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Territorial frictions of digital innovation.

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Chapter for Dratwa, J., Marelli, L., van Hoywehen, I. & Verschraegen, G. (eds.), *Project: Europe. Remaking European futures through the politics of digital innovation*, Edward Elgar, 2024

Introduction

Digital innovation is a domain that plays on imaginaries of fluidity and circulation. These imaginaries tend to ignore the material infrastructures that digital innovation relies on and have consequences if they lead to forget environmental and social costs, and more generally, the numerous political and social controversies related to the production, circulation and use of data (Camus and Vinck, 2019; Lally, Kay and Thatcher, 2019; Leonardi, 2010; Marquet, 2018). These tensions point to potential disconnections between various material and social territorial constructs, be they imagined, realized or experienced, which are associated with digital innovation.

I am interested in this chapter in the questions and debates about the kind of territory that is envisioned when policy-makers and private actors promote digital innovation. I particularly focus on the uncertainties, differences and clashes about conflicting territorial dimensions. Building on Anna Tsing's notion of frictions as "the awkward, unequal, unstable, and creative qualities of interconnection across difference" (Tsing, 2005: 4), I speak of "territorial frictions" to explore the sites where different expectations about territorial formation confront each other. I will show that the analysis of territorial frictions opens up empirical and theoretical pathways to understand some of the wider political implications of digital innovation.

The territorial dimensions that interest me in this chapter articulate material practices and normative constructs. I follow Stuart Elden's suggestion to investigate the understandings and practices of territory rather than building on a fixed definition based on geographical or administrative categories such as borders (Elden, 2013). This

is particularly fitting for digital technologies, which play crucial roles in reconfiguring rather than eliminating territorial dimensions (Hirst, 2005), and which have been the topic of broad science and innovation policy programs with explicit nation-building ambitions (Bowman, 2015; Laurent et al., 2021). Thus, I seek to extend the concept of territory beyond the physical delimitation of a zone controlled by a social group in order to consider that any territorial formation relies on techniques of measurement and control *and* normative considerations about desirable social orders (Jasanoff and Kim, 2015).

I focus on European initiatives to undertake this task. Europe is particularly interesting to explore the connection between digital innovation and territory for two related reasons. First, Europe is an economic and political enterprise for which the territorial dimension has always been problematic and multilayered, associating geopolitical considerations (Rokkan, 1999) as well as technological developments (Misa and Schot, 2005). European integration originating from the institutions and policies of the European Union is very much about territorial formation. Internal boundaries are seen as barriers to lift, while the migration crisis has introduced new urgencies to the control of external ones. Regional policies seek to ensure “cohesion” across the Union by reducing social and economic discrepancies. “Sovereignty”, although more recently explicit, has become a rallying cry for a series of initiatives related to digital innovation. Yet none of the attributions of the territories of nation states can be easily attributed to the European Union. Both “cohesion” and “sovereignty”, as we will see in this chapter, are problematic, and this makes the ontological and normative nature of the European territory fundamentally uncertain.

Second, digital innovation amplifies the debates about the feasible and desirable European territory. European policy documents on the topic, while making pervasive and often ambivalent references to values such as privacy, transparency and openness (see e.g. for health: Marelli et al., 2020), also see data as the “new oil of the digital age”, the basis for the “next industrial revolution”, “gold” and “key asset” for productivity and growth, and resources for “evidence-informed decision making” (Rieder and Simon, 2016: 2). Throughout these documents, the imaginaries of objective knowledge and fluid markets that digital innovation would make possible echo the long-lasting European dreams of harmonization through science and the market that are often articulated with

European objects (Laurent, 2022). Taking inspiration from other cases of frictions related to European objects, I hypothesize that the territorial frictions of digital innovation can be theoretical and empirical entry points to rethink European harmonization, and, more generally, the ways in which the envisioned and desirable political and economic formations that Europe seeks to promote.

This examination is particularly important to undertake as digital innovation is yet another illustration of the risk of disconnection between universal categories such as science and the market and human experiences that are necessarily situated. In turn, and as other manifestations of the modernist project, digital innovation invites us to explore how it is or can be re-entangled with territorially situated social concerns (Jasanoff, 2010; Latour, 2017). Thus, through the European example, we can explore how to re-territorialize technological initiatives, how to rethink the kinds of territory that Europe is and should be, and how to pluralize our understanding of territorialization.

Accordingly, I will consider that European initiatives that connect digital innovation and territories are analytically and politically interesting not because they provide definitive answers but because they are messy, ambivalent and troubled. To do so I develop the analysis from two ethnographic moments, in which I participated and observed people from national and European institutions discussing digital innovation in explicit connections with territorial issues. These two moments were opportunities to discuss “cohesion” and “sovereignty”, two general objectives of the European (digital) policy.

The first of these moments is a conference about Digital Innovation Hubs organized in Warsaw in November 2018. The second one is a one-day meeting at the French ministry of economy in June 2021 about digital innovation and sovereignty, which I attended and during which I spoke about digital innovation in Estonia. The participants in these meetings (myself including) spoke about digital innovation and its roles in Europe, they raised issues related to the spatial and social nature of the European territory and envisioned, in more or less optimistic tone, desirable futures for the European project. As such, these moments are “sites of problematization” of digital innovation and its territorial connections, that is, physical places where public issues are raised and potential solutions explored, and where the work of problematization has consequences related to how things are and should be (Laurent, 2017).

