



Task Force 05

INCLUSIVE DIGITAL TRANSFORMATION

Interoperability as a Lever for Inclusive and Equitable Public Service Delivery: Challenges and Opportunities

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Abstract

Digital public infrastructure (DPI) has become an important strategy for revolutionising public service delivery for many governments worldwide. Last year’s G20 Digital Economy Working Group highlighted ‘interoperability’ as the flagship parameter that sets DPI apart from other forms of (global) technology initiatives. Defined as the ability of two separate computer or software systems to exchange information through commonality in syntax, semantics, or protocols, interoperability is seen as a key lever to drive efficiency, quality, and inclusivity in the platformisation of public services. The proposed benefits of interoperability include enhanced inter-departmental coordination, service accessibility, fiscal savings, preclusion of vendor lock-ins, and reduced carbon emissions. These assumptions have increasingly shaped how e-governance initiatives are designed and implemented. However, many operational issues arise in practice, which can compromise its contribution to more effective and inclusive service delivery – especially for countries without established data creation and collection traditions, and departmental desiloisation.

Building on the last G20, this policy brief provides insights into challenges in operationalising interoperability across low- and middle-income countries. It also provides recommendations for the G20 on how to support DPI governance in ways that help countries build effective and inclusive interoperable systems from different foundations and starting points.

Keywords: Digital Public Infrastructure, interoperability, platformisation, digital governance, digital inclusion.

Diagnosis of the Issue



Interoperability remains narrowly and ambiguously defined in the digital public infrastructure (DPI) context, resulting in limited articulation of how it needs to be effectively operationalised. The lack of precision in defining interoperability and failure to acknowledge its other *non-technical* facets hinders efforts to clearly articulate the desired outcomes linked to interoperability. As raised by previous T20 Policy Briefs, the specifics of interoperability have significant implications for use cases ranging from climate initiatives (Sauvignon, Nair, and Benaglia 2023; Aggarwal and Guliani 2023) to cross-border payments (Nugroho and Supangkat 2023).

Existing guidelines do not pay adequate attention to interoperability's possible risks. Most of the guidelines follow a narrow approach, portraying 'privacy-by-design' principles and consent mechanisms as catch-all risk management strategies. Within such narratives, sectoral idiosyncrasies and local contexts are often ignored. Therefore, to bring more nuance to the discourse, we lay out a practical and human-centric set of considerations that are relevant for countries planning to build interoperable systems.

Establishing a clear theory of change

Many assumptions related to interoperability's outcomes currently exist within the popular imaginations of the term. The DPI narrative views it as a strategy for preventing 'vendor lock-ins' (Eaves, Mazzucato, and Vasconcellos 2024) but limited empirical evidence exists to substantiate such claims. For example, India's Unified Payments Interface (UPI) – often cited as a DPI success story – suffers from market concentration risks despite having an interoperable architecture (Bhakta 2024).

Moreover, motivations behind promoting interoperability remain unclear. There is a need to undertake an *ex-ante* analysis to understand the value proposition of ‘interoperability’ – in what ways do interoperable systems lead to better outcomes in public service delivery? What is the broad theory of change: are interoperable systems better at plugging leakages¹ or are they better at being more inclusive – two outcomes that often contradict each other? Who ultimately benefits from interoperable service delivery? Lastly, it is important to understand the various conditions that will be required to realise the many promises that interoperability holds. What pre-existing conditions are needed to make it work as a concept for a given sector, region, use case, or sub-population?

Recentring local contexts

The discourse on DPI as open, interoperable systems remains generalised. Its ‘global’ nature has diluted the focus on local contexts. One particular country’s or sector’s approach to interoperability may not precisely be transplantable to others. Historical examples show that many operational issues related to interoperability arise in practice. For instance, research has shown that hospitals serving *marginalised* populations in the US are 21% less likely to engage in interoperable data exchange than the rest ([Fox 2023](#)). This example illustrates difficulties in enforcing interoperability, these may potentially get exacerbated for countries and sectors without established traditions of data exchange and departmental desiloisation. In such contexts, such problems as lack of institutionalised mechanisms for accountability, poor last-mile monitoring of street bureaucrats, substandard grievance redressal mechanisms, and state-led exclusionary

¹Within the domain of social protection, interoperable systems have often been proposed as an avenue for ‘de-duplication’ of beneficiary lists in order to achieve administrative savings.

tactics, continue to plague service delivery – whether it is digitalised or not. While interoperability may alleviate certain aspects of these issues, it is not a substitute for long-awaited institutional reforms.

Applying a non-technical lens to interoperability

Within the discourse on DPI, interoperability is frequently portrayed as a technical layer facilitating the platformisation of public services. There is an emphasis on “interoperable open-source solutions,” which make up the “building blocks” of DPI (“About,” n.d.). The G20 definition focused on “open standards and specifications” (Bandura, McLean, and Sultan 2023).

Interoperability is often used as a broad term, but it cuts across multiple layers in practice. While the technical layer is crucial, the interoperability of complex systems includes other facets, including legal², organisational³, and semantic⁴ (European Commission 2017). Within current narratives, inadequate attention has been paid to other non-technical enablers of interoperability, with little empirical evidence available.

