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Data in India's Digital Public Infrastructure (DPI): A Deliberative Policy Ecology Approach

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At the 2023 G20 Summit held in New Delhi and afterwards, India and other multilateral entities made concerted efforts to accelerate conversations on Digital Public Infrastructure (DPI) to enhance digital governance and sustainable development. This article traces its evolution over the last 20 years in India—from its early conception in 2006 as a digital ID for Below Poverty Line (BPL) families to its formalized nomenclature as Digital Public Infrastructure at the G20 summit. I then draw on the theoretical framework of the Deliberative Policy Ecology Approach (Raghunath, 2020, 2022) to examine how data have been imagined and deliberated as part of the DPI in India and internationally. The article concludes by analyzing the deliberative potential of DPI within the policy ecology and reflecting on the strengths and limitations of the Deliberative Policy Ecology Approach for this study.

Keywords: digital public infrastructure, deliberation, policy making, India, development, Global South

With digital infrastructures becoming the mainstay of geopolitical negotiations, diplomatic exchanges, and national development planks, digital tech stacks have gained prominence in various countries. According to proponents, tech stacks connote innovation and sovereignty. In early 2024, Forbes published a piece arguing that the United States needed its own digital public infrastructure (DPI), making both a governance and business case for it. Similarly, the recent announcement of EuroStack, a DPI for Europe's digital economy and technological sovereignty, is striking in this regard. The argument for EuroStack is premised on the notion that, for a region importing 80% of its digital services and caught between the United States' dominance in cloud services and China's dominance in raw materials, EuroStack represents a viable third way (Bria, Timmers, & Gernone, 2025). DPI, however, is a new nomenclature for initiatives with longer histories in the Global South. India's UPI, Brazil's Pix, and Kenya's M-Pesa are all examples of digital technologies for identification, financial transactions, and other purposes, all of which have gained prominence in international development discourses and beyond as DPI. Often developed by states in conjunction with private technology actors, these applications are built on national tech stacks—

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digital infrastructures comprising multiple layers that facilitate various applications. This article specifically focuses on India's DPI, the India Stack.

At the G20 Summit and related events held in India in 2023, India advanced conversations on DPI to enhance global digital development. This effort saw ministers handling digital economies across the G20 countries, as well as intergovernmental bodies like the International Telecommunication Union (ITU), Organization for Economic Co-operation and Development (OECD), United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations Development Programme (UNDP), and the World Bank releasing a document to recognize the importance of shared digital systems in the form of DPIs. Given this concerted push to recognize, adopt, and implement DPI as a way to enhance digital economies and cooperation in the international arena, it is imperative that research in data and society studies acknowledges and analyzes these developments. Data—besides the Identity and Payments layers—form an important part of a DPI, as exemplified by the "India Stack." The India Stack is a volunteer-built public digital system designed to develop and host digital IDs, digital payments, and data exchange initiatives in India.

This article traces how India Stack was rebranded from its (in)famous beginnings into a symbol of India's soft power as the DPI today. In doing so, it focuses on how key actors have advanced discourses around data and their governance across the inflection points that defined this trajectory of rebranding. To this end, this article draws on the Deliberative Policy Ecology (DPE) approach to the study of media and technology policies and policy making. First developed in 2020 (Raghunath, 2020) and later expanded through iterative development (Raghunath, 2022), the DPE approach is a theoretical framework that allows policy researchers to study deliberative practices in policy making over time and across the shifting affordances of a policy ecology. Drawing on this framework, I study a corpus of official documents, public statements, and media reports from India, other countries, and international entities in the context of the DPI.

This article is structured as follows: The section following this introduction presents the background and context of DPI as it developed in India. I then discuss the DPE approach and how it can be further extended by studying the DPI. After a brief note on the methodology, this study examines the discourses and practices of deliberation around data in DPI under three key themes. This is followed by a critical analysis and conclusion that draws on the idea of "deliberative potential," analyzing its veracity within India's DPI policy ecology and the need to strengthen it toward enhancing inclusive governance.

