# Preface

As this thesis have come to an end, we would like to thank our superviser Theresa Scavenius who have help make this thesis come ture. Also we like to thank our informants, from Agency of Digitisation Per Gade, Adam Arndt and Martin Skovbjærg Jensen. From Dragør municipality Kenneth Kristensen. And from Copenhagen municipality Frans la Cour. And to all our family and friends we linke to thank you for your understanding and support in this laboris period

## *Abstract*:

Dette speciale omhandler hvorfor vi i Danmark har valgt at digitalisere vores offentlige sektor, og hvordan forskellige forståelser af begrebet digitalisering er blevet skabt. Vi har ved brug af etnografiske metoder, litteraturstudier, læsning af faglitteratur og interviews undersøgt hvordan digitalisering i Dansk kontekst bliver påtalt. Vi har gennem dette speciale besøgt forskellige konferencer, for at skabe indsigter i hvordan offentligt digitalisering bliver skabt. Vi har snakkede med forskellige centrale institutioner såsom styrelser, kommuner og private virksomheder som udvikler datamodeller til det offentlige. Disse Teknoantropologiske methoder har understøttet en undersøge af hvordan forskellige begrebs forvirringer er opstået, samt hvordan prioriteret digitaliseringen bliver påtalt af centrale skikkelser i Dansk digitaliserings kontekst. Denne empiri har vi brugt til at skabe en dybdegående analyse af hvordan digitalisering har udviklet sig i det offentlige. Ved at bruge Grunddata som udspring har vi skabt en Aktør Netværks-Teori analyse til at forstå hvordan forskellige aktører omkring Grunddata har skabt netværks og allieret sig med andre aktører i Danmark ved brug af Callons oversættelser. .

## Table of Contents

# *Chapter 1*

In this thesis, we will present the Danish digitalisation. This report will introduce different aspects of digitalisation. Such as self-services and iPads. And how these they are connected in this messy field. We will analyse this field by interviewing key actors and investigate the field through conferences and literature. During our time in Techno-Anthropology we have explored different technological artifacts and their use, the aim of this thesis however is to illuminate how the larger umbrella of digitalisation, in Denmark, have been constructed. We will use different methods and techniques to open the field for the reader. We will introduce the field of digitalisation as we have encountered it. This will be shown through a series of narrative short stories. These narrative sections will use `This font, to create create a clear distinction from the rest of thesis.`

In between these narrative section, we will introduce our methods and theories and the context of their application through the first section. In the second section we will present how digitalisation emerged in Denmark. We will introduce the labouring tasks of grooming the infrastructure, and the works of the agencies involved. The technology involved, and the socio-technical atmosphere that let to Denmark as a vanguard in digitalisation. In the last section we will present three different innovations in digitalisation, and analyse how they used the five phases of 'Design Thinking'. The thesis will introduce the field through a narrative story of how we chose our field, leading to the Public Digitisation 2018.

## *The Digitisation journey begins*

In the beginning. We were on the lookout for initiatives which dealt with digitalisation in the public sector. Through different channels, research and investigations. We identified the Basic Data Program as a state of the art project within the public digitalisation domain. We studied how the government presented the Basic Data Program through their public website, youtube lectures etc. As we learned more about the program, we began to comprehend what trends was moving in the domain of public digitisation in Denmark and that open data played a part in it.

When studying the literature, it became clear to us, that the field was vast and trending. We found the amounts of reports, policy papers and academic literature to be comprehensive. Yet most of it came from outside academia or showed little interest in current affairs. Either they studied historical implementations, future technologies or hypothetical scenarios. Especially within our own academic field of: Danish science, technology and society studies, contemporary digitalisation seemed to have been omitted.
Many of the policy papers were based on visions and strategies and had a political agenda, with often limited information on how these ambitions were motivated.. A large parts of these papers was more than five years old, or described a strategy that was years from being realised. Making them irrelevant to understand current affairs. We found that they often were not pragmatic enough, or too pragmatic. Mainly we found that the field were in a state of dissonance between academia, lawmakers, local governments and private actors. A dissonance we found interesting to investigate. Fortunately the big national conference **Public Digitalisation 2018(Offentlig digitalisering 2018)** hosted by the organisation DANSK-IT Being the largest Danish conference about public digitalisation. It hosted actors across the field. This provided us a opportunity to use the conference as a stepping stone into the field. At the conference we came into contact with many of the key-actors and touched many of the themes we found important and interesting.

*Pieces like this continue throughout this paper. They show how we figuratively and literally moved from one point to the next. These reflective narratives illustrates our experience in the field. We use the reflections to set the stage for our findings, and as exposition for our journey through the field by introducing key actors, concepts and perspectives, which we came across while during our research. They are intended to illustrate our state of mind from our original perplexity until we reach some kind of greater understanding. To best present the field we do need to understand a thing or two about the relationship between science, technology and society in Denmark.*

## *Problem area*

Historically danes have inscribed current data about the Danish citizens as far back as the first church books from the 15th century (Christensen and Tobiasen, 2017). With the expansion of literacy (and the printing press) these practices became widespread (Hjelholt and Schou 2017). Under king Frederik the 6th (1768-1808) the modern public official came into place. This were as a result of the king picking the official public servants based on the merits of the individual, instead of the family. Thereby the public official loyalty was placed with the state, instead of with the local lord. As people from all layers of society could raise in the civil service, the civil servant was less prone to bribery and abusing the power of their office. Creating a situation where the citizens believe and trust the public sector (Rehling, 2013).

This trust in the public services have been sustained through the years, and when technologies have been introduced in the public sector, the population have trusted the state and its use of new technologies.

Through the years new technologies have also met resistance as seen in the case of the CPR-number in the 1968, when the state asked the municipalities for information regarding people on social services by asking for the CPR number of these people. This use of data as way of keeping track on the population was meet with resistance both from the public and the municipalities themselves, this case was based on the first set of regulations in which data was allowed to be collected and shared in the public sector (CPR-Kontoret, 1991). This case originates in the late 60's since then through technological advances new tools have made it easier, faster and cheaper. In the 1970's the state and municipalities started amassing the collected data in large standardised data facilities. Where the government started changing how it worked internally (Hjelholt and Schou, 2017).

Since 1994 external forces such as the EU have become major influencer in the Danish digitalisation strategy. In the last decade, the rise of big tech companies and international

trends has pushed the Danish government and small companies in Denmark to stay ahead in digitisation (Hjelholt and Schou, 2017), and expects Denmark to be on the frontier of development. Denmark are being told how data is the new raw material which can help Denmark become a wealthy nation, if we digitise and spend money and energy on developing or digital infrastructure (Franck, 2018).

As most workflows have become purely digital, and snailmail have declined to such a degree that the Danish government have been sued by the postal services (Jv.dk, 2017), the question arises: How are different professions reacting to the digitalisation of their trad, and the use of data, and how do the public sector react to changes in policy and the use of technology. In 2016 a new and still ongoing digitalisation strategy was introduced. This strategy are scheduled to be in effect from 2016 to 2020. This new strategy is focusing on three different topics which are the main goal for the "Digital Strategy 2016-2020" (Agency of Digitisation, 2016) these goals are meant as a guideline to the public sector. The first goal of the 2016-2020 digital strategy is focused on how new digital initiatives and platforms should be easy to navigate, quick, provide a secure platform with good quality. The second goal is that the public sector should be seen as a field which can facilitate innovation and help provide a basis for growth. Third goal is that the public sectors digital actions should always strive to be secure and create trust with the population (Ibid). These goals were set in partnership with the Danish government, municipal councils and the five regions. The strategy is meant to be a guideline into how digitalisation, as a trans disciplinary collaboration, should be conducted. This guideline is meant to be used by the different agencies such as water, it-security and climate. The effect of this strategy are seen throughout the different projects and in the discussions used by the different actors we have encountered during our research period.

## *Problem statement:*

Looking out at the world, from the realm of Aalborg University we see how Danish society are accelerating to the drums of digitalisation. Looking to understand the attraction of digitalisation we ask ourselves “why do we digitise, and how have we come to where we are?” Having encountered public sector when the digitalisation term embraces multiple definitions.

With digitalisation making its presence known in all parts of society and the especially in the public sector, where the digital revolution are welcomed and appreciated by people living on the frontlines of these changes, where new technologies emerges as summer flowers in the sun.And where kindergartens which main concern should be caring for children, with mixed feelings adopts iPads and computers. Exploring the cross section between these different perspective to digitalisation, we wish to understand how digitalisation have become a phrase which can be applied to the Danish state, and also be used when looking at how a document is shared. These different applications of the word digitalisation have prompted the question, “why do we digitise, and how have we come to where we are?”.

*Access*

In order to obtain tickets to the conference, we needed funding. As the price of admission for the conference was too expensive for our limited student budget. The different faculties at AAU could not provide the funds (18.000 kr.) to support us. This financial problem seemed like a show stopper for our plans to participate at the conference.

We called DANSK-IT (the host) as to probe whether they could give us access in the spirit of research. As we were master student writing about digitalisation of the public sector we thought this seemed reasonable. They thought otherwise. There were no or research program in the budget. This meant that it was not possible to be accredited as students. What they did have instead, was a student idea competition. The finalist in the competition would be provided with tickets to the conference.

The concept of the competition was for a single student or a group of students to come up with an idea. The idea should solve: How the public could use the public dataset catalogue to create more value and transparency for the citizens. The dataset catalogue is a collection of the different datasets the Danish state have collected. These datasets contain information about the Danish society. This would be datasets on how many people were admitted to a certain hospital, road congestions, etc. All information collected by the state which are not private, and can be put into a datasets. Most of this information is accessible but there a very few people and companies who uses these databases. There exist a scepticism in parts of the population, when large datasets are collected. This is the reason why DANSK-IT asked students to present ideas at the conference. Ideas on how to create a platform where the data was presented in a transparent and value-creating fashion.

