1. Introduction

In the contemporary moment, the Internet seems to have gained a central political, social, and economic position. According to media sociologist Vincent Mosco, we are living in a time in which the Internet is the last technological and electronic sublime.[1] In this book, I want to stay away from such a glorified view of the Internet and rather explore it from the perspective of an embedded case study, specifically that of post-socialist Lithuania. It is of interest because both it and other Baltic countries are deemed highly advanced in terms of information and communication technology development. Lithuania's case is intriguing: it has enjoyed well-developed Internet services since the fall of the Soviet Union, although there is a paucity of research on the case of its Internet development. In this book, I want to both contribute to this research and complicate general and affirmative stories of the advanced sublime Internet in Lithuania by making it graspable. In order to do so, I situate the Internet through multi-sited fieldwork.[2] From a fieldwork perspective, I focus on places and key stakeholders that developed and continue to maintain physical Internet infrastructure. I explore it through a focus on what is commonly understood as infrastructure providers—telecom industry—but within a context in which the meaning of infrastructure is not given and thus emerges from theoretically informed empirical work. In this book I thus situate the Internet as infrastructure through everyday labor practices, or infrastructuring; geopolitical imaginaries, or often occurring fieldwork-based stories, beliefs, and perceptions about geographically distinct telecom industry actors and their roles in Lithuanian Internet development; and critical negotiations, or particular justifications and future visions, which emerge during crucial events of industry change. These three lenses for analyzing the Internet as infrastructure were formed and honed during my 2017–2018 fieldwork in

1 Vincent Mosco, *The Digital Sublime* (Cambridge, MA: The MIT Press, 2004), p. 24. This can be debated in the context of AI imaginaries, although these are too based upon data exchange and networking technologies.

2 With the perspective and practice of multi-sited fieldwork, I lean on George E. Marcus (George E. Marcus, "Ethnography in/of the World System: The Emergence of Multi-Sited Ethnography," *Annual Review of Anthropology* 24, no. 1 (1995): pp. 95–117) and describe multi-sited fieldwork in the sense that its objects emerge over the course of time, in a field differentiated between multiple local sites.

Lithuania. This infrastructural analysis of the Internet leans on infrastructure studies with perspectives from science and technology studies (STS), organizational theory, ethnographically-inspired digital media research, and Eastern European studies in order to explore post-socialist Lithuania's Internet as a situated media technology and thereby provide a fieldwork-based theorization of the Internet as infrastructure in particular, and infrastructures in general. I use fieldwork as my main research method because its embedded, observational, and open-ended nature is able to emerge over time and thus provide new insights into infrastructure-focused study. It thus allows me to go beyond a totalizing affirmation of the Internet infrastructure as universal as well as beyond its development as a national achievement. This book comprises a place-based, bottom-up focused fieldwork exploration of a complex of actors, who work alongside things, places, practices, imaginaries, and negotiations to develop and maintain the Internet as infrastructure in Lithuania.

I ask: how does the Internet as infrastructure take place in post-socialist Lithuania? Also, how can we use the case of Lithuania's Internet to understand and theorize infrastructures as situated?

I want to produce a different exploration and critique of the Internet than the one that writer Ingrid Burrington describes in her book on New York's Internet infrastructure: a "poorly rendered collages of computers and a globe floating in some ethereal mist that could be data traveling across the network—or could be fairies, no one really knows."[3] In this book, I first aim to shift focus from Internet infrastructure as a stable, universal, ungraspable media technology toward its exploration as a situated process of grounded development and maintenance. I also aim to do so in a place that has not yet aroused interest in infrastructure studies, organizational theory, nor ethnographically-inspired digital media research. Additionally, through this particular exploration of Lithuania's Internet infrastructure, I aim to further the theorization of infrastructures through embedded empirical research.

I use my research to make theoretical and empirical arguments. First, I argue for the simultaneous inclusion of the three conceptual lenses that emerged from my fieldwork—everyday infrastructuring, geopolitical imaginaries, and critical negotiations—in researching the Internet as infrastructure through fieldwork.[4] Secondly, I illustrate how the Internet as infrastructure in Lithuania is specific when examined through these three lenses. I show how the Internet as infrastructure in Lithuania comprises complex everyday labor practices and their situated contingencies, strange geopolitical imaginaries and diverse critical negotiations.[5] I aim for this research to contribute to infrastructure studies by combining perspectives from STS (with the perspective of infrastructuring practices); organizational theory (by exploring how

3 Ingrid Burrington, *Networks of New York: An Illustrated Field Guide to Urban Internet Infrastructure* (Brooklyn, NY: Melville House, 2016), p. 11.

4 I outline these perspectives briefly in empirical chapter description below and in depth in chapter "Internet as Infrastructure: Conceptual Openings."

5 Relying on Zygmunt Bauman, strange geopolitics here connotes ambiguous, indeterminate, and not fitting into a strict realist geopolitical narrative (Zygmunt Bauman, "Modernity and Ambivalence," *Theory, Culture & Society* 7, no. 2–3 (1990), pp. 143–69).

the Internet as infrastructure is developed from "more than representational,"[6] "subverting-and-remaking the method,"[7] and other perspectives that are critical toward idea of objective representation); ethnographically-inspired digital media research (by situating the Internet as infrastructure through fieldwork); and Eastern European studies (with a focus on post-socialist Lithuania and its telecom industry).

I begin this book with a brief narrative from an interview with Lithuanian cybernetician Laimutis Telksnys regarding the first Internet connection in Lithuania. It is important to start with his story because it outlines why it makes sense to explore the infrastructural perspective of the Internet as a complex result of labor practices, geopolitical imaginaries, and critical negotiations, but also because his story is widely represented in Lithuanian media and belongs to the mainstream local imagination regarding the Internet's emergence. I then move on to two chapters that outline this books' conceptual and methodological perspectives, "Internet as Infrastructure: Conceptual Openings" and "Internet as Infrastructure: Methodological Openings." The subsequent chapter, "Internet in Lithuania: The Dominant Narrative," explores how telecommunications and Internet development is represented in the most comprehensive current scholarly history, *Lietuvos ryšiai 1918–2018* (Lithuanian Communications 1918–2018),[8] and aims to present readers with the dominant and thus contextual narrative regarding telecommunications development in Lithuania. This is followed by three fieldwork-based chapters, "Everyday Infrastructuring," "Geopolitical Imaginaries," and "Critical Negotiations," which each explore different aspects of Internet development as infrastructure, before ending with the concluding chapter, "Implications for Situating the Internet as Infrastructure," that discusses merits of situated media research.

6 Following Nigel Thrift, I perceive both research and the observed issues as immanent, processual, complex, interwoven, and creative, instead of objective, in its research results and representations (Nigel Thrift, *Non-Representational Theory: Space, Politics, Affect* (Abingdon: Routledge, 2008), pp. 5–7, 12; Emma Waterton, "More-Than-Representational Landscapes," in *The Routledge Companion to Landscape Studies*, ed. Peter Howard, et al. (New York: Routledge, 2019), pp. 92–95).

7 By relying on this perspective, I here mean John Law's attempt to question, subvert and remake rigid methods that is outlined in his book "After Method: Mess in Social Science Research" (John Law, *After Method: Mess in Social Science Research* (Milton Park: Routledge, 2004), p. 9).

8 The book—Arvydas Pakštalis and Brigita Tranavičiūtė, *Lietuvos ryšiai, 1918–2018* (Kaunas: A. Pakštalis, 2018)—consists of eight main chapters that discuss Lithuanian telecommunications from 1918 to 1940 (post, telegraph, telephone, and radio communications); 1940 to 1944 (Lithuania's telecommunications during first Soviet occupation and during the German occupation); 1944 to 1990 (Lithuania's communications after the Second World war); 1990 to 2018 (with the special focus upon Ministry of Communications and Informatics and telecommunications companies after 1990); and Telecommunications construction, manufacturing, education system during the last 100 years. Its last chapter explores the telecommunications sector's future in the year 2068 and is written by prominent Lithuanian scientist Prof. Laimutis Telksnys.

1.1 Fieldwork-based Chapter Summary

1.1.1 Chapter "Everyday Infrastructuring"

In this chapter, I illustrate how the Internet is maintained at Lithuania's leading telecom provider, Telia Lietuva,[9] by focusing on diverse labor practices that develop and maintain the Internet on a daily basis. I spent two full months observing labor practices at the company, which is reflected in the chapter's structuring of short vignettes from this time. These vignettes resulted from coded and analyzed field notes that I wrote during participatory observation at Telia Lietuva as well as relevant published research on technology maintenance, especially from the fields of STS and infrastructure studies, which focuses on technology development as a result of ongoing producers' practices that link different manual and communicative labor to maintain Internet services. At the company, I observed labor practices and focused on tasks that maintain the Internet on a daily basis as well as observational information that I could not gather from material such as interviews, archives, or published literature. In this chapter, I thus explore how Internet infrastructuring,[10] or Internet maintenance through planned and contingent everyday practices, is diverse and corresponds to distinct company labor practices. In particular, Internet infrastructuring comprises manual work, such as digging, installing, and repair as well as communicative work, such as product and service development, popularizing, and wholesaling. Additionally, Internet labor practices consist not only of these concrete doings, but also situated contingencies such as remembrances, ironic remarks, and diverse customers, which emerge in an unplanned manner and can thus shape everyday infrastructuring in unforeseen ways. Moreover, each distinct labor practice produces a different understanding on the ground of what the Internet actually is: for some, it is an earthly labor practice, for others it is a communicated product. The act of analyzing the Internet as infrastructure through fieldwork thus means that one must first attend to the diversity and specificity of labor practices, to Internet infrastructuring that maintains the Internet in particular places every day and is not only planned and observable, but also contingent and elusive.

1.1.2 Chapter "Geopolitical Imaginaries"

In this chapter, I explore geopolitical imaginaries of the Internet as infrastructure in Lithuania. These imaginaries, i.e., collective beliefs about particular roles played by foreign or local telecom stakeholders in developing the Internet in Lithuania, are geopolitical because they consist of geographically distinct roles that local telecom industry stakeholders attributed to both foreign and local telecom stakeholders in forming post-

9 Also known as "Telia" in Lithuania.

10 I borrow this term from participatory design and anthropology disciplines, especially the work of Pelle Ehn, Helena Karasti, and Jeanette Blomberg, see: Pelle Ehn, "Participation in Design Things" (Paper presented at the Proceedings of the Tenth Anniversary Conference on Participatory Design 2008, Bloomington, 2008), p. 8; Helena Karasti and Jeanette Blomberg, "Studying Infrastructuring Ethnographically," *Computer Supported Cooperative Work (CSCW)* 27, no. 2 (2018), pp. 233–265, 236.

socialist Lithuania's telecom industry, which I mapped during my fieldwork through interviews and participatory observation.[11] In realist geopolitical scholarly literature, Lithuania, the Baltics, and Eastern Europe are often described as both cultural and physical borders between "the West" and Russia that took a straight socio-political path to Europe after the 1990s. In scholarly literature its predominantly foreign-owned telecom industry is perceived as a physical infrastructure that sustains its modern European identity due to its high-level development and integration into global Internet networks, or, in rarer occasions, as a geopolitical threat due to its foreign ownership.[12]

In contrast to such realist geopolitical theories that provide one particular geopolitical narrative of one place, I mapped the Lithuanian telecom industry's complex and ambiguous geopolitical imaginaries of the Internet's development as they emerged on the ground. In this chapter I draw on material from the field in order to situate geopolitical imaginaries amongst telecom industry stakeholders and illustrate that the Internet as infrastructure in Lithuania is framed by binary modernist and transnational cosmopolitan imaginaries, which co-exist and encompass strange geopolitical imaginaries. I call such everyday geopolitical imaginaries "strange," as defined by Zygmunt Bauman,[13] who describes the stranger as both a person and a notion of ambiguity, indecisiveness, and indeterminacy in a modern state, which itself designs, assimilates, and aims to destroy differences.[14] In my exploration of geopolitical imaginaries as strange via Bauman, I want to illustrate how key telecom industry stakeholders, producers of the Internet, not only allow the Internet to emerge through infrastructuring practices, but also frame it as geopolitical through often-occurring stories of a geopolitical nature. These stories narrate complex and different stakeholder roles and imply stakeholder dependencies and tensions. I also use my research on geopolitical imaginaries to illustrate that multiple incommensurable geopolitical imaginaries can exist in one state. I thus use this focus on geopolitical imaginaries on the ground to expand perspective on the Internet as infrastructure from an emphasis on practices of infrastructuring to those of the geopolitical imaginaries that frame these practices. The resulting empirically grounded strange geopolitical imaginaries contribute to the delineation of statist and nationalist realist geopolitical narratives as such, and of telecom industry in

11 Inspiring for this perspective was David Shim's article, in which he conceptualizes the mundane as geopolitical, and addresses geopolitical imaginations of home (David Shim, "Between the International and the Everyday: Geopolitics and Imaginaries of Home," *International Studies Review* 18, no. 4 (2016), pp. 597–613), as well as John O'Loughlin' et al.'s perspective toward geopolitical imaginaries that make geopolitical discourses geographically specific (John O'Loughlin, Gerard Toal, and Vladimir Kolosov, "The Rise and Fall of 'Novorossiya'": Examining Support for a Separatist Geopolitical Imaginary in Southeast Ukraine," *Post-Soviet Affairs* 33, no. 2 (2017), pp. 124–44.

12 See: Jonas Daniliauskas et al., *Šiaurės šalių geostrateginė svarba Lietuvai* (Vilnius: Eugrimas, 2005); Česlovas Laurinavičius Egidijus Motieka, and Statkus Nortautas, *Baltijos valstybių geopolitikos bruožai. XX amžius* (Vilnius: Lietuvos istorijos instituto leidykla, 2005); Viktor Denisenko, "Rusijos periodinės spaudos požiūris į Baltijos šalis geopolitinių pokyčių kontekste (1991–2009)," (PhD diss., Vilnius University, 2016).

13 Bauman relates this term to Georg Simmel's essay on "The Stranger" (Georg Simmel, "The Stranger," in *On Individuality and Social Forms*, ed. Donald N. Levine (Chicago, IL: University of Chicago Press, 1971).

14 Bauman, "Modernity and Ambivalence," pp. 143–169, 145–148, 151, 157.

particular, by maintaining strange geopolitical imaginaries of concomitantly identity-based distinctions and transnational cooperation on the ground. Despite these aims, this chapter runs the risk of reproducing the stereotype of Lithuania as part of chaotic Eastern Europe, mired in discourses of modernization and collaboration. In order to check this possibility, my argument regarding strangeness is empirically grounded in the long history of critical cultural research on "Eastern Europe," especially through the research of Czeslaw Milosz and Tomas Venclova on complicated Eastern European identity and positive valuation of Eastern European societal complexity.[15]

1.1.3 Chapter "Critical Negotiations"

In the last empirical chapter, I illustrate how the Internet as infrastructure is not only accomplished through ongoing infrastructuring labor practices, nor only shaped by strange geopolitical imaginaries, but also comprises ongoing critical negotiations that consist of justifications and future visions. These critical negotiations illustrate that infrastructure development and maintenance consist of struggles for different future visions that continuously take place within the telecom industry, but intensely emerge during crucial industry changes, such as the privatization of main telecom provider Lietuvos Telekomas. While there were many different telecom industry stakeholder critical negotiations during my fieldwork, I chose to focus on archival findings regarding Lietuvos Telekomas's 1998 privatization to the Swedish-Finnish Telia and Sonera consortium, an event that radically changed the structure of the Lithuanian telecommunications industry in terms of ownership, labor relations, and physical technology. I focus on this crucial industry event through fieldwork material such as archival work and interviews in order to posit that the privatization of Lietuvos Telekomas was diversely negotiated as a positive, negative, and necessary event. I explore particular justifications of Lietuvos Telekomas's privatization expressed by trade unions, private citizens, government officials, and other organizations and additionally argue that during crucial industry changes, critical negotiations intensify, become visible, and show potential future turns of prospective infrastructural developments.

Thus, this research situates the Internet as infrastructure in post-socialist Lithuania through multi-sited fieldwork amongst telecom industry stakeholders and was undertaken in the Lithuanian capital, Vilnius, and its second largest city, Kaunas, as well the Telia Lietuva company, different archives, cafes, and offices.[16] By situating the Internet as infrastructure in Lithuania through fieldwork, I illustrate how the Internet is maintained by everyday infrastructuring practices, framed by strange geopolitical imaginaries and is an ongoing process immersed in critical negotiations and their struggles for different future visions. This situated understanding of the Internet as infrastructure not only shows how infrastructuring practices, geopolitical imaginaries, and critical negotiations maintain and shape it in Lithuania, but also provides an example of how

15 Česlovas Milošas, *Gimtoji Europa* (Vilnius: Apostrofa, 2011); Tomas Venclova, *Pertrūkis tikrovėje. Straipsniai apie literatūrą ir kultūrą* (Vilnius: Lietuvių literatūros ir tautosakos institutas, 2013).

16 In the chapter "Internet as Infrastructure: Methodological Openings" I explain my fieldwork process in depth.

the Internet as infrastructure, and infrastructure as such, could be theorized for future situated research endeavors.

1.2 The First Connection

The first Internet connection in Lithuania coincided with the reestablishment of Lithuania as an independent nation-state. Set up in 1991 on the roof of the Parliament building in the capital Vilnius, this connection established new paths for independently communicating with the world.[17] Even in the beginning of the 1990s, the only way to connect to western countries from Lithuania via phone was through Moscow, [18] and these calls were often surveilled. Joseph Kazickas, Lithuanian-American businessman and founder of Omnitel, the first private telecommunications company in Lithuania, wrote in his memoir that:

> after independence, since all calls were still routed through Moscow, I believe there was a conscious effort to hinder international communications. We could sense that someone was listening to our conversations, especially when the contact was with important politicians of the country. We'd hear strange sounds and, when the line would start breaking up, we'd joke around, saying we had to wait until the tape of the outside listener was replaced.[19]

Cybernetician Laimutis Telksnys, a professor of Computer Science famous in Lithuania for helping establish this first Internet connection, told me his oft-repeated story of how the Internet was initiated in Lithuania with the help from Norway.[20] He stated that:

> On 28 June 1991, it was decided that we are pushing this channel to Lithuania and on 10 October this channel started to work. . . . this computer was delivered by the Norwegians. I had to go to Tallinn to meet them, meaning that I had weaponized myself with all the different permissions from the Lithuanian government, because in those days the Soviet Russians were still controlling the borders. I went there, presented myself to the colonel . . . told [him] that we are being given a charitable donation . . . in computers . . . everything went fine, [the computers] arrived from Helsinki to Tallinn by ferry, from which a small van rolled out. . . . this colonel and I went outside and I told [him], '. . . these computers were given to us as a present, as it says in the official document.