Digital Public Infrastructure (DPI) in India: Background and Context

In 2006, India's Department of Information Technology, under the Ministry of Communications and Information Technology (MeitY), set up a project titled "Unique Identification for BPL Families." In 2008, the then United Progressive Alliance-I (UPA-I) government, headed by Prime Minister Dr. Manmohan Singh, invited technologist Nandan Nilekani to chair the Unique Identification Authority of India (UIDAI), established to implement this project. This project became a massive endeavor tasked with recording and providing biometric digital IDs to India's vast population of approximately 1.2 billion at the time (Banerjee, 2015). A key feature of the UIDAI/Aadhaar project was the governance tech stack, popularly called the India Stack

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or the iSPIRT ProductNation initiative (iSPIRT). As part of this effort, technologists—including software developers, coders, and technology entrepreneurs—volunteered their time and expertise with a shared commitment "to making India a Product Nation" (iSPIRT, n.d.). They developed a four-layered tech stack, explained further ahead. These tech volunteers aspired to build for India, pledging not to place private or commercial interests above national interest and committing to protocols such as not becoming an angel investor for companies that may benefit from their voluntary policy advocacy efforts (iSPIRT). It was this idea of building for the nation that characterized the publicness of DPI, although this phraseology would only become associated with these efforts almost a decade later.

In the years that followed the initiation of UIDAI, the Aadhaar biometric digital identity project faced criticisms from several quarters, especially civil society and social activists. They critiqued the imposition of this system on a population with poor digital connectivity and penetration (Panigrahi, 2021), citing concerns over state surveillance and exclusion (Nandgaonkar, 2017). Civil society organizations also emphasized privacy concerns, arguing that privacy was not the right of the privileged alone, especially since the Aadhaar biometric ID was linked to below-poverty-line (BPL) families' access to monthly grains and groceries under India's public distribution system (PDS) (Ramakumar, 2011). With food security being a big concern for India then and today, connecting the PDS to what was seen as an arbitrary and uneven initiative like Aadhaar mobilized many public-spirited individuals as critics.

Within a few years, and following the change in government in 2014, the UIDAI, previously housed under the Indian Planning Commission, was brought under the ambit of the newly established Niti Aayog. The new government's Digital India and Startup India initiatives, initiated in 2015 and 2016, respectively, created an enabling ecosystem for the rollout of the Unified Payments Interface (UPI) using the India Stack architecture in 2016.

Scholarship on Digital Public Goods (DPG) and public interest technologies offers ways to conceptualize and understand approaches to infrastructures that underscore publicness from the past as well as present. Desai, Manoharan, Jayanth, and Zack (2023) use the case of India Stack and its associated services to argue that the Indian people had accrued public value in the form of financial inclusion through the use of applications built on the DPI's technology architecture. Matthan's (2023a) book on India's DPI presents it as a revolutionary "third way" through which countries straddling laissez-faire economies and socialism can reconcile the two using the DPI approach and architecture. Matthan (2024) further states provocatively that the goal of India's DPI is to diverge from Digital Public Goods (DPGs), since it is often the prerogative of the national context in which DPI is deployed to decide who may build upon it and offer services. For DPGs, however, the classic idea of public goods as nonrivalrous and nonexcludable is invoked and updated to make them actionable within today's digital environment (United Nations General Assembly, 2020). Similarly, scholarly work on public interest technologies underscores ideas of "public interest" and "public good" in the digital age (McGuinness & Schank, 2021). The authors emphasize the need for government to solve people's problems and argue that techno-solutionism is not a magic wand, but a tool that can help in solving these problems.

These varying ideas about publicness present themselves in the various discourses about DPI as well as data in it. The debate about how publicness is understood was brought out in the case of the Indian

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Supreme Court's 2017 Right to Privacy judgment delivered by Justice Puttaswamy. While this judgment sparked debates over the mandatory versus optional nature of digital ID, the Indian Parliament had already passed the Aadhaar Act of 2016, leading to the establishment of the UPI digital payments wallet for peer-to-peer transactions. Subsequent initiatives, such as the Ayushman Bharat Health Account (ABHA) digital health ID and the One Nation One Ration Card scheme for food security, launched in response to the pandemic-driven migrant crisis, also relied on Aadhaar seeding and the underlying tech stack.

