Abstract

Digitalisation is advancing in Greenland and globally, with services like MitID, a solution for safe and digital personal identification, exemplifying this trend. When MitID was introduced in Greenland, it faced significant challenges due to the country's unique cultural, historical, and geographical context. This report explores these challenges through fieldwork in Nuuk and Ilulissat. Our findings reveal that MitID's implementation in Greenland has encountered substantial issues relating to lingering artefacts from the Danish context that it was designed for. Drawing on theoretical perspectives from Susan L. Star in infrastructure studies and Denis & Pontille in maintenance and repair studies, it is argued that MitID and its surrounding infrastructures are upheld by invisible work and maintenance and repair. Digitalisation can hold great value for a vast country like Greenland, which struggles with its large distances and remote communities. However, MitID's functionality hinges on underlying work done to secure connectivity, both digital and social, across this expansive terrain. Inspired by Marianne de Laet and Annemarie Mol’s ethnographic work on the Zimbabwe Bush Pump, we incorporate the Inuit concept of Sila and its cultural significance to emphasise that future digital solutions must be embedded in Greenland's unique context to promote inclusivity and avoid marginalisation.

Digital Challenges in the Arctic: The Impact and Maintenance of MitID in Greenland

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1. Introduction

In the middle of Nuuk lies Innuttaasunut - the citizen service centre. Here, citizens come to receive help with various matters such as problems with passports, driver licences, renewal of hunting licences, and catch recording and reporting. The horizon is filled with Greenland's cold and beautiful landscape, the only break from the infinite white of the snow and blue of the sky is the rising smoke from industrial chimneys that carve black stripes in the air. With its 17,000 citizens, Nuuk is by far the largest city in Greenland, but is still considered small in an international context. Grethe, who works at the citizen service, has lived in Nuuk her entire life. She grew up here and has seen the following generations do the same. She knows the residents of Nuuk intimately, having crossed paths with many of them since childhood. As a result, when someone like Mr. Hansen, her former Danish teacher, walks through the door, she immediately recognises him. They exchange warm greetings and spend a couple of minutes talking about life and family. "*How are the children?*". "*Good*", Grethe replies, "*How about your husband?*"

Her teacher requires assistance with activating his MitID, a new secure and encrypted password that citizens must have to access both their bank information and messages from the government. "*I will need to see some identification*", Grethe tells Mr. Hansen. The obvious confusion in her teacher's eyes pushes Grethe to further explain: "*Before I can activate your MitID, I need to see some proof that you are who you say you are.*" There is a moment of silence as the two old friends acknowledge the ridiculousness of the situation. "*It is just something I have to do to follow the standard procedure*", Grethe reasons with Mr. Hansen. But as Mr. Hansen fumbles through his wallet, Grethe's resolve wavers. In that moment, the lines between duty and compassion blur. With a fleeting glance at her surroundings, Grethe makes a split-second decision. She extends her hand, gently pressing Mr. Hansen's with a comforting squeeze. "*It's alright, Mr. Hansen. I'll handle it from here*" she murmurs, a small smile playing at the corners of her lips.

In the middle of Nuuk lies Innuttaasunut. Here, the cold efficiency of bureaucracy is met with the enduring sense of community that defines life in Nuuk and Greenland.

1.1 The Danish Colonisation of Greenland

In 1721, Danish-Norwegian priest Hans Egede landed his ship in Greenlandic territory with a mission: To spread the word of the Christian religion to the Inuits in Greenland (Hansen 2017). Before that, Danish activity had been present since Erik Den Røde came to the country and named the land "Greenland" to attract settlement from islanders from The Faroe Islands and Iceland (Sørensen 2020). From the settlement of Hans Egede and the spread of Christianity, Greenland naturally moved towards the status of a Danish colony. The Inuit population were up to that point nomads that travelled and only stayed at places for a short amount of time. With the colonisation, trade cities were established along the coasts, further establishing Denmark as the sovereign power in Greenland. Soon, fishing was made the commercial focus of Greenland, which was possible because of the industrialisation that Danish power took part in to develop in the country (Hansen 2017). In 1948, the Greenland Commission created G50, which was the Danish plan of modernising Greenland the following years. The plan came to be after the UN started to pressure colonist nations for decolonisation. The plan manifested itself as several laws that had two main purposes: A Danishisation of Greenland and a displacement of the population. The Greenlandic language, known as Kalaallisut, was described as primitive in the plans, which led to Danish being taught for the Greenlandic children in school. To master the Danish language and culture, thousands of children were sent to Danmark, where foster families would take part in the teaching. Following the G50 plan, a part of the Greenlandic population was forcibly relocated to live in one of the four "open water" cities, Paamiut, Nuuk, Maniitsoq and Sisimiut, in the west coast where fishing was possible all year round (Hermann 2021). Today, Greenland has established a Self-Government but the nation's colonial history still casts long shadows over society and it is still part of the kingdom of Denmark.

1.2 Evolution of the Telecommunication Infrastructure in Greenland

During the years of modernising Greenland, the infrastructure was also built upon. Becoming a "modern Greenland" meant that housing, roads, electricity, and telecommunication were developed across the country (Abildgaard 2024). To meet the Danish standards of telecommunication, it was decided that the future of Greenland's telecommunication should be based on radio-communication - a technology running on VHF (Very High Frequency). The

technology has antennas that need to point to each other in the same elevation and it was decided to put them on top of mountains to establish a radio chain that was stable throughout the west coast (Stenfoss & Taagholt 2012). Because all industry was happening in the four cities, which are in the mid to lower west coast, also meant that the tele infrastructure was prioritised to be built around this section of the west coast. The radio chain was built in 1977 and is still relevant today as a backbone of the telecommunication infrastructure in Greenland (Abildgaard 2024).

A rising demand for internet and faster connections resulted in building an underwater fibre optic cable connection running from Iceland to Nuuk and from Nuuk to Canada. The cable was finished in 2007 and provided fast connections along the middle of Greenland from the city of Upernavik to the city Qaqortoq south of Greenland (Stenfoss & Taagholt 2012). To connect the remote northern and eastern parts of Greenland with internet connection, Tusass, who is the sole internet provider in the country, makes use of satellite connections. The population in these areas will not experience high-speed internet connection with the satellite connection and with the high cost of it, this type of connection becomes less attractive for the locals (Abildgaard 2024). Utilising these types of connections, Greenland gets divided into three zones in terms of the telecommunication infrastructure: Zone one is the open water cities like Nuuk along the west coast that are connected by the sea cables, zone two is the radio chain zone where the connection from the sea cables is boosted towards the cities north and south of the sea cables, and lastly is the third zone which is the north and east of Greenland that is connected by satellite transmission (Tele-Post 2017). The telecommunication infrastructure is today a relic from a time of modernisation and centralisation in Greenland when resources were concentrated on coastal cities. This distribution of resources becomes evident when one travels further from Nuuk and experiences the decreasing latency of internet connections.

1.3 The Emergence of NemID and MitID

In 2018, NemID was launched in Greenland, which is a digital identification system for accessing public digital services as well as bank services. It was originally created by the company Nets and was launched in Denmark in 2010 and with the technology's emergence in Greenland, the country took a step towards enhancing their digital security. To authorise logins, the users had a personal username and passcode, which needed to be authenticated by writing in numbers that were stored on a physical key card. It was also possible to generate these

numbers on a separate key generator or through the smartphone app (Digitaliseringsstyrelsen A n.d.). Even though NemID was used as a security measure to access public services, it still had security issues and was in 2021 replaced by its big brother: MitID. Because NemID was a Danish technology, the closure of NemID left Greenland with a choice: Make their own identification to replace NemID or buy into the new Danish system. MitID resembled NemID by being a login portal accompanied with an app on the smartphone where an extra identification step was present (Digitaliseringsstyrelsen B n.d.). Thus, the physical key-card was discarded with the new system and it was up to Greenland now how MitID should be implemented in the country.

Acquiring a new digital technology for the public services also meant that it needed to be implemented in the society so that both the private users but also businesses could use it. Being originally made for a Danish context, we found an interest in how the technology got molded to be appropriated but also how the digitisation in Greenland takes place. Being the biggest island in the world with a population of about 56.000, it is also the country with the lowest population density in the world (Kerrn-Jespersen 2016). Furthermore, the historical and infrastructural context that has been put forth, Greenland's setting of having a threefold telecommunication infrastructure and the history behind it poses an extremely interesting field of study. This is a context that MitID and Greenland's broader digitalisation has to be able to thrive in and adapt to. Having these factors in mind, we could see how there might arise challenges in implementing MitID in Greenland when it comes to both introducing the digital solution in Greenland and subsequently maintaining it in hostile climates and complex infrastructures.

1.4 Problem Statement

Through the following problem statement, we will examine MitID and the Greenlandic context it appears in:

> *How does the unique context of Greenland affect the implementation of MitID, and how do invisible work and maintenance activities within associated infrastructures influence its appropriation and integration?*

To gain insight into the technology and the culture it is placed in, we did three weeks of fieldwork in the Greenlandic cities of Nuuk and Ilulissat. Here, we interviewed actors in both the public -and private sector together with participant observations in key areas to examine the infrastructure of MitID.

To answer the problem statement, we will brush out our methodological decisions, which have shaped our empirical data. The empirical data will be the foundation for our analytical work where we, with departure in Susan Leigh Stars' work on infrastructure and invisible work, and Jerome Denis and David Pontille's presentation of maintenance work, will seek to discover the infrastructure of MitID and the necessary work that goes on in the shadows. To nuance the analytical findings, we will use Marianne de Laet and Annemarie Mol's article on the Zimbabwe Bush Pump and Susan Leigh Star's concept of ecological infrastructures together with the Inuit phenomenon of Sila, to discuss the critical roles of maintenance, repair, and local appropriation in embedding technologies within communities.

Searching for relevant literature about the digitisation in Greenland has shown that the topic is missing attention from the scientific community. Given that Greenland is a large Arctic country undergoing significant development, we consider the topic highly relevant for understanding how digitalisation should be managed in this large and unique nation. We therefore position our thesis as highly relevant as the research is done within a gap in the literature and we hope that highlighting this topic will bring more attention to it.

2. Theory

2.1 Establishing Our Theoretical Lens: Ethnography and Situated Knowledge

Science and Technology Studies (STS) is an interdisciplinary field that examines the social, cultural, and political dimensions of science and technology. Established writers in STS, such as Bruno Latour and Donna Haraway, have emphasised the need to challenge traditional views of science as objective and detached from societal influences. By examining the interactions between technology, society, and culture, STS highlights the role of power dynamics, historical contexts, and ethical considerations in shaping scientific and technological practices. Within this framework, feminist STS brings a critical lens to understanding how gender, race, and

other axes of identity intersect with science and technology. Authors such as Donna Haraway (1988) and Susan L. Star (1999) advocate for revealing how dominant narratives can perpetuate inequalities by engaging with the experiences of marginalised groups. This approach values diverse perspectives and emphasises situated knowledge, which acknowledges that all knowledge is rooted in specific contexts and influenced by the knower's position in society.

Building on these foundational ideas, our approach in this project is deeply inspired by feminist Science and Technology Studies (STS). This inspiration has shaped both our narrative, reflections, and methodological choices in ways that prioritise diversity, inclusion, and accountability in the knowledge production that we ourselves take part in. As ethnographers, we immerse ourselves in the lives and experiences of the people we study. We study and research to create micro descriptions that together infuse into macro perspectives, interpretation, and analysis (Marcus 1986). Given the field we are studying and the history between Greenland and Denmark, this process has from the beginning felt complex and fragile. It has, therefore, been important to draw on theoretical perspectives that not simply address this fragility but acknowledge it as a complex part of the whole. Haraway's (1988) critique of "the view from nowhere" provides a foundational lens through which we approach our work in Greenland, emphasising the importance of acknowledging our own situatedness as Danish researchers. This critique challenges the notion of an objective, detached perspective and compels us to recognise our positionality within the broader historical and cultural context of the region. By acknowledging that our own perspectives are partial and shaped by our identities, experiences, and backgrounds, we strive to engage with the complexities and nuances of the relationships between Greenland and Denmark, mentioned in the introduction. Haraway's emphasis on situated knowledge encourages us to remain mindful of our impact on the communities we study and to prioritise collaboration with the people whose lives we seek to understand.

This approach necessitates a commitment to understanding existing power dynamics and historical narratives for these have not only shaped the field before but continue to do so. Through our research, we aim to produce knowledge that is responsive to the diverse realities of the people we study. This involves navigating the tension between Greenland's cultural sovereignty and Denmark's historical influence, and understanding how these dynamics shape everyday life and social structures - it is our attempt at *staying with the trouble* (Haraway 2016).

2.2 The Study of Infrastructure

Susan Leigh Star's influential work in the field of science and technology studies has significantly shaped our theoretical understanding of what infrastructure is. Here, we will present the literature that funds the conceptualisation of infrastructure as being both relational and ecological. Furthermore, we will bring into focus the ethnographic methodology of studying and uncovering infrastructure.

> Gregory Bateson, an influential anthropologist and systems theorist, once stated: "What can be studied is always a relationship or an infinite regress of relationships. Never a "thing." (As cited in Star 1999:379)

What, then, *is* an infrastructure? We follow along the lines of Bateson and Star to argue that just as a tool, as is the focus of Bateson, does not have any pre-given universal and frozen-in-time attributes neither does infrastructure. It, instead, takes form through use in practice and being connected to specific activities - it emerges *in situ*. Herein lies the rationale of Star, to flip the question of *what is* infrastructure to *when is* infrastructure. This temporal aspect drips through the entirety of Star's understanding of infrastructure. Crucially, infrastructure is never categorised as an entity that "works" or does not work, instead, there are moments. The moments of everyday life which rest on the fact that people may interact with infrastructure in different ways at different times and to some of these moments will be experiences of system breakdowns. This adds another layer to the work of ethnographers, where traditional points of focus such as agency, symbolism, and everyday practices (Marcus 1995) are drawn across a canvas of time and space. The implications for the nature of infrastructures are significant: They are as dynamic as the social life and configurations that shape them!

Conceptualising infrastructure takes us away from more conventional views where it often takes the form of stagnant structures. Instead, as it is to Star, in this thesis infrastructures are seen as living, breathing entities. They are composed of the dynamic interplay of human and non-human actors - much in the tradition of Science and Technology Studies. They consist of the material components that make up its physical structure such as buildings, power lines, and communication networks. The insides of these are littered with technology that ranges from large-scale electrical grids to smaller site-specific tools such as the electrician's circuit tester which is nonetheless also crucial for the functionality of the system. In these sites are the

myriad of workers that build, support, and do other work tasks that constitute the needed human effort and labour. The work these individuals perform is in turn also affected by regulations and rules that range from governmental policies to subtle social and informal arrangements or norms. These aspects of infrastructure are interconnected and depend on each other, for example, the office workers may rely on the electrician to make sure that the subway is working properly and that transportation to the office is available.

Resting on Star's work within infrastructure studies, studying how infrastructure both shapes and is shaped by the conventions of a community of practice, Star's ontological standpoint reflects the way she conceptualises infrastructure as an entity embedded within broader socio-cultural contexts (Star 1999). Therefore, they are not isolated artefacts but are intertwined with social norms, practices, and values to which they share a mutually constitutive relationship. As a result, infrastructures and technologies are often designed with certain assumptions about users' needs, preferences, and capabilities, which may lead to another of Star's focus points - marginalisation. This marginalisation is based on the people who do not live up to the assumptions of the *master narrative* which reflect the perspectives and interests of those in positions of power and authority. Star emphasises the importance of critically examining and questioning master narratives, as they can obscure the complexities of technology and its interactions with society. By challenging these dominant narratives, the hidden assumptions and power dynamics at play appear and it is possible to work towards more equitable and inclusive systems (Star 1991). It is within this intellectual landscape and to uncover moments of master narratives that Star introduces the concept *infrastructural inversion*. Infrastructural inversion is a notion that challenges the investigator to dive deeper than the visible facade: To reverse one's initial position of inquiry and uncover the hidden actors and practices that sustain infrastructure and are fundamental to its functionality and reliability (Star 1999). In lieu of this, the notion of master narrative acts as an incision point into taking the perspective of those who are not served by existing infrastructure and those who do not see their interests and needs reflected in it. Star further writes: *Listening for the master narrative and identifying it as such means identifying first with that which has been made other, or unnamed* (Star 1999:385). For example, it is through engaging with the field that Star uncovered moments where the master narrative became visible in her study of the International Classification of Diseases. Here, attempting to codify what it means to be alive, in a quite literal sense, was affected by religious beliefs and phenomenological distinctions i.e questions such as when is a foetus considered a human being and how many breaths must a baby take or fail

to take before they are alive or dead? As Star was conducting her fieldwork in a field that was, at the time, engaged in trying to codify "the moment of life", she describes the situation as a master narrative-in-the-making. The committee of statisticians tasked with defining the moment of life would inevitably do so through either the frame of the religious or the phenomenological rendering the remaining *other* or *unnamed*. In this task of listening for the master narrative, we find our background as ethnographers to be beneficial and deem ethnographic methods necessary for the undertaking. We conduct in-depth fieldwork and engage with diverse communities to gain insights into the lived realities of individuals and groups affected by infrastructural or technological developments and changes. We can identify how master narratives shape perceptions, behaviours, access to resources, and how they contribute to social inequalities and injustices (Star 1999). We can discover and critically reflect upon the ways in which people are forced to adapt to or work around the master narrative.

2.3 Surfacing Invisible Work

Invisible work is a pivotal term in Star's framework of infrastructure which encompasses the myriad of tasks of coordination, maintenance, and troubleshooting that are essential for the smooth operation of infrastructure but are often overlooked. It is also the layman having to take extra steps to participate in standardised configurations and engage in novel infrastructure. Outside of academia, invisible work has historically also often been used to describe women's work in the house as labour that is very significant but that for the most part has been done without much recognition throughout time (Daniels 1987). Star famously uses her example of being allergic to onions and instead of ordering a McDonald's burger without onions, she orders a regular burger and proceeds to take the onions out herself. This is a compromise she has to make, as through experience she knows that asking for a burger without onions would go against standard procedures and increase her waiting time to 45 minutes, effectively counterworking the idea of fast food. Invisible work is the stories of how individuals adapt and overcome challenges when faced with a configuration, infrastructure, or technology that does not work for them. This is built on the understanding that there will always be individuals who are put in such a situation. Star writes: *"[...] there are always misfits between standardised or conventional technological systems and the needs of individuals."* (Star 1991:36). Here, the

takeaway is that there are no infrastructures that embrace all the people whose lives it touches. The notion of stable networks or socio-technical configurations that can incorporate everyone, is an illusion of flexibility. This means invisible work is present everywhere - the unseen and unacknowledged stabiliser forced to adapt and overcome so the rest can enjoy the benefits of standardised configurations (Star 1999). Star's stake in invisible work is ultimately an attempt at uncovering marginalisation and the hardships of those not in line with the master narrative. While her position is that standardised configurations will always be too inflexible and that marginalisation is unavoidable this is not something to be taken for granted. By shedding light on the myriad tasks of coordination, maintenance, and adaptation that often go unnoticed, we reveal the hidden labour that sustains socio-technical systems. This notion extends beyond academia, resonating with the longstanding recognition of women's invisible labour within the household. Just as the fight for recognition of women's work prompted a re-thinking of the status quo and its perpetuated power dynamics, uncovering invisible work in other areas allows for the accommodation of a broader spectrum of individuals' needs. In short, the existence of invisible work in infrastructures is a constant but through powerful examples, such as Star's personal experience with falling outside of the standardised workings of the fast food industry, we can begin to critically reflect on master narratives and the *others* they make.

