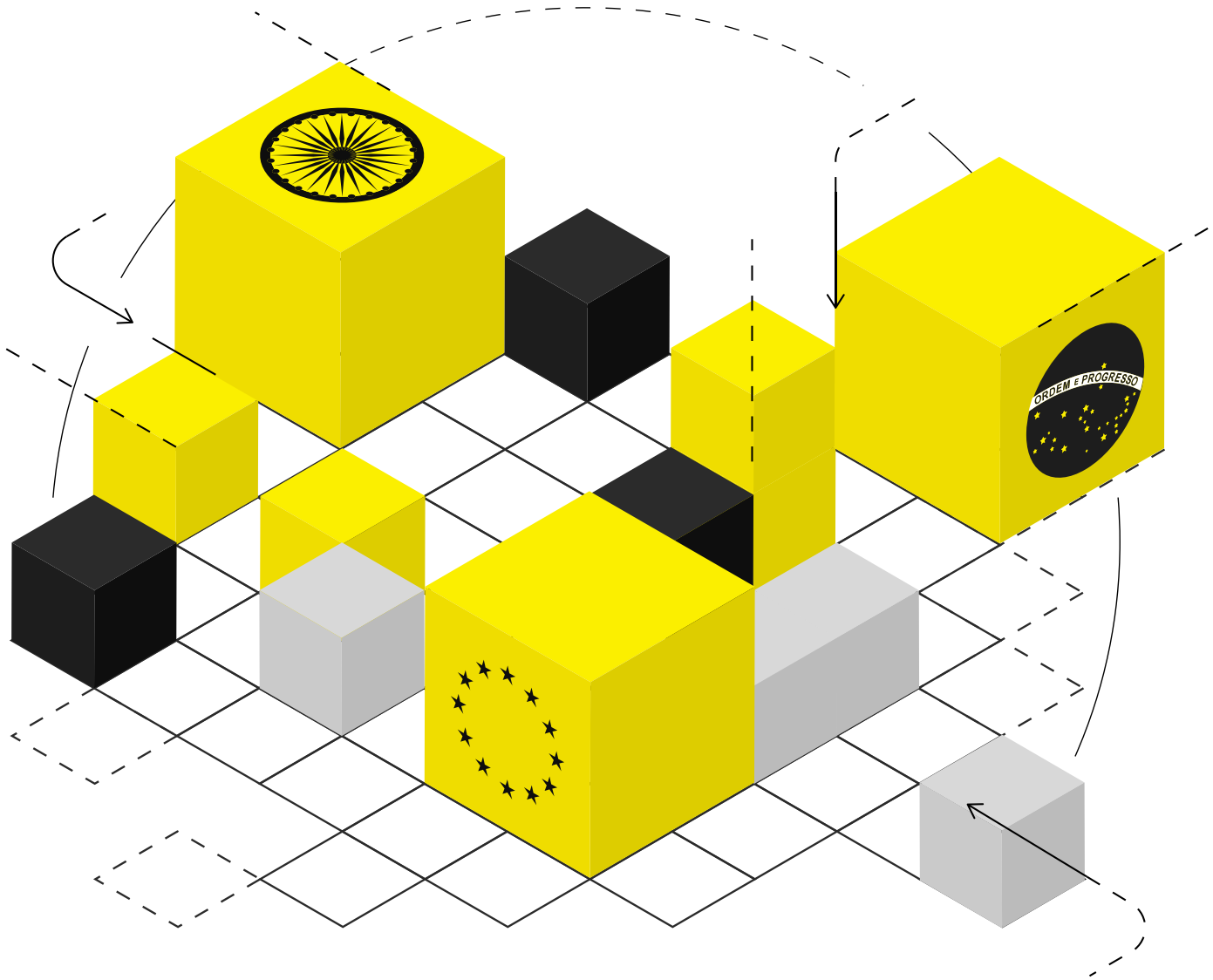
WHY DIGITAL PUBLIC INFRASTRUCTURES?

Infrastructural promises in India, Brazil and Europe



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EXECUTIVE SUMMARY

In geographies as diverse as India, Brazil, and the European Union, states are promoting, building, and operating digital public infrastructures. IndiaStack in India, Brazil's Digital Public Infrastructures for identification and payments, and two proposals for EuroStack in the European Union are at the forefront of this new approach to digitalization. These systems make bold claims about the futures they will bring about. In a geopolitical conjuncture of the breakdown of the liberal consensus and emerging multipolarity, they are increasingly articulated as interventions to secure digital sovereignty. Yet seeing them only through the lens of digital sovereignty misses the broader range of concerns that shape them. They also make a range of contextual and concrete promises that need to be unpacked as sites of discussion and deliberation.

This paper comparatively studies the range of promises that are made by these systems' promoters, builders, and operators. It catalogues seven promises across the three territories: strategic autonomy, securing values and rights, competitiveness and innovation, cost savings, digital and financial inclusion, improving public service delivery, and environmental sustainability. The paper takes a constructionist approach to these promises—which are usually gestured to vaguely rather than in concrete detail—seeing them as discursive moves that legitimize the pursuit of new infrastructures by certain actors. It asks: What concerns do these framings let us address, and what do they sweep under the table?

While promises are important for orienting and mobilizing stakeholders, they are also materialized in the institutional and technical architectures of these systems. Thus, the paper also discusses the planned and existing architectures of these systems, examining the tensions and the power dynamics they encode. These architectural considerations include: the scope of the stack, how to drive adoption, the potentials and limitations of interoperability and federation, infrastructure as derisking, the emergence of new geopolitical alliances, and the missing role of the public across all three contexts. A critical missing piece across all interventions, the paper argues, is the role of the public. By bringing attention to these elements, the paper aims to expand the possible terrain of architectures beyond a handful of "default settings" that have dominated the turn to digital public infrastructures.

PREFACE

At the beginning of my Open Future fellowship, in June 2024, an approach known as Digital Public Infrastructure (DPI) appeared to be the subject of significant contestation. To better understand the possibilities of DPI, the first paper produced under this fellowship tracked the genealogy of the term, showing how it had evolved through phases of openness, consolidation, and localization.[1] The term, I found, promoted a software-centric conception that ignored social and hardware infrastructures. That paper called for a shift in focus away from the abstract universal definitions of this term to the concrete, situated motivations that drive the building and adoption of state-promoted digital public infrastructures.

This paper uses the lower-case and plural term "digital public infrastructures" to encompass not only the Indian model but also the Brazilian localization of it (both of which are referred to as DPI) as well as two different visions for a EuroStack that have been proposed since 2024 (these originated in a single vision that was referred to as DPI but have since dropped the label).[2] It also encompasses "public digital infrastructure", the various visions for a more people-centric digitalization promoted by Open Future and other actors.[3] The lower-case plural not only encompasses these various approaches, it also pushes us to open up a broader question: in the face of entrenched Big Tech infrastructural power, what can we learn about approaches to building digital infrastructures that are genuinely public? Architecturally, what would it look like to materialize digital systems that take the flourishing of publics as a critical non-negotiable goal? What can these different approaches teach about the potentials and limitations of alternative imaginaries for organizing the digital?

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[1] Mila T Samdub, "Digital Public Infrastructure" at a Turning Point: From Definitions to Motivations (Open Future, 2025), https://openfuture.eu/publication/digital-public-infrastructure-at-a-turning-point/.

[2] Christina Caffarra, "The 'Sovereign Democratic Infrastructure'-Hyperscalers Trick. Why We Shouldn't Fall for It, and What We Should Do Instead," The "Post-Bubble" Blog, December 1, 2024, https://cristinacaffarra.blog/2024/12/01/the-sovereign-democratic-infrastructure-hyperscalers-trick/.

[3] Jan Krewer, "Signs of Progress: Digital Public Infrastructure Is Gaining Traction," Open Future, March 13, 2024, https://openfuture.eu/blog/signs-of-progress-digital-public-infrastructure-is-gaining-traction. Cecilia Rikap et al., Reclaiming Digital Sovereignty: A Roadmap to Build a Digital Stack for People and the Planet (2024). Sophie Bloemen et al., Roadmap Towards a Sovereign and Resilient Digital Ecosystem (Commons Network, 2025).

INTRODUCTION

This paper takes a comparative perspective on three major digital public infrastructure projects around the world: IndiaStack in India, branded Digital Public Infrastructure; Brazil's digital ID, payments, and data exchange systems, which have appropriated and localized the concept of DPI; and the promotion of two visions for EuroStack in the European Union.

These projects are all situated responses to the current global moment: the collapse of the post-Cold War liberal order, the hegemonic dominance of US Big Tech in global digital infrastructure, the emergence of China as a major technological power, and the weaponization of infrastructure by states. [4] Broadly, they are expressions of "state-capitalist geopolitics", attempts to define the geography of global networks through the "drastic expansion and reconfiguration of states' roles as industrial policy actors, as tech and innovation catalysts, controllers of key financial nodes and infrastructure, financiers of national champions and strategic sectors, investor-shareholders, and direct owners of capital and assets".[5]

A vision of digital sovereignty is cited as the motivation for these moves. Recognizing the limitations of regulating technologies that are built, owned and hosted in the US or China, states are proactively investing in rebuilding digital public infrastructures within their territories. Yet states are beset by several crises: economic pressures from decades of neoliberalism, the legacy and continued entrenchment of austerity and deregulation, postcolonial conditions of mixed and uneven development, and environmental catastrophe and collapse. These challenges are only partially addressed by aspirations towards increasing digital sovereignty.