The latest in this timeline is the adoption of the official nomenclature DPI at the G20 Summit held in New Delhi in 2023, which has opened up newer formulations and aspirations to be pursued not only in India but also internationally. Under the rubric of digital cooperation, India is now exporting its tech stack and enabling countries, especially those in the Global South, to build their own DPI. This effort is also being championed by multilateral development agencies like the UNDP, the United Nations tech envoy, the United Nations Environment Programme (UNEP), and philanthropic entities like the Gates Foundation.

The Deliberative Policy Ecology (DPE) Approach

Overview

The DPE approach to studying media and technology policies and policy making emerged from a grounded theoretical research of broadcast media policy in South Asia (Raghunath, 2020). This theoretical framework emerged from iterative engagement and analysis of policy ethnography comprising observations, interviews, and field research in four countries, each characterized by connected-yet-distinct political and socio-economic setups. The approach describes a policy continuum as the synthesis of "adaptionist" and "constructivist" stances to policy and social action (McLaughlin, 2001), where the cognitive and social constructions of policy actors—of themselves, other actors, and competing interests—are in an iterative, deliberative–dialectical interaction with broader socio-economic, political, and cultural contexts. The policy ecology serves as an analytic heuristic device that houses this continuum of policy interactions, activities, and deliberations advanced over a temporal trajectory. These iterations and reiterations can be traced through policy documents and their amendments, both in official and in nonofficial advocacy efforts. The ontological proportions of a policy ecology are activated and characterized by deliberation as its epistemological facet. Scholars have advanced definitions that qualify "deliberation." Starting from Habermas's (1984, 1996/1992) concepts of the ideal speech condition and communicative action, through Chambers' (2009) idea of rhetoric as the corruption of deliberation, Dryzek's (1994) distinction between deliberation and other forms of communication in discursive settings, and Benhabib's (2002) two-track deliberation model comprising an official and unofficial public sphere of "cultural institutions," the DPE approach allows policy researchers to study the pushes and pulls of lobbying, the theater of advocacy and negotiation, and the material construction of policy documents and related activities.

Why this Approach?

The DPE approach is useful for unraveling the range and shifts in discourses around data, as seen in the context of India's Tech Stack, in which data constitute a key layer. The approach helps account for

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shifts in power, social status, changing nature of elites with newer entrants and/or consolidations over time, and subversive efforts (Raghunath, 2020). By drawing on what Hayek (1952) terms studying past experience of similar conditions, the approach enables researchers to study changes in deliberative processes, discourses, and practices in political settings across global-local scales, as well as advances in technology, in this case the DPI, to be accounted for over time. The norms, rationalities, ideas, values, and practices are studied to capture the nuances of policies and policy making around data and DPI over time. Spatially, the approach draws on Bohman's (1998) idea of transnational democracy to account for externalities, such as transnational actors, inflection points in the global geopolitics of technology, and development and diplomacy dynamics. Using this framework, this article maps and analyzes the actors, discourses, and imaginaries of data—its policies and practices—in shaping the digital public infrastructure (DPI) in India.

Methodology

The methodology for this study was conducted in two steps, guided by the DPE approach's focus on plural policy actors, processes, and communicative practices. A brief description of the methodology and steps involved is provided below.

Mapping the Policy Ecology

Research for this study began with an initial mapping of the policy ecology, identifying the many actors engaged as stakeholders in the DPI arena, mainly in India but also at the global level. The selection criteria primarily concerned their formal and official positions in relation to the DPI over the past 20 years in India. This included political parties and their official statements, government bodies and officials, technology businesses and their leaders, technology volunteer initiatives, international nongovernmental bodies, and initiatives set up as part of multilateral cooperation. This mapping exercise involved the perusal of policy documents and government reports, news reports, official pronouncements from representative authorities, legal case histories, organizational websites and social media updates, documents emerging from regional and international fora like the G20, reports from intergovernmental, multilateral, and international NGOs and research centers, and the documentation of DPI initiatives and applications. Here, it was observed that these actors often emerged from their own standpoints, articulating their interests and stances based on the norms intrinsic to their roles. This understanding emerged as the key set of discourses from which the prominence, prevalence, and approaches to data were then culled out.