Accordingly, I analyze these two sites of problematization as entry points to explore how the territorial issue of digital innovation is and can be phrased. They will lead me to discuss wider debates about digital innovation and Europe. I want to use these connections to identify antidotes to the too simple imaginaries of digital innovation by putting the territorial issue at the center. For digital innovation as for other domains, the European project may well provide theoretical and practical resources to rethink market and technological dreams, not because it would provide ready-made “solutions”, but because it offers no other choices than to re-problematize these dreams.

Cohesion through competition

In November 2018, I attended an event organized in a historic building that housed the Polish ministry for Entrepreneurship in Warsaw. Sponsored by the European Commission, this event brought together people from across the Union who were involved in the promotion and organization of so-called “Digital Innovation Hubs” (DIHs). Digital Innovation Hubs are “one-stop-shops that help companies to become more competitive with regard to their business/production processes, products or services using digital technologies”¹. They bring together academic institutions, public bodies and private actors with the aim of developing digital technologies and facilitating access to them for the benefit of companies. DIHs have various legal formats, but all of them are local endeavors tied to territorial development initiatives.

At the Warsaw event, academics spoke about shared laboratories that they had set up with the cooperation of local public authorities, and made accessible to private companies for them to test machine-learning tools or digital platforms in order to “increase competitiveness by digitizing industrial processes”². Officials working in local administrative bodies said that they had identified local strengths for producing and using data and had made sure that public and private actors would cooperate to develop them, and representatives of private companies voiced their enthusiasm. Throughout the presentations, DIHs were described as sites for experimenting with digital innovation in a wide range of sectors and projects. They comprised projects as varied as tests of digital platforms for helping SMEs to access information, and machine learning

¹ Frequently Asked Questions, European Digital Innovation Hubs, Version 5.0 – 18 February 2022, European Commission, Directorate-General for Communication Networks, Content and Technology.

² Unless stated otherwise, quotes in this section are excerpts from notes I took when attending the meeting.

experiments bringing together companies and researchers willing to transform industrial practices. In all cases, representatives of DIHs insisted that they sought to elaborate “business cases” and “business plans” for the digital tools and processes they tested.

As she spoke at the end of the first day of the Warsaw conference, Mariya Gabriel, the Bulgarian commissioner who was at the time in charge of Digital Economy and Society explained that “tackling digital divides” across Europe was of course an objective, but not the only one. Hers was “a political project and not a technical one”. She formulated the objective of this project in ambitious terms, as she proposed to “enshrine competitiveness into a broader social project”. She explained that the DIHs were “the concrete vehicles to fulfill this objective”, grounded on the fact that “all the SMEs will be able to digitalize”.

Following a day of presentations replete with references to “competitiveness” in connection with digital innovation, Mariya Gabriel’s speech rehearsed an insistence on competitiveness that had become central in European research and innovation policies. Competitiveness is a governing principle that directly echoes a European version of neoliberalism that sees a crucial role of public bodies in ensuring that spaces of competition extend (Davies, 2016; Laurent, 2022), and which is made explicit in European treaties³. For participants in the discussions about DIHs in Warsaw, competition was not only about individual innovators and institutions competing for public funding or market shares, but also about European regions and cities now expected to act as economic entities competing against each other to attract companies and funding and to develop markets based on their local strengths. In short, the DIH policy marked a territorial objective. It aimed to redefine geographic places as economic entities activated by digital innovation.

This extension of competition to territories is consistent with the evolution of the European regional policy. At the end of the first day of the conference, the European Commission deputy head of unit for “Smart and sustainable growth” at DG Regional Policy spoke about the many connections he saw between Digital Innovation Hubs and the European “cohesion policy”. In the European administrative language, cohesion is an important term that signals an objective of “reducing economic and social inequalities

³ Art. 3 of the Treaty of the European Union refers to the “highly competitive social market economy”

between regions in Europe”⁴. The deputy head insisted that DIHs could get funding from both innovation and R&D policies as well as from structural funds, which are the traditional instruments of the European cohesion policy aimed to reduce economic disparities across European regions. The connection between DIHs and regional policy extend beyond this funding instrument. DIHs are “tools” of the European Commission’s “Smart Specialization” strategy, which is defined as such on its dedicated website:

*Conceived within the reformed Cohesion policy of the European Commission, Smart Specialisation is a place-based approach characterised by the identification of strategic areas for intervention based both on the analysis of the strengths and potential of the economy and on an Entrepreneurial Discovery Process (EDP) with wide stakeholder involvement.*⁵

The presentations of the experience of various DIHS and the many discussions at the Warsaw event were illustrations of this somewhat technocratic language, entirely consistent with a European regional strategy articulating cohesion and competitiveness. Speakers all focused on a “place-based approach”, the “identification of strategic areas”, and “stakeholder involvement” as a way of “discovering” the potential for entrepreneurship. These elements are signs of a transformation of the objectives of the European regional policy and of the notion of cohesion itself, from reducing economic and social disparities across the Union to increasing differences among territories now expected to compete against each other. Thus, smart specialization supposes that territories need to be activated in order to develop economically valuable innovation, and the funding it provides is expected to act as a seed for future growth. As such, the articulation of cohesion and innovation policies requires a form of territorial exploration, including about who and what institution participates in innovation projects⁶.