This paper seeks to more fully account for the multiplicity of concerns that shape the development of digital public infrastructures. It catalogues seven of the motivations—strategic autonomy, financial inclusion, competitiveness and innovation, cost savings, digital and financial inclusion, improving public service delivery, and environmental sustainability—that are cited by these projects in India, Brazil, and the European Union.

The findings are drawn from an interpretive comparative analysis of documents relating to digital public infrastructures. These include policy strategies, legal texts, technical white papers, and promotional reports produced by state bodies, central banks, industry coalitions, and expert groups involved in IndiaStack, Brazil's digital identity and Pix

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[4] Marilia Maciel, "Digital Sovereignty: The End of the Open Internet as We Know It? (Part 1)," Blog, Diplo, April 3, 2025, https://www.diplomacy.edu/blog/digital-sovereignty-the-end-of-the-open-internet-as-we-know-it-part-1/.

[5] Ilias Alami et al., "The New Frontline," Transnational Institute, February 4, 2025, https://www.tni.org/en/article/the-new-frontline

systems, and Eurostack proposals. The documents across cases were juxtaposed to identify recurring discourses, imaginaries, and ideologies that are both explicitly and implicitly structuring interventions. Recognizing the many formal, political, economic, and social divergences between the contexts—not least that two are nation-states and one a supranational federation—the comparative analysis is grounded in the recurrent claims that orient strategies in the three contexts.

It is from the basis of these discursive claims that the analysis opens out onto the technical and institutional architecture of these projects, which influence redistributions of data, capital, and resources. While the paper lacks space to comprehensively cover all aspects of the projects' architectures, it discusses a range of considerations: the scope of the stack, how to drive adoption, the potentials and limitations of interoperability and federation, infrastructure as derisking, the emergence of new geopolitical alliances, and the missing role of the public across all three contexts. The absence of an aspiration to publicness, the paper argues, is a critical lacuna that harms these efforts. If digital public infrastructures are to benefit citizens and end users, they must integrate procedures and systems that meaningfully centre their publics.

If our current digital infrastructures are "accidental megastructures"[6] that have quietly encoded global power relations, the initiatives surveyed here, while differing in key respects, are conscious attempts to plan new megastructures. This paper asks: What infrastructural responses to this conjuncture have developed and are developing in these three locations? What combination of promises is cited by this planning? What concerns do these framings let us address, and what do they sweep under the table?

This paper proceeds in four parts. The first part sketches the theoretical approach, with a focus on both promises and architectures. The second part undertakes the bulk of the comparative analysis between the three geographies. The immediate histories of digital public infrastructures, the particular promises, and the broader sociotechnical imaginaries are covered. The third section is a catalogue of the seven most prominent promises made in relation to digital public infrastructures. The fourth section turns to a discussion of the technical and institutional architectures of these initiatives, asking how promises will be materialized, and what power dynamics are encoded in the resulting infrastructures.

[6] Benjamin H. Bratton, The Stack: On Software and Sovereignty, Software Studies (MIT Press, 2015).

PROMISES AND ARCHITECTURES

"New infrastructures are promises made in the present about our future."[7] In projecting futures, such promises reconstitute the present.[8] They foreground certain aspects of the present as problems that they can fix. As such, they implicitly—and tautologically—perform the work of what policy researchers call problem definition and agenda setting.[9] They bring into focus the particular set of social or economic problems that they can solve while occluding others; they also suggest the solutions to these problems. When circulated broadly, infrastructural promises "demand action, and appear as a necessity for technologists to develop, and for others to support them".[10] In other words, they implicitly set collective goals in the present, and direct attention on how to achieve those goals. To paraphrase Jascha Bareis and Christian Katzenbach, they "talk particular versions of digital public infrastructures into being".[11]

Promises are contextual. In different territories, the promoters of digital public infrastructure projects mobilize a range of different promises. These infrastructures, we are told, may bring about financial inclusion for a country's poorest citizens, they may increase a territory's strategic autonomy, or they might save costs in the administration. Which of these promises resonates depends on dominant socio-technical imaginaries, which are "collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology".[12] Promises are anchored in specific political-economic contexts, the particular distributions of power, resources, and productive capacities that structure our societies. The priorities of digital public infrastructures in a largely agrarian lower-middle-income country like India are naturally different from those of the urbanized high-income EU.

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[7] Hannah Appel et al., eds., The Promise of Infrastructure (Duke University Press, 2018).

[8] Mads Borup et al., "The Sociology of Expectations in Science and Technology," Technology Analysis & Strategic Management 18, nos. 3–4 (2006): 285–98, https://www.tandfonline.com/doi/abs/10.1080/09537320600777002.

[9] Marlon Barbehon et al., "Problem Definition and Agenda-Setting in Critical Perspective," in Handbook of Critical Policy Studies, by Douglas Torgerson et al. (Edward Elgar Publishing, 2015).

[10] Nik Brown et al., eds., Contested Futures: A Sociology of Prospective Techno-Science (Routledge, 2016), https://www.taylorfrancis.com/books/mono/10.4324/9781315259420/contested-futures-nik-brown-brian-rappert.

[11] Jascha Bareis and Christian Katzenbach, "Talking AI into Being: The Narratives and Imaginaries of National AI Strategies and Their Performative Politics," Science, Technology, & Human Values 47, no. 5 (2022): 855–81, https://journals.sagepub.com/doi/10.1177/01622439211030007.

[12] Sheila Jasanoff and Sang-Hyun Kim, eds., Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power (The University of Chicago Press, 2015).

Promises also create coalitions and bestow mandates for action. [13] They "[attract] the interest of necessary allies (various actors in innovation networks, investors, regulatory actors, users, etc.) and … [define] roles and … [build] mutually binding obligations and agendas."[14] Promises that gain social and political acceptance thus legitimize the interventions of certain groups, redistributing agency, responsibility, and resources. Thus, this paper also calls attention to the protagonists of these promises—whether they are interests within the state or coalitions of capital.

This paper takes a constructionist approach to promises in order "to denaturalize taken-for-granted policy assumptions and stress the role that power plays in policy-making". [15] Focusing on promises brings to the foreground what is usually the assumed and largely undisputed background in policy conversations around digital public infrastructure. Policy actors in digital public infrastructure often take goals for granted and do not articulate them clearly. A dominant strain in DPI discourse, for example, borrows Brett Frischman's theorization of infrastructure as "a shared means to many ends".[16] Yet the critical question for large-scale projects of digital public infrastructure is precisely: which means and which ends?

If promises project the ends of digital public infrastructures, this paper also devotes attention to the means, or the material forms they take when built. It conceptualizes them as architectures, understood broadly to encompass both technical and institutional materiality.[17] Thus, architectures encompass the structures of networks (whether, for example, they are centralized or federated; which components are given more importance in a stack) and the institutional set-ups that govern these networks (how states, the private sector, and publics are involved; who pays for what). These material architectures derive their legitimacy from discursive promises and sociotechnical imaginaries, yet they may deliver very different ends from what they promise. Nevertheless, the architectures of new infrastructures enable and constrain the actions of the actors who are involved in them. As such, they are central to the changing operation of power in societies. Centering how these architectures materialize relations of domination and accumulation, they may also be thought of as "infrastructural ideologies".[18]

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[13] Brown et al., Contested Futures.

[14] Borup et al., "The Sociology of Expectations in Science and Technology."

[15] Barbehon et al., "Problem Definition and Agenda-Setting in Critical Perspective."

[16] David Eaves and Jordan Sandman, "What Is Digital Public Infrastructure?," Co-Develop, accessed October 1, 2024, https://www.codevelop.fund/insights-1/what-is-digital-public-infrastructure; Brett M. Frischmann, Infrastructure: The Social Value of Shared Resources (Oxford University Press, 2012).

[17] Lawrence Lessig, Code and Other Laws of Cyberspace (Basic Books, 1999).

[18] Maxigas and Niels ten Oever, "Geopolitics in the Infrastructural Ideology of 5G," Global Media and China 8, no. 3 (2023): 271–88, https://journals.sagepub.com/doi/10.1177/20594364231193950.

Answers to the question of means and ends—of promises and architectures—will encode the distribution of resources in our societies. They should thus be matters of democratic deliberation. While there is a growing trend to acknowledge the choices and trade-offs in building digital public infrastructures,[19] a pervasive sense of urgency means that there is little discussion of who these choices will benefit and who they will harm. This is a form of techno-solutionist "strategic ignorance" that orients debate and discussion away from political questions of distribution towards technical questions of design.[20] In other words, the questions of "why digital public infrastructure" and "what digital public infrastructure" are given far less weight than the question of "how digital public infrastructure". As a first step to redressing this strategic ignorance, this paper brings promises to the foreground, with the intention of opening them up as a site for questioning and debate.