Deliberative Policy Analysis

Deliberative Policy Analysis (DPA) emerged as a distinct strand of public policy analysis in the early 2000s, when calls to go beyond the state as the dominant actor in policy and governance studies were articulated. It is closely linked to the larger ambit of critical policy studies and has some significant overlaps with interpretive policy analysis. However, DPA has retained its distinct focus as a post-positivist approach to policy that recognizes the politics inherent to any policy process (Hajer & Wagenaar, 2003). DPA goes beyond an institutional study of policy and expands into analyzing its networked nature through institutional

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systems, trans-institutional trade and diplomatic deals, and "transient and informal arrangements" (Hajer & Wagenaar, 2003, p. 1). As such, it allows the policy researcher to study diverse settings of policy as well as inquire into the many kinds of actors, deliberations and contestations, rationalities and rationalizations, and values and narratives. In recent years, there have been calls for DPA 2.0, which centers the complexities of policy contexts and places an extended focus on communicative practices (Bartels, Wagenaar, & Li, 2020). Importantly, DPA combines interpretation, deliberation, and practice. While in some instances it does interface with the consultative processes of decision making, this is not a compulsion since deliberation in informal deliberative spaces oftentimes leads to shifts in policy decisions and processes over time and not immediately (Li & Salecker, 2023). In alignment with these tenets of DPA, I analyzed the corpus of documents, reports, official communication, and anecdotal narratives of experiences. Here, I focused on narratives, discourses, and communicative stances that illuminated how data were perceived, approached, used, and governed by various actors over time. I first developed manual codes, which were then iteratively grouped into multiple sets until interrelated—but distinct—clusters emerged. The analysis ultimately yielded three broad thematic clusters, presented below in a nonlinear timeline, to highlight the stances toward and discourses around data in the development of DPI.

Data Discourses in the Making of India's Digital Public Infrastructure (DPI)

Actors' Imaginaries of Data: Three Inflection Points

Not only is the data exchange layer of the tech stack a key component of the DPI architecture, but data also feature prominently in the numerous communicative stances and policy exercises associated with the DPI. The mapping exercise and research corpus showcased the landscape of actors involved in DPI and how they imagined data as building blocks of DPI over time. One can identify this across three inflection points that have determined the course of India's tech stack—its inception and initial stint, the post-2014 era marked by a change in the Indian government and the rise of fintech, and its recent rebranding and expansion as a DPI. These shifts occurred within a complex national and global ecosystem, necessitating the evolution of some actors' identities, the subduing of others, changes in official stances, and the entry of newer actors.

Database Nation and Citizen Data as Capital

In the first few years of its inception, the two sets of actors on the scene, the information technology business community and the Indian government, had different intentions for the rollout of Aadhaar. The biometric ID project was launched as a voluntary exercise to implement the then Congress-led UPA government's welfare schemes. It was also seen as an opportunity to create a database of citizen data that comprised iris scans and fingerprints, especially with growing recognition of data as the new oil, a phrase first coined by Humby in 2006, among global businesses (Jaffrelot & Belorgey, 2021) and to enable a data economy (Ranganathan, 2020). Singh (2019) introduces the design imaginary behind Aadhaar as that of the state functioning as a database with citizens acting as individual data records interacting and transacting with dashboards of public and private services. Data were at the heart of this contentious project, and all sets of actors engaged in communicative stances. The ruling UPA-II government and the technology community sought to provide explanations and assurances (Parker, 2011). While the divergent interests of

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the Indian government and the IT business community still seemed to be complementary, the biometric project was met with significant criticism from two other sets of actors: civil society groups—over its top-down execution, exclusion of citizens' rights, and privacy breaches (Khera, 2018; Ramanathan, 2021)—and the opposition parties, which questioned its loopholes and potential for misuse (Bharatiya Janata Party, 2013). At his campaign before the national elections in 2014, Narendra Modi, who led the opposition, called Aadhaar a "political gimmick" without substance (The Wire, 2024).

