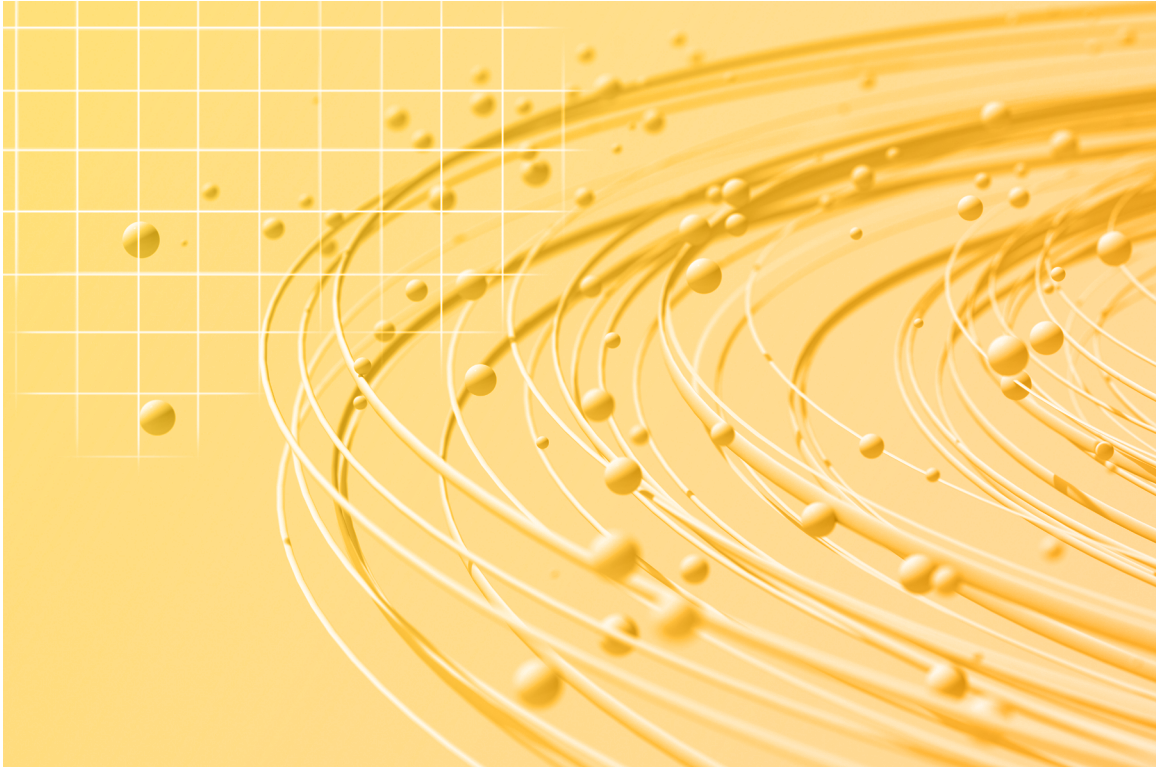**upgrade democracy**

Visions: Democracy and Technology

Part 5

Digital Infrastructures and Sovereignty

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What are infrastructures? One of the most well-known observations regarding this question comes from the American sociologist Susan Leigh Star. She argues that we only notice infrastructures when they break down. While we are all abstractly aware of our dependence on essential infrastructures – think of water, electricity, or transportation routes – they rarely receive political attention. This contributes to the often-hidden fact that infrastructures significantly shape our possibilities for action. In short, infrastructures are the (technical) prerequisites for our complex ways of life, which remain more or less invisible as long as they function. For digital infrastructures, such as fibreoptic, mobile, or satellite networks, cloud and platform services, or smart sensor and control systems, this holds true to a lesser extent at first glance: they are a more recent phenomenon, and because they increasingly encroach on our daily lives and often require updates or changes, they are relatively present to us. Therefore, we want to explore what it means to democratically shape digital infrastructures.

What Is It About?