[19] David Eaves and Beatriz Vasconcellos, "Digital Public Infrastructure Is the New Global Tech Bet—But Everyone's Betting on Something Different," Tech Policy Press, April 1, 2025, https://techpolicy.press/digital-public-infrastructure-is-the-new-global-tech-bet-but-everyones-betting-on-something-different; Rianne Riemens and Jose van Dijck, "Bigger And Faster Or Better And Greener? The EU Needs To Define Its Priorities For AI," Tech Policy Press, August 21, 2025, https://techpolicy.press/bigger-and-faster-or-better-and-greener-the-eu-needs-to-define-its-priorities-for-ai.

[20] Grégoire Mallard and Linsey McGoey, "Strategic Ignorance and Global Governance: An Ecumenical Approach to Epistemologies of Global Power," The British Journal of Sociology 69, no. 4 (2018): 884–909, https://doi.org/10.1111/1468-4446.12504.

COMPARATIVE ANALYSIS

Within the broad category of digital public infrastructures, this paper focuses on three specific interventions: DPI in India and Brazil, and visions for EuroStack in Europe. There are notable differences between the Indian, Brazilian, and European interventions. This section lays out the broad contours of these projects and the sociotechnical imaginaries within which they operate, as well as key observations about the financial, technical, and institutional architectures of these systems.

Broadly, in India, under an imaginary of targeted inclusion for development, DPI promise innovation for domestic industry, financial inclusion for the poorest Indians, and cost savings for the state. Brazil's DPI, by contrast, lacks a coherent imaginary. While financial inclusion is also part of Brazil's DPI agenda, a far greater focus is on increasing the efficiency of public service delivery. Finally, Eurostack visions operate within an imaginary of civilizational defense, promising to increase European competitiveness and strategic autonomy.

Each of these projects is at a different stage of planning and implementation. The models studied here reflect the various interests that are jostling to promote a particular vision of digital public infrastructure at a particular moment. The Indian discourses, produced after a long period of consolidation and confidence, reflect an attempt by a coalition of the state and industry to export a model that has gained widespread usage. The Brazilian materials, by contrast, consist largely of legal documents that reflect the mandates of the state, accompanied by civil society commentary. In Europe, this paper focuses on two EuroStack proposals that are largely in a promissory stage. It reads these alongside broader trends towards digital sovereignty in the EU. Trying to build broad support from states and capital, these documents have a performative, strategic rhetorical register. Importantly, all of the initiatives surveyed here reframe fragmented existing projects—from digital ID programs to sovereign clouds—as part of coherent policy programs aimed towards directing future priorities and investments.

This analysis at the federal level is largely schematic, serving to reveal some of the core similarities and differences between digital public infrastructures and how they are imagined and materialized. Several important complexities are not covered here. For example, in each case, various ministries, states, agencies, and constituent countries (in the case of the EU) bring their own interests and motivations to the table.

	India	Brazil	European Union
Population	1.45 billion	212 million	450 million
GDP	$3.9 trillion	$2.2 trillion	$19.4 trillion
Example digital public infrastructures	Aadhaar Digital ID, UPI payment system, Digilocker	Gov.br ID system, Pix payment system, CAR land database	Chip manufacturing, shared data spaces, sovereign cloud, European Digital ID wallet, LLMs
Protagonists	Private-public	Largely state-led	Public-private
Stage	Expansion into sectoral digital infrastructures	Expansion and coordination of core digital infrastructures	Proposals that combine existing projects and policies with future plans
Functional scope	ID, payments and data exchanges	ID, payments and data exchanges	Full-stack, from critical raw materials to cloud to user-facing applications
Promises	Inclusion, Innovation, Improving public services, Cost savings	Efficiency, Inclusion, Environmental Sustainability	Strategic autonomy, Competitiveness, Protecting Rights and Values, Environmental Sustainability
Posture	Expanding	Developing	Defensive
Sociotechnical imaginary	Development Through Targeted Inclusion	Weak imaginary of efficiency	Civilizational Defense
Coherence	Strong coherence in imaginary and architecture	Little coherence in imaginary; some coherence in architecture, e.g. through the National Strategy on Digital Government	Coherence in imaginary but less in architecture and deployment

Table 1: Comparative analysis of digital public infrastructures in India, Brazil, and the EU. Source: World Bank and the author's argument.

India

Today, India is characterized by high adoption of digital ID and payment infrastructures. While the Aadhaar digital ID project was rolled out starting in 2009, in 2015 it was rebranded—along with the Unified Payments Interface (UPI) system for payments as well as data exchanges—as IndiaStack, a complete model of state-promoted digitalization. Following the 2023 G20 meeting, hosted in India, this approach has been exported, with the support of US philanthropies and international organizations, as

Digital Public Infrastructure (DPI). Today, the suite of Indian DPI in use domestically includes platforms for consumer financial data, for health data, for education data, and more.

The Indian DPI model has emerged at the confluence of two factors: the protagonism of India's powerful domestic software industry threatened by incursions of US capital; and the multiple terms in power of the new government that was elected in 2014, which pursued a protectionist economic agenda and has been willing to compel citizens to use new digital infrastructures.[21] With economic growth being identified with the IT sector over the past few decades—building on a longue-duree pursuit of science and technology—techno-solutionist interventions enjoy high levels of legitimacy in India.[22]

In India, these developments have largely been promoted by the private sector and through policy, relying on sectoral, programmatic, and technical guidelines. There is no Indian law relating broadly to IndiaStack or Digital Public Infrastructure. The Aadhaar digital ID is governed by the Aadhaar Act, 2016, a law that largely upheld the structures and goals that had been entrenched in the project over the previous years. According to the law, the stated aim of Aadhaar is to enable the "targeted delivery of financial and other subsidies, benefits and services", but the actors involved in Aadhaar regularly cite other motivations.[23] Major actors in DPI promotion are the Indian Software Product Industry Roundtable, the Ministry of Finance, and the Ministry of Electronics and Information Technology. In this conjuncture, according to one commentator, "economic prosperity, national security, sovereignty and digital technologies have become intertwined in the present government's agenda."[24]

DPI owes part of its success in India to its expansive sociotechnical imaginary of development through targeted inclusion. As has always been the case in postcolonial India, the antipolitical claim to development legitimates the incorporation of the population into the pursuit of the interests of a dominant coalition, in this case encompassing various parts of the government, the software sector, as well as banking, telecom, and other sectoral interests.[25] Inclusion is the current preferred modality of

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[21] Mila T Samdub, "The State and Software Capital," Phenomenal World, October 16, 2025, https://www.phenomenalworld.org/analysis/digital-india/.

[22] Itty Abraham, "From the Commission to the Mission Model: Technology Czars and the Indian Middle Class," The Journal of Asian Studies 76, no. 3 (2017): 675–96, https://read.dukeupress.edu/journal-of-asian-studies/article-abstract/76/3/675/320082/From-the-Commission-to-the-Mission-Model?redirectedFrom=fulltext.

[23] https://uidai.gov.in/images/Aadhaar_Act_2016_as_amended.pdf

[24] Jyoti Panday, India Stack: Public-Private Roads to Data Sovereignty (Internet Governance Project, 2023), https://www.internetgovernance.org/research/india-stack-public-private-roads-to-data-sovereignty/.

[25] James Ferguson, The Anti-Politics Machine: "Development," Depoliticization, and Bureaucratic Power in Lesotho (University of Minnesota Press, 1994); Partha Chatterjee, "Development Planning and the Indian State," in State and Politics in India, ed. Partha Chatterjee (Oxford University Press, 1998).

development, which is imagined as achievable through the incorporation of marginalized populations into digital capitalism, understood primarily as a commercial space that can unleash entrepreneurial energies.[26] Finally, the possibility of targeting offered by DPI systems attaches conditions to inclusion: for example, it is imagined as a tool to separate out deserving welfare beneficiaries from suspicious freeloaders, but it can also collect financial data that allows fintech companies to generate credit scores.

The imaginary of development through targeted inclusion makes a range of promises. By targeting beneficiaries of welfare, it can save costs within the state by reducing corruption and "leakages".[27] By reducing silos in government databases and enabling the tracking of public servants, it can improve the efficiency of public administration.[28] By streamlining the opening of bank accounts and provision of private sector credit, it can expand financial inclusion for poor Indians.[29] And by bringing new customers and workers into the digital economy, it can support innovation in the domestic software industry.[30]

The platform architecture of Indian DPI makes few distinctions between the state and the corporate.[31] Though the core platforms of DPI systems are identified with the state, they may be run by state agencies, as in the case of Aadhaar, or by private organizations, as in the case of UPI. The complementors that use these platforms to access Indian users can likewise be state agencies or private corporations. Thus, Aadhaar is used by state welfare programs to identify beneficiaries; it is equally used by private telecom operators to identify mobile phone subscribers. The institutional architecture of Indian DPI blurs the lines between the public and private.

Reflecting the Indian technology industry's historical bias towards software, the Indian approach to DPI is restricted largely to software components. As a result, the IndiaStack approach has largely skirted questions of infrastructural dependencies at the hardware level, for example, in cloud, undersea cables, and mobile network infrastructure. Reflecting a technocentric approach, the social infrastructures and human intermediaries

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[26] Toby Carroll, "'Access to Finance' and the Death of Development in the Asia-Pacific," Journal of Contemporary Asia 45, no. 1 (2015): 139–66, https://doi.org/10.1080/00472336.2014.907927.

[27] Shankkar Aiyar, Aadhaar: A Biometric History of India's 12-Digit Revolution (Westland Publications Ltd, 2017).

