend: youth and innovation

The continent's 1.4 billion people include 800 million under age 25. Over 80 percent of youth in school aspire to skilled employment. Yet only eight percent currently find such jobs as growth concentrates in low-productivity agriculture, retail and services.<sup>17</sup> While it is important to recognize young people across Africa as potential beneficiaries of digital transformation, the same cohort can also become its most powerful driver when empowered with access to digital skills, infrastructure and opportunities. The areas identified below illustrate where these effects may be most visible.

## AMPLIFYING AFRICAN INNOVATION

DPI can dramatically amplify what young Africans are already building by dismantling systemic barriers to growth. Interoperable *digital identity systems* that enable verified credentials make it possible, for instance, for a software developer trained in Kigali to be hired by a company in Johannesburg or Dakar without cumbersome, paper-based verification. Similarly, interoperable *payment systems* allow a freelancer in Accra to receive payment from a client in Nairobi instantly and affordably. Digital identity systems, credit access and verified credentials are critical for presenting youth

with viable economic opportunities.<sup>18</sup> Additionally, the continent is already home to one of the world's fastest-growing developer communities. African tech hubs in Lagos, Nairobi, Kigali, Cape Town, Accra and Addis Ababa are producing a generation of entrepreneurs building solutions shaped by local context and local need.

## STRENGTHENING TALENT RETENTION

DPI plays a critical role in improving talent retention across the continent. A significant portion of highly educated Africans relocate to other continents.<sup>19</sup> DPI alone will not reverse this trend, but it is capable of addressing some of its structural drivers. When public services work efficiently, professional credentials are portable and verifiable across borders, and entrepreneurs can access finance and markets without prohibitive friction — the calculus of staying shifts. Interoperable digital identity systems constitute a key lever for greater integration of the job market at the continental level. DPI creates the conditions in which Africa's talent can build careers and enterprises without leaving the continent, connected to regional and global markets through digital rails rather than physical relocation.

## FORMALIZING THE INFORMAL ECONOMY

There is tremendous scope for DPI to boost movement from the informal to the formal economy. Some 82 percent of African workers are in informal occupations, with

wage-paying jobs accounting for 24 percent of total employment.<sup>20</sup> Most informal enterprises remain micro-sized, limiting job creation and productivity growth.<sup>21</sup> DPI can address this by enabling access to credit, skills verification and formal business registration.

The success of M-Pesa — a mobile money service that lets people store, send and receive money using a basic mobile phone instead of a bank account — demonstrates what is possible when digital infrastructure meets people where they are. It succeeded because it worked on basic handsets and through a network of human agents embedded in communities. DPI must follow the same design philosophy. For instance, digital identity systems should accommodate people who lack birth certificates or fixed addresses. Payment systems must work on feature phones and through Unstructured Supplementary Service Data (USSD) interfaces, which allow users to interact with a service by dialling a code.<sup>22</sup> Business registration must be accessible to a market trader in Ouagadougou, not just a tech start-up in Nairobi. Achieving this will require intentional design to serve informal workers, rural populations, low-literacy groups and those without smartphones.

## PROMOTING THE 'PUBLIC INFRASTRUCTURE, PRIVATE INNOVATIONS' MODEL

For entrepreneurs and start-ups, DPI lowers barriers to entry by providing shared infrastructure that would be prohibitively expensive for individual

entities to build. This is the ‘public infrastructure, private solutions’ model — where governments provide open, interoperable rails and the private sector builds services on top. Affordability, trust and digital literacy are key factors alongside technological accessibility.

DPI also provides the common infrastructure that private innovation needs to thrive. When governments provide open, interoperable public rails, the barrier to entry for local technology entrepreneurs falls dramatically. In practical terms, this means a developer in Lagos, a fintech founder in Nairobi or an agri-tech start-up in Accra can build scalable, market-driven applications on a trusted national foundation rather than constructing expensive proprietary infrastructure from scratch. Initiatives such as timbuktoo, UNDP’s pan-African innovation ecosystem, are already building and supporting African-led solutions to the continent’s challenges with African talent. DPI gives these innovators the digital ground on which to build at scale.

## Climate and energy resilience

The same digital rails that expand economic opportunity can also strengthen climate and energy systems. By lowering the cost of measuring, verifying and

transacting, DPI makes climate action easier to finance, target and scale. Shared identity, payment and data systems allow clean-energy subsidies and climate finance to reach verified recipients efficiently, and allow emissions and carbon credits to be tracked transparently. This reduces the fraud and double counting that erode trust in carbon markets. UNDP research across 70 low- and middle-income countries (LMICs) suggests potential impact that can mitigate the equivalent of five gigatonnes of carbon dioxide by 2030 and accelerate emissions control efforts by five to 10 years.<sup>23</sup>

These positive effects are already visible in carbon markets, land mapping and weather monitoring, all of which depend on building and sharing open datasets and coordinating across borders. For example, the ‘Platform for Voluntary Bilateral Cooperation’,<sup>24</sup> one of the tools and mechanisms in the Paris Agreement, follows the DPI approach. It features open components that track carbon credits and enable credit transfers in an efficient and transparent manner between host and buying countries, with Ghana, Malawi and others currently participating.<sup>25</sup>



# HOW DPI IS ALREADY TRANSFORMING AFRICAN ECONOMIES

# Current adoption across Africa

Having considered the potential role of DPI in advancing inclusion, innovation and resilience, a key question is how far these systems have been adopted across the continent. Current progress can be assessed across the three key pillars of DPI, namely:

- Digital identity (ID) systems, which enable secure and remote identity authentication and verification;
- Digital payment systems, which enable more secure, convenient, interoperable and cashless transactions; and
- Data exchange systems, which help optimize the flow and reuse of data in the digital economy, particularly across sectors

Across the 55 AU member states,<sup>26</sup> the adoption of DPI-like systems<sup>27</sup> remains uneven (*Figures 1 and 2*). Digital ID systems — the most nascent of the three pillars — are operational in six countries and in the pilot stage in two (Figure 1 shows adoption by region). Digital payment systems are active in eight countries, with none currently at the pilot stage. Data exchange systems are the most widely adopted, active in 17 countries and under pilot in nine. Yet no country has all three categories fully operational, and only eight have two of the three active — reflecting how early-stage the continent's DPI ecosystem remains overall. Figure 2 shows this distribution: of 55 countries, 32 have no active DPI category, 15 have one, and eight have two. Countries with the most active DPI components — including Kenya, Rwanda, Nigeria, Ethiopia and South Africa — are detailed in Appendix II.