In the near to medium future, it is not to be expected that a single technology or development will stand out in the realm of digital infrastructures. Although technological development is highly dynamic in this area (consider satellite internet, for example), the overall development is more of an evolutionary expansion, leading to increasingly seamless and deeper integration of digital technology into social processes. The internet, due to its importance for our societies, is considered critical infrastructure, with corresponding protective regulations, up to and including the discussion of a fundamental right to internet access.

Revolutionary changes, as recently claimed for artificial intelligence, are not to be expected here, precisely because infrastructures only become infrastructures when they achieve widespread adoption and are accepted as standards. Infrastructures are also not to be equated with applications. Their function is to enable or promote different applications, which, in turn, also shape these applications. They are the physical foundation for most of our digital applications: for example, cable and mobile networks, internet nodes, servers, and the like. Intangible technologies like protocols and standards enable the establishment of common communication spaces. When these material and immaterial components come together, a comprehensive digitally networked space emerges with its variety of services and applications, which is so characteristic of today's societies. Therefore, digital infrastructures should not be thought of in the singular. They are based on the networking and availability of a wide range of services and offerings.

For understanding digital infrastructures, it is also important to recognize that they develop in a highly decentralized manner. While state actors play a significant role, for example in the history of the internet, the transnational nature of the digital space contributes to the overall decentralization of the infrastructure.

However, decentralization does not prevent control over infrastructures, especially as network effects come into play. These have, for instance, placed transnational digital companies in a position to exert significant influence over material infrastructures and to play a major role in the development and enforcement of standards. In many parts of the world, digital infrastructures are financed by private sector actors, which, conversely and unlike most other infrastructures, leads to a dependency of states on companies. Digital infrastructures are increasingly taking the form of platforms, comparable to social networks, for which the concept of the platform was originally established, and they exhibit clear tendencies towards silo formation. Newly emerging digital infrastructures, such as satellite internet or cloud providers, are therefore often directly connected with previously dominant technology providers, as these developments seek to instrumentalize existing network effects for their establishment and differentiation.

🖱️ What Are the Potentials and Risks?

How does the relationship between digital infrastructures and democracy unfold? Here, it is useful to focus on the area of democratic governance, specifically the issue of digital sovereignty. Sovereignty is conceptually linked to democratic self-determination and is sometimes seen as a prerequisite for it or sometimes as an expression of it. The term "digital sovereignty" has become one of the key buzzwords in the debate on governance and regulation of digital infrastructures, especially in Europe. What digital sovereignty means varies greatly in public discourse, but the topic can be related to infrastructures and democracy in at least two ways: with regard to state capacity for action and in relation to societal autonomy potentials.

Regulation of Infrastructure by the State

The first line of thinking understands sovereignty – more or less classically – as the state's potential to set and enforce rules. Digital infrastructures have often been seen as a threat from this perspective because "cyberspace" was perceived as a lawless space that, due to its lack of territorial specificity, opaque technical structure, and the dominant role of private actors, evades effective regulation. This idea of „internet exceptionalism," which still occasionally resurfaces – such as in the discourses around blockchain and related technologies – is technically and legally unsustainable in its strong form. Not only are there effective regulatory possibilities for digital infrastructures, as evidenced by the extreme example of the Chinese internet. But democratic and especially European states have also been convinced of the necessity of democratic regulation for over a decade and have created a variety of approaches to influence digital infrastructures through technical requirements or economic incentives. Although both law enforcement and the formulation of effective rules are difficult and often encounter resistance, the public and political will to regulate is now considered high. The state has recognized digital infrastructure as relevant to security and is increasingly willing to take action itself.