2.4 Working with Maintenance and Repair in Infrastructure

So when *is* infrastructure? Infrastructure does not simply exist *out there* but appears through organised practices that intersect and interweave (1999). The obvious answer is, then, that infrastructure is in everything we do and take part in. But such statements also leave a sense of ambiguity: Is not all ethnographic work a form of infrastructural inversion then? Our stance in this is that while ethnography can sometimes benefit from an infrastructural inversion, not all ethnography inherently takes on this methodological approach. While the phenomenon that is studied is always part of an infrastructure or configuration, infrastructural inversion is a specific methodological approach that focuses on revealing and shifting attention. Infrastructural inversion requires a specific focus on revealing underlying processes, relationships, and the often unseen labour that keeps systems functioning. As will be further explained in the next section, through comparison to Actor-network theory (ANT), these underlying processes require a different methodological incision point. We draw on Jérôme

Denis and David Pontille's work in maintenance and repair studies to ground the idea of infrastructural inversion and invisible work in a more tangible framework.

Inspired by Susan Lee Star's concepts of infrastructure, standardisation, invisible work, and infrastructural inversion, Jérôme Denis and David Pontille give their own take on the feminist approach to ANT. In their article *Why do maintenance and repair matter?*, the two authors start off by focusing on a position in ANT, where the centre of attention goes from the processes of "form-giving" to those of "form-keeping". This focus is central for a newer branch in STS coined maintenance and repair studies. In these studies, Star's concept of invisible work becomes central as Denis and Pontille argue that the maintenance of the social order relies on labour done behind the scenes. The unnoticed work is essential for technologies, objects, and infrastructures, as it is these operations that shape and preserve the material order of things. The action of maintaining or repairing technological systems and objects can be done by workers or laypeople. It is these actions that are the main reason that the systems work and are held off decaying (Denis & Pontille 2019).

Maintenance and repair studies seek to expand on and rediscover technologies by highlighting the people that continue to work on it long after the technology is finished while also highlighting the users who use the technology in their everyday life. Emphasising the invisible labour of technology pulls threads back to Star's work where she critiques the managerial focus in ANT (Star 1990). ANT often has a two-faced view of technology, which is of a black-boxed and stable technology or a technology in controversy and crisis towards breakdown. On the contrary, maintenance and repair studies has its focus on what happens between those situations, which shifts attention, much like Star, towards the overlooked work done on the technology. These studies are also moving away from the heroism that lies in the dramatic thinking and storytelling where everything eventually breaks down and needs to be repaired. Looking into these aspects of technologies and objects opens up and shows how infrastructures work, function, and are maintained on a daily basis. Even when technologies and objects seem mundane and appear stable, they are usually being under maintenance or repaired, which Denis and Pontille (2014) demonstrate in their example of the signs in the Paris metro. Their initial focus was on the standardisation of the signs and their ability to move from place to place without changing their state or losing their form. Instead, Denis and Pontille learned that it was not the signs themselves that were interesting, it was the work around them that took their attention. It was the daily care of the signs by the workers that showed the researchers that these signs in the underground were very fragile due to factors like moisture,

rust, and wear. The invisible work done by the workers showed new aspects of the infrastructure of the metro and order of things revolving around the signs. Towards the end of their article, they use a quote from Star to sum up why maintenance and repair studies are important to understand objects and technology better: *"In these cases the sociologist's job is to surface the invisible work that makes it possible to rediscover "the mess obscured by the boring sameness of the information represented"* (Denis & Pontille 2014:411-412). It is the work that is hidden from plain sight that becomes of interest to the researcher - work that sometimes can be difficult to find but that ensures the technologies and objects can live on (Denis & Pontille 2019).

Having established the use of both invisible work (Star 1991) and maintenance work (Denis & Pontille 2014), we seek to briefly reflect on how we apply them differently in the report. Maintenance encompasses ongoing routine tasks required to sustain the functionalities of a system. This concept highlights the physical and technical aspects of making sure infrastructure does not break down. In contrast, invisible work is seen as containing a broader range of activities such as coordination, communication, and knowledge sharing and draws attention to the social dimensions of infrastructure that are often hidden. There is also a point to be had when discussing *who* sustains the infrastructure. Inspired by Denis & Pontill (2019) maintenance is used when discussing those employed in positions, where they in some way or other sustain infrastructure related to MitID. Unlike Star (1991), however, they do not specifically relate maintenance to marginalisation. Marginalisation in this report follows this trend, and we see that it happens at moments of invisible work, where the *who the* are ones not employed or otherwise tasked with taking care of the technology or infrastructure.

2.5 The Problem with Holism and Marginalisation

Marginalisation can be a difficult topic to work with. Therefore, we seek to create a sound understanding of what marginalisation is in our report and what it means when we claim a person or group is marginalised. Following our theoretical framework, marginalisation appears as the exclusion of certain groups or individuals from access to and participation in infrastructure and systems (Star 1999) and the exclusion of certain groups or perspectives from mainstream knowledge and discourse (Haraway 1988). The range is, then, quite broad. Coupled with the approach that infrastructures intertwine and intersect we are left with the

conclusion that anyone may be subject to marginalisation. The holistic view that Star (1999) argues is required is here problematised, for as Marcus (1986) writes: "*What is holism once the line between the local worlds of subjects and the global world of systems becomes radically blurred?*" (Marcus 1986:171). As systems continue to intersect exponentially making the field larger a line will eventually need to be drawn. Have we achieved holism once this line is drawn? And how will we know where to draw it? To work with holism in this framework is impossibly large. Instead, we rely on the empirical material we have gathered to draft our ethnography. Whilst we know full well that we do not capture the full picture, our fieldwork serves the function of turning and critically reexamining existing master narratives. All knowledge is situated and produced from specific perspectives (Haraway 1988) and the narrative we create and the stories we tell are in this way also influenced. By acknowledging that our perspectives are partial and shaped by our own standpoints, we must be mindful of how our narratives might potentially recreate power structures or marginalisation. For example, by focusing on certain actors or events, we risk overlooking or downplaying the contributions of marginalised groups whose voices have not traditionally been heard. In keeping with the tradition of feminist STS, we acknowledge our position of power as the "knowers", especially in an undertaking that aims to partially designate some as marginalised and others as not. Our work with marginalisation is, therefore, always closely tied to the empirical evidence we have gathered. Just as working with infrastructure is turned to a point of *when* infrastructure *is* we see that marginalisation must be treated the same way. These moments of marginalisation are, as described, seen as the moments of invisible work. This serves the narrative well for our research as it allows us to highlight and question the ways in which structures of power and knowledge are constructed and maintained. By examining marginalisation through the lens of when it occurs, we can capture a more nuanced view of the lived experiences of individuals and groups who are often excluded from the master narratives. This focus enables us to foreground the voices of those who are most affected by these systems and to develop a deeper understanding of how power dynamics shape their realities. Ultimately, our exploration of marginalisation through invisible work serves as a means to challenge perspectives and to account for the complex interplay between people and infrastructures.

2.6 How We Will Use Theories

We have laid out the thoughts of infrastructures and invisible work from Star and the importance of maintenance and repair studies from Denis and Pontille and will now describe how we will use their works in the empirical data that we have collected in Greenland.

To understand and uncover how MitID has been implemented and is being taken care of in Greenland, we will focus on its infrastructure and the invisible work that is being done. When we did fieldwork in Nuuk and Ilulissat, we interviewed multiple informants working in different areas of society in Greenland to gain as many perspectives on the users working with the technology. This is important to uncover how invisible work by actors takes place during and after the implementation of MitID. Uncovering invisible work can be difficult to do but by applying Star's nine dimensions of infrastructures to our empirical data, we wish to understand how the actors are working behind the scenes with MitID as part of maintaining the infrastructure. The infrastructure covers both human and non-human actors, which brings us to the physical telecommunication infrastructure in Greenland as an important role in making sure MitID functions as intended. Because the physical internet in Greenland consists of sea cables, radio towers, and satellites it makes the telecommunication infrastructure very prone to taking damage from the, sometimes, extreme weather, fishing boats etc. resulting in internet downtime. We will focus on our empirical data about the ongoing work that is being done on maintaining and expanding the physical telecommunication infrastructure. This ongoing work on the internet might not be felt by the average Greenlandic citizen but we want to highlight how much and how important the invisible work is for the infrastructure, taking note from Denis' and Pontille's work from maintenance studies.

3. Method

3.1 Our Entrance to the Field

Our access to the field started off with our collaboration with KIMIK iT, where both Nina and the director, Gynter, put us in contact with relevant actors that we could interview. They took on the role of being gatekeepers to the field of MitID in Greenland because they knew many relevant actors from the projects they have been involved in (Hammersley & Atkinson 2007). They also knew about Techno-Anthropology beforehand from when they were studying themselves, which helped in gaining a mutual understanding of how we do fieldwork. We wanted the fieldwork to be as explorative as possible and we did not want to lock ourselves into one exact area, which is why we wanted to interview actors from different sectors in the landscape of MitID in Greenland. Because KIMIK iT has had a role with the implementation of MitID with parts of the public sector, they could get us in contact with people from different parts of the municipality such as The Tax Agency and citizen service.

3.2 Pseudonyms and Rapport

In the report we have decided to use Pseudonyms to protect our collaborators' privacy and confidentiality. This is important to us, as some of the topics spoken about at times become delicate, and to remain consistent with this we have decided to provide all of our collaborators with pseudonyms. The only exceptions to this are our partners in KIMIK iT.

James P. Spradley (1979) uses the term "rapport" about gaining a good relation to informants in order to gain deeper answers from them about their culture. We tried to establish rapport with our informants by being as transparent as possible. When we initially contacted informants, we attached a small text about ourselves and our study so that they knew what to expect from us and our scope. We were also trying to be flexible about scheduling interviews so that it fitted with their time schedule. These were instances of trying to establish rapport online via emails, which can be difficult because there is no face-to-face interaction to lean against. We felt most times that it was during the interviews that the informants started to relax and give better and more deep answers because of the rapport being established. We especially felt that in our interview with Ane, which started like a formal interview about her work and ended with her talking about her personal life as well as inviting us to lunch after the interview.

We also learned and experienced after interviews that MitID was a topic with a lot of feelings and that the informants found our research interesting. Comments like “Have you really travelled all the way from Denmark to study about MitID in our country” were given by many of our informants after the interviews ended and was a sign from them that they found it intriguing that we travelled all that way for something that did not even affect us in our daily lives. As we further expand on later in the report, travelling itself is an interesting concept that operates in Greenland in a very different way than we are used to. Because of the vast geographical distances and the limitations of transportation infrastructure, travelling is a very problematic and time-consuming thing, something we would come to experience and understand ourselves. The established rapport sometimes also created snowballing-like effects where the informants recommended that we could talk with other people that they knew, who could be interesting in our study.

Most of the time, we found it easy to get in contact with informants who were willing to be interviewed by us. Though, we found two instances in Ilulissat where this was not the case and where we had to break out of our comfort zone to interview them before we had to travel back to Denmark. An informant from the Ilulissat branch of Grønlandsbanken and another in the citizen service of Avannaata Kommunia, also in Ilulissat were not responding to our emails and we then found it necessary to visit them and ask if they had the time then and there. From the knowledge we had acquired from the other interviews, we knew that a lot of people in Greenland were busy with their jobs because of the lack of resources and time, which made this option very uncomfortable - but necessary for our empirical data. We turned out to get interviews from both places when we visited, which again shows that a lot of Greenlandic “custom” is about being in the physical space and talking face-to-face. This is a theme that we will return upon throughout this report.

In turn of helping us with our fieldwork, we will write a short version of this report and hand it to Kimik IT together with other informants who requested it.

3.3 Doing Short Term Ethnography

Doing short-term ethnography has its own set of qualities especially in regards to contemporary research practices and foci (Pink 2013). As the name suggests it is a type of ethnography done over much shorter periods of time than those previously thought as ideal covering time spent

in the field that could consist of years. This type of ethnography is experientially intense and can provide many more multisensory experiences than short-term ethnography (Knoblauch 2005). But as Knoblauch (2005:2) explains: "*The short time period covered is compensated for by another type of intensity: focused ethnographies are typically data intensive. That is, they produce a large amount of data in a relatively short time period, and, therefore, they demand an intensive analysis of data.*".

The data we have acquired through our period of short-term ethnography in Greenland has different shapes. Characteristic for focused ethnography, as described by Knoblauch, the type of data extends beyond field notes and is helped by tools to navigate in intensive periods of data gathering: Our interviews are recorded, the places we visit are photographed, and importantly we are able to, as two ethnographers, constantly engage in dialogue and discuss meanings and otherwise analytical insights. This dialogue helped intertwine data collection and analysis in a helpful manner and foster an interactive process regarding both methods and theory. As Pink argues, the short-term ethnography approach fits well with contemporary research settings which are characterised by a need for adaptability and fluidity (Pink 2013). Here, short-term ethnography emphasises the need to be attuned to the complex, dynamic nature of modern life, where phenomena can rapidly evolve and change. Pink suggests that in such contexts, short-term ethnography becomes an essential tool for capturing the immediacy of lived experiences and emerging social practices. The theoretical lens we have applied in this report fits this approach well. In both of these aspects of the report is the understanding that reality is dynamic. If we stop and pause for too long to try to understand it, we risk missing crucial developments and dynamics - our methods must fit a fast and everchanging world.

Furthermore, our approach aligns with the idea of focused ethnography, which hones in on specific aspects of the field to provide a concentrated analysis. By narrowing our focus to particular situations, interactions, and activities, we can better capture the nuances of social actions and performance. As Knoblauch (2005) elaborates:

> *Conventional ethnographies may be called "open" since they define the boundaries of their field in the course of the fieldwork. Focused ethnography, on the other hand, restricts itself to certain aspects of fields. The entities studied in focused ethnographies are not necessarily groups, organisations or milieus but rather situations, interactions and activities, i.e. the situative performance of social actions.* (Knoblauch 2005:11)

In other words, the focus is put on the particular as it occurs in natural settings of everyday life and social interactions. In our attempt to understand MitID and the particular actions that surround it, we do not aim to reconstruct the cultural stock of knowledge necessary to navigate the whole field. We aim at *"certain elements of (partly embodied) knowledge relevant to the activity on which the study focuses"* (Knoblauch 2005:10). This means that studying the activities related to MitID mainly the elements that are relevant to understanding the technology and the practices around it will be highlighted.

3.4 Doing Interviews in the Arctic

We conducted a thorough interview study to gain a better understanding of the implementation of MitID and the current utilisation of it by professionals in Greenland, as well as to explore the telecommunication infrastructure of Greenland. Kvale & Brinkmann (2009) point out that researchers through interviews try to understand the informant's point of view, lifeworld and experiences. During our fieldwork, we have approached how we did interviews in two different ways depending on the interview situation. First, we have done formal interviews with experts and professionals where an interview guide has been utilised. Secondly, we had informal ethnographic conversations with municipal workers by the counter as well as with citizens. In the following, we will dive deeper into our interview approach while also reflecting on the scientific knowledge that has been produced with this method.

3.4.1 Creating Interview Guides

We had prepared interview guides in advance for almost every interview that we held during the fieldwork. The interview guides reflected our research questions and acted as a frame for the questions we had for the informants. The purpose of the guides was to lead us if we got lost in the interview or if we needed to get back on track after asking follow-up questions (Gaskell 2000). Visually, the guides were split in two columns where the left column was for the overall research question and the right column had the questions for the interview. The questions in the interview guides alternated between grand tour -and mini tour questions, where the order

of asking them varied depending on the nature of the conversation. Grand tour questions are open ended and have room for the participant to give long answers while mini tour questions are less open ended and investigate smaller aspects of an experience (Spradley 1979). This resulted in semi-structured interviews that were more towards loose conversations rather than a strict set of questions, which the highly structured survey-like interview is known for (Gaskell 2000). As mentioned before, the level of rapport with the informants was also important so that meaningful answers could be made, which the semi-structured interviews helped with because they resembled conversations. Thematically, the guides always started with background questions to begin the conversations. Afterwards, we proceed towards the informant's work and tasks and how they work with MitID. In this section we have especially focused on their thoughts on how MitID got implemented and how it affected their work tasks. Towards the end, we asked more open-ended questions about the future of digitalisation in Greenland.

The interview guides were crafted during the preparation phase to suit each individual informant we planned to engage with. This customisation was essential due to variations in their knowledge and roles regarding MitID. Furthermore, the guides were continuously refined throughout the fieldwork as we gained insights, allowing us to focus on specific areas that previous informants had discussed, with the expectation that subsequent informants might offer further enlightenment. For example, we were able to more precisely shape and tailor our interviews in Ilulissat, because of our interviews in Nuuk, where we could anticipate certain themes or topics that might arise based on our conversations there. This let us focus more on how different Ilulissat is to Nuuk and how this influences experiences with MitID. One concrete example is the insight we gained from the Tax Agency's citizen service, who informed us that their branch in Ilulissat operates in an area with significantly poorer internet connectivity compared to Nuuk. As a result, they encounter a higher frequency of challenges related to internet access and reliability and have more people that are digitally exempted. This means a lot of people are still being treated in older paper-based ways which let us ask, during our interview, how they balance such things. The interview guides were used for most of the interviews, but we also encountered situations where the context required us to have full focus on the informant and where an interview guide would have been disturbing in the situation. There were 15 interviews in total with experts in their respective field, who we will give a short description of.

3.4.2 Doing the Interviews

As already mentioned, we did do two types of interviews during our fieldwork: formal expert interviews and informal ethnographic conversations. We have chosen to categorise the interviews like this as it shows how the interview situation was and how we situated ourselves to that situation as well as what kind of knowledge got produced. In the following section, we will reflect further on how each of these interviews have enriched us and how they have helped expand our insights in the implementation of MitID in Greenland.

3.4.3 Expert Interviews

Expert interviews, or elite interviews as Kvale & Brinkmann (2009) calls it, are interviews with informants who are experts in a specific field. In relation to our field study, we held 15 interviews and applied 10 of them in this report, with 20 experts spanning from the public, private sector and the government. We will now give a short description of each informant. The first experts we talked with were Nina and Ann Sophie from KIMIK iT, who worked together as business consultants in the company. They have worked on various aspects of integrating MitID into the Greenlandic Tax Agency, with which they have a close relationship due to their several collaborative projects. We also spoke with several experts from the Greenlandic Tax Agency in both Nuuk and Ilulissat. In Nuuk, we spoke with the IT-expert Inuk who has helped employees become administrators and certified users in MitID. We interviewed Per, who is responsible for development and IT-projects in the Tax Agency, about the size of MitID and how the Tax Agency confronted it. We also spoke with Ivalu, Kistaraq, Kuluk, Luna, Nivi, and Nuka who all spoke about their experiences with helping citizens with MitID, working at the counters of the citizen's service in the Tax Agency in Nuuk. At the Tax Agency in Ilulissat, we interviewed the experts Maline and Najaaraq who both work at the counter. In Nuuk, we interviewed the expert, Ane, who is head of citizen's service in the municipality. She told us the implementation in the perspective of being employed at the citizen's service and helping the many citizens convert to MitID. In Ilulissat, we interviewed IT-manager Malik who gave us perspectives on how big public IT-projects like MitID are being handled and implemented in Greenland. Another was Ivalu who work at the Agency for Digital Government. Ivalu and her agency were central figures for the nationwide implementation of

MitID. The interview was held on Microsoft Teams as she was not available for an interview during our field trip. Finally, we spoke with Mikkel who is head of the Greenlandic Tax Agency about his overall thoughts of implementing large technological systems like MitID in Greenland. During our field trip, we also got to interview informants working in private companies central to MitID and digitalisation. Kuno is head of department in Tusass and is an expert when it comes to the telecommunication infrastructure in Greenland. These expert interviews were unique for our fieldwork because they provided a comprehensive view of the diverse challenges and perspectives involved in the implementation of MitID across various fields and locations in Greenland. By engaging with experts from different fields, we were able to gather in-depth knowledge and understand the multifaceted nature of the project. This approach also highlighted the interconnectedness of different sectors and the importance of collaboration in successfully implementing and maintaining such a large-scale digital infrastructure. Furthermore, these interviews showed an interpersonal connection as well, where collaborators would often suggest other people we could interview, suggestions even spanning hundreds of kilometres from Nuuk to Ilulissat.

