2. Everyday Infrastructuring

It was a dark and rainy evening in Vilnius. While searching for a hacker space in one of the side streets in the center of the town, I reached an abandoned collapsing old building—one of those that you could still find in the heart of Vilnius in 2017—and entered its yard. I could not find the entrance in the pouring rain and had to call the hacker space's telephone number to ask for directions. Once inside, I received the contact of a long-term telecommunications industry participant, whom I later contacted for an interview. This interviewee, an employee from a small competitor company, was highly critical of telecom giant Telia Lietuva's activities and employees. He nevertheless advised me to speak with Telia Lietuva's employees and provided me with crucial information regarding the key stakeholder names from Telia Lietuva and other places that facilitated Internet development in Lithuania. One of my following interviewees worked at Telia Lietuva; this person later provided me with an opportunity to observe everyday labor practices at the company and became my mentor there for two months. Thus, I ended up at a telecom corporation by beginning my journey at a hacker space.

The work of all the network maintainers at Telia Lietuva consists of highly diverse practices of manual and communicative labor; mistakes; jokes; conversations in Lithuanian, Russian, and English; and constant travel by car. Their work comprises moments of planned practices, such as digging, mediating, documenting, producing, and others, which I explore in the upcoming chapters in the form of short vignettes. Additionally, network development work consists of what I call "situated experiences," which form the open-ended, unpredictable character of Internet maintenance practices. Situated experiences take place, for instance, when workers are confronted with intense societal differences or fragmented remembrances during their daily work, particularly experiences that cannot be pre-planned and controlled. Thus, the exact workday schedule of the majority of network maintainers is unclear due to these unforeseen variables. What people will they meet? What tasks will they need to carry out? What technologies will be used? What places will be visited? What jokes will be shared? What memories will suddenly emerge? What problems will need to be solved and how? The labor practices described in the upcoming vignettes thus connote place-based doings in which workers' bodies, thoughts, and things, such as used equipment, interact in particular and contingent ways. I avoid assigning those practices to concrete people, because other

Figure 5. Entrance to the hacker space in 2017.

Source: Photograph by author.

people in similar situations would continue to carry out these practices. Despite this, I also claim that practices comprise not only routinized behavior, but also moments of what I call irregular and unpredictable situated contingencies.

Before moving on to the field, it is important to state that a full picture of Internet maintenance practices is impossible. One could, for example, imagine an organogram of a company's structure that elegantly visualizes physical telecommunications network maintenance practices. However, such visualization is not possible due to multiple reasons.

First and foremost, this is not possible because the company's structure is constantly changing; thus, a static picture or a scheme of practices would always be an image too late. During my fieldwork, leading managers at one or another of the company's department often forgot the names of the departments in which they worked because these names constantly changed. Consequently, the company's labor practices are organized not only around formal schemes, but also through established personal contacts. Another reason for the impossibility of the full static picture is the inherently open-ended and transient nature of network maintenance practices. It is possible to explore Internet maintenance practices because they sustain the Internet's material conditions of possibility. Despite this, practices are contingent and thus avoid any description that could encompass all of their constitutive parts. The third reason for this impossibility is rooted in the fact that telecom companies have strict policies regarding knowledge sharing. Although I could visit company's offices, my access was always limited. For instance, I did not have an employee card that would allow me to enter and move be-

tween the floors of various company buildings. My status was unconventional; officially I was an intern who did not really work at or for the company, but carried out my own research. Thus, my movement and possibilities of company exploration were limited.[1] During my first interview at the company, before I acquired intern status, I had to sign a non-disclosure agreement. When I later began my internship, I signed a research agreement that allowed me to gather data relevant for my publication, but necessitated that I confirm its use with the company, which was granted without the need for redactions. Although my internship mentor encouraged me to use my time at the company for my own research goals, support I could not appreciate enough, I felt constantly anxious. This feeling was based on a vague idea that my research might not be allowed to be published due to the atmosphere created by multiple workers, who claimed that the nature of their labor practices is sensitive, cannot be discussed in depth, and cannot be transmitted to outsiders.[2] Some of the workers told me openly that there is information they cannot share with me. At other times, delicate issues—such as worker unionization—were spoken about outside of the company's office. Yet such visible limits upon information sharing were not placed only upon me. Workers from different departments could not walk freely around all company offices or participate in each meeting. My internship mentor contended that some meetings were confidential not only for me, but also for some colleagues who could disturb their flow, and that furthermore they were not relevant for their work. Another reason that it was impossible to gain a full picture of the company's practices was the location of company offices. At the time of my fieldwork, offices were dispersed around the city of Vilnius, and full access was not possible due to limited research resources. The company's buildings comprise not only offices, but also various data centers and infrastructure objects, some of which can be accessed only with special permission, ID cards, keys, and codes.

I realized early on that due to these multiple conceptual, methodological, and practical reasons, the full disclosure of Internet maintenance practices is not possible and thus cannot be the goal in itself. Even a precise description of each and every practice is impossible, because, firstly, there is a multitude of practices, and secondly, because the practices themselves encompass a wide range of situated contingencies that emerge everyday and thus cannot be exhaustively described. These points thus illustrate how participatory observation at the telecommunications company and the consequent description of its labor practices are complex and puzzling. Importantly, these factors are not a means of discouraging fieldwork-based research, but rather a reflexive outline of the access issues I encountered. The following exploration of Internet maintenance practices through the focus on actors, things, qualities, and interrelations discloses the complexities and contingencies of practice-based Internet maintenance. It illustrates that practice—both of Internet infrastructuring and of my research—is always convoluted. After all, this applies not only to practices of media technology maintenance, nor complex research, but also to the lived nature of reality as such.

1 Fieldwork report, Miglė Bareikytė, 12 February 2018.

2 Fieldwork report, Miglė Bareikytė, 14 February 2018.

My participatory observation at Telia Lietuva began at the Physical Network Department.[3] By "physical network," I mean a linkage of material equipment—cabinets, copper and fiber-optic cables, communication channels, server rooms, etc.—that has to be purchased and interconnected by human workers in order to provide the material basis for Internet services. I spent one month observing, participating in and discussing daily labor practices that maintain physical networks. In this context, teams that dealt with network building, data support, resources and other issues ensured a basic level of Internet maintenance by organizing, designing, and building physical telecommunications networks. I observed managers, engineers, documenters, outsourced contractors, and other employees in order to understand how labor practices needed to maintain the physical network are carried out on a daily basis, which resulted in vignettes on Digging, Mediating, Planning, Documenting, and Connecting practices. I also explored Transmitting practice, which links physical network maintenance with more abstract, computer-based maintenance labor. I illustrate the practices, which are predominantly based on communicative maintenance labor, in the subsequent vignettes from the Head Office on Processing, Producing, Wholesaling, and Popularizing.

The maintenance of physical Internet networks at the Physical Network Department includes multiple activities and sites: transportation by car, interconnecting various technical objects, communicating with people, observing and controlling the outsourced laborers, drawing network schemes, and speaking via telephone or Skype. Physical network maintenance practices also include multiple things used at work, including interfaces such as computers, software programs (Microsoft Office for technical requirement designers; Visio, Autokada, internal Oracle, Vantiv, CRM, SAP, and Argis, a map used to observe network configuration; TIS, which describes all network information; and GIS, which is used to visualize this information), cables (fiber-optic, copper), transducers, and many others. In the following section, I take a closer look at the physical network maintenance practice of Digging, which involves laying networks into the ground; Mediation, which includes managing outsourced contractors to build new parts for the company; Planning of technical requirements for new physical network parts; Documenting new physical network parts in order to facilitate network maintenance and avoid future mistakes; and the practice of Connecting, which links company and client equipment. In short, in the following section I explore how the Internet's physical dimensions are maintained in practices that begin in the ground and end at the user's home. While these practices are abstracted by the textual format of this book, it is important to emphasize that they happen repeatedly and on a daily basis; they include planning and contingencies; they consist of bodies, things, implicit and applied knowledge, remembrances, imaginaries, and desires.

In 2017, physical telecommunications networks were maintained in the field and at company offices. My visits to the Physical Network Department in Vilnius' districts of Naujamiestis and Department of Transmission Practice in Karoliniškės district were

3 In 2017, Technology Department that also comprises Physical Network Department at Telia Lietuvaconsisted of nine different sub-departments: IT systems, Infrastructure, IT service management, Customer service, IT service expert, Products and Services, Project management, Service provision and operations, and Network.

initially organized and planned by my internship mentor, who worked as a manager at the Head Office. I first met with network planers, documenters, and installers from the Physical Network Department, all of whom worked in an old Soviet-era building in Naujamiestis. Naujamiestis, which means "new city" in Lithuanian, was built in the nineteenth century as a result of Tsarist government expansions of Vilnius.[4] It is an eclectic district: while close to the Old Town, it comprises occasional factory buildings, Soviet-era apartments, contemporary glass buildings, and a few wooden houses. My second visit, to the Transmission Department in Karoliniškės, consisted of meetings at a comfortable network transmitter building. Karoliniškės, a micro-district (*mikrorajonas*) located in the western part of the city, is famous for hosting Lithuania's largest new construction, a 326.5-meter TV tower that looms above numerous Soviet-era apartment buildings. Karoliniškės emerged during the 1970s,[5] a period during the Soviet Union era but already after the death of Stalin; it is mostly comprised of five, six, and twelve-floor Soviet-era apartment buildings.[6] The district is also widely known in Lithuania for the tragic events of 13 January 1991, when Soviet forces attempted to occupy the TV tower and hinder information transmission to the public. This event resulted in massive protests and the killing of 14 civilians.[7] Despite this history, the current atmosphere felt serene. The telecom building was higher than the others around it and coated with Euroremont-style—a term used to describe homogenous post-Soviet modernization aesthetics—panels. Once inside the building, I was immediately made aware of its corresponding institutional hierarchy. This included a guard positioned at the entrance as well as a renovated interior that spoke to expensive investment. This interior stood in stark contrast to the Physical Network Department in the Naujamiestis district, which is built of decaying grey bricks and lacks worker parking spaces. Once, employees from the Physical Network Department played a mean joke on their colleague by sending him a fake photo of his car with seemingly smashed windows, parked in a shady yard. A vandalized car was not such irrational possibility in the context of such subpar parking, and thus the colleague believed this joke to be true for some time. In comparison, at the Transmission Department in Karoliniškės, there were plenty of parking spaces, while the office itself had an atmosphere akin to a lively newsroom, complete with multiple TV sets and busy workers typing at computers. While the offices in Karoliniškės were bright and workers had access to a refurbished, spacious kitchen, such comfort was not an option at the Physical Network Department, where the kitchen looked abandoned. The Physical Network office was located in two large, open spaces that offered little privacy, a bathroom in need of renovation and a poor-quality free coffee machine.

4 Danguolė Dainienė et al. "Naujamiestis," in *Pasižvalgymai po Vilnių: miesto mikrorajonai*, Zita Tiukšienė and Nijolė Sisaitė, eds. (Vilnius: Vilniaus apskrities Adomo Mickevičiaus viešoji biblioteka, 2015), p. 63.

5 According to Doc. Dr. Darius Linartas, the Soviet Union withdrew from grandiose Stalinist aesthetics in the 1970s and turned to global aesthetics and new Soviet modernism (Darius Linartas, "Lithuanian Architecture Competitions in the Soviet Era," *Virtualus Architektūros Muziejus*, published 7 December 2017, accessed 4 April 2019, http://archmuziejus.lt/en/lithuanian-architecture-competitions-in-the-soviet-era/).

6 Dainienė et al. "Karoliniškės," p. 49.

7 Dainienė et al. "Karoliniškės," p. 50.

The stark differences between these spaces spoke to an idea of advancement, which was reinforced by physical differences. For example, network transmitters, who engaged in office-based rather than manual labor, had small office rooms separated by glass. Employees from the Transmission Department additionally required me to provide more explanation before I could observe their practices. After I was offered coffee and cookies, they expected me to ask precise questions, describe my research premises, and defend the meaning of my research before I could begin. In contrast, at the Physical Network Department, employees usually did not question why I was there and were furthermore open to sharing their knowledge, experiences, and jokes. In this context, I could either work on my computer or question employees without any resistance.

Figure 6. Physical Network Department in 2017.

Source: Photograph by author.

After visiting the Physical Network and Transmission Departments in Naujamiestis and Karoliniškės, I continued my participatory observation at the Telia Lietuva Head Office in February 2018. At the Head Office, the Internet is no longer maintained as physical telecommunications networks, but is rather made into a product and popularized through communicative labor practices, i.e., labor practices that instrumentalize language as a resource to realize work goals.[8] In 2018, the company's Head Office was located in one of few high-rise buildings near the Neris River, in the Vilnius district of Šnipiškės, known locally as "Šanchajus." This district is comprised of extremes: next to old and decaying tiny wooden houses with gable roofs stand high-rise glass and steel municipality and business offices, a mall called "Europe" and multiple restaurants and

8 McKinney, "Communication, Labor, and Communicative Labor," pp. 58, 153.

Figure 7. Transmission Department in 2017.

Source: Photograph by author.

hotels. According to Dainienė et al., Šnipiškės presumably emerged as district in the sixteenth century; during this time, it was inhabited by people of various confessions including Jesuits, Catholic Christians, Jews, and Orthodox Christians. During Soviet times, it was spatially articulated in modern terms through the development of a broad alley enclosed by shops, and recently further developed through high-rises. The current shape of the district emerged in 2002–2004, the period when Lithuania aimed to enter the EU and NATO. [9] Accordingly, the main square between these skyscrapers is now titled "Europe Square" and also contains the "Europe" shopping mall. This district thus encompasses Lithuania's tensions very well: it symbolizes the country's belief that it is possible to become European through industrial advancements such as contemporary architecture comprised of glass and steel, market entrepreneurship, and liberal governance, while ignoring the visible poverty of Šanchajus' wooden houses. My fieldwork in 2018 continued in one of these high-rises.

The three parts of the high rise at the Head Office were titled "smaller seal," "bigger seal," and "the third seal," which prepared visitors for a maritime-themed interior. The lobby was decorated with pastel-blue armchairs and located in a spacious hall with colossal floor to ceiling windows on one side of the high-rise. The floor was shiny and elevators steadily moved up and down. Despite this initial impression, after I spent

9 Danguolė Dainienė et al. "Šnipiškės," in *Pasižvalgymai po Vilnių: miesto mikrorajonai*, Zita Tiukšienė and Nijolė Sisaitė, eds. (Vilnius: Vilniaus apskrities Adomo Mickevičiaus viešoji biblioteka, 2015), pp. 209–214.

Figure 8. Representative side of Šnipiškės. The orange building in the center is the Telia Lietuva Head Office that I visited in 2018.

Source: Photograph by author.

time in closed parts of the building, I noticed that some office door handles wobble, as if to remind me that crumbling wooden houses persist just a few steps behind this luminous and looming building. Usually there were never many people in the lobby; those who worked there promptly jumped into elevators moved by their employee-cards and disappeared from the entrance hall.

Every time I arrived at Telia Lietuva's Head Office, I usually parked my car in a nearby parking lot. I was instructed by my internship mentor to inform the administrator that I am the company's intern and that I parked my car in this parking lot. Every morning I had to enter my car number and surname in a grid notebook on the administrator's table. The female administrator would use this notebook to enter my data into the system in order for me to leave the building without paying for parking. While the lobby is accessible to all, one needs permission to access other floors. I would frequently sit in the lobby waiting for the designated time to call my internship mentor, meet a worker for a pre-arranged interview, or talk with the administrator and ask her to transfer me to a particular floor, which she would always verify with the person I intended to meet. Sometimes I would go out, cross the street, and buy coffee at the "Europe" mall. My participatory observation during this time and in this part of the company was thus not spontaneous, but planned in advance and always traced.

Notwithstanding these limits, I could still access the offices in the high-rise, speak with employees, and participate in their meetings, even if I sometimes had problems with moving from one floor to another. The Head Office was spread out from the 2nd

Figure 9. Visiting Šnipiškės from the other side. On the left side is the Telia Lietuva Head Office that I visited in 2018.

Source: Photograph by author.

to the 18th floor and beyond. Each floor had a curved glass wall, which made the offices look light, as well as multiple red chairs and ubiquitous Telia logos. The floors were so similar that once an employee I shadowed managed to exit the elevator on the wrong floor without noticing. I sometimes felt like I was in in Eldar Ryanzanov's Soviet comedy *The Irony of Fate*, in which a drunk protagonist accidentally travels from Moscow to St. Petersburg in an alcohol-induced haze, only to find the same street and building, and even enter a seemingly similar apartment with his normal key. "They all look very similar,"[10] said Ugnius,[11] an employee from the B2B Department who exited the elevator at the wrong floor. In the high rise, most of the people worked on their laptops, talked with each other softly, and sometimes made a call or met a colleague for a short chat. They also drank many cups of coffee, which was freely accessible in the tiny kitchens on each floor. Their desks looked similar and impersonal: papers, the occasional cactus, and scattered Happy New Year cards. Even an office room for employees responsible for public relations and communication tasks looked as it should look, down to the detail of its expected subtle differences: jazz music playing softly in the background and birthday dates listed on a big board. On one of the floors I found a fridge with food

10 Fieldwork report, Miglė Bareikytė, 13 February 2018.

11 Research participants have been allocated pseudonyms.

one could buy with a debit card. It reminded me of Lithuania's attempt to adopt the ubiquitous cashless payment schemes that were introduced by Swedish banks. In this atmosphere of corporate serenity, comfort, and light, I felt like an obvious outsider with my MacBook, as probably everyone there used Microsoft computers.

At the Head Office, I meticulously planned meetings with the workers responsible for the development of the Internet as a product, which mostly took place during scheduled meetings. In contrast to the cable layers and network planners from the Physical Network Department in Naujamiestis, workers at the Head Office would not simply chat informally with me. Rather, they would only meet me for an interview, which either my internship mentor or I needed to plan in advance. Even if all interviews went well, I was aware that I was being observed and scrutinized by the workers at the high-rise, most of whom carried the title of "a leading manager of X."[12] Sometimes, I was required to prove my telecom industry knowledge before being allowed to observe further. During one interview with a highly-respected-yet-somewhat-hostile employee, I nodded to a concept he mentioned, causing him to ask if I was sure that I understood what I was nodding to. Was I? This questioning made me aware of the tense, self-affirming, and goal-oriented environment at the Head Office. However, similar situations in which my research was explicitly doubted were rare. Notwithstanding occasional suspicions and frequent kindness, since the beginning of my fieldwork, the bar for communication and my self-representation as a knowledgeable researcher at Telia Lietuva was continuously raised higher.