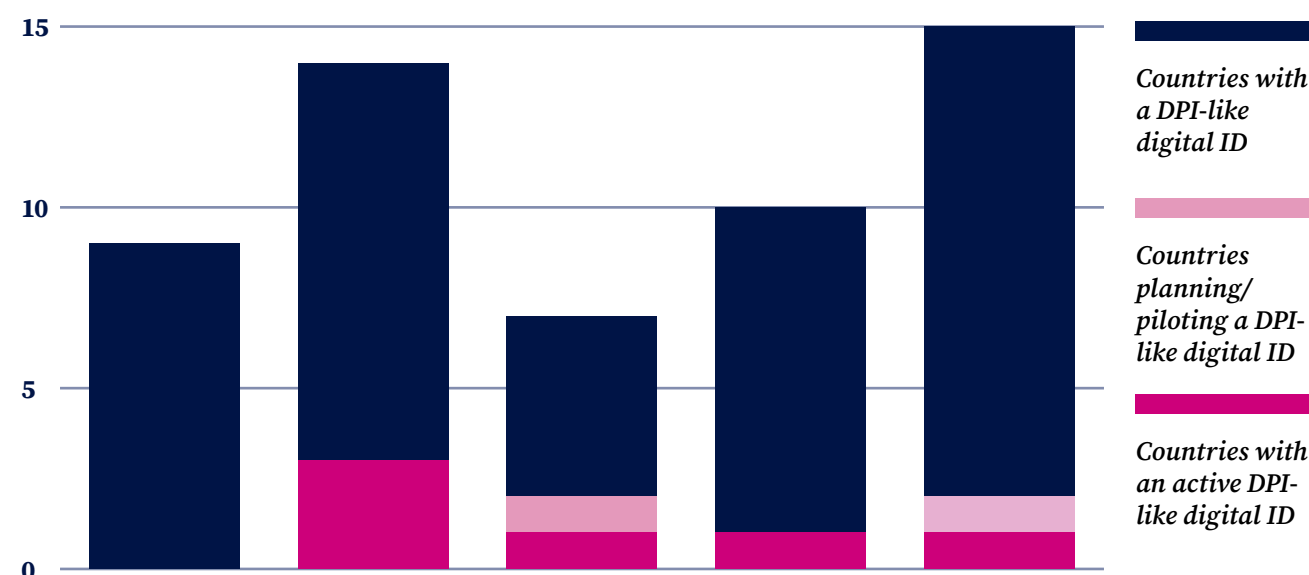


**Figure 1: Number of countries in Africa with active DPI-like ID systems, by region.**  
Source: DPI Map

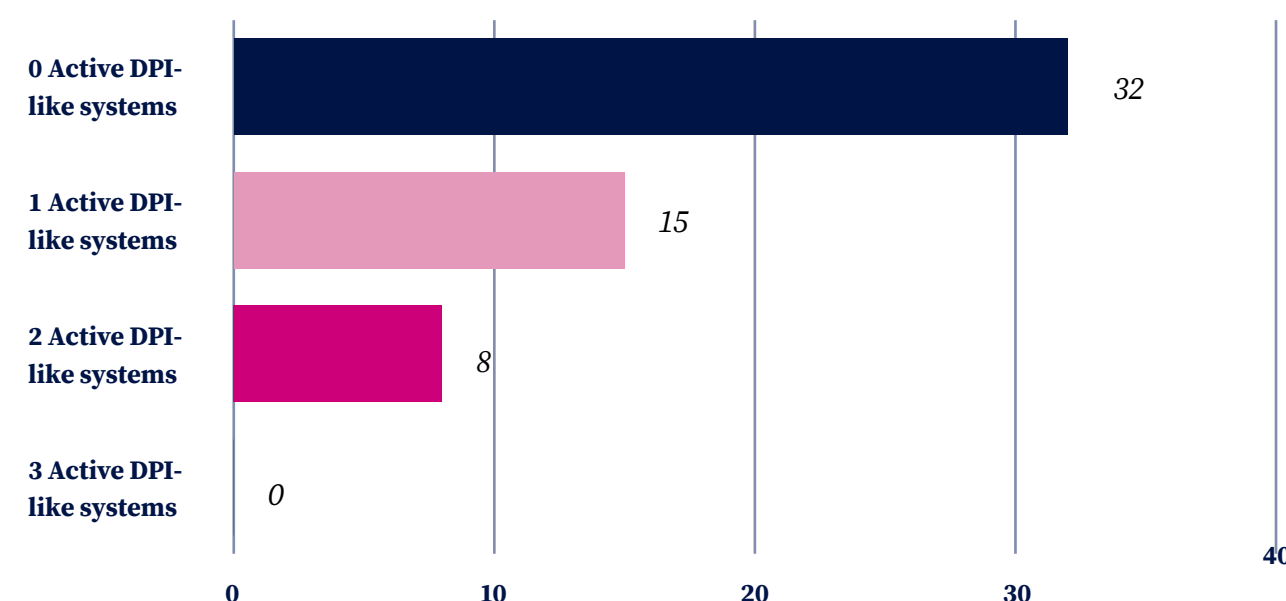


**Figure 2: 32 African countries are in the formative stages of their DPI journey.**  
Source: DPI Map

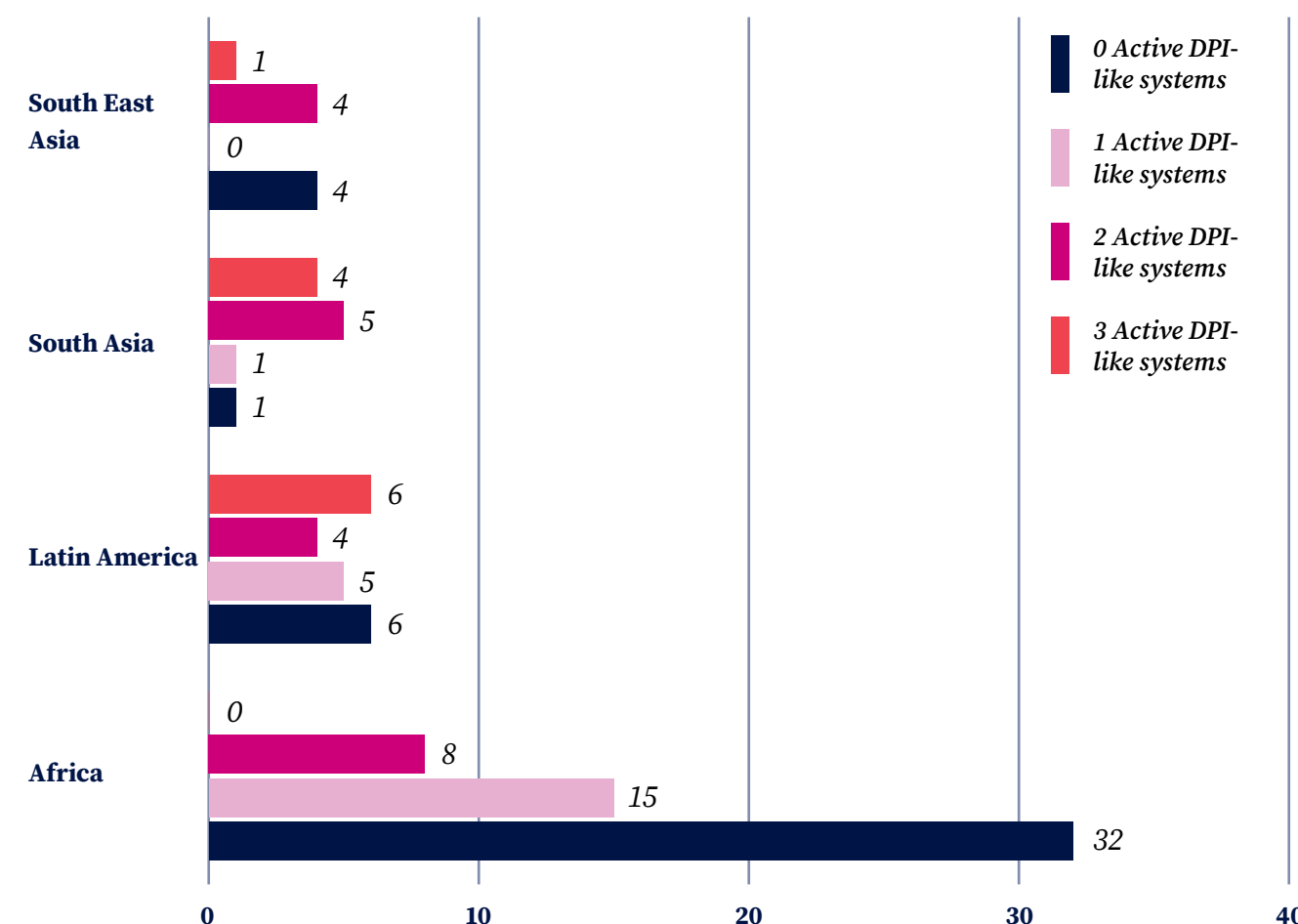


**Figure 3: Global DPI adoption trends.**  
Source: DPI Map

## Box 2: Early signals of DPI impact across Africa

### SOUTH AFRICA: TAX ADMINISTRATION AND SOCIAL PROTECTION

The South African Revenue Service's (SARS) eFiling platform is widely cited as a global example of a DPI system where adoption followed clear public value. Built on taxpayer identity and digital payments, it allows individuals and businesses to file and pay taxes online, and increasingly auto-assesses returns by drawing on data exchanged with employers, banks and other third parties — simplifying compliance and driving high uptake. The same foundations support social protection. The South African Social Security Agency (SASSA) disburses grants through digital payment channels and verifies beneficiaries by cross-referencing the national population register and deaths register, ensuring grants reach authorized and living recipients.