3.5 Observations and Field Notes at the National Library

As part of our fieldwork, we have done participant observations at The National Library in Nuuk. The reason we did observations there was to see how locals used the internet as a resource in their daily lives. Spradley (1980) distinguishes between five degrees of participation. The range goes from non-participation which means that the researcher, who is observerving, does not have any involvement with any people up to the complete participation that is the researcher that studies a situation and culture that they know fully of and can participate fully in. The type of observation that we did the most during our fieldwork was passive observation. This is described as an observer who does not interact with people and is mostly observing from an “observation post”. An example of this was when we did observations in the National Library in Nuuk because we wanted to see how the locals used the free internet that the library provided. We set up a post in a corner and sat there observing the people who used their internet devices.

When we did our observations we considered how to observe something that we did not know the shape or size of. MitID is a technological system that only becomes visible in a

few situations but we did not know when or how often those situations would occur. The explorative nature of our observation studies meant that we did not use an observation guide but that we tried to focus on specific interactions. To remember what we experienced, we wrote down field notes in our notebooks. When writing the fieldnotes, it was important for us to do it strategically so that we did not miss small details happening before us because we were looking down in our notebooks. It was, therefore, important that we concentrated on the interactions and then wrote the fieldnotes after the interaction was done (Hammersley & Atkinson 2007, Flora & Andersen 2018). Sometimes, citizens came in right after each other, giving us no time to write down the notes, which got us to switch our strategy towards writing one or two words during each interaction. This strategy helped us remember what had happened and when there was time, we got to write down our fieldnotes. We also utilised that we were two doing the observations by splitting up and focusing on different employees and citizens or just focusing on one detail each - different things caught our attention.

3.6 Informal Ethnographic Conversations

The informal ethnographic conversations occurred in specific situations where an interview guide would have been a hindrance - or not be used at all. This occurred in both the citizen service in Nuuk and also in Ilulissat where we had short talks with the employees at the counter. Besides citizen service, we also had these conversations with citizens in both cities about their thoughts on MitID and the implementation. To begin with, we thought of using our interview guide when talking with the employees at the counter in the citizen service in Nuuk but the situation quickly showed us that it would become redundant. This was the case because it turned out that the employees at the counter also had to help and service citizens when they dropped in at the counter - a factor that we did not think of when we planned talking with them. Instead, we adapted to the situations and kept the questions short at the counter so that the employee could return to their job quickly if a citizen showed up. After talking with each employee, we withdrew to the background to write down field notes about the conversation we just had because we did not record them. For citizens, we asked one or two questions to citizens at restaurants, local shops or tourist information on what their thoughts were on MitID and if they could remember when it was implemented three years ago. In the citizen service of Ilulissat, we encountered a longer conversation with one front desk employee where she sat us

in another room with her to talk. This meant that the ethnographic conversation became more like an interview but without a guide - a situation where we had to adapt our questions.

The purpose of these conversations was to gain an understanding of how the front staff of the citizen service and the citizens experienced the implementation of MitID when it came to Greenland. The conversations ranged from 5-20 minutes and because we did not record them, it was important to actively listen carefully to what was told and how it was told. Because we were two, it was easier to remember details that the informant had said but also the body language and tone of their voice. This became crucial for the details of our field notes for the informal ethnographic conversations.

4. Analysis

4.1 Follow the Thing/Trouble

As has been clarified, we have drawn inspiration from Haraway's concept of follow the trouble to suggest that our role as ethnographers is to dive head-first into complexity and confront messy issues. In addition to this, we incorporate George E. Marcus' (1995) concept *follow-the-thing*, from his work with multi-sited ethnography. More than having similar-sounding names, we argue that combining the two approaches will allow us to follow MitID in the moments it intertwines and interacts with the people and the infrastructure around it, as it moves through different stages of use, breakdown, and maintenance.

In our effort to follow the trouble, we consequently introduce a great deal of complexity into the report. Our challenge lies in navigating this complexity ourselves and presenting it in a way that preserves important nuances while remaining clear and coherent for the reader. Addressing this challenge is another reason for drawing on Marcus' work as a narrative tool to help make the reading more comprehensive. To do so, we present a brief explanation of Marcus' multi-sited ethnography which follow-the-thing stems from. Firstly, the frame of multi-sited ethnography is since its inception closely tied to the same intellectual wave of postmodernism as Haraway and is directly influenced by her writings. Multi-sited ethnography is inspired by the focus of postmodernist attention to the "*circulation of cultural meanings, objects and identities in diffuse time-space* (Marcus 1995:96)". Unlike previous iterations of ethnography, or single-site ethnography, multi-sited ethnogrqaphy rises from the critique that many objects of study can not be encapsulated through work done in one singular site. MitID remains too elusive to capture if one restricts the analysis to a single location or context. Instead, multi-sited ethnography recognises the interconnectedness and fluidity of social processes, acknowledging that phenomena are often distributed across multiple sites and contexts. This approach allows researchers to trace the movements and transformations of objects, practices, and meanings as they circulate through socio-technic systems. Drawing on Marcus' concept of follow-the-thing within multi-sited ethnography, we adopt a similar approach in our study of MitID in Greenland. Rather than confining our analysis to a single site or moment in time, we follow MitID as it traverses different settings and encounters various actors and infrastructures. Here, the empirical incentive is not to garner vast amounts of information about local cultural phenomena but to empirically follow "(...)*the thread of*

cultural process itself(...)" (Marcus 1995:97). Using Star's (1996) work on the Worm Community System as an example, Star demonstrates the use of multi-sited ethnography through her analysis and involvement of different stakeholders across space and time. She explores how designers, developers, biologists, secretaries, computer programs, coding systems, laboratories, money etc. shape the ecology of infrastructure in her object of study. In this way, she follows the trouble through the empirical breadcrumbs it leaves across multiple sites and contexts. In relation to this, we regard Star's term infrastructural inversion to align with the notions of follow the thing / trouble, pushing us to dive deeper than the visible surface. Navigating this trouble requires choices and interpretation of where the breadcrumbs lead, leaving Star, the ethnographer, in the position of power to deem what is relevant to the story and what is not. This leaves an ethnographic investigation at the inevitable conclusion that it is up to the researchers to define both what the trouble is and how it should be followed. In the following sections, we, therefore, seek to transparently convey the decisions we made about both what trouble is and how we choose to follow it.

This allows us to capture the complex interplay between MitID and its socio-technical environment, as well as the ways in which it shapes and is shaped by the broader Greenlandic society. By adopting a multi-sited approach, we can uncover the diverse perspectives, practices, and meanings associated with MitID across different contexts. This enables us to move beyond simplistic understandings of technology as a fixed object or tool and instead explore its dynamic and contingent nature. Moreover, by tracing MitID's movements and interactions, we can identify points of tension, contradiction, and innovation within the socio-technical landscape of Greenland. By combining Haraway's concept of follow the trouble with Marcus' concept of follow-the-thing, we aim to provide a comprehensive framework for understanding the complex dynamics of technology, infrastructure, and society in Greenland. This approach allows us to navigate the inherent complexity of our study while remaining attentive to the nuances and contingencies that shape the socio-technical landscape. The stories we tell in this analytical section, the thing and the trouble we follow, are based on our empirical dissemination: Stories of small local heroes that keep infrastructure from falling apart. Of course, the title of "hero" has in this context a connotation of sarcasm. These are not the heroes of Greek tragedies or myths through which heroism is expressed through strength and conquest. They are the tales of "*ordinary being"* and *"ordinary becoming"* (Haraway 2016:76), where the heroism lies in everyday acts of maintenance and practices necessary for the functioning of the infrastructure - they are tales of invisible work (Denis & Pontille 2019).

4.2 Arrival in Nuuk

Methods of travel in Greenland are unique. Shaped by the country's geography, climate, and social context, transportation in Greenland is not merely about moving from one place to another; it is deeply interconnected with all other aspects of life. The harsh weather conditions, the vast distances between settlements, and the lack of road connections between towns mean that air travel and sea routes are vital lifelines. These modes of transport are influenced by the nature of Greenland itself, adapting to the environment and the needs of its people. Our flight from Copenhagen to Kangerlussuaq and then Nuuk was also our first physical encounter with Greenland and an opportunity to begin understanding the socio-technical landscape. Having read about the role of digitalisation in bridging the large distances in Greenland (Naalakkersuisut 2023) while at home, experiencing the enormity of the landscape firsthand proved a good starting point for our research. We gained an understanding of both the challenges that MitID faces and the potential it has as a part of digitalisation in Greenland. The following is a field note depicting the thought running through our minds as we board our connecting flight from Kangerlusuaq to Nuuk (Appendix 1:1-2):

"Attention passengers: Flight for Nuuk is ready to be boarded". Walking into the tunnel that eventually led us to the runway of the planes in Kangerlussuaq Airport, we braced ourselves for the sunny, but -30 degrees weather. Coming out to the runway, you could feel your lungs becoming ice cold inhaling the crisp and dry air. In front of us was a small red propeller plane that could fly about 20 people, which said "AIR GREENLAND" on its sides. "Are we flying with that small one?", we asked each other, confused. Neither of us had thought about which size of plane we were going to fly domestically in Greenland but it suddenly made sense because the plane was not even full when we stepped inside the small vessel. Before boarding, we also took notice of the info board, that there were only about 10 departures from Kangerlussuaq that day - the airport in Greenland where every domestic departure needs to make a pitstop before continuing flying for the destination. The insides of the plane looked old and you could see that it had flown a lot of tours. We also took notice of who was flying on this plane with us. It was a mix of tourists, business people and locals who took up about half of the seats that the plane had to offer. Almost all of the locals had small transparent plastic bags that said "BORDER SHOP" filled with cigarettes, candy and beverages which gave us an idea of how these certain things must be expensive in Greenland. "Ready for takeoff", said the

captain as the propellers started turning violently. The small plane started to shake more and more as we drove faster towards the end of the runway and we started to talk and worry about the ice and snow on the runway that we almost slipped on, on the way to the plane. A feeling of worrying of the plane slipping on the ice kicked in until you could feel the plane going up to the sky. We were now floating, shakingly, but steady towards the capital city of Greenland, Nuuk.

Right after getting off the small red plane, we found Nina who wanted to give us a ride to the place we were staying at in Nuuk. Coming out of the airport, which looked more like an office building rather than an airport, and onto the snow filled parking lot, Nina guided us to her car, which was a four wheel drive car - like the other cars in the lot. We thought that it was going to be a longer ride but Nina informed us that it would only take a couple of minutes to reach the house we rented. While driving, Nina told us about the different buildings and scenery that we passed: "*Just on top of the airport is the local skiing resort and right over there is the parliament building"* (Appendix 1:1). She eventually gave us a tour of all of Nuuk, which ended up being about 10-15 minutes, which surprised us as it seemed simply driving in a smaller circle had us experience most of the city. During the tour, Nina began to talk about how the infrastructure had a role in moulding social life in the city: "*Travelling is very limited in Greenland. There are only roads in the cities but not between them so the cars are limited to be used in the cities. If you want to travel between cities, then you have to take a boat, plane or ride the sled dogs*" (Appendix 1:1). Adding to that, Nina told us that even though we were in the capital, you would still end up meeting someone you knew when you went to the supermarket. These first impressions gave us the building stones of what to expect when trying to understand the context and social life that MitID is being used in and how the infrastructure might look like or consist of: A huge country with cities and settlement strewn across it separated by massive distances, but also fostering a feeling that people had a closer understanding and connection to each other.

Days later upon arriving in Nuuk, we got invited into the office of KIMIK iT where Nina would go through questions that we had together with her colleague, Ann Sophie. The bright blue office building was very distinct in the harbour area in Nuuk and we were welcomed by Nina in the parking lot of the office building.

Figure 1 Picture taken from outside KIMIK iT showing their recognizable blue building

We walked into a room with space for two desks where Nina and Ann Sophie sat that day and where we were also going to have the meeting. Before we travelled to Greenland, we did research to learn more about the welcoming of MitID in Greenland, digitalisation in the country and KIMIK iT, but the information online about these topics is scarce. This required us to be more attentive towards learning what we could through interviews and conversations in the field. Also, we were interested in how people thought of MitID, used it and how it was implemented, which essentially is information that can only be obtained by doing fieldwork.

Because we only knew the essentials, meant that we had a lot of questions for both Nina and Ann Sophie. What we learned in that meeting was very important to gain an understanding of how the public services worked in Greenland and essentially what the infrastructure around MitID consisted of. That meeting also turned out to give us waypoints about the difficulties with MitID in the Greenlandic society - of course from the point of view of Nina and Ann Sophie. KIMIK iT works closely together with the Tax Agency and the municipality and had

a big role in helping the employees get onto MitID when it was released in Greenland. Nina also went over the history of Greenland's public sector, explaining how the original 18 municipalities were consolidated into just four during the municipal reform of 2008-09 - a process where centralisation and digitalisation took the main stage. We were having interviews at the Tax Agency later that day, and due to KIMIK iTs close work relation with them , Nina and Ann Sophie were able to tell us a lot about them and the troubles they face. We were told how there were several issues surrounding the implementation of MitID. Issues that are symptomatic for a lot of implementation processes in the public sector of Greenland and are rooted in Greenlandic society and infrastructure, which make the survival of new technology even more difficult. Two recurring points throughout our stay in Greenland included how employees at ministries and agencies in the public sector are employed for a short time before moving on to a new job, creating a void of experience that the next person needs to fill. Nina further exemplified this through an example, stating that it is not a well established thing to keep detailed logs of the work one is part of or has done, which leads to a lot of setbacks in projects. Besides that, we were told that the low digital literacy in the country makes it difficult to introduce new public digital systems to the citizens.

This meeting with Nina and Ann Sophie was important for us because it gave us an introduction to both how the Greenlandic public sector functioned but also issues, stories and experiences about MitID - ultimately giving us a glimpse of the infrastructure that we were going to study the next weeks in Greenland. It also showed us how digital technology is being welcomed in Greenland and how important a company like KIMIK iTs to make sure that the technology is being used properly by the employees. Having issues in the society like low digital literacy and short-time employment showed us aspects of the infrastructure of MitID that we had not foreseen and we used these insights as landmarks to remember for later interviews. We know infrastructures intersect and affect each other and that they may inherit the problems of the bases they are built upon (Star 1999). MitID is no different and we became very aware that understanding the reasons it may have proved difficult requires a contextual understanding of the landscape that surrounds it. After the meeting, we got a ride from Nina and Ann Sophie to the agreed meeting with the Tax Agency, an actor we came to find plays a large part in said landscape.

4.3 The Tax Agency in Nuuk - Conversations With Per and Inuk

We wanted to learn more about MitID, the size of it and how it was used, so we scheduled interviews with different actors from The Tax Agency. The Tax Agency is not directly related to MitID but because citizens need MitID to log into digital services like e-Boks, where they get digital mail from among others the Tax Agency, and "My tax", where they do their taxes digitally, we found it relevant to come in and speak with them. Nina had also told us that KIMIK iT had worked, and still works, closely with this agency with MitID related work so it would be a way for us to access the field through this agency. Besides that, the Tax Agency had a citizen service, where citizens can drop in if they have tax related questions. We saw this as an opportunity to speak with employees that had direct contact to citizens, who could give us insights and thoughts on the citizens' reactions and experiences with the implementation of MitID. Our understanding of MitID and our ethnographic approach to the field was enriched through our dialogue with Nina and Ann Sophie, who provided us with knowledge to follow MitID to a site where it was at play. This allowed us to follow MitID and its troubles within the socio-technical landscape of Greenland, tracing the impacts and interactions of MitID together with those who have experienced it first hand.

Nina and Ann Sophie asked us if we wanted a ride from the KIMIK iT building to The Tax Agency where we had the first interview with Per, who is responsible for IT-development in the Tax Agency. Giving us another ride in a city that is quite walkable gave us a feeling of a mentality that resonated towards helping each other, but was also based on the fact that the two would spend every Wednesday working from the Agency to foster better cooperation. Arriving at the Tax Agency, Nina and Ann Sophie led us to the back behind spaces occupied by citizen service and where the public was welcomed. KIMIK iT had their own office space where we put our stuff and soon Per walked in and asked if we were ready. We sat down together with him around a table in his one-person office space and started the interview. When we asked about the rollout of MitID in Greenland and how it affected the Tax Agency, Per explained: "*We don't have a lot to say. It was announced that, I think it was the 28th of October 2023 that it should go live, I think. And then it was delayed to sometime in January. And the primary implementation in the agency has been that KIMIK iT would develop something on their end [for us] and Magenta would develop something on their end [for us].*" (Appendix 2:13). The Tax Agency had to integrate MitID in their systems and got help from consultant houses like KIMIK iT and Magenta. We learned that The Tax Agency did not have any part in

the implementation of MitID in Greenland and that they needed to implement it in their systems. Something we believe is visible in the answer Per gave is the almost passive formulation surrounding the arrival of MitID. This was the case during our interview with Per, but persisted in most of the conversations we had in Greenland; it is decided that MitID is coming and the relevant party must simply accept and adapt to this. Per also explains that the agency is strongly dependent on IT-consultant houses like KIMIK iT and Magenta to implement technological solutions like MitID and the lack of certain competencies: "*... what I call a business developer. It just doesn't exist as a phenomenon in Greenland. [In my old job in Denmark] we had three-four anthropologists hired and we had user experience people… We just don't have that here.*" (Appendix 2:12). Per further explains that there is a need for competencies in Greenland and that there are not enough IT-people to successfully implement large technological systems. This makes extern IT-consultants like Nina very appealing. The missing competencies became a theme of the interview that we did not expect and Per touched on subjects that were important to start shaping an infrastructure around MitID:

> *... There are also many replacements of employees. That means that the organisational memory is quite small, which also makes it difficult to follow all the time. That's even more important when you have many replacements, then it's your documentation and your way to document that is your organisational memory. So that's really important because if [the documentation] gets lost from time to time then you'll lose momentum…* (Appendix 2:5).

"Organisational memory" was a new term that we learned during the interview and was a theme that Per brought up several times during the interview. Because of the lack of higher education in Greenland, the jobs in public agencies and the government are vacant and are often outsourced to newly graduated academics from Denmark. They will stay and work in Greenland for one-two years and then head home with their newly earned experiences but will again leave a vacant spot in Greenland. Because of the rapid replacements, the organisations have to get the new employees onboard again which results in a loss of momentum. This insight can be applied to the perspective of digitalisation and implementation of systems like MitID, which becomes difficult because of the many employee replacements that are needed, ultimately showing a fragile angle in the infrastructure of MitID. The loss of momentum can be critical when rolling out nationwide public digital systems and it showed us an issue that

was unique for the Greenlandic context and infrastructure. The issue was also taken up during our meeting earlier that day with Nina, who referred to herself and KIMIK iT as "a stable centre of knowledge for the public agencies", which Per also mentioned in the interview.