Throughout my fieldwork, I often encountered an atmosphere of ambiguous and unexpected participant cynicism, which is important to point out. This cynicism was ambiguous because it was simultaneously caring and detached. Once, I was introduced by Matas, an employee from a Technologies-related department, to his coworkers as "a colleague, but only for one day,"[13] to which his colleagues answered that "Telia dropout has increased, but even for Telia one day is exceptional."[14] Often such and similar statements created an atmosphere of a supposedly cynic detachment from the company or from other employees, while those who had expressed them still carried out their work with emotional involvement and care. Anthropologist Alexei Yurchak describes similar aesthetics of living in an ongoing state of precarious attachment through the concept of "*stiob*." According to Yurchak, *stiob* is:

> *overidentification* with the object, person, or idea at which this *stiob* was directed that it was often impossible to tell whether it was a form of sincere support, subtle ridicule, or a peculiar mixture of the two. The practitioners of *stiob* themselves refused to draw a line between these sentiments, producing an incredible combination of seriousness and irony, with no suggestive signs of whether it should be interpreted as the former or the latter, refusing the very dichotomy between the two.[15]

12 Fieldwork report, Bareikytė, 14 February 2018.

13 Fieldwork report, Miglė Bareikytė, 27 February 2018.

14 Fieldwork report, Bareikytė, 27 February 2018.

15 Alexei Yurchak, *Everything Was Forever, Until It Was No More: The Last Soviet Generation* (Princeton, NJ: Princeton University Press, 2013), p. 250.

Media scholar Maria Brock describes *stiob* as a genre of humor that originated in the late Soviet era and laughs at mainstream discourses by over-identifying with them. This is exemplified by the famous case of Sergey Kuryokhin's attempt to prove that Lenin was a mushroom by using scientific arguments. Other, less radical examples include characters from contemporary satires such as *The Colbert Report* or *Borat*.[16] A statement from Nerijus, an employee from the B2B-related department, also exemplifies the *stiob*-ish atmosphere of my company fieldwork. According to Nerijus, "We are very cynical in the organization. There are no emotions. At least I do not come to make friends. You come to work, make money."[17]

The Physical Network Department is not responsible for services that emerge from and in relation to the Internet and does not speculate on the effects of the Internet's spreading access and usage. Technical infrastructure, and therefore physical network maintenance practices, is concerned with the establishment of the conditions through which the Internet can emerge as a service. When a client decides that they need an Internet access, they contact Telia's managers. The managers then forward the query to the Physical Network Department, which ensures that the physical network is built, installed and connected for new clients. Workers there and at the Transmission Department then plan, design, monitor, and describe the physical network's emergence and expansion. The physical network is built exclusively by external contracting companies and subsequently used by the company's engineers-technicians to connect new clients to the company's network. At the Head Office, the Internet as a product is both conceptualized and discussed during meetings and communicated to customers as a service devoid of any physical labor and ongoing maintenance. Finally, Internet access that relies on labor practices predominantly from the Physical Network Department and the Head Office is sold as a service to new customers. In the following section, I explore these maintenance labor practices—digging, mediating, documenting, planning, documenting, connecting, transmitting, processing, producing, wholesaling, and popularizing—in the form of short vignettes.

16 Maria Brock, "Political Satire and its Disruptive Potential: Irony and Cynicism in Russia and the US," *Culture, Theory and Critique* 59, no. 3 (2018), pp. 281–98.

17 Fieldwork report, Bareikytė, 14 February 2018.

2.1 Digging

> The problem is that telecommunication lines and cable networks are objects that cannot be seen visually, therefore no work seems to be happening.
> *Aleksandras Anusevičius, Jie kūrė Lietuvos ryšius: biografinės apybraižos*[18]

Summer is considered the preferable digging season in Lithuania, because it is when the earth is more pliable and thus cables can be easily laid. During my first days at the Physical Network Department in June, I often left the office and visited digging sites with employees, one of whom was Benas. Benas would fill in the necessary information in the office notebook required for renting a company car and we would leave the office. Once, we went to visit two network construction sites that were accidentally located on the same street. In the car, Benas told me that one project is based on digging an approximately 90-meter-long ditch to connect a well to a building with a telecommunications cable. The second network expansion project is larger. As it was my first time visiting a telecommunications construction site, I was unsure what to expect. On the way, Benas told me about his job: he is responsible for observing the physical network infrastructure contractors, technical network maintenance, client complaints, and paperwork. This sounded labor-intensive, so I asked him if it is difficult to manage all these tasks. "It is very difficult," replied Benas.[19] He then provided me with an example of one type of difficulty, which had occurred during an old street reconstruction accident. After a part of the physical telecom network underneath a collapsed street was destroyed, it was unclear who should do the job. He rhetorically asked: "When the street is being reconstructed, when its surface is taken off and, in the meantime, that part of the well crumbles and needs to be repaired, who is responsible for that repair?"[20] When the streets are reconstructed, Benas said, everything can temporarily appear to be fine, but holes can form in an underground network and need to be repaired. "You cannot tell who is guilty," he continued.[21] While Benas is mainly responsible for the observation of contractors, i.e., outsourced constructing companies that repair and build physical telecommunications networks, the very goal of his job is to solve actual everyday physical network problems.

The first site we arrived at was small, and digging had already started. I saw a compact digging machine and three people: the construction leader and two workers. They planned to dig up to 100 meters a day, but they did not know how far they would be able to reach, because digging speed depends on the quality of the earth. Their labor tasks consisted of the following examples: in the first task, two people dug a long ditch from

18 Aleksandras Anusevičius, "Untitled," in *Jie kūrė Lietuvos ryšius*, Basevičius, Kuzma, and Žintelis, eds., p. 525.

19 Fieldwork report, Miglė Bareikytė, 12 June 2017.

20 Fieldwork report, Bareikytė, 12 June 2017.

21 Fieldwork report, Bareikytė, 12 June 2017.

the road to the building premises with a shovel and a tractor. They laid a cable in the pipe hole and put warning tape on the pipe to inform others of the pipe's purpose before covering it with dirt. I was told that sometimes it can be dangerous to use a tractor for digging, because it can easily interrupt other underground infrastructures, such as gas or electricity, and thus a shovel is used. Due to multiple infrastructures buried underground one cannot dig randomly and is also obliged to choose appropriate equipment and follow government-issued standards. After digging and laying pipes and cables, the workers smooth the earth and lay grass on top of it. I asked the work supervisor about his workday. "[It's] hell," he replied.[22] His workday, which starts at 7:00 a.m. and finishes at 4:30 p.m., consists of checking objects and material supplies and learning about new commissions. The supervisor smoked a cigarette and acted cool while he told me how many calls he "picks up" per day. "Around 200," he revealed proudly.[23]

When we arrived to the second site, it was already raining. It was summer, the season of many digging operations, a time when the soil is manageable because it's not too muddy or frozen. At the construction site, an asphalt street disturbed an initial digging plan—a 650-meter-long hole for telecommunication cables—so workers had to use an underground rocket to dig under the street. I saw two workers lifting a seemingly very heavy rocket with their bare hands and a rope, while other people joined the workers to discuss the rocket's route. Air was then pressed out of the compressor, which moved the rocket and pipe from one side of the street to the other. While such underground digging, based on rocket compression, is crucial for asphalt paths, it is only somewhat precise and cannot be fully planned because different layers of soil might pull down or lift the pipe because, "no one knows what type of earth is exactly under the ground,"[24] the lead constructor told me.

At some point, Benas and I started walking around the field. It got cold. The rocket was still moving and trying to pull the pipe to the other side of the road. The pipe would remain underground and the telecommunications cables would be laid inside later. The rain continued as cars passed by; a few workers sat around on the ground. Benas and I noticed that the pipe suddenly reached the other side of the street, but nobody was satisfied: it had come out too high. I asked about the reason for this failure, but nobody seemed to have an exact answer. They now needed to dig again. Benas told me that it is impossible to plan such a digging process; perhaps a stone or a piece of rubbish happened to block the rocket's path. There are situations, he said, when people attempt to avoid paying for rubbish transport, so they cover it in asphalt and put it under the asphalt street without thinking that someone would ever dig there. Some people even claim that rubbish might constitute a good foundation for housing projects. "But not for telecommunications," said Benas.[25]

Currently, Internet network data is transmitted through wired and wireless network technologies. In both cases, physical data transmission networks need to be expanded

22 Fieldwork report, Bareikytė, 12 June 2017.
23 Fieldwork report, Bareikytė, 12 June 2017.
24 Fieldwork report, Bareikytė, 12 June 2017.
25 Fieldwork report, Bareikytė, 12 June 2017.

and maintained. Digging is one example of such crucial wired communications development and maintenance practices. During the digging process, people walk, drive from one building site to another, dig holes, and use tractors, cables, shovels, and bare hands. Benas is responsible for technical repair and the smooth reconstruction of physical networks. He also deals with complaints, observes contractors and drives to various construction sites. They work on a project-by-project basis and are employed as an outsourced labor service hired by Telia Lietuva. Workers at Telia Lietuva's Physical Network Department once told me that these contractors do the "dirty" [26] jobs. They literally work with dirt, dig the earth, lay the pipe, and pull out the cables. There are additionally workers from Telia Lietuva, who document the process; they are responsible for updating contractors with information on real-time Telia network conditions in order to avoid accidentally cutting off cables already in use and thus interrupting the signal flow. These three groups use digging equipment, cars, phones, and computers, all of which maintain their communication and sustain the network-building process. Thus, interaction between an observer, a contractor, and a documenter, alongside manual laborers and equipment, is crucial to building new telecommunications network sections and repairing old ones.

As mentioned above, due to the fact that contractor labor is outsourced, contractor jobs are both more precarious and more autonomous. This leads to tensions between Telia Lietuva and these outsourced labor companies and often results in Telia Lietuva attempting to discipline the contractors. According to Benas, sometimes contractors try to exercise more autonomy than they should: they make decisions by themselves instead of communicating with Telia Lietuva. For example, when a client's wishes cannot be met due to limited network capacity, contractors may make their own decision on how to proceed. "It is not pleasant to be deceived," Benas told me.[27] In order to force contractors to communicate with Telia Lietuva, Benas requires them to send photos of the results of their work. In case of resistance, Telia employees tell the contractors that "'If you cannot make a photo, then let us dig everything up.' That usually helps to make photos appear."[28] Contractors and Telia workers thus cooperate in building the physical networks, but this cooperation is based on a disciplinary hierarchy in which Telia Lietuva controls physical network builders—outsourced contractors—by observing their work and requiring photo documentation of work results.

The practice of digging involves creating a hole in the earth, laying a pipe and a cable, and covering everything up. It might sound simple, but digging is difficult to plan. For example, it is important to lay pipes and cables before covering the aboveground street in asphalt, but such rational planning would mean that all participants (urban developers, contractors, street layers) would need to know about one another's plans in advance, which is not always the case. Notwithstanding the actual visibility of the building process at the building site—one can see piles of soil, tractors, trucks, cars, groups of people, and sets of cables—workers at the Physical Network Department told

26 Fieldwork report, Miglė Bareikytė, 14 June 2017.

27 Fieldwork report, Bareikytė, 12 June 2017.

28 Fieldwork report, Bareikytė, 12 June 2017.

me that many city developers still perceive physical telecommunication as non-essential. Although barely anyone in Europe today could think of living without electricity, running water or roads, workers in the field described how telecommunication structures are still often forgotten by those who build roads and buildings or lay other types of infrastructure. I heard workers say that "Every third person would lay the last brick on the ground and remember that they also needed a network connection. Sometimes there are situations when concrete will be laid tomorrow or, even worse, it has been laid yesterday!"[29] Such perceived ignorance not only leads to miscommunication between contractors and end clients, but sometimes also results in a do-it-yourself culture amongst end clients. Examples abound, such as when random private citizens attempt to dig a new hole for cables by themselves, only to learn later that the national regulator, the Communications Regulatory Authority, has issued standards regarding ditches for Internet cables that require one to dig no less than seventy centimeters deep. In addition to such human-related factors, digging also cannot be precisely planned due to the shifting constitution of the soil. As layers of the earth and soil move, pipes sink or rise more than the required seventy centimeters. Due to the same reason—the difficult soil constitution—it is not certain how many meters one will manage to dig per day.

The task of digging is site-specific due to the fact that it takes place in particular locations. Accordingly, there are different types of earth interventions, depending on what underground equipment already exists. For instance, if there is an underground sewage system near the digging location, a cable can be pulled into a pipe at the sewage system, thus making it unnecessary to dig a long ditch. In other cases, earth must be dug and drilled. The first of the digging processes that I visited with Benas was an open digging process in which a hole was dug and a cable was laid into the soil. Another type of digging practice, closed drilling, takes place when an asphalt street cannot be dug out, as described in the second vignette of pulling out a pipe from under an asphalt street. There are two ways to drill into the earth in such a closed drilling process without upsetting the first ground layers: one can either push a pipe through a rocket or engage in directional drilling. During the latter, a machine drills deep, large distances, and can regulate its direction. While no one can predict the exact kind of soil that will be found underground, everyone knows that sand, gravel and clay are especially bad digging conditions. After the earth is dug via either of the methods, cables are laid into the pipe. They are then soldered, the hole is covered and the soil is evened out. At some point, these covered cables will transmit signals and data.

While currently this process is carried out by outsourced network constructing companies, I found it interesting that in Lithuania only few decades prior, everyone seemed to be involved in such physical infrastructure works. According to telecommunication industry builder memoirs, such as ones by Vytautas Kaušpėdas and Vincas Algimantas Strimaitis[30], students, the military, and lay people helped lay telecommunication cables during Soviet times. As Kaušpėdas remembers:

29 Fieldwork report, Bareikytė, 12 June 2017.

30 Vytautas Kaušpėdas, "Untitled," in *Jie kūrė Lietuvos ryšius*, Basevičius, Kuzma, and Žintelis, eds., p. 511; Vincas Algimantas, "Untitled," in *Jie kūrė Lietuvos ryšius*, Basevičius, Kuzma, and Žintelis, eds., p. 519.

Figure 10. Revisiting one of the digging sites, where the soil was evened out and the cables were already covered with soil and thus invisible.

Source: Photograph by author.

> Some features of the Soviet system need to be mentioned, which do not exist today, and many do not even know what it means. These are the Lenin assistance works. All of the collectives had to work one Saturday in April to clean up the environment, build or lay cables or build telephone canals. Many objects required manual digging in the trenches.[31]

Digging requires the instrumentalization of multiple worker bodies under precarious weather conditions. These workers actually lift heavy digging equipment, carry pipes, connect and cut the cables, repair equipment, observe one another, communicate on the phone, and control the process from afar. Yet digging instrumentalizes not only the human body, but also the body's surrounding environment. It is a violent practice that constantly cracks the earth open and buries glass and plastic underneath. Industry workers used in the field often used "hell" as a metaphor to describe their labor practices. In his memoirs, telecommunications industry participant Vilimas Kulbė remembers how telecom workers during Soviet times engaged with physical infrastructure that was built above-ground:

> The beauty created by nature was not admired by the telecommunications workers. . . . All the repair crews, the installers had to be called forth and sent to the line. They walked along the line and stroke poles with wooden stumps so that the frost would

31 Kaušpėdas, "Untitled," p. 511.

> fall. Wire icing and hurricane winds were the worst. Strong wind struck the trees, twisting and confusing the wires, and breaking the support.[32]

Anthropologist Anna Tsing expresses a similar sentiment, but from a perspective of attentive care. She writes about the instrumentalization of the environment via resourced-oriented mindsets and the resulting alienation from the earth. Tsing posits that "Alienation obviates living-space entanglement. The dream of alienation inspires landscape modification in which only one stand-alone asset matters; everything else becomes weeds or waste. Here, attending to living-space entanglements seems inefficient, and perhaps archaic."[33] Similarly, the main goal of the practice of digging literally fragments the environment and cracks the earth open in order to construct or repair a wired telecommunications network that will enable future data flow.

While digging could be considered an environmentally intrusive practice, other dimensions of this practice also emerged in the field: beyond an observable practice, it was positioned in historical and geopolitical contexts. A worker I met in the field recalled that during Soviet times—although I am not sure how old he was during this period—digging practices were more brutal than today. Massive Soviet digging machines could crush huge stones in one hit. As technology developed, machines got smaller; currently electricians and telecommunications specialists attempt to cooperate and lay cables in one pipe. As Benas claimed, the reason for this is assumed to be European resource optimization policy: "Well, maybe we are getting more European, trying to save."[34] Although there are multiple contractors that compete with one another for network construction projects, I was told that they also cooperate with each other. Benas explained, "Since the equipment is expensive, sometimes some contractors have way more work than others and pass on their work to another company. So, one can come to the field, expect one contractor, but there will be totally different company doing the job."[35] One contractor told me that this strategy of sharing labor with multiple competitive contractors in a capitalist economy is a legacy from a Soviet past in which everyone worked for one structure. In this context, loyalty is important; switching from one contracting company to another is not respected.

While the legacy of Soviet labor cooperation was described in positive terms that connoted loyalty and solidarity, notwithstanding the financial sacrifices of each contractor, current infrastructure builder cooperation deemed "European" was perceived as an ongoing shift. "We are *becoming* more European," remarked Benas in a slightly *stiob*-like manner. "Becoming European" in this context can be understood as an ironic description of becoming more disciplined and rational, a site in which subjects simultaneously laugh both at these categories and themselves. It fits with Yurchak and Brock's description of the late Soviet *stiob* genre of humor, which laughs at mainstream discourses by over-identifying with them. Although some people in the field historicized digging practices through categories such as moving from "brutal Soviet" to "optimized

32 Vilimas Kulbė, "Untitled," in *Jie kūrė Lietuvos ryšius*, Basevičius, Kuzma, and Žintelis, eds., p. 255.

33 Anna Lowenhaupt Tsing, *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins* (Princeton, NJ: Princeton University Press, 2015), pp. 5–6.

34 Fieldwork report, Bareikytė, 12 June 2017.

35 Fieldwork report, Bareikytė, 12 June 2017.

European" cooperation, others felt that cooperation—such as in the example of electricity and telecommunications workers laying cables in one pipe—emerged not because of political changes, but due to physics and the absence of induction problem, because fiber-optic cables, unlike copper, can actually be laid next to electricity lines. While electric cables create magnetic fields that once disturbed old copper wire telecommunications cables and diminished transmission quality, these electric cables do not affect the fiber-optic cables and thus allow electricians and telecommunication specialists to cooperate. Thus, while digging practices are earthly and violent, the respective degrees of involved cooperation were explained in the field in historical, geopolitical, *stiob*-ic, and physical terms.

What, then, does digging tell us about Internet infrastructuring? By focusing on the site-specific practice of digging, we are able to see one part of the overall Internet development—the wired telecommunications network—as an earthly business carried out through ongoing interaction between outsourced and employed labor forces that, mainly due to geographic factors, cannot be fully planned. Digging practices are rooted in hierarchically framed and controlled cooperation between full-time workers and outsourced contractors. They use workers for three crucial roles: to observe practices; to dig, and thereby build wired telecommunications networks; and to collect data, such as photos, related to practice outcomes.