### SIERRA LEONE: FINANCIAL INCLUSION AND SERVICE DELIVERY

Sierra Leone is using digital identity to help formalize parts of the informal economy. By registering individuals and small businesses through digital ID, previously informal actors can access formal financial services such as savings accounts and credit. The system is also expanding into public service delivery, with digital identity being used to automate services such as driver's licence renewals and other administrative processes. Additionally, in the health sector, Sierra Leone uses the District Health Information System (DHIS2) as a national data exchange platform, serving as a central repository for health data across districts and helping improve coordination and decision-making across the health system.

### NIGERIA: SCALING DIGITAL IDENTITY

Nigeria has achieved a major milestone in digital identity, with more than 100 million people registered under the National Identification Number (NIN) system.<sup>39</sup> This expanding digital identity foundation is enabling more secure access to services and laying the groundwork for broader digital government systems.

### ZAMBIA: CONNECTING GOVERNMENT SERVICES

Zambia has placed more than 200 public services online through The Zambia Government Service Bus (GSB) is a national digital platform that integrates all government institutions, departments and agencies into a single, centralized electronic system. The GSB allows different government systems to communicate and enabling citizens to access services more efficiently through digital channels.

### TANZANIA – INTEROPERABLE DIGITAL PAYMENTS<sup>40</sup>

Tanzania has built one of Africa's most advanced public payment rails through the Tanzania Instant Payment System (TIPS), developed in-house by the Bank of Tanzania and launched in 2020. TIPS connects banks and mobile money providers on a single interoperable platform, allowing customers to transfer funds instantly across different providers regardless of who they bank with. In 2024 it processed more than 450 million transactions worth around TZS 29.9 trillion (about US\$11.6 billion) — roughly 1.5 million transactions a day — with 45 financial service providers connected. Tanzania and Rwanda have since begun linking these national systems to enable low-cost cross-border payments.

This uneven landscape creates both a challenge and opportunity. Most African countries are positioned to design systems incorporating inclusion and interoperability from the start, learning from early adopters' experience from across the continent and globally (see global adoption trends in [Figure 3](#)).

DPI is already delivering measurable gains in areas such as financial inclusion, trade, public service delivery, innovation and climate adaptation. Early indications from countries that have started building and scaling these systems show the value that DPI can benefit national as well as regional development agendas. They also demonstrate that when DPI components are connected, they create cascade reactions across sectors that no single digital intervention could achieve alone.

**Box 2** presents a snapshot of early signals of DPI impact across Africa.

## System-level impacts: What DPI enables

### DPI ENABLES HIGH-TRUST TRANSACTIONS, FINANCIAL INCLUSION AND DIGITAL MARKETS

Digital ID systems offer significant economic and social benefits. By 2030, they could unlock economic value equivalent to three to 13 percent of gross domestic product (GDP), with emerging economies potentially

seeing higher gains (around six percent).<sup>28</sup> This value is created by formalizing economic flows, expanding inclusion in services and enabling high-trust digital transactions.

Digital ID also underpins secure government-to-citizen (G2C) and citizen-to-government (C2G) payments, reducing cash handling and leakage. It further serves as the foundation for smart city and e-government platforms, lowering transaction costs and supporting new digital services like e-health and education. Beyond GDP effects, DPI unlocks non-economic value, promoting inclusive access to services, safer migration and greater civic participation.<sup>29</sup>

Digital payments are among the clearest illustrations of DPI's promise in sub-Saharan Africa, though the term covers several models with very different governance and interoperability. Mobile money came first and drove inclusion at scale: transaction values rose from under 10 percent of regional GDP in 2015 to over 40 percent in 2021, giving millions of unbanked people a financial on-ramp.<sup>30</sup> These platforms remain largely proprietary and operator-specific, however, even as interoperability between them improves. The DPI principle of open, interoperable public rails is most fully expressed by fast (instant) payment systems, which let customers transact across any provider on shared infrastructure. Their spread drove annual growth of 37 percent in transaction volumes and 39 percent in values across Africa between 2019 and 2023.<sup>31</sup> Central bank

digital currencies (CBDCs),<sup>32</sup> such as Nigeria's eNaira, represent a further frontier with a different governance model. However, adoption has been low and remains as-yet unproven at scale.<sup>33</sup> The trajectory points to interoperable public rails as the foundation on which mobile money and other instruments increasingly connect.

The potential is significant: these systems expand financial inclusion, lower remittance and cross-border transaction costs, and facilitate trade. E-payments generate data that can improve credit access for small and medium enterprises (SMEs) and households, acting as digital collateral. Technologies like blockchain and smart contracts promise further innovation, driving demand for stronger regulatory frameworks and institutional reforms.<sup>34</sup>

## ENABLING TRADE AND REGIONAL INTEGRATION

DPI provides the operational backbone for Africa's emerging digital economy and for deeper continental integration. By enabling trusted identity, seamless payments and secure data exchange across borders, DPI creates the practical foundations for trade to move faster, more transparently and at lower cost.

This infrastructure is increasingly central to the success of the African Continental Free Trade Area (AfCFTA), the African Union's flagship initiative to create a single market for goods, services and investment. As African economies work to reduce trade costs and harmonize regulations, interoperable digital systems that connect institutions, markets and

traders across borders are becoming essential. In practice, this means adopting shared technical standards, mutually recognizing digital identities and credentials across borders, and connecting national systems through common protocols. Tanzania and Uganda are, for instance, exploring how a single national ID number can be used for cross-border trade.

The importance of this architecture was reinforced by the endorsement of the AfCFTA Protocol on Digital Trade and Intellectual Property at the February 2025 African Union Summit. The protocol establishes the first comprehensive continental legal framework for the digital economy. While it focuses on removing barriers to trade, DPI provides the interoperable rails — including digital identity, cross-border payments and trusted data exchange — that can help translate these commitments into operational reality.

Africa is therefore beginning to shape its own rulebook for digital trade in a global landscape where norms are still evolving. While countries may interpret and implement these frameworks differently, shared digital foundations can enable systems to connect and operate across borders.

Another particularly promising frontier is trade intelligence. Across the continent, traders still face major information gaps on prices, markets, regulatory requirements and supplier networks. DPI-enabled platforms can help close these gaps by connecting buyers and suppliers through verified, interoperable data. Crucially, these

tools must build on traders' existing practices rather than impose entirely new digital behaviours.<sup>35</sup> Intermediaries — agents, cooperatives and trusted platforms — often play a pivotal role here, translating informal practices into digital systems and helping traders adopt new tools without abandoning familiar ways of working.

## TRANSFORMING PUBLIC SERVICE DELIVERY

Public service delivery is another domain where DPI can generate significant gains. By connecting foundational systems such as civil registration, digital identity and data exchange platforms, governments can move from fragmented services to integrated, citizen-centred delivery.