A sense of fragility in the infrastructure occurred again in front of us, when we later that day interviewed Inuk, who is the sole employee responsible for IT in the Tax Agency. We originally wanted to talk with him because he had worked with MitID-related tasks when it was being implemented in the Tax Agency but as we talked with him, we discovered his part in infrastructure beyond the world of MitID. Because he is alone at his post, and not many in Greenland have an IT-background, he has become very much appreciated at the Tax Agency. This quickly became clear during the interview when he explained about his tasks and opening MitID users:

> *And it's me, who creates certificates and users. That's easy for me but the biggest problem I have is to help the other employees. Especially the older generations… Even though it's easy for me, then it's difficult for them. It's where I have the most challenges because it takes time to help them. It's just like being in a kindergarten and helping a young boy, who can't figure it out. You have to be calm and nice to them. Another issue is that there are a lot of employees who don't have a smartphone and then I have to help them with that.* (Appendix 3:1).

Inuk's position is meant to be maintaining and rolling out service in the Tax Agency but because he is the "IT-guy", his job has also become to service his fellow employees with their technical issues. As he points out in the quote, a big portion of the employees do not have strong IT-competences and they resort to him if they have any issues. We view this task as highly important and as invisible work because it is his doing that makes sure that the employees can work with their technologies - technologies that can be difficult to work with if they do not have the competences for them. This type of work takes time and patience from his part but it is also work that goes on behind the scenes and is necessary for the infrastructure and the Tax Agency to work properly. He also mentions that because of this extra work load, he became very busy during the implementation of MitID in the agency because he had to juggle that while also helping other employees. Learning of his position as the sole person maintaining these tasks and the workload they bring, we asked what would happen if he stopped working at the Agency, as we had learned there is a high turnover rate. He told us that this is a

risk he and his boss also are aware of: "*I've actually asked my boss about that. "What do we do if I'm suddenly not here?". There is no answer for that*". (Appendix 3:4). It also shows that the infrastructure is fragile in a sense that some employees in the public sector can have difficulties in using the necessary technology for their job, which is a challenge in Greenlands digitalisation.

An interesting perspective we learned about MitID came up during our interview with Ann Sophie from KIMIK iT when we talked about Inuk's role in the Tax Agency: "*... I sat down together with him, Inuk, and showed him how it was done. So now when I write to him* "*Can I please have a certificate that looks like this and this" and then I receive it from him*". (Appendix 4:4). In the quote, Ann Sophie is referring to Inuk's administrator abilities to MitID certify other employees in the public sector, called a RA-certificate, giving them the ability to make MitID profiles for citizens. That might sound mundane and unimportant but there are only a few MitID administrators in Greenland, stressing the point that he is quite valuable in doing maintenance work in the infrastructure of MitID. Without this kind of work, fewer employees would be able to do their own MitID-related tasks, ultimately making it more difficult to spread MitID in Greenland. For Inuk, this is an everyday task that he does because it is his job, and to ensure MitID is running as intended. It is also these actions that are often overlooked when examining big infrastructures such as MitID because they take place in the shadows. Just like Denis and Pontille's example of the daily care of the metro signs, RA-certifying employees around the country is work that makes sure that MitID is held off decaying. This is important as the points mentioned earlier shows that MitID is threatened by short organisational memory and poor technological literacy.

Uncovering fragility in the infrastructure by talking with Per and the invisible -and maintenance work done by Inuk revealed new levels of the infrastructure. By certifying his employees around the municipality, Inuk makes sure that these employees can get more citizens onto MitID. These citizens might live far away from big cities where RA-certified employees are, and making sure that more and more employees can give access to MitID, might close distances and need to travel to get MitID for the citizens. We were also left with a better sense of how the infrastructure of MitID spanned to many locations while even more questions had also arisen. From a maintenance and repair perspective, we argue that uncovering fragility in the infrastructure through conversations with Per and witnessing the invisible maintenance work by Inuk provides an understanding of the infrastructure surrounding MitID. Fragility, in this

context, implies a lack of completely standardised or rigid configurations, rendering the infrastructure susceptible to disruptions and challenges - as it *becomes visible upon breakdown* (Star 1999) we are confronted with shortcomings and areas for improvement. Fragility also signifies the potential for adaptability and evolution. The ongoing certification efforts undertaken by Inuk show us this dynamic nature of the infrastructure. By expanding the pool of certified personnel and educating colleagues across the municipality, Inuk not only addresses existing vulnerabilities but also fosters a culture of change and improvement. This proactive measure not only ensures the continuous operation of MitID but also facilitates accessibility for citizens, especially those residing in remote areas. Thus, fragility, while initially highlighting weaknesses, also signifies the capacity for transformation. It is through such maintenance and repair work that the infrastructure can navigate challenges and emerge stronger, reshaping the landscape of digital identity within the community - adversity breeds resilience, something very true to all life in the arctic.

Learning more about MitID as we interviewed informants, we wanted to know more about the overarching theme of digitalisation of Greenland that MitID is part of. Being already in the Tax Agency, we had heard from our informants and Nina that Mikkel, The Head of The Tax Agency, had worked in the agency for a long time and that he had a lot of knowledge on the topic. We could also see how talking with Mikkel could give a managerial top-down view on MitID, exploring power dynamics and decision-making on the topic. Mikkel agreed to talk with us and we were booked for an end-of-the-day interview in his big office at the end of the hall in the building that housed the Tax Agency.

4.3.1 Talking with Mikkel Head of the Tax Agency

Mikkel has been in the Greenlandic Tax Agency for 23 years, and is the head of the department which means that he has experienced Greenland's technological development throughout the years and knows the logics that lie behind it. The 23 years he has worked in the Tax Agency come across as unique for he has had no other employers and does not follow the trend of a quick turnover rate. As he explains himself: "*I have worked my way up from the youngest assistant to the oldest grump*" (Appendix 5:2). This made him an interesting informant because he could explain specifically how digitalisation in the Tax Agency has looked like and what benefits it holds for the bigger picture in Greenland. He starts off by telling us how the Tax

Agency looked when he just started: "*And then they were put in hanging files on big shelves. Yes, they took up a lot of space. After the centralisation, we still had that system and we agreed on that there were not room for 50.000 people in here, so we made a digital tax system*." (Appendix 5:3). More than practical reasons, however, we also wanted to understand the underlying logics behind digitalisation, which Mikkel was happy to discuss: "*One of the big drivers in digitalisation is to increase efficiency. We can save money, there's less that needs less resources.*" (Appendix 5:11). From a management level, digitalisation can be viewed as a nice way to save money by making the jobs more efficient. Instead of having to send forms back and forth, a digital tax system, like they have now, can save time when the citizens need to report their taxes. This is not the only upside of digitalisation and he follows up by saying: "*We are extremely challenged on distances. And challenged on competences and education, so how do we make those areas better? We, among other things, use IT.*" (Appendix 5:10). As Mikkel describes in the quote, Greenland is a country with a population of about 56.000 people scattered on the biggest island in the world. Some live in the big cities while others live in smaller cities or in rural areas, so distance plays a big role in how long it takes for cases to be handled. He also came across the same challenges as Per and Inuk did in their interviews about competences and education and, in a technology optimistic manner, positioned technology as the solution. From the managerial standpoint that inhibits Mikkel's claims, his experiences with digitalisation and MitID implementation were less rooted in everyday experiences than Per's and Inuk's. Instead, he was able to describe overarching themes and problems in Greenland that did not reflect the same maintenance and repair as the two others. The value found in this, is that maintenance and repair does not exist in a vacuum. To understand the relation between the maintenance done by Inuk, when educating colleagues for example, and the greater infrastructural landscape that it and MitID are part of, the interview with Mikkel helps put it into perspective. Amongst other reasons shared with other countries, there has historically not been a high level of technological education in Greenland. To present digitalisation as a way of connecting wider Greenlandic society presupposes a certain amount of familiarity and ability to navigate the systems that are introduced. Existing relations have made the kind of maintenance and repair work done by Inuk necessary to be able to reap the posed benefits of digitalisation. However, Mikkel's insights also provoke critical reflection on the accessibility and inclusivity of digital platforms. While technology holds immense potential for streamlining processes and enhancing efficiency, its benefits may not be distributed equally across Greenland. The "Master narrative", here presenting the political interest in digitalisation, of

progress can inadvertently marginalise certain groups, leaving them behind in the intent to address inefficiency and challenges from geographical distances. From this point, we wanted to walk in next door, to the Agency's citizen service to learn about the experiences of the employees in the frontlines, who directly interact with citizens and navigate the tax system on a daily basis. Following the trouble, in this case, was an interest in knowing how individuals experienced this "master narrative" - do the citizens of Greenland hold the same opinions about the positives of digitalisation or is their lived reality something different? We proceeded to agree on a date and time where we could interview employees in the citizen service department of the Tax Agency to explore their perspectives, as well as the citizens', on these themes of MitID and digitisation in their daily work.

4.3.2 Citizen Service in the Tax Agency – "We are ready now"

On the day of our interview with the citizen service, we were eager to begin talking to the employees and try to understand what the biggest problems with digitalisation and MitID are and how the citizens experience these. Walking through the snow from one part of the city to another, from our housing to the Tax Agency, we brushed up on the topics we had discussed prior and the questions we were interested in. We had not agreed to formal interviews with the citizen service, or so we thought, instead, we had been allowed to simply be in and observe the work of the citizens service and were intent on holding informal ethnographic conversations with the municipal workers. Therefore, in contrast to the empirical material gathered until this point, we chose not to create an interview guide deeming it a hindrance to the short conversations we would have. Upon our arrival we greeted Nina, who had decided to also work from the Agency that day, put our things down, and prepared ourselves to be sociable and productive. Initiating in talks with an employee sitting alone, we were suddenly interrupted: "we are ready now" they told us. Whilst both of us were visibly a tad confused, we decided to follow the person. To our surprise, all of the employees were sitting around a table, ready to be interviewed. Although our initial interest in the topics we wanted to explore and discuss could remain the same, we were suddenly confronted with the reality that the empirical procurement of such insights had drastically changed.

It was interesting to see how the tone changed after we had given our introduction and said that we were studying MitID exploratively but also critically. Right off the start, Luna,

who works at the front desk interacting with visitors in the citizen service, told about all of her issues with the tax system that she works with in her daily life and soon the conversation arrived to the topic of MitID but also the issues that exist for the citizens living in the settlements, away from the big cities. The Tax Agency is not directly related to MitID but citizens need MitID to log in on "My Tax" to report their taxes. Also, MitID is required to log into e-Boks where messages and digital post from the Tax Agency are sent to the citizens. Checking their inbox in e-Boks became a problem for the citizens living in the settlements upon MitID's arrival: "*In the beginning, there weren't that many [in the settlements] who had MitID. Those in the settlements called us. They couldn't get MitID, they needed to go to the city first. So, in the beginning, we had a lot of issues because they couldn't log into e-Boks*". (Appendix 6:3-4). Not being able to check their e-Boks or log into any public services makes the citizens living in the settlements unable to access MitID while in their settlement. Because the citizens are obligated to log into these services to, among others, report taxes and check their bank, they have to journey into citizen service to get help and the internet. This journey and the challenges in it is something which Aaja elaborates on: "*Yes, they sail. Well, the settlements around Nuuk. It is also like that in other places. There, they either go by dog sleds, boat, take the helicopter, or what do I know*". (Appendix 6:6). The technology of MitID in Greenland is evidently designed for a Danish context where travel distances to get MitID in the municipality's citizen service is not thought of as a challenge. In Denmark, citizen service buildings are widely scattered around the country and travelling is done in short distances by either walking or worst case by bus or car. The physical infrastructure of transportation in Greenland plays a role in how accessible it is to obtain MitID as a citizen. As we also took notice of when we first landed in Nuuk and drove with Nina, there are only roads within the cities and not between them, making it difficult to travel. The travel time and distances make it absurd for the citizens living in the settlements to travel to a big city only for acquiring MitID and one of the employees at the focus group pointed it out by saying: "*Riding on sled dogs to acquire MitID*" (Appendix 6:6) in a joking manner. We wanted to know more about the conditions in the settlements where Kistaraq replies:

> *"There are almost as many people living in the settlements, as there are people living in the big cities. There are for example a lot of settlements in northern Greenland. Maybe most or about half of them don't have any access to the internet or anything".*

> *"Out in the settlements, the internet is very slow. They don't have any sea cables like we do".* (Appendix 6:4).

The telecommunication infrastructure is another challenge for the citizens living in the settlements and there is an obvious distinction between those that *have* sea cables and those that do not. Telecommunication in Nuuk runs on sea cables that transport high speed internet to the cities along the coast, while the cities further into the mainland run on internet provided by either radio frequencies or satellites. If the citizens in the settlements eventually make the trip to a big city to get MitID, they might not be able to use it to check their e-Boks when they come home because of the bad internet connection in the settlements. Both the travel distances and telecommunication infrastructure are not thought of when enrolling MitID into the Greenlandic context and results in marginalising the citizens living outside of the big cities.

4.3.3 MitID for the Homeless

Still, in the big cities they have their own problems, homelessness is a big issue in the capital city and this group is also receiving important mail from the public organs to their e-Boks so MitID is a must for them. We are told that to register for MitID, the citizens need to be living in a residence with an address which homeless citizens of course do not have. While this might be a hindrance, they will also need a device like a smartphone or computer to check it on, which the employees also say that most homeless do not have. Highlighting some of the issues that exists for this group, the employees also told us about some of the solutions:

> "*Yes, yes, but then they have a %*[1] *address that they can use to register for MitID.* (...) *Yes, they can get that or they can go to the National Library where there are computers or to the municipality. We have laptops available for everyone, so they can also print.*" (Appendix 6:8)

These quotes highlight the solutions that have been done to accommodate the situation of the homeless, so they also can register for MitID. Providing a c/o address to the homeless might not be unique for Greenland but it is an example of how this specific group of marginalised

[1] An in the "care of" address where individuals can receive post without having their name registered on the post box.

have been thought into the technology. The solution of providing computers and internet to the homeless also represents the maintenance that is being done, so the marginalised are able to check their digital post.

4.3.4 Partial Conclusion

Our interviews with Per, Inuk, Mikkel, and the employees highlighted several key challenges and adaptations associated with the implementation of MitID in Greenland. Citizens in remote settlements face difficulties accessing MitID due to travel requirements and poor telecommunication infrastructure, exacerbating their isolation. Homeless individuals in Nuuk struggle with obtaining MitID due to the lack of a permanent address and necessary digital devices, though some solutions have been implemented. Mikkel's managerial perspective emphasises digitalisation for efficiency and cost reduction, while frontline employees in the citizen service focus on practical challenges and solutions. The implementation of MitID has inadvertently marginalised certain groups, highlighting the digital divide and the need for localised efforts to adapt and maintain digital infrastructures in Greenland's unique environment. Additionally, the invisible work of employees and the crucial aspects of maintenance were evident, showing how localised efforts and adaptations are essential for the functionality and inclusivity of such digital systems. We saw the master narrative of Greenlands digitalisation, focused on efficiency, at times clashing with the lived realities of the individuals we spoke with, something that would also permeate in the rest of our fieldwork.

4.4 Navigating MitID Challenges in Greenland's Citizen Services

Now that we had spoken with the citizen service in the Tax Agency, we also wanted to speak with the municipality's citizen service. The difference between these is that the municipality can help citizens onto the MitID platform and it is also the place where the citizens can go if they have questions about the technology - if citizens' lived realities clashed with the master narrative it was here we could find out how. To learn more about their role with MitID, we set up an interview with the head of citizen service in Kommuneqarfik Sermersooq.

Ane has been employed in the Kommuneqarfik Sermersooq since 2014 and has since her employment seen great change in both the use of digital tools and the city of Nuuk itself. "*In the past, I have always said a quarter of the city is my family, but now the city has grown so much*" (Appendix 7:1) she tells us. She knows a lot of people in Nuuk and a lot of people

know her, a relationship only strengthened by her work in the municipality where she has served as a direct point of contact for Nuuk's inhabitants. Her job as head of the department at the Innuttaasunik Kiffartuussivik, or citizen service, has put her in contact with many of the problems citizens have and has given her a direct insight into the difficulties that the transition to- and use of MitID has brought since its arrival in 2021. She experiences on a daily basis both the positives and negatives of the digitalisation of Greenland. Although her statement that "*digitalisation is welcome but not always a good idea*" (Appendix 7:1) is a truism it comes from a place of experience. As we will explain, the trouble with MitID is not always unique to Greenland and did not grow de novo (Star 1999): Its threads can be followed all the way back to Denmark. There are two points to make in this statement. Firstly, many of the *general* problems regarding individuals' use of MitID is a trouble that has followed MitID from Denmark to Greenland and is by no means unique to Greenland. Digital literacy, for example, where it must be mentioned that navigating digital systems like MitID requires a certain amount of competency which not all people have; Greenlandic or Danish. Secondly, the landscape of Greenland, both infrastructurally and geographically, may exacerbate the experienced troubles with MitID for both the average citizen and employees of citizen service such as Ane. As we continued our interview with Ane it was especially this second point that stood out. Drawing on her time spent studying in Copenhagen, she goes on to describe the problems inherent in taking MitID out of a Danish context and placing it in a Greenlandic one:

> *I usually say... I'm half Danish myself, so it's not that I'm against Danes, it shouldn't be understood like that, but it annoys me so much that it's so Danish. Everything is designed in Danish. Danish conditions, Danish circumstances. How it is in Denmark, which is far from what we have here.* (Appendix 7:2)

The differences the two countries have had in trying to adjust to implementing MitID are significant. Ane participated in ongoing forums where representatives from different municipalities in both Greenland and Denmark would discuss the process of implementing MitID and the problems they faced. Throughout these forums, it was clear to Ane that when it would become her and Greenland's turn to implement MitID it would add a huge workload just as the Danish representatives described. As time went on and it became their turn, citizen service was overwhelmed with citizens trying to get help for the technology. The monthly

amount of visitors in need of assistance more than doubled and as a result the practices in the citizen service had to adapt (see figure 1).