Digging requires cooperation, the capacity for hard physical labor and the ability to endure both failures and expectations of loyalty. While it is planned as much as possible, unexpected remembrances, political and critical judgments, and geography render digging a geographically and culturally contingent manual and communicative labor practice that sustains Internet infrastructuring in specific places. To dig in a Lithuanian context means to be confronted with Soviet infrastructural legacy, post-socialist labor relations, everyday task distribution, and a large amount of rain.

2.2 Mediating

My internship mentor gave me Physical Network Department employee Emilis's telephone number. When I called, Emilis seemed quite surprised to hear from me. Later it became clear that it was my German number, which started with a +49 area code, that confused him. I stood in front of the Naujamiestis district office building for network installers, documenters, builders, and other Telia Lietuva employees who work with physical telecommunications networks, and waited for Emilis. The building is only accessible with an employee card; I did not have a card, so Emilis used his to let me in. I was led directly into his office, where I sat on one of five leather chairs. His spacious office consisted of what looked like the furniture from the 1990s; glazed glass windows surrounded the space and looked out onto the street and the neighboring open office spaces. Emilis, whom I will call "the mediator," had his computer monitor projected on the office wall. In a few minutes, the first contractor was scheduled to come in and thus the meeting would begin. In such meetings, the mediator—the Telia Lietuva employee who manages contractor work—and the contractor—the company representative who actually builds the physical part of the network—discuss various physical network build-

ing works. A big excel sheet comprised of more than 900 titles and tables with project numbers, client names, dates of commission takeoffs, planned ending dates, and completed works is projected on the wall and serves as the backdrop for this discussion. One of the excel sheets is titled "Goal: construction in time,"[36] and is concerned with projects that are either problematic or must be delivered soon. This immediate delivery is an apt summary of the main goal of the meeting: to communicate with contractors in order to finish telecommunications network construction on time.

I participated in a few of such meetings between contractors and mediators, and they all unfolded in a similar manner. The contractor and mediator looked at the excel spreadsheet and spoke about their client's needs and project uncertainties. The discussion of each issue was followed by the contractor's answer, which was followed by another address, followed by another contractor answer. Conversations were mostly relaxed: the contractor and the mediator not only discussed construction projects, but also shared jokes, such as one about infrastructure builders who plan to lay cables without discerning street layouts. I mostly remained silent: I listened to their conversations, took notes, and heard the sounds of neighboring cars. These conversations bored me because they discussed similar information about telecommunications equipment construction in a seemingly unending loop.

During one meeting, this loop was broken by rising tension between the mediator and the contractor. In fact, there were times during these meetings when the mediator questioned contractors about their unfinished works and plans to finish them in a patronizing manner, to which contractors usually responded by changing the topic or providing ambiguous answers. One time, the mediator tried to squeeze information out of the contractor. Suddenly, the meeting was interrupted by a telephone call: the mediator picked it up while the contractor was still speaking. Afterwards, an utterance of an address was followed by another utterance of an address while the contractor elaborated on the situation, which included statements such as: "We are planning to make it," "We are waiting for the call," "After some time the project will be arranged," and "After two days".[37] This conversation reminded me of other interrogations carried out by mediators in which contractors vaguely admitted that although they had not yet finished building a particular part of physical telecommunications network, they would definitely do so. Once, the contractor complained that he could not enter an apartment building. The mediator answered, in a didactic manner: "How is that logical? One just needs to drive there after work."[38] When the dissatisfied contractor refused, the mediator raised his voice and asked why clients should sacrifice their working days in order to let contractors into their apartments earlier. He suggested that instead, the contractor could sacrifice one of his own free evenings, an observation to which the contractor finally seemed to agree. Thus, most of the contractors took upon a passive and vague role in answering mediators' questions or reacting to their comments. Examples include:

36 Fieldwork report, Bareikytė, 12 June 2017.

37 Fieldwork report, Bareikytė, 12 June 2017.

38 Fieldwork report, Miglė Bareikytė, 19 June 2017.

1. Mediator: It shall be understood that this week you are not going to finish that.
Contractor: If it is possible, I will finish.
Mediator: When will I know that?
Contractor: Tomorrow, maybe.[39]

2. Mediator: This month you are going to finish it.
Contractor: Maybe, I cannot guarantee.[40]

3. Mediator: Will you finish this month?
Contractor: No, next month, God willing.[41]

I wondered why so many construction works needed to be guided by a mediator but also ran behind schedule. Only after some time I noticed that contractors and mediator did not meet to discuss all of the construction works they were involved in, but rather to speak about those that still needed to be completed and thus were particularly demanding. Thus, the mediators needed to pressure contractors to quickly finish their tasks.[42]

Mediating practices take place at the Physical Network Department offices. Mediating consists of an exchange of information between two subjects. It entails weekly mediator and contractor meetings, during which the mediator accepts several contractors and they provide an update about the status of physical network construction. Clients of contractors and Telia Lietuva include private companies, developers, and sometimes even Telia Lietuva's competitors, who need a new cable entry. The mediator makes sure that clients and contractors communicate, while the contractor is responsible for actually building the physical network.

Mediating thus means providing an ongoing communication line between Telia Lietuva and the contractors who build its physical networks. It is a routine practice and takes place at one of the Telia Lietuva offices. The practice of mediating consists of meeting contractors and speaking with them in person, answering their questions about specific objects, and accepting finished projects by occasionally sending a Telia employee to observe a new construction. The mediator and the contractor meet every week and usually discuss projects delays. In these monotonous *tête-à-tête* meetings, long excel spreadsheets containing information on concrete objects and their construction status are projected on the wall. The mediator and contractor focus on the usual problematic issues: why is the contractor late; who is responsible; and what needs to be done in order to move forward?

Once, when I was alone in an office with the mediator, I asked him about why contractors are late. The mediator defended contractors by elevating this problem from an individual to a structural level: he stated that not just some, but *all* contractors are late due to a lack of resources and bad management. This includes instances such as new

39 Fieldwork report, Bareikytė, 12 June 2017.
40 Fieldwork report, Bareikytė, 12 June 2017.
41 Fieldwork report, Bareikytė, 19 June 2017.
42 Fieldwork report, Bareikytė, 12 June 2017.

building developers disturbing the network building process by leaving their equipment on the contractor's work site. Although this practice now happens rarely, I was told that five or ten years ago, one third of house builders laid their final brick only to remember that they also needed a network connection. After the street is laid, it is very difficult and expensive to dig it up again in order to lay a new telecommunications cable. Even today, when everyone wants to be connected, and cooperation between the telecommunications contractors and building developers should flow, mediator Emilis said that "sometimes developers are saving on something, but it is not clear on what. Sometimes developers lay the cables by themselves, and then we receive problems, such as who will pay for electricity?"[43] When a cable is laid by a non-professional, such as a housing developer, this often involves the omission of the necessary pipe for laying cables in order to save money. If the building process takes place in a special territory secured by the state or municipality, contractors need to communicate with institutions that are responsible for the conservation and restoration of cultural heritage. If the special territory is already well researched, it is easier; if not, then "with fetlock and whisk the little bones are being looked for,"[44] and the process becomes slower and more expensive. All of these various causes—bad planning, forgetful clients, saving, secured architectural legacies—contribute to a delayed physical network building process. They also shape the dynamics between the mediator at Telia Lietuva and outsourced contractors. During the meetings I observed, contractors often attempted to win space for action by ambiguously deferring their answers. They would rarely say an exact project completion date, and thus maintained space for unexpected contingencies.

Mediating is a practice that is built upon dependency, meaning that it could not be done without contractors. The decisive factor for Telia Lietuva to choose one contractor over another is not only the best price offer, but also contractors' willingness to participate in the often difficult and complicated network building process. At the time of my fieldwork, Telia Lietuva worked with six to eight contracting companies. During Lithuania's cold winters, contractors do not have much work. During summer, on the other hand, contractors can choose between many projects and tend not to apply for each one that is available. Some objects are so big that contractors even refuse to participate in the competition process. By outsourcing the physical network building process to external private companies, Telia Lietuva gets the best price through competition and saves money through employing part-time contractors, but it also depends on these contractors. Some contractors build networks both in Lithuania and abroad, in countries such as Germany, Sweden, or Norway. Emilis once told me, "Lithuanian salaries are not comprehensible in Sweden, while Lithuanians do comprehend Swedish salaries."[45] Even though contractors comprise an outsourced labor force, they gain some autonomy through the processes of migration and refusal to participate in the Lithuanian competition process.

The practice of mediating thus facilitates communication between a client and a contractor. This infrastructuring practice develops and maintains new physical net-

43 Fieldwork report, Bareikytė, 12 June 2017.

44 Fieldwork report, Bareikytė, 12 June 2017.

45 Fieldwork report, Bareikytė, 19 June 2017.

works that expand physical Internet network access. To build physical network connection involves not only digging the earth and laying and repairing equipment, but also managing the process with the help of a mediator, who guides infrastructuring practices related to physical network building and controls ubiquitous, uncontrollable delays. Physical network building processes depends on many contingent factors, such as the attitude of contractors, shared information about other infrastructure works with city developers, and the location of building sites, among others. To mediate thus means to be able to manage Telia Lietuva's dependency on the outsourced contractors that build physical networks in an inherently contingent environment of network construction, as well as the ability to push them to do their digging job. The practice of mediating is important for the physical telecommunications network building process and Internet infrastructuring because it coordinates communication between two crucial subjects: contractor and client. While the latter wants the network to be built, the former actually does the job. In other words, the mediating practice illustrates that the Internet does not emerge ex-nihilo, but also that the equipment required for Internet access is not randomly dug into the earth. Mediating requires not only a meticulous understanding of the physical network building process, but also the communicative skills required to guide, judge, criticize, and practice empathy toward the contractors who infrastructure the Internet. Thus, a physical network emerges from a routinized, organizational practice of mediating that brings together Telia Lietuva employers and outsourced contractors, but which is also inherently contingent and full of surprises due to often delayed work of physical network contractors.

2.3 Planning

Planners are people in motion. They constantly move from the office at Physical Network Department to the various outside objects that need to be connected to the physical telecommunications network in order to better inform themselves about the situation on the ground and see it with their own eyes before preparing the actual technical requirements that will guide the digging and mediating practices. From a planner's perspective, the physical telecom cable network comprises three main objects: a cabinet, a connection, and a building. A connection is connected to the cabinet, which consists of multiple fiber threads that are eventually connected to the user. From the other side, the connection is attached to the main network transmission channel, the so-called "highway," which uses the connection to connect the user to the physical telecommunications network and, eventually, to global Internet networks.

During one of my field visits, I shadowed a planner at Telia Lietuva named Karolis. One of the designated objects we visited was located in a forest within a gated community. We were only allowed to approach the security booth that stood in front of the neighborhood entrance. Two turnstiles additionally prohibited our entry to a gated street in which the houses had sculptures in their yards. A steward, who stood next to the security booth, greeted us. Our goal was to discuss and gather information about the needed connection between the security booth, which was located just outside the entrance to the district, and the small building in the forest that already had fiber-optic

network access. The steward and Karolis discussed digging issues: who would dig the ditch and how deep should it be? Afterwards, Karolis told the steward that the ditch would need to be 70 cm deep according to Communication Regulatory Authority standards, and the steward looked surprised. Karolis then told him that it would take at least 35 days to build the connection. After this short conversation, Karolis photographed the security booth and small forest building from afar in order to later prepare a project plan and meet its technical requirements. We then moved to the security booth, and after we came closer, the security guard sitting in the booth strictly asked us if it was possible to see the earlier documentary photographs. Upon seeing that his presence in the photo was minimal, the security guard visibly relaxed. We also needed to enter the security booth in order to check its telecommunications equipment, in particular its switchboard cabinet. The guards reluctantly allowed us to enter. Next, Karolis counted the steps from the security booth to the tiny forest house and evaluated an approximate digging distance. When this process of observation concluded, he ordered a taxi and we slowly walked down the road to meet the car.

There was only one road that led back to the city. While walking, we spoke about salaries in Lithuania—a ubiquitous topic at that time that provoked societal indignation—and apartment prices in Vilnius. Karolis was both surprised that I knew nothing about Vilnius' apartment situation and that I had not yet bought an apartment myself, which suddenly made me feel anxious. The taxi arrived and Karolis immediately bonded with the driver by discussing their labor conditions and how difficult it is to pay back credit or save up for a holiday. The taxi driver suddenly started sharing more details about his life. He looked young; he worked as a freelancer for a Lithuanian version of Uber. He was satisfied with this work: although the company took part of his salary, it also provided him with clients. The driver also shared how he would sometimes drive for dozens of hours without a pause, and how he once drove for 49 hours without taking a break. At a certain point, when the conversation turned to remembrances and critique, Karolis—who seemed to be my age, early thirties—started speaking about Soviet times. He told us how back in Soviet times, people saw each other more often and were nicer to each other, while nowadays they are "wolves" and count everything. "Going to a friend?" he asked. "It is expensive, you need to buy gifts! So why go?"[46] He posited that while people in Soviet times did not have a lot, they would still meet often. Him and the driver continued discussing working conditions and income deficiencies until we reached the office building.

At the office, the conversation turned to the underground telecommunications network channels, called "canalization," and other employees joined. I think it was Karolis who claimed that if this "canalization" system of underground telecommunications channels was not built during Soviet times, the physical Internet infrastructure in Lithuania would not be as good as it is today. "Why?" I asked.[47] He responded that this was "Because it would be necessary to dig everywhere" [48], and that would increase the cable laying price. I then asked why such a good "canalization" system

46 Fieldwork report, Miglė Bareikytė, 13 June 2017.

47 Fieldwork report, Bareikytė, 14 June 2017.

48 Fieldwork report, Bareikytė, 14 June 2017.

was built during Soviet times. No one really knew the answer. Employees reiterated that neither Germany nor England had built as good an underground infrastructure as Soviet Lithuania, although in Germany the underground tubes for cables were said to be broader than in Lithuania. "We have been given a present," one of the employees joked.[49] I was told that during Soviet times, everyone could dig under the soil and build a part of "canalization," but after the "canalization" system was privatized in the 1990s, one could sell their share to the privatized telecom industry only up until a specific point. While some people sold their part of the "canalization" system to the main telecom operator, nowadays not everyone has the ownership documents, which leads to difficult situations. I was told that "if it is nobody's, then it is Telia's sewage system."[50] At certain times throughout my fieldwork at the Physical Network Department, the Soviet Union, its cultural and infrastructural legacies, seemed to be a reference point—a floating signifier—for talking about telecommunications development, but it was rarely grounded in specific examples.

At some point, four of us left the office and went to the basement. While there, the concept of "Internet as a service" emerged for the first time during my fieldwork, when I heard from the employees that cabinets located in different basement rooms provide services such as the Internet or television. Up until this point, the Internet had barely figured as a reference point among those employees, who actually build and manage physical underground network channels that are crucial for data transmission in Internet networks. Workers here spoke of the Internet as such rarely, although once, during an occasional walk to a street cabinet I asked Karolis about the meaning of his job, to which he answered, "We give birth to the Internet. . . . If only they paid more."[51] I was told that not everyone at the company is paid low wages, but those who supposedly do the "dirty" work, the "builders" who take care of "canalization plumbing" issues—namely, people from the Physical Network Department—are paid less.[52] On one occasion I was made aware of tensions that exist between the Physical Network Department and upper level managers who remain invisible to one another because their offices are located far away from each other.[53] Despite seeing tensions, workers exercised their complaints and critique lightly, through jokes, such as when one day at the office a few employees told me, "There are four [people here who are] willing to go to Germany [and] work anywhere."[54]

Before the process of competition for outsourced contractors to build future physical telecom networks, workers at Telia Lietuva plan and prepare technical requirements. Each object—a house, an apartment, a new storage building, and others—that needs

49 Fieldwork report, Bareikytė, 14 June 2017.

50 Fieldwork report, Bareikytė, 14 June 2017.

51 Fieldwork report, Bareikytė, 14 June 2017.

52 Fieldwork report, Bareikytė, 14 June 2017.

53 In 2019, Telia Lietuva moved seven of nine Vilnius offices into a new fifteen thousand square-meter office building: Viktorija Karsokaitė, "Naujieji 'Telia' namai – su miško motyvais ir šikšnosparniais ant stogo," *15min.lt*, published May 17, 2019, accessed May 10, 2020, https://www.15min.lt/verslas/naujiena/kvadratinis-metras/nekilnojamasis-turtas/telia-apsigyveno-miske-graziausias-vietas-atidave-siksnosparniams-ir-virtuvei-973-1146166?copied.

54 Fieldwork report, Bareikytė, 14 June 2017.

to be integrated into company's network is different in size, geographical location, and required services; thus, technical requirements are crafted for each object separately, often with the help of field visits. One usually needs to get out of the office and visit the object, because a photo or a map often does not suffice to grasp the complexity of a building site. Thus, a virtual map devoid of empirical ground observation and experience might be unable to disclose the location of the server room, its situation in space, and its material composition. Even when the object is small, it is necessary to drive to the place, find the related server room, and outline its internal piping, the height of the ceiling, and other characteristics that are important for the building process and the design of technical requirements, but are invisible during mere virtual interaction with the site. After these short field trips, workers return to the office, draw up network schemes, and prepare technical requirements, according to which the physical telecommunications network will be built. Thus, during my time amongst physical telecom network planners, we constantly moved: from the office to the field, back to the office, and yet again to the field. Planning practice was encapsulated in ongoing conversations between planners and clients, taxi drivers, and amongst planners themselves, who either discussed new network equipment requirements or sometimes shared ongoing jokes.

Mobile planning practices thus result in a document that details technical requirements that specify which tasks need to be carried out by contractors during the digging process. The document also specifies the type of network access (the cabinet, a secured hub (*krosas*), wells in a underground telecommunications channel system "canalization" or in a cable cellar called *šachta*); types of cables; network cable channels (telephone sewer channels); existing and planned transmission network (types of cable, connections, etc.); and the name of the person who prepared these conditions. The outlines of prices, materials, types of connections, and tasks, as well as specific technical requirements, object photos and related network schemes serve to define what contractors need to build in each particular situation. In short, these technical requirements provide information about current physical network resources and their interoperability with the foreseen physical network. In this way, planning practices manage the uncertainty of the physical network building process. After technical requirements are outlined, competition amongst contractors begins, and their implementation is synchronized with the municipality.

Planning practice comprises object observation and description; it results in technical requirements, rules for the upcoming competition, and network building processes. Infrastructuring depends on such manual planning practices that control its complexity by outlining a set of rules that determine how the physical network will be built. While planning is still done predominantly by human beings, they use various instruments, such as software, paper, pens, and cars in order to produce a set of rules for the contractors. Amidst these current instruments, it is possible to think about the future automation of planning. By entering a few data points, such as an address, a type of network access, a location of the nearest cabinet, and other categories, a software program can generate a future network scheme, albeit one that is not as precise as is currently needed.