Data as Propelling Good Governance

The 2014 national elections heralded major shifts in India's political and governance landscape, with the hitherto opposition winning by a huge popular mandate, riding the wave of anti-corruption protests. Just after the elections, the new government's stances and discourse on Aadhaar changed, especially after a meeting between Nandan Nilekani and the new Prime Minister Modi (The Times of India, 2017). Nilekani seemed to have persuaded the government that the biometric digital ID was meant to address corruption and had now become an instrument for delivering government subsidies and good governance (Aiyar, 2017). Other statements, for instance, by the communications minister were made: "Aadhaar is an instrument for good governance. Aadhaar is a mode to reach the poor and needy without the middlemen" (India Today, 2016, para. 2). What is striking in the post-2014 period is the shift in statecraft, from a visible centralization of policies and governance mechanisms to the rise of a majoritarian state (Maiorano & Sen, 2021). The retreat of civil society paralleled the entry of newer actors into the Aadhaar policy ecology, including the Indian Parliament, judiciary, technology start-ups, and legal firms.

With this shift came a change not only in the Aadhaar enterprise but also in the associated discourses and deliberative capabilities of opposition and civil society activists, both rendered subdued. This was evidenced by the passing of the Aadhaar Act as a Money Bill in the Indian Parliament in 2016, since taking this route would not need the vote of the Rajya Sabha (Upper House), where the ruling government did not have a majority. The Act's enactment underscored political will in establishing the UPI digital payments wallet that followed it, signaling a move from a mere ID system to authentication for financial transactions. This, coupled with programs like Digital India and Startup India, led to the uptake and expansion of digital financial services, including the building of fintech mobile applications. This strategic shift was explicit in Nilekani's (2018) essay in Foreign Affairs, where he highlights India's approach to digital technology by describing digital ID and UPI as digital public goods, moving beyond the notion of data as akin to oil: "If the idea that digital infrastructure should be a public good is the first guiding principle of the Indian approach to the Internet, the second is that people should be empowered by data" (p. 25).

Even as this unfolded, the Indian Supreme Court ruled that ". . . biometric data collection by private agencies is not a great idea" (Business Standard, 2017, para. 2). This ruling, together with the 2016 Right to Privacy ruling, paved the way for accelerating efforts toward data protection legalities, which is discussed further below. A few years later, the government's focus on having the Citizenship (Amendment) Act 2019 (CAA) passed led to numerous controversies around citizenship. Against this backdrop, the Indian Comptroller and Auditor General (CAG) released an audit report on the Aadhaar, identifying numerous issues

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and stating that ". . . there is no assurance that all the Aadhaar holders in the country are 'Residents' as defined in the Aadhaar Act" (Comptroller and Auditor General of India, 2022, p. 2). Here, issues in identity ownership, such as noninclusion, duplication, and technical access difficulties, are juxtaposed with their potential misuse. In both instances, we see shifts in data discourses—from valuing data economically to associating data with publicness.

Data as Diplomatic Treaty

The next inflection point came with developments at the 2023 G20 Summit, which marked the official adoption of the nomenclature DPI under India's presidency. The Summit also saw the promulgation of the New Delhi Leaders Declaration 2023, which explicitly stated India's stance as follows: "In our voluntary efforts to make digital public infrastructure interoperable, we recognize the importance of data free flow with trust and cross-border data flows while respecting applicable legal frameworks. We also reaffirm the role of Data for Development" (Ministry of External Affairs, 2023, p. 22). This push found an audience with multilateral development and donor agencies, who published several reports and opinion pieces on DPI as an enabler of development in recent months (Alonso et al., 2023; Bill and Melinda Gates Foundation, 2023; UNDP, 2023; World Bank, 2023). Recently, countries such as Brazil, Kenya, Uganda, Thailand, Singapore, and Ghana have begun building and scaling DPI, either independently or through inter-country cooperation. Similarly, advocates have called for a focus on the "two critical needs of today's new digital paradigm—sovereignty and collaboration" (Massally & Kapoor, 2023, para. 2). The authors called for bridging Japan's proposition of data-free flow with trust (DFFT) at the G7 and India's push for DPI from the G20 Summit, arguing that sovereignty and collaboration are complementary. They suggested that cross-border data flows could be enhanced for data cooperation with the DPI architecture, providing the needed privacy and security. As such, data and the values they are imbued with here—including sovereignty, trust, and cooperation—is a key negotiating commodity in diplomatic engagement, standing in for and performing the role of international legal instruments.