The inward-looking collaborative processes are complemented by initiatives turned outwards. DIHs are part of a broader program aiming to digitize European companies; they are an element of the “digital Single Market package”, and this is no accident. Their purpose is to transform economic actors by bringing digital technologies to them, and to

⁴ https://ec.europa.eu/health/funding/structural_funds_en

⁵ “What is Smart Specialization”, European Commission website: <http://s3platform.jrc.ec.europa.eu/what-is-smart-specialisation->

⁶ Innovation scholars have described the collaborative dimension of DIHs and the public-private partnerships on which they are based with terms like “co-design” and “co-participation” (Hervas-Olivier et al., 2020).

transform the European economy itself by creating markets for digital technologies. Accordingly, DIHs are expected to produce innovative products and processes that will be able to circulate throughout Europe, thereby ensuring the economic growth of the region in which they originate. Participants in the Warsaw conference insisted on the “bottom-up” process they followed to identify local strengths and local needs *and* also stressed that the technologies developed in each DIH could be sold elsewhere in Europe. The digital characteristic is an important element here, because it makes it possible to envision circulations that would not be possible in the material world. Thus, several participants in the Warsaw meeting stressed the need to “network DIHs” with one another in order to make technological innovation circulate throughout Europe, ensure that each DIH could be accessed from everywhere in Europe, and offer opportunities for companies participating in a local DIH to sell digital products and services everywhere in Europe. Three years after the Warsaw meeting, DG CONNECT of the European Commission launched a 250 million euros call for proposals for “European Digital Innovation Hubs”, which, as Digital Innovation Hubs before them, would provide “access to technical expertise and experimentation as well as the possibility to ‘test before invest’”.⁷ The call aimed to create “a network of EDIH aiming to cover all regions of Europe”.⁸

In Warsaw, many discussions were devoted to the “replication” and “scaling-up” of the digital technologies that were experimented with in DIHs. The persistent reference to the network of DIHs was repeatedly used to discuss what could help local Hubs extend their projects throughout Europe. For scalability appeared both as a desired quality of digital innovation projects situated in local Hubs and a problematic one. The tone of the conversation in Warsaw was very positive, if not enthusiastic about the promises of digital innovation. But there was an unmistakable underlying current of anxiety among the participants. They were all waiting to push their projects “to the next level”, namely the European one, and faced difficulties to do so. In presentations, and more often in informal conversations during coffee breaks, they spoke about the tension between their “solutions tailored to local needs” and their possible adaptations to “the whole of

⁷ Digital Europe’s multiannual work programme – European Digital Innovation Hubs for 2021-2023: p.7

⁸ Digital Europe Programme Call for proposals, European Digital Innovation Hubs, DIGITAL-2021-EDIH-01, version 1.0, 17 November 2021: 6. The call was open “only to entities or consortia whose coordinators have been designated by Member States through an open and competitive process”. It contains a table listing member states each associated with an expected number of EDIH.

Europe". Several participants mentioned SMEs or local public bodies that were reluctant to engage in collaborative projects that would not directly benefit them but were developed for the sake of future European-wide markets. For these anxious promoters of digital innovation, networking DIHs could provide ways of solving these tensions by bringing together the most active players in the field of digital innovation who were still scattered across Europe with few connections other than the fact that they participated in the same European policy program.

Writing in 2001, Andrew Barry already identified the connection between digital innovation (which at the time was called "information technology") and the network as a political, social and technological project. Barry argued that the reference to the network in European circles brought together the material and virtual networks of information technologies and a mode of organizing spatial connections that cut across national boundaries. Within the European institutions, the network was seen as "the perfect material infrastructure for a European society of consumers and citizens, increasing the density of flow of information and services" (Barry, 2001: 91). Twenty years later, the network format is still present, and has acquired additional dimensions. It is now attached to regions, cities, areas expected to be activated by innovation, engaged in a self-exploratory work meant to reveal their specific economic strength, connected through the circulation of digital products and services, and functioning as elements of a regional policy that is as much about cohesion as it is about competition.

Networked territories function on existing and promised circulations. They articulate local explorations and expectations of future extensions beyond experimental sites. In doing so, they are sources of territorial frictions. The first one is geographic and social. It opposes the "local" and the "networked". In Warsaw, the anxiety about the possibility to scale-up DIHs and the potential reluctance of local actors to engage in them raised questions such as: What elements of the local are expected to circulate beyond experimental sites? What is excluded in the process? Anna Tsing has discussed the risk of leaving the diversity of the local behind in scalability-based projects (Tsing, 2012) and contemporary innovation practices based on the promise of exponential amplification have broader consequences as they turn local explorations into scalable experiments (Pfothenhauer et al., 2022). In all these processes, territorial frictions occur between visions of the local as a laboratory for the sake of future extensions on the one hand, and,

on the other hand, situated explorations of what could benefit a city or a region according to its specific material properties, social concerns and priorities.