Planning practice is crucial for Internet infrastructuring, because it describes physical requirements of future projects via empirical site observation and thereby lays out

key conditions for further expansion of physical telecommunications networks. While planning aims to predict and balance current network resources with future needs, its practice also comprises multiple situated contingencies. During my time with the planners, I was made aware that planning does not only comprise linear, dry tasks that result in a document of mere technical requirements. Planning is also encapsulated in emerging and fragmented remembrances that materialized at different times in the field through stories about Lithuania's societal communication culture as well as the telecom network path dependencies on its Soviet legacy through jokes, moments of nostalgia, or remarks about other technical legacy from the past. Also, planning practices consisted of contingent everyday expressions of irony and criticism that often circulated around the topics of fair remuneration and tense internal relations within the company. To plan future physical Internet networks thus means to be able to suppress the empirical complexity of future building sites, which emerge from daily interaction with multiple infrastructure objects and clients, into the form of clear technical requirements that will guide the digging process. Planning thus illustrates how physical Internet networks, and thus Internet infrastructuring, not only result from coordinate and earthly practices of mediation and digging, but also from site-specific planning practices that pave the way for future network expansion and could be automated in the future.

2.4 Documenting

At the Data Linkage team in the Physical Network Department, people enter data concerning new parts of physical telecommunications networks into the company's databases. One day, I talked with and observed the work of Jona, a documenter from this team. While she spoke on the phone with a network installer, I had time to observe her unusual office surroundings, which consisted of a tree branch hanging from the ceiling and a box of cables tucked under the table. This room was a part of the bigger open office that was separated from the Physical Network Department by a wall, on the other side of which sat the planners. I asked Jona about the other colleagues in her side of the room, specifically about what work they did. She told me that two other people do a job similar to hers, while others collect information about projects related to copper cables, data on geodesics, and other issues. Jona, who had worked at the company for 30 years, was working on storing information on fiber-optic cables.

During our conversation, I noticed that seven out of ten workers in this part of the room were women. This team of Data Linkage documenters was thus the first group of employees in the Physical Network Department whom I had met and observed in which the majority of workers were female. I signaled my surprise to Jona and asked her why she thought there were so many women in her team in contrast to the mostly male employees, predominantly network planners, on the other side of the room. Jona replied that "maybe the boss has chosen men for the other team. Women here are responsible for checking what the contractors have done."[55] After I later spent more time

55 Fieldwork report, Bareikytė, 14 June 2017.

at different company departments, I noticed that there were many female employees in the company, even in high positions such as testing laboratory manager, which entails the supervision of highly skilled, predominantly male workers. Consequently, I do not claim that female workers are not represented in the company's different departments. In this particular situation however, I saw one big office divided into two spaces: one made up of predominantly male workers on the right side of the room, and one comprised of mostly female workers on the left side of the room. The group on the right planned technical network requirements that required active decision-making and field-based experiences, while the group on the left entered the data about the built network and helped other workers if information was incomplete. Although both planning and documenting processes could be described as supportive Internet maintenance work—both planners and documenters help maintain and expand physical telecommunications networks—the practice of documenting is less physically active and thus helps other workers both do their jobs correctly and avoid mistakes.

Documenting consists of filling in company databases with updated information about new parts of the physical telecommunications network. During the practice of documentation, information regarding transmission channels and geodesic conditions of recently constructed telecom network parts are provided in the form of texts, numbers, addresses, and photos of various physical network construction sites. They are saved digitally in the company's internal digital systems, such as a network information software called TIS. Documentation practice not only archives physical network information, but also attempts to avoid network maintenance mistakes in the future. Correct information is crucial in cases such as when, for example, network installers need to connect the right cable threads for their customers, but are not sure which fiber-optic cable threads they should splice. In such cases, documenters support telecommunications workers via phone by relaying stored information about already-built objects in real time.

The practice of documenting is barely visible for customers and other telecom company colleagues, because firstly, it does not directly result in any empirically apparent physical or virtual object and secondly, its invisibility arises because documenters have recently literally stopped leaving their office to meet other company's employees on the physical construction site. Employees told me that only half a year ago, documenters physically visited and observed construction sites to ascertain the correctness of the data they entered into company databases. At that time, documentation practices depended on the mobile labor of driving around and personally perceiving the broader context, including the construction site, equipment, place where cables were laid, underground wells, and physical network locations. I was told that things changed when the company went through the process of resource optimization. Currently, documenters sit in the office and use computers to both enter and find information about the objects provided by contractors earlier—such as photos from digging sites—instead of personally visiting construction sites and comprehending the problem based on information gathered through experience.

Jona was concerned that the automatization of documenter labor in such a way leads to a particular kind of oversight. For example, repetitive staring at a computer screen impedes documenters' comprehension of actual physical network conditions.

She said that "earlier you could physically see, nowadays it is rather monotonous, it is not clear, what fiber threads are where. Earlier, more information was gathered and it was clear what problems which object has. Nowadays, the information just flies by and it is easy to forget what a particular object is about."[56] In order to support this new type of distanced and immobilized documentation practice, contractors share photos from the construction site with documenters. Such photos from the field are called "extra eyes" by documenters. Notwithstanding the fact that documentation needs to be precise in order to avoid future mistakes, and that empirical experience strengthens worker capacity to grasp future problems—for example, the exact location of a broken cable—by seeing built objects with their own eyes, much data from the construction sites is now easier to forget, because the site-specific, empirical experience of documenters is vanishing. In this way, the labor practices of documenters are deskilled. Such cases of deskilling through automation, as media scholar Alexander Galloway contends, change the type of labor by replacing manual work with specialized labor and thereby discarding those who cannot cope with new practices.[57] Similarly, documentation practices have eventually transformed from an expansive work comprised of empirical site experiences and site documentation into a more focused and immobile labor practice carried out with the help of computers. Although these services are crucial for Internet maintenance in its supporting role for cable installers and cooperation with network planners, it is possible to glimpse how documentation practices could eventually disappear due to optimization and automation. For example, perhaps network builders or planners will start documenting network objects themselves in a more comprehensive manner and thus render documentation practice redundant.

The practice of documenting is also not exempt from mistakes. When two fiber-optic cable threads are joined together, it is important to find the right one to splice. If one splices two threads that are already connected to two different clients, both of them will lose service. Documenters told me that this happens, because technical requirement planners make mistakes: they sometimes forget or provide false information about existing network resources, such as cables threads that are supposedly unused but are actually in service. In such cases, documenters communicate with cable installers via phone and attempt to find the right fiber thread by analyzing previously documented information. Mistakes thus belong to the practice of documentation, and they result from the discrepancy between documented information and actual, empirical telecom network conditions.

In short, documenting practice facilitates Internet infrastructuring by helping other physical network development teams and by organizing, storing, and sharing information that is useful for the maintenance of physical telecommunications networks. This practice illustrates a few things about Internet infrastructuring. In order to document successfully, one has to know the constitutive parts of the physical network and be able to collaborate with other employees, such as network installers, in order to help maintain the network, repair mistakes, and connect new users. Thus, infrastructuring

56 Fieldwork report, Bareikytė, 14 June 2017.

57 Alexander R. Galloway, "Brometheanism," *Cultureandcommunication*, published 16 June 2017, accessed 13 March 2019, http://cultureandcommunication.org/galloway/brometheanism.

depends on the precise documentation of information. Despite this, stored information also includes mistakes that emerge from false documentation. In other words, the practice of documenting is never precise, because it involves human labor, and humans inevitably make mistakes and forget and delay the documentation process. Additionally, documentation practice illustrates the fact that in practice, Internet infrastructuring depends on feminized labor, which is increasingly made less visible through the decreasing participation of its workers in empirical network maintenance observation. Moreover, this labor is less visible because it is located in the already less visible Physical Network Department. This situation is similar to what historian of science Margaret Rossiter describes as the "Matilda effect," a phenomenon in which top employees receive ongoing publicity, while the work of their subordinates fades from historical records.[58] Although documentation practice is crucial for Internet infrastructuring in its supporting role for cable installers and network planners, I could see how future documentation practices might disappear due to labor optimization and automation. If such optimization did occur, current practitioners of documentation practice would disappear without a trace.

2.5 Connecting

During connecting practice, engineers connect client homes and offices to the rest of Telia Lietuva physical telecommunications network, which has already been planned, mediated, dug, built, and documented. During my fieldwork, there were three client service installer teams which carried out connecting work in different Vilnius districts; I spent time with one of them. I was located at the Center team, which is responsible for Vilnius' central and southern districts. There, I followed the daily practices of installers—sometimes called "technicians" by colleagues, when their work is underestimated, or "engineers," when they themselves describe their work practice—who work for private clients.

Once, I travelled with an engineer named Pijus to repair a failed network connection. We went to Nauja Vilnia, a Vilnius suburb famous for its post-Soviet mafia organizations and its large psychiatric hospital. This suburb became vastly impoverished after the disintegration of the Soviet Union; when factories closed, the majority of its Russian and Polish speaking citizens lost their jobs. One can easily reach multiple collapsed Soviet factories, but also Belarus, via a short train ride from the district's center. It is located next to the bus and train station commonly known as "Friendship," which was recently starkly renamed to "Exile" in order to commemorate not only the now-closed Soviet factories, but also the train station from which many people under 1940s Soviet rule were deported to Siberia. Currently, hilly Nauja Vilnia is full of Soviet-style apartment buildings and wooden houses, and a tiny river runs between the wood and the concrete buildings. Pijus and I drove until we finally reached a street containing a Soviet high-rise, located next to an empty field and a bus station. He told me that we were visiting so-called "pilot" clients. This name is given to the customers who have no

58 Jennifer S. Light, "When Computers Were Women," *Technology and Culture* 40, no. 3 (1999), p. 482.

concrete time prescribed for a company visit. We went inside an apartment building whose walls, floors, stairs, and communal corridors had not been renovated for a long time. Due to high security measures, it was not easy to enter the elevator. We needed to use a chip key or contact a resident who had a special chip to both open the entrance doors and activate the elevator. Finally, we were able to use the elevator to reach the apartment, which was located in the back of a long, dark corridor. The apartment was a mess: the floor was partially demolished, bits of broken glass lay on the floor, and it was generally dirty and cold. A friend of a client was smoking in the communal balcony in front of the entrance to the flat. The client started complaining about how difficult it is to install Internet connections in Lithuania in comparison to the good Internet, and life, in Germany. Pijus noticed that the client did not have an Internet connection not only due to unpaid bills, but also because of physical network connectivity problems. Our journey to find and repair the broken signal flow thus began. We first left the building and went to the main connection hub. Before leaving, Pijus borrowed the apartment chip and keys from the client in order to easily enter the building when we came back again. Although in hindsight sharing one's private key seems daring, it felt totally normal in the field. Outside, Pijus warned me that the hub we were going to visit is highly secured. At the gates, we were asked to give our surnames. In order to get into the building, we were required to show our Telia Lietuva ID cards, a form of documentation that I did not have. I was nevertheless reluctantly let in, only after I showed my Lithuanian ID and explained my intern status at the company. Everybody inside wore boots with disposable plastic covers. We needed to pass through two secured doors to enter a server room. The last door was protected by a mechanical lock, which we unlocked by manually providing an entrance code. Finally, we entered the server room, where the installer found the optical distribution frame (ODF) that serves the high-rise we had just visited. He noticed the problem: a required cable had not been connected to the main network. In practice, a fiber-optic cable thread that comes from the main network is divided into more threads, which are then connected to the ODF. The ODF thus connects the user to the main network through designated fiber thread, divider, LAN, and fiber-optic cable equipment. After we connected the ODF to the main "highway" network, we left the hub and went back to the apartment. In the apartment, the installer turned on the router and it worked; the signal flow was thus restored. The client, however, was not fully satisfied. She complained about her TV and the installer attempted to help her. Pijus told me that he receives a bonus for each additional service he sells, and thus his help was not altruistic. Lastly, he prepared an electronic bill with his tablet, and we left for another client residence. This next site was the apartment of a diplomat in Vilnius' old town: it had high ceilings, walls painted a stylish shade of grey, oil paintings, and several visible bottles of whisky. There, Pijus needed to connect a new Internet access point by welding fiber-optic cable threads.[59] Later, we went to yet

59 In the very last meter of a physical network—at the client's house—fiber and copper cables need to be connected through the transducer, an instrument in the form of a little box that changes the signal from fiber to electro impulse through which the data is then being transmitted. When, for instance, a fiber-optic cable, which consists of multiple glass threads and is protected with a layer of varnish, has to be taken of before splicing, a fiber cable gets increasingly naked and lo-

another Soviet-era building, which was located in one of the Soviet low-rises in central Vilnius. An intoxicated client opened the door. She repeated multiple times that she had been in this apartment for only one night in an attempt to explain why it was so messy. Despite these protestations, this statement was not true, as the technician had already visited the apartment a short while ago and had had to come back again due to missing repair connection equipment. While Pijus reconnected to the router, the client drank vodka and occasionally offered us a sip.

The job of a cable engineer mostly consists of manual tasks supported by physical and virtual tools, although there has been a recent push for this job to include communicative labor as well. In addition to an engineer's daily tasks, they are increasingly required to sell products. Pijus once told me, "We come to work as engineers and they ask us to be salesmen,"[60] because cable installers are also encouraged to promote additional telecom services to clients. Importantly, the image of a telecom worker as a salesman is a rather recent one. During one of my interviews with telecom stakeholders, I learned that in the 1990s, and earlier Soviet times, telecom-provided citizen telephone access was highly desired but rare. In those times, telephone line deficiencies meant that "telecom worker" was both a desirable status and an entity that people begged for services. When the biggest telecommunication company, Lietuvos Telekomas, was established as a state enterprise on 1 January 1992, more than two-hundred thousand people waited for telephone access.[61] Aloyzas, a government official and academic I interviewed after my fieldwork at Telia Lietuva, described how after Lithuania's independence and the subsequent emergence of market economy services needed to be sold, which resultantly shattered the identities of telecom industry workers:

> During Soviet times it [for instance, a telephone line] was a deficit. He did not need to sell, but he was given a bribe for making it. . . . And it is, again, a psychological thing . . . imagine, a person is 50 years old, his whole life he was sitting in an office, and someone comes to his door, 'Maybe you could do me something.' Well, 'Alright,' or 'Not alright.' And suddenly he is being told that 'You need to sell this thing.' . . . What does it mean, 'to sell'? His whole working life, [people] were walking on their knees for him to provide to them. And now he needs to sell. . . . Can you imagine, what a psychological breaking point?[62]

Not only telecom workers subjectivities changed after the emergence of the market economy and subsequent rise in the number of telecom services and providers. The

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ses its peel. Because fiber threads are made of glass and thus immensely fragile, their threads are secured from breaking with a metal tube. In the practices I observed, fiber threads were spliced and connected to the transducer with an optical fiber fusion splicer. When it was done, transducer—a little box—is connected to the electricity network, fiber cable, and copper LAN cable, and constantly sends signals to Telia Lietuva. Transducer's identification happens all the time in order to track if the signal is active or broken. With this task, the cable is installed in the client's house and the connecting practice is ended.

60 Fieldwork report, Miglė Bareikytė, 21 June 2017.

61 Jonas Jagminas, "Lietuvos telekomunikacijų 80 metų kelias," in *Lietuvos ryšiams – 80*, Arūnas and Povilas, eds., p. 61.

62 Interview with Aloyzas, 9 November 2017.

number of workers in the telecom sector, especially at Lietuvos Telekomas after its privatization, dropped by thousands. While the majority of workers were fired, some technicians managed to integrate selling procedures into their work. According to Aloyzas, the majority of remaining workers who wanted to survive in the changing industry needed to accept new work ethics and integrate a seller's mentality into their work practice:

> It was needed to sell a product after the establishment of commerce. . . . Telekomas, that of Lithuania, when it was privatized, during the privatization, almost eleven thousand people were working there. Two years after the privatization, three thousand people worked there. More than seven [thousand], we fired. The remaining ones there, for instance, there were brigades, people, who, if the cable is broken, they drive and physically connect the cable, [do] that technical work. They were told, 'If you want to earn extra, since you are working in contact with people, offer them telecom services, some extra ones.' . . . Well, what happened? That was told to everyone. A portion of people after some time said, 'No, that work is not for me, I simply do not want,' or, 'I simply do my work, but that other one—no.' That's fine, such ones are also needed. Others said, 'I like it this way, I do not want to do my old job, I will only do this one, selling.' Good. And some part remained doing both things [doing technical job and selling].[63]

Thus, according to long-term industry expert Aloyzas, the image of a desired telecom worker in post-socialist Lithuania eventually changed into a part-time seller, and the cable installer I encountered corresponded to this new, post-Soviet telecom imaginary of a flexible telecom employee.

Connecting practice is mobile. Engineers barely stay in the office. In the morning, they change into their uniforms and receive a pre-planned daily schedule from an administrator. They then get into a company car, enter their daily schedule into a GPS device and make sure that they have the right equipment for the day's job. When everything is prepared, engineers call their clients and the road trip begins. Although their schedule is preplanned, work situations only become clear at the site of the client's home. Also, although cable installation is partially a manual labor practice—i.e., it requires human physical labor to install the right equipment—it comprises multiple tools that enhance and automate the engineer's work. The main tools an engineer uses to connect, cut and splice include: cables (copper/LAN and fiber-optic); transducers, fiber optic splicer (which connect fiber optics with copper cables through a transducer); power meters (which check whether signal suppression is weak enough); an engineer's tablet (for data entry); and protective shoe covers. Engineers also rely on tablets to connect to Telia's virtual systems during the cable installation process. Pijus used his tablet to manage his work in real time; to describe specific network conditions at client premises and thus help other colleagues by documenting client-rented hardware; and to manage his list of upcoming jobs. There are more instruments and objects involved in this task, yet it is impossible to outline their entirety, as each installation requires a different set of equipment. Perhaps the engineer will need a ladder to reach a subscriber's box attached

63 Interview with Aloyzas, 9 November 2017.

to the façade of a house? Maybe an engineer will need to borrow the inhabitant's keys, as illustrated in the earlier example, because the signal was lost somewhere between the house and the street and thus frequent visits to the house and the hub are necessary? Signals can get lost in many places. While physical telecommunications networks are predominantly physical, they are also notably complex. Fiber threads emerge from an underground trunk cable and reach the client's house through multiple mediators, including but not limited to cabinets, buildings, staircases boxes, subscriber boxes in the apartment, transducers, and routers. If one of those objects malfunctions, is disconnected, or connected falsely, a cable installer needs to find the problem and repair it. In any case, the end goal of engineers is the same: they need to arrive at a specific place, evaluate the situation, decide how they can establish or repair the physical Internet connection at the client's house with the help of multiple tools, and leave after their job is done.

