SoLiXG

Keywords of the Digital Present

XG

In the evolution of cellular networks, experts distinguish several ‘generations‘ of technological standards, ranging from 1G, the first analogue networks formulated in the 1980s, to the advent of 5G. These generations are the result of continuous technological developments and complex standard-setting processes involving the collaboration of various transnational institutions (such as the International Telecommunication Union or the 3rd Generation Partnership Project). They bring together governmental and industrial stakeholders to negotiate technical consensuses for the global operation of mobile communications. The introduction of new generations of mobile telecommunications follows a pattern well established in the development of digital technologies. It promises increasing bandwidth, decreasing latency and novel applications that are set to revolutionise personal and business use of technology.

While labels such as 4G, 5G or 6G attempt to define bundles of technologies and standards, ‘XG’ is an industry term for anticipatory technological iteration that we in SoLiXG extend to capture the process of developing, expanding and maintaining digital infrastructures, always with an eye to the next generation.

As the media scholar Wendy Chun points out, this process is never finished and constantly gestures towards the next update. It is driven by crises such as security risks, environmental imperatives, geopolitical struggles or armed conflicts. [1] We also acknowledge that it is often simply the necessity for profit that drives the constant regeneration of the network, staging hopes and promises of a better future through new imaginaries and buzzwords.

Although the expansion of technological possibilities seems inevitable, the subjects of the infrastructures—be they consumers or customers, users, or producers—are suspended in a state of constant anticipation, waiting to adapt to the latest version. Such a temporal rhythm goes beyond cellular networks. Increasing connectivity and computing power means expanding the material infrastructures that make ‘the Internet’ possible. This includes erecting radio towers and antennas, laying fibre-optic cables across continents and the ocean floor, building data centres, semiconductor fabrication plants or ‘gigafactories’ producing lithium-ion batteries.

1 Chun, Wendy H. K. 2016. Updating to Remain the Same. Habitual New Media. Cambridge, MA: MIT Press, p. 69.

Imagined community

The concept of ‘imagined communities’ is famously taken from Benedict Anderson’s seminal text Imagined Communities: Reflections on the Origin and Spread of Nationalism (1983). At its core is a historical account of the emergence of the “nation” as the paradigmatic form of political self-determination in modernity. According to Anderson, the nation is an imagined horizontal affiliation that is presented as bounded—it has borderlines beyond which other nations lie—and sovereign—it seeks to govern itself. It occupies the space historically created by both the decline of religious communities and their sacred languages and the idea of political rule by divine authority.

Crucially, Anderson emphasises the role of media technologies in the emergence and maintenance of nations. The printing press and its commodities—the novel and the newspaper—allow a shared sense of time and rhythm to develop across geographical distances. When he opens the morning paper, each reader …

„… is well aware that the ceremony he performs is being replicated simultaneously by thousands (or millions) of others of whose existence he is confident, yet of whose identity he has not the slightest notion. […] observing exact replicas of his own paper being consumed [in the] subway, at the hairdresser’s or in the apartment building, [the reader] is constantly reassured that the imagined world is visibly rooted in everyday life.“ [1]

Beyond the conditions of ‘print capitalism’, however, Anderson outlines technologies of state power for the maintenance and management of a nation. The census, which makes it possible to quantify and categorise a population; the map, which defines the borders of the nation and the territory of its sovereignty; and the museum, which forges and fixes a mythological past divorced from the present. [2]

In line with other authors such as Michel Foucault [3] or James C. Scott, [4] he considers how states use technology to govern and manage subjects. Anderson does not offer a general theory of the construction of social groups, but a historical account of the emergence and maintenance of a specific form. His work inspires our investigation in SoLiXG of how political and social affiliations and boundaries are created under specific historical and technological conditions.

1 Anderson, Benedict. 2016. Imagined Communities: Reflections on the Origin and Spread of Nationalism. London: Verso, p. 35–36.
2 Anderson, Benedict. 2016. Imagined Communities: Reflections on the Origin and Spread of Nationalism. London: Verso, p. 163–185.
3 Foucault, Michel. 2008. The Birth of Biopolitics: Lectures at the Collège de France, 1978–79 (M. Senellart, eds.; Paperback ed). London: Palgrave Macmillan.
4 Scott, James C. 1999. Seeing like a State: How Certain Schemes to Improve the Human Condition Have Failed. New Haven, CT: Yale University Press.