The second source of territorial friction relates to the consequences of cohesion through competition, and to the type of European space deemed desirable. Cohesion policy originally envisioned the European geographical space as a background unto which economic agents could compete against each other, and where social and economic characteristics had to be harmonized to eliminate trade barriers. When connected to innovation policy, cohesion policy extends the dynamics of competition to the European geographical space. No longer a background where differences need to be ironed out, the European space now thrives on differences across various territories. Is it then possible to define collective orientation, either at the level of technological choice, or by formulating something like a common will across Europe? The European DIH policy favors certain technological domains, such as Artificial Intelligence and agriculture, by requesting at least one European DIH for each.⁹ But how the objective of competition that is associated with networked territories can translate in shared perspectives – other than competition itself – remains uncertain. Neil Fligstein has described the fracture that divides those able to benefit the European project and its mobility opportunities and those who are excluded from the circulations of people, goods and capital (Fligstein, 2008). Using digital innovation to turn local territories into economic entities competing against each other might well produce new sources of territorial inequality across Europe.

Sovereignty with or without territory

Andrew Barry points to a displacement introduced by networks: “by cutting across national boundaries, networks formed new entities which could not be encompassed by the territory of one nation-state. Thus, the network model could displace the territorial model of sovereignty” (Barry, 2001: 91). These words apply well to the networked territories of digital innovation in Europe, and suggest that it reformulates sovereignty alongside cohesion, by associating both with competition. Yet what the 2018 meeting in Warsaw about Digital Innovation Hubs made explicit is not the only way to articulate

⁹ Frequently Asked Questions, European Digital Innovation Hubs, Version 5.0 – 18 February 2022, European Commission, Directorate-General for Communication Networks, Content and Technology.

digital innovation and territorial formation. I now turn to another empirical site where sovereignty was explicitly discussed in terms that made visible, as we shall see, other sources of territorial frictions of digital innovation.

In June 2021, I participated in a one-day public meeting at the French ministry of finance in Paris. Organized by a think tank focusing on digital innovation and which partners with both national and international public bodies, the event focused on “digital sovereignty”. It brought together French and European civil servants, representatives of large companies such as Orange and CapGemini, start-ups and researchers. In Warsaw, the tone of the discussions was very optimistic about the promises of digital innovation. Even as they were uncertain about the possible extension of locally developed technologies and were still waiting for the promise of Digital Innovation Hubs to translate in visible and durable achievements, the participants all concurred in seeing digital technologies as engines for both local prosperity and European integration. Three years later in Paris, the tone was entirely different. The Covid-19 pandemic was still active, and other geopolitical threats had put issues such as the access to raw materials and the resilience of supply chains at the forefront of discussions about digital innovation. In Warsaw, the territorial aspect of digital innovation was reserved to the exploration of local strengths and resources and the activation of local territories then expected to network with each other. In Paris, it seemed that the very existence of digital infrastructures was under threat, and had to be protected by extending national and European control. In a speech that concluded the meeting, Thierry Breton, the French Commissioner for Internal Market, insisted on “being able to take our fate in our hands” by “controlling supply chains”.¹⁰

Throughout the meeting, participants seemed to return to the “territorial model of sovereignty” that Barry saw displaced by the network model. They did so by connecting technological, economic and political elements in defining sovereignty, when they spoke for instance about the difficulty to craft new technological solutions independently from the major (often American) tech companies, and explore ways to relocate data and the infrastructures on which they rely on the European soil. During this event, which had been opened by the French junior minister for Digital Transition, the French experience was abundantly discussed. France had been the first European country to launch a

¹⁰ Unless stated otherwise, quotes in this section are excerpts from notes I took when attending the meeting.

“sovereign cloud” project, which was supposed to associate public and private actors in developing new nationally based digital infrastructures comprising data centers, standards and processes. The project had faltered for reasons that comprised the difficult relations between public bodies and the major French companies that would have been associated with the project (Bomont and Cattaruzza, 2020). This failure was still debated at the June 2021 event, and opened up a range of questions in presentations and discussions among participants. Could a public cloud be replaced by a certification system that would label technological solutions deemed appropriate for sovereignty reasons? The French government had just introduced a “trust cloud” (*cloud de confiance*) label, but the implications were still uncertain. What could be mandated by the state and what should be left to private actors? How to control supply chains? In conversations during presentations and breaks, people explored possible answers to these questions, by arguing for more or less significant interventions of the state, and by linking the control of data with that of the raw materials digital technologies require. These conversations brought together the material and legal dimensions of sovereignty, as well as its normative ones about the desirable role of the state. Sovereignty, in these discussions, was tied to a potential “digital territory”, understood as a “nationalized information infrastructure in a double sense: nationalized as in materially under state control and nationalized as in invested with normative ideas about nation and citizenship” (Möllers, 2021: 116). This definition of digital territory connects it with the nation-state. In the discussions in Paris, the territorial frictions of digital innovation indeed articulated the materiality of infrastructure with the appropriate state interventions and eventually with the nature of the state itself.

Yet all participants in the Paris meeting were also keen on saying that any digital sovereignty would have to be European. In 2020, the German EU Presidency had called for a “European sovereign cloud” and endorsed a project called Gaia-X to do so (Autolitano and Pawlowska, 2021: 5). One year later, Francesco Bonfiglio, the CEO of Gaia-X, participated in the Paris meeting from his Brussels office. He was enthusiastic about the project, which he described as a “federated and secure data infrastructure”. He talked about “producing the next generation of cloud infrastructure, of data spaces that are the basis of the digital economy that is open, federated, transparent, trusted and sovereign”, and saw Gaia-X as “something new that will produce an opportunity,

competitiveness, and therefore the opportunity also for the European market to regain sovereignty”.