In our call with DANSK-IT about this idea competition we were told that very few if any people had submitted, and if we submitted it could be our only chance to attend the conference. At this time in the phone call with DANSK-IT. We had accepted the offer to submit a

proposal to the competition. and asked to know the deadline. They told us that it was in less than two and a half hours, we assured them that we had already begun the proposal, and just need some last minute touch ups;
At this time we started panicking about whether we could do it, and what to submit. We immediately began a combined empathization and ideation brainstorming, with the ferocity of a hurricane. Ideas were pitched and shot down again in quick succession. After 5 min of coming up with ideas we decided that we needed a walk, and a cigarette in order to think straight. The sun was shining we ended walking around using this time as a more informal brainstorm where ideas were build and then refocused in a collaborative space. After a walk around the campus we believed that we had settled on an original and solvable idea. All we needed was for it to be written down and submitted. When we came back to our desk we started writing on our proposal with such a haste that at multiple times we ended up writing the same sentence and augmentation in different sections. Instead of working on the same prototypes, we tried to blindly collaborate. As we were writing there was a sense of urgency combined with a sense of disbelief and optimism. The text was written in a quick fashion. When the initial excitement changed into the sensation of concentration, where the words and sentences became a series of well worded arguments. We discovered that our initial agreement was not concrete enough and two different ideas was being presented in the same proposal. By chance we got a opportunity to test our prototypes before the professors at TANTLab[1]. Their feedback helped us reiterate. This helped us to consolidate our ideasThe brainstorms ended up in a idea where we recommended a new section in the Danish citizen portal Borger.dk. This section would grant access to a interface where the individual citizen could navigate through different projects that represented their personal data. This interface could in this way create transparency in a time where the use of personal data is a hot topic in the media.

[1] http://www.tantlab.aau.dk/

Shortly after we had applied the competition with this idea we got feedback that our concept had been approved an thereby access to conference had been secured.

## *Motivation*

As part of our schooling as Techno-Anthropologists we have learned to understand and analyse technology and its impact on the world and society, this have been done through different courses and projects during our bachelor and master. We have worked with technologies ranging from electric cars, stoma products, smartboards and green energy . All affected or a part of the digitalisation. These technologies have all had an effect on the world surrounding them, and have had a practical use and a defining artefact. We started this project by looking at the world around us to understand how the technologies from former projects, are interacting in the Danish society. And how we as Techno-Anthropologist have worked towards grasping the discourses, practices and understandings which are connecting technology and humans.

Looking at the world through the eyes of a Techno-Anthropologist we started to see how the different technologies were connected through different parts of the public sector. The interstructural effects on being able to charge your electric car and the political decisions that have let to this..The ostomy bag being subsidy by the Danish healthcare system, and new research being funded by the Danish state. Looking at these technologies, the Danish government marks are all around, and are either funding or helping in some way through different agencies. We began our study, to understand how all of these different agencies creates knowledge and facilitates information. As we became more aware of the influence of the Danish state. We became aware of how we during our education, neglected the government in our prior analysis' and projects. Through this process we took a closer look at how the state have been collecting data, and how the states digitalisation agenda has showed itself over time through different initiatives.

In our private life, we also had different interactions with the public sector and we began to understand how we as Danish citizen are in contact with the state throughout our entire life. Either as new parents interacting with the state on behalf of their child, or as students applying a scholarship, or european citizen asking for a new passport, health card etc.

These points of contact with the Danish state have all become digitised, and self-serviced, through the dataportal borger.dk[2]. Thereby having a single point of contact with the state, which holds all of the information we as citizens need for interacting with the Danish state.

The debate of digitalisation has been growing, tapping into this debate with a starting point from our different courses at the university such as *big data, digital methods and controversy*

[2] Borger.dk is the Danish national citizen portal. Its is the single entry point for Danish citizens to access their public personal data.

*mapping* and different jobs. Our knowledge have consequently given us a starting point, because we individually have been intertwined in this field. This through personal experience as we are in contact with public digital platforms as part of our everyday life and as mentioned through academia, various projects and courses that involves digitalisation in various degrees. This ignites an interest towards the debate of digitalisation, and an understanding of how it is being implemented. Looking at the media coverage of digitalisation we have found plenty of articles and research papers that either map out digitalisation. Or analyse and explain how the society of tomorrow are created by the tools and insights from digitalisation. This can provide valuable insights for those who can understand the data and make it meaningful.

In our research phase, we explored different topics of interest; Citizens understanding of the government when fully digitalised. How public data have started to become debated in the terms value of innovation, moving away from the idea of public data. These aspects are all parts of why we have chosen to write about digitalisation in the Danish public sector and how it will affect the society and our understanding of the Danish state for many years to come. This leads to the dataportal Basic Data Program and the implications it has for the digitalisation of the Danish public sector. We find these particular aspects interesting because of the underlying ambiguity about its effect on society, as initiatives like Basic Data Program gets introduced by the government. We question both the limits on how digitalisation influence the society and which issues that arise when big digitalisation strategies get implemented in a more local context.

*Arriving in Arhus*

We arrived at Aarhus the night before the conference started, we had rented a small room on they opposite side of Aarhus from the train station. As we walked through Aarhus in the dark of night, talking about our excitement for the next days. We walked and talked about the conference, we talked about the different presentations we were going to attend, which booths to visit and what kind of merchandise we hoped for. We talked about the competition and presentation we were going to give in front of 1500 people at the conference the next day.

As we arrived at the conference early Wednesday morning, at Musikhuset Aarhus. Which presents itself as a big building with a glass entrance, that rises 3 floors in the height, a main conferences floor, four different halls. The building is usually used for concerts and other cultural events, but these days housed the public digitalisation conference.

We arrived at the main entrance with the other 1500 participants that day at around eight in the morning.

The first order of the day was to participate in the breakfast and coffee. We noticed how other people walked around in what looked like total disarray and greeted each other like old friends. The mornings confusion was interrupted by the loudspeaker announcing the opening speech from nine to ten was about to begin. The opening were hosted by DANSK-IT, in the main hall, and almost all participants was present. Looking out over the main hall and realising that we had to stand on the stage in just a few hours, the nervousness hit. During this first hour the hosts of the conference had an award for three different public digitisation projects that had been successful in 2017, during these parts of the presentation, we took a backseat, and had a fun breaker on Twitter.

One of the ways that people at the conference could participate in the debates was through Twitter, by using the hashtag that represented the conference (edt. #offdig). For example the audience could ask question to the people on stage. This was one of the ways that we could follow the discourse at the conference. As we scrolled through twitter we found that the language used on the twitter

handle #offdig was very buzzword heavy. We started having fun playing a game of #buzzwordbingo. The idea of the game is that as people tweet using a lot of buzzword, we would start complimenting them on how well they were doing in the game. During the opening talk, some people started joined in on the fun. They tweeted several serious question to the stage using a lot of hashtags, and adding the #buzzwordbingo hashtag. At this point the opening speech was almost over and we talked about what to do after.
After the introduction was finished we decided to split up. One of us was going and listen to a debate regarding how the youth was coping with the digitalised public sector. The remaining two members of the party decided to explore the conference floor. The big room was filled with different private institutions that each had their own booth and a agenda to lure the public actors with candy, merchandise, competitions and different gadgets as visual attractions.

We started talking to with a man named Bjarne. Who were standing at a booth from a company that created it-solutions and products for healthcare industry. As we talked with Bjarne he bragged about different places in the industry where their product was used. The setup of the conference reminded us of a flea-market but here the booths was engrossed by big and mid-sized IT-consultancies. As the conversation with Bjarne went on, we asked him to explain what digitisation was for him. This was an method to get different understandings of digitisations, from private companies in the public digitisation. Bjarne defined digitisation as: ”*Providing more service for less money*” this formulation of digitisation leaded our thoughts towards that the the discourse surrounding digitisation was a perspective primarily from a optimization point of view. This understanding would later reoccur over and over again.

As we talked with other vendors at the different consultancy booths we experienced that everyone had their own unique formulation of digitisation. We started wondering how we could make sense of a field were the technology was so fluent.

## *Genres and forms of the project*

In our time at Aalborg University Copenhagen we have worked in a lot of different groups, and studied various topics, mainly through group projects. Some following the classic taxonomy, of having a description, method, theory, analysis and discussion ending with a conclusion. Some being more narrative and thematic structured. Working with our master thesis, having one last chance to experiment with the writing and the structure of a project report. We will be attempting a new structure in this thesis. As this thesis asks questions about how the Danish society is changing with digitalisation of the public sector, and how we as Techno-Anthropologist can find our place in this world(Jensen, 2013). We will be asking different questions, such as, what is the discourses which are being used by the different actors in the field of digitalisation. And how these actors are connected through different platforms and data portals. How are the citizens and the public understood. And how can we as Techno-Anthropologist help create new knowledge in the field of digitalisation(Børsen, 2015), which can be seen as a semi closed arena. This thesis will be divided into three different chapters

*the first* is to understand how our worldview presented itself and how we have applied different methods to open the field of digitalisation. *The second* chapter of this thesis will introduce our theories and how we create meaning in the field. As we apply the theories to our interviews we will introduce different terms which will guide us in or search for meaning, thereby creating knowledge. *The third chapter* will be an examination of how we as techno-anthropologist can explore digitalisation and whether the field of digitalisation can embrace Techno-Anthropology where we will be using design thinking as a method for understanding how digitalisation have become part of different arenas.