17 Algirdas Pakštas and Sonata Pakštienė, "Networking in Baltic Countries: Current Developments" (Paper presented at the Proceedings of Phoenix Conference on Computers and Communications, Tempe, AZ, 1993), p. 462.

18 Angelė Lekavičienė, "Untitled," 2002, *Dokumentų rinkinys. Pirmajai Lietuvos telefono linijai — 120 metų, šventė Rietave 2002 09 27*, DT-25, 1/2151, Registracijos aktas Nr. 46 2002 12 17, p. 4, Kauno miesto muziejaus archyvai.

19 Joseph Kazickas, *Odyssey of Hope* (Scotts Valley, California: CreateSpace Independent Publishing Platform, 2013), pp. 346–347.

20 I am grateful to Daniela Wentz for suggesting that I use this story as an introduction that discloses the complexity of the topic. She shared this advice with me during the Lüneburg Summer School for Digital Cultures in September 2018.

> Everything is sealed.' They told us, 'Remove the seal.' I said to them, 'Wait a minute . . . if it is sealed, it means that everything has already been checked.' They told us, 'We know you, maybe you are delivering stingers.' Well, I tried to convince them again. The Norwegians were so afraid that they asked us, 'Should we just not head back?' I told them, 'Just wait.' They were not used to it, and the military personnel [was] screaming horribly. Later we opened the van, and there were the displays mounted from the top to the bottom. . . . They got furious, you know, how they get furious, and told us, 'Go.' . . . we knew about computer networks not only in theory since 1980s . . . 'Akademset' already existed.[21] Moreover, our public was constantly working with Soviet machines which were breaking all the time . . . it was needed to know how to repair [them], so the people were highly qualified. So, what happened? They brought this [Norskdata] computer, turned it on, everything was fine. . . . But suddenly the computer broke. The Norwegian, who delivered this computer, called Oslo. Since the surveillance was normal, and they [the Soviet government] probably had no listeners who knew Norwegian, who could listen. As soon as he tried speaking on the phone, the connection was interrupted. He calls—it is interrupted, tries again—it is interrupted again. He tried for maybe seven times before starting to complain, 'What is up with you here?' Then I attempted to explain to him that it is not us [interrupting], but we are being surveilled. Later, our public asked, 'Maybe you have some documentations, we will have a look at it?' Our men repaired everything in half an hour. It left an astonishing impression on [the Norwegian], because after he arrived, we did not even have a keyboard . . . They were laughing about what a terrible village it is. After the computer was repaired in half an hour, he [the Norwegian] looked at us with respect.[22]

Telksnys's story illustrates how the first Internet connection was carried out through practices encapsulated in both imaginaries of a geopolitical nature and the critical negotiations of everyone involved. The story discloses the need to analyze the Internet as a result of multiple everyday practices, geopolitical imaginaries, and critical negotiations. In this context, when one thinks of materials such as wool, cotton, plastic, gum, or silk, there are great differences in their respective texture. Some of these materials, such as plastic, survive for hundreds of years, while others are delicate and wear down, leaving remnants of fragmented threads. Similarly, perceiving the Internet as infrastructure in this work means envisioning it as a textile composed of decaying layers that have been sewn, that co-exist, collapse, and re-emerge together. Thinking about the Internet as complex infrastructure means exploring and digging deeper into its different layers. Analyzing the Internet as infrastructure means, for example, exploring these layers as comprising the labor practices, geopolitical imaginaries, and critical negotiations in specific places. The Internet as infrastructure is about challenging a media format as an a-priori concept: it consists of the situated critical, geopolitical, and labor-based complexity of a media technology that must be maintained, imagined, and criticized.

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21 Packet-switched network of the USSR Academy of Sciences (National Research Council, *Global Trends in Computer Technology and Their Impact on Export Control* (Washington, DC: The National Academies Press, 1988).

22 Laimutis Telksnys, Interview by Miglė Bareikytė, 14 March 2017.

Telksnys's story additionally depicts the first Internet connection in Lithuania as possible due to active cooperation between Lithuanian and Norwegian academics, engineers and politicians who physically brought the equipment from Norway to Lithuania through a Soviet-controlled border in Tallinn, Estonia, and installed it in Vilnius, Lithuania. The Internet as infrastructure thus comprises contemporary labor practices that not only keep the Internet intact and maintain it in a particular place against the backdrop of unexpected failures, but also ones that draw strength from their past legacies of knowledge, technologies, and institutions that were developed during Soviet times and earlier. These legacy-based practices of maintenance and repair enabled the first Internet connection in Lithuania.

Figure 1. 1991: Lithuanian academics from the Institute of Mathematics and Informatics of Vilnius University greeting Norwegians in Tallinn with kompotas, a sweet fruit drink.

Source: private archive of Vidar Bjerkeland (Vidar Bjerkeland, "Private Photography Archive of Travels to Lithuania in the 1990s," 1991, private archive).

Figure 2. October, 1991: On the way to Lithuania from Norway to set up Internet equipment.

Source: private archive of Vidar Bjerkeland.

Figure 3. 1991: At the Institute of Mathematics and Informatics, adjusting Norskdata computers.

Source: private archive of Vidar Bjerkeland.

Figure 4. 10 October 1991: On the rooftop of the Parliament in Vilnius after the establishment of an Internet antenna (visible in the background).

Source: private archive of Vidar Bjerkeland.

A second major point in Telksnys's story is that it touches upon the geopolitical tensions and imaginaries between the Cold War territories of "the West" and "the East." They are expressed not only by an image of friction at the border control post, the last physical bastion separating the Soviet world from the non-Soviet world, but also by beliefs from within Lithuania. We can read these imaginaries in the context of local belief in the centralized Soviet surveillance of academia in Lithuania, but also in the local expectations of recognition by allegedly superior partners from Norway. In Telksnys's story, the Norwegian partners cooperate and help, but also take on a role of those who "laugh" and the Lithuanian telecom realm is demoted to a "village" that later gains respect through Norwegian praise.

Lastly, while Telksnys's narrative expresses implicit critique of Soviet and Norwegian actors, who "were screaming," "were afraid," and "were laughing," and required various negotiations to let equipment enter and be connected in Lithuania, this critique also hints at the implicit hope to be accepted and respected by western neighbors. This is emphasized by Telksnys's statement that "After the computer was repaired in half an hour, he [the Norwegian] looked at us with respect."[23]

This seemingly straightforward story shows how the first Internet connection in Lithuania emerged through complex practices of maintenance framed by unexpected contingencies, geopolitical imaginaries, and critical negotiations, which required interactions between people and things in specific places. It also illustrates the stakes of

23 Telksnys, Interview by Bareikytė, 14 March 2017.

the symbolic hope imbued in the emergence of the Internet in Lithuania. Its initiation story represents tensions between "the West" and "the East," with the Soviet Union fearing missile defense imports from "the West," but allowing foreign aid to cross the border anyway, thereby enabling the first Internet connection in Lithuania. In 1990, Lithuania was still dependent on Moscow. Soviet troops only left the country in 1993, i.e., three years after Lithuania's official declaration of independence and two years after the first Internet connection was established. The Soviet border control officers could have decided not to let the Norwegians cross the border with their equipment, which they perceived as "stingers," portable defense missiles that might help destroy the Soviet Union. In Telksnys's story, these stingers function as a metaphor for a planned military attack (with the help of US, stinger missiles were used to target the Soviet Union in the Afghanistan war).[24] Although for some reason—perhaps for no reason at all—the military let in the equipment necessary for the first Internet connection, but it could have easily turned out differently. Finally, while this remembrance regarding the emergence of the Internet is layered, it presents a dominant, widely communicated perspective in Lithuania concerning the establishment of the first Internet connection in the country. It stresses collaborative, if somewhat tense, interactions between Lithuania and Norway and criticizes the role of the Soviet Union. In contrast, according to the story that the Lithuanian SSR Communications Minister, Vytautas Jonas Kuzma, presents in his memoir, the disentanglement from the Soviet Union with this first connection was actually less autonomous than widely imagined. Kuzma posits that this connection was still dependent on the Soviet Union because it happened only with the help of the Soviet Union. He states that:

> The paradox is that our attempt to distance ourselves from the USSR's international communications system had to take place with the help of the USSR. The first non-public international connection was established thanks to the Norwegian communications administration, but the establishment of this connection had to be authorized by the USSR Ministry of Communications. . . . The said permit was signed as a border communication organization.[25]

The development of the first and subsequent Internet connections was entangled in practices, imaginaries, critique, which will be explored in the following book with the analysis of contemporaneous and historical examples. Yet before diving into stories from the field, I want to introduce the main concepts and methodological approach that have guided this research.

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24 I am grateful to Thomas Haigh for the discussion of stingers as a metaphor for geopolitical fears of Cold War during the Lüneburg Summer School for Digital Cultures in September 2018.

25 Vytautas Jonas Kuzma, "Untitled," in *Jie kūrė Lietuvos ryšius: biografinės apybraižos*, Alfredas Antanas Basevičius, Vytautas Jonas Kuzma, and Gintautas Žintelis, eds. (Vilnius: Petro ofsetas, 2008), pp. 123–124.

1.3 Internet as Infrastructure: Conceptual Openings

The aforementioned Internet initiation story thus presents us with one popular narrative. I aimed for my fieldwork to provide a means to situate this narrative in the present and thus complicate it. I wanted to experience and describe the Internet by focusing on the telecom industry because it both maintains socially valuable physical telecommunications networks and is traditionally perceived as the main physical Internet access infrastructure provider. Starting with this subject of focus—Internet infrastructure providers—I aimed to research and complicate Internet development and maintenance on the ground. Thus, I focus on Internet infrastructure, i.e., telecom industry providers 'as infrastructure'. Additionally, I do not take Internet infrastructure for granted, but study it on the ground and thereby theorize Internet as infrastructure with conceptualizations that are informed by fieldwork and the theoretical work of others.

Before delving into fieldwork material, in the following section I examine the main concepts that have guided this research during and after my fieldwork. In particular, I examine the concepts of infrastructure, infrastructuring, practice, strange geopolitical imaginaries and critical negotiations, which helped me situate the Internet as infrastructure through fieldwork. Situating in this book comprises place-based, bottom-up focused, fieldwork-based exploration of a complex of labor practices, geopolitical imaginaries and critical negotiations of actors in combination with things, places and events that comprise the Internet as infrastructure in Lithuania. I illustrate how I was inspired by and used these concepts in my fieldwork with the aim to contribute to infrastructure studies with perspectives from science and technology studies (STS), organizational theory, ethnographically-inspired digital media research and Eastern European studies.

I focus my attention on the telecom industry as an entity that develops and maintains a global physical network of networks comprised of cables, data exchange points, servers, and is commonly described as 'Internet infrastructure'. In fact, in many scholarly studies Internet infrastructure is described as a global physical network comprised of and maintained by cables, data centers, exchange points and institutional forms.[26] According to media studies scholars Gabrielle Schabacher and Liam Cole Young, the concept of 'infrastructure' was first used in 1875 in the context of the organization of French railways. It was first mentioned in English in 1927, and became popular in the 1960s in global military, logistic, commercial and political circles such as NATO and the European community.[27] Schabacher writes that contemporary systems considered

26 Martin Cave and Robin Mason, "The Economics of the Internet: Infrastructure and Regulation," *Oxford Review of Economic Policy* 17, no. 2 (2001), p. 199; Milton L. Mueller, *Networks and States: The Global Politics of Internet Governance* (Cambridge, MA: MIT Press, 2010), p. 15; Nicole Starosielski, "Fixed Flow: Undersea Cables as Media Infrastructure," in *Signal Traffic: Critical Studies of Media Infrastructures*, Lisa Parks and Nicole Starosielski, eds. (Champaign, IL: University of Illinois Press, 2015), p. 54; Hernán Galperín, "Localizing Internet Infrastructure: Cooperative Peering in Latin America," *Telematics and Informatics* 33, no. 2 (2016), p. 631; Dwayne Winseck, "The Geopolitical Economy of the Global Internet Infrastructure," *Journal of Information Policy* 7 (2017), p. 228.

27 Gabriele Schabacher, "Medium Infrastruktur. Trajektorien soziotechnischer Netzwerke in der ANT," *Zeitschrift für Medien-und Kulturforschung*, no. 2 (2013), pp. 133–134; Liam Cole Young, "Innis's Infra-

indispensable to society and the economy—such as schools, hospitals, communication systems, the Internet, telephone networks and others—have historically been described as 'critical infrastructures'.[28] Currently in academic and public discourses infrastructures are also often perceived as foundational and durable big stable physical systems or networks that support operations of society, such as the Internet, electricity, or railroads.[29] In the context of crucial critical infrastructures, telecommunications infrastructures have often been described as improving competition, trade and economy operations, as well as enabling contemporary societal progress.[30] However, despite these widespread conceptions, infrastructure need not be perceived as an overarching, stable system.

Accordingly, I aimed to research the development and maintenance of the Internet as infrastructure from a bottom-up perspective; I did so through fieldwork that was multi-sited in the sense that its object emerged over the course of time, in a field differentiated between multiple sites,[31] and eventually distanced from an abstract view of Internet infrastructure as a stable generalized system or network of networks. I wanted to experience how Internet infrastructure is actually developed and maintained in the field of telecom industry stakeholders. I base this research on the approaches of STS and organizational theory, which are interested in diverse ways an entity or a phenomenon emerges through social activities,[32] and which have inspired me to explore the complexities of the Internet via fieldwork.

According to Penny Harvey et al., "Once we approach infrastructures as dynamic and emergent forms, it is clear that we cannot specify their contours in advance. The question 'what is infrastructure' must therefore be addressed, and experimented with, in registers at once conceptual and empirical."[33] For anthropologist Brian Larkin, current studies of infrastructures are diverse; they destabilize and complicate the meaning and

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structure: Dirt, Beavers, and Documents in Material Media Theory," *Cultural Politics* 13, no. 2 (2017), p. 231.

28 Schabacher, "Medium Infrastruktur," p. 133.

29 Arghya Ghosh and Kieron Meagher, "Political Economy of Infrastructure Investment: A Spatial Approach" (Paper presented at the North American Econometric Society Summer Meetings at Brown University, Providence, 2004), pp. 2–3; Annalisa Meyboom, "Infrastructure as Practice," *Journal of Architectural Education* 62, no. 4 (2009), p. 72; Paul N. Edwards, Geoffrey C. Bowker, Steven J Jackson, and Robin Williams, "Introduction: An Agenda for Infrastructure Studies," *Journal of the Association for Information Systems* 10, no. 5 (2009), p. 365; Shane Greenstein, "Six Infrastructure Trends," *IEEE Micro* 39, no. 1 (2019), p. 70.

30 Paul N. Edwards, "Infrastructure and Modernity: Force, Time, and Social Organization in the History of Sociotechnical Systems," in *Modernity and Technology*, Thomas J. Misa, Philip Brey, and Andrew Feenberg, eds. (Cambridge, MA: MIT Press, 2003), pp. 185, 191; Ghosh and Meagher, "Political Economy of Infrastructure Investment," pp. 2–3; Jörg Niewöhner, "Infrastructures of Society, Anthropology Of," in *International Encyclopedia of the Social & Behavioral Sciences. 2nd edition*, ed. James D. Wright (Oxford: Elsevier, 2015), p. 119.

31 Marcus, "Ethnography in/of the World System," p. 97.

32 Sergio Sismondo, *An Introduction to Science and Technology Studies* (Malden: Blackwell Publishing, 2010), pp. 10–11.

33 Penelope Harvey, Casper Bruun Jensen, and Atsuro Morita, "Introduction," in *Infrastructures and Social Complexity: A Companion*, Penelope Harvey, Casper Bruun Jensen, and Atsuro Morita, eds. (Milton Park: Taylor & Francis, 2016), p. 6.

object of infrastructure-focused research.[34] Similarly, through multi-sited fieldwork I trace "a complex cultural phenomenon given an initial, baseline conceptual identity that turns out to be contingent and malleable as one traces it."[35] This fieldwork-based tracing resulted in three empirical chapters, each of which is indebted to the particular conceptual approaches outlined below.

Also, this perspective in researching infrastructure as complex is inspired by "more-than-representational" or "non-representational," "subverting-and-remaking the method," "mangled," "looking elsewhere" approaches. "More than representational" theory—which was originally termed "non-representational theory" by human geographers Nigel Thrift and J.D. Dewsbury,[36] and later termed "more than representational" by scholars such as Hayden Lorimer[37]—perceives living and thinking in processual terms. Accordingly, "more than representational" theories are interested in experimental descriptions of life as a complex, messy, and resulting from immanently linked research acts that link together humans, things, meaning-making, and pre-cognitive affects.[38] These "more than representational" representations thus aim to "add to the world rather than extract stable representations from it,"[39] i.e., to contribute to the world with their descriptions rather than claim to perfectly mirror it. This is why "more-than-representation" or "non-representational" approaches distance themselves from allegedly objective representation and use comparative words "more" or "non" in their titles; they aspire to present different practices and meanings that can be messy and do not represent a true and one-dimensional picture of the world, but rather enact it in their own way. Sociologists John Law and Andrew Pickering provide similar arguments that inquire into emerging differences produced in the world, which cannot be represented as natural facts due to the problem of reductivity and limits of representation.[40] For Pickering, the world is "a mangle," an immanent ongoing, historical mess of life, from which indefinite cultural multiplicity emerges. Pickering argues, "On my analysis, no substantive variable fills the gap between the world and our knowledge—there is only history and the mangle."[41] This also resonates with sociologist John Law's perspective; the world is too unpredictable and complex to be

34 Brian Larkin, "The Politics and Poetics of Infrastructure," *Annual Review of Anthropology* 42 (2013), p. 339.

35 Marcus, "Ethnography in/of the World System," p. 106.

36 Thrift, *Non-Representational Theory: Space, Politics, Affect*; John-David Dewsbury, "Language and the Event: The Unthought of Appearing Worlds," in *Taking-Place: Non-Representational Theories and Geography*, Ben Anderson and Paul Harrison, eds. (Milton Park: Routledge, 2016).

37 Hayden Lorimer, "Cultural Geography: The Busyness of Being 'More-Than-Representational'," *Progress in Human Geography* 29, no. 1 (2005).

38 Thrift, *Non-Representational Theory: Space, Politics, Affect*, pp. 5–7, 12; Louisa Cadman, "Non-Representational Theory/Non-Representational Geographies," in *International Encyclopedia of Human Geography*, Nigel Thrift and Rob Kitchin, eds. (London: Elsevier Science, 2009), pp. 56–61; Waterton, "More-Than-Representational Landscapes," pp. 92–95.