Cable engineers use the tablet to connect to Telia's RKVD Department, a department whose title I could not decipher throughout my stay, and which controls signals from a distance. Signal routes are thus both physical and virtual: they are installed physically and managed virtually. Thus, it is possible to see whether fiber threads are physically spliced and connected, observe the router, touch the cabinet and get into a secured hub called *krosas,* which contains multiple cables, dividers, cabinets, and optical distribution frames. Yet the internal virtual system of RKVD also establishes a non-physical path of signal transmission that guides the virtual connection of physical fiber threads. RKVD thus manages the signal's route by accepting a signal sent by a transducer. Accordingly, the physical network needs to adapt to the virtual one in order for a signal to flow, whereas a signal flow can be disconnected virtually without detaching a physical cable. Despite this seeming clarity, Pijus was unsure of what information RKVD could exactly see or even where the team was located. While Pijus could physically establish a route, RKVD could virtually shift the route or even disconnect the client. Engineers thus often somewhat ironically say "NKVD" instead of RKVD. In the Soviet Union, the NKVD (People's Commissariat for Internal Affairs) was an invisible governmental security agency feared by the citizens because of its unpredictable terror and ubiquitous surveillance. Similarly, in a *stiob* kind of way, the cable engineer's work is observed and controlled by an actor of whom he is aware, but knows little about.

Although a cable engineer's work can be observed in real time, the connecting practice also requires interaction with virtual systems that engineers cannot fully comprehend. Connecting practices are thus physical, but also more abstract than digging or planning. During my observation of this labor practice, my sense of the complexity of what the Internet means in workers' daily life increased. Although in other forms of labor practices there was a feeling of control, total visibility and comprehension of one's tasks—such as in practices of digging and planning, which were perceived as birth places of the Internet—here the graspable materiality of cables was abstracted into a signal flow that was not only maintained by engineers like Pijus, but also by the software he and a RKVD team used and that he could not directly access.

Although the practice of connecting employs software-aided services such as virtual signal distribution, contract signing, and network diagnostics, it still requires humans who can endure everyday contingencies, repair faulty cables, install new ones, and talk

to different clients and colleagues. To connect thus means to use various tools, as well as communicative and technical skills, and thus simultaneously engage with unforeseeable contingencies while maintaining the end customer's physical telecom network connectivity. An installer needs to deliver, but will also be exposed to the constantly changing environments of private spaces and people. In other words, physical network maintenance practices require engineers to exercise emotional distancing, which allows them to distance themselves from these situated contingencies and learn to adapt to continuous experiences of unforeseeable differences. This is necessary because the weight of situated contingencies is heavy; engineer Pijus once contended that it is "difficult to not think about work after work."[64]

In summation, connecting practices are one of the main parts within Internet infrastructuring, as they connect and repair the company client's physical communications networks. Connecting practices involve users and engineers who carry out installation work and use various pieces of equipment. They take place at multiple private and public locations in which private and business clients are connected to the physical telecommunications network. Physical network engineers such as Pijus, have to visit multiple places every day in order to personally observe crucial physical network equipment (cables, routers, etc.) and environments (fields, forests, yards, houses, apartments, corridors, rooms, furniture, staircases, floors, and elevators), and decide how each particular physical network building process should be connected or repaired. A physical network might fail (a glass cable can crack, rain can affect the transmission of the wireless signal, a user's router can fall and break), and thus tracing the malfunction and repairing the problem depends upon the ability to rapidly discern its localized problem. Thus, experiencing and seeing the environment in an empirical manner is an imperative that is necessary for engineers to make grounded decisions and solve actual problems. Nevertheless, visiting and working at various places also means exposure to multiple contingent experiences. Although such situated experiences cannot be foreseen, they often comprise feelings of inequality, transience, and precariousness during a physical network installer's daily practice due to the fact that they engage with different societal groups. In his book *Talking about Machines*, anthropologist Julian Orr describes the work of service technicians as comprised of a workers-customers-machines triangle.[65] Similarly, Telia Lietuva's connecting practice also consists of a technician's negotiation with clients and equipment in order to find the source of a possible malfunction and immediately solve problems. As Orr describes, "Although management theories claim that modern workers, both users and maintainers, will need to understand modern machines less, the technicians' job also requires learning and preserving otherwise unavailable information."[66] This quote also poignantly illustrates the labor practices of the cable engineers I observed. Connecting practices demand an experienced understanding of physical telecommunications networks and all potential malfunctioning sites in order to link users to telecom operator networks. Engineers gain this knowledge through long-term situated experiences that not only are goal-oriented,

64 Fieldwork report, Bareikytė, 20 June 2017.

65 Orr, *Talking About Machines*, p. 3.

66 Orr, *Talking About Machines*, p. 4.

but also—similar to Orr's claim that technicians not only repair the machines that break unexpectedly, but also need to keep customers content[67]—involve engaging with, taking care of and enduring unpredictable client personalities and technical problems to bind the company to its users.

2.6 Transmitting

I felt as if I was floating in space. Throughout the course of my fieldwork, I moved from the Physical Network Department—where I observed digging, mediating, planning, documenting, and connecting practices that expand and upkeep the physical telecom infrastructure that secures daily data flow and Internet connectivity—to the Transmission Department. This department was located in spacious offices in Vilnius' Karoliniškės micro-district. In some of my conversation with employees, I was told that workers in this department do not usually speak about "the Internet," but rather that they use the term "data transmission from A to B." Statements also began to emerge about the non-specificity of a Lithuanian telecom market that is a part of global telecommunications industry,[68] although it is important to note that multiple Transmission Department office workers do not leave their office space. As workers always remain behind their computers, their outdoor experience of physical networks is rare. While I previously observed the Internet as the result of physical cables dug, connected, and installed in specific places, here I noticed its emergence as an allegedly non-physical service build upon protocols.

Accordingly, there was not much action to observe. At this point I remembered one of my PhD thesis supervisor's cautious stories about uneasy situations in which field researchers have to shadow people working on their computers. I remained at the office for a couple of days and tried to ask as many questions as possible. Where am I? What do employees do here? What is the role of this department in the company? Can I participate in a Skype meeting?

"Transmission Department" is an invented title for an amalgamation of teams, such as Resource, Network Maintenance, and Troubleshooting, as well as others located in one Karoliniškės building that I visited during my fieldwork in June and July 2017. Shortly after I arrived to the office, I was told by the team leader Erikas that "the Transmission Network Department is like a truck which carries something, but the type of carriage does not matter . . . as it is only this truck on which everything is stacked."[69] After a short introduction, I was brought into an office room, where I sat with two female employees. One of them, Rūta, told me that workers here describe "the frame and containers, configure and transmit the stream."[70] In other words, employees at the Transmission Network Department are responsible for the virtual interconnection of telecommunications equipment that serves to link the different virtual packages that

67 Orr, *Talking About Machines*, pp. 62–63, 159.

68 Fieldwork report, Miglė Bareikytė, 26 June 2017.

69 Fieldwork report, Miglė Bareikytė, 22 June 2017.

70 Fieldwork report, Bareikytė, 22 June 2017.

flow through the network. The Transmission Department is thus a necessary condition for the emergence of the Internet, although it maintains not only the Internet, but also all the telecom networks and dozens of their different services. This means that only one part of the network's equipment, such as the portion that processes IP traffic, is devoted to the Internet.

Stream transmission plays a crucial role in the Transmission Department. It comprises the transmission of coded information in the form of a signal, which moves from point to point, or station to station. Streams are expressed in speed (Gb/s) and types (LAN, Ethernet, fiber, etc.). They comprise both virtual and physical equipment, which help transmit signals and can only later take the form of specific services. Thus, a combination of floating signals can be used for different services according to the upper management's needs; the Internet is only one of these services. While transmitters, aided by computers, maintain stream transmission networks, services are created on top of those networks. Stationers, who sit elsewhere, receive a stream of signals from the transmitters and fragment it, describe it, and provide it to clients.[71] Employees at the Transmission Department not only take care of the stream, but also monitor the network and troubleshoot client problems. Within this, a part of this department known as the Back Office manages stream transmissions in order to maintain the network. Other employees are responsible for telecommunications resources: they make sure that there are enough resources, such as bandwidth, available for the over one hundred Telia Lietuva services. Yet another group of employees observe the telecommunications network, take care of system crashes, manage cyber-attacks, collect information on usual network activity, and flag anomalies.[72] Thus, multiple employees maintain virtual networks in general and the stream in particular. The stream has a double identity and can be understood as a service for, for instance, internal telecom company's requirements, but also as a service for the more specific end-user services, such as the Internet. The Internet thus would not exist without both stream transmission and physical network maintenance practices, such as digging or planning, which serve to maintain it on the ground. One of the differences between transmission of stream and physical network services is that transmission is very difficult to observe empirically.

At the Transmission Department I saw the sterile side of Internet maintenance, which was tethered to laptop screens and opaque qualities of stream maintenance. Akin to the variation of employees at the Physical Network Department, different people worked here: men and women, old and young, and people who spoke Lithuanian, Russian, and English. Although the overarching tendency to make cynical jokes was visible at each of my stays at various company departments, here the employees even warned me to prepare for their daily jokes. I already had the context of growing up in Lithuania, so I was thus aware of the mundane nature of daily ironic and sarcastic remarks. In this department I also observed an employee named Vakaris make a comment regarding the lack of rural need for not only fast but also exciting new telecom services beyond mere Internet access. He said, "There is enough speed already, maybe in 'some villages' this topic is still relevant, but it is not that 'in' anymore. Something

71 Fieldwork report, Bareikytė, 22 June 2017.

72 Fieldwork report, Bareikytė, 26 June 2017.

new is needed."[73] Also, Vakaris described telecom industry users as drug addicts: "All service providers are looking for 'how to put a human on the needle'—they are allowed to offer, but better not to choose."[74] Such a cynical and ironic attitude was not unique to Telia Lietuva's Transmission Department: rather, it was the prevailing attitude within the whole company and, dare I say, the entire industry. I also found it interesting that so many telecom industry workers I met during my fieldwork—Telia Lietuva employees such as Vakaris or public academics outside of the company, such as Kaunas Technology University professor Jonas, and many others—did not invest much hope in future Internet technology developments, but rather shared a sarcastic attitude toward Internet usage, best expressed as "better not to choose."

I became dizzy after spending a few days at the department staring at the computer screens full of software that defines streams, listening to the jokes and drinking lots of coffee. It was a stark change to move from the Physical Network Department, with its predominantly earthly focus—even during documentation and mediation practices—to a department primarily oriented toward computer screens. I thus found the Transmission Department to be a place of irritation. Here, the physical, observable and tactile side of everyday Internet infrastructuring began to dissolve and disappear from my empirical sight and the Internet began to emerge as a virtual abstraction. Here, the Internet was perceived by employees not as a collection of physical equipment and manual labor, but rather as one of more than 100 telecommunications services provided by Telia Lietuva,[75] all of which are maintained by streaming upkeep tasks. From the Transmission Department, I moved to the Head Offices, where the meaning of the Internet and its infrastructuring became even more abstract and shifted even further from physical toward communicative labor.

2.7 Processing

After I spent one month at the Physical Network Department and Transmission Department from June to July 2017, I received approval from the company to carry out the second part of my participatory observation at Telia Lietuva. In February 2018, I went to the Head Office.

My first day at the Head Office began with a discussion. The internship mentor and I talked about sites I could visit to explore the Internet's maintenance as a sold product. Thus, at the Head Office the understanding and praxis of the Internet production shifted: it moved from a physical media technology maintained through observable labor practices toward a form of communicative labor that does not result in a tactile

73 Fieldwork report, Bareikytė, 26 June 2017.

74 Fieldwork report, Bareikytė, 26 June 2017.

75 Telecom companies provide different services, such as: service of international stream, payphone, virtual servers, TV for business, etc. At the time of my fieldwork, Telia Lietuva provided over 100 different services, many of which were Internet-related (ADSL service, FTTx service, Wifi service, etc.), but others ranged from office equipment rent to cloud computing (Telia, e-mail message to author, 27 June 2017).

product, but rather one that is sold to customers of company's retail stores. My mentor at the Head Office advised me to start exploring the Internet as a product and its production practices at the Process Department (this title is my invention: the department's full title at the time of my fieldwork was Operation Activity Efficiency Department), which is responsible for the optimization of organizational processes, such as production. Thus, my fieldwork moved from observation of predominantly manual infrastructuring practices toward an examination of predominantly communicative labor in which the main work resource was the language spoken in numerous meetings.

I began my observation by meeting with the Process Department's leading manager, Laima, and an employee, Ana, in order to learn more about the Process Department's activities and discuss my further research plans. In fact, during most of my time at the Head Office, I spoke, interviewed people and listened to various conversations.

The Process Department establishes rigid processes—in 2018 there were 95 general processes at the company—to systematize and monitor other departments' activities through concepts such as key performance indicators, process flow, standards, and others.

During one of my visits, Laima and I looked at the online technical service catalogue, in which the Internet was described as one of many company's products. The technical service catalogue outlined different telecommunications product groups categorized into Connectivity, Customers, End User Services, Infrastructure, IT, TV, Voice, and Unified Communications. In the catalogue, the Internet was located under the category of Connectivity and divided into four product types: mobile Internet, fixed Internet, Internet VAS (value added services), and wholesale Internet. Later I noticed that the company presents Internet products through even more differentiated lists, such as the Internet for private customers, which differs in technological solutions and speeds: FTTH (up to 1 Gb/s), DSL (19 Mb/s), DSL+LTE, VDSL (up to 100 Mb/s), SVDSL (up to 250 Mb/s), and MBB mobile 4G Internet.[76] Laima showed me an image detailing how the Internet as four main products is developed by two department groups that were responsible for managing and developing Internet products: the Business and the Technology. The Business-related departments focus on client needs through commercial and communicative tasks such as pricing and advertising. A group of departments linked to Technology is concerned with feasible technological solutions that maintain sold customer services. I use the aforementioned broad department categories ("Technology" and "Business") because they outline key parts of the practices that are used to create Internet products, which are sold to customers as services. In particular, these terms link multiple departments that work together to develop new projects via technology maintenance, product management, commerce, and marketing. Additionally, I use these terms because multiple workers from the Head Office used them to describe actors from different departments (for example, employees would say, "He works at Business"); these terms were also used to refer to specific departments ("Business Department"), and commercial as well as technical rationales ("Business logic").

Throughout the course of my fieldwork, Laima and I discussed my plan to explore practices that maintain the Internet as a group of products. Based on our conversation,

76 Fieldwork report, Miglė Bareikytė, 19 February 2018.

I attempted to build the following Internet product development logic scheme. If the Internet is perceived as a group of products and sub-products at the Head Office, and a product is developed according to a specific process, it should be possible to disclose Internet production practices by following these systematized processes via the list of involved people. Accordingly, Laima and I planned to move through the product register and find the responsible Business and Technology "owners," i.e., workers from crucial department groups responsible for Internet product management, contact them and plan my stay at the Head Office.

While I assumed that it would be possible to use participatory observation to track Internet production practices at the company in real time, the employees from the Process Department warned me that a process-oriented perception of Internet production practices did not necessarily exist in other departments. They stated that "people in different departments will perceive the Internet, what it is, differently. . . . every department would speak about the Internet from a different perspective, or use different names for it, e.g., not the Internet, but TCP."[77] Moreover, Laima told me that "the Internet is already done, but it has to be maintained and developed."[78] While we tried to create a plan for my stay at the Process Department, we could not find any particular individual who was responsible for the company's Internet product strategy and management.

In light of this information, I desperately hoped to explore Internet production by using the "Confluence" software, in which all company's products, including the Internet, are listed and described. I also thought I could search for Internet "owners" in a product catalogue that outlines managing personnel responsible for product maintenance from either technical or business perspectives. This software listed nine business owners and four technical owners as currently responsible for Internet production at the company. However, if I were to follow through with the Internet "owners" listed in company's software systems, I would end up talking to proxies, i.e., workers who did not carry out actual Internet production work. Furthermore, what work actually goes in to Internet production?

During these discussions, it slowly and heavily dawned on me that it would not be easy to find a clear description of Internet production practices at the company. Either the Internet as such would be perceived, and thus described, differently or its production would be questioned by pointing out that it has been already produced long ago. Also, since there were many people responsible for various Internet products, I could not find a person solely responsible for these tasks. It became clear to me that my initial aim to withdraw from abstract conceptualizations of the Internet by conducting fieldwork-based, situated research of the Internet infrastructuring was suddenly destabilized: I spent my first days at the Head Office meticulously conceptualizing my stay.

In fact, conceptual perspectives regarding the Internet and its description as a result of product management processes and without clearly definable, responsible people did

77 Fieldwork report, Miglė Bareikytė, 12 February 2018.

78 Fieldwork report, Bareikytė, 12 February 2018. This statement, of course, can be destabilized by arguing that 5G Internet is not currently finalized.

not negate my fieldwork. The conceptualization of the Internet as a group of products is part of the Head Office's work.

What, then, can we learn about Internet infrastructuring from the Process Department? Processing perceives the Internet as a result of systematized conceptualizations that are organized and enacted by Technology, Business, and other departments and their interactions. If I had only followed the department's conceptual logic, I could have asked company employees to send me various documents that conceptualized Internet production and undertaken much less fieldwork. Actually, for a brief moment I found myself willing to plan the second part of my fieldwork at the Telia Lietuva Head Office according to how it conceptualized specific Internet product management processes. For a short time, I thought that I could link all production practices in a linear sequence at the Process Department—do what Process Department does, try to systematize my own research practice—and thus follow them during my participatory observation. After a day at the Process Department, I understood that the conceptual optimization of labor practices, including Internet production is the task of Process Department employees. However, my hope to fully plan and trace empirical, live equivalents of these conceptualizations crumbled in light of my lack of meetings planned for the next days. Thus, my expectations to develop a schedule for the observation of practices according to a plan I hoped to find in Process Department that systematizes action at the Head Office also failed, because the Internet here is perceived as a highly fragmented product comprised of sub-products and their sub-sub-products (mobile, fixed, value added services, wholesale, and others). Accordingly, there was no "Internet product" that I could track and conversely no clearly responsible people who "produced the Internet." This is because the Internet as a product comprises a group of products that is managed by a vast group of people, many of whom have different views regarding the Internet's product development. Consequently, I continued my participatory observation by visiting the Technology, Business, and other departments, such as Wholesale, to familiarize myself with their labor practices and try to understand their perspectives regarding Internet production.