*First chapter*

The first chapter is to help understand the field which we enter, through a ethnographic description of the conference *Public Digitalisation 2018.* As this conferences was our first introduction, into the field of digitalisation in the Danish public sector. We will use narrative field descriptions from our visit to the conferences. This will open the field and provide the reader with a sense of our own confusion and overwhelming eagerness to understand this field and its actors. Having a description of the field this early in the report will open the report and hopefully create a situation of confusion and curiosity for the reader. Which we hope can be used as a investment for the reader to continue reading through the part, as we will build this part of the thesis with inspiration from Clifford Geertz, *Deep play: notes on the Balinese cockfight.* Where the reader are not sure what they are being introduced to, but is drawn to our process of investigation as it unfolds slowly, we hope that the reader will understand the madness of it all. After an introduction of the field we will move on to our lifeworld, where we will examine which different methods and tools we as Techno-Anthropologist have at our disposal.

Working with some of the different basic texts we have been introduced to during the bachelor and master We will provide an insight into how we as Techno-Anthropologist perceive the lifeworld, and theories that have shaped this. We will present and reflect on the different methods we applied to make sense of our impressions. Working in a time when new laws are implemented. We try to comply with the European Union's General Data Protection Regulation. This have affected and influenced how we generate and utilize our data and our quantitative or qualitative methods. We had to find new ways of rethinking our interviews as the data product are under new legislation. This conditioned new ethical problems. We strive to make this thesis, and the methods behind, as ethical sound as possible, within the limitations of our capacity. We believe that by upholding transparency as a methodological virtue, qualitative research and especially etnografic investigation we can achieve this. This is important when navigating a field that is usually dominated by quantitative analysis.

Second chapter

The second chapter will work by ending our narrative stories from our trip to Aarhus. We will then introduce the reader to Actor Network-Theory which we are using as a framework that can help us understand how networks are created in the digitalisation arena and the role of technology. Working with a case from Dragør were we demonstrate how Actor Network-Theory (ANT) have helped us analyse why people use technology and how these technologies become part of the digitalisation conversation.

At the middle of the second chapter we will open the technology domain of digitalisation, looking at how different technologies had to evolve for digitalisation of the public sector.

Working through some of the different aspects of digitalisation such as how *data* have transformed from punch cards into big data. We will be working with the concepts of stacking technologies(Straube, 2016), as a way of presenting complex and connected technologies.

Thereafter we will open the network of Agency of Digitisation and how they have performed a series of negotiations leading to the launch of Basic Data Program.

The third chapter

In the third chapter we will analyse how the innovations in different arenas use the five phases of design thinking. And how this affects the messiness of digitalisation, both locally and nationally. By focussing on historical turning points in the innovations process behind NemID, we investigate how a national digitalisation process led to the digitalisation we have today. We apply the same approach to digitalisation projects in the Capital, and in Dragør one of smallest municipalities in Denmark.
These analysis' will show how we as techno-anthropologist are capable of submerging in the empirical evidence and use a series of different theories as the basis for our analytic points. These three stories will conclude our exploration of the Danish digitalisation field.

With a combination our different insights from the different chapters into the conclusion of this thesis. We will reflect on how the thesis have worked for understanding the messiness of the digitalisation field in Denmark and how this have impacted our problem statement. Lastly a perspectivation on what future research in this topic could focus on.

### *The floor*

As we had used most of the morning, navigating through the countless different booths around the main floor. Our heads were booming with information from all of the people we had encountered. We needed a break, fortunately there were a announcement over the speakers informing us that it was time for lunch. We took the opportunity to sit down,reflect and compare our different experiences. After walking around with our heads in the *cloud*, trying to find a place to sit, we finally found a table. We began talking about whether our questions about digitisation had been answered on the floor.

It is important to understand, that even though this is the fourth annual conference about "Public Digitisation" hosted by Dansk IT, the consensus have yet to arrive. Most of the actors we met told different variations of the same story, yet none of them seemed to agree about the conclusion. In one end of the conference floor some salesperson tried to sell used computers. In the other end a speed-talking Key account manager tried to convince us that his microsoft solution package were the best in the crowd. Around the center a group of big consultancy agencies were placed. One told us that digitalisation really meant doing stuff in the cloud better. Next to them stood the public contractors and reminded us about the digitalisation we had already undergone, like the obligatory digital ID. Somewhere close to the fire exit away from it all, companies tried to let us know about their new Scanning and Optical Character Recognition systems. Meanwhile the lectures revolved around "Digital Futures", "Digital Leadership", "Digital foundations and Infrastructure", "Digital Law", "Digital Communication and Connected user Journeys" and at last "Digital Security".
It really did not help the coherency that right in the center of the main hall a big sign said "Trust is great, but blockchain is better". This meant that our collected experiences where a messy.
As we opened our small food boxes which contained a number of different wrapped meals, it dawned on us how poor the Danish language is suited to have this discussion.
Throughout the entire conference the participants had used the Danish word "digitalisering" as a common word for everything

digital…Digitisation means to change data into a digital form so it can be easily read and processed by a computer (oxford dictionary) which is aligned to the Danish definition of *'Digitalisering'* . Digitalisation on the other hand is the adoption or increase in use of digital or computer technology by an organization, or country (oxford dictionary). In Danish *'digitalisering'* covers both these meanings and can therefore be ambiguous, when navigating a field where everything is already digitised.

Digitalisering also covers the term digital transformation; "Digital transformation is a managed approach that indicates to: "Digital transformation refers to the changes associated with the application of digital solutions in all aspects of human society. The digital transformation of a specific function or organization implies that digital usages inherently enable new types of innovation and creativity in a particular domain, rather than simply enhancing and supporting the traditional methods. Digital transformation is essentially connected with these of advanced technologies in support of management. Digital transformation affects all sectors and all functions" (Nicoletti, 2018)....As we took a walk on the wild side on the Danish digitalisation scene when we participated in the 'Public Digitisation 2018'. We quickly noticed that the Danish discourse on *'digitalisering'* mostly leans towards the definition of digitalisation: Digitalisation; the adoption or increase in use of digital or computer technology by an organization, or country.

Our experience at the conference showed us that digitisation is perceived in many different forms especially within the discourse surrounding optimization. Optimization through implementations of different digital platforms or solutions that were surrounded in a cloud of buzzword lingo. Many of these solutions tried to simplify confusing or complicated process, and help the users focus on their tasks. We all had an impression of this lingo's distractibility in regards to the message that these different actors at the conference were trying to communicate.

If we ever wished to understand "Why we digitisise" we needed to figure out the relationship between the different actors and the incommensurability we had just experienced. And we most certainly need to demarcate us from the noise.

## *Demarcation*

Entering into the field we have chosen to close some of the arenas of digitalisation as these have been at the edge of our investigation and only presented themself in passing remarks by our informations. Looking at how the EU or the world have taking on digitalisation, have become a field which we have been aware of. Large parts of our literature have been policy papers which have looked at how Denmark are faring in relation to the rest of EU or the world. However these relations have been of less of a concern to us when trying to understand the Danish digitalisation. Our fieldwork, with a few exceptions, have shown little to no interest in the global rankings of danish digitalisation, and our analysis reflects that.this have let us to make a conscious decisio to minimise influence the danish ranking in the world in this thesis. Having met the field, both public and private actors which are also represented. We have chosen to limit the exploration of these actors. This have been done by designing our interview guides in such a way that the emphasis have centered on the public digitalisation. Knowing that private actors also roam the field of digitalisation have enabled us to ask question to our informants more precisely about their role. We entered the field without prior knowledge of the private actors this focus could have created a another thesis. In which the connections between the public and private was the main interest. Instead as described in the problem statement, it is the public sector and the digitisation of this, which have motivated us to write this thesis.

Having chosen to mainly work with one theory in chapter two. This was applied as method to show how different parts of digitalisation were a part of constant negotiations.

Focusing on the negotiation we chosen to apply a simpler use of Actor Network-Theory as this presents itself with the means of unfolding how these networks have been constantly under pressure. Having introduced multiple theories as a method for describing how these changes had taken place could have substantiated the messiness we had encountered.

In chapter three when introducing design thinking we have directed our focus into the five phases of design thinking. This was done to introduce the reader to how this field of digitalisation is working and how these different phases are represented in the cases we have chosen to explore. These phases can be applied either very rigidly or elastic. We have used both of these forms to understand the difference in the innovations we analysed. We use these as the basis for our analysis with the input from our informants. To display the many ways individual innovations contribute to the messiness in the field.

*Stage Show*

*As the main point of the first day at Public Digitalisation 2018; The student idea competition, it was our time to shine. As one of the finalist in the student idea competition we had the stage for three minutes to present our 'Find Waldo' solution to the conference. During the day we had promoted this session on twitter and followed the hashtag for the conference #Offdig. Through twitter and our #buzzwordbingo we had connected with the other students long before the presentations, we realised that our "competition" had came up with a similar solutions to the case. This and our common bonding of being students in a new setting resulted in a good connection between us. We discussed about how we had come up with the ideas. The group whom we had become closest with ended up winning, they were composed of a philosopher student and a IT-Engineer student. Twenty minutes before the idea competition started we were called in backstage to prepare the pitch. Behind the side curtains on the big stage, where we just a few hours ago had sat among thousands participants. we now gathered with the other participants. As we stood in a circle small chatter started. We spoke about how we had experienced the conference so far. Then we got briefed on the format of the competition, three tables had been placed on the scene where each group would stand and wait until it was time to present.*

*The first names was being called to the stage then a second, and then lastly our names was called. As we walked onto stage the lights, sound, smell, heat, noise and the feeling of being blinded by the stagelight hit us like a ton of bricks. While the other groups was presenting their pitch. We stood and recited our own pitch in our heads. As our turn came we looked up and started our prepared presentation(appendix pitch). After we had finished our pitch. A vote among the audience began to find the winners. They voted via the conference app. The winner (1st place) was the group with the IT-programmer and philosopher. Their approach began as a technical solution using the topical and contemporary buzzwords they focussed on which criteria the solution should fulfill (. Where ours had the culture and citizens in scope, (2nd place). The last group presented a mock-up build to fit both of our solutions (3rd place).*