39 Cadman, "Non-Representational Theory/Non-Representational Geographies," p. 56.

40 Miglė Bareikytė, "Migration as Becoming: The Experience of Immaterial Laborers from Lithuania in Berlin," (M.A. thesis, Vytautas Magnus University, 2012), pp. 16–17.

41 Andrew Pickering, *The Mangle of Practice: Time, Agency, and Science* (Chicago, IL: University of Chicago Press, 2010), pp. 211, 216.

squeeze into stable and universally applicable descriptions. Law characterized "the world as an unformed but generative flux of forces and relations that work to produce particular realities. . . . in this way of thinking the world is not a structure . . . We might think of it, instead, as a maelstrom or a tide-rip."[42] It requires new concepts, methods, ways of thinking and research methods "if we want to think about the messes of reality at all then we're going to have to teach ourselves to think, to practice, to relate, and to know in new ways."[43] Thus Law, akin to sociologist Howard Becker's approach of "looking elsewhere,"[44] argues for embodied engagement with and interest for under-researched places and issues. This perspective also argues for subverting and remaking methods that aim for general applicability, thereby relaxing the desire for certainty and providing peculiar conceptual and empirical examples on researched issues.

In summation, the aforementioned approaches are interested in processual, engaged, reflexive research-based representations through a focus on complexities and ambiguities; they explore different topics by focusing on complexities,[45] messiness,[46] and mangles of observed issues.[47] My fieldwork-based tracing of the Internet as infrastructure is inspired by these approaches that helped open up and situate discussions about Internet as infrastructure development. This fieldwork is indebted not only to empirical experiences but also to theoretical perspectives that helped me perceive empirical material as a result of not only planned, but also messy, contingent forms of labor practices, strange geopolitical imaginaries and diverse critical negotiations.

1.3.1 Everyday Infrastructuring

In the first empirical chapter, "Everyday Infrastructuring," I relate my fieldwork experiences with practice-focused perspective of infrastructure. In late 1980s, with the help of social anthropology, feminist critique, STS, and other disciplines, infrastructure began to be researched as a result of situated practices. In this context, the meaning of infrastructure transformed from a stable system, an object, or a network toward a dynamic result of emergent, ongoing practices.[48] The work of sociologists and STS scholars Susan Leigh Star, Karin Ruhleder, and Geofrey Bowker was instrumental in this shift; they argue that infrastructure should be seen as a constitutive part of social and technical organization, and that a resulting special focus needed to be devoted to backstage elements of infrastructure, such as the practices that allow an infrastructure to emerge.[49]

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42 Law, *After Method*, p. 7.

43 Law, *After Method*, p. 2.

44 Howard Becker, "Connaissances générales et universalité du travail sociologique," *Socio* 1, 2013, (2013), pp. 109–119; Jason Hughes, "Looking Elsewhere: Howard S. Becker as Unwilling Organisational Theorist," *Organization* 22, no. 6 (2015), pp. 782–784.

45 *Complexities: Social Studies of Knowledge Practices*, John Law and Annemarie Mol, eds., (Durham, NC: Duke University Press, 2002).

46 Law, *After Method*, pp. 45, 56.

47 Pickering, *The Mangle of Practice*.

48 Niewöhner, "Infrastructures of Society, Anthropology Of," p. 119.

49 Susan Leigh Star and Karen Ruhleder, "Steps toward an Ecology of Infrastructure: Design and Access for Large Information Spaces," *Information Systems Research* 7, no. 1 (1996), p. 112; Susan Leigh

According to Leigh Star, infrastructure is not only dynamic, but also a relational category. For a cook, the water system is an essential cooking infrastructure, yet for a technical engineer, infrastructure is a variable in a complex process of city planning.[50] This relational approach argues for studying different practices that allow an infrastructure to emerge, disappear, break, become stable, or remain fluid, depend on legacies and other aspects,[51] such as invisibility, modularity, or standardization.[52] Infrastructures according to such a perspective are thus often invisible or visible upon breakdown.[53] In this perspective, infrastructures are perceived as constantly developing and emerging in practice,[54] as well as in need of complex building, maintenance and repair work,[55] which enacts order against a backdrop of a constantly decaying world.[56] According to science and technology historian Etienne Benson, the ignorance of labor practices involved in the emergence and maintenance of infrastructures is fostered by privileged optics of infrastructural reliability[57]; simply put, rich industrialized societies can afford to disregard the ongoing work required to maintain such infrastructures.

Star, "The Ethnography of Infrastructure," *American Behavioral Scientist* 43, no. 3 (1999), p. 383; Niewöhner, "Infrastructures of Society, Anthropology Of," p. 120.

50 Star, "The Ethnography of Infrastructure," p. 380.

51 Ehn, "Participation in Design Things"; Christian Sandvig, "The Internet as Infrastructure," in *The Oxford Handbook of Internet Studies*, ed. William H. Dutton (Oxford: Oxford University Press, 2013), p. 96; Karasti and Blomberg, "Studying Infrastructuring Ethnographically," pp. 235, 237.

52 Star and Ruhleder, "Steps toward an Ecology of Infrastructure," pp. 112–113; Star, "The Ethnography of Infrastructure," p. 377.

53 Star and Ruhleder, "Steps toward an Ecology of Infrastructure," p. 112; Geoffrey C. Bowker and Susan Leigh Star, *Sorting Things Out: Classification and Its Consequences* (Cambridge, MA: MIT Press, 2000), p. 33; Edwards, "Infrastructure and Modernity," p. 191; Paul N. Edwards, Geoffrey C Bowker, Steven J Jackson, and Robin Williams, "Introduction: An Agenda for Infrastructure Studies," *Journal of the Association for Information Systems* 10, no. 5 (2009), p. 365; Etienne Benson, "Generating Infrastructural Invisibility: Insulation, Interconnection, and Avian Excrement in the Southern California Power Grid," *Environmental Humanities* 6, no. 1 (2015), p. 125; Niewöhner, "Infrastructures of Society, Anthropology Of," p. 120; Karasti and Blomberg, "Studying Infrastructuring Ethnographically," p. 237.

54 Star and Ruhleder, "Steps toward an Ecology of Infrastructure," p. 114; Niewöhner, "Infrastructures of Society, Anthropology Of," p. 123; Lisa Parks and Starosielski Nicole, "Introduction," in *Signal Traffic: Critical Studies of Media Infrastructures*, Lisa Parks and Nicole Starosielski, eds. (Champaign, IL: University of Illinois Press, 2015), p. 9; Katie Shilton, "Engaging Values Despite Neutrality: Challenges and Approaches to Values Reflection During the Design of Internet Infrastructure," *Science, Technology, & Human Values* 43, no. 2 (2018), p. 2; Karasti and Blomberg, "Studying Infrastructuring Ethnographically," p. 236.

55 Bowker and Star, *Sorting Things Out: Classification and Its Consequences*, p. 10; Jon W. Anderson, "Producers and Middle East Internet Technology: Getting Beyond 'Impacts'," *The Middle East Journal* 54, no. 3 (2000), p. 422; Stephen Graham and Nigel Thrift, "Out of Order: Understanding Repair and Maintenance," *Theory, Culture & Society* 24, no. 3 (2007), p. 10; Jérôme Denis, Alessandro Mongili, and David Pontille, "Maintenance & Repair in Science and Technology Studies," *TECNOSCIENZA: Italian Journal of Science & Technology Studies* 6, no. 2 (2016), p. 10; Young, "Innis's Infrastructure," p. 231.

56 Graham and Thrift, "Out of Order: Understanding Repair and Maintenance," p. 1; Denis, Mongili, and Pontille, "Maintenance & Repair in Science and Technology Studies," p. 10.

57 Benson, "Generating Infrastructural Invisibility," p. 125.

In this book I use "infrastructuring," a term that was developed upon conceptualization of infrastructure as a result of ongoing and often invisible practices. "Infrastructuring" as a term stems from participatory design and anthropology disciplines and stresses open-ended practices of infrastructure maintenance through which an object emerges.[58] In this research, I use infrastructuring as a collective term that comprises multiple situated labor practices that allow the Internet to emerge as an infrastructure. This is underlined by my explorative fieldwork, which I detail in the first empirical chapter "Everyday Infrastructuring."[59] The chapter's use of the term specifically explores the labor practices of the Lithuania's main telecom provider, Telia Lietuva, as a means to research the ongoing maintenance of the Internet as infrastructure through infrastructuring practices.[60]

In the following paragraphs, I briefly elaborate upon the concepts of labor and practice used in the "Everyday Infrastructuring" chapter. Practice-focused research is often

58 Ehn, "Participation in Design Things," p. 8; Christopher A Le Dantec and Carl DiSalvo, "Infrastructuring and the Formation of Publics in Participatory Design," *Social Studies of Science* 43, no. 2 (2013), p. 247; Erling Björgvinsson, Pelle Ehn, and Per-Anders Hillgren, "Participatory Design and 'Democratizing Innovation'," (Paper presented at the Proceedings of the 11th Biennial Participatory Design Conference, New York, 2010), p. 43; Niewöhner, "Infrastructures of Society, Anthropology Of," p. 123; Gertraud Koch, "Ethnography of Digital Infrastructures," in *Digitisation: Theories and Concepts for Empirical Cultural Research*, ed. Getraud Koch (Milton Park: Taylor & Francis, 2017), pp. 83–84; Karasti and Blomberg, "Studying Infrastructuring Ethnographically," p. 236.

59 The focus on the situated usage and development of the Internet is practiced by digital media ethnographers. While in this book I lay the focus on the telecom industry that maintains the Internet as infrastructure in particular, digital media ethnography constitutes a broad field of research approaches that situate digital media usage, production, effects, and operations through field research, e.g. Gabriella E. Coleman, "Ethnographic Approaches to Digital Media," *Annual Review of Anthropology* 39 (2010), p. 488; Sarah Pink, "Digital Ethnography," in *Innovative Methods in Media and Communication Research*, Sebastian Kubitschko and Anne Kaun, eds. (London: Palgrave Macmillan, Cham, 2016). Focus on situated telecom industries and their work in maintaining and developing physical Internet infrastructure through fieldwork: going to particular places, speaking with workers, observing their labor practices, and embracing the unknown, has been emerging, but is not yet widespread. For example, in 1999, Jane Abbate has written an excellent conference paper on the emergence and usage of the Internet in Estonia (Janet Abbate, "New Technology for a New Nation: Building an Internet Culture in Estonia" (Paper presented at Society for the History of Technology Annual Meeting, Detroit, 1999). Sarah Harris has explored cybercafé Internet services providers in Turkey as comprising digital media infrastructure (Sarah Harris, "Service Providers as Digital Media Infrastructure: Turkey's Cybercafe Operators," in *Signal Traffic: Critical Studies of Media Infrastructures*, Lisa Parks and Nicole Starosielski, eds. (Champaign, IL: University of Illinois Press, 2015)). Lisa Parks researched rural Zambia's Internet development and usage with the focus on infrastructure orderings and usage in real time (Lisa Parks, "Water, Energy, Access: Materialising the Internet in Rural Zambia," in *Signal Traffic: Critical Studies of Media Infrastructures*, Lisa Parks and Nicole Starosielski, eds. (Champaign, IL: University of Illinois Press, 2015)). Asta Vonderau explored the implementation of a Facebook data center in the Swedish city of Lule using the concept of infrastructuring (Asta Vonderau, "Scaling the Cloud: Making State and Infrastructure in Sweden," Ethnos 84, no. 4 (2019)). Fieldwork was also used by Nicole Starosielski to research global undersea cable networks that maintain physical Internet networks (Nicole Starosielski, *The Undersea Network* (Durham, NC: Duke University Press, 2015)).

60 For a more detailed methodological description, please see section "Internet as Infrastructuring: Methodological Openings."

traced to what Theodor Schatzki proclaimed as the "practice turn" in social theory at the end of the twentieth century. As with many such turns, this turn also implies a new ontology, which in this case brings dynamic practices, rather than stable structures, to the fore.[61] Schatzki states that "By 'practices' I mean spatially-temporally dispersed, open sets of doings and sayings organized by common understandings, teleologies (ends and tasks), and rules."[62] While Schatzki agrees that diverse research approaches can tackle the problem of practice, he also outlines the main attributes of the practice turn—activities organized by common rules, goals, or understandings—thereby explaining the importance of turning to practice in the first place. Schatzki asserts that within practice-ontology, practices grounded in practical understandings are the primary basis for the social.[63] During my research, I was fascinated by the concept of practice, because it allowed me to reflexively relate my approach of open-ended fieldwork and an interest in media technology development with theoretical-ontological underpinnings that the term "practice" carries in the arena of "practice turn." In short, this theoretical perspective inspired me to theoretically reflect upon what I was doing in the field instead of categorizing my fieldwork-based research as either subjective or objectively representative of empirical reality. This focus on practice fits well with a research practice such as mine, which is based on open-ended fieldwork that aimed to describe and conceptualize the Internet as infrastructure. I undertook this research by observing practices at a telecom company that maintained the Internet *in practice*—i.e., through fieldwork observations of everyday company's life—and *as practice*—i.e., through its conceptualization as infrastructuring.

Importantly, the radical nature of practice theories differs based on the extent to which they organize research material into strict categories of practice. I found it difficult to organize my fieldwork experiences into the habitual patterns required by some practice theorists due to the multiple situated contingencies I encountered throughout my research. One example of such patterns is prominent in practice theorist sociologist Andreas Reckwitz's notion of practices as temporal, routinized actions in which body, mind, things, tacit knowledge, concrete skills, emotions, and desires are interconnected. The configurations of these routinized activities can change when their orders are transgressed and new practices are carried out.[64] Within this schema, an activity is a practice when it becomes routinized and regularly followed. In this line of thought, sociologist Barry Barnes describes practice as a social activity characterized by shared customs, which cannot be exhausted by a list of allegedly definite activities. Thus, two vegetarians practice vegetarianism because they follow shared practical guidelines by

61 Theodore R. Schatzki, "Introduction: Practice Theory," in *The Practice Turn in Contemporary Theory*, Karin Knorr Cetina, Theodore R. Schatzki, and Eike von Savigny, eds. (London: Routledge, 2005), pp. 11–13; Theodore R. Schatzki, *Social Practices* (Cambridge: Cambridge University Press, 1996).

62 Ted Schatzki, "Where the Action Is (On Large Social Phenomena Such as Sociotechnical Regimes)" (Working paper 1, Sustainable Practices Research group, 2011), p. 4.

63 Schatzki, "Introduction: Practice Theory," p. 13.

64 Andreas Reckwitz, "Toward a Theory of Social Practices: A Development in Culturalist Theorizing," *European Journal of Social Theory* 5, no. 2 (2002), pp. 249, 255–256.

avoiding meat consumption, but they do not necessarily eat the same food.[65] According to Barnes's description, practitioners thus use a shared understanding of practice, yet they do not necessarily act in the same way. Schatzki also stresses the commonality, similarity and rules that organize practices.[66] If practice is a primary field of action that results in a shared, routinized doings that can be carried out in manifold of ways and are in this way open-ended, the practices that I observed during my fieldwork not only consisted of repetitive doings, but also of multiple contingencies that could not be foreseen as constitutive parts of a practice, and which furthermore avoided routinization.[67]

Accordingly, while I was originally inspired by the practice theory turn and its focus on everyday doings, throughout the course of my research I began to lean toward other approaches that follow complexity and indeterminacy focused approaches to practices that I outline above as "more-than-representational" and "subverting-and-remaking the method." Thus, such approaches argue that practices are based on open-ended, messy, ongoing interactions among humans and things, and are therefore characterized not only by routines, but also and especially by unpredictable outcomes, mistakes, and ruination.[68] In this line of thought, practices are "continually bringing forth new hybrids."[69] Scholars who engage with such approaches are thus interested in experimental, dynamic descriptions of life as embodied in everyday practices that are not only orderly, but also contingent. As sociologist John Law argues, "Realities are not secure but instead they have to be practiced. And the world is not passive, waiting to be seen by people."[70] Instead of stable, allegedly objectively accessible, and habitually organized practices of the outside world that can be truthfully explained and mirrored through text, their messiness and complexity comes to the fore.[71] The infrastructuring detailed in this book's first empirical chapter relies on this perspective that Internet infrastructuring comprises open-ended practices that are not only repetitive, but also messy and contingent.

Finally, infrastructuring practices in this book not only involve complex messy acts, but also labor practices that I observed at private Lithuanian telecommunications company Telia Lietuva. Since the eighteenth century, industrial capitalism has intensified not only with the help of developing technologies, but also due to workers' labor power,

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65 Barry Barnes, "Practice as Collective Action," in *The Practice Turn in Contemporary Theory*, Karin Knorr Cetina, Theodore R Schatzki, and Eike von Savigny, eds. (London: Routledge, 2005), p. 26.

66 Schatzki, "Where the Action Is," p. 4; Raymond Caldwell, "Reclaiming Agency, Recovering Change? An Exploration of the Practice Theory of Theodore Schatzki," *Journal for the Theory of Social Behaviour* 42, no. 3 (2012), p. 289.

67 Importantly, Schatzki also acknowledges contingency as constitutive to practices (Schatzki, "Where the Action Is," p. 23).

68 Thrift, *Non-Representational Theory: Space, Politics, Affect*, pp. 8–9; Cadman, "Non-Representational Theory/Non-Representational Geographies," p. 59; Timon Beyes and Chris Steyaert, "Spacing Organization: Non-Representational Theory and Performing Organizational Space," *Organization* 19, no. 1 (2012), pp. 46–48.

69 Thrift, *Non-Representational Theory: Space, Politics, Affect*, p. 8.

70 Law, *After Method*, p. 15.

71 Beyes and Steyaert, "Spacing Organization," pp. 51–52.

which Karl Marx famously analyzes and describes as the "mental and physical capabilities existing in a human being, which he exercises whenever he produces a use-value of any description."[72] As political economist Harry Braverman contends, worker's labor power is a capacity to produce commodities that are sold in the market; under capitalism, this labor is hired, exploited, and eventually deskilled.[73] According to social theorist Ian Hunt, because contemporary capitalism "sets the social standard of employment, it is reasonable to say that contract labor is in fact capitalist employment of labor-power, especially where supposed contract workers are employed for set hours, and work with means of production owned by the employer."[74] Notwithstanding gig, invisible, or illegal labor, much of contemporary labor in the European Union is based on employment contracts and paid employment. Thus, labor power, i.e., a person's inherent capacity to work, is often contractually agreed upon and used for everyday maintenance and development practices of the Internet and its infrastructuring, although there is a multiplicity of activities that sustain paid labor practices but are not remunerated, such as unpaid housework[75] or free digital labor.[76] In this book I use the term "labor" to situate infrastructuring as a concept that is based on practices framed by contractual employment occurring in particular places. I use this concept as it here refers to contract-based, skilled, and instrumental capacities that are enacted in places by humans and things during complex practices that function on a daily basis to maintain and form the Internet. The observation and description of Internet infrastructuring practices I carried out during my fieldwork at Telia Lietuva thus illustrates how these labor practices are deployed within a private company. Accordingly, these activities are not neutral, but rather are focused labor practices that are sold on the market, contractually agreed upon, and remunerated accordingly.