That “competiveness” was mentioned in the previous quote and that it was the European *market* that was expected to “regain sovereignty” were not incidental formulations. These words point to a version of sovereignty that is addressed to an economic agent (whether an individual or a company) owning data and eager to control them. Thus, the technical description of Gaia-X defines “data sovereignty” as “the execution of full control and governance by a Data Owner over data location and usage”.¹¹ In Paris, the CEO of Gaia-X echoed those words when he explained that “sovereignty means moving from an era where you give up your data to be controlled by someone else to a new era in which you get control over your data”. This approach is significantly different from what the proponents of digital territories had in mind when they discussed the French “sovereign cloud”, namely public interventions associated with an objective of economic and political control by the state. In Gaia-X, sovereignty addresses the rights of economic agents eager to use their own data or those of others¹² and the project is integrated within a broader objective of market making. Its technical specification document states that

*GAIA-X is aligned with the European Data Strategy, which aims to create a genuine single market for data, and is open to data from across the world. Data may encompass personal, as well as non-personal data, including sensitive business data. The intention is to provide businesses an easy, safe and secure way to an almost infinite amount of high-quality industrial data.*¹³

Thus, when he talked about Gaia-X, Bonfiglio introduced a displacement in the discussions about digital sovereignty. Whereas those who discussed the French sovereign cloud made an explicit connection between sovereignty and the physicality of the national territory, the CEO of Gaia-X saw no other territory than the virtual “single market for data” that rely on many of the “values” he repeatedly mentioned, such as “trust”, “openness” and “transparency”.

¹¹ *Gaia-X technical infrastructure*, June 2020: p.3

¹² This understanding of sovereignty is close to what Couture and Toupin label “personal digital sovereignty” in an analysis of the various uses of the term (Couture and Toupin, 2019), although here “personal” refers to an individual economic agent who can be a human being or a company.

¹³ *Gaia-X technical infrastructure*, June 2020: p.3

After his enthusiastic presentation of Gaia-X, the journalist who moderated the meeting asked Bonfiglio about the involvement of tech giants such as Microsoft in the project. This was not an innocent question. Critics had written that Gaia-X could be a Trojan horse for American tech companies, and about the fact that the board of Gaia-X comprised not only executives from large European companies such as Orange and Deutsche Telekom but also professional associations that represented the interests of such companies as Amazon, Google and Microsoft. In October 2021, a critical article in the press quoted the CEO of a French cloud provider saying that “all board member companies are either a client or a major partner of U.S. cloud giants”, and listed the many European initiatives parallel to Gaia-X that sought to answer these shortcomings.¹⁴

Bonfiglio’s answer was clear. He “disagreed that Gaia-x wouldn’t be sovereign”, and his position was grounded on the type of technologies and markets he envisioned. He considered that all companies, including the American tech giants, understood that Gaia-X was building “something that is orthogonal, completely different from has been built today” since it connected various data infrastructures. That the CEO of Gaia-X did not accept the often-heard criticisms of the project is not surprising when considering that his understanding of sovereignty differs from the one grounded on national territory. It is based on a market territory that empowers economic agents.

Thus, the meeting in Paris revealed long-lasting tensions about the connections between digital sovereignty and territory. It made visible a fracture between would-be national digital territories and an envisioned European sovereignty tied with the extension of the Single Market to digital products and services. None of the terms of this alternative is without ambiguity, and each reveals deep uncertainties about the nature of the territory at stake. As the failure of the French sovereign cloud shows, what the role of the state should be and the extent of its control on material infrastructures and private companies is far from clear. In other words, the practical manifestations of the territorial dimension of the national digital territory and their normative implications are still sensitive and unresolved issues. The European half of the alternative reveals another territorial friction, typical of the European project. There are policy documents in which

¹⁴ “Inside Gaia-X: how chaos and infighting are killing Europe’s grand cloud project”, *Politico.eu*, October 26, 2021. The other initiatives listed in this article comprise a funding scheme for cloud services and a new organization called Euclidia that gathers European companies in the cloud technology sector.

European public bodies announce that they seek to minimize technological dependency on cloud infrastructure and services¹⁵, and Gaia-X's future is uncertain as it faces almost constant criticism because of its technical and organizational complexity. Here again, the territorial dimension of digital sovereignty appears as a crucial and unresolved issue, whether the European space is the virtual one of the "single market for data" or possibly the outcome of networked local territories activated by digital innovation.

I had been invited to speak during the event in Paris about Estonia, following up on previous works I had done with the organizers of the meeting. Estonia was presented in the program as a "pioneer in digital sovereignty", which would illustrate a "European initiative" and provide lessons for others to follow. This case fits well with stories of national digital territories, such as those France and Germany (the two countries that pushed for Gaia-X) have been trying to emulate. Estonia is also a nod in the European network of activated territories as other Eastern European places that I had heard about in Warsaw. We will see that Estonia adds yet another layer to our exploration of the territorial dimensions of digital innovation, and epitomizes many of the territorial frictions we encountered so far.