One of the most transformative possibilities is that services can be delivered *proactively*. Instead of requiring people to navigate complex administrative processes to apply for benefits, interoperable systems allow governments to securely use existing data — from civil registration, tax records or health systems — to trigger services automatically. Social protection enrolment, health insurance coverage or education subsidies can be delivered more efficiently, reducing exclusion errors, administrative burdens and service delivery costs.

The examples that follow illustrate how DPI can transform the relationship between people and the state. When digital systems are designed to connect institutions rather than operate in isolation, governments can deliver services that are faster, more reliable

and more responsive to people's needs.

## COUNTRY EXPERIENCES: BUILDING DPI IN PRACTICE

Across Africa, countries are building DPI through diverse national pathways. These experiences highlight both the opportunities and the complexities of developing interoperable systems that connect identity, payments, data exchange and digital services. While contexts differ, several lessons are emerging about the importance of strong governance, interoperability and continuous system improvement. Starting points differ widely. Some countries began with a foundational digital ID, others with payments or sector-specific data systems. Differences in institutional capacity and resources shape the pace and sequencing of reform. Critically, the experiences below show that DPI progress is as much a function of institutional design and political coordination as it is of technology — a finding that cuts across every country context.

### *Mauritius' interoperable digital government*

In Mauritius, the **infoHighway** platform enables government agencies to share data across institutions through a secure interoperability layer inspired by Estonia's X-Road model. The platform now supports more than 600 digital services, including identity verification and business registration. Processes that once required multiple physical visits can now be completed in a single day, while export processing times for compliant traders have been cut significantly.

The platform is supported by a strong enabling framework, including a Data Protection Act aligned with international standards and a national Open Data Policy. Since its launch, infoHighway has helped streamline service delivery and is estimated to have saved more than 10,000 working hours across government services.<sup>36</sup>

### ***Rwanda's integrated digital service delivery***

Rwanda's **Irembo** platform has become one of Africa's most comprehensive digital government service portals. Developed as a public-private partnership, the platform integrates digital identity verification with more than 100 public services, including birth registration, driving licences, business permits and land title transfers. By 2025, Irembo had processed more than 30 million service requests,<sup>37</sup> dramatically reducing the time and cost of accessing government services. For rural citizens, services that once required multiple trips to urban centres can now be initiated from local agents or mobile devices.

### ***Nigeria's digital identity and financial inclusion***

Nigeria's **Bank Verification Number** (BVN) system illustrates the potential of digital identity to expand financial inclusion. By linking biometric identifiers to bank accounts across the financial system, BVN has strengthened fraud prevention and enabled interoperable customer verification. Close to 70 million individuals have been enrolled.<sup>38</sup> Nigeria's subsequent rollout of the National Identification Number (NIN) system, and ongoing efforts to harmonize NIN and BVN,

reflect the iterative and context-specific nature of DPI development as countries expand foundational identity systems.

### ***Tanzania's digital health interoperability***

Tanzania has made notable progress in building interoperable digital health information systems. The national **Health Management Information System** (HMIS) now connects more than 7,000 health facilities, enabling real-time reporting on disease surveillance, supply chains and service delivery. Built on open standards, the system is designed to integrate with civil registration and national identity systems. At the same time, Tanzania illustrates a common challenge across many countries: multiple digital pilots exist but often remain insufficiently connected, underscoring the importance of moving from fragmented initiatives to coherent national systems.

### ***South Africa's digital social protection at scale***

South Africa's experience with digital social protection highlights both the potential and the risks of large-scale systems. During the COVID-19 pandemic, the South African Social Security Agency (SASSA) rapidly deployed the **Special COVID-19 Social Relief of Distress Grant**, reaching more than 10 million beneficiaries through digital channels. The programme demonstrated how digital systems can enable rapid crisis response, while also revealing gaps in foundational systems — including documentation barriers, connectivity challenges and system errors that affected some eligible citizens.

### ***Ghana's public-private partnerships for digital identity***

Ghana's **Ghana Card** system illustrates how DPI can be developed through public-private collaboration. The national digital identity programme resulted from a long-term public-private partnership model, where a private sector partner helped to develop and operate the system. It now supports digital identity verification across sectors and provides application programming interfaces (APIs) that allow third parties to verify identities securely.

### ***Benin's instructive governance model***

In 2025, the government established a public-private coordination mechanism to streamline DPI across priority sectors — the first of its kind in the ECOWAS region. With ministerial leadership and multi-stakeholder participation, DPI reforms are now embedded in all government action plans. The country now mobilizes over one third of public revenues digitally, strengthening domestic resource mobilization and reducing leakages.

Together, these experiences demonstrate that DPI development is not a single technology project but an evolving institutional process. Countries build systems incrementally, often starting with sector-specific platforms before connecting them through interoperable digital foundations. As these systems mature, they can generate broader economic and governance benefits by reducing transaction costs, strengthening trust and enabling new forms of service delivery and economic participation.

# 03



## AN ECOSYSTEM APPROACH

Early adoption and implementation across the continent show that DPI can deliver tangible results. This is evident from the country evidence set out in the preceding sections. However, moving from promising pilots to sustained, inclusive scale requires action from multiple actors with different roles and constraints. This ecosystem approach calls for coordination and shared direction despite differences in policy, institutions, financing, standards, infrastructure and trust.

Across consultations with the key ecosystem actors, a consistent message emerged: the DPI landscape in Africa is crowded with well-intentioned pilots that have not delivered systemic change.<sup>41</sup> What is needed is a shift from proof-of-concept to structured, sustained programmes that are bankable, country-owned and designed for scale.

National governments, regional bodies, development organizations, the private sector and civil society must work in a more complementary and accountable way to accelerate DPI implementation — ensuring that it strengthens sovereignty, expands opportunity and delivers for all.

## For national governments: building whole-of-society coordination

Across consultations, one finding was clear: DPI adoption hinges less on technical readiness than on political economy. Whole-of-government coordination remains the most significant barrier and coordination depends in turn on clear mandates and decision rights — an explicit answer to who holds the authority to set standards, align budgets and resolve disputes across institutions. Institutional leadership varies — from the presidency or prime minister's office to ICT or finance ministries — and no single model fits all contexts.

In many contexts, governments are required to envision, design, operate and regulate DPI in resource-constrained environments and amid competing priorities. However, government stakeholders and development partners often lack guidance on how to strategize DPI rollout and use-case thinking, and coordinate across ministries, departments and agencies. As a result, DPI often emerges as a patchwork of donor-funded sectoral pilots — valuable in isolation but rarely designed to scale or deliver systemic gains.

The core challenge is strategic: a shift is required to ensure that DPI is recognized as foundational

national infrastructure and a development imperative, with a clear vision for how it will unlock inclusive growth, improve service delivery and strengthen prosperity.

UNDP advocates a three-step framework: first, identify the development challenge; second, assess the country context (political, institutional, legal and social); and third, select the technical solution best suited to that context. This

challenge-first sequencing ensures that DPI serves national priorities rather than becoming a technology agenda in search of a problem.

Additionally, a safeguards-first approach is critical and makes DPI trustworthy enough to scale. The Universal DPI Safeguards Framework offers actionable guidance for this.<sup>42</sup> The framework embeds privacy- and security-by-design, independent oversight and audit, and inclusion

measures across the full DPI life cycle, from architecture and procurement through to day-to-day operation. It also aligns DPI with international human rights frameworks and the SDGs. The risks it addresses are concrete: people excluded during rollout because they lack documentation or connectivity, or automated decisions deployed without accountability for how they affect individuals.<sup>43</sup>

Approached this way, safeguards are not constraints on progress — they are capacity-building mechanisms that build trust and open the door to important political conversations about DPI. They also provide governments with practical tools for navigating complex global frameworks.