*As we walked off stage, all the competitors stuck around and walked the conference floor as one big multidisciplinary group. We discussed approaches, literature and the conference. We soon realised that the entire conference floor had transformed itself into a firesale for cocktails and drinks. Most of the booths that before had intellectual conversations and new solutions to digitisation, had become the family reunion we had heard so much about. Now we were constantly greeted welcome by people whom had seen us on stage and wished to congratulate us or pick our brains. This situation reminded us the massive scale of the field. The conference and the amount of companies we met, who gladly spend vast amounts to promote their business. They were all catering to those in charge of procurements and us, who in their minds might be their new talent. This gave us an impression on how this field are capable of creating big national projects with many private actors bidding to win procurements.*

## *The lifeworld and theories.*

Our lifeworld is reflected throughout our study. In this study we have seen digitalisation as a 'multiple' formless concept (Mol, 1998). We understand our relationship to the field, as people who are a part of the world we study, and that this reflects our perception and understanding of the field. This places us as a actor with agency in the network (Callon, 1984), as much as any of our informants. All of the actors has to be understood as subjective, and partial (Lincoln & Guba, 1994:109). We have based our lifeworld on a understanding that knowledge is constructed from a variety of measures in our ethnographic work (Botin, 2015). One of the key measures, positions us in a latourian constructivism, that understands that we study, explain, understand, reflect and follow our actors through a network. We interest our self, in the goals they set, how they move the goal post as casually as one waves off a fly, in order to set another goal. Because that's what actors do...(Latour, 2005-1). We set up the moments of translations in the spirit of Callon, only to understand that either the networks are betrayed or the translations never succeeds (Callon, 1984). They do however provide meaning to our actors movements in the network, and it is this movement that we wish to understand.
These measures portray varied understandings of knowledge, to such a degree that they might be internally conflicting. While we have studied the field, understood it as the real world. We can attend that the plurality of digitalisation have let us to believe that this thesis isn't a portrayal of realism (Haraway, 1988) but a multifaceted representation of the many varieties of the digitalisation we live with (Salk, Latour and Woolgar, 2013 p: 152). We have studied our field with a constructivist spirit (Latour, 2005) formed by partial perspectives (Haraway, 1988). This study is a construction of these varied measures to approximate a understanding of the Danish digitalisation.

This lifeworld have affected our prospect to obtain what Marco Iansiti describes as a "T-shaped skills". Iansiti describes the t-shape as on one hand having a deep knowledge of a specific discipline. Being the vertical stroke of the T, but also a integrated understanding of how this interacts with others, this being the horizontal stroke of the T (Iansiti, 1993).
We use the concept of the t-shaped skill as a way to enter the interdisciplinary field of public digitalisation. In which we understand a wide variety of complex concepts, systems and initiatives, often running in parallel. It is the wonders of the all-encompassing nature of digitalisation in the modern life in Denmark that have let us to write this study. At the Public Digitisation 2018 conference we were met with the multitudes of different initiatives and aspects in this field. The experiences at and around the conference have provided a sturdy horizontal stroke on our T. The 'Deep cuts' we made into the three arenas of digitalisations

provided a deep understanding of how digitalisation came to be this chimera in our society, and what purpose they serve.

We use concepts of stacking technologies (Straube, 2016) method works by slicing the large technical system of digitalisation into small parts which can then be dissected. Presenting these aspect of the technology domain to the reader will create a understanding in the reader which enables us to aske more demanding questions from our informants, thereby creating a thesis where multiple views and understanding are brought into focus enabling the project to move from a sociological report, into the realm of Techno-Anthropology.
We understand technology in the field of digitalisation as a non-entity (Birkbak, 2013). One informant describes it as, "I was hired to sprinkle some IT over this project", these statements have become a part of the daily discourse of digitalisation. And a part of the messiness we are trying to comprehend. Our understanding of the underlying technologies, that form the chimera comes from (Bruun Jensen, Lauritsen and Olesen, 2008; Jamison, Hyldgaard Christensen and Botin, 2011; Botin 2015 ; Straube, 2016). Working with technologies and the new networks it helps facilitate, we understand technology as an evolving entity where stories are told as a way of legitimising new actions (Jamison, Hyldgaard Christensen and Botin, 2011). We look at how the technologies lets it's users become self-serviced in order to 'Cut the red tape' As this is one of the many goals of digitalisation. The systems and technologies are designed to create an action or by setting in place a system which binds us to the society we a part of (Akrich, 1992; O'Reilly 2015; Salk, Latour and Woolgar, 2013; Gad and Bruun Jensen, 2009).

In a field as wide, complex and messy as digitisation in Denmark. Following the actors as they move in their networks, sets up goals and moves them again becomes crucial to understand and comprehend their fields. In order to follow the movements in the network we focussed on the different strategies from the national Agency of Digitisation. This allowed us to study a clearly defined technological development and decisions for implementation. We have untangled the messiness, by following the biggest needles(actors) in the haystack to understand how Denmark became so digitised (European commision, 2018 **-1**).

We used 'the five phases of Design thinking' (Plattner, 2010, Brown, 2008) as a analysis tool to understand how the three different arenas experiment with solutions and implementation in digitalisation. From it's conception Design thinking have been a trendy way to understand and innovate anything from mundane products to corporate identities and strategies (Martin, 2009) . These five phases are applicable to the conception and integration of innovative

concepts, both in the long innovations process of political solutions such as NemID, and in the small local quick work-arounds, as using iPads in kindergartens.

The five phases of Design thinking comes a variations, but the general idea is based around a human centered approach, early testing and outside help (Brown, 2008). The human centered approach revolves around designing a solution with a specific user group in mind, and taking in their experience and knowledge into account. This is often elaborated upon when early testing begins, the user group will let the innovators know if they have correctly estimated their needs. In the seeking outside help, allows for excessive feedback, and to iterate on the previous design based on this feedback. Plattner's guide to design thinking are meant as a guide for innovators (Plattner, 2010). In our analysis we use them to go backwards and understand to what degree these innovation process have taken into account, and if it has affected the outcome.

*Empathize, define, ideation, prototyping, test*

Plattners design thinking guide begins with the empathize phase.

-The ‘empathize’ phase encourages the innovators to understand who they design a solution for. They underline three important ways to help the empathize phase. To “observe” the prospected users to understand how they solve their problems already, “engage” with them by interviews and conversations to understand the relevance of the innovation and in the end “watch and listen” in order to have the informants narrate their own actions.

-The ‘define’ phase is about bringing clarity and focus to the solution. This is where the different pointers from the empathize stage are materialised into problemsations that can be solved. in this phase the different aspects and actors are defined, and their relation provides a frame. In the end the ‘define’ phase should set goals for the innovation

-The ‘ideation’ phase is often compared to a free brainstorming phase, however the ideation can be elevated by a number of different methods such as design games, removing or adding constraints such as budgets, technological limitations etc.

-The ‘prototype’ phase is a part of the early testing concept, in where the solution is build in a variety of sizes, abstractions and fidelities. they key point is to start building different prototypes with different setups in order to figure out which combinations are plausible and would solve the issue.

The ‘test’ phase is the last part before ending the innovation, or beginning another iteration. This phase requires the involved parties to solicit feedback, and evaluate if the problem from the definition phase have been solved.

We use the design phases as a tool to retroactively understand the innovation process of digitalisation, and provide context innovation to the techno-social construct of digitalisation in

three specific arenas. These analyses provide insights into the variations of innovation we have met in the field.
By using our the horizontal stroke on the T-shape to provide context to these developments, and our analysis of the digitalisation of denmark on three different arenas to the vertical stroke. The understandings of the context the innovations occurs in, and how they went through the five phases of design thinking. Should provide a deeper understanding into why the field of digitalisation is so messy, and in the end what have prompted the digitalisation of Denmark. These different scopes are what constitutes the decisions we make, in the process of research and creation of knowledge that builds this thesis. It is the lens that we perceive our field through which forms our techno-anthropological perspective.

The process of digitalisation is not only ongoing, but cascading at a pace, that many may find it difficult to comprehend. **We** describe this as a messy field, because it is not only arduous to look for a structure in this field. The messy field has a vague or non-existing structure, in which terms and concept freely diffuses back and forth through the membranes that supposebly divide the fields. They move across sectors, fields and actors with no regards for it's original meanings or purposes. To try to crystallize them may only reveal a contextual understanding that evaporates as quickly as the context changes.
We use this idea of messy fields to follow the movements of digitalisation,

Our lifeworld is henceforth a guide that helps us navigate towards the right analytical approach when we question the messiness of the field.

*Second day at OFFDIG18*

As we woke the second day of the conference the combination of the cocktails and the gala dinner, had taken a toll on us. As we packed our clothes and started preparing to leave the room we had rented. We talked about what we had learned and who we had met the day before. With this straighten out, some clarity dawned on us, and during our walk to the conference, we started to divide some of the actors in into different groups. Some, even though just a few, still cared for the digitisation; converting analog material into digital signals and data. Another grouping were the vast majority who had focussed on the digitalisation and new and exciting ways to use what is already digitised, and apply new methods of analysis. As we were arrived at the Music House. We began outlining strategies to understand how these different applications could be opened. When talking to the employees and representatives from the municipalities. We were met with an openness and candor. They were happy to talk about their problems and limits of digitalisation. The other group was the consultancy, multinational accountancy firms, and data-analysis companies who all swarmed around and expressed how their solution was the best use of data. We agreed that they had a even more candor agenda on the conference. We realised that asking questions about their competition in a certain way, helped us gain insights into the issues of digitalisation. Lastly the more futuristic actors focused on "digital transformation" in order to change society and the interplay between the public and the public sector such as "sundhedsplatformen" and "min id". We still had issues clustering different actors who worked with all of the different variations of "digitalisering". As we entered the conference with our new strategy for how to open some of the different actors and extract information while still being a polite student. We discovered how the second day of the conference was more relaxed, and the fast pace from the day before had settled, people was sitting around and enjoying coffee and there existed a atmosphere of greater openness and informal small talk. As we walked around talking to people at the stands, we became aware that our new clever strategy had become somewhat obsolete, the different people

we met had a more open and relaxed attitude towards our less impressed curiosity.