In order to explore how the Internet is maintained through everyday labor practices, it is important to focus not only on labor as an abstraction or theoretical conceptualization, but to also to use practice-based fieldwork to analyze it as a situated practice. I derive this observational perspective from STS and organizational studies by relying on the research of Vicki Smith, Götz Bachmann, and Julian E. Orr,[77] all of whom have contributed toward the situated research of work. I particularly ground my focus on Internet maintenance labor practices in Lucy Suchman's idea of "situated action," which posits that the organization of action is always emerging and built on interaction between mangled, emergent socio-material conditions, and actors that shape them

72 Karl Marx, *Capital* (Ware: Wordsworth Editions Limited, 2013), p. 225.

73 Harry Braverman, *Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century* (New York: Monthly Review Press, 1998), pp. 34–37; Vicki Smith, "Ethnographies of Work and the Work of Ethnographers," in *Handbook of Ethnography*, Paul Atkinson, et al., eds. (Thousand Oaks, California: Sage Publications, 2001), pp. 221–222.

74 Ian Hunt, "Labour and Labour-Power," *Radical Philosophy* 52 (1989), p. 26.

75 Silvia Federici, *Wages against Housework* (Bristol: Falling Wall Press, 1975).

76 Tiziana Terranova, "Free Labor: Producing Culture for the Digital Economy," *Social Text* 18, no. 2 (2000).

77 Smith, "Ethnographies of Work and the Work of Ethnographers"; Götz Bachmann, *Kollegialität: Eine Ethnografie Der Belegschaftskultur Im Kaufhaus* (Frankfurt: Campus Verlag, 2014); Julian E. Orr, *Talking About Machines: An Ethnography of a Modern Job* (Ithaca, NY: Cornell University Press, 2016).

daily,[78] and Donna Harraway's concept of "situated knowledge," which argues that each way of knowing is situated, i.e., partial, locatable, and embodied.[79] I was also inspired to perceive technology as emerging from the situated labor of different groups of workers by scholarship that explores multidirectional, as alternative to linear, social construction of technology,[80] and takes non-human actors, things, as constitutive of the field of practice.[81] Based on these influences, I carried out a situated—i.e., place-based, bottom-up focused, fieldwork-based—exploration of the Internet infrastructuring.

In the context of the telecom industry, I also build upon ethnographer Julian E. Orr's book *Talking About Machines* and its foreword by organizational theorist Stephen R. Barley that argues how current organizations are complex in character; workers do not share the same knowledge and experience as their colleagues, because they often change jobs and industries.[82] Barley critically questions the routinely defined types of labor within these organizations:

> What meaning can the "service economy", the "information economy", the "knowledge economy", and similar terms have unless they denote substantive changes either in what people do for a living or how they do it? The obvious answer is, very little. Yet journalists, futurists, and even sociologists routinely employ such epithets without explaining precisely what kinds of work they have in mind.[83]

These reflections encouraged me to observe diverse Internet maintenance labor practices in order to grasp their lived specificities in a company rather than speaking of infrastructuring as an abstraction. Place-based engagement with labor practices thus is a means of making this often-hidden labor visible.[84] In the first empirical chapter I thus rely on more than representational approaches toward practice as habitual and concomitantly contingent, messy doings that in a telecom company are based on contractual employment as labor practices. In the "Everyday Infrastructuring" chapter, I

78 Lucy Suchman, *Human-Machine Reconfigurations: Plans and Situated Actions* (Cambridge: Cambridge University Press, 2007), pp. 70, 177.

79 Donna Haraway, "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective," *Feminist studies* 14, no. 3 (1988), p. 584.

80 Trevor J. Pinch and Wiebe E. Bijker, "The Social Construction of Facts and Artifacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other," in *The Social Construction of Technological Systems*, Wiebe E. Bijker, Thomas Parke Hughes, and Trevor Pinch, eds. (Cambridge, MA: MIT Press, 1989), pp. 28–34.

81 Bruno Latour, *Reassembling the Social* (Oxford: Oxford University Press, 2005), p. 72; Bruno Latour, *We Have Never Been Modern* (Cambridge, MA: Harvard University Press, 1993).

82 Orr, *Talking About Machines*; Stephen R. Barley, "Foreword," in *Talking About Machines*, Julian E. Orr (Ithaca, NY: Cornell University Press, 2016), pp. ix, xi.

83 Barley, "Foreword," p. xi.

84 Orr, *Talking About Machines*, pp. 10–11; Barley, "Foreword," p. xiii.

particularly focus on manual,[85] and communicative labor practices,[86] carried out by middle and lower managers, as well as manual workers I observed at the company.

Accordingly, I lean on the conceptualization of the Internet infrastructuring as a result of situated, ongoing, and messy labor practices. I focus on what is traditionally perceived as a stable infrastructure—the telecommunications industry—in order to shift the understanding of infrastructure from an abstract object to a situated dynamic group of practices, to an infrastructuring, that took place at Telia Lietuva and its different sites in the Lithuanian capital of Vilnius. I specifically carried out participatory observation by looking at how various people maintain the Internet through their everyday labor practices at the telecom company, speaking with them about their daily work and participating in various related meetings. I use an infrastructuring—rather than objective representational—approach, which is applied to practice and sensitive to daily contingencies. My resulting research is likewise an open-ended inquiry. After carrying out fieldwork, I was motivated by a radical rather than representational approach to practices, i.e., the idea of practices as, to put it bluntly, an embodied mess. This allowed me to take the minutia from my fieldwork seriously, without the need to edit out parts that did not fit into the conceptualization of practice as a habit or a routine. This approach additionally resulted in a research process less fraught with pressure, because the practices I observed are assumed to be open-ended and not perfectly describable, and thus the process of research is open-ended, i.e., evolving, unsure of its final results and, following George E. Marcus, disinterested in a perfect representation of a whole.[87]

1.3.2 Geopolitical Imaginaries

Internet as infrastructure is not only maintained through ongoing labor practices of infrastructuring. Its maintenance and development are deeply framed within specific and diverse geopolitical imaginaries that coexist among key telecom industry stakeholders with respective interests at stake, such as businesspeople, academics, and politicians. I mapped geopolitical imaginaries I encountered on the ground, which resulted in an empirical chapter titled "Geopolitical Imaginaries." According to political geographer John O'Loughlin, et al.:

> A geopolitical imaginary is a geographic signifier that helps organize and anchor geopolitical discourse. Most are meta-geographical abstractions, like 'the West' and 'the East', which are put to use in multiple ways by political entrepreneurs, party

85 "Meaning of Labour in English," Cambridge Dictionary, Cambridge University Press, updated 2020, accessed 3 April 2020, https://dictionary.cambridge.org/dictionary/english/labour.

86 Rachel McKinney, "Communication, Labor, and Communicative Labor" (PhD diss., City University of New York, 2015), pp. 58, 153. Immaterial labor is a term often used to describe a form of labor that does not result in a material product and is rather used to create relations with consumers through, for instance, affective relations, and thereby convince them to consume (See: Maurizio Lazzarato, "Immaterial Labour," *Generation-Online*, accessed 3 April 2019, http://www.generation-online.org/c/fcimmateriallabour3.htm). Communicative labor in this book is a particular form of immaterial labor that instrumentalizes language to realize a work goal.

87 George E. Marcus, "Imagining the Whole: Ethnography's Contemporary Efforts To Situate Itself," *Critique of Anthropology* 9, no. 7 (1989), pp. 7–9.

> organizations, and state elites. Some are mobilizational images, symbols, and slogans for political movements.[88]

In this book I relate geopolitical imaginaries with infrastructure research and access them through stories and remembrances of events that emerged in the field of telecom industry stakeholders during interviews and participatory observation. Also, I borrow the term "imaginary" from STS scholar Sheila Jasanoff and political theorist Charles Taylor. For Jasanoff, who builds on the research of anthropologist Arjun Appadurai, imaginaries refer "to collective beliefs about how society functions,"[89] and, as argued by Appadurai, are made multiple in a globalized world.[90] Taylor uses the concept of the imaginary to explore how different people imagine their social surroundings, which is often not expressed in theoretical terms, but is rather carried in images, stories, and legends.[91] For Taylor, the imaginary is an evolving perception of "how we got to where we are, how we relate to other groups, and so on. . . . It can never be adequately expressed in the form of explicit doctrines because of its unlimited and indefinite nature. That is another reason for speaking here of an imaginary and not a theory."[92]

I also build on research by anthropologist Anna Malewska-Szałygin, who explores imaginaries by additionally using Paul Ricoeur's understanding of discourse. Malewska-Szałygin argues that imaginaries are expressed predominantly during discourses, which are "utterances ('speech events') and the world-views revealed through them ('sense')."[93] Imaginaries in this book are thus different collective beliefs that are expressed through utterances and reveal how particular issues, such as the geopolitics of Internet development, emerge and are made sense of by those who carry out the utterances, such as telecom industry key stakeholders.

Traditionally, geopolitics is understood as a discipline concerned with the politics of the state or blocks of states in relation to their geography.[94] From a geopolitical position, the relative power of a region or state is measured according to its size and geographical position. Traditional geopolitical approaches are interested in questions such as: how can state power be maintained through strategic regional collaboration? Which countries hold the most resources? What alliances could support better access to resources? How could resources such as technology shape state power? Investigations that attempt to answer such and similar questions are titled "realist," as they are based

88 O'Loughlin, Toal, and Kolosov, "The Rise and Fall of 'Novorossiya'," p. 125.

89 Sheila Jasanoff, "Future Imperfect: Science, Technology, and the Imaginations of Modernity," in *Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power*, Sheila Jasanoff and Sang-Hyun Kim, eds. (Chicago, IL: University of Chicago Press, 2015), p. 5.

90 Arjun Appadurai, "Disjuncture and Difference in the Global Cultural Economy," in *Media and Cultural Studies: Keyworks*, Meenakshi Gigi Durham and Douglas M. Kellner, eds. (Malden, MA: Blackwell Publishing, 2006), p. 587.

91 Charles Taylor, *Modern Social Imaginaries* (Durham, NC: Duke University Press, 2004), p. 23.

92 Taylor, *Modern Social Imaginaries*, p. 25.

93 Anna Malewska-Szałygin, *Social Imaginaries of the State and Central Authority in Polish Highland Villages, 1999–2005* (Newcastle: Cambridge Scholars Publishing, 2018), p. 10.

94 Stasys Vaitekūnas, *Lietuvos geopolitika* (Vilnius: Mintis, 1991), p. 5; Laurinavičius, Motieka, and Statkus, *Baltijos valstybių geopolitikos bruožai. XX amžius*, pp. 11–12.

on a rationalist paradigm of positivist epistemology and materialist ontology.[95] Until the end of the Cold War, the doctrine of realism has dominated international relations and geopolitical perspectives.[96] For realists, a state is the main rational actor that functions in an anarchic international arena in order to maintain interests such as increased power and security.[97] Thus, realist investigations assume that an existing external reality could be measured, utilized to obtain power, and ultimately controlled. According to realists, state strategies should be developed for the maintenance and expansion of state resources (territory, population, etc.) on the basis of the state's respective geographic position and regional alliances.[98] In short, the realist geopolitical approach is interested in exploring how a political unit could transform its power in space by actively increasing its resources. Around the 1970, the role of statist geography in geopolitical scholarship was replaced by emerging pluralist geopolitical views. These views posit that not only a territory but also diverse actors such as smaller states, corporations, and NGOs contribute to the formation of state geopolitics.[99] In summation, the pluralist perspective injected fatalist realist geopolitics of geography-bounded states with quantitative (more actors) and thus qualitative (different agencies) pluralism. Thus, the realist understanding of a world comprised of centers and losers expanded to include multiple actors and a distribution of power in space. Similarly, another, critical geopolitical, perspective maintained that power distribution is not limited to the state apparatus or its geographic position but is also distributed among multiple actors and their respective attitudes. This perspective posited geopolitics as embedded in and resulting from everyday discourses, rather than solely resulting from specific territories or institutions and their finite resources.[100] This is in line with geographer Merje Kuus' assertion that critical geopolitics invites one "to more closely consider the daily production of geopolitical knowledge—the mundane repetition of claims not just in official speeches, but also around the coffee machine."[101] The critical reflective approach thus opposes realist epistemology by proclaiming that reality is inseparable from the observer, and thus subjectively produced.[102] Eventually also realists acknowledged that cultural factors, such as attitudes and behaviors in a state, could shape state strategies and interests.[103] Thus,

95 Nortautas Statkus and Kęstutis Paulauskas, *Tarp geopolitikos ir postmoderno: kur link sukti Lietuvos užsienio politikai* (Vilnius: Generolo Jono Žemaičio Lietuvos karo akademija, 2008), pp. 7–8.

96 Statkus and Paulauskas, *Tarp geopolitikos ir postmoderno*, pp. 7–8.

97 Statkus and Paulauskas, *Tarp geopolitikos ir postmoderno*, p. 10.

98 Joe Painter, "Geographies of Space and Power," in *The Sage Handbook of Political Geography*, Kevin R. Cox, Murray Low, and Jennifer Robinson, eds. (London: Sage, 2008), p. 60; Saul Bernard Cohen, *Geopolitics: The Geography of International Relations* (Lanham, MD: Rowman & Littlefield, 2014), p. 1.

99 Česlovas Laurinavičius, Egidijus Motieka, and Nortautas Statkus, *Geopolitikos Įvadas: Tarptautinės Politikos Kurso Metodinė Priemonė* (Vilnius: Eugrimas, 2002), pp. 7–12.

100 Gearóid Ó Tuathail,"Introduction: Thinking Critically about Geopolitics," in *The Geopolitics Reader*, Gearóid Ó Tuathail, Simon Dalby, and Paul Routledge, eds. (London: Routledge, 1998), p. 11; Painter, "Geographies of Space and Power," p. 65.

101 Merje Kuus, "Critical Geopolitics," in *Oxford Research Encyclopedia of International Studies*, ed. Nukhet Sandal (Oxford: Oxford University Press, 2010), p. 14.

102 Statkus and Paulauskas, *Tarp geopolitikos ir postmoderno*, pp. 8–9.

103 Statkus and Paulauskas, *Tarp geopolitikos ir postmoderno*, pp. 11, 13–14.

while the pluralist realist geopolitical approach expanded the narrow scope of state realist geopolitics by multiplying the number of actors that contribute to the geopolitical distribution of power, critical geopolitics introduced a reflective analytical focus on the everyday as a site where geopolitics is also practiced and shaped. What unites all of these perspectives is their geopolitical nature, namely, the interest to imagine, exercise, and shape state power in a world bound by geography.

I link the concepts of geopolitics and imaginaries because a focus on situated utterances of a geopolitical nature allowed me to explore ubiquitous field utterances from key telecom industry stakeholders within the context of geographically distinct and nationally situated actors and the resulting tensions that were implied in stakeholder utterances. I map different and contradictory geopolitical imaginaries that I encountered in my fieldwork research with telecom industry providers, which led me to designate these geopolitical imaginaries as "strange." I situate these concepts within Zygmunt Bauman's notions of "stranger" and "strange"—which was also explored by sociologist Georg Simmel[104]—to connote both specific people and designate a part of the logic of modernity as ambiguous, indeterminate, and ultimately evading a strict binary imaginary of orderly societies. Bauman asserts that "No binary classification deployed in the construction of order can fully overlap with essentially non-discrete, continuous experience of reality. The opposition, born of the horror of ambiguity, becomes the main source of ambivalence."[105] He describes this experienced quality of modernity as strange, because it avoids the clear binary distinctions upon which modern states are constructed, such as good and bad, and friend and enemy. For Bauman, the stranger "calls the bluff of the opposition between friends and enemies as the complete mappa mundi, as the difference which consumes all differences and hence leaves nothing outside itself."[106] I use this concept of the stranger as a means to employ an ambiguous and indeterminate logic in conceptualizing geopolitical imaginaries. This is essential to my specific research because field-based geopolitical imaginaries do not result in one national geopolitical imaginary of Lithuanian state. Instead, the geopolitical imaginaries that I mapped in the field and present in this chapter disturb the possibility of one national imaginary and one story by presenting contradictory, strange geopolitical imaginaries on the ground. Thus, strange geopolitical imaginaries that emerge in the field of telecom industry stakeholders also correspond to a messy geopolitical perspective, because they produce contradictory and indeterminate geopolitical imaginaries on the ground.

Situated geopolitical imaginaries in this book often occur through fieldwork-based stories, beliefs and perceptions about geographically distinct telecom industry actors and their roles in Lithuanian Internet development. This chapter maps and describes place-based geopolitical imaginaries from the bottom up and conceptualizes them as framing the Internet as infrastructure. I do not focus on if, and how, these imaginaries were used for specific political purposes. I also do not subsume imaginaries into the

104 Simmel, "The Stranger."

105 Bauman, "Modernity and Ambivalence," p. 151.

106 Bauman, "Modernity and Ambivalence," p. 145.

field of infrastructuring practice. Rather, I contend that ambiguous, strange, geopolitical imaginaries coexist in and frame the broader field of the Internet as infrastructure comprised of various stakeholders.

1.3.3 Critical Negotiations

In the third empirical chapter, I focus on the privatization of Lithuania's Internet by its main telecom operator, Lietuvos Telekomas, as an event that drastically changed Lithuania's telecom industry in terms of ownership, labor relations, and technical conditions. Within this, I explore critical negotiations undertaken by key telecom stakeholders, such as trade unions, private citizens, politicians, academics, and industry employees, which I researched through archival material, memoirs, and interviews. By focusing on critical negotiations concerning Lietuvos Telekomas privatization, I illustrate how the field of Internet as infrastructure consists not only of infrastructuring practices and geopolitical imaginaries, but also comprises ongoing critical negotiations in which particular justifications and future visions of multiple industry stakeholders are discernable in intensified and visible manifestations during crucial events such as privatization.

In this context, it is helpful to first briefly explore the meaning and usage of the term "critique" in social sciences in order to understand how and why I use the term "critical negotiations" in my final empirical chapter, which is inspired by the diversification of critique within the turn to everyday critique.