Digital Infrastructure

Digital infrastructure connects both physical and virtual technologies to deliver computational processing power, digital file storage and software applications to billions of devices. While the term lacks a precise definition, it is used by policy makers to refer to an infrastructure of infrastructures that includes the Internet, but also mobile telecommunications networks, satellites, sensor networks and cloud computing. Digital infrastructure is sometimes referred to as „computational infrastructure“ because it involves large amounts of computing hardware distributed in strategically located data centres connected by public and private networks. It relies on specific software architectures, such as virtualisation and advanced programming interfaces (APIs), as well as undersea cables, computer chips, mobile devices, internet browsers, 5G masts and lithium batteries.

Operating in diverse geopolitical and financial contexts, digital infrastructure is rapidly evolving, requiring constant updates and consuming increasing amounts of depletable resources such as clean water for cooling, critical metals and electricity. Despite ongoing investment by governments and the EU, most digital infrastructure is now managed by global Big Tech companies such as Amazon, Apple and Microsoft. These companies are owned by shareholders who need to demonstrate growth year after year. Their services are therefore constantly expanding into new areas, increasing the need for more digital services or more computing power. Whether it is moving parcels around the globe, organising against oppression and exploitation, or conducting border politics, digital infrastructure has become almost a condition of existence, with no outside.

(Digital) Sovereignty

In contemporary debates on ‘digital sovereignty’, the term takes on multiple meanings. It can concern questions of state security, of economic prosperity, of cultural values or of personal liberties. Sometimes it refers to the protection of individual rights and sometimes—or at the same time—it advocates the revival of state or regional sovereignty over the uncharted territory of the digital world. [1]

The simplest definition of sovereignty is that it is the exclusive power of an authority within a given territory, represented by the state. Wendy Brown outlines a composite figure of sovereignty along six characteristics: 1. supremacy: nobody supersedes the sovereign. 2. perpetuity: the sovereign is not limited in time. 3. decisionism: the sovereign decides unbound by law. 4. absoluteness and completeness: sovereign power cannot be uncertain or partial. 5. non-transferability: sovereign power cannot be transferred. 6. territoriality: sovereign power is limited to a specific jurisdiction, a territory. [2]

The epochal changes in Europe in the 16th century provided the context for such an understanding of sovereignty. Impacted by religious wars and the conflict between central monarchies and the feudal aristocracy, state theorist and advocate of absolutism Jean Bodin developed perhaps the best-know formulation of sovereignty. [3] Perry Anderson described this era of feudalism as an age of “parcelled sovereignties”. [4] Absolutist regimes concentrated political and military power in the hands of a single governing unit, epitomised by the absolute monarch. However, they never succeeded in completely replacing the feudal structures of rule. It was only through the combined effects of the development of the capitalist mode of production, colonial expansion, bourgeois revolutions, and nation-building that a modern form of sovereign statehood was gradually able to replace the feudal order.

Modern sovereignty is not only associated with the sovereign state, but also with the concept of the popular sovereignty—the sovereignty of the people. State sovereignty, as Étienne Balibar argues, is based on a contradictory balance in which the sovereignty of the people is simultaneously enabled and restricted by the polity. [5] The concept of sovereignty has therefore a dual and conflictual character: It refers at the same time to the protection of individual rights and popular participation from the state, as well as the protection of the freedom of the state from competing power centres and prescribing obedience to its subjects.

Today, ‘digital sovereignty’ is situated within these contradictory developments and is characterised by the same dual and conflicting understanding of sovereignty. The term refers to both a nation-state perspective of sovereignty and an individual and rights perspective. In the context of European integration policy, digital sovereignty functions as an umbrella term encompassing the entire value chain of the digital sphere, from cloud infrastructures, cables, and data centres to the production of minerals and semiconductors, which entails regulations on data surveillance, data extraction, and privacy, as well as strategic geopolitical positioning.

Moreover, ‘sovereignty’ is applied to increasingly diverse fields that are unrelated to its state-centred meanings. Concepts such as ‘body sovereignty’, ‘food sovereignty’ or ‘energy sovereignty’ have become popular terms for individual and collective control and access to essential resources. At the same time, national sovereignty is increasingly understood as being eroded by globalisation and technological change. In our research at SoLiXG, we understand ‘digital sovereignty’ as a heuristic tool within a broader hegemonic project, situated between previous conceptualisations of the digital sphere and governance, such as data sovereignty and cyber sovereignty.