## For regional bodies: scaling standards and sharing

At the regional level, Africa has laid important foundations for DPI — but translating vision into widespread adoption remains uneven. Continental frameworks such as the AU's Agenda 2063 and Digital Transformation Strategy for Africa (2020–2030) set the political direction for an integrated digital economy. Technical platforms like the Smart Africa Trust Alliance (SATA), which promotes cross-border interoperability, and the Pan-African Payment and Settlement System (PAPSS), which facilitates pan-African payments, provide practical building blocks.

### Box 3: The 5Cs for accelerating DPI implementation

Accelerating DPI implementation requires five practical shifts — the “5Cs”.

- 1. Commitment.** Political leadership is essential. Governments need clear authority at the centre of decision-making, strong coordination across ministries and better alignment among development partners. Ministries of finance must be central to this effort, as budget decisions determine whether DPI is treated as foundational national infrastructure or a discretionary technology project. Neutral brokers can also help harmonize fragmented donor efforts and bridge the gap between technical teams and policy leaders.
- 2. Capacity.** Countries must invest in domestic technical expertise so they can build, adapt and maintain digital systems locally, rather than relying indefinitely on external vendors.
- 3. Capital.** Financing must move beyond short-term projects toward sustained investment across the full lifecycle of DPI systems, including maintenance and upgrades. The financing landscape is often stronger than assumed. Institutions such as the African Development Bank can finance integrated packages — including technology, infrastructure, training and sectoral applications — through sovereign lending, grants and concessional finance. The challenge is less the availability of capital than the readiness of bankable projects. Here, UNDP can play a catalytic role by supporting readiness assessments, governance frameworks and institutional arrangements that help unlock available financing.
- 4. Community.** Trust and sovereignty are essential. People must have confidence that their data is protected, while governments must see digital systems as strengthening — not compromising — independence and agency. Robust safeguards, including data protection frameworks, should therefore be established before scaling high-stakes systems such as digital identity.
- 5. Collaboration.** DPI works best when governments, the private sector and civil society design systems together, and when countries adopt shared standards that enable secure cross-border data exchange and regional integration.

### Box 4: Building regional avenues for regional learning and sharing

Other regions offer instructive models of how structured peer networks can accelerate reform. In Latin America and the Caribbean, a Community of Practice on Data-Driven Communications — led by Cepei and PARIS21 — brings together national statistical offices and partners to share tools, strategies and practical experience, strengthening how data informs decision-making. In Africa, ID4Africa's Ambassadors Programme connects senior government officials across 48 countries to coordinate digital identity development, prevent fragmentation and foster accountability through peer exchange and high-level leadership.

Country-cluster approaches also show promise. Nigeria, for instance, has convened Ghana, Egypt, Kenya, Rwanda and South Africa to jointly address implementation of the AfCFTA Data Trade Protocol — a model of harmonized, peer-led coordination that the broader DPI agenda could emulate. These examples demonstrate how regional learning communities can shorten implementation cycles, build trust and translate technical ambition into sustained institutional change.

The AfCFTA offers the broader policy architecture for a connected single market. Yet regional institutions cannot compel national uptake. Their role is to lower coordination costs — by setting common standards, harmonizing legal frameworks and enabling countries to pool expertise rather than building in isolation.

Progress now depends on moving from pilots and principles to sustained implementation. Platforms such as SATA and PAPSS require consistent political backing, financing and active participation from member states to mature into trusted, continent-wide infrastructure. Driven by AfreximBank in close collaboration with the AfCFTA Secretariat and private sector partners, PAPSS demonstrates the potential of scalable cross-border DPI. Yet despite its technical readiness, some central banks remain hesitant to adopt it — underscoring that even strong regional platforms depend on active political backing from member states. At the same time, regulatory alignment is critical. The AU Data Policy Framework provides a reference point for managing cross-border data flows while protecting privacy and national sovereignty, but countries must translate these principles into practical legislation adapted to local contexts.

Regulatory harmonization across African jurisdictions is critical to cross-border DPI. This means more than policy alignment on paper. It requires mutual recognition of digital identities across borders, harmonized data protection frameworks that enable secure cross-border data

flows, common technical standards for interoperability, and coordinated regulatory approaches that prevent a patchwork of incompatible national systems. Emerging efforts — such as the Southern African Development Community's (SADC) work to streamline e-KYC processes by linking financial services to national digital ID systems — illustrate the promise of regional cooperation, while also underscoring the need for careful coordination among national regulators.

Regional bodies are therefore most effective not as enforcers, but as conveners and catalysts: creating space for peer learning, sharing implementation lessons, supporting regulatory harmonization and building trust across borders. If strengthened and better aligned, this regional layer can accelerate national DPI efforts while anchoring them within Africa's broader integration agenda.

## For development organizations: systems over projects

Development partners have a critical role to play — but only if they move beyond funding isolated digital projects toward investing in shared foundations and delivering coordinated outcomes. Too often, one donor may for instance support a health information system, another finances

digital payments and a third builds a social registry — all operating in parallel. The result is often duplication, inefficiency and systems that cannot connect. This fragmentation may persist for structural reasons: donors operate within distinct institutional mandates, funding cycles are short, and accountability pressures reward visible, attributable projects over shared infrastructure whose benefits are diffuse and slow to materialize.<sup>44</sup>

A more strategic approach is to invest in core DPI (digital identity, payments and data exchange) that can support multiple sectors simultaneously. When these foundations are open, interoperable and adaptable, they unlock value across the entire development ecosystem.

This requires a shift in how development organizations operate. The traditional model of convening and brokering dialogue remains important but is no longer sufficient. The DPI landscape increasingly demands orchestration: actively ensuring that governments, donors, technical providers, civil society and the private sector work in concert toward integrated outcomes. Orchestration implies stronger leadership, clearer accountability and greater responsibility for results than facilitation alone.

UNDP is well positioned to contribute to this role. With a wide country-level presence across the continent, strong relationships with national governments and a mandate spanning governance, economic transformation, climate and inclusion,

UNDP can help align DPI investments with national priorities, sequence them strategically and design them for long-term sustainability.

Crucially, this role must reinforce — not substitute — domestic leadership. UNDP's value lies in bridging: between national priorities and global technical expertise, between the African Union's continental vision and country-level implementation, and between donor financing and domestic capacity development. In Kenya, for instance, UNDP has worked with the Ministry of Information, Communications and the Digital Economy on a DPI portfolio that covers data governance, e-government and digital skills — aligning external support with the government's own digital agenda.<sup>45</sup>

Stronger coordination among funders is essential. The DPI landscape is crowded, and well-intentioned initiatives risk reproducing the very silos DPI is meant to dismantle. Meaningful collaboration requires partners to look beyond individual mandates and timelines toward shared, country-led objectives — aligning investments, sequencing support and recognizing comparative strengths.

Encouragingly, funders and ecosystem partners are beginning to converge around more practical, country-led approaches to digital public infrastructure (DPI). A recent convening of DPI government leaders from ten countries, hosted by Co-Develop, Galaxy Backbone, Smart Africa and MicroSave, pointed to two important shifts. First, governments are moving beyond isolated pilots

and applying DPI to concrete sectoral priorities, including health, agriculture and public service delivery. Second, they are increasingly looking for shared and reusable assets, rather than building fragmented systems from scratch. This is precisely where coordinated support can add value: helping countries translate ambition into interoperable systems, align technical and financing partners around shared outcomes, and build institutional capability over time. UNDP's African Accelerator for Digital Public Infrastructure (AA4DPI) is designed to respond to these dynamics by supporting the transition from fragmented pilots to coherent national systems anchored in domestic priorities.