*Methods and Boundaries*

Techno-Anthropological metier is relying on the researcher's ability to connect academic research, empirical data and technological artifacts. Certainly not a easy task. Empirical data is generated under a variety of circumstances which impacts what experience we the researchers end up with. Through this chapter we will open our method up and provide an illuminated path into how we achieved our findings through literature reviews, empirical generations, analysis and validations in order to construct and generate knowledge of a translucent field. We will make it transparent how we approached the field, our preparations beforehand and in the end discuss how this approached influenced our findings. Lately it has come to light that three major Danish universities have had severe data leaks in successful hacks from a foreign government (edt. 2018). We acknowledge this as our new reality, and as a new dimension to our methodology that should be regarded on the same level as representation and ethnographic candors(Sanjek 1993).

In our analysis we will represent the informants testimonials as best as possible while still allowing ourselves to analysis a greater body of work. This prompts a compromise where the virtues of letting the informants have a degree of auto-representation is overshadowed by the need for researchers to not just document but to evaluate and construct new scientific knowledge. To us this means that we as researchers are left with the burden of trust, both from the informants who let us into their fields and spend their time allowing us to get a glance in their world, as well as the scientific community to whom we write, and the greater public to which we are concerned(Emerson, Fretz and Shaw, 1995).

Our methodology emanates from both personal and academic curiosity. With this in mind we must understand that, how we satisfy our curiosity, impacts what understandings we gain. Our field is a culture which revolves around technologies, and where technologies interacts with actors. These interactions, actores and technologies changes both in form and purpose over time. To better understand these different forms and purposes and to satisfy our curiosity we study those who are already in the know. (Brinkmann and Kvale, 2009).

Fieldwork tries to answer those questions not obtainable through literature studies, since we study something happening in the now, it tries to understand those situations not explainable from laboratory experiments. In the end it suggest that sometimes we have to observe and interact in order to find the relationship between what our field is during rather than what they would answer in a survey.

Being in the field is about generating empirical data through observations, conversations &

interviews. It is a way for researchers to see cultures in action, to understand the dynamics and interactions between actors human and non-human alike. It is a way to open a door into another world, and being able to follow the culture all the way down the rabbit hole and see how far it goes.

Before we contacted the field we did exhausting research on the field. This meant that we did not contact the field until we had resolved other resources such as public information, public meeting minutes, academic research and companies websites, statues, interviews etc. Such preliminary research allowed us to prepare themes relevant to the informant, and made sure that we focused on the one with the knowledge we needed and couldn't be gained from other sources. We then contacted the gatekeeper through their public channels, such as listed phone number or email addresses. In some cases we met with representatives from the field at the Public Digitalisation 2018 in March. This established a clear point of first contact, we made sure to send a short email to the gatekeeper or informant after a meeting or phone call confirming in brief what we just talked about and what was expected to happen next. When we did interviews, either by phone/skype or in person, We used an digital audio recorder, without network capabilities, as an aid to keep notes, as well as individual notepads and pens. We further used a camera for photographic fieldwork, however, as this camera is a big and clunky tool, it is used hesitantly and very obviously. Observations
Through observational studies we understand how actors interact with other actors. This constitutes their specific collected culture. The culture is influenced by the actors and the other cultures they might also be a part of. In our observations we are able to glimpse into their workflows and perhaps better understand the context of our findings. The observations are the first and last part of our fieldwork surrounding and providing critical context to our interviews, litterature and conversations. Observations are a fluid tool, that conditions itself to the situation. With this fluidity a keen researcher always let the field influence their method. This fluidity is key, as it lets observations slip through the cracks of the methodology onto other disciplines of the fieldwork. Our observations will establish the setting and foundation of the fieldwork, all the tacid feelings, stimuli, and other inputs. They will be described through our observational notes and be reflected in our empirical data. This will further support our interviews and conversations. When observations always are a part of our fieldwork, our represiational principles must match the fluidity of our observations. This leaves us to rely on our phronesis to ensure a valid representation of our field and informants. We rely on our phronetic judgement to figure out if a situation is taken out of context, our even "off-the-records". Every observational study will eventually only be a glimpse and its situatedness will limit how we as researchers can describe the culture on its own (Brinkmann and Kvale, 2009) Our presence in these situations influence how our field behave and it is hard to imagine a

field not changing while we study them.

When we inscribe these observations we base it upon Emerson, Fretz & Shaws concepts of *Jotting notes* (Emerson, Fretz and Shaw, 1995). They encourage the researchers to note their first impressions, and build upon these as the observations unfold while noting key events and incidents by taking notice of feelings, tones, impressions and interactions both verbal and physical. Notes of personal ideas concerns are included to these key events. Yet these notes should be clearly marked as to allow for a "cleaner" analysis with a more cultural empathetic non-clouded agenda (Ibid). As we study our field as a material semiotic network all impressions and notes concern all actors human or non-human alike. It is within this we can take special notice of when actors "Stop and await" (ibid) and let these moments guide us to what our field find especially interesting. These should be the focal points of our interviews, as these are not necessarily self explanatory.This is to ensure that we the researchers do not over empathize the wrong interactions.

The Jotting notes themselves can be seen as a compression technique to write more with less. In order to be decompressed at a later time. By using Jotting notes in the field we acquire to significant benefits. Jotting notes by writing less is faster, which lets us inscribe more. Yet it is often unintelligible for most, since it is a personalized technique that often makes most sense to those noting. It is not until the digitisation where the notes will be decompressed that these notes becomes intelligible for outsiders.
Headnotes (Sanjek, 1993) apply the same basic principles, of several memory tools where the researcher constructs memories of certain key events, actors and interactions in order to construct a high fidelity memory later when inscribing notes. Headnotes works best when used in relation to other notes, such as jotting notes, and are essential to decompressing Jotted notes.(Emerson, Fretz and Shaw, 1995)

## *Informal conversations*

The informal conversations during our observations will allow us to focus our observations better and ensure that our understandings of the field corresponds with how the field views itself. Informal conversations are often unscheduled and often with a minimum of preparation into the questions themselves. Many times this will be done without the usual notetaking aids for several reasons, the main ones being that the conversations take place in front of coffee machines or while working. What is more important is that pulling up a huge setup of cameras, microphones and notebooks can switch the focus of an interesting and intense conversation. In these cases we rely heavily on what Roger Sanjek describes as 'Headnotes'(Sanjek, 1993), a method of remembering important themes of conversations rather than verbatim.
However when possible, and if the informants consents, we will use discreet aids such as notebooks or small audio recorders. The informal conversations is a great way to let the field guide us towards where they figure we would be interested in going, as well as getting some pointers towards where the more regular interviews should go.

## *Interviews*

The interview, in contrast to the informal conversations, is scheduled in advance, often planned through several phone calls, emails or previous meetings. The interviews are constructed to let the informants feel comfortable in a unfamiliar situation. To best represent the interviews both during the analysis and later on in our final product. We tend to use some aids that can seem exotic or unsuitable for normal conversations. As this equipment is only here to support us later on they are redundant and shouldn't intimidate the informants, if so they are promptly shut off and tugged away. It is in these situations where we plan ahead in order to have several tendency plans described in the interview guide. Careful and, even, profound planning relieves the interviewer doing the interview and comforts the interviewee by letting them know what to expect in advance (Brinkmann and Kvale, 2009)

When all of the above are taking into consideration we rely on a modified version of interview guides which we call "module based semi structured interview guide "inspired by the handbook Interview from Kvale & Brinkmann. The interview guide is as its name suggest a guide to where we expect the interview to go, and not a strict plan for what questions the informants will be asked but rather hint at where to take the conversation. We build upon the concepts of *the narrative interviews and conceptual interviews*.
Conducting narrative interviews is a way to make the informants answer the questions with narratives (Brinkmann and Kvale, 2009). This is the quintessential of getting the big picture of a intangible concept. It is a very natural way of communication, a kind to how we typically talk,

and not only a tool to make sure that we, as researches, grasp where the informants come from and how they formed their knowledge of the field but also a way to make the informant comfortable in their own story and place in this otherwise atypical situation. The narrative interviews is an exercise in listening, the interviewer ask very few questions. Which are as open as possible and control the interview as little as possible, and are merely here to guide the informant to stay on track in their stories and help them out if they feel that the topic is exhausted.

The conceptual interview is a very controlled form of interview (Brinkmann and Kvale, 2009). We use it to "zoom and enhance" on elements from the field and narratives. It is a way to uncover how the informants relate to specific terms and ideas. With the conceptual interviews we ask the informants for explicit descriptions that will illuminate already established jargon through the understanding of the informants. It is a powerful tool to establish if there is incommensurability or consensus across the field. To control the interview the interviewer will ask a lot of supportive questions and exhaust the informants until every nook and cranny is covered.

To create a synergy between these oppositional forms of interviews we have created a fluent model where we continuously craft interview guides based on both principles, but tailormade to every informant and the situation the interview takes place in. By making a module based interview guide, we allow ourselves to create modules of themes that can be added, subtracted or replaced without tearing the interview. The modules contains questions that needs to be illuminated from multiple actors and are the key to finding correlations in both narratives and concepts. However due to this multi exposure we might find that we need to modify or even discard some of these modules the further we investigate, which is why it is important that the modules can be interchanged without the entire interview falling apart. The modulation of the interview guide also allow us to move the modules up or down according to where the informants takes the interview while still leaving them on the page to come back to in a more appropriate time. Within the semi structured interviews we allow the informants to set both the pace and the direction while still ensuring that we get answers to every questions we have prepared. The semi structured interview is a very capable method to create the synergy between the narrow conceptual interviews and the wide narrative interviews as it relies on bigger themes with a subset of tighter questions below. By having these questions contained in modules that we can swap in and out on demand we have the possibility to create a intuitive easy to use interview guide that is even transparent if it needs to be modified on the fly.