2.8 Producing

What comprises the production of the Internet? How does an Internet product differ from an Internet service? In the following section, I explore how these questions were answered by multiple employees from the Head Office departments, such as Business-to-Business (B2B), Business-to-Consumer (B2C), Marketing, Technology, Portfolio and Project Management Office, and Wholesaling (or Business, Technology, and Wholesale in brief). These places are responsible for the development of the Internet as a product and a service. While I briefly described the Business and Technology departments, the Wholesale Department differs from the latter due to its selling of wholesale access to Telia Lietuva's physical Internet infrastructure for company's competitors.

Currently, the telecom industry is locked in cooperative tension with over-the-top (OTT) service providers, which use physical telecommunications infrastructure to transmit data, such as user content. In fact, the telecommunications industry seems to sink

into widespread oblivion once Internet users start to perceive the Internet as a quality—the fast Internet—or equate the Internet with Facebook or Twitter, which are OTT provider services. Importantly, telecommunications operators maintain physical telecom infrastructures that are also used by OTT service providers. I was interested in how telecommunications operators make Internet access into a product that both private customers and OTT service providers can buy and later use to generate new online services, applications, and platforms. Accordingly, in the following section I explore field-based meanings of the "Internet as a product" and the ways of producing it.

At Telia Lietuva's Head Office, terms such as "Internet as a service" and "Internet as a product" were often used interchangeably. While both I and company employees often struggled to discern a meaningful difference between the two, in this book I use the term "Internet as a product" in the context of labor practices that take place in the company's Head Office to develop, manage, and maintain Internet products during internal meetings. I use the term "Internet as a service" to indicate a client-oriented end result, such as "Internet for Home" or "Internet for Business," which can be purchased at company stores.

Once, I told my internship mentor how workers at the company perceive the Internet as a product, to which he answered that the Internet is not a product, but a group of products comprised of fixed Internet, mobile Internet, wholesale Internet, and value-added services.[79] According to Povilas, an employee from the B2C Department, "product" is a technical term that designates methods of construction, while "service" designates something provided to a client. Povilas contended that Telia Lietuva develops many Internet products (such as IPTV, digital TV, Internet TV, Home telephone, Broadband Internet, City Wi-Fi, Antivirus, and others) that are sold under specific conditions and prices as services and offerings (e.g. Broadband DSL, bundles Namai 123, Internet bundles, Broadband DSL Internet offers, and City Wi-Fi offers).[80] Nojus, another employee from the B2C Department, stated that the Internet is a service because someone pays money for it, that "In everyday activity the Internet is a service. It is simply a service which we *charge* and get money for. Whether it is mobile data, or MBB, that mobile broadband, or fixed Internet lines—does not matter, but it is simply a specific service."[81]

This focus on the Internet as a product and its distinction from, for instance, Internet as a physical telecommunications network, allowed me to focus on the contemporary situation: Internet is not provided as one public infrastructure for everyone under same conditions, but is rather sold in a competitive market that requires differentiated services that need to be continuously produced.

One way to describe Internet product production is titled PDMP, an abbreviation for "product development and management processes." At the Process Department I was introduced to three systematized product development and management processes that take place in Business and Technology related department groups, which manage Internet as a product at Telia Lietuva. The first PDMP is related to market analysis.

79 Fieldwork report, Miglė Bareikytė, 14 February 2018.

80 Fieldwork report, Bareikytė, 19 February 2018.

81 Interview with Nojus, 15 February 2018.

The second PDMP is responsible for linking market needs with Technology product processes. The third PDMP is initiated by the CRA, an external regulator which obliges Telia Lietuva to develop or change certain products due to the company's substantial role in the telecommunications market. The latter process results in the Internet as a wholesale product.

While product development, such as modernized VDSL Internet, which was already sold on the market during my fieldwork, is mostly internally initiated by Business and Technology department groups, the company's market position necessitates that it is also regulated by an external regulator, the CRA. Wholesaling manages and rents Internet-related products, such as physical communication channels, against the regulatory backdrop of CRA, while Business and Technology department groups have more freedom and engage in the development of different Internet products, such as FTTH, DSL+LTE, VDSL, SVDSL, and MBB.

Retail product development and management follows a flow path also known as a product lifecycle. It comprises five main steps: product and strategy, idea creation, development, business management, and completion in the case of product failure. Multiple employees thus told me a very similar, linear story of the development of the flow path comprised of idea creation, development, production, and, in the occasion of failed success, closure. Initially, a small team from both Business- and Technology-related departments consults an idea and then they discipline one another. "Because an idea can emerge, you know, well, 'let's do, *davai*, a teleportation apparatus,' well but, so to say, there are no means to do it," claimed Matas from Technologies.[82] According to Vytautas, who is responsible for product development, due to an abundance of ideas and lack of resources, products have to be prioritized:

> there are plenty of ideas in *telco* business. . . . Our job is to properly select those ideas, isn't it, and then with internal stakeholders coordinate if those ideas are really *relevant*. Sometimes the idea itself dictates that it is important, right, useful. Other times we have to test with a user survey, focus group, or simply through some conversations with future clients or employees and so on.[83]

At the Head Office, multiple employees told me that ideas for new telecom products come from various sources, such as customers, competitors, and company departments. In particular, the company's long-term strategy, existing market competition, global technology innovations, market research, as well dissatisfied customers, can push the company to develop new products faster. Nevertheless, it usually takes years for the ideas to mature.

If an idea is chosen, investment documentation is prepared on the basis of the developed technological solutions. This includes information regarding resources such as production time, hardware equipment, human labor, and other investments. After an idea is chosen, it is delivered to the Business group departments, which defend the investment documentation against an Investment Committee. According to Gabrielius from Head Office, this

82 Interview with Matas, 22 February 2018.

83 Interview with Vytautas, 5 July 2017.

> consists of higher-level managers, who decide upon strategy, investments, investment basket, where to invest, where not to. Because not one product, not one solution comes in. In reality there are tens or hundreds. . . . if it is decided . . . then a product manager is assigned and the whole project team with project members is formed . . . and the development takes place. At the same time those technical product owners, experts, architects, they participate in the project as resources and . . . control as well as wait for the result.[84]

Production begins after the idea has been successfully defended in front of the Investment Board, which reviews payback and risks related to new resource distribution. Matas from Technologies told me that a prototype of one product, a broadband VDSL Internet service, was planned for many years. He said, "Finally, well, Business saw that now, perhaps, it is the time."[85] One of Telia Lietuva's leading managers, Lina, explained that production is followed by a test phase and product delivery to the market, during which vendors are instructed on the proper marketing strategy.[86] Next, the product is sold to retail stores and maintained by employees, who are responsible for client support, service installation and repair.

The documentation of product development is an important production step. Productists insert information about product business and technical owners, architects, vendors, technological service details, and other details in the Microsoft "Confluence" system. Nerijus, a productist who develops and documents projects, told me that documentation serves to render employees replaceable. He stated, "For instance, if I am hit by a car while crossing the zebra . . . or if I am fired, or if I quit, documentation still will be there, on its basis someone could go deeper to understand how the service functions or to take over some things."[87]

New products are almost always developed in the form of projects that last for one or two years and are important for tracing the work process. Projects are managed through meetings, which follow different goals and varying levels of complexity.[88] To organize a project meeting—a crucial form of employee collaboration for project management—workers use an online platform in which available meeting rooms and names of colleagues are listed, visible, and can be booked. Informal meetings take place at the Head Office floors, while online meetings take place through Polycom, Skype, and other software tools.

According to Matas, it is crucial to use the form of a project, because they allow one to track old agreements:

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84 Interview with Gabrielius, 5 March 2018.

85 Interview with Matas, 22 February 2018.

86 Interview with Lina, 12 March 2018.

87 Interview with Nerijus, 15 February 2018.

88 For example, steering meetings gather the company's upper management to discuss projects that cost more than fifteen thousand euro. Reporting meetings distribute information about the ongoing project status. Team meetings share and discuss specific tasks and general information. Irregular meetings can be initiated by everyone to solve particular problems. While meetings comprise one of the crucial forms of the Internet product management practice at the Head Office, they also differ in complexity. (Interview with Matas, 22 February 2018; Fieldwork report, Bareikytė, 14 February 2018).

> During this time, for one thing, market demands can change anyway. Another thing: in an organization of this size, again, there are . . . changes in agreements, that dynamic is unavoidable. But with this, just well it can be that finally nobody would know what we are actually trying to do. *Project management* here is, well, an important part.[89]

During my fieldwork, I participated in many meetings that served to discuss not only the development of new products, but also maintenance of already existing ones. This included the advertisement of Internet services, ordering of new equipment, introduction of business management software SAP into companies' systems and many other issues. While the meeting rooms at the Head Office seemed dull and similar—the same red chairs, conference phone, occasional flat-screen TV, and Telia Lietuva poster—communication aesthetics and meeting content were diverse. Some of the meetings were casual, while others consisted of so many technical abbreviations that were incomprehensible to non-company members.

One time, Business and Technology specialists discussed potential advertisement strategies for Telia's retail customer Internet services. In this meeting, employees critiqued both themselves and their competitors, while minor tensions arose between the Business and Technology groups. They discussed ways to better represent Telia's Internet to customers: should they focus on quality and technological capacities, or prepare a tremendous representation of the Internet, as was currently done by competitor Tele2 via their "free Internet" advertisements? At the beginning of the meeting, Technology and Business representatives encouraged each other to collaborate with an implied tension:

> *A:* I hope that we will also make some sort of a flying house [as the competitors did with their 'free Internet' advertisement].
> *B:* Well, it will depend on you now. We will help you in the same way you will help us.[90]

Over time, the room simmered with intense, critical judgments. One time, managers reflected upon their own shortcomings:

> *C:* Tele2 [the competitor] goes, we follow, and it was very much about adapting, instead of trying to find our own edge.[91]

Sometime later, they criticized the same competitor, Tele2:

> *X:* Because, even after having seen that animation [the competitor's ad in which the house attached to an air balloon flies in the sky while a voice in the background states that the Internet is free], well there was not a single number mentioned, it seems to me.
> *D:* No, it said, 'We raised the Internet to the higher level.' What does that mean? Nobody understands.
> *A:* Well, with a balloon.

89 Interview with Matas, 22 February 2018.
90 Fieldwork report, Miglė Bareikytė, 26 February 2018.
91 Fieldwork report, Bareikytė, 26 February 2018.

B: Yes, and they, and they will defend for sure, defend legally through the following: 'I took, you know, my modem and raised it.'[92]

This mixture of self-criticism and critique of others is prevalent in the industry. Issues specific to the case of production are also the implied tensions between Technology and Business departments. I was told several times in the field that telecommunications company employees are often specialized in issues either related to technology or commerce, although rarely in both. This specialization might lead to internal misunderstandings and conflicts. Once, Lina, a leading manager, shared her experience with Business employees who, she claimed, tend to think in a rather homogeneous manner. According to Lina, Business employees need to describe customer needs in a precise manner during the product development process, although they often fail to do so:

> business [group employees] have to be very clear in what they want. But what they want in a language of business: what needs, expectations they want to satisfy. Based on that, [someone] needs to tell how is it possible to do it: through some tool, or some system, or something else. . . . they need to say: 'I need a car, I need it to be big, because . . . Four children and two adults [will use it]. This family lives in the suburbs and will need to drive, I don't know, all the time.' These are the needs. And accordingly, the IT then says: 'Aha, since it is a big car . . . perhaps it is that big jeep, then so-called *mini for the city* will not fit . . . we need to think about fuel consumption and so on.' Very often Business tells us: 'I need a car.' That's it. . . . What is that? What kind of car? What are your expectations, what needs do you want to satisfy? 'Oh. It would be cool if there were leather seats. And the color needs to be green.' Wait, [I am] not [talking] about that, these are not expectations, these are not your needs. . . .this is simply a classic [case] . . . Also in the bank it was the same, also here, I also had to work in a start-up with various companies. 'What is unclear, I, well, said?' It has to be understood, [they think], as if you were a psychic. It is everywhere.[93]

Although new Internet products are developed according to projects that comprise not only constructive and planned work, but also criticism and tensions, their beginning and end are contingent. While an idea can emerge from multiple sources, the end of production is often open-ended and not equated with the time when the product is actually sold in the market as a service. Current market competitiveness requires producers to both quickly launch their products on the market and continuously maintain them. Matas argued:

> There is one [project] that is closed formally, but in reality it is not closed: hybrid Internet project . . . so I, let's say, still provide a significant amount of time to bring that service to a normal level, although it already is in commerce. But it is normal, because in . . . current fast world you cannot plan in a way that first we will lick everything, and then launch it, because when that happens, so to speak, it will probably take up three times as much time there and the market won't need it anymore. So a normal

92 Fieldwork report, Bareikytė, 26 February 2018.

93 Interview with Lina, 12 March 2018.

> activity model is, so to say, that you will launch on the market as fast as you can. You will finish developing it later.[94]

My internship mentor similarly posited that while it is possible to deduce the type of project development I explored through flow paths—i.e., conceptual project development through idea creation, development, run, and closure—earlier, in reality, all product development practices happen simultaneously.

The Internet as a particular product—such as recent VDSL Internet, which increases copper-based Internet speed—is prepared for market by Technology and Business departments, which are responsible for idea creation, further development and run comprised of market analysis, pricing, advertising, selling, and other tasks, that take several years to mature. Yet this part of Internet infrastructuring, often described in linear narrative of flows by multiple company employees, comprises tensions and criticisms from idea creation to a product's release to the market. Furthermore, its maintenance is ongoing and does not finish after the product is sold on the market. In other words, production practices do not only follow clear paths of product development that start with ideas, continue with their development, and end with production. Additionally, production practices involve situated contingencies, such as ongoing criticisms, emerging tensions between various internal product development stakeholders, the respective judgments and gossip about internal and competitor performances, and irrational expectations exchanged between these stakeholders. Moreover, in practice, product development doesn't finish when the product is available for market purchase but must be constantly maintained. As such, production is a long-term, planned, and contingent practice of conceptual and technical means to shape the Internet into a particular service for customers.

2.9 Wholesaling

There is another Internet product produced at Telia Lietuva but not available for retail customers: wholesale Internet, or broadband access sold to other telecom companies. The sale of this service is based on legal requirements that require Telia Lietuva to provide other Internet service providers access to its underground communications channel infrastructure, which was privatized in 1998. While previously I explored Internet product management practices for retail customers that encompass Technology and Business rationales through a conceptual flow path and its contingencies, here I focus on the Internet as a regulated wholesale product. In the Wholesaling team, the Internet is sold as a wholesale product to other telecom operators, thereby providing those operators access to Telia's physical underground infrastructure and an opportunity to later resell Internet access services.

Wholesaling is an ongoing daily practice that takes place against the backdrop of telecommunications market requirements issued by the national CRA, which is a member of the Body of European Regulators for Electronic Communications (BEREC). Dur-

94 Interview with Matas, 22 February 2018.

ing my fieldwork in 2018, the CRA's 2011 market analysis stated that Telia Lietuva was a substantial market power in Lithuania and therefore had to take the CRA's mandates into account,[95] but also the mandates and laws of the Competition Council. This meant that Telia had to sell access to its physical network infrastructure to its competitors, in this case broadband wholesale access to its physical infrastructure. Despite these rules, Ugnius from the Wholesale Department told me that the company's department is unknown: "Eight out of ten people at the company would not know that such a service exists."[96]

When I arrived at the Wholesale Department, as per usual, I parked and registered my car at the front desk, and then an administrator accompanied me to the elevator. He brought me to the 18th floor, where I was met by Ugnius. We passed a room of eight women working on their computers and sat down in a small office hidden behind a corner. The room was very bright and had a column next to the left side of the room, slopping walls, and bent glass windows. Like most of the offices at the Head Office, it was furnished with a computer, telephone, red chairs, and, unexpectedly, a small bistro table on which a calculator and a rubber stamp rested. I could see about half of Vilnius through the glass wall. Due to the fact that I had met Ugnius because he was an Internet business owner, I still hoped he would help me find some correspondence between the schemes from the Process Department and the Wholesale Department's daily practices. I shared my highly conceptual schematization in which, according to my understanding, the Internet as a product emerges from the Connectivity catalogue and has four sub-products (wholesale, fixed, mobile, and VAS) that are managed by the designated Business and Technical owners. In turn, I learned that Ugnius does not feel that the concept of "owner" applies to his work. Also, he stated that he might not see the same schemes as his colleagues at the Process Department due to different information access options for each of the company's employees. Actually, Ugnius did not even personally know his colleague who had arranged our meeting. While we sat in a tiny office and I attempted to translate conceptual correspondence from the Process Department into an empirical reality, I learned that long-term personal interaction carries much more importance in everyday work than any scheme. Every day, Ugnius prepares and signs contracts with clients, administrates services, and arranges reports for the CRA. He additionally collaborates with clients, negotiates faster service installation, troubleshoots, and takes care of client service maintenance. Thus, the department's place within the official company's structure did not mean a lot in Ugnius's daily work, and, thus, finally

95 RRT, e-mail message to author, 11 April 2019; Lietuvos Respublikos ryšių reguliavimo tarnyba, *Dėl didmeninės (fizinės) tinklo infrastruktūros prieigos (įskaitant iš dalies arba visiškai atsietą prieigą) fiksuotoje vietoje rinkos apibrėžimo, Nr. 1V-628*, (Vilnius: Lietuvos Respublikos Ryšių Reguliavimo tarnyba, 2011), https://www.rrt.lt/d/del-didmenines-fizines-tinklo-infrastrukturos-prieigos-iskaitant-is-dalies-arba-visiskai-atsieta-prieiga-fiksuotoje-vietoje-rinkos-apibrezimo; Lietuvos Respublikos ryšių reguliavimo tarnyba, *Dėl ūkio subjekto Teo Lt, Ab, turinčio didelę įtaką didmeninės (fizinės) tinklo infrastruktūros prieigos (įskaitant iš dalies arba visiškai atsietą prieigą) fiksuotoje vietoje rinkoje, Nr. 1V-629*, (Vilnius: Lietuvos Respublikos Ryšių Reguliavimo tarnyba, 2011), https://www.rrt.lt/d/del-ukio-subjekto-teo-lt-ab-turincio-didele-itaka-didmenines-fizines-tinklo-infrastrukturos-prieigos-iskaitant-is-dalies-arba-visiskai-atsieta-prieiga-fiksuotoje-vietoje-rinkoje/.

96 Fieldwork report, Bareikytė, 13 February 2018.

lost meaning for me as well. In fact, few Telia Lietuva employees knew the title of their own department, but after being asked about the names of the departments that they communicate with, they remembered people instead of official department names.