The financing landscape for DPI in Africa is also more promising than often assumed. Beyond the African Development Bank's integrated lending and concessional instruments, financing windows exist through the World Bank, the Islamic Development Bank, the European Bank for Reconstruction and Development and bilateral partners. As the 5Cs note, the binding constraint is the readiness of bankable proposals, not the availability of capital.

UNDP can play a catalytic role in closing this gap. Through digital readiness assessments, governance framework design and institutional strengthening, UNDP can help governments structure DPI programmes that meet the investment criteria of development finance institutions. This shifts

the conversation from seeking additional donor funding toward unlocking existing financing through stronger project preparation.

Financial sustainability must also be considered from the outset. While DPI is often described as soft infrastructure, it can generate returns. Transaction-based fees, tiered service models, verification services and public-private partnerships can contribute to long-term sustainability. The objective is infrastructure that remains viable beyond donor cycles by enabling economic activity, formalization and more efficient governance.

**Ultimately, DPI systems endure only when they reflect local realities, are owned by national institutions and remain financially viable beyond external support. Designing with domestic capacity in mind — and exploring realistic financing models such as public-private partnerships, tiered user models or regional cost-sharing — helps transform short-term projects into durable public infrastructure. A systems approach, grounded in national ownership and coordinated investment, is what ultimately turns digital initiatives into the public infrastructure that underpins inclusive development.**



# DPI DONE RIGHT

**The impact of DPI depends entirely on how it is designed, governed and safeguarded. The same systems that can expand opportunity, improve service delivery and strengthen state capacity can also entrench exclusion, concentrate power, or erode trust. DPI is infrastructure in the deepest sense: once embedded, it shapes how people interact with the state and the economy for decades. Getting it wrong carries long-term costs.**

Across Africa, momentum behind DPI is accelerating. But speed cannot substitute sound foundations. Many countries are already operating partial DPI systems, so getting it right is a continuous process of reform and improvement, not only a question of initial design. Countries face a delicate balancing act: moving fast enough to capture economic and development gains, while ensuring systems are inclusive, rights-respecting and resilient. Inclusion, trust and sovereignty are not secondary considerations; they are structural requirements. Without them, adoption falters, legitimacy weakens and the promise of digital transformation dissipates.

DPI ‘done right’ therefore demands deliberate choices — about who is included, how data is protected, how power is distributed and how accountability is enforced. It requires investment not only in technology, but in institutions, safeguards and human capacity.

## Inclusion needs intentional action

Inclusion is not an optional feature of DPI. It determines whether systems succeed or fail. DPI can expand opportunity and access at scale, but only if it is designed around the realities of those who are least connected, least literate or least visible to the state. When inclusion is treated as an afterthought, digital systems can entrench exclusion just as easily as they resolve it.

Biometric tools may fail for elderly people with worn fingerprints. Smartphone-only applications overlook feature-phone users. Interfaces designed in non-local languages exclude millions. Systems that assume constant connectivity collapse in rural areas without reliable coverage. These are not marginal issues; they shape adoption, trust, and long-term viability. When built deliberately and inclusively, however, DPI allows countries to bypass legacy-systems constraints and extend services to people historically beyond reach. The difference lies in design choices — and in whether inclusion is treated as foundational rather than decorative.

## What inclusion requires

Inclusive DPI rests on practical design choices and institutional safeguards. First, systems must accommodate different levels of connectivity, literacy and documentation. Offline and low-tech options — such as USSD channels (simple menu-based services accessed by dialling short codes on basic mobile phones without internet), QR-based access (scannable codes that allow credentials or payments to be verified even offline), agent-assisted registration and voice interfaces — ensure that access does not depend on owning a smartphone or maintaining constant connectivity.

Second, strong data protection frameworks are non-negotiable. Independent oversight authorities, enforceable privacy rights, accessible grievance mechanisms and transparent breach reporting are essential to building trust. Citizens must know what data is collected, how it is used and how they can challenge misuse. Without these protections, uptake will remain fragile.

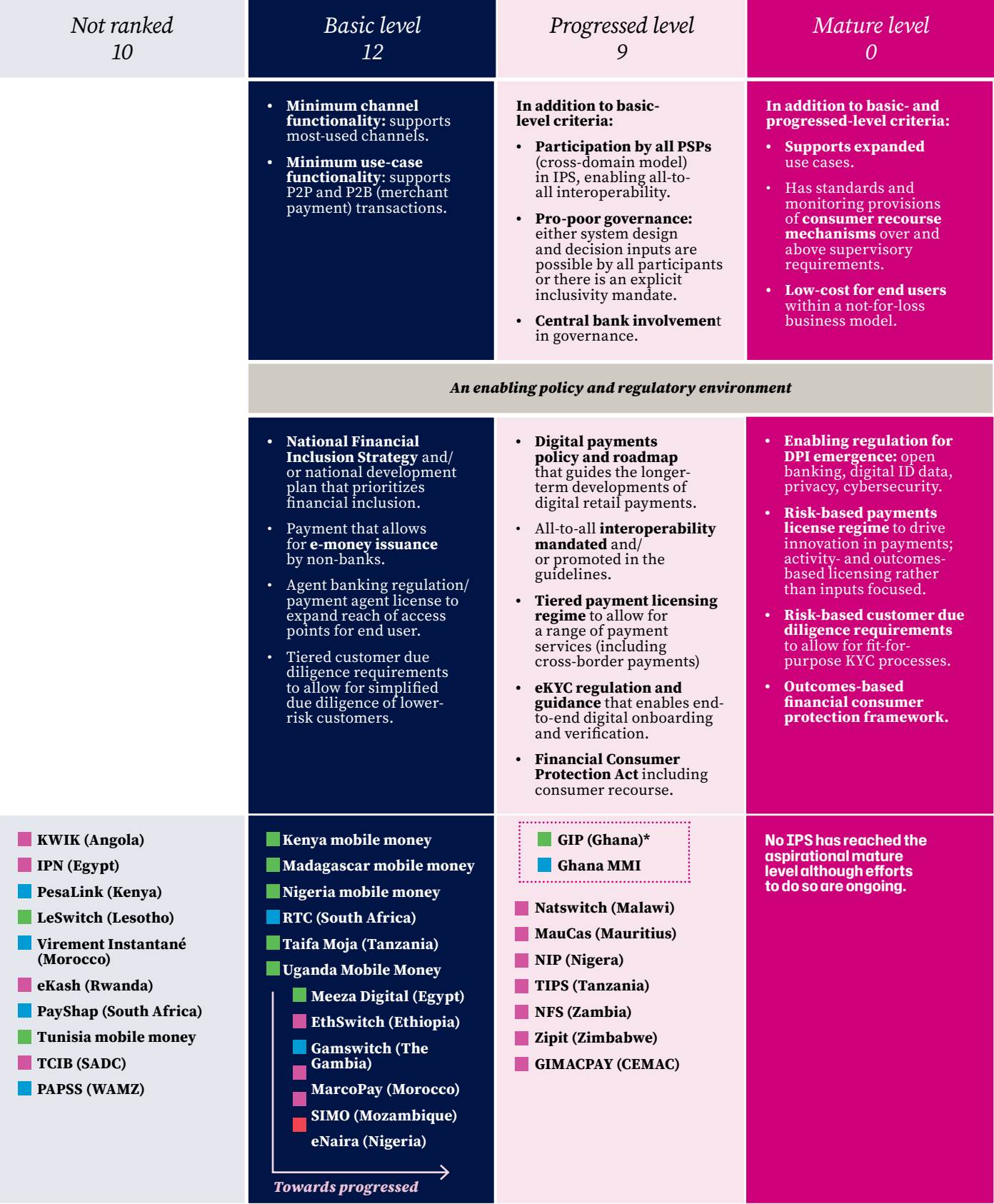
Third, interoperability and open standards matter. Systems built on widely adopted technical standards reduce vendor lock-in, enable competition and allow governments to evolve their infrastructure over time. Closed, proprietary systems may deliver short-term functionality but can create long-term dependency and fiscal risk.