Critique is associated with Greek verb *krino* and adjective *kritikos*, which both describe a capacity to distinguish and judge in realms such as the judicial and political, while the substantive *kritikos* corresponds to the analysis of textual practices.[107] The meaning of "critique" eventually expanded from these particular scenes, and its characteristic functions—analysis and judgment making—became increasingly self-reflective,[108] namely applicable to any societal practice. Sociologist Georg Vobruba posits that the concept of critique moved away from textual interpretation involved in an intellectual praxis of distancing to a critique of societal conditions in the eighteenth-century Enlightenment era.[109] Likewise, sociologist Gerard Delanty asserts that disciplines such as sociology also emerged as theoretically grounded critique of society in the same century. Sociology's early history consists of influences from the German philosophical tradition (i.e., Immanuel Kant, Friedrich Hegel, and Karl Marx),[110] and, according to Delanty, comprises four main forms: critique as practiced by Enlightenment intellectuals, critique as positive science of society influenced by Immanuel Kant, immanently reflective Hegelian-Marxist critique, and critique as ongoing obtainment of knowledge (Bildung).[111] Delanty outlines five main types of critique prevalent in cur-

107 Georg Vobruba, "Soziologie und Kritik," *Soziologie* 42, no. 2 (2013), p. 149.

108 Sverre Raffnsøe, "What is Critique? The Critical State of Critique in the Age of Criticism" (Working paper no 1—2015, Copenhagen Business School, Copenhagen, 2015), pp. 1–8, 11–12.

109 Vobruba, "Soziologie und Kritik," pp. 151–152.

110 Gerard Delanty, "Varieties of Critique in Sociological Theory and Their Methodological Implications for Social Research," *Irish Journal of Sociology* 19, no. 1 (2011), p. 69.

111 Delanty, "Varieties of Critique in Sociological Theory and Their Methodological Implications for Social Research," pp. 69–70.

rent social sciences: normative-diagnostic critique stemming from the tradition of the Frankfurt school; critical realism; Pierre Bourdieu's critical sociology; Michel Foucault's genealogical critique; and the turn to critical practices that, he argues, resulted from the cultural turn that diversified the meaning of critique.[112]

The turn to critical practices was famously explored through a specific form of critical sociology, the sociology of critique, which was furthered through disciples such as sociologists Luc Boltanski and Laurent Thévenot, whose approach to critical practices is arguably one of the most currently prolific in the social sciences.[113] While Delanty describes their focus on critique within society as "a loss for sociology,"[114] due to its micro-focused nature and absence of critique that condemns structural inequalities and fosters collective struggles,[115] Vobruba aptly claims that such focus also understands society—and I would add, its media technologies, such as the Internet as infrastructure—as also made by people.[116] Thus, it seems that scholarly focus on critique throughout the course of history has descended from the top of the academic mountain to the valley of diverse people with agency for critique. In this context, Boltanski and Thévenot explore critique as mundane and expressed during everyday critical practices. For them, critique comprises ongoing societal justifications that are based on plural worlds and their different life forms, which constantly denounce one another. For Boltanski and Thévenot, not every social situation comprises critique, but critique is an everyday praxis. They state that "human capacity for criticism becomes visible in the daily occurrence of disputes over criteria for justification."[117] According to Delanty, Boltanski and Thévenot perceive critique as a highly diversified capacity of ordinary people that is practiced in everyday contexts in order to "justify the views, beliefs and attitudes they have about specific issues with reference to some notion of a common good or a principle of a shared interest."[118] Thus, Boltanski and Thévenot link justification, critique and the notion of generality. They assert that "To criticize or to justify, the persons have to extract themselves from the immediate situation and rise to a level of generality."[119] In this context, to criticize means to exercise claims that are oriented toward a particular horizon of justice. In the absence of a transcendental aspiration of justice—and there is a diverse array of spheres of justice that people strive for when

112 Delanty, "Varieties of Critique in Sociological Theory and Their Methodological Implications for Social Research," p. 71.

113 Delanty, "Varieties of Critique in Sociological Theory and Their Methodological Implications for Social Research," p. 84; Stephan Lessenich, "Soziologie–Krise–Kritik: Zu Einer Kritischen Soziologie Der Kritik," *Soziologie-Forum der Deutschen Gesellschaft für Soziologie* 43, no. 1 (2014), p. 18.

114 Delanty, "Varieties of Critique in Sociological Theory and Their Methodological Implications for Social Research," p. 71.

115 Delanty, "Varieties of Critique in Sociological Theory and Their Methodological Implications for Social Research," p. 86.

116 Vobruba, "Soziologie und Kritik," p. 165.

117 Luc Boltanski and Laurent Thévenot, "The Sociology of Critical Capacity," *European Journal of Social Theory* 2, no. 3 (1999), p. 359.

118 Delanty, "Varieties of Critique in Sociological Theory and Their Methodological Implications for Social Research," pp. 85–86.

119 Luc Boltanski and Laurent Thévenot, "The Reality of Moral Expectations: A Sociology of Situated Judgement," *Philosophical explorations* 3, no. 3 (2000), p. 213.

they criticize—critique could become "an egoistic confirmation . . . or an ad hominem insult . . ."[120]

In the third empirical chapter, "Critical Negotiations," I am inspired by Boltanski and Thévenot's turn to mundane critical practices and their conceptualization of critique as justifications that not only judge, but also strive for a more just horizon. By arguing that critical negotiations intensify during crucial events of change, and exploring the crucial event—Lietuvos Telekomas's act of privatization, which shaped the telecom industry into its current form—and the resulting critical negotiations, justifications and future visions implied in it, I illustrate how key stakeholders (telecom industry workers, managers, politicians and academics) in this privatization process criticized it on the ground. I explore these diverse critical negotiations through primary archival sources, memoirs, and fieldwork interviews. In this chapter, I argue that the Internet as infrastructure development is always embedded in critical negotiations, which become intensified and visible during crucial moments of change, such as privatization, and thereby disclose the various future visions at stake in developing infrastructure. Thus, the path of infrastructure development is not an unproblematic undertaking, but rather a convoluted process of societal struggle embedded in different visions of the future.

In this book, I thus situate the Internet through the lenses of infrastructure with a focus on the telecom industry in Lithuania. I do so by exploring the Internet as developed and maintained by people with the help of things in particular places and as a result of infrastructuring practices, geopolitical imaginaries, and critical negotiations. This situated understanding thus demonstrates how the Internet as infrastructure is maintained and shaped in Lithuania. I situate the Internet as infrastructure in Lithuania through fieldwork in order to illustrate how it happens in particular places and is comprised of multiple bottom-up labor practices, geopolitical imaginaries, and critical negotiations; and how it is not only a national, but also corporate, academic, and societal undertaking. Within this, field research provides novel, unpublished, and culturally attentive material about important digital media technology development and maintenance—the Internet—in post-socialist Lithuania by seriously considering fieldwork.

Lastly, one may ask: if I carried out fieldwork-based research, why did I engage in the theoretical analysis of terms such as "infrastructuring," "practice," "geopolitical imaginaries," and "critical negotiations"? Do these conceptual reflections serve to further remove us from actual experiences in the field? If I chose to omit these conceptual reflections, I would need to claim that there is no mediating screen between the material that I gathered in the field and my descriptions and analysis, which is false. I did not conduct fieldwork in order to grasp objective reality but rather to creatively situate the Internet as infrastructure. The following text is a result of fieldwork that was carried out by accessing different sites, negotiating with fieldwork participants, observing various objects, using multiple methods, and evaluating the material against the backdrop of theoretical and empirical knowledge from infrastructure studies, STS, organizational theory, ethnographically-inspired digital media research, and Eastern European studies. Exploring the Internet as infrastructure through a situated fieldwork perspective

120 Boltanski and Thévenot, "The Reality of Moral Expectations," p. 214.

allows me investigate and empirically analyze actors, places, and temporalities without claiming to extract laws that form the Internet as infrastructure. Analysis of the Internet as infrastructure therefore results from a research practice that collects fieldwork material, organizes it, and links it with concepts.[121] The results, relying on the claim made by anthropologist Stefan Beck et al., are contingent, particular, and have an argumentative character.[122] My research has resulted in three main motifs of Internet as infrastructure study—labor practices, geopolitical imaginaries, and critical negotiations—which emerged after fieldwork, coding processes, and ongoing theoretical and methodological interventions. Following this, I enact my research by connecting different aspects of Internet as infrastructure (infrastructuring practices, geopolitical imaginaries, critical negotiations), material types (interviews, fieldwork reports, archival documents), and fieldwork sites from a situated stance outlined above. My focus on infrastructure research is foremost a means to abandon methodological formalism via the compelling stories of others, but also a chance to reflect upon the concepts and methods I use to frame the research. In short, it means allowing oneself to inhabit the research context and experience the unexpected by following an open-ended, situated fieldwork, but to also remain aware of one's personal involvement with research participants and theoretical conceptualizations: in the end it is a subjective formation of research results. This means carrying out fieldwork and using concepts, but also explaining methodology and methods.

1.4 Internet as Infrastructure: Methodological Openings

I began my fieldwork in March 2017 by traveling from Berlin to a hacker space in Vilnius. I have lived in Germany since my mid-twenties, but I was born and grew up in Vilnius, which helped me to plan, prepare, and execute my research mostly in my mother tongue, Lithuanian. In the hacker space, which has already moved to another location since the time of my fieldwork, people were kind enough to share contacts of those involved in the telecom industry. With these contacts in hand, my research developed, and I started reaching out to people for expert interviews and learning about potential new interviewees from previous ones. After one such interview, and due to my persistent contact, I managed to enter telecom corporation Telia Lietuva and observe labor practices that maintain the Internet by spending two months at different company departments from June to July 2017 and February to March 2018. In addition to the interviews and fieldwork at Telia Lietuva, I also carried out archival research. This archival research, which constitutes one type of fieldwork material and will be outlined in depth later, often occurred as a surprise. Not all of the archives I visited were easily accessible,

121 Similarly to Kalthoff's et al. attempt to work with and solve the tension between "empirical" and "theoretical" research (Herbert Kalthoff, Stefan Hirschauer, and Gesa Lindemann, *Theoretische Empirie: Zur Relevanz Qualitativer Forschung* (Berlin: Suhrkamp, 2008).

122 Stefan Beck, Jörg Niewöhner, and Estrid Sörensen, "Einleitung," in *Science and Technology Studies: Eine Sozialanthropologische Einführung*, Stefan Beck, Jörg Niewöhner, and Estrid Sörensen, eds. (Bielefeld: transcript Verlag, 2014), pp. 12–16, 24.

and one of the archives had even migrated to various different institutions throughout the course of my fieldwork. Accordingly, both my initial access and the overall fieldwork could not be repeated again in the same form as my 2017–2018 research. In one of my evening fieldwork diaries, I attempted to tame my anxiety about this constantly shifting ground. I wrote that "It is a kind of multi-sited, unplanned, half-planned research. All of the plans are shifting throughout the week, and it is fine."[123]

My overall multi-sited fieldwork began in March 2017 and continued until October 2018 and comprised five visits from Germany to Lithuania. I started with explorative interviews in March 2017, continued with participatory observation at Telia Lietuva and short-term archival work from June to July 2017, and followed this up with interviews in November 2017. From February to March 2018 I carried out the second part of my participatory observation at the company, which was followed by interviews and archival work. In October 2018, I carried out the last part of my fieldwork: local and relevant literature research at the Martynas Mažvydas National Library of Lithuania, Vilnius. My fieldwork material consists of field reports, diaries, memos, interview transcripts, archival documents, audio and photo recordings in Lithuanian and English through which I explored what people do, how they do it, what this tells about their actions, and how they criticize and geopoliticize actions related to the Internet as infrastructure development, production, and maintenance. Especially interviews concerning key contributing actors to the telecommunications sector development in post-socialist Lithuania proved a more difficult task. Unlike flashy articles in the news media about speedy network development or the occasional celebration of heroic individuals who developed technological innovations, the majority of network maintainers work silently and allow their accomplishments to support the relatively few people celebrated by the media.

Thus, I—a post-local, an emigrant—carried out this research in an open-ended and bottom-up manner. This research is not representative, because it is based on dynamic fieldwork material that emerged and was evaluated over time. Consequently, the fieldwork material I collected was neither raw nor objective, because its emergence was always guided by research problems, my own academic and cultural background, the willingness of others to participate and luck, which I definitely needed in order to get into Telia Lietuva for participatory observation or carry out multiple interviews outside the company.[124]

This research is thus based on a combination of multiple research methods that I used in different times and places in Lithuania. I used expert interviews to enter the field and gather diverse views about Internet development in post-socialist Lithuania throughout my fieldwork. I also carried out participatory observation at Telia Lietuva in order to observe how the Internet is maintained on a daily basis at a leading telecom corporation. Additionally, I carried out research in multiple archives in two Lithuanian cities—the capital, Vilnius, and the second-largest city, Kaunas—in order to find relevant material that would help me ground findings from interviews and participatory observation field notes in the past. Eventually I combined these sources in my three

123 Evening Diary, Miglė Bareikytė, 14 February 2018.

124 Jochen Gläser and Grit Laudel, *Experteninterviews und qualitative Inhaltsanalyse als Instrumente rekonstruierender Untersuchungen* (Wiesbaden: VS Verlag für Sozialwissenschaften, 2006), pp. 21–22.

empirical chapters, although each chapter is framed by its respective leading source material. "Everyday Infrastructuring" is based chiefly on participatory observation at Telia Lietuva, "Geopolitical imaginaries" is centered primarily on a combination of expert interviews and participatory observation, and "Critical Negotiations" is based predominantly on archival research.

It is usually not disciplines, methods, or theories that play a crucial role in an ethnographic approach, but rather the attention given to a particular field. In other words, an ethnographer has to explore the field according to its dynamics and adapt their methods to fit the field.[125] According to anthropologist Michael Angrosino, "good ethnography is the result of triangulation—the use of multiple data collection techniques to reinforce conclusions."[126] While I used different methods to explore the field of telecom industry stakeholders, I approached the notion of the field of ethnography with caution, because I believe there is no field that can be accessed by a neutral observer.[127] Thus, in this ethnographically inspired research, I never addressed a mystical "field," but, akin to anthropologists Jeanette Blomberg and Helena Karasti's argument that fields emerge during fieldwork process and can take unexpected forms,[128] I combined fieldwork experiences with different methods and theories, the process of evaluation, coding, literature research, and writing in order to form a field and situate my research inquiry via writing. In the following book, I present this evaluated and analyzed material to develop a particular depiction of the Internet as infrastructure. I show an illustration of Internet labor practices, geopolitical imaginaries, and critical negotiations that are based on particular fieldwork experiences and material collected in Lithuania from 2017 to 2018. This picture develops a presentation of Internet as infrastructure in Lithuania that is not an objective representation but is rather purposefully focused on complexities that emerge when the Internet as infrastructure is analyzed by zooming in on its situated issues through ethnographically-inspired fieldwork.[129]

1.4.1 Expert Interviews

At the beginning of my research, my knowledge of the telecommunications industry field was mostly research and media-informed. For this reason, I used in-depth interviews as an initial method to get into the field. I aimed to meet experienced telecom industry veterans—the academics, politicians and business people who support and develop the Lithuanian telecom industry—in order to get a better overview of the field. I thus began my interview process in March 2017 with explorative expert interviews,

125 Gläser and Laudel, *Experteninterviews und qualitative Inhaltsanalyse als Instrumente rekonstruierender Untersuchungen*, pp. 77–78.

126 Michael Angrosino, *Doing Ethnographic and Observational Research* (Thousand Oaks, California: SAGE Publications, 2007), p. 51.

127 Jane Elliott, *Using Narrative in Social Research: Qualitative and Quantitative Approaches* (London: SAGE Publications, 2005), pp. 18–20; Karasti and Blomberg, "Studying Infrastructuring Ethnographically," p. 234.

128 Karasti and Blomberg, "Studying Infrastructuring Ethnographically," pp. 241–242.

129 Uwe Flick, *Managing Quality in Qualitative Research* (London: SAGE Publications, 2007), pp. 45–46.

which were then followed by more organized, semi-structured interviews throughout my fieldwork visits. I conducted expert interviews with people from Lithuania's telecommunications industry who have been directly involved in Internet development and maintenance processes in post-socialist Lithuania's two biggest cities, Vilnius and Kaunas. During my research, I conducted 33 interviews, 22 of which were in-depth interviews with various industry stakeholders from the fields of academia, politics, and business and 11 of which were interviews carried out at Telia Lietuva. I used snowball sampling to recruit interviewees, each of whom were previously informed about my research purpose and had to agree to the use of their interview in my research. The interviews were long, open, and in-depth and thus allowed me to collect the firsthand stories and critical judgments of those who actually contributed to and experienced the development of the Internet in Lithuania. During each interview I aimed to collect, confront, and clarify interviewees' answers in order to understand their opinions beyond mere positive self-representation. I asked interviewees to describe their activity in Lithuania's telecom industry; describe and share their opinions about the main actors and events in both Soviet and post-socialist Lithuania's telecom sector; discuss decisive internal and external factors and actors in the development of Lithuania's telecom industry; and share their opinions about the differences between academic and commercial networks in Lithuania. These general questions were refined and made more specific through concrete questions.

According to social scientists Jochen Gläser and Grit Lauder, expert interviews should be carried out with people who belong to the elite strata of their respective field of analysis and, consequently, have gained substantial information about that field through their position in the field. Expertise is thus not based on a higher position in organizational hierarchy, but because of special knowledge on the researched issue gained through life practices.[130] Stefan Beck et al. question this separation between the knowledge of experts and lay people from a STS perspective; they complicate this division by asserting that knowledge emerges in a continuum of culturally situated, specific practices.[131] I use the designation of "expert interviews" to describe interviews that were used to gather information about specific events, situations, and issues in the telecommunications field from a diverse field of people with intensive experience in the industry, such as telecommunications industry advertisers, managers, politicians, academics, and others.[132] These interviews allowed me to access different narratives and judgments of the Internet as infrastructure development and maintenance than the ones found in historiographies, scholarly articles, or during participatory observation of labor practices. Their interpretation allowed me to construct a contemporary picture of the views of Lithuania's engineers, academics, and businesspeople and additionally helped me map geopolitical imaginaries of the telecom industry in Lithuania.

130 Gläser and Laudel, *Experteninterviews und qualitative Inhaltsanalyse als Instrumente rekonstruierender Untersuchungen*, pp. 9–10.

131 Beck, Niewöhner, and Sörensen, "Einleitung," p. 14.

132 Ulrike Forschauer and Manfred Lueger, "Expert Interviews in Interpretive Organizational Research," in *Interviewing Experts*, Alexander Bogner, Littig Beate and Menz Wolfgang, eds. (London: Palgrave Macmillan UK, 2009), pp. 220–223.