In addition to technological compliance, what other conditions are needed to make interoperability work? How should government departments – working often in silos – come together to build interoperable systems? What kind of groundwork needs to be undertaken – in terms of data collection, data cleaning, data sharing, and training of personnel? Who gets access and to what information? Who can rectify shared records?

²Legal interoperability focuses on the coherence of legal and legislative frameworks across jurisdictions.

³Organisational interoperability concerns the alignment of business processes and organisational relationships. This includes defining trust frameworks and standards for the service in question, as well as establishing commonly accepted modelling techniques.

⁴Semantic interoperability ensures that data exchanged between parties retains both precise format and meaning, as information is being exchanged in linguistically, culturally, and administratively diverse contexts. This layer encompasses both semantic understanding of data elements and syntactic specification of information format, facilitated through coordinated management, data dictionaries, standardised vocabularies, and linked data technologies.

How many such processes are decentralised and empower local governments? Given the diversity of actors involved in interoperable systems, how do capacities and roles vary? Where will accountability lie within such a shared ecosystem? Which regional/sectoral jurisdiction's rules will prevail?

The difficulty for governments in answering these questions is apparent in experiences like South Africa's challenges in integrating different data systems into their national identity system ([Breckenridge 2008](#)) or the lack of interoperability between different digital identity standards like OSIA, MOSIP, GovStack, and G2P Connect ([Dubois 2023](#)).

Recommendations

As mentioned above, interoperability directly features in G20 discussions, including as a necessary feature of digital public infrastructure ([G20 – India's Presidency 2023](#)). However, developing interoperable systems requires actors to **enact legal, organisational, semantic and technical** changes. Facilitating truly inclusive and equitable DPI systems will then require a focus across these layers. We argue that the G20 is well-positioned to take this expansive view and facilitate cross-layer interoperability. It thus requires close attention to both **technical and non-technical pre-conditions** necessary to mobilise all four dimensions of interoperability effectively.

This section outlines recommendations for the G20 as a global forum, with convening power across sectors, to help ensure that interoperability – key to DPI – facilitates the desired outcomes for member and non-member governments, diverse private sector actors, and citizens.

We identify specific opportunities for a multilateral forum like the G20 to share knowledge and experiences of operationalising safe, secure, and reliable interoperable

systems. We focus on three areas that build on existing G20 priorities, initiatives, and strengths:

1. Invest in research and technical support for member and non-member countries.

Currently, members and non-members, as well as different sectoral actors, have varying levels of knowledge and understanding of the conditions, risks, and technical and non-technical dimensions of developing interoperable data exchange systems.

We recommend that the G20 Digital Economy Working Group (DEWG) and Development Working Group (DWG) take forward an opportunity to contribute to building the required knowledge and capacity to effectively and smartly develop and deliver interoperable DPI through their existing delivery plans (G20 – Brazil’s Presidency 2024b; 2024c). This includes commissioning research into the costs of setting up and maintaining secure, equitable, and resilient interoperable systems, helping to drive a push for members and non-members to consider evidence on cost and financing in the development of interoperable systems.

Strengthening members’ and non-members’ understanding of the conditions and contexts for secure, safe and valuable data flows could be included, for example, in the DWG’s plan to deliver ‘Practical Interaction Activities’ including the “establishment of practical activities aimed at developing and specialising the participants’ capabilities” (G20 – Brazil’s Presidency 2024b). Another opportunity is the DWG’s ‘Survey of successful practices and strategies,’ which could consider DPI and interoperability, helping to build and collate information on the conditions and context in which interoperability is operationalised, sustained and contributes to inclusive economic growth (*ibid*).

Further, the G20 DEWG and the G20 official engagement groups have an opportunity to facilitate open conversation about the relative costs facing member and non-member countries in setting up and maintaining secure, up-to-date interoperable systems and the nature and distribution of costs, benefits and risks. The G20’s multi-stakeholder structure has already facilitated discussions of DPI and its potential value more generally. We recommend extending open discussions to the costs and conditions of interoperability in public services, utilising G20 engagement groups to consider different views, including business, women’s groups, and civil society. A multi-stakeholder perspective is a critical foundation for governing the introduction and operationalisation of interoperable DPI and taking into account the distribution of benefits and risks of data flows.

2. Promote an outcome-driven view of interoperability.

The G20, especially under Brazil’s Presidency, seeks to shape “a global agenda for a more equitable and sustainable future” (G20 – Brazil’s Presidency 2024a). The DWG also set out that “[t]he G20 should send a strong political message on the need for reducing inequalities” (G20 – Brazil’s Presidency 2024b).

Building on the success of previous G20s in putting the platformisation of public services on the global agenda, we recommend that the G20 forum shift to discussing *how* and under what conditions key technical aspects of DPI, like interoperability, contribute to desired economic, political and social outcomes, specifically countering inequality, and promoting inclusive and sustainable economic growth.

Technical interoperability will not necessarily result in resilient, safe, secure, and useful data exchange for governments, private sector actors, and citizens. Failing to consider the non-technical aspects of interoperability can create new risks and costs.