Challenges of Regulation

However, three areas of challenges can be identified. First, the complexity of digital infrastructures makes extensive independence or control by territorially based political actors enormously costly and resource intensive. This prevents democratic states from being able to autonomously manage the broad spectrum of digital infrastructures. Recent geopolitical disruptions in a multipolar world have raised awareness of the importance of broader diversity in sources and distribution of know-how (think of 5G wireless standards or chip production in the context of a potential China-Taiwan conflict). A second aspect is the relationship between public and private power. Strong network effects in various technologies, applications, or standards have, for example, favoured the dominance of American digital companies. To create alternatives to these, to distribute development opportunities more equitably, and to maintain potential avenues for influence remains a politically urgent task, not just an economic one. Finally, there is also a need to consider how the exercise of the existing state power to shape digital infrastructures can itself be democratized. Too often, state control is equated with democratization. However, this is a simplification, especially since digital infrastructures profoundly configure individual options for action. Creating broader participation opportunities here, as expressed in the ideal of transnational multistakeholder processes in relation to Internet governance, is a developmental direction that seems desirable from a democratic theory perspective but does not yet reflect the real developments. For this to change, greater resource allocation and a stronger commitment by democratic states would be necessary.

Sovereignty as Individual Self-Determination

In addition to the state-related understanding of digital sovereignty, a perspective focused on individuals and societal actors plays a role, especially in the German discourse. Digital sovereignty here means that individuals in digital contexts, which are heavily dependent on the design and providers of technologies, must receive effective protection and options for choice. Precisely because digital infrastructures increasingly shape social coexistence, it is important from a democratic perspective that they are configured in a way that provides opportunities for voice (objection, change) and exit (alternatives). Technical alternatives are conceivable here – for example, in the form of open-source projects or open hardware. However, even these are not completely independent as they rely on access to data networks, which is why usage rights must be secured by law in the long term. Furthermore, legal approaches play a role in norming the form and usability of technical infrastructures, and thus, for example, can be directed towards the ability to collaborate. Finally, the broad dissemination of skills, the strengthening of civil society representation, and the ability to change social structures are important for the exercise of societal autonomy and should be part of a democracy-friendly development of digital infrastructures.

✎ In Conclusion

The short- and medium-term development in the field of digital infrastructures is less shaped by specific technological developments and more by the increasing politicization of the area over the past few years. Digital infrastructures are today considered far more as regulatable entities than in other periods of the internet discourse, when they were attributed with a natural force and development dynamics. From a democratic perspective, this presents an opportunity, as a variety of requirements can be established regarding accessibility and design, ensuring that the shaping power of infrastructures does not undermine democratic self-determination.

On the other hand, the expansion and intensity with which digital infrastructures shape social life are a challenge for democratic processes and governance capacities. Whether it will be possible to reduce the already strong dependencies, for example regarding the private sector or geopolitical conditions, and to counter the high complexity of networked infrastructures with competent governance approaches remains unclear. However, it will be crucial for the democratic assessment how the political power struggle between different political regimes, civil society actors, and transnational digital companies develops.

👁 Further Reading

- Benkler, Yochai 2016: Degrees of Freedom, Dimensions of Power, in: Daedalus 145: 1, 18 – 32. *// Open-access article that explains how the development of internet infrastructures and protocols enables power and control but also creates spaces of freedom, and discusses how privately owned infrastructures can limit public self-determination.*

- Glaze, Georg / Odzuck, Eva / Staples, Ronald (Eds.) 2022: Was heißt digitale Souveränität?: Diskurse, Praktiken und Voraussetzungen »individueller« und »staatlicher Souveränität« im digitalen Zeitalter, Bielefeld. *// German-language, open-access anthology that provides a good overview of the debates on digital sovereignty from various academic disciplines.*

- Pietron, Dominik 2021: Plattform-Kommunalismus. Für eine technopolitische Infrastruk-turoffensive von unten. RLS Standpunkt 4/2021. *// A German-language, concise debate contribution advocating for the development of alternative digital infrastructures in the Smart City sector.*

- Stocker, Volker / Knieps, Guenter / Dietzel, Christoph 2021: The Rise and Evolution of Clouds and Private Networks – Internet Interconnection, Ecosystem Fragmentation, Rochester. *// Open-access research paper that illustrates the privatisation of communication infrastructures, particularly at the material level, and discusses the regulatory challenges.*

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