Month	MitID	Reg. Citizen service	Reindeer	Facilities and Environment	Total	Notice
Jul. 2020		1083	465	57	1605	Corona time
Aug. 2020		1456	566	55	2077	Corona time
Sept. 2020		1139	184	70	1393	Corona time
Jul. 2021		463	16	25	504	Corona time
Aug. 2021		1530	204	79	1813	Corona time
Sept. 2021		734	49	30	813	Corona time
Jul. 2022	642	1416	642	68	2768	MitID 11th July
Aug. 2022	1138	1347	580	85	3150	
Sept. 2022	767	1147	148	56	2118	
Jul. 2023	817	1573	741	51	3182	
Aug. 2023	1206	1591	479	66	3342	
Sept. 2023	772	1031	156	52	2011	
Okt. 2023	871	1117	132	53	2173	
Nov. 2023	570	1030	94	63	1757	
Dec. 2023	413	668	26	16	1123	
Jan. 2024	620	1156	39	33	1848	

Figure 2 An overview of citizen service's cases we created based on information given to us by Ane

Danish citizen service centres started using a timeslot table to manage the influx of visitors to make sure a fixed amount of people came every day - a number of people that was manageable (Appendix 7:7). In Nuuk, however, the use of such an instrument was not possible, or rather, as Ane explains, *"there was an existing policy that everyone should be able to come whenever they had the need"*. As a result, the employees in Nuuk's citizen service felt the burden. Not long after the introduction of MitID five out of six of the other employees quit - a fact Ane directly attributes to the introduction of MitID:

> *It was black with people. Every single day. Time passed, then it was a year and a half or a little over a year, and then... Well, people were just worn down and tired. They were so tired of MitID. So out of those six employees in there, five quit one after the other. 3 in the same month and then just... Sort of one after the other. It was incredibly stressful and very tough. Fortunately, I've been lucky with support from my boss and hiring some from outside.* (Appendix 7:2)

4.4.1 Maintenance Work in Citizen Service: Journeying Across Greenland and Helping the Homeless

Furthermore, as the head of the department of citizen service in Kommuneqarfik Sermersooq, Ane had the duties of travelling to other cities and settlements in the municipality to open MitID administrators. This is the work Inuk also does in the Tax Agency, but as it is exemplified here, it could in the beginning only be done by being with the employee physically. This is a process also used in Denmark, where *superusers* could go to the citizen services distributed in their municipality and as long as there were two of them they could open another administrator. This practice takes on another form in Greenland. As there only was more than one superuser in Nuuk, Ane had to travel all over Kommuneqarfik Sermersooq, in what was already the most busy period in Nuuk citizen service. Here, travelling seems more akin to an odyssey: It was a long journey filled with ups and downs, where the geography of Greenland stretched thin and highlighted the problems that implementing MitID posed:

> *So I had to travel around East Greenland, took 14 days. Because to get to a northern town in East Greenland, I had to go via Iceland and then over, and the weather is often unstable. And from there, I had to go to a southern town in East Greenland, so I spent 14 days and over 50,000 kroner on opening... How many employees? Five, six employees? And I couldn't even open all the employees in Tasiilaq, because even though I had informed them that the requirements were that they needed to have a driver's license or passport before I could open it, they didn't have it.* (Appendix 7:2)

Displayed in this story is more than just a glimpse into the geographical challenges with MitID - we see different dimensions of infrastructure. Pushing Greenland to conform to standards of safety, cybersecurity, and identification, this embodiment of standards leads to the formation of new sets- and change of existing practices. Ane's requirement of travelling to the cities around Greenland might have come as a surprise but it was necessary to do so if she wanted the survival of an infrastructure that was still in its early phases. New sets of rules came with the infrastructure of MitID and she could not have foreseen the urgent travels that were needed during the peak of MitID inquiries. The maintenance work she did by travelling resembled the work that Inuk from the Tax Agency did by also giving administrator rights to employees in the municipality. It also forces us to reflect on the concept of maintenance and repair. Focusing

on the physical act of maintenance Denis and Pontille (2019) use the exact moment of maintenance and repair as their object of research. Reflecting on our interview with Ane, we find that as much importance can be placed on the journey towards the place in need of repair. Characteristic of maintenance work in Greenland, when what is broken is spread out across a large area and is at times even inaccessible, there is a need for significant measures and patience to reach these locations.

Not only has the implementation of MitID generated the need for large journeys across national and international borders, local interactions in the different citizen service centres have also changed. Just as the employees in the Tasiilaq branch did not have a driver's licence or passport, or at least did not bring it with them, Ane and others from citizen service speak of many that come with no form of personal identification. The clear standards and rules that MitID sets for the interaction is that before the visitor can receive help the employee must see identification or they will risk losing their MitID authorisation. Briefly digressing to discuss a related but distinct topic, we see this as another junction of infrastructure the context of Greenland is forgotten. Needing and having personal identification is invariably tied to Greenland's transportation infrastructure but for people that live in villages where cars have no relevance there is no need for drivers licences. For people that live their lives within the confines of Greenland and do not travel using airplanes there has never been the need for a passport. Although these are not the only forms of identification that can help visitors activate their MitID account, Ane proceeds to criticise inherent problems in these too:

> *(...) what would you need it for? If you never leave your settlement with 40 or 100 inhabitants, or if you never leave your town. For example, Nuuk is a "big city" in quotation marks, but in other places... You don't need a car, for instance; it's only in the larger towns where there are many cars. You don't need a car, and not everyone has a driver's license. Not everyone has a passport because what would you need a passport for if you never travel? A residence certificate? You only need that if you're applying for education or flying within Greenland or to Denmark, for example. And a baptismal certificate, who carries their baptismal certificate around? I don't even know where mine is. When you have to get a baptismal certificate from the parish, it costs (...) 150 or 300 DKK, so it's kind of a hassle.* (Appendix 7:10)

Whilst only one of a passport or driver's licence is needed, the forms of identification that are not photo identification cannot be used alone. The 150 DKK one may pay for their baptismal certificate is not enough to get MitID if you do not have something more to show. A common approach is to couple it with a certificate of residence, however, this may require a fee of an additional 75 DKK. Here, we pose that this undoubtedly presents an amount of invisible work for the people who have to go through the bureaucratic processes of acquiring alternative ways to activate their MitID account. Drawing on a specific example, the ones for whom this presents the biggest challenge are the homeless. As previously described, the Tax Agency tries to take into account the homeless by creating unique solutions and options for them to access their documents otherwise hidden behind MitID. And so too has the municipality's citizen service started to do.

It is true that the embodiment of standards has caused a shift in the interactions between employee and visitor where identification has become almost part of the greeting. But there is also a great deal of empathy and understanding from the employees to the visitors: They know many of the faces that frequent the citizen service from their daily lives. They know their struggles and the hardships they may be going through to reach someone who can help them. The heroes in this context might not think themselves heroes, and the rigid infrastructure and standard of safety associated with MitID does not leave much room for local appropriation. But while most interactions happen according to protocol there are moments of compromise, where to help an individual, employees dare to risk it all. Empathy and understanding trump standards and bureaucracy. These are the stories we choose to follow in the next section; they seem by far the most troublesome because rules are bended, which can be a necessary practice if MitID also should reach the marginalised in the Greenlandic society.

Caught in the fringes of MitID, the homeless of Greenland are a group that both the citizen service at Kommuneqarfik Sermersooq and the Tax Agency problematise. Through our interview with Ane, it was also clear that it is a topic she found important. Marginalisation in this case is perpetuated through a standardised configuration that presupposes its users can prove, through personal identification, who they are and that they have the means to do so in the first place. Drawing on Haraway's notion of situated knowledge, Ane's experiences travelling through Greenland, dealing with the unique challenges posed by the geography and the social realities of the people, reflect this situatedness. These experiences highlight how, in contrast, MitID in Greenland appears detached from the local context, where not just the technology itself but the necessity of personal identification is a novel concept to some - they

do not live up to the master narrative. Coupled together with the previous statement that citizens might have to travel far to reach a citizen service centre, the master narrative in this case assumes a level of infrastructure, mobility, and familiarity with bureaucratic processes that many people, especially the homeless and those in rural areas of Greenland, do not possess. Using the marginalisation of homeless people as an incision point, we reflect on the practices that sustain the infrastructure and are fundamental to MitID's functionality and reliability. Ane explains both the monetary and bureaucratic troubles that especially the homeless have to face when trying to get MitID:

> *So it all costs money, and if you have... Let's say you're homeless, we have quite a few of those. Or people who don't have a job or an education or anything, who aren't earning money (...). Then they lose their debit card (...). They go to the bank, and the bank says, "Well, we need to see a proof of residence first." And they might have 200 kroner in the bank, so they go to get a residence certificate, and they have to pay 75 kroner for it. Then they go back to the bank to get the money transferred to our account. They come back with the certificate. And then, "Yes, but you can't just have a residence certificate; if you need MitID, you need something else as well." And then I get a bit like, "Ejjjj."* (Appendix 7:11)

What allows in one instance the homeless to be a part of the MitID infrastructure is the invisible work of the employees in the citizen service, who, rooted in their understanding of local life, allow for a different kind of personal identification. Even though, as Ane says, *it is not something I am entirely sure is fully approved* (Appendix 7:11), they have chosen to allow the use of final statements from the Tax Agency or payslips that include information such as a CPR-number as forms of personal identification on the same level as residence- and baptismal certificates.

Our interest in this topic was piqued during the interview with Ane and we wanted to explore other instances of invisible work done by citizen service. And it seemed this was also something Ane was happy to share and talk about - the extra work citizen service does to accommodate for MitIDs Danishness. Following this trouble further through the interconnected infrastructures in public services and the banks, workers in the citizen service have also taken on the role of translators. When MitID was first introduced in Greenland, the entire portal was

in Danish. The security questions posed to visitors attempting to obtain MitID are still in Danish and often require translation. This issue extends beyond just the lack of a Greenlandic translation. On a cultural level, some of the questions are unfamiliar to and pay no heed to the context of life in Greenland. Ane explains that the issue with translation is especially prevalent in the settlements in Kommuneqarfik Sermersooq, where it is not given that the employees speak Danish themselves:

> *Yes, so everything is in Danish, so you have to ask in Danish, and an employee in the settlement who doesn't understand Danish can't read what it says. And then they ask someone else who also doesn't understand Danish. So, when we talk to those settlement employees, we have to translate it in our heads on the spot. And it's often like, "In which year was your oldest child born?" And then there's a parenthesis "Only applies to currently living children, not missing ones." But in Greenlandic, it's like… How do you translate that?* (Appendix 7:9)

To help employees in other branches of civil service it has become part of Ane's, and other Danish-speaking employees', invisible work to translate for those who do not speak Danish. It falls on them to guide two other people through a sequence of questions, translating and conveying to the other employee the different questions who in turn asks these questions to the visitor. Further alluded to is the question of how to translate the concept of only referring to currently living or non missing children. The translation itself is often easy and learnt with routine, but hidden within is an underlying fragility. As Ane goes on to point out some of the questions they go through would never be asked in Greenland and feel transgressive:

> *For example, with currently living children and not missing ones. Many people disappear in Greenland out at sea. (...) and then there's also... At least in... Well, there's the issue of suicide. The suicide rate is high up here, and when you have to ask such questions to someone who has lost children, it's a bit... You can hear it in the local employees. I ask them, "Have you asked if all their children are okay?" And they say, "No, they're not okay."* (Appendix 7:14)

With no root in or understanding of local context, the questions used lead to difficult situations: How can employees bring themselves to ask questions about the visitor's children, when they

already know they are missing or have committed suicide? In settlements, but also in the larger cities, where everyone knows everyone, we see that these questions are not only translated, through invisible work, but maintained and repaired. They become so through translation and conveyance of meaning to other employees and are appropriated and tethered to the local context. For example, the previously mentioned question concerning living and not missing children is being translated to "Are all your children doing well at home?". And although this question is sometimes met with the response "*Yes, except the one that passed away*", the experience is that it has made it easier to both ask and answer the question.

The questions inherited from MitID in Denmark provide uncertainty and confusion, even more than on the front of context-sensitive formulation. One question that the employees were required to go through until it was removed the day prior to our interview with Ane, was the question of whether or not the visitor had a secret address. While possible in Denmark, secret addresses are not something you can have in Greenland. Needing to go through this question with every visitor, one of the busiest periods of Kommuneqarfik. Much to the frustration of Sermersooq's citizens, because of this they had to explain what a secret address is and then why it is not possible to have in Greenland.

The process of acquiring MitID comes with demands for personal identification and the ability to go through a set of standardised security questions. It is an infrastructure that requires the individual to understand both the administrative process and have the means to go through it. In reality however, it takes a lot of repair and maintenance work to make it work.

4.4.2 Partial Conclusion

Our investigation into the citizen service at the Tax Agency and municipality revealed the profound impact of MitID implementation in Greenland. Ane's experience at Kommuneqarfik Sermersooq highlighted the immense challenges faced by both citizens and employees in adapting to this digital infrastructure. The influx of inquiries and the rigid Danish standards posed significant hurdles, leading to employee burnout and turnover. Ane's odyssey across Greenland underscored the logistical complexities of maintaining MitID infrastructure in such a vast and diverse landscape. Moreover, the requirement for personal identification exposed systemic inequalities, particularly affecting marginalised groups like the homeless. Through Ane's experiences, we glimpsed the intricate web of maintenance, repair, and adaptation necessary to sustain MitID in Greenland, shedding light on the nuanced realities beneath the

surface of technological advancement: Translating MitID to fit the Greenlandic people, requires a lot more than just translating Danish to Greenlandic.

4.5 The Telecommunication Infrastructure in Greenland: A Crucial Yet Fragile System

When we interviewed our informants about MitID, we found that a recurring theme kept showing up: The telecommunication infrastructure in Greenland. This infrastructure seemed unique in Greenland, as it is delivered by either underwater sea cables, radio towers or low orbital satellites. The three types of connection do not provide the same connection throughout the country which gives different experiences of what "internet" is, which is why it has also been a recurring topic - the citizens living in the settlements have little to no access, while those in the larger cities have a stable connection via the sea cables. We also noted, when we talked with the informants, that the telecommunication infrastructure seemed much more physical in Greenland than we experience in Denmark, which is a topic Abildgaard et al. (2022) note while focusing on the role it has for the people living in the country. The trouble around MitID led us to this topic, where we made contact with the only internet, post -and phone provider in Greenland, Tusass. In their headquarters, on a snowy hilltop in Nuuk, we were to talk with Kuno, who is an expert in the telecommunication infrastructure of Greenland.

Walking into the meeting room with Kuno, our attention immediately went towards the wall where a big map of Greenland was hanging where lines and small markers were painted on the cities. Naturally, we asked Kuno about it and he started explaining that it was a map of where the sea cables ran, where the radio towers were placed and how they were connected, and which cities were provided with satellite connection. He passionately told us about the map, while pointing to the different cities and telling us about Tusass' work there. All of this happened before the interview and gave us a good reference of what kind of infrastructure we were about to interview Kuno about. It also opened up the conversation, so that the interview started naturally by talking about the map (See figure 2).

Figure 3 Map of telecommunication infrastructure. Solid lines show sea cable connections, dotted lines show radio tower connections, and satellite connections are indicated by small triangles. Retrieved from https://www.tusass.gl/da/infrastruktur/sokabel/

Kuno is Head of Department in Tusass while also being on the board of directors in the company. Before this position, he worked as a technician in northern Greenland. He starts the interview off by telling us a little more about the map and how the telecommunication infrastructure around Greenland is constructed. He starts off with explaining the sea cables: "*...and in 2008, I believe it was, we got these two undersea cables. Additionally, we have the undersea cable between South Greenland and Nuuk, used from the South. That is where the undersea cable to Iceland also connects…*" (Appendix 8:3). He goes on to explain that the sea cables carry fibre connection and that the one that goes along the west coast of Greenland is provided from New York, where it passes through Canada to reach Greenland. It connects the largest cities in the coast, or the open water cities, with the high speed internet because "*...we just know that there is a need for capacity and it is almost increasing exponentially, so it is important that we can continuously deliver it.*" (Appendix 8:3). As can be seen on figure 2, the sea cable stops at Aasiaat in the west coast where it gets replaced with radio links for the cities further north: "*We also have some towns and settlements in between, which we also serve via radio links. These are the antennas that stand on mountain tops and transmit to each other.*" (Appendix 8:3). Finally, in the northernmost cities Pituffik and Qaanaaq, the internet connection is provided by satellites. The same goes for the southern city Narsasuaq.

Establishing early in the interview how Greenland is connected by different sources of internet, led to a further discussion of the kinds of work that uphold these. We learned that, behind the scenes, a lot of work goes to, among other, making sure the radio links work all year round:

> *… a radio link requires you to fly up to each mountain top because we have chain stations on each mountain peak. They are about 80 kilometres apart because that is the range of the system we have. We have some generators and so on at these sites that also need maintenance. So, we have a team that goes out every summer to perform maintenance on everything related to the system, which includes generators, batteries, electrical cabinets, and such things. This also needs to be maintained. The same goes for the radio link systems. We don't go out to maintain them regularly, but we do have to physically go out and check the cables, filters, and antennas. It's a harsh environment, and failures can happen. An antenna can break, even though it is very robust, or the radio link system can go down, or a generator might fail. We have to go*

> *out and repair these things. This is very costly, you could say, because you need a helicopter, and helicopters are expensive.* (Appendix 8:4-5)

Kuno points towards the importance of doing maintenance work to making sure that the radio links keep working. It seems that these towers are especially prone for breakdowns because they are situated on top of mountains to ensure the best signals. The work is necessary but the harsh environment and nature of Greenland only allows the workers to come out in the summer to do the repairs and maintenance, where they will work on the antennas, generators and other parts of the towers. It goes to show how much work goes into making sure that the citizens in Greenland have access to the internet. The citizens depend on the annual work on the towers because there are no backups in most cities if the radio link goes dead. Another aspect of the importance of the maintenance work is how troublesome and costly it is to reach these towers as they are situated on mountaintops that are difficult to reach. Looking at the map, we can see how many radio towers there are, and how many helicopters and crews that are needed. We are reminded of Per' point about the lack of engineers in Greenland, which might mean that the crews for repairs can be people hired from outside of Greenland, making the maintenance work of the telecommunication infrastructure even more expensive - but necessary. We are also reminded, like in the interview with Ane, of how maintenance work in Greenland appears unique, in that transportation infrastructure plays a large part in how accessible it is to maintain and repair in the first place.

Kuno not only spoke about the radio links but also covered the threats against the sea cables in the infrastructure: "*But the problem is that if it [the sea cable] breaks, it is extremely expensive. If someone comes with a trawler and, let's say, catches the cable and it cuts or whatever, and it breaks, then we have to get a cable ship up here.*" (Appendix 8:5). This quote describes how the sea cables also are at risk when operating daily. Here, fishing trawlers become the threat to the sea cables. The fishing industry has been the main source of income for many people in the country since the modernisation of Greenland and trawlers are therefore not a rare sight in the Greenlandic seas. The sea cables run close to the coast, which is why they are more prone to be damaged when big fishing boats like trawlers are sailing out. In the quote, Kuno expresses how it is difficult and expensive for them to repair the sea cables when they become damaged. It is therefore important to make sure they stay intact. Unlike the radio links, it is difficult to do physical maintenance work on the sea cables because of their location underwater. However, Tusass has done work that resembles maintenance work, which is by

communicating to the Greenlandic citizens about the sea cables - primarily towards the ones in the fishing industry. Running campaigns on Facebook and sharing informative videos, Tusass have tried to raise awareness about the sea cables and their importance to Greenlandic society, which can also be seen in the below picture from their website.