[28] Aakash Solanki, "Management of Performance and Performance of Management: Getting to Work on Time in the Indian Bureaucracy," South Asia: Journal of South Asian Studies 42, no. 3 (2019): 588–605, https://doi.org/10.1080/00856401.2019.1603262.

[29] Sudeep Jain and Daniela Gabor, "The Rise of Digital Financialisation: The Case of India," New Political Economy 25, no. 5 (2020): 813–28, https://doi.org/10.1080/13563467.2019.1708879.

[30] Samdub, "The State and Software Capital."

[31] Kavita Dattani, "'Governtrepreneurism' for Good Governance: The Case of Aadhaar and the India Stack," Area 52, no. 2 (2020): 411–19, https://doi.org/10.1111/area.12579.

that are critical to the regular functioning of these systems have also largely been bracketed out of the dominant Indian conception of DPI.[32]

Brazil

In Brazil, digital ID and payments emerged through different routes, with less coordination. Brazil's gov.br Single-Sign-On project was launched in 2019 by the Presidency through a decree to offer unified access to public services. Its Pix digital payments system was launched in 2020 by the Central Bank of Brazil. The legal mandate for governing these systems in a coordinated fashion was first promulgated in its 2020 Digital Government Strategy[33] and 2021 Digital Government Law[34], with the stated motivation of increasing the efficiency of public administration. Following the global popularization of DPI, such systems were framed as DPIs by decree in Brazil's 2024 National Strategy of Digital Government. The plural framing of DPIs ("infraestrutura digitais publicas") that is favored in Brazil reflects the heterogeneity of approaches to building these infrastructures.[35] Under the strategy, Brazil has adopted a national definition of DPIs: "structuring solutions of cross-sectional application, which adopt built network technology standards for the public interest, follow the principles of universality and interoperability, allow the use by various entities in the public and private sectors and can integrate services into physical and digital channels." [36] The strategy's stated objective is to make the state "more inclusive, effective, proactive, participatory and sustainable".[37]

Despite its legal formalization, the Brazilian project has lacked an overarching single sociotechnical imaginary, though discourses of improving administrative efficiency are central to the framing. Indeed, in Brazil, "most DPIs have originated and developed with a focus on digital *governmental* infrastructure rather than digital *public* infrastructure".[38] Unlike in the Indian case, no strong state-private coalition drives these developments in a coordinated manner, and efforts are fragmented within the state. The main actors in

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[32] Mila Samdub, "What Would It Take for Digital Public Infrastructures to Actually Serve the Public?," Tech, The Wire, March 14, 2025, https://thewire.in/tech/what-would-it-take-for-digital-public-infrastructures-to-actually-serve-the-public.

[33] Decreto No 10.332 (2020), https://www.planalto.gov.br/ccivil_03/_ato2019-2022/2020/decreto/d10332.htm.

[34] Lei No 14.129 (2021), https://www.planalto.gov.br/ccivil_03/_ato2019-2022/2021/lei/l14129.htm.

[35] Chloe Teevan et al., From IndiaStack to Eurostack, Discussion paper no. 384 (ECDPM, 2025), https://ecdpm.org/application/files/2117/3874/5474/From-India-Stack-to-EuroStack-Reconciling-Approaches-Sovereign-Digital-Infrastructure-ECDPM-Discussion-Paper-384.pdf.

[36] Decreto No 12.069 (2024), https://www.planalto.gov.br/ccivil_03//_Ato2023-2026/2024/Decreto/D12069.htm.

[37] Decreto No 12.069.

[38] Mariana Mazzucato, State Transformation in Brazil, IIPP Policy Report no. 2024/15 (UCL Institute for Innovation and Public Purpose, 2025).

promoting, building, and maintaining DPIs are the Ministry of Management and Innovation in Public Services (MGI) and the Central Bank (BCB). The Casa Civil, the President's Chief of Staff office, also plays an important coordinating role across digital projects in the state. MGI manages and operates gov.br and the Rural Environmental Registry (Cadastro Ambiental Rural - CAR), following the centralization of digitalization efforts in 2023.[39] The MGI's projects are articulated in relation to its mandate of increasing the efficiency of the administration. BCB manages, operates, and regulates the Pix payments system. In contrast to MGI, BCB's Pix promises "financial system efficiency, security, competition and inclusion".[40] Reflecting the broader digitalization of financial inclusion, another key promise of Pix is financial inclusion.[41] Pix has been described as an "unintentional DPI" because it was not initially built with goals of interoperability.[42]

Environmental sustainability is a key emerging promise of DPI in Brazil. At the COP30 Summit held in Belem in November 2025, CAR was launched as a DPI by MGI. This project showcased the possibilities of a "brownfield" approach to DPI, wherein preexisting projects are made interoperable and turned into DPI.[43] The main cited motivations for this transformation have been in increasing government efficiency and for sustainable development.[44] As a DPI, the CAR will be accessible to a broader range of actors, who can use it, for example, to ensure traceability in forest products. Yet third-party descriptions of CAR also appear to be positioning it as a tool that can give private financial institutions access to new data points to make determinations of risk, helping them set insurance premia and loan rates.[45] While the apparent goal of using the database for financial inclusion and innovation appear to be largely unrealized, it is indicative of the clash of different interests at play in these systems. What's more, widespread reports indicate that CAR facilitates *grilagem*, land-grabbing practices that are threatening indigenous lives and ecologies.[46]

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[39] Lei No 14.600 (2023), https://www.planalto.gov.br/ccivil_03/_ato2023-2026/2023/lei/L14600.htm.

[40] "Pix," Banco Central Do Brasil, accessed December 8, 2025, https://www.bcb.gov.br/en/financialstability/pix_en.

[41] Daniela Gabor and Sally Brooks, "The Digital Revolution in Financial Inclusion: International Development in the Fintech Era," New Political Economy 22, no. 4 (2017): 423–36, https://www.tandfonline.com/doi/full/10.1080/13563467.2017.1259298.

[42] Teevan et al., From IndiaStack to Eurostack.

[43] Teevan et al., From IndiaStack to Eurostack.

[44] Rodrigo Duarte, Infraestruturas Publicas Digitais e Bens Publicos Digitais Para Combate as Mudancas Climaticas (Data Privacy Brasil, 2024).

[45] The Case for Nature ID (United Nations Development Programme, 2025), https://www.undp.org/publications/case-nature-id-how-digital-public-infrastructure-can-catalyze-nature-and-climate-action.

[46] Claudia Horn, "The International and Local Politics of the Rural Environmental Registry: Brazil's Green Currency," Development and Change 55, no. 6 (2024): 1230–58, https://doi.org/10.1111/dech.12863.

Despite Brazil's distinctive approach to DPIs, functionally, its systems largely mirror the dominant software-centric Indian model that has been globally promoted by philanthropists and International Organizations.[47] DPIs in Brazil thus refer to digital ID, payments, and data exchange systems, largely excluding hardware and public participation. However, Brazil's legacy with computing places it well to develop a more comprehensive approach to digital public infrastructures. Its IT state-owned enterprises, SERPRO and DATAPREV, have a long history of building public infrastructures, and host gov.br as well as a recently launched government cloud.[48] Brazil also has a distinguished past in citizen participation in Internet governance, as exemplified in the participatory process that produced its Marco Civil internet law.

Europe

EuroStack refers to two separate policy proposals that combine an already existing set of technologies and institutions with ambitious plans for the future. In 2024, a report authored by Mario Draghi, former President of the European Central Bank, diagnosed the EU's declining competitiveness, especially in digital technologies such as AI, pointing to EU regulation and a lack of investment in infrastructure as major barriers.[49] The Draghi Report catalyzed major commitments to build new technological capacities, including an European Commission plan to build domestic "AI gigafactories". It was in this context that EuroStack was first proposed at a conference organized by Cristina Caffarra, Francesca Bria, and Meredith Whitaker at the European Parliament in September 2024. EuroStack has since splintered into two similarly named but slightly divergent projects promoted by different groups, which are distinguished here by the shorthand titles "the industry initiative" and "the public-interest EuroStack".

Both EuroStack proposals are shaped in response to the dominant paradigm of large-scale compute-intensive cloud computing.[50] In this context, EuroStack is pitched as a shift in the European mode of engagement with US Big Tech, from regulation to

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[47] Stephanie Diepeveen et al., The Global DPI Agenda: Promises vs. Realities in the Evolution of DPI for Digital Transformation, Draft Working Paper (2025), https://early-paint-426.notion.site/The-Global-DPI-Agenda-Promises-vs-Realities-in-the-Evolution-of-Digital-Public-Infrastructure-DPI-191557d32fa08072a585d79ea5d9da22.

[48] Eaves et al., Leveraging Digital Public Infrastructures for the Common Good to Promote Inclusive and Sustainable Economic Development in Brazil. IIPP WP 2024-19. Working Papers Series. (UCL Institute for Innovation and Public Purpose, 2024). https://www.ucl.ac.uk/bartlett/public-purpose/publications/2024/nov/leveraging-digital-public-infrastructures-common-good. Cristofari, Gianmarco. "Digital Tribulations 3: Interview with James Gorgen on the Brazilian Governmental Plan of Digital Sovereignty." (Institute of Network Cultures, 2025). https://networkcultures.org/blog/2025/12/11/digital-tribulations-3-interview-with-james-gorgen-on-the-brazilian-governmental-plan-of-digital-sovereignty/

[49] Mario Draghi, The Future of European Competitiveness. Part A, A Competitiveness Strategy for Europe (Publications Office of the European Union, 2025), https://data.europa.eu/doi/10.2872/9356120.