Fourth, inclusion depends on institutional and human capacity. Policymakers, regulators, technologists and frontline administrators must be trained and retained. Sustained investment in professional development — including prioritizing women in technical and leadership roles — strengthens both system resilience and public legitimacy.

Finally, inclusion requires communication. People cannot trust or use systems they do not understand. Strategic outreach campaigns, civic education initiatives and transparent public reporting help people know their rights, recognize responsible institutions and hold them accountable. Effective DPI implementation therefore combines technical design with public engagement — ensuring that systems are not only accessible, but also intelligible and contestable.

## Closing gender gaps by design

DPI is built on the very systems where gender gaps are widest. Women are less likely than men to hold a foundational ID. Sub-Saharan Africa, for example, has the largest ID coverage gap of any region.<sup>46</sup> Connectivity shows the same pattern: women in sub-Saharan Africa are 29 percent less likely than men to use mobile internet — the widest regional gap — leaving roughly 205 million women, about three in five, offline.<sup>47</sup>



\* The two Ghana systems jointly achieved progressed level.

- Cross-domain IPS
■ Bank IPS
■ Mobile money IPS
■ Sovereign currency IPS

Figure 4: Inclusivity level of payment systems.  
Source: Africa Nenda

These gaps are driven by affordability (of handsets and data above all), literacy and digital skills, restrictive social norms and safety concerns such as harassment and fraud. Where DPI ignores them, it risks hard-coding exclusion: systems that assume a personal smartphone, online-only enrolment, or registration mediated by a male relative push women further from identity, payments and public services.

The same design choices can also narrow the gaps. Assisted and offline enrolment, female registration and agent networks, fee waivers, low-bandwidth interfaces and privacy- and safety-by-design can make systems more usable for women. Tracking gender-disaggregated data on registration and use allows governments to identify whether a system is closing a gap or widening it, and correct course early.

# Safeguarding requires constant effort and multistakeholder collaboration

DPI concentrates sensitive personal data and system-level power. Without strong safeguards, it can become a tool for surveillance, discrimination or political misuse — particularly in contexts where institutional checks and balances are

weak. Centralized databases and integrated identity systems magnify both benefits and risks. The larger and more foundational the system, the greater the consequences of design flaws or governance failures.

Effective safeguards must therefore be embedded from the outset. Privacy-by-design principles, data minimization, clear consent frameworks, independent regulatory oversight and enforceable legal protections are structural conditions for legitimacy.

Safeguards should be recognized as African-led mechanisms for building the trust that enables adoption at scale. Recent experience illustrates this. In Kenya, the High Court halted the rollout of the Huduma Namba digital ID system in 2021, ruling that it had failed to conduct a mandatory Data Protection Impact Assessment under the Data Protection Act (2019).<sup>48</sup> The episode underscored that procedural safeguards are not optional. Kenya is now transitioning to a revised system under strengthened oversight and compliance requirements. It serves as a reminder that accountability mechanisms can correct course, but at significant political and financial cost.

Safeguarding DPI is therefore not a one-time compliance exercise. It requires continuous collaboration among governments, regulators, technologists, civil society and the judiciary to ensure that innovation advances public value without compromising rights. Kenya illustrates these safeguards functioning in practice.

# Civil society and independent oversight

DPI gains durability when it is subject to independent scrutiny. Civil society organizations, data protection advocates, researchers and investigative journalists play an important role in identifying exclusion risks, privacy breaches, algorithmic bias and implementation gaps. Their engagement can surface blind spots early — before they escalate into systemic failures or public backlash.

Transparency is central to this process. Public reporting on system performance, grievance mechanisms, data breaches and exclusion rates allows for corrective action and builds institutional credibility. Yet such disclosure remains uneven, and many civil society actors lack the technical resources required to engage meaningfully on complex digital standards and governance frameworks.

Governments therefore have a responsibility to create enabling conditions for constructive oversight. This includes protecting freedom of expression and association, providing formal consultation channels during system design and piloting, and responding transparently to documented concerns. At the same time, capacity-building — through training, university partnerships and technical

resource support — can strengthen civil society's ability to engage substantively on interoperability standards, data governance and algorithmic accountability.

## Private sector: innovation within guardrails

Private sector participation is essential to scaling DPI. Governments rarely possess all the technical expertise, implementation capacity or innovation agility required to design and evolve complex digital systems. Partnerships with technology firms, fintech providers and platform developers can accelerate deployment and expand service delivery.

At the same time, governments cannot cede strategic control over systems that underpin identity, payments, data exchange and public services. Poorly structured public-private arrangements can create long-term dependency, opaque pricing, vendor lock-in or misaligned incentives. The challenge is not whether to engage the private sector, but how to do so on terms that safeguard sovereignty and public interest.

Clear regulatory frameworks are therefore critical and should encompass open standards, transparent procurement, enforceable data governance rules, audit rights and tailored intellectual property

provisions. Pricing transparency and competitive ecosystems encourage innovation while protecting fiscal sustainability. These protections must be embedded in contracts and law — not left to corporate goodwill.

Regional coordination can further strengthen governments' negotiating position. Joint procurement mechanisms and shared technical standards reduce asymmetries between individual countries and large technology providers, preventing a race to the bottom in contract terms. When structured with clear guardrails, private participation can drive innovation and competition while preserving public ownership of core digital rails.



**Digital public infrastructure (DPI) is not merely a technology upgrade — it is the foundational infrastructure on which inclusive, resilient, and future-ready societies are built. From protecting people's rights to strengthening resilience in fragile contexts, DPI is as much a trust framework as it is a technological one.**

**The DPI approach brings together technology components through trusted institutions, shared governance, and universal safeguards. In doing so, it transforms isolated digital solutions into coherent, interoperable systems that serve the public good. By embedding principles of inclusion, human dignity, transparency, accountability, and meaningful public-private collaboration from the outset, countries can build digital systems that are not only effective and scalable, but also trusted by the people and communities they serve.**

**ROBERT OPP**

Chief Digital Officer,  
UNDP



# A CALL TO ACTION: BUILDING AFRICA'S DIGITAL FOUNDATIONS

Africa's digital transformation has commenced. The question is not whether digital transformation will reshape the continent's economies and institutions, but whether that transformation will be shaped by African leadership, grounded in African priorities and urgently serve all African people's needs.

The next five years will be decisive. Decisions taken now on standards, governance, financing and institutional design will determine whether DPI becomes a platform for shared prosperity or a source of new dependency and exclusion. Digital infrastructure, once embedded, is difficult to unwind. The opportunity to shape it deliberately is therefore finite. Delay is not a neutral choice. As slow, fragmented, vendor-locked or exclusionary systems take root, the cost of correcting course rises and external dependencies deepen. The people already left out fall further behind and economies lose resilience and competitiveness.

The foundations are already in place. The African Union's Agenda 2063 and Digital Transformation Strategy for Africa articulate a clear continental vision. The African Continental Free Trade Area provides the policy architecture for an integrated digital market. Platforms such as PAPSS and SATA offer practical building blocks. A growing number of African countries — including Rwanda, Nigeria, Mauritius, Tanzania, Ghana and South Africa — are demonstrating what DPI can deliver when built with

political commitment, institutional capacity and inclusive design.

In the next one to two years, the priorities are concrete: adopt open standards and interoperability requirements, put data-protection laws and governance bodies in place, designate a mechanism to coordinate DPI across ministries, and build a pipeline of bankable projects to unlock the financing that is already available.