Another question arose: when do other Internet service providers want to buy a competitor's service? Ugnius told me, "It is hard to say, depending on an operator, when they feel competition, when they supply services through mobile network but need fixed [access], when they have a network in one city, but not the other."[97] In order to buy a wholesale Internet service, a client needs to complete an online order form. This order then migrates to a system within the company called Vantiv, although during my time at the company it was already being shifted to the SAP business management software. After workers have processed the order and evaluated technical requirements (i.e., if it is possible to provide access), the client receives an answer. If the answer is positive, the client needs to confirm the order and then receives the service, which includes options such as access to a particular fiber thread in a Telia Lietuva-owned underground network channel. After this step, Ugnius's colleagues use Vantiv to arrange when engineers will install the service. During the week I visited, they received 197 orders, yet only 47 of them were technically feasible.

Due to the partial regulation of the Lithuanian telecommunications market, wholesaling is strictly defined and rigidly observed. For example, Wholesale product prices cannot be calculated freely and have to be confirmed with the CRA. Thus, wholesale service prices cannot be higher than Telia Lietuva retail service prices. Retail prices are disclosed to the Wholesale Department after they are calculated, which defines their wholesale prices and offerings. According to the unwritten agreement with the Competition Council, the wholesale price needs to be at least 10 percent lower than the retail price. Additionally, Internet retail services can only be publicly offered after wholesale services have taken effect. I was told that clients always buy their wholesale services through offering campaigns. According to CRA requirements, offers must appear two months before they are issued to the retail market. Additionally, Telia Lietuva cannot use their offers before these two months have passed. While it is interesting that external operators are concomitantly Telia's competitors and clients in a liberalized regulated telecom market in which the CRA aims to "ensure effective competition" by limiting Telia Lietuva actions through Wholesale Department,[98] it must be emphasized that Lithuania's competitive environment did not emerge naturally, but rather through the 1998 privatization of publicly developed networks. According to an email sent to me by a CRA employee, physical infrastructure channels have been used commonly since 2002. The symmetrical regulation of physical infrastructure was defined in 2011 according to rules instated in 2005 regarding the installation, marking, maintenance, and use of electronic communications infrastructure. This physical infrastructure regulation stated that because Telia Lietuva has a significant market impact it must follow additional obligations for physical infrastructure sharing.[99]

97 Fieldwork report, Bareikytė, 13 February 2018.

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

99 RRT, e-mail message to author, 11 April 2019; Lietuvos Respublikos Seimas, *Lietuvos Respublikos elektroninių ryšių įstatymas, Nr. IX-2135* (Vilnius: Lietuvos Respublikos Seimas, 2004), https://www.

Although the sharing practices of Telia Lietuva's substantive ownership of underground physical network channels were debated during my fieldwork,[100] Ugnius contended that Telia would risk big fines if it attempted to hinder general network development and competitor access.

I was additionally told that companies in other Lithuanian cities, such as Šiauliai, have more clients than Telia. During the period in which I undertook fieldwork, Telia wanted to convince the CRA to introduce geographical market segmentation. This technique would enable telecommunications companies to analyze their market share according to their particular market share in the counties rather than on a national level. If Telia Lietuva could prove that the majority of the county's inhabitants are not their clients, it would not need to provide wholesale service to their operator-clients. Despite these attempts, I was currently told that data regarding the exact number of operator-clients in different counties is still lacking.

Daily competitor cooperation is thus not trivial. Ugnius shared that in cases such as technology malfunctioning, it can be difficult to determine whether Telia's client or Telia's employees should undertake repairs. Additionally, it can be hard to juggle two contradictory tasks at the company: first, Telia Lietuva has the largest role in Lithuania's telecom market. It sells Internet services both to its retail customers and competitors, who then attempt to resell their own access to the same customers that they and Telia Lietuva compete to attract. How does a company maintain this internal contradiction? Ugnius claimed that when a conflict arises, the other telecom operators go immediately to the CRA. He did not understand why operators do not communicate their issues to Telia Lietuva, or why they sometimes avoid providing more information on the exact usage of their company-rented broadband access. He stated that "maybe they imagine that Telia will cheat,"[101] there is perhaps some "mistrust,"[102] but these evasions are not practiced by all operators. While currently there are fewer disagreements, I was told that sometimes operators mistrust the company and avoid sharing all their service information with Telia. When we went back to the office, Ugnius received a call in which he learned that a client-operator does not disclose his client's identity to Telia Lietuva. Ugnius told to "write a comment, that there are no TR [technical requirements],"[103] thereby implying that the wholesale services will not be sold to that client-operator. When I asked Ugnius why this client refused to provide this information, he replied,

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e-tar.lt/portal/lt/legalAct/TAR.82D8168D3049/asr; Lietuvos Respublikos ryšių reguliavimo tarnyba, *Įsakymas dėl elektroninių ryšių infrastruktūros įrengimo, žymėjimo, priežiūros ir naudojimo taisyklių patvirtinimo, Nr. 1V-978*, (Vilnius: Lietuvos Respublikos ryšių reguliavimo tarnyba, 2011), https://www.e-tar.lt/portal/lt/legalAct/TAR.D560737E2392/KdgYfoBXYc; Lietuvos Respublikos ryšių reguliavimo tarnyba, *Dėl ūkio subjekto Teo Lt, Ab, Nr. 1V-629*; Lietuvos Respublikos ryšių reguliavimo tarnyba, *Dėl didmeninės (fizinės) tinklo infrastruktūros prieigos (įskaitant iš dalies arba visiškai atsietą prieigą) fiksuotoje vietoje rinkos apibrėžimo, Nr. 1V-628*, (Vilnius: Lietuvos Respublikos Ryšių Reguliavimo tarnyba, 2011), https://www.rrt.lt/d/del-didmenines-fizines-tinklo-infrastrukturos-prieigos-iskaitant-is-dalies-arba-visiskai-atsieta-prieiga-fiksuotoje-vietoje-rinkos-apibrezimo.

100 Interview with Vytenis, 21 March 2017.

101 Fieldwork report, Bareikytė, 13 February 2018.

102 Fieldwork report, Bareikytė, 13 February 2018.

103 Fieldwork report, Bareikytė, 13 February 2018.

"You tell me. . . . They are afraid that we pass this communication to our sales people. It is an ungrounded fear. After we tell them that we do not provide the TR, they will call."[104]

I later sat down on a pouf in the lobby and stared at my laptop. The few employees nearby did not seem to mind my presence. I overheard them speaking about processes, highways, and non-stimulation of tendencies, but I only later understood the direction of this cryptic conversation. Ugnius had already told me that competing operators buy increasingly more wholesale Internet services from Telia Lietuva, but during this informal meeting I overheard that the company's two departments have two different goals. This was what is known as a "coded confrontation."[105] One employee claimed that "the goals need to be synchronized,"[106] but the other contended that "they have their selling goals, and we have [ours],"[107] and "I don't know, maybe there is an internal conflict."[108] Another employee complained, "Today I say: 'Give me the numbers,' and they say, 'We will not give them to you!'"[109] The other carefully conceded that "it is a sensitive topic."[110] The first tried to discuss the topic further and suggested, "but perhaps [we could share the information] in the organization, internally,"[111] to which someone replied, "No, the Authority [CRA] is checking, there are auditors."[112] The conversation was summarized by the following sentence: "The problem of Wholesale [Department] is that they do not need even to build the infrastructure, and they can get any client they want,"[113] which implies that inside the company, two logics—wholesaling to competitors and selling retail access to customers—work in tension.

Internet products are infrastructured not only as multiple retail products, but also as a wholesale product, which includes other telecom players renting access to Telia Lietuva's physical telecom infrastructure. While retail Internet products can be conceptualized and developed in a creative, rather open-ended manner against the backdrop of existing path dependencies and complex project development process, wholesale Internet as a product is relatively stable and sold daily to other telecom operators through an online tool. External regulator CRA controls wholesale prices and offers, which requires Telia Lietuva to sell other Internet service providers access to its physical telecom infrastructure. Although wholesaling practice seems straightforward—a wholesale client orders a service online and a Telia Lietuva employee then manages it —it includes ongoing observation by an external regulator, tensions between Telia Lietuva, and other operators and tensions between internal company departments. Thus, the very existence of the Wholesale Department is politically charged due to Telia Lietuva's dominant role in the market. By looking at both wholesale and retail Internet production as a part of

104 Fieldwork report, Bareikytė, 13 February 2018.
105 Fieldwork report, Miglė Bareikytė, 15 February 2018.
106 Fieldwork report, Bareikytė, 15 February 2018.
107 Fieldwork report, Bareikytė, 15 February 2018.
108 Fieldwork report, Bareikytė, 15 February 2018.
109 Fieldwork report, Bareikytė, 15 February 2018.
110 Fieldwork report, Bareikytė, 15 February 2018.
111 Fieldwork report, Bareikytė, 15 February 2018.
112 Fieldwork report, Bareikytė, 15 February 2018.
113 Fieldwork report, Bareikytė, 15 February 2018.

infrastructuring, one can see how a smooth plan of product development—idea creation, development, and production—is actually not so smooth at all. Due to the fact that the Internet as a product at the Head Office is a result of communicative labor practices carried out by company managers and external actors (regulators, and retail and wholesale clients) through continuous meetings and reports on Telia Lietuva's role in the market, the Internet shifts from being solely physical technology toward a conceptualization involved in ongoing debates.

2.10 Popularizing

> According to data published at the end of April by the Telecommunication Statistics Centre 'Europe-Internet', the international electronic communications network Internet is not yet popular in Lithuania. Only one in 3,578 residents of Lithuania regularly uses Internet services. According to BNS, one in 679 people uses the Internet in Latvia and 266 in Estonia. The most popular Internet from European countries is in Finland (one in 20 people regularly use electronic network services), in Iceland respectively 27, in Norway, 41, in Sweden, 52, in Switzerland, 74, in the Netherlands, 78.
> *Verslo Žinios*, "*Internetas Lietuvoje nepopuliarus.*"[114]

Internet products are not only produced and maintained, but also must be made desirable in order to be sold.[115] While it seems like everyone these days is interested in the Internet, customers still need to choose one particular Internet service. At the Head Office, I spoke to people from the Marketing and Commerce departments and visited Telia Lietuva's retail store in order to grasp how the Internet is sold as a service and popularized in practice. It is also important to remember that Internet access was not always desired, what made me wonder how the Internet's significance is contingent on varying factors. As far-fetched as it is to imagine, perhaps there may come a time when Internet usage does not play such a major role in our lives.

During conversations at Marketing and Commerce departments, it seemed that those who work with language and images needed to rigidly control their statements. This was exemplified during a conversation with Jurga, then head of the Marketing department; I finished all the questions I had to ask her in fifteen minutes because she

114 "Internetas Lietuvoje nepopuliarus," *Verslo Žinios*, updated 14 May 1996, accessed 12 July 2019, https://www.vz.lt/archive/news.php?id=402865#ixzz6CPuJP3tL.

115 Fieldwork report, Miglė Bareikytė, 3 July 2017.

replied to each one with brief, crisp answers. Jurga perhaps sensed my confusion and eventually opened up and discussed the Marketing Department's work. She told me that its main goal is to communicate with clients, interpret valuable research, and adapt the company's communication in order to reach more future customers. Thus, the department's main marketing tasks comprise brand development, promotional material, and copywriting special offers. Due to the fact that not every message has an impact, employees also investigate if customers have actually understood their messages. Jurga stated that "if the offer was irrelevant, then it is the fault of the Commerce Department; if people did not understand it, then this department is guilty."[116] Employees at the Marketing Department thus constantly prepare and evaluate advertisement campaigns, discuss company brand development paths, meet other managing leaders from Business group departments and discuss the results of product sales. Their most important communication channels are TV, digital banners, and Facebook—"The only relevant social media in Lithuania," according to Jurga.[117] In their Internet service advertisements, Telia Lietuva does not advertise their technological service background; they only occasionally mention the titles of respective services and their speed, because, as I was told, there is already a strong desire to consume technology, and technological construction of services is complicated. Instead, it is easier to sell the Internet as a service through its affective characteristics by outlining vague Internet qualities such as the absence of any genuine distinction between the physical and the digital life, or the importance of speedy connectivity without interruptions.

Jurga told me that accordingly there has been a shift in Lithuania's telecom market toward emotional marketing that focuses on the Internet's qualities and values, such as speed. Their client focus is on "a 35-year-old person with a family, well adapted, prone to pay."[118] Yet one can still find residual discourse with more explicit statements about media technologies that include topics such as 3G and 4G mobile Internet due to high competition among various Internet Service Providers for these Internet services. While the Marketing Department does not advertise Internet through technologically comprehensive messages, I was interested in how Jurga herself understands the Internet. She told me that "the Internet is like H20, electricity. Its purpose is for that, what is accumulated on the Internet, to reach people."[119] Additionally, Jurga described infrastructure in abstract terms, as "a network which supports life."[120] It seemed to me that departments such as Marketing, which communicates messages about the merit of purchasing Internet services, perceive and foster an understanding of the Internet in a non-physical manner akin to air or electricity. Similarly, Technology Department employee Matas once told me, "Usually they [Business people] have a very limited understanding of technical implementation . . ."[121]

116 Fieldwork report, Bareikytė, 3 July 2017.
117 Fieldwork report, Bareikytė, 3 July 2017.
118 Fieldwork report, Bareikytė, 3 July 2017.
119 Fieldwork report, Bareikytė, 3 July 2017.
120 Fieldwork report, Bareikytė, 3 July 2017.
121 Interview with Matas, 22 February 2018.

At my visit to the Business group's Commerce Department, Arnas, then a head of B2C business development, told me that the current telecommunications market is fragmented, highly specialized, and difficult to innovate within. He stated that "there is no unified market: there is a market for TV, Internet, etc. . . . Market competes through mobile solutions. . . . The borders between mobile and fixed Internet are being dissolved. People understand less how the Internet functions, who supplies them with it, where it comes from."[122] Due to the fact that various commercial aspects—the pricing and selling of services, user transfer and management, market research, business plan development, communication with the company's sale channels, and other tasks—need to be taken into consideration, employee roles within the telecom branch are highly specialized. Arnas said that "only telco and banks have such a specialization of work—other companies have single people who take care of these issues."[123] He additionally contended that the telecom market currently struggles to innovate new products and services. In this context, every fiber is similar to every other fiber and the company must try to differ in the quality of their services and added value services. Arnas described this as: "Evolution, not revolution."[124] He explained that his department does not create change, but rather aims to continuously improve user service experience.

During the course of my fieldwork, not only Arnas or Jurga, but also multiple other industry stakeholders, described the typical lack of user understanding regarding how the Internet functions. I often heard statements akin to those of Arnas, that the customer's lack of knowledge is good: "we can create new offers, new technologies, and consumer does not care."[125] Consumers actually care about specific Internet qualities, such as "speed, stability, and price. Internet is a commodity and consumers want good conditions."[126] Jurga also argued that contemporary users seek simplicity, speed and connectivity; thus the department's communication strategy is also focused on speed, that "you do not have to think, but trust the experts—us—and do what you like."[127] In order to communicate Internet services in an abstract, simple way, the company used the phrase *visakotinklas* (the network of everything). This slogan is supposed to create an image of a seamless national network that includes each and every technology and connects all corners of Lithuania.[128] Povilas, another Business employee, similarly contended that if a client actually starts to think about how a service works "it is perhaps a signal that something is not working."[129] While the Business group is concerned with simplifying user experience and developing communication strategies focused on ease and speed, at Telia Lietuva's physical shop in a Vilnius' mall, shop manager Rasa told me

122 Fieldwork report, Bareikytė, 3 July 2017.
123 Fieldwork report, Bareikytė, 3 July 2017.
124 Fieldwork report, Bareikytė, 3 July 2017.
125 Fieldwork report, Bareikytė, 3 July 2017.
126 The main telecom retail services today comprise mobile connection, mobile data, Internet, IPTV and the value-added services, such as particular programs from the IPTV system, mobile and travel insurances, telephone insurance, rent of office equipment, cloud, data centres for businesses (Fieldwork report, Bareikytė, 3 July 2017).
127 Fieldwork report, Bareikytė, 3 July 2017.
128 Fieldwork report, Bareikytė, 3 July 2017.
129 Fieldwork report, Bareikytė, 14 February 2018.

that clients "sometimes know issues concerned with the Internet better than us,"[130] and thereby want to understand the technical background of the services they purchase.

These experiences led me to conclude that although telecom company communication strategies have become increasingly non-technical and built upon the image of clients who know little, this does not mean that users are actually not interested in technical basis of their Internet services. Perhaps on the contrary, if digital technologies do actually become all-pervasive due to the expansion of systems such as the "Internet of Things," the users will increasingly require more information about the production, maintenance, and development of these services.

While the Internet is currently communicated to customers as an abstract service through metaphors of connectivity and speed, there was a time when people had no desire to use this media technology. Telia Lietuva store manager Rasa told me that the store's team nowadays consists of 10 salespeople who have to be psychologically strong, because in the context of strong customer demand, "only the strongest survive, like in a war."[131] Despite this mentality, demand for Internet services is relatively new. Since the 1990s, private businesses, and governmental- and non-governmental organizations—such as the Open Society Foundation, the public infrastructure project RAIN, and private companies such as Omnitel—have actively popularized the Internet access services to the general population. When one accepts the current perception of the Internet as ordinary and common, it is easy to forget that the need for this media technology did not emerge naturally, but has been created and maintained throughout the years.

One example of an active maintenance and popularization force is the Open Society Foundation (OSF; in Lithuanian: *Atviros Lietuvos Fondas*, or ALF), which was established in Lithuania in 1990 against the backdrop of multiple foundations developed by investor and philanthropist George Soros in Central and Eastern Europe since 1984. The OSF foundation stayed in Lithuania until 2008 and was reestablished in 2017. The Foundation supports the notion of diverse democratic societies by implementing various re-

130 Fieldwork report, Miglė Bareikytė, 1 March 2018; Additionally, at this Telia Lietuva's retail store, I was provided with internal company documentation. According to this documentation, company's customers were typed into four types: "doubtful," "rational," "e-generation," and "visible," each of whom require different approach from the retailers. Accordingly, doubtful clients are not interested in deep technological understanding of services they are buying; they purchase the most popular services and require retail store assistance. Rational clients constantly compare Telia Lietuva services with their competitors, search for the best technological solutions, do not require retail store assistance, are said to have friends in foreign countries and stand for justice: "They can be bothered, for example, if the customer queue is managed not incorrectly." (Fieldwork report, Bareikytė, 1 March 2018). E-generation follows online reviews, is technologically most advanced, but does not show it. They require most qualitatively advanced Internet services and related products, and do not want long-term obligations. Visible customers take care of their appearances, know substantially about technologies and want to express themselves through their brands. They require high quality service, attention, and high quality (Material received during fieldwork. Fieldwork report, Bareikytė, 1 March 2018). Although general Telia Lietuva message for customers is abstract, some of the customers, accordingly to internal company's documentation, want to understand technical background of services they are purchasing.