## *Anonymization*

Our fieldwork relies heavily on authority figures, experts, public figures and policymakers, which would make anonymization impractical, these actors will be given the possibility of anonymization yet they will be informed of its impracticality (Brinkmann and Kvale, 2009). We will continuously evaluate whether or not their identities are relevant to our analysis. Once again we must rely on our phronesis to deliberate within the group, and with our informants, if we should provide them with an alias'. If so - they will be anonymized through the public accessible FakeNameGenerator set to Danish nameset and Denmark with randomly assigned genders(Fakenamegenerator.com, 2018). This could result in somebody gaining an alias that corresponds with parts or entire real name, to prevent any possibility of traceability any anonyminised alias' will feature Alias: [name] when first introduces whether or not their alias is the same as their name. If any informants mention any third-party, whom we are unable to identify. Or if they do not fall into the above mentioned categories, they will be given a random alias using the same procedure.

## *Transcription and digitisation of notes*

Our fieldwork relies on our informants' comfortability to express themselves in our proximity as well as them letting us into their worlds. A way to secure their trust in us is to make sure that we are transparent in our transcription and digitization methods:

Handling of field, audio and visual-notes is always done in non-public spaces with access control. Beforehand we decide if any of the actors mentioned needs an alias (Alias' are denoted with "Alias: [Name]" when first introduced), which then is generated and applied during the transcription, inscription or digitisation. This is done in order to prevent anyone gaining access to a master-alias key, In this matter there will never be a materalias key. If the same actor is mentioned more than once the researcher might have a temporary key to keep continuity which is immediately destroyed when the transcription or digitisation is done. The transcription is made using the tool OTranscribe, which is a web-based service that runs locally on our computer, which means that the files and text never leaves our computer during this process. When the process is done we save the file locally and, if necessary, share it between us using removable drives (Most likely SD Cards), which will be erased when this study is over. This local (non-internet) process will carry over to our handling of handling of pictures as well, where the pictures are handled in a non-tethered lightroom program. This makes it impossible for lightroom to synchronize the pictures to Adobe's servers even without us noticing it.

The observations, conversations and anonymisation are all part of our 'Fieldnote Evidence' and will be prominently displayed within our analysis, yet what can be perceived as "ethnographic intermediate result" will often be displayed as part of the analysis.

## *Pitfalls of doing fieldwork.*

When doing fieldwork the pitfalls can be plentiful. Often are these traps only noticed when pointed out by peers or outsiders. A common misstep is to be to reliant on people in the field, which can lead to a biased representation of the informants, also known as "To drink the koolaid" or to swallow their stories "hook, line and sinker".. In extension we as researchers might overinterpret the meaning from our informants. Both of these can be seen as symptoms of a bigger issue. Usually these issues can be solved by having the correct volume of fieldwork. The correct volume is always an estimate made by us the researchers, often this estimate is approximate to when funding and or time runs short. Yet when this is not the issue, or when the fieldworkers are better prepared (or at least more true to their methodology), a rough guideline can be taken from the snowball method (or chain referral sampling). Here one piece of empirical data leads to the next, and when inevitable some part of the empirical data leads back to where you have already been (meaning that the findings begins to resemble one another) the study is adequate saturation. With this saturation, the researcher should be able to determine by their field notes if they are overinterpreting as well as (though harder) if they drink the kool aid. Doing fieldwork is a ambidextrous process, and the reliance of the researchers common phronesis can create a nebulous product if done poorly. As the data we generate are inseparable from our observation (Emerson, Fretz and Shaw, 1995) our process most be as well documented as our findings (Sanjek, 1993). As we study our field, it is not only crucial to give special attention to the fields own meanings and concerns, but will provide us with pointers to tacit knowledge not being displayed in our surroundings. (Kvale, 2009; Emerson, Fretz, Shaw, 1995). Yet field notes are a subjective understanding of a situation, and most be considered as situational (Haraway, 1988) and can be elaborated upon when decompressing to make more coherent accounts taking other sources into consideration (Emerson, Fretz, Shaw, 1995)

Fieldwork is not replicable and should be considered a different science then the normative concept of positivistic natural science. Sanjek suggested in 'Fieldnote' that ethnographers should follow three canons: 'Theoretical Candor', 'Ethnographer's Path', and 'Fieldnote Evidence'. These canons in combination with the concepts of Kvale & Emerson, Fretz, Shaw provides a clear orientation towards openness, transparency and representation. All of these components come together to ensure representation, integrity and transparency of our fieldwork, which is constructed on the bases of Kvales 'seven stages of interviews', Emerson, Fretz, Shaw's 'Observations and note taking techniques' and Sanjeks 'documentation'. It is through them our lifeworld are constructed and through these our toolbox are compiled.

To ensure 'the ethnographers path' we chart our informants according to workplace, stance and if so what kind of public figure they are. We will keep a chronographed narrative throughout this study, to ensure our readers are kept up to speed on how the snowball rolls. This is also where we can indicate whether certain informants "guided the snowball" in a way by referring to other informants or to whom our gatekeepers sat up communication to.

It is of the utmost importance that our empirical data reflects our fieldwork in order to protect the integrity of this study as well as the integrity of our informants. Yet as we constantly generate data in contact with the field and reflect upon this during our research, analysis and writing we might (hopefully) gain a deeper understanding of the field when our research is coming to its end. Than what we had when we did our fieldwork. Our final understanding could change how we temporarily understood the experience we had with our informants. To validate our final understanding we will ask the informants to confirm that they were quoted corresponding to their experience and memory of the situation and that this is still their stance on the matter. In case of a controversy between our quotation and their current position, stance or memory we will ask them for a new quote which can be added instead or below the former quote. Depending on the severity of the controversy it's up to our phronesis to figure out what best represents the informants then and now. Any revisions in quotes will be noted with "Revision:[content]" .

*Train ride home*

As the day came to an end, and most people was making preparation to leave. We sat and watch a presentation about how innovation could be done using open data, with the case of Aalborg city. As we sat there (pretending to be) listening, we talked together in our lowest voices. We discussed the different forms of digitalisation and how some viewed it through the lenses of innovation, optimization or technological determination and wondered if we should define a broader technological understanding within the field. And how we would grasp all these different understandings of digitalisation?

When the talk was over and we came back into the halls of the conference, people were busy with wrapping up and getting home. We had scheduled some extra time to observe all of this, and figured we might as well sit in a couch and let the packing unfold before us like a timelapse of a anthill. As we were sitting watching the conference unfold in front of our eyes.
Before we headed towards the train station and found our seats in the train back to Copenhagen.
As our obligatory coffees peacefully vapored, we made ourselves comfortable in the train. We then opened our notebooks and began to compare impressions from the last two days.
As the train passed over Funen our notes and trip came closer to their inevitable end. Our fieldwork had brought a lot of pieces that needed to be put together, and in order to make sense of it all we needed exercise some reflection on our experiences through the last two days. Our general understanding of the digitalisation in Denmark had been challenged. Not only was this field a lot bigger than what we originally assumed, but a lot messier as well.

## *End of chapter summary*

We have in this chapter looked at some parts of our fieldwork through a narrative story about our participation in the national public digitalisation conference. Here we have expressed our experiences at the conference and shared our reflections from it. This in an attempt to share the proximity to the messiness that we felt. This messiness has become an important factor for our view of the Danish digitalisation field, that we will explore further during this thesis.

Furthermore we have introduced how we as techno-anthropologists operate both through the scope of our lifeworld and the methods that we use. When deployed in a field like the one that we have experienced. This understanding is important when we later introduce to the arrangement that we have chosen to display the empirical research that lies as the foundation to this thesis.

In order to gain as broad of a horizontal stroke on the T as possible we met many actors, with different positions. This prompted many interesting ideas, prospects and focusses. Most of these turned out to be ellipsis... To achieve the deep cuts of the vertical stroke. We opened followed our informants narratives of the digitalisation strategies, and analysed how the change from the agency of IT-Telecom to Digitalisation changed to innovations and integration of digitalisation in Denmark. As we learned more about this developments, we decided to demarcate us to a very specific techno-anthropological perspective

# *Chapter 2*

We have in the previous chapter looked into narrative parts of the fieldwork in this study, and given insights into the modus operandi of the Techno-Anthropologist. In this chapter we will shed light on different parts of digitalisation seen through the eyes of actors that operates within the different levels of public digitalisation. We will use a simple case of digitalisation from Dragør. To demonstrate how and why we use ANT, and moments of translations, to analyse the change in Danish national digitalisation.This will be shown with, a case of the use of iPads in kindergartens. And then an analysis into the digitalisation from the perspective of the Danish Agency of Digitisation. Especially how their operations and goals have evolved over time. As we do this we will operate within the constructivism scope of Actor Network-Theory (Latour, 2003; Latour, 2005; Salk, Latour and Woolgar, 2013) to map the different network constellations that binds them to digitalisation. To give a better understanding of these networks and the technologies that connects them, we will sequentially open up for the technological specifications of these constellations.. Lastly we will look into, what we see as significant technological outcomes of Danish digitalisation in an explanation of how government and digitalisation confines within the concept of E-government and how digitalisation is measured on a national scale.