[50] Jai Vipra, "Computational Power and AI," AI Now Institute, September 27, 2023, https://ainowinstitute.org/publications/compute-and-ai.

industrial policy, paralleling the broader entry of the EU into the "AI Arms Race".[51] The shift to proactive building of infrastructures cites the inspiration of IndiaStack—and both EuroStack visions encompass elements of DPI, such as the EU digital identity wallet ID system. Yet in distinction to the DPI model, they emphasize physical components of the stack, including manufacturing of digital components and the provision of cloud services, possibly a reflection of broader shifts towards chips and compute-intensive computing in the time of AI. In a blog post comparing the EuroStack industry initiative to IndiaStack, Caffarra writes, "the vision for EuroStack is broader [than DPI], extending beyond public service delivery and inclusion to address the imperatives of sovereignty, independence, and security across the digital supply chain. EuroStack does not just involve interoperable software components, but includes the entire digital value chain, from hardware and basic infrastructure to applications, services, and governance."[52] In scale and in constituent elements, both variants of the EuroStack mirror the paradigm of cloud digitalization.

Both proposals share the same broad sociotechnical imaginary: an imaginary of civilizational defense, where investments in digital sovereignty can stall the continent's decline, rebuild Europe's competitiveness and strategic autonomy, and protect European values. Yet there are also important differences in the articulation of this imaginary. In the industry initiative, which takes a more alarmist tone, Europe is imagined as a digital colony or vassal to foreign powers, leading to the erosion of a European way of life. "Urgency is key to the mission. The window of opportunity for Europe to act before our indigenous digital capacity is extinguished to the role of accessory to US corporations (and China) is very narrow."[53] The public-interest vision, while noting that Europe is "vulnerable to external dominance", also gestures towards a brighter future in which "Europe has the potential to emerge as a global leader in the digital era by embracing the concept of digital sovereignty".[54]

Perhaps the biggest substantive difference between the EuroStack proposals is in their visions of economic architecture, where funds would come from and how they should be spent. The industry-centric EuroStack plan focuses on directing existing public funds to private industry, particularly commercial actors that are imagined as strategically having the best chance to compete with US and Chinese behemoths. It calls, for example, for a reallocation of EU research funding, which it argues is currently largely "burned" on

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[51] It is also accompanied by deregulatory trends, under the title of "simplification" of the EU regulatory framework. https://ec.europa.eu/commission/presscorner/detail/en/ip_25_2718

[52] Berjon et al., #Eurostack: European Strategic Sovereign Digital Infrastructures.

[53] Robin Berjon et al., #Eurostack: European Strategic Sovereign Digital Infrastructures (2025).

[54] Francesca Bria et al., EuroStack - A European Alternative for Digital Sovereignty (Bertelsmann Stiftung, 2025).

research institutes and universities, to the private sector.[55] It also calls to steer European savings in the form of pension funds into private equity and venture capital.[56] Rather than building from scratch, its model hinges on federating and combining existing initiatives: "Lack of capital and time make it realistically impossible to build any alternative comparable to current incumbents in a feasible timeframe. Given urgency, the approach must involve identifying existing assets that can be integrated into federated networks, commercially and technically interoperable."[57]

The more public-interest EuroStack vision, by contrast, calls for large-scale new public funding in the form of a new European Sovereign Tech fund that will invest €300 billion in European technology initiatives over the next decade. It also calls for new mechanisms for the coordination of investment, research, and production.[58] Finally, it envisions funds being spent on a broader range of initiatives, including a major focus on commons approaches.

[55] Berjon et al., #Eurostack: European Strategic Sovereign Digital Infrastructures.

[56] Deploying the EuroStack: What's Needed Now. (2025), https://eurostack.eu/the-white-paper/.

[57] Deploying the EuroStack: What's Needed Now.

[58] Bria et al., EuroStack - A European Alternative for Digital Sovereignty.

THE PROMISES

This section teases out several of the promises attached to the digital public infrastructure systems discussed above. These promises are not independent and self-contained but operate in tandem with each other. The same system, for example, can serve as a tool of industrial promotion as well as of improved public service delivery. The mix of promises that is cited in a given region reflects its history, economy, and politics.

What do we talk about when we talk about digital sovereignty?

Digital sovereignty is an ambiguous concept that is being increasingly widely cited as a motivation for building digital public infrastructures. In 2020, Julia Pohle noted that "a common or at least consistent understanding of what is meant by this or what its associated requirements are, has yet to emerge."[59] The situation is even less consistent today. As such, digital sovereignty is perhaps best understood in a constructivist fashion, as "a discursive resource that is employed by actors in a context of political struggles over the control of digital networks".[60] The most overarching struggle that is indexed by digital sovereignty is the by-now widespread criticism of the "US-dominated multistakeholder [internet] governance order".[61] As Mauro Santaniello puts it, "the digital sovereignty discourse signifies a rupture in that hegemony, a point where U.S. dominance in the digital realm begins to be challenged".[62] While discourses of sovereignty are mobilized by a range of groups to promote self-determination, in the context of digital public infrastructure, digital sovereignty assumes that the state is the most effective and desirable entity for the expression of digital self-determination.[63] Its ambiguity has also meant that this discourse is vulnerable to capture by Big Tech, which promotes "sovereignty-as-a-service".[64]

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[59] Julia Pohle, Digital Sovereignty: A New Key Concept of Digital Policy in Germany and Europe (Konrad-Adenauer-Stiftung e. V., 2020).

[60] Mauro Santaniello, "Attributes of Digital Sovereignty: A Conceptual Framework," Geopolitics 0, no. 0 (2025): 1–22, https://doi.org/10.1080/14650045.2025.2521548.

[61] Julia Pohle and Mauro Santaniello, "From Multistakeholderism to Digital Sovereignty: Toward a New Discursive Order in Internet Governance?," Policy & Internet 16, no. 4 (2024): 672–91, https://onlinelibrary.wiley.com/doi/10.1002/poi3.426.

[62] Santaniello, "Attributes of Digital Sovereignty."

[63] Luca Belli, "Building Good Digital Sovereignty through Digital Public Infrastructures and Digital Commons in India and Brazil," CyberBRICS, September 11, 2023, https://cyberbrics.info/building-good-digital-sovereignty-through-digital-public-infrastructures-and-digital-commons-in-india-and-brazil/.

[64] Rafael Grohmann and Alexandre Costa Barbosa, "Sovereignty-as-a-Service: How Big Tech Companies Co-Opt and Redefines Digital Sovereignty," Media, Culture & Society, SAGE Publications Ltd, November 11, 2025, 01634437251395003, https://doi.org/10.1177/01634437251395003.

Instead of treating digital sovereignty as a single promise, this paper disaggregates it in the hope of concretizing the conversation. To make sense of its role in digital public infrastructures, digital sovereignty is largely disaggregated into economic sovereignty and state sovereignty.[65] While the former refers to an economic argument for competitiveness and innovation, the latter is a political claim for strategic autonomy and security. Of course, digital sovereignty can and does encompass other promises, but those are largely less visible within the discourse of digital public infrastructures.[66] In disaggregating digital sovereignty, this paper hopes to add to the efforts of those who are asking: "sovereignty for what purpose and in service of whose political project?"[67] If sovereignty enables more agency for states, what concrete outcomes would that agency be used towards, and how would it translate into changes in citizens' lives?

Competitiveness and Innovation

Increasing the competitiveness and innovation of domestic industries is a guiding force in digital public infrastructure projects. In Europe, the Draghi report, released in September 2024, catalyzed a new conversation about Europe's declining competitiveness relative to the US and China.[68] The promoters of the public-interest EuroStack "[champion] a more balanced power dynamic by enabling smaller firms to access advanced tools and technologies, creating a level playing field that fosters entrepreneurship and innovation".[69] Yet critics have long argued that the competitiveness agenda depends on the mistaken metaphor that a nation is "like a big corporation competing in the global marketplace".[70] International trade is not a zero-sum game, and the rhetoric of competitiveness has historically favored large, dominant

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[65] Julia Pohle and Thorsten Thiel, "Digital Sovereignty," Internet Policy Review 9, no. 4 (2020), https://doi.org/10.14763/2020.4.1532.

[66] Leevi Saari disaggregates sovereignty into regulatory, economic and political. Ramsha Jahangir, "What Is Europe Trying to Achieve With Its Omnibus and Sovereignty Push?," Blog, in Tech Policy Press, 2025, https://www.techpolicy.press/what-is-europe-trying-to-achieve-with-its-omnibus-and-sovereignty-push/. Corinne Cath meanwhile disaggregates it into concerns around economic dependence, around surveillance infringing the rights of European publics, and of loss of control of vital infrastructures. Cath, Corinne. Clouds Over the Netherlands: Preserving Public Interest Internet Governance in the Era of Hyperscaler Clouds. Zenodo, 2025. https://doi.org/10.5281/ZENODO.15230914.