1 Lambach, Daniel/Oppermann, Kai. 2023. Narratives of digital sovereignty in German political discourse. Governance, 36(3).
2 Brown, Wendy. 2010. Walled States, Waning Sovereignty. New York: Zone Books, p. 22.
3 Bodin, Jean. 1576. The Six Books of the Republic.
4 Anderson, Perry. 1996. Passages from Antiquity to Feudalism. London: Verso, p. 148
5 Balibar, Étienne. 2004. We, the People of Europe? Reflections on Transnational Citizenship. Princeton: University Press, p. 134.

Resilience

Resilience is generally understood as the capacity to quickly adapt to or recover from shocks. It was coined in the 19th century after the Latin word resilire (to rebound or recoil) and was meant to describe the trait of certain materials to return to its initial shape after being impacted by exterior forces. Nevertheless, it was only in the latter half of the 20th century that researches in the fields of psychology and ecology developed the word into a scientific concept. In this context it was adapted to describe not only the capability of ‘bouncing back’, but also of ‘bouncing forward’, i.e. to recover and improve at the same time. The ecologist Crawford S. Holling was especially important in developing and popularizing the concept. In an influential article from 1973 he criticized the then hegemonic understanding of ecological systems as governed by equilibrium states and theorized them instead as systems that have to continually adapt to unforeseen disruptions and sudden changes. [1]

As a philosophical position resilience-thinking entails four central pillars: (I): the assumption of an ontology of volatility, i.e. a “random world” [2] that is in constant instability, disrupted by indetectable forces from without and within. This also translates in a conception of social agents as being in a constant state of vulnerability, since actors are permanently exposed to dangers due to abrupt changes in their environment. From this conception, resilience-thinking derives (II): an epistemological defeatism, i.e. a view of disruptions and crises as unpredictable and at the same time inevitable events. David Chandler has described this onto-epistemological commitment as one that sees the world as consisting of “unknown-unknowns” [3] by which causal mechanisms underlying events can only be known post-hoc. From this follows (III): a cataclysmic optimism which makes a virtue out of necessity and frames disruptions, shocks, crises and catastrophes not as negative eventualities one should try to avoid, but as chances to adapt, to learn and to improve. The resilient subject is thus constructed as one characterized by spontaneous adaptive rather than reflexive agency, viewing existential uncertainty as an opportunity rather than a burden. Translated into governance, resilience thinking therefore privileges (IV) micro-strategies of adaption to unforeseeable events, centered on small units like communities over large-scale crisis prevention, that seek to avoid disruptions and try to maintain stability and equilibrium for society as a whole. As a mode of governmentality, resilience was shaped in the early 2000s in reaction to sudden shocks to Western societies such as different crises. The European Union defined it in 2016 as “the ability of states and societies to reform, thus withstanding and recovering from internal and external crisis”. [4] The notion of resilience is a concept of particular interest in the current era of disruptions, which has been termed a ‘polycrisis’. This is due to its function as a guiding concept in times of crisis. Economic, ecological, medical, political and social crises and catastrophes are increasingly seen as a constant feature of society. They are understood to be at the same time more probable and also as inherently unpredictable. While the concept of resilience has historically been associated with neoliberal governance frameworks, recent applications have emerged in the context of geopolitical dynamics, advocating for a state interventionist approach. This shift has placed significant emphasis on issues pertaining to digital technologies and infrastructures, underscoring the integration of technological and social dimensions in contemporary geopolitical analysis. In this spirit, within the more recent policy discourse of the European Union resilience is bound up with other social imaginaries such as digital sovereignty and the twin transition. Some argue these expansions of the concept have reduced it to a buzzword. [5] Nevertheless, the fact that we can identify simultaneities and contradictions in the concept’s definition means that the imaginary is contested and that its significance is still up for debate.