### Monday morning after the conference at the university.

As we meet again the following monday we started understanding what we had just been experiencing. Starting by looking at the different people we had meet at offdig18, to understand who they were. By clustering the actors from the conference, and understand their relationship to each other we were able to identify actors and their constellation, dividing them into larger groups and when further looking at how they presented themselves, we could then divide them into different communities. Some lines were clear like the vendors who talked directly to the acquisitions about Digitalisation, and others kind of blurred lines like the consulting groups trying to raise awareness of their potential in data analytics. In this stage of the process we reflected on how digitalization can be seen from different perspectives and how it is many things depending on which perspective you have as an actor. Because the digitalization is so ambiguous but still such a dominating domain within the public sector, the possibility of taking advantage of public market is practicable for corporate actors. This atleast is the feeling we had when we entered the Danish digitalisation flea market in Aarhus the week before. This feeling strived us towards getting a deeper understanding of the composition of digitalization, and its actors, in Denmark even more.

*Digitalised antThe messiness of digitalisation*
When entering the field of digitalisation we encountered a messy field. In this field different terms of digitalisation were used without a clear sense of consensus. We let the use of the terms define the membranes of the fields. Everytime the term diffuses through the membrane it switches fields and is no longer within our reach. As long as the term stays within the membrane, the context may change, and by that the use, but the original idea only shifts slightly. By using our empirical data as a way to select phrases and terms that we wish to follow we find these membranes and can crystalise its contextual meaning. It is however impossible to know whether it has just changed into this, or will change again.. We believe that these provide a fundamental insights into understandings of how digitalisation changes by following it around within its membranes. The messy fields allows us to understand how digitalisation is used by different actors and how alliances forms, shapes and sustains the membranes. We will follow the actors and their actions in their networks to identify and open these different actions. In order to understand how the terms are being used and the incommensurability of digitalisation. In order to do so we need to introduce key elements form Actor network-theory (ANT) as they are needed throughout this chapter.

Another note worth mentioning is that: Digitalisation in the english language are better defined than in danish; where three different words describe the different stages of digitalisation. Our fieldwork were conducted in the informants native tongue, which made for some translation difficulties as they used the Danish word ‘Digitalisering’ interchangeably. This difficulty of translation have taken up considerable consideration as we worked with our fieldwork. However the messiness of the field do not dissipate when this translation hurdle have been overcome.

## *Digitalised*

All around us we meet the phrasing ‘A demand for increased digitalisation’(Jørgensen, 2010). We have come to know the concept of digitalisation, but had a hard time understanding the meaning of it. In this study we have learned that one of the reasons this concept can be difficult to understand, lies not in the concept but within the use. In some fields, digitalisation can be, to adopt a tangible artefact into a practice in order to free up resources (Kenneth Kristensen d. 06.04.18) and for others it might be to sprinkle some IT on a project (Adam Arndt 13.04.18) or to deliver broadband connections to every household (GlobalConnect @ Offentlig digitalisering 2018). The relevant question behind the menagerie then became “why do ‘we’ digitise” rather then “what is digitalisation”. The question of why opens up the possibilities to understand not only what they do when they digitise, but what have let to this decision and what they hope to gain from it.

In our research we have come to learn that the actors involved are plentiful and connected. Connections that form a network across the field. All the actors in this network works to obtain a common goal, regardless of their messy field and their use of the therm . The revelation of this goal would answer the question “why do we digitise”

A few actors have connections that spread all across the network, either directly or through others. These are the key players in the digitalisation debate. The key players methods and lingos become a integral part of the network. When we entered the field of digitalisation, we perceive it through our lifeworld, where we observed actors in context to their agency . This allowed us to identify how the different people operate in the field. We use the term actors from Bruno Latour *Laboratory Life; The construction of scientific facts* (Salk, Latour and Woolgar, 2013 and Michel Callon; *Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay* (Callon, 1984), as a flexible way to describe them. These ideas (Actors, Spokespersons, boundary objects etc.) lives within our messy fields, and can permeate through membrane without changes. Actors (nonhumans, and humans alike) fits both those who are directly interacting with the digitalisation, and those who are derivatives.

Common goal in translations

Networks are created when a series of actors initiate a series of negotiation, and define a common goal which they collaboratively try to obtain (Callon, 1984). The negotiations are described as a translation between the different actors in order to identify a goal. As the translations progress the goal can change. We found that actors who agree on a set of methods and uses the same lingo often created translations in order to make alliances with one another. Within these alliances they work together to achieve a separate common goal for the alliances that interprets the common goal for the network.
The interpretation of the common goal, is a recognition of the confusion of the word ‘digitalisering’ and the pressure for ‘increased digitalisation’. Within this interpretation, the alliance negotiate the possibilities of the common goal with the resources they have available.
These interpretations allows the alliance to create consensus’ about what digitalisation means for them. And how they can achieve the common goal, while they pursue their own individual goals. The goals as we know, can move, switch or change with the actors. This consensus becomes a boundary object, that stands in, and eliminates the need for a deeper discussion about the messiness of digitalisation, in order to focus on pragmatic solutions.

As different networks collaborate, the need for a common ground and understandings are needed as a means for enabling interactions between the different networks (Bruun Jensen, Lauritsen and Olesen, 2008), without the grueling work connected to constant negotiation, when defining concepts. In this project we have worked with the concepts of boundary objects as outlined by Jensen, Lauritsen & Olesen in *Introduktion til STS p.146-147* were the boundary object a seen as either a object or understandings where different meanings can be extended, as described in Ideal Types, circumstantial boundaries, repositories and standardised forms. These different concepts have a validity in the construction of digitalisation, we however have chosen to use the ideal types as this form of boundary object permits us to look at how different actors access the concept and knowledge that are stored in the digitalisation terminology. The ideal types have a form that illustrates the consensus of the group when it's between fields, but transforms when it diffuses through a membrane, to suit the needs of the field.

The fewer actors acting in the alliance, the more specific this consensus are allowed to become. While bigger alliances tend to negotiate a broader definition in order to gain consensus. The boundary object needs to be flexible enough to withstand the compromises of a negotiation, while being robust enough to create a sense of identification for the alliance. It is to say a "Ideal types" that enhances communication across multiple actors in a alliance or network. The Ideal type's purpose is to facilitate understanding across a network. It achieves this by being adequate vague and generalistic for everyone to understand it. While being plastic enough to be adjusted to fit a specific purpose for a specific alliance (Bruun Jensen, Lauritsen and Olesen, 2008). In the network of digitisation, digitalisation itself is vaguely defined. This is especially clear when it moves across the network or from alliance to alliance. When a boundary object is used within an alliance it suddenly hardens and solidifies.

The big network, an alliance of alliances, have developed a similar boundary object that ensures that network speaks with some sort of unison about digitalisation. The sheer legion like proportion of the network trammels the negotiations in such a way that only the most cliche definitions stands. Such as Charlotte Sahl-Madsen the former Danish minister of sciences appraise of digitalisation and IT.

*>>IT is a central source for innovation, it is the catalyst of new growth companies, it is the engine for effictivasation<< (translated from Danish: Jørgensen, 2010.)*

*Alliances in translation*

To understand how digitalisation becomes a useful 'boundary object'. We need to understand the different uses of 'Digitalisation' across multiple alliances.

The translations of these boundary objects between the alliances can be explained through "moments of translation"

Translations happens when actors acts to make changes in their own goal as a method of aligning themselves with the goal of the network (Callon, 1984). This creates a situation were the different actors can achieve their own goal by aligning themselves with the larger goal of the network, as in the case of fishermen of St Brieuc Bay were the goal of the biologist was to re-populate the bay with scallops. Whereas the fisherman's goal was to fish, this meant that they also could align themselves with the biologist in re-populating the bay, but their goal was further down in the action sequence.

Translations exist in the networks, these happens when actors interact either by strengthening their connections, reopen negotiations, appoint *spokespersons* or creates small networks within the larger network.

The concept of a spokesperson is that within a network of multiple actors. A single actor can be appointed spokesperson for the network and speak on behalf of the network. Spokesperson are appointed within the network. This can be determined by how well connected they are, if they posses some knowledge which grants the network legitimacy, or if they have been placed in a position of power by a larger network.

As in the case with the fishermen of St Brieuc Bay where the biologist acted in their own network. Butt also interacted in the larger networks with the fishermen, the japanese researchers, the scallops and the collectors in which the larvars anchored themselves. These different networks were all connected through a series of spokespersons. They could be a representative of the fishermen, or from the scallops, and the larvars which anchored themself in the collectors. Having non-human actors in the networks, is part of the lure of working with digitalisation through the scope of ANT were actions and agencies are both aserting from human and non-human actors alike. Working with a homonogent network, enables us to ask question into how the actors are interacting, whether these be non-human or human.

*Translations in digitalisation*

Moments of translations as described by Callon(Callon 1984) are divided into four stages, these different stages are defined by actions where the actors partake in negotiations.
We have followed the actors in their networks and seen how they act . But as a way to introduces this we use a sample from one of the fields we visited during our interviews. We will first introduce how the different parts of Callons moments of translations relate to this scenario, and then show how the translation moments occured working with the translation model as shown above.

The first stage of translations are the problematization where the different actors are identified, in the case with digitalisation in Dragør, some of the actors who are easily identifiable as the municipality, kindergartens, parents, pedagogue, kids and iPads. These actors are defined by agency and appointed by our informant Kenneth Kristensen from Dragør municipality, these actors were already place in the network predating the digitalisation.
The second stage of the translation is the intressetment where the actors are drawn into the network and kept in place, as digitalisation are introduced into the networks from actors which have control over the networks.
This can be the government introducing digitalisation into Dragør municipality as we have studied. In Dragør the digitalisation are being placed in the network by actors at the edge of the Dragør network. The interessment takes the form of being; interacting with digitalisation. Here the network can not work against the digitalisation as this comes from a stronger actor. Dragør have taken the digitalisation into its network and worked with it, they have engaged in negotiation with digitalisation, as we will show in the interviews and our analysis the digitalisation of kindergartens with the iPad.
The third stage of translation are how the different actors become enrolled in the network, this stage focus on the creation of alliance in the network, as we will show how the kindergartens have used iPads as a method of communication more abstract concepts such as children's birthdays. As the network are stabilised around the use of iPad in the kindergarten, the network mobilise actors as a method for strengthening the network. By appointing spokespersons the network can expand, and move it’s ideas or common goals into other networks. Appointing a spokesperson creates a network which can interact with other networks and mobilize new actors into join the network.