[67] Zuzanna Warso, "Building Digital Sovereignty: What Does Europe Need and How to Achieve It," Blog, in Tech Policy Press, 2025, https://www.techpolicy.press/building-digital-sovereignty-what-does-europe-need-and-how-to-achieve-it/.

[68] Mario Draghi, The Future of European Competitiveness. Part A, A Competitiveness Strategy for Europe (Publications Office of the European Union, 2025), https://data.europa.eu/doi/10.2872/9356120.

[69] Francesca Bria et al., EuroStack - A European Alternative for Digital Sovereignty (Bertelsmann Stiftung, 2025).

[70] Paul Krugman, "Competitiveness: A Dangerous Obsession," Foreign Affairs 73, no. 2 (1994): 28–44, https://doi.org/10.2307/20045917.

players.[71] In the European context, critics point out that "competitiveness is an undefined catch-all term that gives businesses more space to act as they wish".[72] In India, promoters of DPI have claimed that they will both limit the expansion of US Big Tech and release a wave of innovation that will serve the nation.[73] Similar questions arise about innovation as about competitiveness: what and who determines the direction of innovation? In India, for example, DPI has been aligned with the interests of a VC-funded startup industry whose social dividends should not be assumed.[74]

Digital and financial inclusion

Inclusion is a major motivation for digital infrastructure in India and Brazil, postcolonial economies characterized by mixed and uneven development, where large populations are structurally excluded from access to the state and markets. Since the 2008 crisis, financial inclusion, in particular, has become development orthodoxy, promoted by a "fintech-philanthropy-development complex".[75] According to this promise, digital public infrastructures can expand access to credit for marginalized communities, giving them the ability to participate in capitalist economies. While financial inclusion is related to economic formalization, one does not necessarily result in the other. In fact, financial inclusion interventions often simply financialize credit while maintaining poor and marginalized subjects in states of informal precarity. It is part of a broader suite of "development discourses that naturalize 'the market', with a shift in emphasis from correcting market failures ('making markets work for the poor') to creating market subjects".[76]

Improving public service delivery

Digital public infrastructures promise to improve outcomes for citizens by improving convenience and speed of access to services. This is a continuation of the promise of e-

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[71] Nicholas Shaxson, "The Great Competitiveness Hoax," Substack newsletter, The Counterbalance, May 16, 2022, https://thecounterbalance.substack.com/p/the-great-competitiveness-hoax. Jan Krewer, "Draghi's Plan: Rewriting or Repeating EU Tech History?," Open Future, September 13, 2024, https://openfuture.eu/blog/draghi_rewriting_or_repeating_eu_tech_history/.

[72] Ramsha Jahangir, "What's Behind Europe's Push to 'Simplify' Tech Regulation?," Blog, in Tech Policy Press, 2025, https://www.techpolicy.press/whats-behind-europes-push-to-simplify-tech-regulation/.

[73] Regina Mihindukulasuriya, "'All about Helping Rajni' — Tech Gurus at iSPIRT Quietly Power India's Digital Revolution," ThePrint, June 25, 2022, https://theprint.in/india/all-about-helping-rajni-tech-gurus-at-ispirt-quietly-power-indias-digital-revolution/1007652/.

[74] Samdub, "The State and Software Capital."

[75] Daniela Gabor and Sally Brooks, "The Digital Revolution in Financial Inclusion: International Development in the Fintech Era," New Political Economy 22, no. 4 (2017): 423–36, https://www.tandfonline.com/doi/full/10.1080/13563467.2017.1259298.

[76] Gabor and Brooks, "The Digital Revolution in Financial Inclusion."

government and the government-as-a-platform movements.[77] Better citizen outcomes will result from new infrastructures for targeting, transparency and efficiency, such as digital ID projects in India and Brazil. Here, the scope of digital public infrastructures is largely focused on government services. In the EU, the promise of making states more efficient is articulated in the EU Parliament's Committee on Industry, Research and Energy Report on Technological Sovereignty and Digital Infrastructure, where digital public infrastructures are recognized as key enablers of efficient public service delivery.[78] While improving public services is one motivation among many in India and Europe, in Brazil it appears to be a primary motivation for pursuing DPIs. This reflects a longer historical and political preoccupation with creating citizen-centric services in Brazilian administrative reform.[79]

Cost savings

Digital public infrastructures promise to cut administrative costs. After decades of neoliberal interventions, in states faced with fiscal constraints, cost-cutting is a central appeal of these projects. In India, in particular, DPI's ability to reduce corruption and leakages through the targeting of subsidies have been central to its appeal.[80] Even as India's DPI has transformed over time, from systems internal to the administration to platforms that are open for commercial use, a commitment to fiscal discipline has remained front and centre.[81] When faced with an existential legal challenge on purpose limitation, Suyash Rai argues that the state chose fiscal discipline over supporting private sector innovation as the major use for Indian DPI.[82] More broadly, fiscal discipline is manifested in pressures to articulate a business case – in addition to or instead of a public interest case – for state investments. Following the Draghi report's call for an unprecedented €800 billion investment into European economies, the European case appears to be operating in a different fiscal environment from India and Brazil.

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[77] Richard Pope, Platformland: An Anatomy of next-Generation Public Services, ProQuest Ebook Central (Publishing Partnership, 2024).

[78] Committee on Industry, Research and Energy, Report on European Technological Sovereignty and Digital Infrastructure.

[79] Gabriela Andrade et al., eds., Policy Analysis in Brazil, International Library of Policy Analysis (Policy Press, 2013), https://doi.org/10.51952/9781447311492.

[80] Cristian Alonso et al., Stacking up the Benefits: Lessons from India's Digital Journey, IMF Working Paper Working Paper No. 2023/078 (IMF, 2023), https://www.imf.org/en/publications/wp/issues/2023/03/31/stacking-up-the-benefits-lessons-from-indias-digital-journey-531692.

[81] Samdub, "The State and Software Capital."

[82] Suyash Rai, Economic Development and Digital Transformation: Learning from the Experience of Aadhaar and Financial Inclusion in India, XKDR Forum Working Paper no. 35 (2024), https://papers.xkdr.org/papers/2024Rai_ecoDevelopmentDigitalTransformation.pdf.

Strategic autonomy

Strategic autonomy, a concept derived from the military, refers to the ability to control vital infrastructures in domestic hands.[83] This is often characterized as having a set of domestic options to choose from, freeing oneself from dependence on foreign actors "who hold the 'kill switch' on technologies".[84] The most critical case for strategic autonomy is often made in terms of a national security threat, which reaches its apogee in defense applications, but it is often applied to society as a whole. The discourse of strategic autonomy is widespread in Europe, where it accompanies the increasing militarization of the bloc following the Russian invasion of Ukraine on the one hand, and Donald Trump's perceived willingness to weaponize Big Tech dependency against adversaries on the other. It was first introduced in the EU in the 2016 "Global Strategy for Foreign and Security Policy".[85] The broader context of the discourse of strategic autonomy is the globalization of digital infrastructures and supply chains.

Securing values and rights

The protection and promotion of European values through digital sovereignty is a distinctive motif of European digital discourse, and has been articulated in relation to a range of initiatives from the Gaia-X data infrastructure to the European Commission's Next Generation Internet initiative.[86] In the sphere of digital public infrastructure, the content of these values is occasionally named yet often left vague. For example, the EuroStack industry initiative doesn't define European values, while the other lists them as "shared governance, subsidiarity and solidarity."[87] Privacy and social equity are also invoked as European values. Notably, these diverge from the official list of EU values as reflected in the Treaty of Lisbon and in the European Declaration on Digital Rights and Principles for the Digital Decade.[88] A related discourse frames digital public infrastructures as tools for securing fundamental rights, for example, in the promotion of "public digital infrastructure that supports our democracies, allows people to enjoy their fundamental rights, and prioritizes the creation of public value while protecting the

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[83] Corinne Cath, Clouds Over the Netherlands: Preserving Public Interest Internet Governance in the Era of Hyperscaler Clouds (Zenodo, 2025), https://doi.org/10.5281/ZENODO.15230914.

[84] Robin Berjon et al., #Eurostack: European Strategic Sovereign Digital Infrastructures (2025).

[85] Pohle, Digital Sovereignty: A New Key Concept of Digital Policy in Germany and Europe.

[86] Huw Roberts et al., "Safeguarding European Values with Digital Sovereignty: An Analysis of Statements and Policies," Internet Policy Review 10, no. 3 (2021), https://doi.org/10.14763/2021.3.1575.

[87] Bria et al., EuroStack - A European Alternative for Digital Sovereignty.

[88] European Union, "Aims and Values," accessed October 4, 2025, https://european-union.europa.eu/principles-countries-history/principles-and-values/aims-and-values_en. European Declaration on Digital Rights and Principles for the Digital Decade 2023/C 23/01, OJ C (2023), https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:JOC_2023_023_R_0001.

commons".[89] Such normative promises to secure rights and values are largely absent from the motivations for digital public infrastructures in India and Brazil.