Although the snowball sample method I used to find interviewees carries the warning of resulting in biases by representing only a network of well-connected people that refer to each other, I aimed to limit this bias by speaking with people from various telecom sector fields (academia, politics, business) who not only cooperate, but also compete with and criticize one another in interviews.[133] I met with people who all have worked in the Lithuanian telecom industry, but they were of varying ages, professional affiliations, and knowledge backgrounds. The sites in which these interviews were conducted were also diverse: I spoke with experts in offices, cafes, and online. Thus, in my sample, interviewees come from small and big businesses, official politics, non-governmental organizations, and academia. One obvious bias of this book that resulted from limited resources is the lack of pointed analysis of female involvement in Lithuania's Internet development. In other words, limited discussions of female participation in developing and maintaining the Internet in Lithuania should not be perceived as objective representation of the circumstances, but rather as a starting point for future research.

Although the majority of participants come from the realm of business, many interviewees who currently work in business (or in politics) previously worked in academic institutions or started their academic careers after ending their political careers. It should thus be noted that the interviewees' sectorial occupation had often changed over time. In this context, Table 1 represents a sector in which the interviewees' work was mostly related to Internet development and maintenance. As it is visible in Table 1, most (95 percent) of the interviewees were male and came from the realm of business, which hints at the existing gender gap and importance of private companies in the current telecom industry. It should also be noted that because a few interviewees requested anonymity, I decided to anonymize all interviewee names by replacing them with pseudonyms.

Table 1. Summary of Interviews.

Sector of Occupation	**Public Sector (Academia, NGO)**	**Politics**	**Business**
Number of Interviewees	5	5	12 (+11 fieldwork interviews from Telia Lietuva)
Time Employed in the Telecom Sector	>10 years	>10 years	>10 years
Male/Female	5/0	5/0	22/1

Source: Author's data.

133 Claudia S. Lopes, Laura C Rodrigues, and Rosely Sichieri, "The Lack of Selection Bias in a Snowball Sampled Case-Control Study on Drug Abuse," *International journal of epidemiology* 25, no. 6 (1996), p. 1268.

1.4.2 Participatory Observation and Interviews at Telia Lietuva

In addition to expert interviews, I also gained access to participatorily observe Lithuania's biggest telecom provider, Telia Lietuva. Telia Company currently owns 88.2 percent of Telia Lietuva.[134] Telia Company was founded in 1853 in Sweden and is currently active in seven countries: Denmark, Estonia, Finland, Latvia, Lithuania, Norway, and Sweden.[135] The largest current owner of Telia Company is the Swedish government, which as of 2021 held 39.5 percent of its shares.[136] When I did the first part of my participatory fieldwork at the company in summer 2017, 2200 people were working at Telia Lietuva. Formally, the structure of Telia Lietuva is hierarchical, with a top-down division of labor and clearly defined positions of authority. As of 2017, the company was managed by Telia Company and the CEO of Telia Lietuva, which controlled 11 departments: Finance, Human Resources, Technologies, Group Services and Operations, Corporate Affairs, Risk Management, Business Development, Client Process, Law, Private Clients, and Business Clients. The list of the departments is not definite, because the structure and the name of the company constantly changes. For example, the company changed its name from Lietuvos Telekomas to Teo in 2006 and from Teo to Telia Lietuva in 2016.[137]

Participatory observation of labor practices at Telia Lietuva was thus another method I used to collect material in order to explore the Internet as infrastructure on the ground. I wanted to conduct my participatory observation at this particular company because it is *de facto* the most influential telecom corporation in Lithuania and constantly expands its networks.[138] In other words, in order to describe how the Internet is infrastructured, I was not only interested in expert representations, but also in accessing the Internet's maintenance labor practices through participatory observation. Despite these goals, access to Telia Lietuva could not be planned in advance. Usually, such large telecom companies do not allow anyone external to enter their spaces out of a grounded fear of competition and information leaks. I got access only after I conducted an interview with one employee and asked him repeatedly if it was possible to conduct participatory observation at the company. In the very

134 Telia Company, "Lithuania," *Telia Company*, accessed 15 January 2020, https://www.teliacompany.com/en/about-the-company/markets-and-brands/lithuania/.

135 Telia Company, "About the Company," *Telia Company*, accessed 24 July 2021, https://www.teliacompany.com/en/about-the-company/.

136 Telia Company, "Shareholders," *Telia Company*, accessed 24 July 2021, https://www.teliacompany.com/en/about-the-company/corporate-governance/shareholders/.

137 "'Lietuvos Telekomas' pakeitė pavadinimą į 'Teo Lt' (papildyta)," *Lrytas.lt*, published May 5, 2006, accessed October, 10, 2019, https://verslas.lrytas.lt/-11468135401145248654-lietuvos-Telekomas-pakeit%C4%97-pavadinim%C4%85-%C4%AF-teo-lt-papildyta.htm.; "'Teo Lt' keičia pavadinimą," *Delfi.lt*, published 15 December 2016, accessed 11 October 2019, https://www.delfi.lt/verslas/verslas/teo-lt-keicia-pavadinima.d?id=73183164.

138 Lietuvos Respublikos ryšių reguliavimo tarnybos strategijos departamento ekonominės analizės skyrius, *2019 m. II ketvirtį vykdytos elektroninių ryšių veiklos ataskaita pagal elektroninių ryšių tinklų ir (arba) paslaugų teikėjų pateiktą informaciją, Nr. LD-2314* (Vilnius: Lietuvos Respublikos ryšių reguliavimo tarnyba, 2019), p. 7, https://www.rrt.lt/wp-content/uploads/2019/09/Ataskaita_2019_II_ketvirtis.pdf.

beginning, I spent one day observing infrastructure maintainers after signing a non-disclosure agreement. Two months later, I secured a two-month tripartite contract between Leuphana University, Telia Lietuva, and myself with the stipulation that I conduct participatory observation as an "intern." I signed a short-term contract and a non-disclosure agreement with the company, although I was officially employed in Germany. Prolonging this participatory observation for a third month was not possible due to Telia Lietuva's set time limits. In short, I could conduct my research at the company only after signing multiple documents, which illustrates that the field was cautious of outsiders. Nevertheless, after I got inside, people willingly conversed with me: they allowed me to join their meetings, field trips, lunches, and workshops; they commented on my field reports; and they participated in fieldwork interviews.

Most of the time, I detailed my observations in the form of field notes (reports, memos, and diaries) and handwritten notebooks. In my field reports, I wrote down my observations regarding what people did, said, how they interacted with one another, and the environment in which these interactions took place. In addition to these fieldwork reports, I also wrote fieldwork diaries and memos in my notebook. In fieldwork diaries, I described my emotional status during my time at Telia Lietuva, while I used memos to outline especially important concepts and ideas from the field. At the company, I not only observed and described worker's everyday labor practices, but also conducted on-site interviews with workers from the company, which are indicated in Table 1. In these interviews, I asked focused questions about employee's work experiences or asked them to explain actual events, concepts, and remembrances concerning the telecom industry's development. I used material and inspiration gathered at Telia Lietuva for the whole book, but predominantly for two chapters, "Everyday Infrastructuring" and "Geopolitical Imaginaries."

My internship mentor, whom I had interviewed earlier in an expert interview, originally guided my movement at the company. He helped me enter the company and establish contact with company departments by reaching out to them directly (as the company employs a few thousand workers in Lithuania, its offices were spread throughout Vilnius during my fieldwork). He also took the time to explain the company's corporate structure, find relevant departments regarding Internet maintenance—as not all departments at the company work with the Internet—and critically engaged with my observations. At first, I shadowed the practices of those who maintain the Internet on a physical level: infrastructure builders, planners, and installers. Afterwards, I observed and interviewed workers from managing departments in which the Internet is maintained as a product and service.

During my participatory observation process at Telia Lietuva, I particularly focused my attention on what I term the Physical Network and Head Office departments, where the Internet is maintained as a physical network and product. I visited the Physical Network Department and its different teams for a month from June to July 2017 and observed how workers maintain observable physical telecommunications networks that create a material basis for Internet services. I observed the laying of cables as well as installing, documenting, and connecting practices that require either direct physical work or conversations about physical work. My observations consisted of spending time with respective employees in their offices and shadowing them in their immediate work en-

vironment, such as offices, server rooms, fields, and private customer homes. I also spent time with network transmitters, who develop and distribute streaming services, a practice that serves to distance them from tangible network maintenance practices and likewise creates a basis for the emergence of the Internet as a product and service. In this context, I mostly observed computer-based work and conversed with employees. During the second part of my research at Telia Lietuva, which took place from February to March 2018, I moved from telluric physical Internet production observation to the study of Internet maintenance as a product and service by observing mostly communicative labor at the Head Office. There, I shadowed employees in various meetings, which comprised one of the main Head Office work forms, and conversed with the employees at their work places.

Thus, I termed these contexts "Physical Network Department" and "Head Office" to describe multiple departments and teams according to their primary labor practices. These titles also stress two different types of labor practices—manual and communicative, and their situated contingencies that illustrate their unexpected, messy character—that are used to maintain the Internet by these two groups of employees and types of labor that in practice comprise many of the company's departments. In the first chapter, "Everyday Infrastructuring," I illustrate how Internet infrastructuring can be explored through participatory observation at its maintenance sites by sharing vignettes of everyday manual and communicative labor practices. Vignettes are short descriptive stories that I wrote after material collection and analysis. They are based on my field experiences, field reports, and memos. I ground the vignettes in my field reports written throughout my stay at the company and analyzed thereafter. I wrote the vignette texts with participant pseudonyms in a manner that stresses the diversity of place-based practices, which are also supported and contextualized by relevant scholarly literature. Additionally, I cite relevant excerpts from my fieldwork conversations and interviews that I bring back into the vignettes. Thus, vignettes are first used to illustrate the multiplicity of practices that I observed at the company, but also to illustrate a broader argument, namely that the Internet is a situated emergent media technology that has to be maintained on a daily basis through diverse manual and communicative labor practices and their situated contingencies. Thus, Internet infrastructuring is a result of human labor: hard, sweaty, precise, lacking, and full of jokes, (geo)politics, and negotiations.

1.4.3 Archival Work

Throughout my fieldwork, I accessed different archives relevant to telecommunications development in Lithuania.[139] In Lithuania, there is no one place where all documents

139 I visited Lithuanian Central State Archive, Lithuanian State Modern Archives, Archives of Kaunas City Museum, 7th Fort of Kaunas Fortress, Online archive of Communications Regulatory Authority, and got access to the private photo archive of Vidar Berkeland. In the bibliography, I cite published primary sources, such as memoirs, the Communications Regulatory Authority (CRA) online archive of laws and reports under categories "Edited Books," "Book sections," "Government documents, Legal Rules and Regulations," and "Reports." I cite unpublished primary sources from the physical archives I visited under the category "Unpublished documents in physical archives."

related to the telecom industry development are stored, but rather, material is dispersed in various archives. In these archives, I accessed documents outlining issues including: local telecom industry development, the maintenance and repair of Lithuania's telecommunications field, academic research on Internet network development, private memories of the first establishment of Lithuania's Internet connection, and tensions among industry participants. In the archives, I photographed archival documents, which I later reviewed and analyzed. Specifically, I found documents related to the Ministry of Communications and Informatics, the public company Lietuvos Telekomas, the LITNET academic network, the opinions of various actors (academic, governmental, citizens, and trade unions), and criticism of Lietuvos Telekomas privatization, among other topics. In addition to this official archival information, I used the *Jie kūrė Lietuvos ryšius: biografinės apybraižos* (They Developed Lithuanian Communications: Biographical Descriptions, hereafter *Jie kūrė Lietuvos ryšius*) as an important historical primary source.[140] First published in 2008 by the Lithuanian Informatics Communication and Electronics Society, *Jie kūrė Lietuvos ryšius* is a memoir book that comprises over one hundred unedited remembrances of telecom industry stakeholders: producers from the realms of academia, business, and politics.[141] Ultimately, selected and coded archival findings particularly helped me explore the third chapter, "Everyday Critique," but I also used some of the material in two other empirical chapters, "Everyday Infrastructuring" and "Geopolitical Imaginaries."

Fieldwork material was coded following a grounded theory approach by coding, revisiting, clustering, and developing networks between prominent codes that were organized according to their themes, which, in accordance to their content and corresponding literature, resulted in three empirical chapters. For example, geopolitical imaginaries motif emerged after I coded all of my material and noticed how often the sentences related to codes that marked different roles of geographically specific actors were expressed in the field. Afterwards, I looked into and analyzed the chosen coded material in depth, grouped the codes, and related them to relevant published research. I translated the interview excerpts, field notes, and archival material that I use in this book from their original Lithuanian; these have been lightly edited in places for clarity. I also translated citations from sources published in Lithuanian language into English that were important to be represented as accurately as possible, and that otherwise would not be accessible for international readers. While most of the interviews were conducted in Lithuanian and translated, one was conducted in English[142]; field notes were written in Lithuanian and English, and comprise observations and hand-written citations from the field. Grammar of quoted citations from the field was slightly altered for legibility. Where needed, the interview grammar has been altered slightly for legibility, marked with square brackets.

In summation, I use these three empirical chapters to situate the Internet as infrastructure in post-socialist Lithuania. I develop an argument that the Internet as

140 *Jie kūrė Lietuvos ryšius*, Basevičius, Kuzma, and Žintelis, eds.

141 In this book I cite excerpts from 13 different memoirs from *Jie kūrė Lietuvos ryšius* that were especially pertinent to my research.

142 Interview with Romas, 5 February 2018.

infrastructure in Lithuania comprises ongoing critical negotiations, strange geopolitical imaginaries, and complex infrastructuring practices. With this research, I aim to de-universalize: I focus on the situated Internet by concentrating on place-based key stakeholders often omitted in media infrastructures research focused predominantly on Western Europe and the US.

Finally, I want to address how and when I decided to complete my fieldwork. I stopped carrying out my research when I became aware that I had spoken with the key stakeholders from the field and visited all the relevant accessible archives. My participatory observation at Telia Lietuva was initially planned for one month, and although I managed to stay for a second month, it was not possible to prolong my stay further. While my fieldwork allowed me to gain access to relevant material, the telecom industry's work remains ongoing. Thus, while this book delivers empirical and conceptual contribution to Internet infrastructure studies, it is not exhaustive, because the nature of the field is that of perpetual change and transformation.

Table 2. Fieldwork Material Summary.

Fieldwork Material Summary
Ca. 800 pages (Times New Roman, font 12, line spacing 1.5) of interview transcripts: 33 interviews (22 expert and 11 fieldwork interviews at Telia Lietuva, ca. 50 hours). 12 of the interviews were transcribed by me due to sensitive data and requests for anonymity and 21 were transcribed externally, comprising overall ca. 50 hours of interview material. Almost all of the interviews were conducted in Lithuanian (with one exception). Thus, in addition to evaluating, coding and analyzing the interviews, I also translated their key parts into English.
Ca. 350 pages (Times New Roman, font 12, line spacing 1.5) of field notes: written by me during participatory observation at Telia Lietuva. I translated the selected excerpts into English.
Ca. 500 pages of archival documents: this includes valuable primary sources and archival findings on the topics of telecom privatization, foreign company involvement in Lithuania's telecom sector, and local critique of privatization. I translated the selected primary sources used in the book into English.
In Total: ca. 1650 pages of material.

Source: Author's data.

1.5 Dominant Narrative: Internet Development in Lithuania

While this book explores the Internet as infrastructure through fieldwork, one can also investigate the Internet's development in Lithuania through historical research. Accordingly, historical narratives contribute to Internet as infrastructure research with publicly available analyses of crucial past telecommunications developments. In this chapter I examine one particularly dominant narrative and I argue that it currently forms the central historical representation of Lithuania's telecommunication and Internet development. I use it as a means to ground readers in how this telecommunications development narrative is commonly told in Lithuania before moving on to empirical, fieldwork-based chapters.

Stories of the historical development of the Internet belong to the broader thematic field of telecommunications technology development. This development comprises media technologies such as the telegraph, which was first used to send a message by Samuel Morse in 1844; cables, which were first laid intercontinentally in 1866; the telephone, which was first used for conversation by Alexander Bell on 10 March 1876; the radio telegraph, which was based on electromagnetic frequency waves and patented by Guglielmo Marconi in 1896; the integrated circuit, which was invented by Jack Kilby in 1958 and served to fuel the development of computers and operating systems; the subsequent development of data transmission technologies and mobile communications[143]; and other inventions that help transmit information in space, such as televisions, pay phones, satellites, and others. Important developments for the Internet as a telecommunications technology include TCP/IP network protocol developed by Vint Cerf and Robert Kahn in the late 1970s,[144] the WWW online content network developed by Tim Berners-Lee at CERN in 1989,[145] and the emergence and globally expansion of access to the Internet through dial-up, broadband, and wireless technologies and their regulation.[146] Lithuania's Internet development is not exempt from globally relevant issues such as the evolution of telecommunications equipment and its suppliers, the globalization of markets, and international regulatory policy decisions. Notwithstanding these implications and dependencies, there is always a local story to tell.

In the following section, I explore one local story that contributes to the dominant means of presenting telecommunications history in Lithuania. In particular, I look at predominantly *Lietuvos ryšiai 1918–2018* (Lithuanian Communications 1918–2018),[147] a scholarly book about post-socialist Lithuania's telecommunications and Internet history, which, I argue, currently comprises the most comprehensive research-based history of telecommunications thus far produced in Lithuania and serves as the main source for my exploration of the dominant narrative of the country's Internet history.[148] I explore this historical dominant narrative in order to illustrate how the development of Internet in Lithuania is represented in local scholarly historical literature today: what dates, events and institutions are perceived as crucial to the development of the Internet in post-socialist Lithuania. While the following introduction to the dominant narrative presents a contextual narrative for readers who know little about Lithuania

143 Algimantas Kajackas, Artūras Medeišis, Šarūnas Paulikas, and Saulius Sidaras, *Telekomunikacijų technologijų raida* (Vilnius: Technika, 2008), pp. 13–20.

144 Janet Abbate, *Inventing the Internet* (Cambridge, MA: MIT press, 1999), p. 130.

145 "The Birth of the Web: The World Wide Web Was Invented by British Scientist Tim Berners-Lee in 1989 While Working at Cern," *CERN*, accessed 17 October 2018, https://home.cern/science/computing/birth-web.

146 Cave and Mason, "The Economics of the Internet: Infrastructure and Regulation," pp.192–195.

147 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, *1918–2018*.