Coordinated execution is required across five priorities.

- 1. African heads of state and governments** should recognize DPI as foundational national infrastructure and a development priority of the highest order, and establish clear mandates, governance structures and delivery models. They must invest in domestic digital capacity and ensure that safeguards — particularly data protection and inclusion measures — are in place before systems scale. Ministries of Finance should be central to this effort, as budget decisions ultimately determine whether DPI is resourced as national infrastructure or treated as a discretionary technology project. Governments should also empower and adequately resource the independent regulators on which DPI depends — data protection authorities to enforce safeguards, and central banks to govern interoperable, inclusive payment systems — and protect their independence.
- 2. The African Union and regional institutions** should accelerate the harmonization of standards, legal frameworks and cross-border

protocols. These bodies must strengthen continental platforms such as PAPSS and SATA through sustained political support and financing. Structured mechanisms for peer learning should be established so that countries advancing DPI implementation can share lessons with those beginning their journeys.

3. **Development partners** should shift from fragmented project funding towards coordinated investment in shared digital foundations. Moving beyond proof-of-concept pilots towards structured, bankable programmes that unlock sovereign lending, concessional finance and domestic investment will be critical. Support must align with national priorities and timelines. Partners should invest in institutional capacity and coordinate efforts across the development ecosystem.
4. **The private sector** should engage in ways that support open standards, transparent procurement and long-term interoperability. Durable commercial opportunities will emerge from ecosystems built on trust, inclusive access and interoperable digital foundations. This is especially true for telecommunications operators, whose networks provide the connectivity on which all DPI ultimately depends. This gives them a central role in extending affordable, universal access.
5. **Civil society and academia** must ensure transparency and accountability in system design, data governance and inclusion safeguards. Research institutions and academia should also supply technical expertise and independent evidence on what works, informing better

design and implementation. DPI systems are most durable when subject to independent scrutiny and informed public oversight.

## UNDP's role: contributing to Africa's DPI transition

UNDP is committed to supporting this transition as an orchestrator of the ecosystem required for DPI implementation. Through the Africa Accelerator for Digital Public Infrastructure (AA4DPI), UNDP is supporting African governments to move beyond pilots toward sovereign, scalable DPI systems grounded in human rights and inclusive design.

The programme provides a structured pathway for implementation across three phases.

- First is **diagnosis and design**, including digital readiness assessments and the co-design of governance frameworks and implementation roadmaps tailored to national contexts. This addresses a critical need that emerged from extensive consultations.
- Second is **implementation support**, mobilizing specialized technical expertise and strengthening domestic digital capacity through mechanisms such as Open Source Programme Offices; the building blocks that allow for sustained change.
- Third is **knowledge sharing, advocacy, and partnership building** that connects

governments to global initiatives such as the 50-in-5 initiative and DPI Safeguards Initiative. This area also includes facilitating peer learning among countries implementing DPI, linking national efforts with UNDP's timbuktoo pan-African innovation ecosystem and advocating for accelerated design, adoption and the implementation of good practices in building DPI.

Participation requires demonstrated national commitment. Partner countries should secure engagement from key ministries — including home affairs or its equivalent, ICT, and finance or planning — alongside financial co-investment and measurable impact commitments. This ensures that DPI implementation is anchored in national leadership and results-oriented partnerships.

UNDP's role is catalytic. By supporting readiness assessments, governance frameworks and institutional strengthening, UNDP helps governments develop bankable DPI programmes that can unlock larger financing from development finance institutions such as the African Development Bank, the World Bank and others.

**Ultimately, however, the leadership must remain African. UNDP's role is to support governments with the tools, expertise and coordinated partnerships needed to build DPI deliberately, inclusively and on their own terms — laying the foundations for Africa's next generation of growth and opportunity.**



## APPENDIX I: KEY TERMS

**African Continental Free Trade Area (AfCFTA):** Agreement creating a single market across all African Union member states aiming to boost intra-African trade through reduced tariffs, harmonized regulations and facilitated cross-border movement.

**Data sovereignty:** The principle that data is subject to the laws and governance of the jurisdiction where it is collected, ensuring national control over digital infrastructure.

**Data exchange:** Consent-based frameworks allowing individuals and organizations to securely share verified information while maintaining control and privacy, enabling service interoperability without centralized data repositories.

**Digital identity:** Systems enabling individuals, businesses, and entities to prove identity across public and private services, reducing fraud, enabling instant verification, and underpinning access to financial services, social protection, credentials and cross-border movement.

**Digital payments:** Interoperable, real-time systems allowing instant, low-cost transfers between bank accounts, mobile wallets and providers, reducing cash handling and enabling direct government-citizen transactions.

**Digital public goods (DPGs):** Open-source software, open data, open AI models, open standards and open content that adhere to privacy and other applicable laws and best practices, are designed to do no harm, and help attain the Sustainable Development Goals. Defined in the UN Secretary-General's Roadmap for Digital Cooperation (2020) and stewarded by the Digital Public Goods Alliance, DPGs are often the reusable building blocks from which digital public infrastructure is assembled.

**Digital public infrastructure (DPI):** Foundational, interoperable systems (identity, payments and data exchange) enabling service delivery and private sector innovation, built on open standards and designed for universal access.

**Inclusive design:** Designing systems to serve all populations by incorporating offline alternatives, low-literacy interfaces, accessibility features and mechanisms preventing digital exclusion.

**Interoperability:** The ability of systems to exchange and use data seamlessly across platforms, vendors and borders, enabled by open standards and preventing vendor lock-in.

**Open standards:** Publicly available technical specifications (ISO 20022 for payments, W3C Verifiable Credentials for digital IDs) enabling multiple providers to build compatible systems.

**Pan-African Payment and Settlement System (PAPSS):** Continental infrastructure enabling real-time, cross-border transactions in local currencies, reducing costs and settlement times.

**Smart Africa Trust Alliance (SATA):** African-led initiative creating trusted, interoperable digital identity infrastructure to support an African Single Digital Market, guided by sovereignty, transparency, inclusion, open standards, and data privacy.

**Vendor lock-in:** Dependency on a single technology provider that makes switching prohibitively expensive, reducing government leverage and flexibility—prevented by open standards.

# APPENDIX II: ID SYSTEMS IN AFRICA ACROSS VARIOUS STAGES OF IMPLEMENTATION

DPI systems in Africa across various stages of implementation:\*

|                               | Active                                                                                                                                                                                                         | Pilot                                                                                                        | Total |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-------|
| DPI-like ID system            | Algeria<br>Ethiopia<br>Ghana<br>Lesotho<br>Seychelles<br>Uganda<br>(n=6)                                                                                                                                       | Egypt<br>Togo<br>(n=2)                                                                                       | 8     |
| DPI-like payments system      | Djibouti<br>Egypt<br>Gambia<br>Mauritius<br>Nigeria<br>South Africa<br>Tanzania<br>(n=8)                                                                                                                       |                                                                                                              | 8     |
| DPI-like data exchange system | Angola<br>Benin<br>Botswana<br>Burkina Faso<br>Egypt<br>Lesotho<br>Liberia<br>Madagascar<br>Mauritius<br>Morocco<br>Namibia<br>Nigeria<br>Rwanda<br>Seychelles<br>South Africa<br>Tanzania<br>Uganda<br>(n=17) | Cabo Verde<br>Chad<br>Côte d'Ivoire<br>Djibouti<br>Ghana<br>Senegal<br>Somalia<br>Tunisia<br>Zambia<br>(n=9) | 26    |

\*These systems possess DPI-like characteristics (interoperable, real-time)

Source: DPI Map, covering the 46 countries covered by the UNDP Regional Bureau for Africa

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