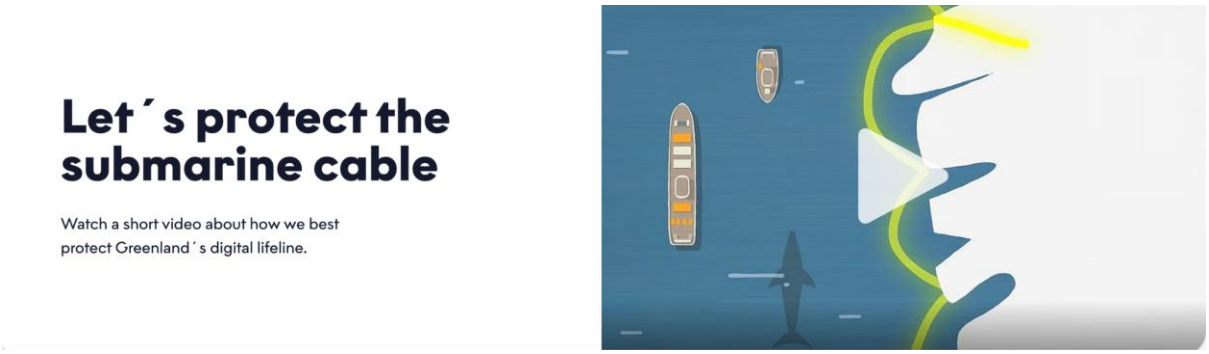

Figure 4 Screenshot from Tusass' website displaying a video urging citizens to helpe maintain the sea cable. Retrieved from https://www.tusass.gl/da/infrastruktur/sokabel/

It is not only because of the cost of reparation, that Tusass wants to protect the sea cables but also because of their significance in the Greenlandic society, which Kuno touched upon in the interview: "*It is quite important. It is critical infrastructure. The police need to be able to call another city or send an email to headquarters and so on. The healthcare system. Everyone uses these connections. VHF radio that connects to the planes up there in the air.*" (Appendix 8:6). The telecommunication infrastructure concerns not only the private citizens in Greenland but also the daily operations in various fields across the country. We find it interesting to experience that something we cannot see, like the internet, is part of a physical infrastructure that is quite fragile. In both the examples of the radio towers and the sea cables, Kuno describes infrastructure that needs constant care and maintenance to make sure that they do not break down.

4.5.1 Domestic and foreign threats in telecommunication

Even though Tusass do what they can to maintain the infrastructure, breakdowns happening outside of Greenland can still have an effect on the country. Tusass and the people of Greenland experienced this in 2017 where a fire at a Canadian internet provider caused cities of the Greenlandic west coast to be without internet and unable to send text messages (Fievé 2017). The fire was at the provider, who connects Greenland with the Canadian sea cable and goes to show that it is not only fragile from trawlers but can also be affected from affairs outside of

Greenland. While this may show another threat to the infrastructure, we also want to point out how the infrastructure that we follow and try to map out starts to move outside of domestic territory and towards international interconnectedness.

As Kuno mentioned before, the climate in Greenland can sometimes get extreme for the citizens living in the country but it is also something that can affect the telecommunication infrastructure. One point during the interview, Kuno thinks back on the three breakdowns that Tusass and Greenland suffered from in 2017:

> *We also had, in 2017, three failures at once, and it was a huge setback for us. Not a setback, but a huge challenge for me, because we had to repair it. We had a failure down in southern Greenland, then a failure south of Sisimiut, and north of Sisimiut... Yes, almost at the same time. We couldn't repair them because it was over the winter, so we had to wait until we could get to them and repair them.* (Appendix 8:6)

We found this quote interesting because it both captures the fragility of the telecommunication infrastructure but also how the Greenlandic climate is an active actor in Tusass' work of repairing and maintaining it. Earlier in the interview, Kuno also explained that when they need to repair the sea cable, they hire a special ship that does the work but that can take several weeks, if not months, and ends up costing a lot of money for Tusass. Returning to the three breakdowns in 2017, he continues telling us that even though they waited until the summer for repairs, drifting ice from the north was floating down to southern Greenland, making transportation and repairs on the broken sea cable problematic. Because of the major situation, Tusass experienced the longest time that they have had their contingency system active, which was eight months. In this period a major part of the citizens in Greenland experienced little to no internet together with no access to make calls or write text messages - they were off the grid. This situation was a "worst case scenario" for Tusass but also serves as an example of the reality of working with critical infrastructure that is as fragile as the telecommunication infrastructure is. The climate in Greenland also becomes an interesting factor in terms of when Tusass can do their work, which is something they also are trying to prepare better for in the future. Because of climate change and warmer weather, the radio towers around the country will also be exposed for more extreme weather (Kristensen 2023). This can result in the towers being covered in more ice than usual, which is something Tusass is also preparing for by reinforcing the radio towers. The need for maintenance of the towers can therefore be even

more crucial in the future, if they want to combat breakdowns caused by the weather. This is a reality MitID has to exist in. When technology and digitalisation exists in Greenland, there are forces at play that must prompt one to also be able to envision how well they can be maintained and repaired in a climate where they inevitably will face breakdowns.

The last aspect that we want to highlight from the interview with Kuno is how he also expressed a concern of political attacks on Greenland's telecommunication infrastructure. Because it is critical infrastructure, there is a lot at stake for Tusass and past major breakdowns have already shown the consequences when the citizens are left with no connection. On the topic he says: "*We also have Ukraine. The war has made us much more focused on these things now. That pipeline from Russia to Germany, which was blown up, makes everyone much more aware. And we've also seen that undersea cables to Svalbard have been cut…*" (Appendix 8:8). As fragile as the telecommunication infrastructure is in Greenland, a major part of it, being the sea cables, are also exposed out in the ocean. Global tensions and attacks on foreign critical infrastructure make Kuno and Tusass concerned about the risk on Greenlandic soil. There is only so much that can be done on making the sea cables more robust, which Kuno also says during the interview, but Greenland's foreign policy and safety are also beginning to look more towards what can be done preventively (Holm 2023). The sea cables have become a matter of politics instead of just carrying high speed internet connections around in Greenland, which we initially thought of. During the interview, the infrastructure around MitID went places that we did not expect and it was interesting to hear about what Tusass did of maintenance work and how much breakdowns would impact the citizens in Greenland. This interview may have pushed MitID to be a peripheral subject but we view it as important to understand the foundation that MitID is built on. Many threats are lurking and Tusass' work is important to have in mind when we talk about MitID.

We left the interview with more knowledge about Tusass' work on the telecommunication infrastructure, but we wanted to know more about it. We wanted to experience how it was used, but how does one make something invisible, visible? From our talk with Nina in the beginning of our fieldwork, she mentioned that the National Library in Nuuk was heavily used by the citizens because of the free wi-fi it provided. We, therefore, headed towards the library to see if we could catch a glimpse of the locals using the internet.

4.5.2 The National Library in Nuuk

> *When we arrived at the library it was not clear how many citizens were visiting. We were there around 12.30 on a Monday - 30 minutes after it had opened. Entering the library, there was a counter where citizens could get help and information when you step inside. We were instantly met with people sitting on chairs and either reading the newspaper or using the free wi-fi and scrolling on their phone. We tried to look for a place to sit but almost every chair or table was occupied with people sitting there. Walking around, we also saw computers that people could borrow from the library and they were all occupied by citizens. It was clear for us that the people staying at the library were people who maybe don't have wi-fi at home - or maybe don't have a home at all.* (Appendix 1:1).

Right from the beginning, it became clear for us that the library was a place that gathered people because they needed an internet connection. Already when we saw the distinct green building, we could see that people stood right outside with their phones out. As described in the field note, almost all of the seats inside the library were taken 30 minutes after they had opened that day and to our surprise, it was not books that people had in their hands, it was their phones. We found it interesting to see how many people were there because of the free wi-fi and how many gathered just after the library opened. Before our talk with Kuno from Tusass, we had checked the website for the prices of wi-fi and saw that they offered very slow speeds for very high prices, compared to speed and prices in Denmark. Tusass has a monopoly on telecommunication in Greenland and the high prices for internet can be seen as barriers for many. Here, we see that marginalisation happens when individuals due to social or economic circumstances, are not able to take part in the digitalisation of Greenland. Consequently, this may lead to invisible work and a change in mobility when individuals have to find places where internet is provided to access mandatory a digital service like MitID.

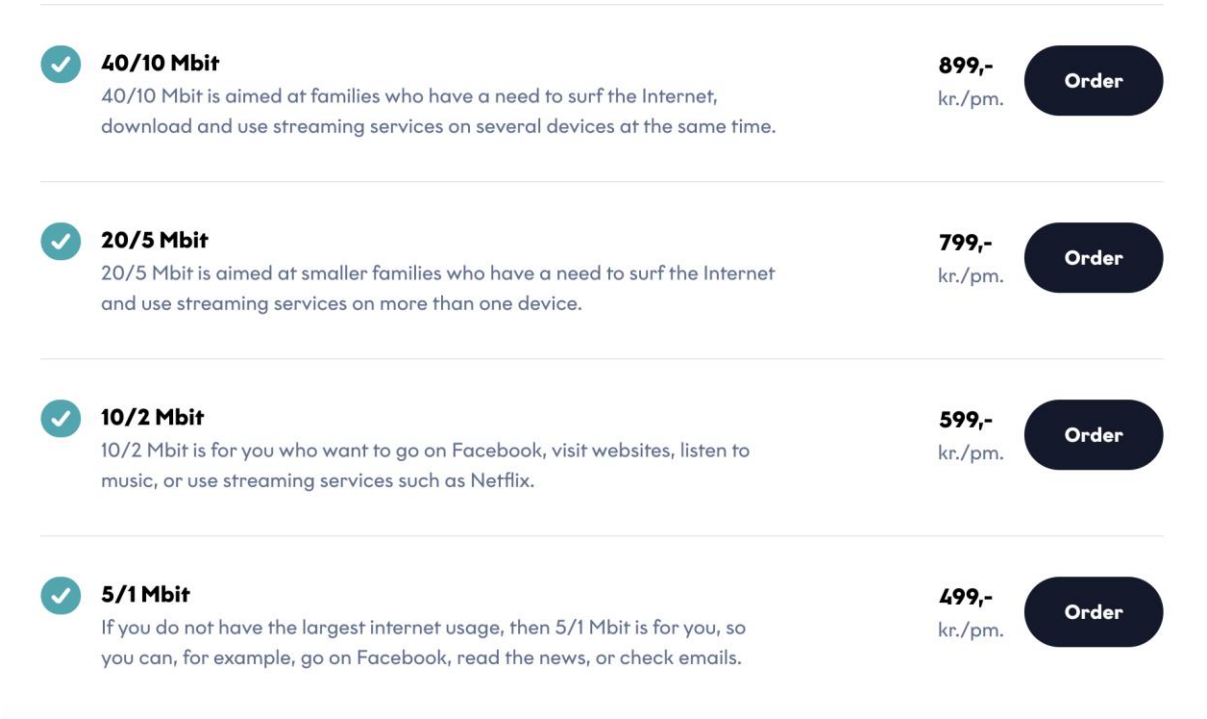

Figure 5 The prices for internet in Nuuk from where we lived. Retrieved from https://www.tusass.gl/da/internet/privat/

It was clear that the internet became a resource that had the ability to physically mobilise the citizens to move to different locations where free wi-fi was provided. We saw an example of that with the people standing just outside the doors of the building with their phones in their bare hands in -20 degrees weather. Those standing outside might just need the wi-fi to quickly check something on their phone and then go on with their day. We even experienced this ourselves, days later our first visit to the library, when we were walking by the building again where we tried to check our mail because we were writing back and forth with an informant. We did not have service during our field trip, so when we finally found a free connection, we used it to check or write emails or to simply scroll on our phones. Because we were checking our phones very briefly, we joined the small gathering with people standing outside the building. Inside of the library were for the people who planned on using the free wi-fi for more than a couple of minutes.

4.5.3 Partial Conclusion

Our interview with Kuno and our observation at the National Library gave us another aspect of the telecommunication infrastructure and how it affects the lives of people in Greenland.

Highlighting how Greenland's telecommunication infrastructure is quite physical and fragile from factors like the weather and fishing trawlers, we want to stress the importance of the maintenance work that Tusass does in the background, so that the citizens and the institutions around the country can access the internet. This work becomes even more important, considering that it is maintenance work on a critical infrastructure - an infrastructure that is not only threatened by domestic factors but also by foreign, political, factors. By highlighting the work and care that goes to make sure that the Greenlandic population can access the internet, we also want to highlight that this is the foundation that MitID is built on. Our visit at The National Library made it clear for us how the internet is a luxury resource and how its expensive prices are marginalising the citizens who cannot afford it. It also became clear that the internet has the power to physically mobilise people in Greenland as we saw, and experienced, standing outside of The National Library, indulging in the free wi-fi.

4.6 Arrival in Ilulissat

After tracing the winding lines of sea cables and radio towers across the pronounced white ridges and valleys on maps of Greenland, it was time to leave Tusass and Nuuk. The flight from Nuuk to Ilulissat would have us make an intermediate landing in Kangerlussuaq. As we had been told, the further a city or settlement is from a sea cable, the further a signal has to travel through radio towers and the worse our connection would get. And as we were about to experience after our two-hour flight it was truly a large distance from Nuuk to Ilulissat; from sea cable to radio tower.

Before the trip, the people we had spoken with or had interviewed were happy to give us advice on our stay in Ilulissat. More than once we had to reassure people that we had remembered to bring ski pants and Nuka from the Tax Agency's citizen service joked that before we go to Ilulissat we should make sure not to cut our hair so we could keep warm. Another common conversation point was the presence of dog sleds in Ilulissat; they stop for no one, so we had to be careful and look out for them. Many times advice and questions were exchanged with a glint in their eyes, and we could tell they imagined us, two young Danish men from Copenhagen trying to cope with the raw, unfamiliar setting of Ilulissat. Like fish out of water. Making sure we did not make the same mistake as tourists before us have done, we reassured them that we would not pet the dogs without their owner's permission, recognising the good intentions behind the tips. Danish people have come to Ilulissat before us. They have

done so for hundreds of years. And either as tourist, scientist, or colonisers Danish presence in Greenland is deeply entrenched. We have posed that we follow the trouble, but in Greenland there is no doubt the feeling that the Danish often are the ones that bring the trouble, a sentiment we were very aware we did not want to play into: We would never dare to put our hand too close to the dog and risk getting bitten. This journey, from Nuuk to Ilulissat, was not just a physical crossing from one point to another but also a traversal of historical, cultural, and social landscapes weaving together infrastructures. As we flew over the infinite icy expanse, the vast distances and rugged landscapes reminded us why we chose to leave Nuuk in the first place. We are in search of the experiences that people have with MitID outside of Greenland's largest city and the sea cables, aiming to provide a perspective of how it affects the country's rural areas.

4.7 Digitalisation in Ilulissat: Insights from the IT Manager

In Ilulissat, the first interview we had planned was with Malik, IT manager in Avannaata Kommunia. Walking on the icy roads to find the municipal building he was working in, we talked and wondered how, and if, the public services are different than in Nuuk. We found the red building and wondering which of the several entrances we should go through, suddenly a "Hi!" was said behind us. It was Malik and he could see the confusion in our faces, when we turned around. "We get that all the time.", he said and opened the door so we could find the meeting room he had booked for us. Going through several corridors and up to the top of the building, we suddenly found ourselves in a big conference room with microphones on the tables. The microphones did not have our attention for long before we saw all the Greenlandic artefacts that were hung on the wall and laying on the floor.

Figure 6 A picture from the inside of the meeting room in Ilulissat. The whole room was ordained with pelts kayaks and other such items.

Malik said he had designed the room himself and that it was used for online meetings with the other cities in the municipality, or with colleagues around the country

Malik has worked as IT department manager in Avannaata Kommunia since 2016 until his promotion in 2022 where he started working as IT manager. Working at the forefront of the digitalisation of Greenland, the years he has spent in the municipality have provided him with experience and knowledge in the implementation of digital services that have come before MitID. These are services that are intrinsically linked with MitID, even in their different shapes and forms. In particular, Malik's work with NemID, the predecessor of MitID, provides valuable insight into the base that MitID was built on, a dimension of infrastructure that has passed on both its strengths and weaknesses. Using NemID as a vantage point for addressing

experiences with MitID, we see the transition from one digital service to its successor and the logic behind why such a transition was necessary.

In many ways the relation between NemID and MitID is that of an evolutionary step, where MitID builds upon the foundation laid by NemID, integrating lessons learned from the problems experienced with security and trying to adapt to a rapidly changing digital landscape. The introduction of both NemID and MitID seemingly fits in well with the evolution that Greenland strived for at the time of centralisation and the aim of having digitalisation support this transition. Malik explains:

> *(...) it was originally a decision by the Self-Government, which decided that there should be shared digital systems across all organisations, including the Self-Government, the healthcare system, and the municipalities. That's where the initiative to start having a unified system came in. Consequently, the municipalities had to say goodbye to some modules and welcome new modules in the process of digitalisation.* (Appendix 9:12)

The increase in use of digital services and the storing of personal data, necessitated new means of digital protection. The acquisition of digital protection, in this instance NemID Business, however, also had a great impact on the types of data that could be stored. NemID Business was for businesses and their employees, who need to log in on the service in relation to their work. MitID presupposes the use of personal identification commonly found in Denmark, but perhaps an even more telling example of how Danish artefacts linger in the digital systems that have been adopted in Greenland can be found in the problems with NemID Business. Here, logging in and registering as a company so they can use and administer NemID Business requires the use of CVR-numbers from Denmark's Central Business Register. Seeing that CVR-numbers were not in use in Greenland, which instead used The Greenlandic Business Register (GER), Malik had to take part in an overhaul of standardised configurations related to the registry of businesses. A process he describes as difficult and time-consuming:

> *Yes. Suddenly, there was just one system we had to log into, the CVR system, in order to handle our registrations. (...) There were many discussions back and forth, via email and phone. Also with other municipalities and so on. I don't think it was easy at all, but we managed, even though it took us quite a long time to get started. (...) It was very*

> *time-consuming. There were also many different laws we had to support and declare ourselves capable of handling MitID, a digital world as it is today, and that is not something that can be done in a day.* (Appendix 9:11)

The communication and cooperation necessary between different actors in the municipalities and IT-consultants such as KIMIK iT has been a paramount aspect in the digitalisation of Greenland. Particularly, the role of the BANK of Greenland has been spoken about by multiple of our collaborators. Before our meeting with Malik, both citizen service at Kommuneqarfik Sermersooq and citizen service at the Tax Agency in Nuuk had informed us of the bank's role with MitID and how they, especially in the beginning, helped share the role of helping citizens getting help for MitID. Malik further contextualises the bank's role, as an institution that could handle much of the initial work of opening MitID accounts and provide, much like the municipalities' citizen service, a physical place where people could come for help. This was a job that was necessary for the bank to do while municipalities worked to establish the necessary platforms and maintain behind-the-scenes infrastructure. Working in IT in the municipality for several years, Malik experienced on a day-to-day basis how the implementation of first NemID and now MitID is an ongoing process. He takes part in the repair and maintenance that is associated with making sure that servers run smoothly.

In 2018, when Qaasuitsup Kommunia was split into two, Qeqertalik and Avanaata Kommunia, Malik travelled across Avanaata to update and replace servers and upgrade both machines and operative systems. Although they were upgrades used for more than just the introduction of NemID in the same year, they were indeed necessary to be able to support the digital solution and now its successor MitID. Malik describes this as the last great journey they were on but divulges that routine trips are made when maintenance is needed. As already pointed out, and once again made clear to us, managing IT in Greenland is an ongoing endeavour. It is marked by constant adaptation to the unique climatic, geographical, and infrastructural challenges. The journey Malik describes, from NemID to MitID and from outdated IT to new IT, underscores the collaborative effort required to bridge both the geographical and digital divide in such a vast and rugged landscape. Malik encapsulates the IT-department's journey succinctly:

> *We have simply worked our way to where we are today with the systems we have. As for our IT-department, we need to keep track of operations most of the time, and then*

> *there are small and large projects that we have also had to handle. I wouldn't say they were thrown at us, since we are the IT-department and there was only one IT-person assigned to the project, even though it didn't necessarily have to be us. We just need to discuss it. It just needs to be up and running, the servers, and then the rest largely involves people when it comes to system implementation. It has to be adapted from the old work processes to the new work processes, and it heavily involves employee participation.* (Appendix 9:10)

This quote encapsulates the essence of the digital transformation in Greenland: A meticulous balance of maintaining operational stability while embracing new projects, ensuring that infrastructure is robust, and engaging employees in the transition process. It underscores the practical realities of digitalisation, highlighting the importance of adaptability and collaboration at every level. It is clear that the digital development in Greenland is not just about technology, but about people and processes adapting to an ever-evolving digital landscape, maintaining and repairing in different ways the dependencies of infrastructures that weave together the digital, the geography, and the individuals.