148 I also briefly rely on a few other publications (outlined in the following text and footnotes), which explore specific aspects of Lithuania's telecommunications development, such as its history before 1918, or the European Union's telecommunications sector regulation at the end of the twentieth century that Lithuania has had to follow since its EU accession in 2004. These sources elaborate more on the dominant narrative via dates and specific examples.

and its telecommunications, it also makes a theoretical point that this particular historical telecommunication narrative frames and maintains the current development of the Internet industry in Lithuania.[149]

The pagan Grand Duchy of Lithuania was established in the middle of the thirteenth century and was Christianized in the beginning of the fifteenth century. In the fifteenth and sixteenth centuries, the Duchy increased its cooperation with Poland due to the threat of the Teutonic Order and eventually established a union with Poland in the form of a dual state in 1569, the Polish-Lithuanian Commonwealth.[150] Ever since the Polish-Lithuanian Commonwealth was first partitioned in 1772, Lithuania has consistently been a—or part of a—different country, with the relatively short exception of Lithuania's interwar independence, which lasted for 22 years (1918–1940), until its finally regained independence in 11 March 1990. Following the partitions of the Polish-Lithuanian Commonwealth at the end of the eighteenth century, the Tsarist Russian Empire controlled the majority of Lithuania. Lithuania emerged as an independent country from the Tsarist Russian Empire for 22 years during the interwar period of 1918 to 1940, but it was occupied in 1940 by the Soviet Union, in 1941 by Nazi Germany, and again in 1944 by the Soviet Union. This second Soviet occupation lasted until 11 March 1990, when Lithuania formally proclaimed its independence. In 2004, Lithuania's entry into the EU and NATO officially secured its official pro-transatlantic and pro-western geopolitical orientation.

The past few hundred years of telecommunication development in the region comprised telecom network development, equipment production and professional education, all of which took place in vastly different socio-political environments.

149 There are other relevant publications that explore telecommunications development in Lithuania, for instance the collection of articles "Lietuvos ryšiams – 80: straipsnių rinkinys," e.g., *Lietuvos ryšiams – 80: Straipsnių rinkinys / Lietuvos informatikos, ryšių ir elektronikos bendrija*, Arunas Krotkus and Povilas Vitkevičius, eds. (Vilnius: Ryšių Technikos Naujienos, 1998), Povilas Vitkevičius, *Nuo žygūno - į pasaulį* (Kaunas: Aušra, 1997), and Kostas Birulis, *Laisvės kodas: netolimos praeities kronika* (Vilnius: Lietuvos informatikos, ryšių ir elektronikos b-ja, 2001), among others. However, these books are not directly concerned with the history of post-socialist Lithuania's Internet development, and Lithuania's Internet history research field is still modest. There is another book that I identified as relevant for the exploration of the Internet emergence in post-socialist Lithuania titled *Jie kūrė Lietuvos ryšius* (*Jie kūrė Lietuvos ryšius*, Basevičius, Kuzma, and Žintelis, eds.), as it presents readers with over one hundred biographical memoirs of twentieth century telecommunications workers who lived during interwar, Soviet, and post-Soviet times in Lithuania. However, these texts are non-edited memoirs of telecommunications industry workers. Instead of a comprehensive narrative, we are left with fascinating fragments from the workers' pasts, which are different in tone and stories, because they have been written as personal memoirs. Thus, although this book is important in exploring post-socialist Lithuania's telecommunications and Internet development, it does not present us with a scholarly history and can be counted as a primary source together with media articles and archival material that was produced about the topic. It leaves me to conclude that *Lietuvos ryšiai, 1918–2018* currently constitutes the most extensive academic text that explores both Lithuania's telecommunications history of the last 100 years and the Internet's development in post-socialist Lithuania. This 379-page book, with plenty of illustrations, is based on extensive literature research, publication of unpublished archival sources from state and private archives, interviews, and other primary sources and written by two historians.

150 Alfonsas Eidintas et al., *The History of Lithuania* (Vilnius: Eugrimas, 2015), pp. 21, 26.

The transnational development of telecommunications in Lithuania's territory began during Tsarist rule in the mid-nineteenth century, when the first telegraph station for the St. Petersburg–Warsaw line was built in the Lithuanian city of Marijampolė in 1854.[151] A few decades later, the first telephone communication line was laid in 1882 by Duke Oginskis and counts Tiškevičius and Zubovas between the cities of Kretinga and Plungė.[152] When post-socialist Lithuania emerged as an independent political unit from the Soviet Union in 1990, it created new telecommunications paths with the US and Western Europe, which were built upon the pre-existing physical telecommunication infrastructure developed in the Soviet Union. Therefore, one theoretical reason—beyond the fact that these issues emerged from my fieldwork material—to look into geopolitical imaginaries and critical negotiations in addition to current infrastructuring practices is that telecommunications in Lithuania (and elsewhere) has gradually developed against the backdrop of the physical infrastructure development of different political regimes.

In 2018, Lithuania, Latvia, and Estonia organized a vast number of commemoratory events to celebrate gaining independence in 1918; the co-authored history on Lithuania's telecommunications sector, *Lietuvos ryšiai, 1918–2018,*[153] is one of the cultural goods produced in the context of these state commemoration activities. It is written by historians Dr. Brigita Tranavičiūtė and Arvydas Pakštalis, but the initiators of the book are Alfredas Basevičius and Gintautas Žintelis, who have vast experience in Lithuania's public and private telecommunications industry sectors. The book is heavily funded by multiple private and public organizations, whose logos are printed on the first pages of the book. Printed at the top of the page is the largest of the logos, that of Lithuania's main telecom provider, Telia Lietuva.

The book explores telecommunications development in Lithuania over the past one hundred years. It is sensitive to ongoing geopolitical shifts that shape Lithuania and the technical, political and educational legacies that formed the country's current telecommunications scene. It describes telecommunications development in interwar Lithuania, 1918–1940 (post, telegraph, telephone, and radio communications); during WWII, especially during the wartime occupation, 1940–1944 (Lithuania's telecommunications during the first Soviet and Nazi Germany occupation); during the Lithuanian Soviet Socialist Republic, 1944–1990; and post-socialist Lithuania, 1990–2018. The telecommunications history of post-socialist Lithuania is described mainly by the development of crucial events concerned with the new Ministry of Communications and Informatics (established in 1991), as well as the various telecommunications companies that formed Lithuania's new, market-oriented telecom industry. The book also explores the development of telecommunications construction, manufacturing, and education systems, and presents readers with a future prognosis for the year 2068, which is written by prominent Lithuanian engineer and cybernetician Laimutis Telksnys. The authors convey that

151 Povilas Vitkevičius, "Lietuvos telekomunikacijų 80 metų kelias," in *Lietuvos ryšiams—80*, Arūnas and Povilas, eds., p. 9.

152 Vitkevičius, "Lietuvos telekomunikacijų 80 metų kelias," p. 9; Alfredas Antanas Basevičius, "Pratarmė," in *Jie kūrė Lietuvos ryšius,* Basevičius, Kuzma, and Žintelis, eds., p. 6.

153 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai, 1918–2018*.

the book aims to "disclose the processes and dynamics of Lithuanian telecommunications system development, whose inspirers and implementers were destined to be all of the specialists who worked in this system."[154] Thus, it outlines a well-researched institutional and actor-focused exploration of Lithuania's telecommunications history over the past hundred years and thereby presents us with a dominant narrative—based on scholarly research, written in a comprehensive manner that has not been repeated thus far—on the development of telecommunications in twentieth and twenty-first century Lithuania.

It is a story of ongoing institutional transformation that encompasses private and public actors, companies, educational institutions, and physical infrastructure that continuously renews and updates local telecommunications systems. The book thus focuses much attention on the actors and events that shaped the telecom industry in post-socialist Lithuania, in particular the establishment of the Ministry of Communications and Informatics (hereafter the Ministry) in 1991, its dissolution in 1998, and the emergence of then state-owned telecom provider Lietuvos Telekomas in 1992.

Although Lithuania declared its independence from the Soviet Union on 11 March 1990, its beginning as an independent country was tumultuous. In April 1990, the USSR enacted an economic blockade against Lithuania; in January 1991, the Soviet military attempted to occupy the Radio and Television Committee building and the Television tower in Vilnius, which resulted in multiple deaths. As the book outlines, the Lithuanian Ministry of Communications was established just a few months after these disturbing events (30 May 1991), only to be dissolved a few months later (3 October 1991) and reconfigured into the Ministry of Communications and Informatics.[155] The new Ministry was responsible for the organization of state programs and telecommunications works as well as the establishment and maintenance of international relations and thus overall telecommunications development in Lithuania.[156] Telecommunications development was a key state strategy: in 1991, the Supreme Council and the Government of the Republic of Lithuania claimed that Lithuania's main strategy for national market formation, as well as integration into European markets and global democracies, would be built upon unified national communication and information infrastructure.[157] In contemporary official political discourse, post-socialist telecommunication development in Lithuania has thus been linked to the idea that this networking fuels economic prosperity and development that is maintained by the telecommunications sector.[158]

The internationalization of the Lithuanian telecommunications system began against the backdrop of these institutional changes, including Lithuania's acceptance into the International Telecommunications Union (ITU) in 1991 and its 1992 entry into the Universal Postal Union (UPU), The European Conference of Postal and

154 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai, 1918–2018*, p. 8.

155 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai, 1918–2018*, pp. 278–280.

156 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, pp. 298–303.

157 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 280.

158 Algirdas Butkevičius, "Įžanginis žodis," in *Jie kūrė Lietuvos ryšius*, Basevičius, Kuzma, and Žintelis, eds., p. 4.

Telecommunications Administrations (CEPT), and Eutelsat.[159] International telephone connections were secured in 1993 using the international-intercity Kvarc station in Vilnius and the Norsat B, Eutelsat and Intelsat satellite systems through Oslo and Copenhagen.[160] Another significant event in 1993 was the freeing of the "37" GDR code, which allowed ITU to provide Lithuania with the new national "+370" code. This meant that Lithuania could exchange its previous "7" Soviet code, which had routed international telephone communications through Moscow.[161] In 1994, cooperation agreements regarding the redistribution of the radio frequency spectrum were signed with neighboring Finland, Poland, and Belarus.[162]

In addition to the recommencement of international relations, the Ministry of Communications and Informatics was tasked with creating new telecommunications subjects.[163] On 1 January 1992, Lietuvos Telekomas (Lithuanian Telecom) was established as a state-owned telecom operator by separating the electronic and postal communications services. The new company—the state-owned Lietuvos Telekomas—became responsible for electrical communications as well as for the organization, development, and management of telecommunications services in the country.[164] In October 1993, Lietuvos Telekomas, together with several other organizations, became part of the government-issued list of companies that are not planned to be privatized until 2000.[165] By 1996, Lietuvos Telekomas and public broadcaster Lietuvos radijo ir televizijos centras provided data transmission, telephone, telegraph, radio, TV broadcasting, and radio network services. Cellular communications were provided by companies such as Comliet, Omnitel, and Mobiliosios telekomunikacijos (named Bitė Lietuva since 2005), while companies such as Omnitel, Taidė, and academic network LITNET provided Internet access.[166] In 1997, the main telecommunications operator, Lietuvos Telekomas, was reorganized into a joint-stock company.[167] On 8 June 1998, a new Telecommunications Law deemed Lietuvos Telekomas the main telephone operator in the country with the monopoly right for fixed telephone services until the liberalization of the telecommunications market on 31 December 2002. The company was then privatized on 3 July 1998 by TeliaSonera, a Swedish-Finnish consortium.[168] This resulted in a new phase for the Lithuanian telecommunications market, including the emergence, stabilization, and privatization of Lietuvos Telekomas; the dissolution of the Ministry of Communications and Informatics; the monopolization of fixed telephone services; and subsequent market liberalization.

159 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, pp. 292–293.
160 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 331.
161 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 298.
162 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 301.
163 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 283.
164 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, pp. 283, 323.
165 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 284; Lietuvos Respublikos Seimas, *Dėl valstybinių įmonių, kurių iki 2000-ųjų metų nenumatoma nei akcionuoti, nei privatizuoti, I-744* (Vilnius: Lietuvos Respublikos Seimas, 1994), https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.15176/HXtdPWeMqZ.
166 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, pp. 303, 339–340.
167 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 332.
168 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 335.

Another major event in 1998 was the dissolution of the Ministry of Communications and Informatics. After the Ministry's dissolution, its functions were transferred to the Ministry of Transport and Communications and the Ministry of Government Reforms and Municipal Affairs.[169] From 2000 to 2016, the Information Society Development Commission (later renamed the Information Society Development Committee) was responsible for legal acts and policies related to information society, state information technology, telecommunications development and their implementation. Despite this, the Committee's 2005 statute no longer mentioned telecommunications; instead, it stated that it is responsible for societal information development policy.[170] While the book mainly uses a neutral tone to describe these events, in a rare act of judgment it provides readers with a critique of the Ministry's dissolution in 1998 by summarizing a memoir of one of the government officials also published in the book *Jie kūrė Lietuvos ryšius*,[171] Vice Minister Henrikas Varnas:

> Although claiming that the establishment of informational society is a strategic objective and priority area of Lithuanian state, it was decided to abolish the Ministry of Communications and Informatics of the Republic of Lithuania. Thinking about the negative consequences of such a move for the development of telecommunications in Lithuania, society and professionals were trying to stop this process of eradication. The writing, which presented arguments against the dissolution of the Ministry, was submitted to the President of the Republic of Lithuania Valdas Adamkus, Speaker of the Seimas Vytautis Landsbergis and the Head of the Government Gediminas Vagnoris by the Vilnius Professors' Club with the signatures from the most famous people in Lithuania. The Lithuanian Science Council argued against the liquidation of the Ministry, but the President, the Speaker of the Seimas and the Prime Minister were silent.[172]

In addition to the rather loose governmental apparatus for governing telecommunication development in the country after the Ministry's dissolution, the current industry is also regulated by the independent Communications Regulatory Authority (CRA), whose evolution is closely linked to Lithuania's 2004 EU accession. In 2001, a few years before the accession, the State Radio Frequency Service was reorganized into the CRA under the provision of European Union directives and the Telecommunication Law of 1998 of the Republic of Lithuania.[173] Since then, the CRA has aimed to synchronize local communication regulations with the EU telecommunication regulation system,[174] and is devoted to "regulating the electronic communications, postal, rail markets under the European Union directives and the laws of the Republic of Lithuania".[175] The CRA was thus formed to adjust Lithuania's communication regulatory system with the liberalized EU telecom market in order "to ensure effective competition, investment, innovation

169 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 287.

170 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 305.

171 Henrikas Varnas, "Untitled," in *Jie kūrė Lietuvos ryšius*, Basevičius, Kuzma, and Žintelis, eds., p. 219.

172 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 286.

173 "Briefly about RRT," *RRT*, updated 29 May 2019, accessed 20 October 2019, https://www.rrt.lt/en/about-rrt/briefly-about-rrt/; Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 306.

174 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 310.

175 "Briefly about RRT," https://www.rrt.lt/en/about-rrt/briefly-about-rrt/.

and a variety of consumer-friendly services in the areas of electronic communications, postal services, rail transport and trust services,"[176] while Lithuania prepared for accession into the EU. Thus, the CRA prepared the Lithuanian telecommunications market for liberalization and EU market competition against the backdrop of the telecommunications industry. Since its inception, the CRA's work has been guided by the European Union directives for national regulatory authorities.[177]

According to legal scholar Emmanuelle Mathieu, the European Union's telecommunications policy management that Lithuania adjoined only in the twenty-first century was developed in three stages, with increasing centralization. The first phase, 1988–2002, was characterized by nationally-based regulations; the second phase, 2002–2009, included the establishment of the European Regulators group, which coordinated national regulatory authorities, and the increased regulatory authority of the European Commission; and the last phase, 2009–present, began after the 2009 emergence of the Body of European Regulators for Electronic Communications (BEREC), "a hybrid body located at the crossroads between a network and an EU agency, consisting of a reinforced network assisted by the Office, a small EU agency, in charge of administrative and logistical tasks."[178] The ultimate aim of this evolving European regulatory framework and task organization for national regulatory authorities was to fully liberalize all telecommunications services and networks and introduce competition into the formerly monopolistic telecommunications sector.[179] Economist Marec Bela Steffens argues that telecommunications infrastructure development is thought to be "a key factor of success in global economic competition."[180] According to economist Paul J. J. Welfens, the drive to liberalize the telecommunications industry in Europe has been fostered by various European nation-states, the European Commission, the US, and intensive technological developments.[181] Welfens states that 1990s Eastern European telecom networks were underdeveloped in the sense that they lacked international telecommunication networks as well as local telephone lines.[182] He claims that post-Soviet Eastern Europe needed to overcome their lack of development in national and international communications, because the emerging decentralized market economy required a vast exchange of information as well as continuous communication.[183] Thus, Welfens argues that the telecom industry has played a role both in market economies,

176 "Briefly about RRT," https://www.rrt.lt/en/about-rrt/briefly-about-rrt/.

177 "Ryšių reguliavimo tarnybos 15 metų veiklos pristatymas," *Ryšių reguliavimo tarnyba*, published 12 May 2016, accessed 21 January 2020, https://youtu.be/RCEZTguhObA.

178 Emmanuelle Mathieu, *Regulatory Delegation in the European Union: Networks, Committees and Agencies* (London: Palgrave Macmillan, 2016), p. 127.

179 Mathieu, *Regulatory Delegation in the European Union*, pp. 128, 130.

180 Bela Marec Steffens, "Modernizing Telecommunications in Central and Eastern Europe: A Business Perspective," in *Telecommunications and Energy in Systemic Transformation: International Dynamics, Deregulation and Adjustment in Network Industries*, Paul J.J. Welfens and George Yarrow, eds. (Berlin: Springer, 1997), p. 197.

181 Paul J.J. Welfens, "Telecommunications in Systemic Transformation: Theoretical Issues and Policy Options," in *Telecommunications and Energy in Systemic Transformation*, Welfens and Yarrow, eds., p. 85.