Environmental sustainability

Environmental sustainability is often cited as a promise of digital public infrastructures. In Europe, this is often manifested in the discourses of the green and digital "twin transitions", the "green-digital nexus" and "sustainable digitalisation".[90] In the context of the EU's AI policy, this discourse has been critiqued as wanting to "have it all: bigger and faster AI does not align with better and greener AI".[91] In Brazil, where deforestation is a major threat to ecology, the Cadastro Ambiental Rural (CAR) database is articulated as part of a commitment to sustainable futures. [92] At COP30, the database was launched as a DPI with the goal of tracking deforestation and enabling product traceability.[93]

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[89] Paul Keller, "Europe's Digital Infrastructure Needs — Consultation Response," Open Future, July 3, 2024, https://openfuture.eu/blog/europes-digital-infrastructure-needs-consultation-response.

[90] Tamian Derivry, "Greening Digital Sovereignty: Uncovering the Links between Green and Digital Policies in the EU," Sciences Po, January 24, 2023, https://webserver07.reims.sciences-po.fr/public/chaire-numerique/en/2023/01/24/greening-digital-sovereignty-uncovering-the-links-between-green-and-digital-policies-in-the-eu/.

[91] Riemens and van Dijck, "Bigger And Faster Or Better And Greener?"

[92] Duarte, Infraestruturas Publicas Digitais e Bens Publicos Digitais Para Combate as Mudancas Climaticas.

[93] https://www.gov.br/gestao/pt-br/assuntos/noticias/2025/novembro/na-cop30-mgi-lanca-o-car-como-primeiro-bem-publico-digital-do-brasil

ARCHITECTURAL CONSIDERATIONS

This section teases out critical commonalities and differences between the three projects. In doing so, it stages a conversation between the promises surveyed above and the material architectures of these projects. Across the case studies above, these are choices that encode particular approaches to the distribution of resources. This section opens them up as sites of discussion.

Framing the stack: mirroring Big Tech or avoiding the scale of the problem?

The full-stack EuroStack models largely mirror the scope and scale of the cloud-based model of computing that has been developed under US Big Tech, but with different protagonists. For example, three of the seven layers of the public-interest EuroStack proposal are chips, cloud and models, and it repeatedly compares European initiatives against the scale and investment of US Big Tech AI development: "scaling [European] efforts to match the transformative potential of AI requires bolder investments, improved coordination among member states, and more streamlined pathways for public-private partnerships. Without addressing these gaps, Europe risks losing control over sovereign AI capabilities and its own development model".[94] The industry initiative also calls for European chipmaking capacity, data centers, cloud, and language models. In order to challenge Big Tech, in other words, much of its architecture is replicated.[95] Leaving aside questions of feasibility,[96] this approach may risk mirroring the existing resource-intensive, hyperscaler-led cloud model, and may run counter to commitments to environmental sustainability, a tension that is only fleetingly touched upon.[97] The strategy of countering Big Tech by investing in chips and cloud, Corinne Cath points out, is "akin to saying, we would be better off if there was more competition in the petrochemical and oil sector".[98] Vendor lock-in may be averted, but at the cost of a broader model lock-in.

The DPI model, which originated in India and is being localized in Brazil, by contrast, reframes the problem to only part of the stack: software. This paradigm ignores massive and critical parts of the stack of contemporary computing, and focuses instead on a

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[94] Bria et al., EuroStack - A European Alternative for Digital Sovereignty.

[95] Kate Brennan et al., Artificial Power: 2025 Landscape Report (AI Now Institute, 2025), https://ainowinstitute.org/publications/research/ai-now-2025-landscape-report.

[96] Bert Hubert, "Taking the Airbus to the IKEA Cloud," Posts, Bert Hubert's Writings, January 11, 2024, https://berthub.eu/articles/posts/taking-the-airbus-to-the-ikea-cloud/.

[97] Riemens and van Dijck, "Bigger And Faster Or Better And Greener?"

[98] Cath, Corinne. "Is 'More Clouds' the Future We Want? A Dispatch from the FTC AI Tech Summit." Blog. In Tech Policy Press. 2024. https://www.techpolicy.press/is-more-clouds-the-future-we-want-a-dispatch-from-the-ftc-ai-tech-summit/.

more manageable set of software platforms. The strength of this approach lies in its refusal to engage with Big Tech on its own terms, instead promoting an alternative vision of technological development that is tied to the efficiency of the state. Yet this is also its weakness, for it promises more than it can deliver: the best-case scenario for a software-only approach would leave Big Tech's hegemonic control of hardware untouched.[99]

A third set of options may lie in proposals for "decomputing", a "decolonial option" or "AI commons". All three take inspiration from indigenous movements and thinking to face the reality that our interlinked climate and social crises require radical shifts in our economies and societies. The former is "the combination of degrowth and critical technopolitics that says other worlds are still possible".[100] The "decolonial option" is the appropriation of the idea of digital sovereignty "from below so as to make it compatible with worlds not driven by monocentrism, capitalism and anthropocentrism".[101] Finally, the AI commons maps initiatives to build AI systems that depart from the extractive dynamics of Big Tech.[102] In short, these approaches counter Big Tech by rejecting the scale and extractive dynamics of the hyperscaler model altogether.

Driving adoption

Adoption is the first step to creating viable digital public alternatives. Digital public infrastructures will only meaningfully change the status quo if they are used by citizens, governments, and the private sector. Yet it is not always clear what the pathways for adoption are. The global DPI model, which is being exported from India, for example, has been critiqued for being a supply-side intervention that lacks organic demand.[103] Eurostack proponents, cognizant of the importance of adoption, state that their endeavor "requires prioritizing services with strong "adoption" prospects, rapidly creating demand to be served and stimulating supporting infrastructure creation. This can benefit from the Indian experience."[104]

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[99] Amrita Sengupta et al., "Understanding Interrelationships between AI and Digital Public Infrastructure (DPI) in India and Brazil," The African Journal of Information and Communication (AJIC), no. 35 (July 2025): 1–11, India, Brazil, https://doi.org/10.23962/ajic.i35.20800.

[100] Dan McQuillan. "Decomputing as Resistance." Danmcquillan.Org, July 16, 2025. https://danmcquillan.org/decomputing_as_resistance.html.

[101] Sebastián Lehuede, "An Alternative Planetary Future? Digital Sovereignty Frameworks and the Decolonial Option." Big Data & Society 11, no. 1 (2024). https://doi.org/10.1177/20539517231221778.

[102] Joana Varon et al., AI Commons: Nourishing Alternatives to Big Tech. Coding Rights, 2024. https://oneproject.org/ai-commons/.

[103] Stephanie Diepeveen et al., The Global DPI Agenda: Promises vs. Realities in the Evolution of DPI for Digital Transformation, Draft Working Paper (2025), https://early-paint-426.notion.site/The-Global-DPI-Agenda-Promises-vs-Realities-in-the-Evolution-of-Digital-Public-Infrastructure-DPI-191557d32fa08072a585d79ea5d9da22.

[104] Berjon et al., #Eurostack: European Strategic Sovereign Digital Infrastructures.

States have multiple levers for creating demand for digital public infrastructure. In India, for example, the state has compelled citizens to adopt its DPI by making them de facto mandatory, which has led to large-scale exclusions. In Brazil, meanwhile, the state has coerced the private sector to enlist banks in its Pix project.[105] EuroStack projects, by contrast, point towards government procurement as a key tool for demand-creation, with the industry initiative in particular embracing "Buy European" initiatives. However, like DPI, EuroStack has also been criticized for being a demand-side intervention.[106] Given the monopoly of Big Tech incumbents, consumer-facing adoption that addresses user needs may be a more difficult task, though, with the breakdown of trust in US platforms, projects like the Eurosky social network may have potential.[107]

Interoperability and federation

Interoperability and federation are common technical principles across all three strategies. One of the EuroStack reports, for example, notes that "lack of capital and time make it realistically impossible to build any alternative comparable to current incumbents in a feasible timeframe. Given urgency, the approach must involve identifying existing assets that can be integrated into federated networks, commercially and technically interoperable."[108] The Indian and Brazilian payment ecosystems serve as examples of successful interoperability and federation of this kind, where the state cajoled and coerced banks and fintechs to use the payment rails of UPI and Pix, enabling these DPI to leverage the scale of banks' customer bases and fintechs' ability to innovate, displacing the Visa-Mastercard duopoly in payments.

Yet such approaches succeed only in particular cases. They succeed in situations where incumbents are weak, as in the Indian and Brazilian payments cases—both were largely cash economies before their payments DPIs took off.[109] They may also stand a chance in case of market failures where supply exists or can be relatively easily deployed but is poorly matched to demand. In such situations, where discovery is the primary issue, federated platforms can efficiently match buyers to sellers in the domestic market. This may be the case in sectors like ridesharing, where the zero-commission Indian Open Network for Digital Commerce Platform has been relatively successful at the municipal

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[105] Jeff Alvares, "The Political Economy of Brazil's Pix Payment System," ProMarket, December 3, 2025, https://www.promarket.org/2025/12/03/the-political-economy-of-brazils-pix-payment-system/.

[106] Mike Bracken et al., "The Service Gap: Europe's International Digital Strategy 2025", The Lisbon Council, 25 June 2025. https://lisboncouncil.net/the-service-gap-europe-international-digital-strategy-2025/

[107] https://www.eurosky.social/

[108] Berjon et al., #Eurostack: European Strategic Sovereign Digital Infrastructures.