One aspect that further challenges the digitalisation of Greenland, is present in the allocation of responsibility and the roles in its undertaking. Here, Malik tells us that many of the projects handed to Avannaata Kommunia by the Agency of Digital Government find their way to the IT-department, even though they may not be well equipped to undertake them and only one person is assigned to them. Greenland's Agency of Digital Government has had a leading role in implementing and communicating the tasks related to MitID to both civilians and bodies of government, however, they too have had major hurdles. They have been part of the trouble, since the beginning and they are the ones we introduce next.

4.7.1 Greenland's Agency of Digital Government

In 2023 Greenland's Agency of Digital Government established a department for cybersecurity and information. Their work is multifaceted and consists of both the heightening of cybersecurity as well as spreading awareness of the topic across Greenland and its inhabitants. Our interview with Ivalu, who works in Greenland's Agency of Digital Government, helped make clear why the creation of such a department is needed and the difficulties they face.

Creating a national infrastructure capable of addressing cybersecurity goes beyond implementing MitID; it also involves ensuring that people understand why and how they should use it. It is something that has been the focus of the Agency since MitID's arrival, to make the service comprehensible to the Greenlandic citizens and fit their daily lives. Tasked with many of the same goals for digitalisation as the Danish Agency of Digital Government, they have to take different precautions to live up to their strategy for digitalisation. Returning to the story that Malik told, Ivalu and the Agency of Digital Government know that their job is to make sure municipalities are able to keep up with the new policies they lead and the workload they add. Ivalu explains:

> *We also can't just accelerate development wildly because, for example, the municipalities need to be able to keep up, or our collaborators need to keep up, and we are the ones responsible for this development. What we typically see is that people are naturally focused on their core tasks, and then they get involved in a project. Often, they get involved in several projects at once. So, in addition to their core tasks, they also have to participate in and be active in one or two projects on the side.* (Appendix 10:5)

Aiming to let the municipalities keep up with the development in digitalisation and MitID the Agency helped put in place a new solution for RA-certifications. The troubles mentioned by Ane and experienced by most of our collaborators with having to cover huge distances to open employees in settlements as administrators have caused the creation of a new practice in RA-certifications. Specifically, what the Agency of Digital Government calls *the settlement solution* and the rest of our informants call *the local employee solution*. In this solution Ane would not need to travel across the country, but need only make sure that the local employee has undertaken a course to be able to open them as RA-administrators. As a standardised configuration, work is being done so that practices surrounding MitID are embedded in the context of Greenland. It implies that the implementation of MitID is not just a straightforward application of the same practices used elsewhere but involves tailoring these practices to fit the unique needs and circumstances of Greenland. Another example of this, is that since knowing MitID was coming to Greenland the Agency has worked to create a Greenlandic translation of the portal. More than practical difficulties translating and fitting the Danish portal to Greenlandic, however, the reason there still is no translated portal has much to do with the

political landscape MitID exists in. This reflects Star's insight that infrastructure is always a work in progress, shaped by and shaping the social and political environments in which it operates. Taking ownership over the digital solution, in a figurative sense, and appropriating it to fit the dimensions of infrastructure that already exist in Greenland is a time consuming and ongoing process. Here, we briefly mention the confusion Ivalu describes when trying to understand who is responsible for the translation of the portal in the first place. Although they had already begun some of the translation work, they discovered, through their lawyer, that it was actually the Danish Agency of Digital Government's responsibility to provide such a translation, which is now underway. To the Digital Agency of Government, novel situations about how to navigate digitalisation arise, in this case owing to the acquisition of the Danish owned MitID.

4.7.2 The Tax Agency in Ilulissat - Insights in Local Life

Following our interview with Malik, we were going to talk with the Tax Agency in Ilulissat. We had spoken with the department in Nuuk because they were handling systems like e-Boks and My Tax that require the citizen to be registered to MitID to log in. Now that we were situated in Ilulissat, we wanted to hear if there were any differences living in a smaller city north of where the sea cable ends, compared to Nuuk.

The interview was going to be in a focus group setting, to mirror our experience in Nuuk, where we sat down with Maline and Najaaraq. Maline has worked in the agency since 2015 and is daily in the citizen service where she answers citizens' requests by email. Najaaraq has worked in the agency since 1988 where she today answers phone calls from citizens while also helping citizens when they come in physically to the agency building. Right from the start a big difference from Nuuk, was the focus of emails and phone calls that the employees had. Avannaata Kommunia is enormous and importantly consists of more settlements, where travel to the office in Ilulissat is difficult, making modes of remote communication more important. While talking with Maline and Najaaraq about their daily tasks, the conversation landed on living in Ilulissat and the digitalisation that has been happening over the years. Maline explains: "*Especially this digitalisation. It is very difficult, especially when living outside of Nuuk. The internet connection is very low. The sea cable stops at Aasiaat, that's why it's much slower,*

because we get it via airways… so it's much slower." (Appendix 11:2). Sea cables are quite important to secure fast internet connection and the citizens living north of the cables meet barriers with their connection from the radio towers or satellites. This is an important theme of the interview and it gets brought up several times, underlining how infuriating and difficult life is without the sea cables. The slow connections and digitalisation are two infrastructures that are highly intertwined and as a result, getting MitID suddenly becomes an obstacle. Fewer people have smartphones or computers, which is less incentivised because of the lack of fast connection. This is especially a trend that is seen in the settlements in Aavanaata Kommunia, which stretches from the mid of Greenland to the top, and both Najaaraq and Maline are concerned about those citizens: "*It's a bit slower than in the big city, but once they have learned it once, they can learn it again and again. However, it just becomes more difficult to access data when you live further north, so it's harder.*" (Appendix 11:14). Maline experienced that it is possible for the citizens to learn to use MitID but the slow connections are barriers for using the service. MitID was originally developed for a Danish context, where high speed internet connection has become the norm in the whole country over the years. The service is suited to function in these circumstances but this standardisation and requirement for a stable internet connection functions as a barrier when it gets put into a Greenlandic context. Here, high speed internet connection, or at least serviceable but expensive, is only experienced in the open water cities running along the coast with the sea cables. This barrier results in a more poor adaptation of MitID in the cities without the sea cables and as Maline also points out, it becomes a hindrance generally for the digitalisation. In other interviews, we have heard about the importance of the internet but suddenly talking about it in a city of about 4800 people who get their internet connection from radio signals, the issue in the telecommunication infrastructure is felt much closer and becomes visible. It was apparent from Najaaraq and Maline that this was an issue that separates Greenland into two groups: Those living with the sea cables and those who do not. We learned, during the interview, that there has been a poor adaptation of MitID in Avannaata Kommunia and because of the poor reception, the Tax Agency gets put in a strange place where the citizen service both handle physical documents that get sent to them by the citizens that are digitally exempted and the digital inquiries from the citizens that are enrolled in the digital services.

Following the topic of digitalisation and how it is being experienced in Ilulissat, Maline and Najaaraq touch upon the predecessor of MitID, NemID. Maline recalls the transition from using NemID to using MitID in 2021: "*But quite a few people were really angry that just as*

they had learned NemID, they suddenly had to get used to MitID. Many people didn't want to bother with it anymore." (Appendix 11:5). With the keycard that came with NemID, there was still some sense of analogue mechanisms connected that did not require a smartphone with internet connection, which might have benefitted the Greenlandic context. Later with NemID, an app was also created and worked much like how MitID does today. As already established, the digital literacy in Greenland is not high and learning a new public digital service like MitID can be a challenge for many citizens in the country. The reason for more safety that pushed MitID to replace NemID gets pushed to the background and instead the inconvenience of having to learn a new system becomes the focus. We asked further into this topic about how the employees in the Tax Agency prepared for this transition, to which they answered: "*We just received an A4 page on what we should do to inform the citizens about what they need to do. Nothing else. So it is very confusing for us as well.*" (Appendix 11:20). It seems that this period was confusing for Najaaraq, Maline and other employees at the Tax Agency because they did not get much information on what to do with the citizen inquiries that were bound to come in. They further explain that the one-pager was sectioned into half a page in Danish and half a page in Greenlandic. The citizens were puzzled about the sudden shift to MitID and it seems that the employees in the Tax Agency were just as puzzled with only having received half an A4 page of information. At the same time, it was their duty to inform the citizens on what to do and why it was necessary. Maline and Najaaraq became the messengers of this news to the citizens, while being in doubt themselves they had to do an important amount of invisible work communicating with citizens. Their work in the beginning of the implementation of MitID is important because they are part of making the infrastructure run smoothly while guiding the citizens to the municipality or the bank to get help for MitID, without even knowing themselves why MitID needs to replace NemID. This is also an example of the chaotic beginning of MitID in Greenland where the employees that were going to work with the service did not know much about it at first.

Our talk with Najaaraq and Maline highlights some of the struggles that exist living north of the sea cables and how much the telecommunication infrastructure matters for the digitalisation in Greenland. Living without a good internet connection, or even with no internet connection at all, public services like e-Boks and MitID become challenging the further north and away from the open water cities you go in Greenland. This results in a mix of citizens being on these digital services and those without, which Najaaraq and Maline can feel in their daily work in the citizen service in the Tax Agency in Ilulissat. The invisible work that was carried

out by the employees was significant in terms of running the infrastructure of MitID smoothly because they were guiding the citizens on what to do with the service while not knowing very much about it themselves. The chaotic state of the beginning of MitID needed to be addressed by helping the citizens as much as they could while struggling to know more details than the A4 information flyer that was given to the employees in the Tax Agency.

Viewing these insights in regards to the concept of an ecological infrastructure (Star 1999), the physical infrastructure is evident in sea cables and radio towers that dictate the availability and quality of internet connections. The nonexistence of high-speed internet beyond coastal cities like Ilulissat highlights the limitations of existing infrastructure and the challenges it poses for digitalisation efforts. Equally as significant, are the experiences of Maline and Najaaraq in the Tax Agency. Their interactions with citizens reflect the social implications of digital infrastructure, including the frustration and confusion caused by transitions from older systems like NemID to newer ones like MitID. Despite limited information and support, they play a crucial role in facilitating citizen engagement with digital services, highlighting the human aspect of infrastructure maintenance.

4.7.3 Partial Conclusion

The interview with Malik opened up new aspects of MitID's predecessor, NemID. Having worked with NemID business, Malik highlighted how even back then, the technology did not fit into a Greenlandic context because of its requirement of Danish CVR-numbers rather than the Greenlandic GER-numbers. The standardised configuration of NemID Business, being tied to the Danish system of CVR, turned out to be more troublesome for Malik's work because Greenlandic business now also needed CVR-numbers. Needing to travel to other cities in the municipality, doing necessary maintenance work to make sure the servers were running smoothly and alike in the cities, Malik's work in the shadows ensure that the digital development in Greenland is possible and is a foundation for MitID. The work that the Agency of Digital Government has done with the local employee solution, is also an example of how digital solutions can be appropriated to fit Greenlandic society, making life easier for employees like Malik.

In a subsequent interview with Maline and Najaaraq at the Tax Agency in Ilulissat, they discussed digitalisation challenges in northern Greenland where slow internet connections are

caused by the lack of sea cables north of Aasiaat. The slower internet impacts MitID adoption, as fewer citizens have smartphones or computers. The transition from NemID to MitID frustrated many citizens, and with only little information provided, the employees at the Tax Agency had to guide and help these citizens. Despite uncertainties and a chaotic beginning of MitID, the employees' invisible work in the form of helping the citizens, made sure the MitID infrastructure functioned as smoothly as possible in its beginning in Greenland.

5. Discussion

In this discussion, we aim to analyse the introduction and adaptation of MitID in Greenland through the theoretical lens provided by Marianne de Laet and Annemarie Mol's study of the Zimbabwe Bush Pump 'B' type. By examining the socio-technical dynamics of the Bush Pump, which effectively integrates into local contexts and builds community ownership, we draw parallels and highlight contrasts with the implementation of MitID in Greenland. We use the concept of ecological infrastructure, as articulated by Susan Leigh Star, to explore how MitID interacts with and is shaped by the unique social and infrastructural conditions in Greenland. Our discussion emphasises the critical roles of maintenance, repair, and local appropriation in embedding digital technologies within communities, arguing that successful integration requires ongoing adaptation to local needs and conditions.

Marianne de Laet and Annemarie Mol (2000) write about the emergence of the Bush Pump 'B' type in Zimbabwe, which we put in relation to our analysis of MitID and the digitalisation in Greenland. In their article, focus is on the Zimbabwe Bush Pump and how the technology not only delivers clean water from the ground but is also a *fluid* actor in the Zimbabwean socio-technical landscape. By examining how the pump is embedded in its social and material context, de Laet and Mol highlight how the technology is appropriated to serve local needs while being tailored to the country's standards. This means it is made from locally sourced materials, designed, and produced within Zimbabwe. The pump comes with guides on how to install it, which makes it unique because of its ability to gather the villagers to drill the hole in the ground and install the pump. Included are also guides on how to do maintenance work on it, increasing the lifetime of the pump. These features are made on purpose and are part of the design to increase the villagers' feeling of ownership of the technology. The Zimbabwe Bush Pump stands as an example of how technology can be designed to adapt local contexts and create value according to the local needs and conditions. Building on the article, we will discuss and highlight how MitID has been appropriated in Greenland based on our findings.

When our analysis of MitID is compared to the Bush Pump, it becomes clear that the technology introduced in Greenland in 2021 was far from being appropriated to the unique context. Following the trouble, we discovered that there were several issues in implementing the Danish technology to the society of Greenland - issues that are still present three years later. The infrastructure that we examined and unveiled, showed that there were several issues and

fragile points linked to it, which arose because of the lack of adaptability to the local context. The lack of appropriation was seen, among other, in how the only language that was provided in the MitID portal was Danish - a language that is only spoken by about 20% of the population in 2018 (Sæhl 2018). Fragility in the infrastructure and another example of the less adapted MitID is seen in how the technology is trying to fit into a society that has big differences in internet connection. The harsh reality of Greenland's telecommunication infrastructure is that citizens living close to sea cables can enjoy the high speed connection, which also helps them access digital solutions, while those relying on radio or satellite connections struggle. They will at times have to do invisible work by venturing to internet hotspots, for example at the library or citizen service, where and when it is available.

Another point that we want to highlight about the Bush Pump is how important it becomes for the country of Zimbabwe:

> *As it is, there are great social divides in Zimbabwe between those who have plumbing in their houses, those who have water in their yards, and those who have to walk miles to get it. Setting up a national water infrastructure may help to bridge such divides. And government support for buying a pump may link up the village to the state, thereby enlisting villages in what is otherwise likely to remain an abstract nation. So the Zimbabwe Bush Pump builds the nation.* (de Laet and Mol 2000:235).

Just as the Bush Pump builds the nation of Zimbabwe, we see that MitID and digitalisation can do the same for the nation of Greenland. As established in the analysis, Greenland suffers from having large distances between cities and travelling between them can be time consuming and expensive because of factors such as the weather and the transport infrastructure. Our collaborators in the public sector point out how e-Boks, which is a cause of the digitalisation, is making their workload easier, as the digital solution helps close the distances between them and the citizens. The five municipalities in Greenland stretch over several hundred kilometres and instead of waiting on a document being sent by mail, the process can instead be sped up by using e-Boks. If done in a way, which takes close notice to the environment and unique society of Greenland, the digitalisation can help build the nation, which underlines the importance of the digitalisation to be successful in the country. Though, as highlighted above and in the analysis, infrastructural barriers need to be addressed and overcome before

Greenland can feel the full benefits of the digitalisation - which again calls for the future solutions to be tailored more towards the country's social and infrastructural context.

Having gained their independence one year after the establishment of Greenland's home-rule in 1979 (Hansen 2017), Zimbabwe has had about the same amount of time to shake off the turmoils of colonialism (Government of Zimbabwe n.d.). Although it can be said that these were different types of colonialism, shared between them is the fact that their many years as colonies are embedded in the forms and shapes that their infrastructures and social life take; infrastructure does not grow de novo (Star 1999). For both Greenland and Zimbabwe, the post-colonial period has involved efforts to reconfigure inherited infrastructures to better serve their populations. In Greenland, this has included initiatives to enhance digital connectivity and integrate modern technologies in ways that incorporate local needs and practices. The introduction of MitID, for instance, represents an effort to modernise digital identification systems and access to municipal or political organs, though it also highlights the tensions between standardised technological solutions and local adaptations.

To Ivalu and the Agency of Digital Governance, MitID is part of a process larger than itself:

> "*I think I would put it this way: I believe that if there is a country where digitalisation makes sense, it is Greenland. One thing is that, geographically, we are quite spread out. It is a huge country with few people, as you know. You can't just drive from one town to another, so digitalisation helps democratise things. It makes citizen services more accessible. But it also requires sufficient internet speeds and access to digital solutions. So, there is a significant infrastructural challenge that we are facing in some way.*" (Appendix 10:8)

Digitalisation is seen as a potential tool to support democratic processes on the fringes of Greenlandic society. Ever since the consolidation of and removal of Greenlandic people into the open water cities, the narrative used when discussing this period of time in Greenland is often concerned with the marginalisation of those who were forcibly moved, and rightfully so, but there is also a case to be said for those left behind. With limited access to essential services and opportunities for political participation, they are marginalised by the infrastructures that once were put in place to promote life in the cities and that continue to influence life in Greenland today. In light of this, digitalisation presents an opportunity, offering a means for

marginalised communities to engage in democratic processes and access vital services, and particularly in this case, citizen service. However, as highlighted by the challenges faced in implementing MitID, the digital divide remains a significant barrier. The uneven distribution of telecommunication infrastructure and connectivity disparities exacerbate existing inequalities, making it difficult for remote communities, at least remote to centralised instruments of infrastructure, to fully benefit from digital initiatives or understand the need for it in the first place.

5.1 Appropriation of MitID - Invisible Work and Maintenance

Through both de Laet and Mol's article on the Zimbabwe Bush Pump and our own experiences in Greenland we come to find that maintenance work is invariably linked to local appropriation of technologies. They write that the Pump's design includes local materials and simple construction techniques that enable villagers to perform maintenance themselves. This self-sufficiency fosters a sense of ownership and ensures the pump's sustainability, as the community is directly involved in its maintenance and repair. The manuals provided with the pump not only instruct on installation but also on regular maintenance, reinforcing the idea that the technology is embedded within the local context and adapted to local skills and resources. The constitutive relationship de Laet and Mol describe between the Bush Pump, local communities, and Zimbabwe as a whole is reflected through the stories we have found, of ordinary people working to make sense of a technology that in many ways challenges daily life in Greenland but represents a great opportunity.