182 Welfens, "Telecommunications in Systemic Transformation," p. 87.

183 Welfens, "Telecommunications in Systemic Transformation," p. 88.

but even more so in the market economies of developing countries.[184] Welfens provides data from the "Mobile Communications Newsletter," which illustrates that Lithuania had a massively low amount of mobile cellular telephone subscribers in 1993 (0.08 per 1000 people; in comparison, Latvia had 0.37 telephones per 1000 people, while Poland had 0.24, Estonia had 2.59, Slovenia had 2.00 and Russia (Moscow) had 0.24 analogue networks per 1000 people).[185] Logically it should follow that a well-developed telecommunications infrastructure could facilitate the advancement of in these terms less developed Eastern European countries transformation into market economies. Despite this, Steffens argues that Eastern European countries have not developed their telecommunications infrastructure in the same manner as Western European or Southeast Asian countries, because their communist regimes limited their access to foreign innovations, prioritized other internal infrastructural developments, and avoided equating (physical telecommunications) infrastructure with economic prosperity and growth. He states, "The necessary resources were never devoted to this aim, as the communist planners focused on large steel works and other prestige projects and, for ideological reasons, regarded all infrastructure as non-productive."[186] With the establishment of CRA in post-socialist Lithuania, privatization of its state-owned main telecom market player Lietuvos Telekomas, subsequent market liberalization and EU accession, Lithuania aligned its national telecommunications regulation both with the EU and with discourse that equates telecommunications development with economic growth. Thus, the Lithuanian government's 2004–2008 program, which declared information, knowledge society and innovative technologies development as one of its strategic goals[187], was a means to break away from its communist past and align with the official EU strategy of IT and telecommunications development as a means for economic growth and social cohesion. Although post-socialist Lithuania's telecom sector is estranged from centralized developments and its Soviet past, parts of it continue to exist in the presence, such as "the canalization," an underground telecommunications channel system that is a key part of the physical telecommunications infrastructure, which began to be built in the early twentieth century,[188] was widely expanded in Soviet times and has been developed further in post-socialist Lithuania.[189]

Lietuvos ryšiai 1918–2018's chapter on post-socialist telecommunications additionally focuses its narration of telecommunications history on Lietuvos Telekomas, the biggest telecom operator in the country, especially its state-owned period (1992–1998). Lietuvos Telekomas emerged in 1992 as a state-owned enterprise and was eventually reorganized and privatized to Amber Teleholding AS, a joint venture of the Swedish Telia and Finnish Sonera companies in 1998. According to an OECD report, 60 percent of its shares were sold to Amber Teleholding AS in 1998, 5 percent were sold to the company's employees,

184 Welfens, "Telecommunications in Systemic Transformation," p. 97.

185 Welfens, "Telecommunications in Systemic Transformation," p. 93.

186 Steffens, "Modernizing Telecommunications in Central and Eastern Europe," p. 197.

187 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 306.

188 Egidijus Žilius, "Istorijos raida," in *Lietuvos ryšiams – 80*, Arūnas and Povilas, eds., p. 81.

189 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, pp. 187, 191, 193, 195–196.

25 percent were sold in 2000 on the stock exchange, and 10 percent are controlled by the state.[190] In 2020, Telia Company controlled 88.15 percent shares of Telia Lietuva and 11.85 percent shares were controlled by other shareholders.[191] It is a unique situation in the region: the report states that "Lithuania is the only Baltic country where a strategic investor has a controlling interest in fixed telephony."[192] In 2006, Lietuvos Telekomas changed its name to TEO LT; in 2017 it switched from TEO LT to Telia Lietuva.[193] Thus, while Lietuvos Telekomas emerged as a state-owned company in 1992, it was continuously reorganized and eventually privatized in 1998, with the right to fixed telephone monopoly services until 2003 and subsequent telecom market liberalization. In addition to the presence of Lietuvos Telekomas, the 1990s telecommunications market in Lithuania was also shaped by the emergence of mobile operators such as NMT-450-based operator Comliet (partially owned by state-owned Lietuvos Telekomas, Danish Telecom, and Millicom), GSM-based Omnitel, and Bitė GSM.[194] While mobile operator Tele2 has been present in Lithuania since 1999, it was not cited in the aforementioned book. While I cannot verify the connection, Tele2 was not part of the long list of book patrons presented in the book's first pages. Although this is a surprise given that Tele2 is currently one of the biggest mobile operators in the country, it is important to stress that Tele2 (established in 1993, started serving mobile (GSM-900) telephone communication in 1999),[195] Bitė GSM (established in 1995),[196] and Omnitel (established in 1991 as Litcom, renamed Omnitel since 1994),[197] comprised Lithuania's main mobile service operators until 2017, when the main telecommunications provider TEO (known until 2006 as Lietuvos Telekomas,[198] and from 2017 as Telia Lietuva) merged with Omnitel and Baltic Data Center into the Telia Lietuva company.[199] The book's chapter on telecommunications ends rather abruptly with the name of the last Telia Lietuva CEO, Dan Strömberg, who started leading Telia Lietuva in 2018. It thus provides no further information about how the Lietuvos Telekomas privatization process took place, how the main telecommunications provider in the country developed during and after its privatization, and avoids elaborating upon some important telecom industry actors, such as Tele2.[200]

Beyond the exploration of governing and regulating institutions and the telecom industry development in post-socialist Lithuania, *Lietuvos ryšiai 1918–2018* has a short

190 OECD, *Promoting Trade in Services: Experience of the Baltic States* (Paris: OECD Publishing, 2004), p. 92, https://doi.org/10.1787/9789264106161-en.

191 Telia, "Shares and Shareholders," *Telia.lt*, accessed April 14, 2020. https://www.telia.lt/eng/investors/shares-and-shareholders

192 OECD, *Promoting Trade in Services: Experience of the Baltic States*, p. 92.

193 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai, 1918–2018*, p. 340.

194 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai, 1918–2018*, pp. 331–332, 337.

195 Alfredas Antanas Basevičius, Vytautas Jonas Kuzma, and Gintautas Žintelis, "Svarbiausios Lietuvos ryšių istorijos datos," in *Jie kūrė Lietuvos ryšius*, Basevičius, Kuzma, and Žintelis, eds., p. 11.

196 Basevičius, Kuzma, and Žintelis, "Svarbiausios Lietuvos ryšių istorijos datos," p. 10.

197 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai, p.* 338.

198 Basevičius, Kuzma, and Žintelis, "Svarbiausios Lietuvos ryšių istorijos datos," p. 11.

199 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 340.

200 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 340.

chapter that especially explores Lithuania's Internet development. It states that the first Internet connection in Lithuania was set up on October 1991 by establishing a communications satellite connection Lietuva-Internetas, made possible by help from the Norwegian government, Norskdata computers, and the Intelsat satellite connection. This was developed further by the Norwegian and Danish governments as well as the NORDUnet Scandinavian academic computer network in cooperation with Lithuania's LITNET academic network; these parties further developed data transmission networks based on X.25 protocol and, from 1993, on TCP/IP protocol.[201] LITNET is a computer network established in 1991 that connects different Lithuanian Research and Education institutions[202]; it is differentiated from other telecom operators by its non-profit status.[203] In 1993, the first Lithuanian web address, www.mii.lt, was registered to a LITNET member, the Institute for Mathematics and Informatics. By that time, 17 research institutions and over 60 governmental and non-governmental institutions had been using e-Mail, which leads the book authors to claim that "LITNET laid the foundations of the current Lithuanian Internet."[204] In the early days, the most-used service was e-Mail.[205] Thus, as early as the 1990s, users from research and governmental institutions could connect to the Internet through UNINET/NORDUnet networks. Importantly, in 1990s Open Society Foundation also provided free Internet services to citizens.[206] Currently, LITNET's development is managed and supported by an agreement between the Ministry of Education and Science and Sport, and LITNET centers, which comprises six of Lithuania's main universities.[207]

The first private telecommunications company in Lithuania, Litcom (founded in 1991, later re-named Omnitel), established direct satellite-based communication with the US in 1992. In 1994, it started transmitting data through the X.25 protocol-based Sprintnet network, and in 1995 it offered its first commercial retail Internet services, primarily used by academic institutions.[208] The non-profit organization Plačiajuostis Internetas (Broadband Internet) and its publicly funded RAIN project additionally played an important role in the telecom market. The RAIN project had two phases, 2005–2008 and 2015, respectively, during which it developed a non-profit wholesales physical telecommunications infrastructure in rural areas. This was made possible by the help of the Skaidula company, among others, which was the first company to build

201 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 352–353.

202 "About Litnet," *LITNET*, updated 3 March 2020, accessed 15 March 2020, https://www.litnet.lt/en/about-litnet.

203 Interview with Linas, 17 March 2017.

204 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 353.

205 "LITNET, Lietuvos Mokslo ir Studijų Kompjuterių Tinklas," 1993, Lietuvos Respublikos ryšių ir informatikos ministerija (LVNA), 17, Valstybinių programų skyriaus veiklos dokumentai: 4, F 17, AP 4, B 104, p. 21, Lietuvos valstybės naujasis archyvas (LVNA).

206 The Open Society Foundation's contribution is mentioned briefly in Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 353; In 1995–1997 the OSF provided the possibility for individual users to connect to the Internet from home before for-profit companies started broadly selling Internet access (Sigitas, e-mail message to author, 18 January 2019).

207 "Apie mus," *LITNET*, updated 19 July 2010, accessed 10 May 2019, https://www.litnet.lt/lt/apie-litnet.

208 Interview with Donata, during which she shared informal Omnitel documents, where these dates were outlined, 27 March 2018.

an underground fiber network infrastructure (2003–2004) in Lithuania that did not belong to Lietuvos Telekomas.[209]

By the end of the 1990s, Internet access and usage in Lithuania rose. Lietuvos Telekomas entered the emerging Internet market and started providing the Takas DSL service in 1998. According to the book, in 1998 there were already 40 companies in Lithuania that provided Internet services.[210] By the end of the 1990s and the beginning of 2000s, cable TV companies such as INIT also began providing cable Internet services.[211] The book details the periodic development of Internet in Lithuania according to five phases provided by long-term telecommunications industry practitioner Darius Didžgalvis to describe the emergence of LITNET, Lietuvos Telekomas, and other telecommunications market players. These phases include: the dial-up phase, based on telephone networks; the cable TV phase, based on TV cables and DOCSIS technology to provide both Internet and TV connectivity; the DSL phase, which brought about faster data transmission; the mobile Internet phase (2G, 3G, HSPDA, LTE); and the FTTB and FTTH phase of fiber cable technology.[212] Today, the biggest players in the industry are Telia Lietuva, Bitė, and the unmentioned Tele2, among many other service providers that offer broadband Internet, IPTV, telephone services, and more.

In the book *Lietuvos ryšiai 1918–2018*, four of the main topics—the Ministry of Communications and Informatics; the Communications Regulatory Authority; telecommunications industry actors with a focus on Lietuvos Telekomas, especially its state-owned phase; and Internet development—present telecommunications development in post-socialist Lithuania as a story of modernization through institutional changes by focusing on private and public actors, companies, and physical infrastructure development. Based on mainly the book summary I provided above, it is plausible to state that Lithuania's telecommunications sector underwent structural changes that can be broadly summarized in two main phases: before privatization (1990–1998) and after privatization (1998–present). This second phase includes the dissolution of the Ministry of Communications and Informatics (1998); the establishment of a regulatory body, the Communications Regulatory Authority (2001); Lietuvos Telekomas's telecom market monopolization of fixed telephone services (1998–2003); market liberalization and European regulation (from 2003); and the spread of Internet service providers and data transmission technologies. Thus, *Lietuvos ryšiai 1918–2018* presents a narrative of the Internet's emergence and transformation from public, academic, state-owned networks toward privatized Internet services. Some actors, such as public official Jonas Ūsas, argue that Lithuania had to liberalize and privatize its telecommunications market in order to join the EU.[213] As mentioned above, the EU has fostered telecommunications market liberalization and competition since the 1980s. Akin to discourse that aligns telecommunications development with economic prosperity, the liberal and competitive telecommunications industry today is also commonly understood as a means to

209 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 195.

210 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 353.

211 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, p. 350.

212 Pakštalis and Tranavičiūtė, *Lietuvos ryšiai*, pp. 353, 355–356.

213 Jonas Ūsas, "Untitled," in *Jie kūrė Lietuvos ryšius*, Basevičius, Kuzma, and Žintelis, eds., p. 229.

foster and fuel market economies.[214] This discourse presents a narrative of a modern European nation-state whose telecommunications industry endured historical hardships and continues to grow and prosper. While more mature telecommunications infrastructure might certainly nurture economic prosperity, its sole herculean agency can be doubted by taking into account the highly developed nature of Lithuania's current telecommunications networks in comparison with the high number of Lithuanian emigrants since 1990; 24 percent of the total population has left the country since 1990s.[215] Against this backdrop, the telecommunications narrative provided by the book is mainly a positive one. The text is written in an objective tone that presents well-researched primary sources that focus on the successful development of an emerging telecommunications industry, with barely any mention of the critiques and debates that surrounded these developments. A notable exception is the already-mentioned dissolution of the Ministry of Informatics and Communications in 1998 and its critique in the book. *Lietuvos ryšiai 1918–2018* thus presents telecommunications development in post-socialist Lithuania as an ongoing transformation toward a modernized, liberalized, and evolved telecommunications network that is emerging through allegedly smooth, chronological development of mainly positive institutional and technological changes.

Despite this smooth narrative, certain aspects of post-socialist Lithuania's telecom industry restructuration in the 1990s are omitted from the discussion, particularly details concerning the 1998 privatization of main telecom provider Lietuvos Telekomas, which shaped the industry through its new ownership, services, and other issues, and some of the crucial market players, such as Tele2. In this way, the book's neutral tone and chronological layout of historical dates provides a continuous, evolving, and future-oriented history. This does not mean that events that shaped the industry, such as privatization or market liberalization, simply happened and were not debated. During my research, I encountered many critical statements concerning Lietuvos Telekomas's privatization in various primary sources. I will explore critical negotiations that I encountered during my fieldwork in the third empirical chapter of the book, "Critical Negotiations," in order to illustrate that media technology development is not as smooth as it is sometimes presented, and how it is surrounded by critical negotiations that intensify during industry crucial events.

I would like to finish this presentation of the dominant historical narrative of Lithuania's telecommunications development with an idea from the field that illustrates the current state of remembrance regarding telecommunications development in Lithuania beyond positive historical representation. During my fieldwork in Lithuania from 2017 to 2018, I happened to discover the Network History Museum in the city of Kaunas, which had belonged to the telecom operator TEO,[216] and which, to my misfor-

214 Chrisanthi Avgerou, "The Link between ICT and Economic Growth in the Discourse of Development," in *Organizational Information Systems in the Context of Globalization. IFIP — The International Federation for Information Processing, vol 126*, Mikko Korpela, Ramiro Montealegre, and Angeliki Poulymenakou, eds. (Boston: Springer, 2003).

215 "Migracija skaičiais," *Europos migracijos centras*, accessed 15 January 2020, https://123.emn.lt/.

216 Lietuvos telekomas was privatized in 1998; in 2006 it changed its name to TEO, and in 2017 TEO became Telia Lietuva.

tune, had been closed since 2016. The museum's director Angelė Lekavičienė stated that although the plans to open such a museum in Kaunas had been developed since 1979, the museum was opened only in 1994, after 15 years of historical research alongside resident eviction and resistance to the upkeep and repair of the museum buildings. The museum exhibited material on Lithuanian post, telecommunications, radio, and informatics developments and consisted of 7617 exhibits, 438 old publications and documents, 34500 postal marks, and technical equipment.[217] In his memoir in the telecommunications memoir book *Jie kūrė Lietuvos ryšius*, the Minister of the Ministry of Communications and Informatics Gintautas Žintelis claimed that:

> It is pleasant that ever since it came under the control of the Telecom, even after privatization of the company, under foreign administration . . . the museum has been operating and is being maintained. I am very happy with it because it is a part of Lithuanian culture. "Lietuvos Telekomas" can also be proud of the fact that besides the production issues, its activity includes such a cultural aspect. . . . So now we have the most developed communications museum in Lithuania.[218]

Despite this praise, the museum was closed in 2016 after TEO decided to sell its premises. The CEO of TEO at that time, Kęstutis Šliužas, explained to the journalists the decision to sell the historical building in the center of Kaunas and give museum's content to the city as if historical reflection does not currently apply to the telecom business. He stated that "By focusing on building a next-generation telecommunications business, we are refining our operations and abandoning unrelated real estate management and museum development projects."[219] Simonas Kairys, the vice-mayor of Kaunas, promised the prompt delivery of the updated future museum, which would provide public access to the museum's exhibits.[220] One media article claimed that TEO sold the museum under the condition "that exhibits have to be moved to places where people can see them, not to dusty warehouses."[221] After the closure of the museum in 2016, its contents were dispersed among multiple institutions that I encountered during my fieldwork. As of 2020, the museum has not yet been re-created. During my fieldwork, after multiple attempts to track down the museum's remains, I arranged to visit one of the locations where parts of the museum's former exhibits were stored, the 7th Fort of the Kaunas Fortress. Here I found technical exhibits and documents

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217 Angelė Lekavičienė, "Pašto, telekomunikacijų ir informatikos muziejus," in *Lietuvos ryšiams – 80*, Arūnas and Povilas, eds., pp. 77–78.

218 Gintautas Žintelis, "Untitled," in *Jie kūrė Lietuvos ryšius*, Basevičius, Kuzma, and Žintelis, eds., p. 143.

219 "Lietuvoje liks vienu muziejumi mažiau: Kauno Ryšių istorijos muziejuje įsikurs verslininkai," *Statybunaujienos.lt*, published 18 January 2016, accessed 20 January 2020, http://www.statybunaujienos.lt/naujiena/Lietuvoje-liks-vienu-muziejumi-maziau-Kauno-Rysiu-istorijos-muziejuje-isikurs-verslininkai/6724.

220 "Kaune veikęs Ryšių istorijos muziejus – naujose rankose," *Lrytas.lt*, updated 26 May 2017, accessed 14 October 2019, https://kultura.lrytas.lt/meno-pulsas/2016/05/09/news/kaune-veikes-rysiu-istorijos-muziejus-naujose-rankose-1407872/.

221 Edita Radzevičiūtė, "Ryšių istorijos muziejus kraustosi į naują vietą," *Kaunodiena.lt*, published 12 April 2016, accessed 7 July 2019, https://m.kauno.diena.lt/naujienos/kaunas/miesto-pulsas/rysiu-istorijos-muziejus-pradejo-kraustytis-743612.

that were unsorted and stored in a rundown building that I could access freely without supervision. The next time I wanted to visit these museum's exhibits, I was told that they had migrated to the Kaunas City Museum M. and K. Petrauskas House, where they were now organized and only accessible to researchers. After I inquired about 2020 development plans, I received an answer from the employee of the main Kaunas City Museum that while some of the exhibits are digitalized, and some are partially accessible in one exhibition, "It is really not possible to put all exhibits in the exposition. The exhibits stored in the storage are not publicly accessible, they are only made available on request, for the purpose of research, upon application."[222] In short, the Network History Museum, which offered empirical access to the public, was eventually dissolved, and current engagement with telecommunications history requires effort. It seemed unfortunate that while telecommunications and IT development is celebrated in Lithuania and elsewhere, the one publicly available museum of telecommunications history has been reorganized under precarious conditions. While the dominant narrative I explored against the backdrop of *Lietuvos ryšiai 1918–2018* provides an uncritical historical narrative about telecommunications development in Lithuania, and the sole museum for its history has closed, there is a need to foster engaged studies about the Internet development through fieldwork in Lithuania and elsewhere to situate and complicate such dominant narratives. In the following section I thus focus on my situated fieldwork study of the Internet as infrastructure in Lithuania, which I explore through three empirical chapters: "Everyday Infrastructuring," "Geopolitical Imaginaries," and "Critical Negotiations."

222 Kaunas City Museum, e-mail message to author, 4 February 2020.