Looking for a digital territory

Self-described as "e-Estonia", the country has developed its own digital infrastructure with a data exchange layer called X-road, which has become crucial in the development of digital services within the Estonian public administration. Regularly dubbed "the busiest highway of e-Estonia" and meant to "modernize Estonia's national databases" (Kalja, 2002), X-road makes it possible to extract and use various data coming from diverse public databases. I had met Martin Männil, the CIO of the City of Tallinn two years before the Paris event. He had told me that he saw X-road as a central component of the digitalization of public services, since most of these services needed to use government data, often coming from different registers that need to be access in real-time. For Männil, X-road served a crucial function since its technical specifications, including authentication and encryption systems, ensured a high level of security. Männil explained to me that it was complemented by a sophisticated ID system, through which each citizen is unambiguously identified and can use a digital signature.

¹⁵ European Commission, *A European Strategy for Data*: p. 9; quoted in Autolitano and Pawlowska, 2021

X-road and digital IDs are integrated in wider political projects meant to regroup the Estonian society toward shared goals. Successive presidents of Estonia have referred to a “new social contract” to describe the digital relationships between citizen and the state that Estonia has been experimenting with.¹⁶ They have used the expression to describe how the government is expected to “serve” each of its individual citizens according to their needs, as well as foreigners living outside of Estonia and participating in a program called “e-Residency” that offers access to government services beyond the geographic boundaries of the state.¹⁷ The terms “social contract” refer more to political philosophy than information technology, and this is no accident. They point to the fact that the digital infrastructures of Estonia combine technical specifications and a vision of the country meant to be shared across the Estonian polity.

As I spoke in Paris, I described the Estonian version of the digital territory associating a material infrastructure connected to a nation-building project. I also insisted on its European inscription. One of the four priorities of the 2017 Estonian presidency was “a digital Europe and the free movement of data”.¹⁸ Estonian members of the European Parliament saw Estonia’s role as promoting digital innovation in Europe and spoke about Estonia’s “duty to solve as many questions involving digital technology as possible”.¹⁹ In turn, Estonia has benefited from structural funds in developing digital services, and has taken part in the Digital Innovation Hub initiative²⁰. The country is a nod in the European networked territory of digital innovation that functions as a provider of digital services and a contributor to the Digital Single Market.

The inclusion of Estonia at the Paris event was itself a sign of the success of the country’s digital policy, which is directed as much towards external actors as its own citizens. “We have built a digital society and we can show you how” is the first thing the visitor of the

¹⁶ Toomas Hendrik Ilves, president from 2008 to 2016, used these words (quoted in Keen, 2018) as did president Kersti Kaljulaid in public interventions (see: “Kaljulaid in Paris: social contract between state, citizens needs new ideas”, July 2, 2018 <https://news.err.ee/843677/kaljulaid-in-paris-social-contract-between-state-citizen-needs-new-ideas> last accessed May 10, 2022)

¹⁷ The initial development plan proposed having 10,000 e-residents by 2020. The program included 62,000 participants in 2019 (see: “E-residency creator: It is Estonia’s soft power”, interview by Agaate Antson, Nov 25, 2019, *Estonian News*, <https://news.postimees.ee/6834270/e-residency-creator-it-is-estonia-s-soft-power>)

¹⁸ “Estonia’s focus on delivering concrete results for European citizens”, *E-Estonia.com*, September 13, 2017, <https://e-estonia.com/estonias-focus-is-on-delivering-concrete-results-for-european-citizens/> last accessed May 4, 2022

¹⁹ quoted in Papp-Váry, 2018

²⁰ Artificial Intelligence and Robotics Estonia (AIRE) is the Estonian candidate to the network of European Digital Innovation Hubs (see aire-edih.eu, last accessed May 6, 2022).

e-Estonia website sees, and the first thing I displayed when I presented the case²¹. It is easy to find illustrations of Estonia's public demonstration of its digital nature. Estonian President Kersti Kaljulaid wrote in 2019 that "Estonia is running its country like a tech company"²², and one of the "core messages" of the *brand Estonia* website is that "Estonia is the first country to function as a digital service"²³. E-residency is itself a brand, "the most influential positive branding campaign for Estonia" according to its creator Taavi Kotka, whom Wikipedia described as an "IT visionary" and who has been central in the development and promotion of e-Estonia²⁴.

Participants in the Paris meeting were prompt to identify the marketing dimension of E-Estonia and were gently ironic about this all too visible effort at self-promotion. This self-branding aspect has been described in academic papers. For instance, political scientist Wolfgang Drechsler contrasts the "fairy tale" of e-Estonia being the perfect role model where everything, society included, is digitalized, with what he calls the "β version", which designates the actual digital projects happening in Estonia. In practice, these projects, whether tests of self-driving cars or e-government initiatives, are tentative and incomplete attempts at associating physical and digital services, and their replication outside of Estonia is largely uncertain (Drechsler, 2018). The discrepancy between the "fairy tale" of a model ready for replication and actual experimental practices echoes one of the territorial frictions we encountered about Europe's networked territories of digital innovation. This friction originates from the tension between the adaptation to local specificities and the promises of replication and scalability, as if what has been carefully crafted according to local needs and specificities could be easily extracted from its site of production to be reproduced elsewhere. Branding e-Estonia is a way of harnessing the tension between local exploration and global circulation by maintaining both the promise and the ambiguity of scalability. It is a way of obscuring the territorial friction that originates from the quandary about whether the local is a bounded laboratory useful for testing technologies before external extension or a source of multiple experiences tied to situated specificities. By contrast, speaking of the β version offers a way to understand the Estonian experiment not as a

²¹ <https://e-estonia.com/> last accessed May 4, 2022.