131 Fieldwork report, Bareikytė, 1 March 2018.

gional programs in Central and Eastern Europe that are able to undertake independent local activities.[132] One of the OSF programs in Lithuania was concerned with Internet development. According to Sigitas, the former director of the Information Program, the development of the Internet at the OSF focused on online content creation, access, and usage.[133] From 1995 to 1997 it was also possible to connect to the Internet for free through the OSF by using the telephone lines of then state-owned Lietuvos Telekomas. This was because the OSF provided the possibility for individual users to connect to the Internet from home when for-profit companies had only just started professionally selling Internet access. Eventually, around 1998, when the Internet access became increasingly commercialized by multiple Internet service providers, the OSF shifted their focus from Internet infrastructure access management toward its usage in communities, schools, universities, hospitals, and governmental institutions.[134] Despite this access, throughout this period of OSF support, the Internet usage was not always desired. Sigitas remembered that the first big problem in Lithuania was the lack of useful online information in Lithuanian. Also, some institutions that the OSF aimed to support with Internet access, such as hospitals, initially did not see the merit of using the Internet and accessing online content. Sigitas stated:

> We offered money also for Santariškės [one of the biggest hospital complexes in the country] to connect to the Internet: we gave money to lay the cables. Well, they were laid, but were used very little. And then there, in the library, we wanted to set up a few computers, and [they] said, 'Who needs that?' etc. While the doctors were saying, 'We don't need [this] at all, we get articles, those, who need receives books, why do we need that Internet?'[135]

Sigitas also argued that while some professionals did not use Internet much, others perceived the Internet as a morally dubious medium:

> OSF even bought many electronic data bases, which humanitarians, medics, lawyers, and everyone who wanted could connect to. [OSF] paid a lot. And the usage was very small . . . already in 2010, 2011 among the humanitarians there started a movement, that it is evil. . . . [Those,] who already surfed the Internet, saw that also pornography started to spread, and fears emerged. We then started even with our own cinema . . . organized public discussions about the Internet: whether it is good, or it is bad.[136]

Lack of access, disinterest, and distrust were not the only causes of low Internet usage. Sigitas also contended that urban and rural tensions framed the expansion of Internet access and usage. While OSF popularized Internet usage in rural areas,[137] the intervie-

132 Atviros Lietuvos Fondas, *2002 m. veiklos ataskaita* (Vilnius: Atviros Lietuvos Fondas, 2002), http://olf.lt/wp-content/uploads/2017/03/alf_ataskaita_2002.pdf.

133 Sigitas, e-mail message to author, 18 January 2019.

134 Sigitas, e-mail message to author, 18 January 2019.

135 Interview with Sigitas, 9 September 2018.

136 Interview with Sigitas, 9 September 2018.

137 The OSF also supported Internet usage and electronic communication among people with disabilities and among ethnic minorities. They also supported processes of distanced learning and information society research in order to strengthen links between citizens and the government

wee claimed that those who promoted rural IT integration were criticized by the media as only seeking profit. According to the interviewee, an ongoing popular negative opinion about village inhabitants described them as disinterested in Internet access due to social fragmentation between cities and villages, higher poverty levels in the villages, and condescending media coverage:

> Because collective farms collapsed . . . there were many poor people, who were just starting to develop their own farms, and big fragmentation emerged. As you know, people were used to working in collective farms, and when there is no one to work for, getting drunk [alcoholism] was increasing, city dwellers had very poor opinions of them. And even our media promoted that: newspapers, photos of how a drunken pensioner is walking . . . Nowadays it is so, that a majority of village inhabitants buy tickets to theatres [online] . . . Then nobody believed, [they] were saying: "Why for this drunken part of society, it is not necessary, it is an expensive thing, who would use those computers?" As it appears, it was untrue.[138]

While Internet access, online content development and usage was promoted by the OSF in Lithuanian cities and rural communities, Sigitas provided different examples that illustrate how some usage of Internet services in the 1990s and early 2000s was limited due to the lack of access to Lithuanian content and distrust in the moral character of the Internet. Another portion of this lack was due to those, such as doctors or lawyers, who had little interest in the Internet as a service, and contempt toward disadvantaged rural parts of the population was expressed through critique of rural Internet access expansion. Importantly, these examples illustrate how interest in Internet usage has not emerged naturally, but is rather the result of long-term popularizing practices of non-governmental organizations, such as the OSF, which were embedded in societal disinterest, distrust, and negative critique.

Lack of initial user interest in the Internet was also described by Donata, one of the first employees at private telecommunications operator Omnitel, which was established in the early 1990s. According to Donata, the first sale of the Internet by a private telecom company in the 1990s was rather difficult because

> technologies were not mature. . . . In Lithuania there were practically no websites. Basically, only e-mail. . . . and only later, Web surfing . . . In the beginning, browsers were not even graphical. There was a browser 'Links,' basically a text browser, which allowed one to review only textual information without any pictures.[139]

Omnitel used to educate potential users about the merits of Internet usage. It also employed a sales team, developed marketing material, conducted multiple seminars and workshops, used door-to-door selling techniques, and even developed an online news portal in Lithuanian. Donata stated that the "situation was the following: nobody—not only customers were unaware of the services, but also potential providers, which could

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with equipment and direct community engagement (Sigitas, e-mail message to author, 9 April 2018).

138 Interview with Sigitas, 9 September 2018.

139 Interview with Donata, 27 March 2018.

use the Internet and provide services . . . It means that it was needed . . . to make the beginning ourselves."[140] In 1996, Omnitel had approximately 2500 Internet users, the majority of whom were small companies. At the same time, other Internet service providers emerged in Lithuania, some of which, such as Baltneta, Infostruktūra, and Penki Kontinentai, obtained a dedicated line for fixed network interconnection from Lietuvos Telekomas and sold Internet connections to their clients. Donata posited that the growth of telecom service providers also lead to the spread of information about the Internet. At first, users knew little about the Internet:

> In most cases, those users knew nothing: neither about the Internet, nor, often, about technology. And actually that initial act of selling was very difficult. Since at that time I had to . . . coordinate the selling, thus the sellers were in Vilnius, Kaunas, Klaipėda, Šiauliai later, Panevėžys, and Marijampolė, and they . . . just kept telling . . . They say: "I went, for half an hour I was telling what is that Internet, what it is possible to do with it. I am told: 'Well', [they] say, 'you talk nicely, I don't understand, why is this Internet necessary, you talk nicely, well give it to me, I will buy.' Another one says: 'Don't tell me fairy tales, I have partners in the US, there [they] have fax, telex, it is fully sufficient, why do I need your Internet? It is unnecessary.'" . . . Actually it was needed to educate people, to simply explain, that the Internet exists, what it is used for. There were loads of seminars. Going to the companies, inviting companies to our place. And we had really not a small team of sellers because it was them at first who needed to go, offer, explain to the company, and finally help install. Those marketers had both IT knowledge and business inclinations.[141]

In 1998, there was a breakthrough: people started widely using the Internet and mobile phones due to the emergence of country-wide alternative providers and government-led project Rural Area Information Technology Broadband Network RAIN, which took place in Lithuania from 2005 to 2008. RAIN aimed "to provide broadband access for all rural public sector administration institutions."[142] Gediminas, an academic involved in the RAIN project, also claimed that the users, such as farmers, did not initially understand why they might want to use the Internet, but later changed their opinions:

> [People] did not understand why it was needed. It was necessary to explain it to them, that, for example, when they want to declare their crops, they need to measure them and later fill in the documents, bring them somewhere to Vilnius . . . now, not only it is unnecessary to agitate, they are saying: 'Give,' because it is a practical thing. . . . it is not enough to have infrastructure, it is necessary to have people who are prepared and ready to use this infrastructure. In Lithuania, this issue is still to be corrected. It should be pushed a little bit more.[143]

Public and private telecom operators have advertised Internet services since they were first established. Although the desire to purchase Internet access in the 1990s differed

140 Interview with Donata, 27 March 2018.

141 Interview with Donata, 27 March 2018.

142 "Rain," *Plačiajuostis Internetas*, accessed 20 June 2019, https://www.placiajuostis.lt/en/rain.

143 Interview with Gediminas, 14 March 2017.

from current times, especially because access technologies and services were much more expensive, the need to advertise Internet services in the private sector is an ongoing daily practice. Internet access in Lithuania has thus had to be constantly advertised by telecom industry stakeholders including NGOs, government entities, and private businesses. As illustrated in the examples above, diverse groups of Internet users, such as doctors, farmers, and businesspeople, with the exception of academics, initially did not see the value in Internet usage. In fact, most people did not understand what the Internet was and had to be convinced to give it a try. According to data from EUROSTAT, provided by the Information Society Development Committee [*Informacinės Visuomenės Plėtros Komitetas*], 75 percent of Lithuanian households in 2017 had Internet access, while the EU average was 87 percent. Moreover, in the EU, 90 percent of urban dwellers had access to the Internet (compared to 83 percent in Lithuania) and 82 percent had access to the Internet in rural areas (compared to 67 percent in Lithuania). Although access to the Internet in Lithuania—both in rural and urban areas—has been so well developed that today anyone could have it if they wanted to, currently 62 percent of Lithuanian households that do not have Internet access claim that they simply do not need it.[144]

Thus, even today Telia Lietuva devotes many resources to convincing customers to buy Telia's Internet products that are sold to them as services. In this context, the high number of telecom operators and the resulting competition certainly contributes to the practice of convincing customers to purchase particular company services. I have heard from multiple sources at Telia Lietuva's Business departments that Lithuanian telecom users have thus developed a habit of bargaining. According to Povilas, "This can be felt so much in Lithuania, [because there] is a big price-sensitive segment here that searches how to save. But there is a huge segment, [that] simply demands for a discount . . . "[145]

Thus, the popularization of Internet services is an ongoing practice at both Telia Lietuva and the broader Lithuanian telecom industry. Although supposedly the Internet is currently a widely desired service, popularizing it is still a crucial infrastructuring practice in the telecom industry. Due to high market fragmentation and different Internet service packages, the recent popularization focused on simplicity. Telia Lietuva is not exceptional here: other telecom operators seem to pursue similar advertising strategies. For example, mobile Internet providers Tele2 advertised the Internet as "free,"[146] Bitė Lietuva spoke of "the home Internet,"[147] and Telia Lietuva described itself in universal terms, as "the network of everything."[148] Increasing number of users had to, and still have to, be convinced of the merit of the Internet since its emergence in the 1990s in

144 "Lietuva pagal interneto naudojimą namų ūkiuose vis dar atsilieka nuo ES vidurkio," *Informacinės visuomenės plėtros komitetas*, updated 27 February 2018, accessed 7 July 2018, https://ivpk.lrv.lt/lt/naujienos/Lietuva-pagal-interneto-naudojima-namu-ukiuose-vis-dar-atsilieka-nuo-es-vidurkio.

145 Fieldwork report, Miglė Bareikytė, 21 February 2018.

146 "Su laisvu internetu gyvenimas tęsiasi," *Tele2*, accessed 3 April 2020, https://tele2.lt/privatiems/laisvas-internetas; "Free" here refers to liberating potentiality of the Internet, not that it is provided for free.

147 "Laisvai įdiegiamas visuose namuose: neribotas namų internetas," *Bitė*, accessed April 3, 2020, https://www.bite.lt/internetas/namams.

148 "'Teo' ir 'Omnitel' tampa 'Telia,'" *Telia.lt*, published 1 February 2017, accessed 10 November 2019, https://www.telia.lt/pranesimai-spaudai/-teo-ir-omnitel-tampa-telia-.

Lithuania. Although the advertisement of Internet services in the competitive liberalized telecom market will certainly continue to be an ongoing practice of Internet infrastructuring that upkeeps societal interest in services of various telecom providers, after my fieldwork experience I began to wonder what alternative communication strategies telecom market departments will pursue in the future. How will current popularizing strategies change if customers, with their dynamic desires, increasingly educate themselves about Internet infrastructuring and actual technological developments of telecom networks that are exposed to growing societal criticism and are, by some,[149] said to be part of surveillance capitalism that gather user data for profit?

2.11 Chapter Conclusions: Everyday Infrastructuring

The Internet is infrastructured through situated labor practices. According to media scholar Martin Warnke, technical infrastructure does not determine the services it will maintain in advance. Instead, it provides the conditions for the possibility of the emergence of Internet services. In this research and especially in this chapter, I use infrastructuring as "a condition of possibility" for the emergence of the Internet by moving away from a traditional understanding of infrastructure as a network of technical objects toward exploring it as a result of ongoing and contingent labor practices that maintain the Internet services to exercise an immense effect on daily life.[150]

To illustrate how Internet infrastructure is not a stable thing, but rather a result of ongoing labor practices I turn to particular doings, places, and actors of the Internet's production and maintenance at telecommunications company Telia Lietuva that provide both necessary and unexpected situated conditions for the emergence of the very possibility of the Internet. Media technologies such as the Internet did not naturally come into existence, nor are they effortlessly global. I argue that such situated focus on labor practices that maintain the Internet allows us to better understand the nature of media technology development as constantly emerging, changing, and requiring lots of maintenance work, communication, and the endurance of tensions and other contingencies.

In this chapter, I explore labor practices at the company Telia Lietuva, in particular its Physical Network Department and the Head Office. I use fieldwork-based vignettes to illustrate how different labor practices work together on a daily basis to maintain Telia Lietuva's Internet on the ground. Digging practices comprise wired telecommunications network construction and are carried out by outsourced and employed laborers in various field sites in Lithuania. They are both planned and contingent due to unforeseeable geographic factors such as soil constitution. Mediating practices manage Telia Lietuva's dependency on outsourced physical network builders, the contractors; these practices push the outsourced laborers to do their often-belated jobs through systematically occurring office meetings. Planning practices reduce the empirical complexity of

149 Shoshana Zuboff, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power* (London: Profile Books, 2019).

150 Martin Warnke, *Theorien des Internet zur Einführung* (Hamburg: Junius Verlag, 2018), p. 111.

future building sites by preparing technical requirements for future network constructors. They are based on mobile labor that first observes future building sites and their immanent situated contingencies and then prepares technical requirements based on these empirical experiences. Documenting practices facilitate the work of other physical network developers, such as cable engineers who install telecom networks at end-user premises by organizing, storing, and sharing information useful for physical network maintenance. They depend on the feminized labor from the Physical Network Department, which is increasingly office-based, as well as less visible and empirically experienced. Connecting practices are based on installing and connecting network equipment between users and physical telecommunications networks at user premises. They involve the experience-based knowledge of engineers who swiftly repair and connect users to the network, as well as workers' capacity to endure ongoing daily experiences of social difference in the form of client home meetings. During transmitting practices, the Internet's physical maintenance practices of digging, maintaining, documenting, planning, and connecting—as explored above—have become increasingly less physically graspable and empirically observable due to the emergence of the Internet as a virtual product of stream maintenance. Through processing practices of systematized action monitoring, an increasingly abstract perception of the Internet is particularized by the conceptualization of this media technology as a virtual group of products. Producing practices at the Head Office develop the Internet as a product through Business and Technology department groups and are comprised of idea creation, development, production, and specific tasks, such as pricing and advertising work, as well as situated contingencies such as tensions that arise during frequent company meetings. Wholesaling practices maintain and sell the Internet as a wholesale product to other telecom network operators in compliance with external regulatory requirements particularly issued to Telia Lietuva by the Communications Regulatory Authority. Finally, popularizing practices aim to advertise the Internet as a group of different services and sell physically built and communicatively managed Internet services to customers by continuously using simple and accessible messages.

Through its focus on manual and communicative labor maintenance practices at multiple departments, the Internet at Telia Lietuva first emerged as a result of earth-based and tactile practices such as digging and cable installation. In the departments I later visited, the company's internal perception of the Internet changed to an understanding of it as an abstract media technology that transmits data, is developed as a product, and is sold as a service. Thus, while these labor practices result in a media technology usable by consumers, all Telia Lietuva employees implicitly both carry out and practice different perceptions of the Internet in their everyday work. For some, Physical Network Department labor comprises the Internet's point of emergence; for others, the Internet is an abstract product and a service that results from communicative labor such as idea creation and project management. The underlying similarity is that among the actual Internet producers in the company, the Internet is rarely perceived as a thing in itself, but rather as the result of manual and communicative labor practices.

These practices comprise not only daily planned tasks, but also involve situated contingencies such as everyday critique, fragmented remembrances, multiple experiences of difference, and limited access to locations that help maintain the infrastructure, such

as company offices and customers dwellings. Thus, Internet maintenance comprises not only foreseeable planned labor tasks, but also involves situated contingencies that are inherent to Internet maintenance on the ground.

To infrastructure the Internet means to be immersed with one's body and mind in a particular environment, to conduct tasks and undergo experiences within the realm of the Internet as a constantly expanding physical network and product. I argue that in order to understand how the Internet is produced and maintained, it is important to explore its maintenance from the situated perspective of labor practices, which not only involve labor tasks by people and things in particular places, but also are made up of tensions, failures, change, and uncertainty. By problematizing labor practices, it is possible to discuss the ways in which these practices are routinized *and* avoid routinization. Specifically, when the Internet is perceived through the lens of practice, "it" turns out to not only affect our attention.[151] It is also not a mere vessel of colonizing datafication[152]; a social control mechanism that looms over us in an eternal feedback loop[153]; or a result of one heroic human mind, as propagated by the veneration of actors such as businesspeople Steve Jobs or Elon Musk. The Internet is a conglomerate of situated infrastructuring that is not only rational, deterministic, concrete, foreseeable, or planned, but also contingent. In this chapter I illustrate how the Internet as a complex of practices emerges and is maintained in a particular place. By doing so, I revise "the hyperrational and intellectualised picture of human agency and the social . . ."[154] The complexity of infrastructuring practices that are both planned and contingent, as well as their increasing abstraction from the physical to the communicative, demonstrates that the Internet needs to abstract its different physical foundations to be useful, as well as sellable. In the upcoming chapter, "Geopolitical Imaginaries," I will further enact a situated approach to infrastructure by exploring how the Internet is not only a result of infrastructuring labor, but is also encapsulated in complex strange geopolitical imaginaries.

151 Jonathan Crary, *24/7: Late Capitalism and the Ends of Sleep* (New York: Verso Books, 2013).

152 Nick Couldry and Ulises A. Mejias, "Data Colonialism: Rethinking Big Data's Relation to the Contemporary Subject," *Television & New Media* 20, no. 4 (2019), pp. 336–49; Nick Dyer-Witheford and Svitlana Matviyenko, *Cyberwar and Revolution: Digital Subterfuge in Global Capitalism* (Minneapolis, MN: University of Minnesota Press, 2019).

153 Michel Foucault, *The Order of Things* (Abindgon: Routledge, 2005); Michel Foucault, *The Archaeology of Knowledge* (New York: Vintage, 1982).

154 Reckwitz, "Toward a Theory of Social Practices: A Development in Culturalist Theorizing," p. 259.