We observed the importance of maintenance and repair of both the digital solution itself and its interdependencies. MitID relies on the work of citizen service, who do maintenance and repair work, addressing the shortcomings of the technology. This takes form in both the interactions had with citizens, incorporating and appropriating Greenlandic social etiquettes into MitID: How can they make the homeless to pay 225DKK for forms of identification they did not need before and how can they ask a bereaved parent about the status of their child? In addition to the work that citizen service has done to make sure MitID also runs in settlement, the technology relies on large-scale telecommunication infrastructure. The maintenance thereof is done by multiple actors, with our focus mainly being the work done to uphold the physicalities in play that are prerequisites of a functioning MitID. The Zimbabwe Bush Pump

is the product of a long set of interactions, from the historical background of its inception, to its shape-taking in factories, and finally finding its place in villages and communities. Once there, the people know it has become their responsibility to maintain and repair it. To help them do so, they of course have the instruction manuals, but at the same time they are able to touch it, see it, witness its mechanisms when it is working, and just as importantly, when it is not working. MitID exists in a different dimension, spread across inaccessible areas; its server lies somewhere distant. The internet that upholds it flows under the ocean from Canada and Iceland, the reason MitID is needed in many ways is simply a response to decisions made in Brussels by the European Union[2]. No wonder then it is so difficult to understand for many; it is a technology that is far away both physically and conceptually. We see that the lack of direct engagement and visibility makes it challenging to foster a sense of ownership of MitID and in return it becomes difficult for individuals to maintain and repair. In many ways, it is not something that they can maintain and repair - the responsibility falls on such actors we have shown as citizen service, Tusass and municipal branches.

MitID differs in many ways from the bush pump, as a technology that many do not understand the need of and is misaligned to daily life and needs in Greenlandic settlements. As has been an important part of this report, however, efforts are being made to address these problems, through maintenance and repair, MitID is evolving to better fit the challenges of a Greenlandic context. Still, an integral part of the Greenlandic strategy for digitalisation, is the goal of exacting change in exactly the daily lives and actions of the country's inhabitants, arguing that the individuals of Greenland will have to change alongside the rest of society in a process of digitalisation:

> Creating change requires that we are all willing to change ourselves. Undergoing a national change – a transformation – can only succeed if we, as individuals, are capable of altering our ways of doing things. And as a society, we must welcome new methods while helping and supporting each other in saying goodbye to slow procedures and the mindset of "doing things the way we always have". (Naalakkersuisut 2023)

[2] Greenland is currently classified as an unsafe third country outside the EU. This designation presents challenges for Greenlandic businesses and authorities when they need to share data with European partners and suppliers. The Naalakkersuisut considers it essential for Greenland to achieve the status of a secure third country outside the EU in connection with digitalisation. However, this requires Greenland to adhere to EU standards for personal data protection, which means that Greenland must be able to present data protection legislation equivalent to the EU's General Data Protection Regulation. (Naalakkersuisut 2023)

Star's concept of ecological infrastructure states that infrastructures are not just backdrops or landscapes where events take place (Star 1999). They are deeply intertwined with the social practices and the contexts in which it operates, continuously evolving through the constitutive relationships it shares with social norms, practices, and values. The transformation that MitID brought to Greenland has similarly reflected the change that the technology has undergone itself. Fighting to create awareness of the geographical problems inherent in the way MitID ran in Greenland, a new solution for administering RA-certifications evolved to eliminate the need for long travels. Norms in Greenland about what is acceptable to ask other individuals about have influenced the way Danish security questions are asked, translating the questions to fit both Greenlandic language and social life. Using this example as one of multiple, we pose that maintenance and repair does not lend itself to simply upholding the status quo or keeping in place standardised configurations; it takes an active part in shaping them. As Denis and Pontille agree, *This is precisely what de Laet and Mol (2000) emphasise with the notion of "fluid object": the longevity of Zimbabwe Bush Pump does not depend on its immutability, but on its ability to support multiple changes.* (Denis & Pontille 2017:3). Seeing MitID as a similar fluid, but still in many ways different, object, it is part of an equally fluid infrastructure, where breakdowns are not final conditions but intermediate stages that hold within them an opportunity for change and improvement. Presenting ourselves, as ethnographers, as those who follow the trouble is in this case perhaps a privileged position we have given ourselves. While we of course have used it as a narrative tool, to follow stories of the maintainers that keep infrastructure from falling apart, we have more accurately followed those who have been a part of the trouble. We have told tales of small local heroes that keep infrastructure from falling apart. Tales of "*ordinary being"* and *"ordinary becoming"* (Haraway 2016:76), where the heroism lies in more than just everyday acts of maintenance and practices necessary for the functioning of the infrastructure. Here, people do not only maintain but actively engage in bettering both MitID and surrounding infrastructures, so that they better represent and are able to contain life in Greenland.

5.2 Sila is boss

> *Sila is boss. There is a saying in Inuktut that sila is boss. It is very easy to accept and understand this concept as an Inuk, as a person who is from the arctic. (...) despite planning a hunting trip, if the weather does not cooperate the hunt will not occur. Very quickly we realize and we are continually reminded how much we are not in control and how we are just a small part of the bigger cosmos.* (The Inuit Circumpolar Council 2018:1)

Life in Greenland has a mind of its own. If we are to discuss ordinary being and ordinary becoming in Greenland the concept of Sila provides a conceptually rich perspective. Sila, which translates to "weather" but also encompasses a broader understanding of the environment and the interconnectedness of all things (Merkur 1983), serves as an interesting lens through which we can understand the infrastructure in Greenland. The notion that "Sila is boss" highlights the intrinsic link between people and their environment, emphasising adaptability, resilience, and a deep respect for the natural world. No one knows better the rhythms and demands of Greenlandic life than its inhabitants, whose daily existence is shaped by the whims of Sila. This idea is essential when discussing the adaptation and integration of technologies like MitID into the Greenlandic context. Just as Sila dictates when and how activities can occur, the successful integration of MitID hinges on its ability to accommodate the unique environmental and social conditions of Greenland. The Zimbabwe Bush Pump, as described by de Laet and Mol (2000), showcases how technology can be seamlessly woven into the fabric of local life through its adaptability and reliance on local resources and knowledge. It becomes a "fluid object" that changes and evolves with its surroundings, much like how life in Greenland must constantly adapt to the unpredictability of Sila.

In our analysis, we see that MitID, introduced without sufficient consideration for local context, initially struggled to align with the Greenlandic way of life. The language barrier, inconsistent internet connectivity, and high costs of access presented significant challenges. However, through the ongoing efforts of local maintenance and the evolution of the technology to address specific needs, MitID is gradually becoming more integrated into daily life in Greenland. This process mirrors the ecological infrastructure concept articulated by Star (1999), where infrastructure is not static but continually shaped by the social norms, practices,

and values of the community it serves. The establishment of settlement offices with RA-certified employees is one such adaptation, showing how local engagement and understanding are crucial for the successful implementation of MitID. These offices bridge the gap between a standardised digital identification system and the lived realities of Greenlandic citizens, ensuring that the technology can be more effectively used and maintained within the local context. The transformative potential of MitID for Greenland is akin to the nation-building role of the Zimbabwe Bush Pump. While the pump connects villagers to the state by providing a vital resource and fostering a sense of ownership, MitID and the broader digitalisation efforts have the potential to democratise access to services and strengthen the connection between remote communities and the central government. However, this potential can only be realised if MitID and other technological solutions are continuously adapted to meet the unique challenges of the Greenlandic context. Our stance on this, is that the concept of maintenance and repair plays a huge role in appropriating technology, through it, incremental changes that echo through the surrounding infrastructure as well are made. The understanding of infrastructure, inspired by Star, is broadened by the inclusion of both maintenance and repair approaches and the insights presented from de Laet and Mol's article on the Zimbabwe Bush Pump - digital solutions are parts of ecological infrastructures that hinge on and are locally appropriated through acts of maintenance and repair. The concept of Sila reminds us that successful integration of technology in Greenland requires a deep understanding and respect for the environment and the interconnectedness of all aspects of life. Here, Greenland is unique in the fact that there are simply times where climate or weather, Sila, does not always allow for repair and maintenance. As Greenlanders must adapt their activities to the weather, technological solutions must be flexible and responsive to the specific needs and conditions of the community, especially for ecological infrastructures where Sila remains boss.

6. Conclusion

Digitalisation is developing in Greenland and worldwide, and it will play an increasingly significant role in the future. Public digital services like MitID are just one example of this trend, and many more such technologies are inevitable. When MitID reached Greenland, it became evident that this technology was not developed to suit Greenland's context. Our report focuses on these challenges, based on fieldwork conducted in Nuuk and Ilulissat. We analysed and discussed the data from this fieldwork to address the following problem formulation:

How does the unique context of Greenland affect the implementation of MitID, and how do invisible work and maintenance activities within associated infrastructures influence its appropriation and integration?

Our report concludes that MitID's implementation did not initially account for the unique challenges in Greenland, such as language barriers, inconsistent internet connectivity, and high costs of access. The master narrative behind digitalisation, promoting efficiency, economy, and democratisation, shows big potential in bridging many of the challenges presented by Greenland's unique context but is inevitably a source of marginalisation as well. Ongoing maintenance and repair work shows that it matters in this sense, and has been pivotal in adapting MitID to better fit the local context. Inspired by Star's ecological infrastructure, we see a constitutive relationship between these maintenance efforts and the integration of social norms into MitID's infrastructure.

For example, the extensive maintenance work by local employees, such as Ane's multi-week journeys to register MitID administrators and Malik's efforts to sustain the digital infrastructure, illustrates how maintenance work not only upholds but also transforms the technology to better serve Greenlandic needs. These efforts have led to the development of local solutions, such as settlement offices with RA-certified employees, which bridge the gap between standardised digital systems and the lived realities of Greenlandic citizens.

MitID relies on the stability of the telecommunication infrastructure, which is both experienced differently according to where you are situated in the country, and at the same time fragile from threats like the weather, fishermen, and foreign, political, affairs. Because of these threats, Tusass performs crucial maintenance and repair work both physically on radio towers on

mountaintops but also via online campaigns to inform the citizens about the underwater sea cables. The slow internet connection in northern Greenland particularly hinders digitalisation and access to MitID and appears marginalising to those who do not have the digital device or internet necessary to use digital solutions like MitID. At times where maintenance in telecommunication infrastructure is not possible in the first place, due to climate, weather or other factors, all the interconnected infrastructures are at risk of crumbling, going against all intents and purposes of digitalisation in the first place. Incorporating the concept of *Sila* reminds us that successful technological integration in Greenland requires flexibility and responsiveness to local conditions. Just as Greenlanders must adapt their activities to the weather, technological solutions must be tailored to the community's specific needs and conditions. This approach ensures that technologies like MitID can become more democratically accessible and better integrated into daily life in Greenland.

7. Litterature List

Abildgaard, Mette Simonsen. 'Untitled', 2024.

Benedict, Ruth. 'Anthropology and the Abnormal'. *The Journal of General Psychology* 10, no. 1 (1934): 59–82. https://doi.org/10.1080/00221309.1934.9917714.

Daniels, Arlene Kaplan. 'Invisible Work'. *Social Problems* 34, no. 5 (December 1987): 403–15. https://doi.org/10.2307/800538.

Denis, Jérôme, and David Pontille. 'Beyond Breakdown: Exploring Regimes of Maintenance.' *Continent*, 2017, 13–17.

Denis, Jérôme, and David Pontille. 'Maintenance Work and the Performativity of Urban Inscriptions: The Case of Paris Subway Signs'. *Environment and Planning D: Society and Space* 32, no. 3 (2014): 404–16. https://doi.org/10.1068/d13007p.

Denis, Jérôme, and David Pontille. 'Why Do Maintenance and Repair Matter?' In *The Routledge Companion to Actor-Network Theory*, 1st ed., 283–93. Routledge, 2019. https://doi.org/10.4324/9781315111667-31.

Digitaliseringsstyrelsen A. 'Forgængeren Til MitID', n.d. https://digst.dk/it-loesninger/mitid/forgaengeren-til-mitid/.

Digitaliseringsstyrelsen B. 'Om MitID', n.d. https://digst.dk/it-loesninger/mitid/om-mitid/.

Fievé, Jonas. 'Brand i Canada Rammer Forbindelserne i Grønland'. KNR, 2017. https://knr.gl/da/node/75360.

Flora, Janne, and Astrid Oberborbeck Andersen. 'Taking Note: A Kaleidoscopic View on Two, or Three, Modes of Fieldnoting'. *Qualitative Research* 19, no. 5 (October 2019): 540–59. https://doi.org/10.1177/1468794118782897.

Gaskell, George. 'Individual and Group Interviewing'. In *Qualitative Researching with Text, Image and Sound*. 6 Bonhill Street, London England EC2A 4PU United Kingdom: SAGE Publications Ltd, 2000. https://doi.org/10.4135/9781849209731.

Government of Zimbabwe. 'History of Zimbabwe', n.d. https://www.zim.gov.zw/index.php/en/my-government/government-ministries/about-zimbabwe/460-history-of-zimbabwe?showall=1.

Hammersley, Martyn, and Paul Atkinson. '3. Access'. In *Ethnography: Principles in Practice*, 3. ed., Reprinted., 41–62. An Informa Business. London: Routledge, 2007.

Hammersley, Martyn, and Paul Atkinson. '7. Recording and Organizing Data'. In *Ethnography: Principles in Practice*, 3. ed., Reprinted., 116–28. An Informa Business. London: Routledge, 2007.

Hansen, Klaus Georg. '3 Kolonihistorie'. In *Fra passiv iagttager til aktiv deltager*, 1. udgave, 1. oplag., 32–66. Nuuk: Forlaget Atuagkat, 2017.

Haraway, Donna. 'Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective'. *Feminist Studies* 14, no. 3 (1988): 575–99. https://doi.org/10.2307/3178066.

Haraway, Donna J. *Staying with the Trouble: Making Kin in the Chthulucene*. Duke University Press, 2016. https://doi.org/10.1215/9780822373780.

Hermann, Anne Kirstine. 'Afkoloniseringen Forvandlede Grønland Til En Kamufleret Koloni'. Altinget, 2017. https://www.altinget.dk/arktis/artikel/afkoloniseringen-forvandlede-groenland-til-en-kamufleret-koloni.

Kassaaluk, Kristensen. 'Tusass Opruster Mod Overisning På Upernaviks Sendemaster'. Sermitsiaq, 2023. https://www.sermitsiaq.ag/erhverv/tusass-opruster-mod-overisning-pa-upernaviks-sendemaster/109334.

Kerrn-Jespersen, Rasmus. 'Greenland in Numbers: Eight Key Statistics to Understand the World's Largest Island'. ScienceNordic, 2016. https://www.sciencenordic.com/denmark-greenland-science-special-society--culture/greenland-in-numbers-eight-key-statistics-to-understand-the-worlds-largest-island/1434313.

Knoblauch, Hubert. 'Focused Ethnography'. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research* Vol 6 (2005): 1–14. https://doi.org/10.17169/FQS-6.3.20.

Kvale, Steinar, and Svend Brinkmann. '1. Introduktion til interviewforskning'. In *InterView: introduktion til et håndværk,* 2. udg., 6. opl., 17–38. Kbh.: Hans Reitzels Forlag, 2009.

Kvale, Steinar, and Svend Brinkmann. '8. Interviewvariationer'. In *InterView: introduktion til et håndværk*, 2. udg., 6. opl., 163–82. Kbh.: Hans Reitzels Forlag, 2009.

Malik Fuglsang Holm, Mads. 'Grønlands Søkabler Er Sårbare Overfor Angreb'. KNR, 2023. https://knr.gl/da/nyheder/groenlands-soekabler-er-saarbare-overfor-angreb.

Marcus, George E. 'Contemporary Problems of Ethnography in the Modern World System'. In *Writing Culture: The Poetics and Politics of Ethnography ; a School of American Research Advanced Seminar*, Nachdr., 165–93. Experiments in Contemporary Anthropology. Berkeley, Calif.: Univ. of California Press, 1986.

Marcus, George E. 'Ethnography in/of the World System: The Emergence of Multi-Sited Ethnography'. *Annual Review of Anthropology* 24, no. 1 (October 1995): 95–117. https://doi.org/10.1146/annurev.an.24.100195.000523.

Merkur, Daniel. 'Breath-Soul and Wind Owner: The Many and the One in Inuit Religion'. *American Indian Quarterly* 7, no. 3 (1983): 23. https://doi.org/10.2307/1184255.

MitID. 'Få Hjælp Til MitID i Borgerservice', n.d. https://www.mitid.dk/hjaelp/mitid-support/borgerservice/?language=da-dk.

Pink, Sarah, and Jennie Morgan. 'Short-Term Ethnography: Intense Routes to Knowing'. *Symbolic Interaction* 36, no. 3 (August 2013): 351–61. https://doi.org/10.1002/symb.66.

Sæhl, Marie. 'Sproget Splitter Grønland: Nina Kan Kun Tale Dansk - Sebastian Vil Kun Tale Grønlandsk'. DR Nyheder, 2018. https://www.dr.dk/nyheder/indland/valgigroenland/sproget-splitter-groenland-nina-kan-kun-tale-dansk-sebastian-vil-kun.

Simonsen Abildgaard, Mette, Carina Ren, Israel Leyva-Mayorga, Cedomir Stefanovic, Beatriz Soret, and Petar Popovski. 'Arctic Connectivity: A Frugal Approach to Infrastructural Development'. *ARCTIC* 75, no. 1 (2022): 72–85. https://doi.org/10.14430/arctic74869.

Sørensen, Axel Kjær. 'Grønlands Historie'. Danmarkshistorien, 2020. https://danmarkshistorien.dk/vis/materiale/groenland.

Spradley, James P. 'Asking Descriptive Questions'. In *The Ethnographic Interview*, 78–91. Belmont: Wadsworth group, Thomson learning, 1979.

Spradley, James P. 'Doing Participant Observation'. In *Participant Observation*, 53–62. Forth Worth Philadelphia San Diego [etc.]: Harcourt Brace Jovanovich College, 1980.

Star, Susan Leigh. 'Power, Technology and the Phenomenology of Conventions: On Being Allergic to Onions'. *The Sociological Review* 38, no. 1_suppl (1990): 26–56. https://doi.org/10.1111/j.1467-954X.1990.tb03347.x.

Star, Susan Leigh. 'The Ethnography of Infrastructure'. *American Behavioral Scientist* 43, no. 3 (November 1999): 377–91. https://doi.org/10.1177/00027649921955326.

Star, Susan Leigh, and Karen Ruhleder. 'Steps Toward an Ecology of Infrastructure: Design and Access for Large Information Spaces'. *Information Systems Research* 7, no. 1 (March 1996): 111–34. https://doi.org/10.1287/isre.7.1.111.

Steenfos, Hans P., and Jørgen Taagholt. '23. Tele'. In *Grønlands teknologihistorie*, 1. e-Bogsudgave., 1508–71. Gyldendal : [Sælges på internettet], 2012.

Tele-Post. 'Det Nye Zonekoncept', n.d. https://web.archive.org/web/20171107013509/https://telepost.gl/da/privat/internet/det-nye-zonekoncept.

Tusass. *Get Faster Internet in Nuuk!* n.d. https://www.tusass.gl/en/internet/private/.

Tusass. *Let's Protect the Submarine Cable*. n.d. https://www.tusass.gl/en/infrastructure/submarine-cable/.

Tusass. *Submarine Cable*. n.d. https://www.tusass.gl/en/infrastructure/submarine-cable/.