Values Encoded: Data in the India Stack Architecture

The India Stack architecture has been well documented and discussed by those associated with iSPIRT/Product Nation, the volunteer technology group that developed it. Imaginaries of people's data within the DPI center is not only on building but also on enabling or exporting "population-scale solutions" (Centre for Digital Public Infrastructure, n.d.). The Tech Stack comprises four layers—presence-less (biometrics for digital IDs), paperless (digital records), cashless (enabling digital payments), and consent (authorizing data exchange)—built as an open architecture using Application Programming Interface (APIs) and designed for efficiency and scalability (Varma, 2014).

Myth of Tech Neutrality

The technologists emphasized the importance of avoiding a Traditional Custom Build (TCB) approach, opting instead for one that would be vendor-neutral and malleable to requirements (Varma, Matthan, Chaudhuri, & Madhukar, 2024). They suggest that adopting this approach has transformed what began as a "platform approach" into a "network topology" comprising multiple nodes and embedding

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interoperability (Centre for Digital Public Infrastructure, 2024). This discourse on data can be understood as an underlying layer that is "neutral" in that it allows web/mobile applications to be built upon it in a way that can be connected to the wider ecosystem of similar applications. Reports mention the "lego block approach" (Deloitte India, 2023, p. 21) to discuss how data and the stack serve as underlying "rails" for agile and plural deployment of the DPI, including applications for online education (DIKSHA), COVID contact tracing (Aarogya Setu), and document verification (DigiLocker). As per the vision of the technology architects, this enables market innovation since it deepens decentralization by design.

A key facet of this approach is the equation of decentralized design to democracy, where the latter is realized through democratized innovation. Here, we see the myth of "value-neutrality" in the tech stack revealing itself. The tech stack is essentially encoded with values associated with free markets and open competition, as has been explicitly mentioned by advocates of DPI. Scholars like Parsheera (2024a) suggest that instead of assuming values of either public-spiritedness or competition, any potential underlying normative framework must be demonstrated in law and practice. To further drive the point home, the author cautions against what she terms a growing "alt Big Tech" in India (Parsheera, 2024b), where market ideologies are packaged as value-neutral technology under the garb of democratized innovation.

Deliberating Data Ownership

Scholars studying DPI have highlighted nuances in data ownership and the infrastructure that the architecture entails. These range from investigating ideas of publicness, private-public partnerships, and a commons approach. Scholars interrogating the publicness of DPI discuss notions of "common good" (Mazzucato, 2023) as a way to maximize public value, as opposed to what they term the vague idea of public interest (Eaves, Mazzucato, & Vasconcellos, 2024). They emphasize the need to make the governance of DPI co-creative (Eaves et al., 2024; Zuckerman, 2020). Other scholars proposing the Commons approach to DPI suggest that "new configurations of responsibility between the state and corporations are necessary" to ensure that these infrastructures are co-governed by communities and tailored to their local contexts (Avila, Chandrashekhar, Dulong de Rosnay, & Rens, 2024, p. 5).

Chakravorti (2023) highlights the misalignment between the motivations of public and private actors involved in the building of DPI, making it siloed and/or disproportionately leaning in one or no direction. This is evident in how a project that began as a state-welfare initiative evolved into a market-enabler for fintech businesses and digital payment applications. Some scholars have described the India Stack journey as "goventrepreneurism" (Dattani, 2019) and others as an entrepreneurial state (Mazzucato, 2023) working in tandem with the private sector to create market-driven technology solutions for socio-economic problems. This shift became more prominent in 2016 when the National Payments Corporation of India (NCPI) set up the UPI using India's Stack architecture. Chakravorti suggests that the more appropriate term for the India Stack would be "Digital Public-Private Infrastructure." To this mix of public-private-commons, I add voluntarism as a lens to study India Stack, since a sizable group of technology developers volunteered to code and bring the tech stack to life. The iSPIRT website showcases the technology volunteers' base, their motivations, rationalizations, and practices, with the idea of building for the nation and making it a Product Nation coming to the fore.

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Governing Data

Even as the technology architecture is encoded with potential for certain kinds of uses, mainly market-facing, the security of citizen data has been a major rallying point for criticisms and mistrust in Aadhaar and beyond. Taking the cue from the Indian Supreme Court's landmark Right to Privacy judgment of 2016, the government constituted a committee under Justice Srikrishna in 2017 to explore and frame data protection legalities toward facilitating "a free and fair digital economy" in India.