²² Kaljulaid, Kersti, "Estonia is running its country like a tech company" - Quartz 19 February 2019 <https://qz.com/1535549/living-on-the-blockchain-is-a-game-changer-for-estonian-citizens>

²³ <https://brand.estonia.ee/story/core-messages/>

²⁴ Quoted in Blue, 2021.

well-packaged model ready for circulation elsewhere, but as an illustration of a joint problematization of digital innovation and the nation-state promoting it, which is still tentative and open for potential redefinitions.

When Thierry Breton, the French Commissioner for Internal Market, concluded the meeting in Paris he reminded his audience that “they may know what sovereignty is in France, but it might be different elsewhere in Europe”. He then mentioned a recent trip to Lithuania, where, he claimed, “the take on sovereignty is quite different, after 70 years under Soviet rule”. The allusion became even more powerful when Russia invaded Ukraine a few months after the event in Paris. At the time, it directly echoed the Estonian example, which also illustrates a much more traditional understanding of territory and the threats it faces in close articulation with digital innovation.

Thus, the public display of the Estonia brand by state and private actors (and by researchers such as myself, as I presented the case in Paris) has another territorial dimension, which adds another layer to our understanding of territorial frictions. This additional layer is visible when considering that Estonia’s insistence on self-branding is not just an amusing, if not annoying tendency to tout technological achievements that are perhaps more public discourse than material realizations, and to perpetuate a somewhat naïve trust in digital technologies to transform society for the better. The promotion of the Estonian brand is also connected to security issues in explicit ways. Consider how an official in the Estonian government speaks of the e-residency program, which provides access to public services outside of the country:

E-residency has been noticed in diplomatic or cultural circles. It has caused excitement, made Estonia look better. While decisions of whether to station NATO troops here are likely not made based on e-residency, it supports things like that indirectly. The soft power side of it has exceeded our expectations. Estonia’s e-residents make up a community interested in Estonia, our circle of friends in the world. This should be knowingly empowered and managed to have them spread faith in Estonia so to speak.²⁵

This points to a version of sovereignty that is neither Gaia-X’s market-based data sovereignty, nor that of a country eager to control what foreign companies do with

²⁵ “E-residency creator: It is Estonia’s soft power”, interview of Siim Sikkut, Deputy Chancellor of the Ministry of Economic Affairs and Communications (Nov 2019) by Agaate Antson, Nov 25, 2019, *Estonian News*, <https://news.postimees.ee/6834270/e-residency-creator-it-is-estonia-s-soft-power>, see also Blue, 2021

national data. When the Estonian official quoted above spoke about the value of branding e-residency for the sake of “a circle of friends”, he saw the initiative in connection with a clear objective, namely contributing to the fact that NATO troops stationed in the country. The economic value of the Estonian brand joins a political one, and the economic understandings of European cohesion and digital sovereignty acquires a geopolitical dimension in considering the country’s territory as a physical area, possibly under military threat and against which the risk of invasion looms.

The connection between the Estonian brand and the security of the country’s territory runs throughout the digitization project of the country. When I visited Tallinn’s Museum of Occupations and Freedoms, I was struck to see that e-Estonia was the topic of the final panel of an interactive timeline narrating the history of Estonia from the successive occupations by Nazi Germany and the USSR to the restoration of the country’s independence, as if it were the culmination of the history of a country finally recovering from the struggles of the 20th century. Here was yet another illustration of the close connection between the promises of information technologies and the reference to the identity of a country that existed before the Soviet period, re-gained its independence in 1991 and is still under threat because it chose Europe over its powerful Russian neighbor (Heller, 2017; Kaljund, 2018).

This connection manifests itself when the issue of the protection of the virtual and physical territory of the country is raised. This issue has been pressing since the cyber-attack that followed a decision the Estonian government made in 2007 to move a Soviet-era statue from the center of Tallinn to the outskirts of the city. At the time, automated online requests and spams coming from Russian IP addresses were massively sent to websites of government bodies, banks and media outlets, which temporarily slowed and in some cases stopped online services. Widely described in the press and regularly referred to in Estonian government circles, the cyber-attack has functioned as a public demonstration of the importance of security and the stability of the country’s digital infrastructure²⁶.

There is here another problematization of territory and digital innovation, connected to the crucial need to protect material and virtual infrastructures, and the physical territory itself from armed threats. In a paper he co-wrote, promoter of e-Estonia Taavi

²⁶ See for instance McGuinness, Daniel, “How a cyberattack transformed Estonia”, BBC News, April 27, 2017.