1 Holling, C S. 1973. Resilience and Stability of Ecological Systems. Annual Review of Ecology and Systematics 4(1).
2 Ibid. p. 13.
3 Chandler, David. 2014. Beyond Neoliberalism: Resilience, the new art of governing complexity. In: International Policies, Practices and Discourses 2(1). p. 51
4 European External Action Service. 2016. Shared Vision, Common Action: A Stronger Europe : A Global Strategy for the European Union’s Foreign and Security Policy. LU: Publications Office of the European Union. https://data.europa.eu/doi/10…
5 Joseph, Jonathan/Juncos, Ana E. 2024. Conceptual politics and resilience-at-work in the European Union. In: Review of International Studies, 50(2). p. 385.

Twin Transition

In response to climate change urgencies, governments are combining increased digitisation efforts with plans for a greener future. [1] For example, the EU [2], Switzerland [3], and the UK [4] have issued policy frameworks promoting the ‘twin digital and green transition’ as part of their commitment to Net-Zero. The idea of the twin transition as the road to a new regime of accumulation is especially pronounced in the European Union’s Green New Deal, which stresses the necessity “to leverage the potential of the digital transformation” and raises the prospect of a “sustainable model of inclusive growth” on the basis of a circular economy. [5]

To achieve this goal, various technological fixes for a range of problems within the process of production and social reproduction are put forward. Investments are made in, for example, blockchain technologies and cryptocurrencies because they “could be used in material tracing, promising to aid the circular economy by better maintenance and recycling”. [6] ‘Digital Twins’, virtual models based on large amounts of captured data, “can model, among others, traffic, to optimize traffic flows, reduce jams, and slash emissions in the process”. [7] By adding a digital layer on top of common infrastructures such as mobility, energy, healthcare and education, the twin transition claims to make these infrastructures configurable and easier to monitor. All in all, the role of digital technology in these imaginaries is to ensure the avoidance of waste and an increase in efficiency and transparency, which is associated with an increase in sustainability. What is often left out of such propositions is how the twin transition is itself resource intensive, as it relies heavily on so-called Artificial Intelligence for deciding what is efficient. It increases the need for computation, and therefore additional data centers need to be built, which consume electricity, clean water, arable land, and metals. The reliance on digital technologies for basic public infrastructures might also create issues with privacy and security, and reshape governance structures as dependencies on Big Tech players increase and decision-making processes are informed by algorithms. Furthermore, the promise of green growth within a circular economy on the basis of digital infrastructures rests on the denial of decades of research that has clearly shown that the decoupling of economic growth from environmental devastation is impossible, and at the current conjuncture represents a dangerous illusion. [8] The promise of the twin transition is to offer the prospect of a green reorganisation of society without having to question the capitalist growth imperative in any meaningful way. With the discursive fusion of digital technologies and the ecological shift, the prospect of a circular economy that is efficient, profitable, and sustainable becomes the only reasonable response imaginable to climate change.

1 UNCTAD. 2023. Policy Brief No. 111—Twin Transition for Global Value Chains: Green and Digital.
2 European Commission. 2023. Green Digital Sector: Shaping Europe’s Digital Future. https://digital-strategy.ec.eu…
3 FOEN, Federal Office for the Environment. 2023. Long-Term Climate Strategy to 2050.
4 GOV.UK. 2022. Net Zero Strategy: Build Back Greener. https://www.gov.uk/government/…
5 European Commission. 2019. The European Green Deal. https://eur-lex.europa.eu/reso…
6 European Commission. 2023. Green Digital Sector: Shaping Europe’s Digital Future. https://digital-strategy.ec.eu…
7 ibid.
8 Haberl, Helmut et al. 2020. A Systematic Review of the Evidence on Decoupling of GDP, Resource Use and GHG Emissions, Part I: Bibliometric and Conceptual Mapping. Environmental Research Letters, 15(6).

Further Keywords online:

Crisis, The State, Automation, Stack, Compute, The Cloud, Bordering, The Crowd, Social Life …

→ www.solixg.net

Funded by:
Bundesministerium für Forschung, Technologie und Raumfahrt
FORTE: Swedish Research Council for Health, Working Life and Welfare
FWF Österreichischer Wissenschaftsfonds
CHANSE. Collaboration of Humanities and Social Sciences in Europe

Institut für Europäische Ethnologie
JKU Johannes Kepler University Linz
LINKÖPING UNIVERSITY
The Institute for Technology in The Public Interest
n|w University of Applied Sciences and Arts Northwestern Switzerland
HUMBOLDT-UNIVERSITÄT ZU BERLIN
UNIVERSITY OF PLYMOUTH