Individual Autonomy Versus India's Data Sovereignty

This Srikrishna Committee report touched upon concepts of personal and nonpersonal data, data principals, and fiduciaries, as well as the establishment of a data protection authority. Importantly, the report stated its approach as a Fourth Approach, beyond those of the United States, the EU, and China, aimed at enhancing individual autonomy while focusing on the common good (MeitY, 2018). Furthermore, in 2019, the Ministry of Electronics and Information Technology (MeitY) instituted a Committee of Experts under Kris Gopalakrishnan of Infosys to examine the governance of nonpersonal data and propose regulations (PRS Legislative Research, 2020). The years that followed saw several consultations and advocacy efforts from various stakeholders, ultimately leading to the draft reports being dropped when it became evident that strong regulations could impinge both on participation in the (multinational) technology market and on government authority. One key point of contention was the data localization clauses, a concern for multinational Big Tech companies and India's start-up community. Data localization was originally conceptualized to ensure the data privacy of Indian citizens, but soon assumed a tone of digital sovereignty (Burman, 2023; Panday, 2023). The Indian government passed the Digital Personal Data Protection (DPDP) Act in August 2023, following public consultations on the Bill. Significantly, unlike the Bill, the final Act does not provide strict guidelines for data localization and instead speaks about sector-specific localization needs. Scholars such as Prasad (2022) have written about how the Indian state's response to digital geopolitics, not only from nation-states but also from foreign Big Technology corporations, has been in the form of invoking digital sovereignty. This is essentially backed by the biopolitics of initiatives such as the biometric digital ID, where citizens' bodily data are extracted to enact the state's digital sovereignty.

From Citizen Rights to Consumer Empowerment

In recent years, even as these data policy making processes were ongoing, the government's policy think tank, Niti Aayog, officially introduced the Digital Empowerment and Protection Architecture (DEPA) in 2020, following an earlier soft iteration in 2017. The DEPA and the DPDP Act work in tandem within the consent layer of the DPI. The discourse around India Stack's data layer has focused on user/consumer empowerment through the consent framework, since users can allow for their individual data to be shared or made portable from one service provider/application to another using the underlying APIs. However, at the height of the global COVID-19 pandemic, when the CoWIN application was used to book and certify vaccinations—and again in late 2023—massive data breaches were reported (Mint, 2023). These incidents raise significant concerns about data security and privacy (Bhatia & Bhabha, 2017) in this digital age, which advocates suggest must be accepted as reality and work toward mitigating (Matthan, 2023b). With individual

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autonomy becoming a less important feature of the data governance framework, many policy exercises and discourses around it are rendered futile.

Exporting Decontextualized DPI-as-a-Service

While the developments discussed so far pertain to India's domestic context, the last couple of years have seen conversations on national Tech Stacks, and now DPIs, emerge in multilateral venues and spaces. As mentioned above, the Indian Presidency at the G20 Summit allowed the country to showcase its tech stack architecture and position DPI as the basis for international digital cooperation. The Digital Economy Working Group (DEWG), as part of the Sherpa Track, and the Global Partnership for Financial Inclusion were the two deliberative sites where these discussions occurred. Here, India proposed, among other things, the One Future Alliance (OFA), "a voluntary initiative aimed to build capacity, and provide technical assistance and adequate funding support for implementing DPI in LMICs" (Ministry of External Affairs, 2023, "Point 56"). This was in addition to initiatives such as the Global Digital Public Infrastructure Repository and the Centre for Digital Public Infrastructure. These instances reflect India's strategic stances in two ways: reconciling the earlier trysts with Aadhaar and subsequent efforts to build technology and governance architectures as DPI, and leveraging its status as a technology innovator to project soft power as a leader in digital cooperation within the Global South. In line with this stance, DPI is now promoted as the DPI-as-a-Service (DaaS) model, where the DPI architecture, including its software and documentation, implementation details, and governance package, could be made open source for countries to layer and customize according to their governance structures and protocols (Varma et al., 2024). The authors suggest that this would allow for the DPI architecture to be shared as a neutral technology architecture that could then be implemented in accordance with a country's preferences and needs, ensuring privacy and sovereignty.