The G20 forum can be a leading space for developing new narratives around digital transformation that focus on the actual negative and positive impacts on different actors. We recommend the G20 forum create space to help shift narratives about interoperability in digital public infrastructure from being technically led to being outcome-led. This can help ensure that digital transformations are being approached purposefully.

3. Build consensus around a comprehensive/holistic approach to governance of the technical aspects of DPI, including interoperability.

A strength of the G20 is its emphasis on consensus and the scope for members to explore positions and openly discuss issues without decisions being legally binding. This presents a significant opportunity to openly discuss some of the different and challenging aspects of the governance of DPI. We recommend that the G20 facilitate discussion of governance in relation to the multiple technical and non-technical dimensions of interoperability, utilising the different perspectives of its official engagement groups (e.g., T20, C20, W20). By considering governance issues more holistically, the G20 could equip members with a framework from which to consider a comprehensive governance framework within which to make decisions about how to set up and operationalise interoperable systems.

4. Promote cross-sectoral, equitable partnerships around the development of interoperable DPI.

We recommend that the G20 call for equity in partnerships for the design, development, and maintenance of interoperable DPI. A key feature of Brazil's G20 presidency is the focus on a trilateral cooperation model, e.g., by the DWG. We suggest that the principles of equitable cooperation, considering the added value of different roles

and relationships as opposed to a hierarchical north-south partnership, can be a foundation for a more inclusive, equitable, and secure approach to promoting interoperability for public service delivery.

For example, the trilateral cooperation model could be utilised to help map different roles, e.g., financing and/or facilitating, and encourage recognition and equal weight to partners involved in the various aspects of the delivery and governance of interoperability. Also, it can help identify potential risks and/or dependencies between different stakeholders or countries and create an opportunity to mitigate inequalities in partnerships for development.

Therefore, the G20 presidency could advocate for equitable cooperation models in the development and implementation of interoperable systems for platform-based public services, encouraging members and non-members to pay attention to *how* DPI is being developed, through which partnerships, and with what implications for inclusion and equity.

Scenario of Outcomes



Adoption of the aforesaid recommendations can lead to many positive future scenarios for DPI deployment within the G20 context:

1. The proliferation of avenues and initiatives within the G20 that enable the more evidence-based digital transformation of public services – especially for lower-income member and non-member countries.
2. Provision of knowledge, discussion and partnership models for more equitable processes and outcomes of DPI, especially equipping civil society and government actors with a more holistic picture of the non-technical requirements of effective, safe and inclusive DPI.
3. Changed narratives about DPI development and governance that are more oriented to equitable and inclusive outcomes – empowering members and non-members to assess technical options for interoperability within the context of its non-technical dimensions.
4. Pre-emptive management of potential risks, especially related to data use and the long-term health/maintenance of digital systems.

Adopting our recommendations also involves some potential trade-offs, which we detail below. Equally, while introducing additional challenges in the implementation and governance of interoperable DPI, these future scenarios reinforce the importance of attention to supportive knowledge generation, open discussion, and a focus on inclusion and equity to ensure that technical developments are aligned with inclusive and equitable economic and political outcomes.

Firstly, adopting an expansive approach as detailed above— considering preconditions, risks, and different dimensions/aspects of interoperability— could introduce friction and slow down progress in implementing interoperable DPI within and across countries. However, this will also help countries prevent risks later.

Focusing on research and technical support could lead to enhanced knowledge and capacity building across member and non-member countries, enabling evidence-based digital transformation of public services, especially for lower-income nations. However, investing in research and technical support may divert resources from other critical areas of development and potentially delay the implementation of interoperable systems. Still, knowledge and capacity alone may not directly address the existing operational challenges in countries with poor accountability mechanisms, underscoring the importance of addressing non-technical requirements and long-awaited institutional reforms.

Promoting an outcome-driven view of interoperability could also lead to a more purposeful approach to digital transformations. An outcome-driven view could facilitate a long-term and holistic approach. Ultimately, such an approach could lead to changed narratives about DPI development and governance that are more oriented toward equitable and inclusive outcomes – empowering members and non-members to weigh technical options for interoperability within the context of its non-technical dimensions. However, shifting the approach from being technically-led to outcome-led may require significant mindset shifts and institutional restructuring. This could introduce practical challenges. And, overly rigid outcome targets may overlook the complexity and context-specific nature of interoperable systems, potentially leading to unintended consequences.

Facilitating a discussion on governance issues beyond technical dimensions could promote a comprehensive framework for decision-making on interoperable systems.

Empowering civil society and government actors with a more holistic picture of the non-technical requirements could help facilitate effective, safe, and inclusive DPI. However, achieving consensus on holistic governance approaches may be challenging due to divergent interests and priorities among members and non-members. While this may slow down progress on the implementation of DPI systems, it may help mitigate future DPI risks.

Promoting cross-sectoral and equitable cooperation models in the development of interoperable systems could promote inclusivity and mitigate inequalities of outcomes. Balancing the interests and contributions of various stakeholders in equitable partnerships may be challenging, and providing cross-sectoral discussions may illuminate some of the challenges in data sharing within the G20 structures themselves.

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