Kotka spoke of “digital continuity”. The expression echoed “territorial continuity”, and Kotka and his co-author presented it as such:

“Digital continuity requires more than just the preservation of critical data sets and IT solutions on Estonian territory; a solution must also be found for a situation in which the Estonian state does not have control over the datacenters located within its own territory. The need may also arise for operating some services outside the borders of Estonia. The challenge here is to develop a solution whereby the Estonian state would endure even despite an occupation of its territory.” (Kotka and Liiv, 2015: 152)

As an answer to the problem of digital continuity, Estonia introduced in 2017 the concept of a “data embassy”, formalized in an agreement the country signed with Luxemburg. The agreement stipulates that the data embassy is “a dedicated data centre space provided by the Grand Duchy of Luxembourg and meant for the purpose of hosting Estonian data and information systems and equipment”²⁷, which has similar legal status than a diplomatic mission (Sierzputowski, 2019). Despite what Kotka’s words above suggest, the technical specifications of the data embassy make it difficult to use it for ensuring the continuation of the day-to-day functioning of the state in situation of armed conflict (Kaljund, 2018). The data embassy is better understood as a secured copy of the state’s data and information systems, so that the state can be “re-booted” once it recovers its territory, just as it was restored in 1991 after the Soviet period. Like a government in exile hosted in an allied and safe country, the data embassy is a way of ensuring that the state still exists even if it has lost its physical territory. Yet what matters for the data embassy is less the human representation of a polity than its digital one. It is a way of situating in a safe place a material repository of the virtual descriptions of what makes the state what it is.

Anthropologist Lorraine Kaljund has shown that the data embassy project is a magnifying lens on the ongoing debates about the nature of the Estonian state (Kaljund, 2018). Can the state be fixed in time, described through data, extracted from its own geographic territory to be safely restored in the future? Or is it an entity changing other time, including because of the demographic changes throughout the 20th century that have seen a Russian-speaking population settle in the country? The data embassy

²⁷ Article 1(b) of the 2017 ‘Agreement on the hosting of data and information systems’, quoted in Sierzputowski, 2019.

chooses the first half of this alternative by providing a technological fix to a military threat. Yet rather than solving once and for all this joint geopolitical and national quandary, the data embassy reveals an ongoing territorial friction about the very nature of the Estonian national polity.

Multiplying territorial frictions

Digital innovation conveys dreams of de-territorialization that are explicit in Europe's visions of the "single market for data", and are manifest in initiatives such as Gaia-X, which frame sovereignty in market terms. Faced with military threats, Estonia also mobilizes a dream of de-territorialization and re-territorization. The data embassy is imagined as a technological fix that could "save" the core identity of the state by extracting it from its geographic and historic position. Yet each of these dreams faces frictions that are as much about practical realizations as about the kind of imagined territories, or, in other words, territorial frictions.

In the two sites of problematization of digital innovation we encountered in this chapter, in Warsaw about Digital Innovation Hubs and in Paris about digital sovereignty, policy-makers, representatives of companies and researchers discussed the ontological and normative nature of various territories. These territories comprised the cities and regions aimed to be activated through a cohesion policy rephrased in the vocabulary of competition, nation states eager to control data infrastructures and possibly reinvent themselves by engaging in broad digitization projects, and Europe itself, whether imagined as a network of activated geographic places, tied to extended markets of data or understood as a desirable political and economic union. Throughout these discussions one can identify sources of frictions that are not just about the materiality of digital infrastructures (although that is of course part of the pictures) but also about the ontological and normative nature of the territories at stake.

I described territorial frictions that emerge from two broad objectives. The first one, cohesion, is a principle of the European regional policy. Rather than a counterpoint to competition, cohesion has extended this chief principle of the European project to local territories. The transformation of cohesion by the extension of competition to local territories forces local and European actors to interrogate the conditions under which the European space can be economically and socially consistent. What about the places

that are left behind? Who benefits from local experiments that are expected to provide scalable outcomes bound to travel beyond testing sites? Sovereignty is a second principle that has been more and more associated with digital innovation. We saw that competing understandings of sovereignty are associated with digital innovation, from the control of supply chains by Member States to the extension of choice and control for the benefit of individual economic agents. This plurality raises a number of issues about the role and the very nature of both the nation-state and the European virtual and physical territory. Thus, the case of Estonia shows that Europe is not only the envisioned outcome of the extension of markets through competition, but also a geopolitical zone that comprises relatively safer territories where data embassies can be hosted.

The examples discussed in this chapter do not cover the entire spectrum of European initiatives about digital innovation. Yet they do show that Europe provides a perfect illustration of the importance of the territorial element of digital innovation. In contrast with pervasive de-territorialization dreams, it invites us to explore the spatial and normative constructs that digital innovation is or can be associated with. One can then read the territorial frictions we encounter in two opposite ways. The first one would insist on a dual failure, that of getting rid of dreams of de-territorialization that keep ignoring the territorial dimension of digital innovation and risk leaving social concerns aside *and* failing to territorialize in ways that can satisfactorily define what territories such as regions, nation states or Europe are. The second reading recognizes the messy situation that emerges from the multiplication of territorial frictions, and the pervasive issues that accompany such general principles as cohesion and sovereignty. But it sees this situation not as a hopeless outcome of the impossibility to imagine and realize shared digital territories, but as an invitation to pursue the exploration of what these territories might be. It is at this point this second reading is empirically more subtle (since it can identify and explore the flurry of attempts to re-territorialize digital innovation) and politically more relevant. Rather than closing down what the territories of digital innovation should be, it opens up the range of its manifestations. A fruitful avenue for critique then consists in multiplying the sources of friction, and considering them as entry points to possibly make digital innovation closer to people's concerns.

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