These numerous shifts—from enshrining individual autonomy in data governance to maneuvering it to enhance national digital sovereignty, leveraging the rubric of empowerment while incentivizing the market, and displaying soft power as a technology innovator—have been accompanied by an orchestration of changing discourses and policy pronouncements on data at the national and international levels. Mapping how data has become a "codified artifact" that registers the pushes and pulls of various competing interests and politics adds facets to the saga of rebranding the India Stack. With a key architect of India's DPI, Nandan Nilekani (2023), indicating "the seamless fusion of Digital Public Infrastructure (DPI) with artificial intelligence propels us into a new world of 'Digital Public Intelligence'" (Press Insider, 2023, para. 6), the shift in discourses around data is yet again beginning to pivot, this time to intelligence.

Analysis and Conclusion

The above section laid out the deliberative policy ecology for what is now officially called the DPI, with a lens on India domestically as well as at the international level. The DPE approach to the study of media and technology policies and policy making brings forth the idea of the "deliberative potential" in a policy ecology (Raghunath, 2020). This deliberative potential is marked by (a) the ability of policy actors to be reflexive of their individual roles as deliberators and shapers of the policy process in question, (b) various contextual attributes that include the regional, temporal, cultural, social, and spatial aspects of the policy

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journey, and (c) larger aspects like questions of power, governance structures, and the cultures and relations between the policy actors they engender. I draw on these ideas to analyze DPI, as presented in this study.

First, for a deliberative shaping of policy processes, it is important that actual democratic public engagement with key proposals occur. With India's DPI and, more importantly, the governance of people's data, this is absent. Championing the decentralization of the technology architecture of DPI as a democratized innovation does not equate it to becoming a truly public infrastructure. While this enables freedom of innovation and enterprise, it hardly levels up to the demands of the rigors of an inclusive rights-based democratic process (Rao & Nair, 2019). Instead, with the DPI in India, democratized innovation ends up becoming a proxy for deliberative governance.

Second, public imaginaries are often significantly correlated with those of a "consumer." This contrasts with being a member of the public or a citizen, as the language of a "vendor-neutral" technology stack or fintech service consumers has become the dominant discourse of DPI in India. This corresponds to shifts in political contexts rendering the digital ID a benevolent tool to enable financial inclusion through access to loans and credit rather than guaranteeing the right of the citizen's access to social security. Furthermore, the shift from individual autonomy to digital sovereignty of the Indian nation-state as the overarching framework for data governance negates any notions of competing sovereignties at the individual, community, or sub-national levels. As it stands today, DPI could perhaps be qualified more strongly as GovTech (Bharosa, 2022) built in tandem with private actors. While GovTech has traditionally come to be understood as a translation of analogue processes to digital processes of governance, it could be reimagined to make it more responsive to the needs of end users. It could lay the groundwork for clearly identifiable authorities, allowing the onus of responsible governance to be assigned for specific functions they oversee.

This brings us to a most crucial and final point toward analyzing the deliberative potential of the policy ecology for DPI. As it stands today, the fairly closed setup of the DPI policy ecology presents a high entry barrier for public participation in the governance processes around DPI. This is because of the requirements of technology and/or legal capacities and know-how. If one does not understand the technology apparatus behind the DPI or the fine prints of legal frameworks and legalese, one almost has no way of participating in its further functioning, uptake, critique, or grievance redressal mechanisms as an engaged member of the public. For the DPI to truly function as one, India will need to create an equally important enabling social infrastructure in the form of deliberative policy processes for deeper public participation in governing its own data.

This study drew on the DPE approach to map and analyze actors and their approaches to data in the context of the DPI in India. While the approach has rendered the tracing of this phenomenon and associated discourses possible over time, a key shortcoming of this approach is that it does not consider political offstage lobbying that often shapes technology development and governance, including how data are defined, described, approached, and used in this process. As such, backdoor policy processes and offstage negotiations may defy rational approaches to idealized policy stances and argumentation. However, they do provide insight into how key policy decisions are finally made. This approach could be further

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developed in that direction. A second important area for development is incorporating the study of the digital and technical design of Tech Stacks or applications. By extending the approach to examine how this design shapes—or constrains—how citizen users push back, offer feedback, deliberate, or effect change, researchers could deepen their analysis of design-as-policy in the context of technology policy.

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