[109] Polina Kempinsky, "Fast Payments in Action: Emerging Lessons from Brazil and India," Atlantic Council, April 21, 2025, https://www.atlanticcouncil.org/blogs/econographics/fast-payments-in-action-emerging-lessons-from-brazil-and-india/.

scale.[110] Yet several of the most critical sectors are characterized by entrenched monopolies and supply constraints due to structural factors, which cannot be fixed through making more efficient markets. For example, efficient discovery cannot sidestep the immense technical barriers to building large-scale chip manufacturing or cloud capacities.[111]

Infrastructure as derisking

While digital public infrastructure systems are often framed as "public options" that "maximize public value", it is important to distinguish narrative from the material affordances of these systems.[112] State investment or promotion does not inherently lead to public value.[113] Rather, under the dominant "Wall Street Consensus", the turn to industrial policy and building new infrastructure often functions as a means of derisking private investments.[114] Ironically, after a long period of neoliberal orthodoxy, this offers states new opportunities to sectorally and spatially direct and allocate investments, yet it requires careful design and governance to ensure that the value generated by these investments translates into public interest rather than only private profit.

Both the Indian example and one of the EuroStack proposals involve such derisking. The IndiaStack model, where initial state prerogative and investment in infrastructure reduces costs for commercial actors, has been criticized for socializing risks and privatizing profits.[115] This model is cited as an inspiration for the Eurostack industry proposal, which calls for "public investments and incentives for private investments by European companies, including in the capital-intensive parts of the value chain."[116] However, EuroStack proposals vary in this regard: the industry proposal argues that public R&D funding should be redirected from universities and research centres into private industry; the more public interest proposal, by contrast, also seeks to allocate

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[110] Saritha Rai, "With Zero-Commission Ride Hailing, India's ONDC Jolts Uber, Ola," Bloomberg.Com, March 23, 2023, https://www.bloomberg.com/news/articles/2023-03-23/with-zero-commission-ride-hailing-india-s-ondc-jolts-uber-ola.

[111] Bert Hubert, "Taking the Airbus to the IKEA Cloud," Posts, Bert Hubert's Writings, January 11, 2024, https://berthub.eu/articles/posts/taking-the-airbus-to-the-ikea-cloud/.

[112] Mariana Mazzucato et al., Digital Public Infrastructure and Public Value: What Is "Public" about DPI?, nos. 2024–05, Working Papers Series (UCL Institute for Innovation and Public Purpose, 2024).

[113] Suyash Rai, Economic Development and Digital Transformation: Learning from the Experience of Aadhaar and Financial Inclusion in India, XKDR Forum Working Paper no. 35 (2024), https://papers.xkdr.org/papers/2024Rai_ecoDevelopmentDigitalTransformation.pdf.

[114] Seth Schindler et al., "Goodbye Washington Confusion, Hello Wall Street Consensus: Contemporary State Capitalism and the Spatialisation of Industrial Strategy," New Political Economy 28, no. 2 (2023): 223–40, https://doi.org/10.1080/13563467.2022.2091534.

[115] Aria Thaker, "The New Oil: Aadhaar's Mixing of Public Risk and Private Profit," The Caravan, May 1, 2018, https://caravanmagazine.in/reportage/aadhaar-mixing-public-risk-private-profit.

[116] Berjon et al., #Eurostack: European Strategic Sovereign Digital Infrastructures.

resources to public institutions and commons. In Brazil, while there are tensions over the use of public funds to derisk private investments, as seen in the example of CAR above, this approach appears to have less support.

The New Non-Alignment?

These projects are emerging as the architecture of a new digital geopolitics. They are mediums for geopolitical non-alignment, often self-consciously proposed as alternatives to the US and to China, but riven with contradictions and internal power dynamics. For example, Indian DPI have been characterized by its promoters as a "third way".[117] Yet the Indian and Brazilian DPI projects emerge within the geopolitical alliance of the BRICS as well as with support from US funders and the World Bank.

This new non-alignment is also offering new ways to exert power. For example, India has been active in exporting versions of its DPI, such as the Modular Open Source Identity Platform, an offshoot of Aadhaar that has now been rolled out in 11 countries. While these are promoted as open-source interventions that enable countries to avoid vendor lock-in, Indian grants given to countries rolling out MOSIP have conditionalities requiring the selection of Indian companies for implementation.[118]

Meanwhile, both EuroStack approaches identify potential allies in non-EU member states, particularly in the Global Majority. As the industry proposal puts it, "it is an opportunity for Europe to place itself at the core of a network of countries in the "Global Majority" with similar aspirations: from India to Brazil, from Singapore to Taiwan and multiple others." [119] Yet despite the real anxieties that motivate such proposals, Europe is not a part of the majority world. Indeed, European states like France maintain overseas territories, and in many parts of the formerly colonized world, European states and corporations exist as neocolonial presences.[120] Internal colonization—the subordination of one part of Europe to another, for example Central and Eastern Europe to Western Europe—is also an ongoing concern within the continent.[121] Framing

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[117] Matthan, Rahul. The Third Way: India's Revolutionary Approach to Data Governance. Juggernaut, 2023.

[118] Duruthu Edirimuni Chandrasekera, "Strings Attached to Sri Lanka's Quest for MOSIP Integrator Revealed | Biometric Update," May 5, 2025, https://www.biometricupdate.com/202505/strings-attached-to-sri-lankas-quest-for-mosip-integrator-revealed.

[119] Berjon et al., #Eurostack: European Strategic Sovereign Digital Infrastructures.

[120] Gregory Valdespino, "How France Has Continued Exploiting Its Former African Colonies," Jacobin, March 12, 2023, https://jacobin.com/2023/12/france-africa-empire-neocolonialism-domestic-far-right-repression-elites.

[121] Małgorzata Głowacka-Grajper, "Internal Colonisation," Keywords | ECHOES, April 1, 2019, https://keywordsechoes.com/internal-colonisation/.

EuroStack projects as a resistance to US digital colonialism requires reckoning with Europe's existing colonial relations, internal and external, historical and ongoing.[122]

Building for the public

Infrastructures can and should produce publics. When people and communities contest, negotiate, or tussle against infrastructures, they form infrastructural publics, creating active democratic deliberation about collective futures. Yet "there is no predictable relation between infrastructures and the production of publics… the fact that infrastructures can participate in the making of publics does not mean that they always do so. On the contrary … infrastructures can just as easily impede and proscribe the formation of publics."[123]

In the cases studied here, the emergence and flourishing of publics is largely unsupported by the design and rules of digital public infrastructures. None of the surveyed promises meaningfully names publicness. A "normative aspiration to publicness" is central to democratic politics of infrastructure yet is largely missing from these projects.[124]

Rather, the surveyed projects are distinguished by their technocratic framing of infrastructure. In general, they see networked computing as a managerial tool that can increase optimization and efficiency. In doing so, today's digital public infrastructures risk trading in participatory democracy for apparently more hard-nosed concerns—competitiveness and strategic autonomy in the case of the EU, rapid development in the case of India. The Brazilian case is more complex because the development of digital infrastructure is taking place under a mandate to increase government efficiency, and the country has a distinguished history of participatory decision-making for internet policy, yet even the framing of efficiency largely forecloses public contestation.

An alternative approach would begin with the recognition that infrastructures themselves are social and political, and that active publics are a critical part of them. The challenge is to design and build digital public infrastructures that are both technical and social, to forge an approach that doesn't force a false choice between efficiency and publicness. In practice, taking publicness seriously could mean a range of interventions, such as instituting public fora for critique, collective self-assertion, negotiation, accountability and, potentially, radically altering the ends and means of

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[122] Mark Boyd, "The EuroStack as a Decolonisation Project," EuroStack Potential, March 27, 2025, https://platformable.beehiiv.com/p/the-eurostack-as-a-decolonisation-project.

[123] Appel et al., The Promise of Infrastructure.

[124] Benedict Kingsbury and Nahuel Maisley, "Infrastructures and Laws: Publics and Publicness," Annual Review of Law and Social Science 17, no. 1 (2021): 353–73, https://www.annualreviews.org/content/journals/10.1146/annurev-lawsocsci-011521-082856.

these infrastructures. These reflexive infrastructures have been referred to as "public digital infrastructures" that can provide “digital public space”.[125] Another approach to the normative aspiration to publicness may be found in the claim to a "right to infrastructure".[126]

CONCLUSION

This paper has sought to surface questions around the motivations that guide digital public infrastructures. To ask "why digital public infrastructures?" is to ask "for whom digital public infrastructures?" and "to what end digital public infrastructures?" While there is broad agreement across the three surveyed contexts that the answers to these questions cannot be "Big Tech", there is little further consensus and not enough debate and reflection. Such questions can only be pursued so far at the comparative global scale: they open out to domestic political economy, power distributions within federalism, and local and community civil society mobilizations. This paper has unpacked some of the global pressures and shared discourses that are framing digital public infrastructures around the world. Hopefully, making them more visible and drawing out some of the tensions can contribute towards navigating, imagining, and building more democratic collective futures.

[125] Jan Krewer and Zuzanna Warso, Digital Commons as Providers of Public Digital Infrastructure (Open Future, 2024), https://openfuture.pubpub.org/pub/digital-commons-public-digital-infra/release/2.

[126] Mila Samdub and Astha Kapoor, “The Right to Infrastructure”, forthcoming.

ABOUT OPEN FUTURE

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