## *Dragør the iPad story*

The story of digitalisation shows the wide use of the phrase digitalisation. In Dragør we met one of the most tangible uses. We will use a specific example on how this is expressed from the Municipality Director, and use this as a guideline to how digitalisation can be understood with a ANT analysis.

The Danish society, as many others, have seen a influx of citizens who doesn't necessarily speak the language. We expect them to receive the same care and benefits as every other member of our society. This also relates to the extracurricular activities parts of having children in the kindergartens.
The embodiment of this in Dragør, have resulted in a appreciation of digitalisations. The iPads in the kindergartens have become a part of the method of translations especially when the language barrier becomes to big. The municipality director Kenneth describes a situation like so

*"A couple of years ago, we began to receive a lot of refugee families. This were a new development for us in Dragør(...) a kindergarten on the forefront of digitalisation began to use the iPad (and Google translate) to communicate informations to the children's parents. Like: "Remember to bring rubber boots tomorrow, because we are going on a fieldtrip - ten years ago we couldn't do that, even though it's not exactly rocket science."*

*Kenneth Kristensen d. 06.04-18 translated from Danish*
In this scenario, the iPads becomes a part of the moment in translation. The kindergarten teacher needs an aid to communicate with the parents to ensure the message is correctly understood.

This short simple scenario can be analysed much like 'the four moments of translations' where we will try to analyse the different actors in question, and what paths they take in order to obtain the same common goal

Callon introduces the first moment as "Problematization or how to become indispensable". The name implies that something becomes indispensable, and as we walk through these four steps it will become obvious what and why.

In order to best follow this analysis, we will introduce the actors once again.
*The kindergarten teachers* whose common goal is to provide care to the parents children. They relies on the parents ability to provide the correct clothing for the children, before they arrive at the kindergarten. In order to ensure this, they need to be understood.

*The parents* whose common goal is to have their children best taken care of by the kindergarten and its teachers. They need to understand.The first communication they have, becomes a negotiation among which language they both speak, and if the negotiations goes belly up, so does this communication.

**The problematization** lies therein the kindergarten teacher and the parents are unable to communicate without a interpreter, either another parent who speaks both languages and just happens to be close by or a professional translator paid to come. in either case, this person becomes the obligatory passage point for the communications, and if one is not around, the negotiation doesn't succeed.

The problem becomes: how to transfer a message across a language barrier from one actor to another, in order to achieve the common goal.

In this relationship it becomes obligatory for the message to pass through a passagepoint in order to be understood. In this case the translator is a obligatory passage point (OPP). By moving the message through the OPP both of their interest can be obtained. The parents interest in their kids receiving the best possible care, and the kindergarten teachers interest in also caring for the kids.

**The fundamental interest** of both actors is to care for the kids In the end the main interest of this particular scenario for both actors means caring for and preparing the kids, and communicating with the parents and kindergarten teachers. This fundamental interest tries to circumvent all other interruptive communications while in progress.

For the negotiation to happen, we need to have at least one actor who can interpret across the language barrier. In order to enlist this actor as a OPP, we must ensure that all criteria is met for both actors, which is this case is the ability to speak each of their languages. if all criteria for the negotiation is met, all the actors will **enroll** without resistance.

This would begin the **mobilisation.** The kindergarten-teachers have communicated successfully to the parents. And the point about the importance of bringing rubber boots have been translated and understood. The day after the kids come wearing rubber boots and goes on a field trip. It is when they kindergarden teacher have succeeded in making the parents mobile, this is to be understood as they (the kindergarten teacher) have directed their opinions and beliefs onto the parent and aligned their goals with the common goal. Their opinions in this case being that they prepare the child for the field trip and brings rubber boots the day after.. The mobilisation links the translations from the problematization through the ipad, that translates it to a language the parent can understand. The moment when the parent understands  and acknowledges it by taking action is the moment of mobilisation. thereby stabilising the network.  These negotiations will be described further in the coming section.

Lastly there we notion the concept of **betrayal,** this moment is conceptualised when an actor questions the foundation of the network and therefore its validity. When a betrayal occurs the actors agency shifts and is no longer represented in the network. Here new negotiations for the terms of the network must take place if the actor is to be included in the constellation again. In the case of the iPad an exemplification of betrayal could transfigure if the iPad is unable to translate the message, due to connection problems therefore not fulfill its part.. Here the kindergarten teacher would be forced to make a

new problematization where the iPad would be able to mobilise in the network again. This is also a presentation of the fragility that lies within the translations, as they are to be considered as continuously negotiations between the actors in the network.

In the case of Dragør, digitalisation takes the shape of the introduction of iPads among others. In this kindergarten, the one being on the forefront of digitalisation in Dragør. They not only use the iPad as a toy for the kids, or a tool for the teachers. It becomes the interpreter between the teachers and the parents. This introduction is self-imposed by some teachers which were bewildered when they first met parents that didn't speak the same language. Instead of relying on others (parents) in the proximity they picked up the iPad, and used this to translate. Since the iPad is a constant part of the kindergarten, they could rely on the iPad being available. The negotiations to use the iPad as a interpreter is often very easy, As Kenneth explains >>it's not rocket science<<.
The iPad have come to be a solution for many obstacles related to language and cultural barriers in the parent-teacher relationship. Kenneth the municipality director reminisces:

*"If a refugee family are uncomfortable with allowing your kids to go to a kids birthday, the kindergarten teachers have recorded a short video from another birthday for the parents to see. The kids then bring the iPad with them back home, so the family together can see the video and what is happening at a kids birthday party [edt. containing emotions, expressions and joy]. This allows the families to get a better understanding of the concept(...) Its has a great impact to have digital aids which lets us do more than we could with a pamflet."*

*Kenneth Kristensen d. 06.0418 translated from Danish*

This shows not only that the kindergarten uses the iPad to translate conversations and important messages. They use them to translate complex situations not usually conveyed by words. The use of of iPads expands from being a toy and entertainment unit for kids and kindergarten teachers, and a tool for translation between parents and employees This relationship will play a big part in the use of digitalisation in Dragør in chapter three.

## *SUMMARY*

Digitalisation have shown itself in many different concepts and constellations of actors as we have tried to demonstra with Dragør and the kindergartens. Different methods of digitalisation provides a range of outcomes, introducing technologies into the care sector can result in excellent use cases. ANT have illustrated how simple actions can be followed and understood. When we analyse how actors start negotiations in these moments of translation, it can help us with insights into why actors engaged in longer translations and alliances.

The moments of translation are used in this section to illustrate how different actors (often the human) starts negotiations when a new actor (often technologies) are introduced into their network.
Problematization shows how actors can start negotiations when they both understand that there exist a problem which can be solved by working together.
As the interest in the problem becomes clear, the actors engages in this selected solution for solving the problem.
As they enroll in this network they chose to work with this problem.
At the end in the mobilisation when they have acted on the solution they have mobilised the network, and achieved their goal. Here there is a meaning in the description of the process of transferring actors opinions on the common goal on to others.
When working with a problem such as solving the language barrier, ANT helps us understand complex situations. The moments of translations helps us to expand a understanding, that might become overly simplified if the complexity of these moments of translation are neglected in search of actors agency, and the construction of networks.
We will come back to ANT later in this chapter as we will demonstrate how different actors have joined the network of digitalisation.
Now we will open and follow a network in the field of digitalisation., Here we will show how digitalisation have been situated and contextualised when looking at how the Danish state have prioritised digitalisation. We have interviewed the Agency of Digitisation and been introduced to Basic Data Program, which we will explore by starting with an introduction into the technology which have enabled digitalisation.

# *The Danish It-Telecom agency*

Digitalisation in Denmark have happen over a series of years. The start of the digitalisation process in the public sector happened in IT Telecom agency which was located at the ministry of sciences, technology and development. This department was centred and focuses around the telecom aspect as described by our interview with Agency of Digitisation.

*"In IT Telecom we were around 300-350 people, where about 200 was sitting working with telecommunications conditions"*

*Digst 13.04.18 translated from Danish*

The focus on digitalisation have intensified and the technical solutions have transformed how the public sector sees telecommunication and the internet. Understanding how internet and digitalisation have been priorities by different governments. We will explore and map how the technology which enables the digitalisation of the Danish state have developed, and how it have become the forefront of technological investment.
In this section we will we will share insight in how digitisation has changed over time and what agendas from a political perspective drives the different developments within digitisation and how different technologies are rooted in digitisation.

The first part will explain how we see digitisation and how it has changed. To understand the state of digitisation today it is important to know how it has evolved and how strategies from the government has shaped the different initiatives that has shaped the Danish society.

## *A montage in digitalisation*

The possibilities of technology have brought onto us not only a transformation from analog to digital; With the possibilities to link data across documents, folders, file cabinets, locations, organisations and languages. Through advances in data management, computing and networks, the possibilities of data interpretation and utilisation have expanded. The fields of ICT research and studies have appeared and impacted administrations, politics and many aspects of citizenship in Denmark and other countries (Dansk industri, 2011).

While many governments and administrations have collected data for different purposes throughout the history, inter-department data-sharing were a rare event . Standardisation issues, legal restrictions and cost issues made the process of sharing data difficult to realise.

The Danish government implemented Electronic database systems. As these systems became more widespread not only in public and private sectors but also found a steady foothold in private households as a consumer good. In 2001 the "Agency for Digitisation" crafted the first general public digital strategy. This included possibilities for every citizen to use the personal computers with internet connections to communicate with administrations and government. After 2001 Emails were considered a legal opportunity to communicate with every part of the government, the citizens were given the possibility to sign documents digitally and authorities would begin to communicate digitally on a wider scale.

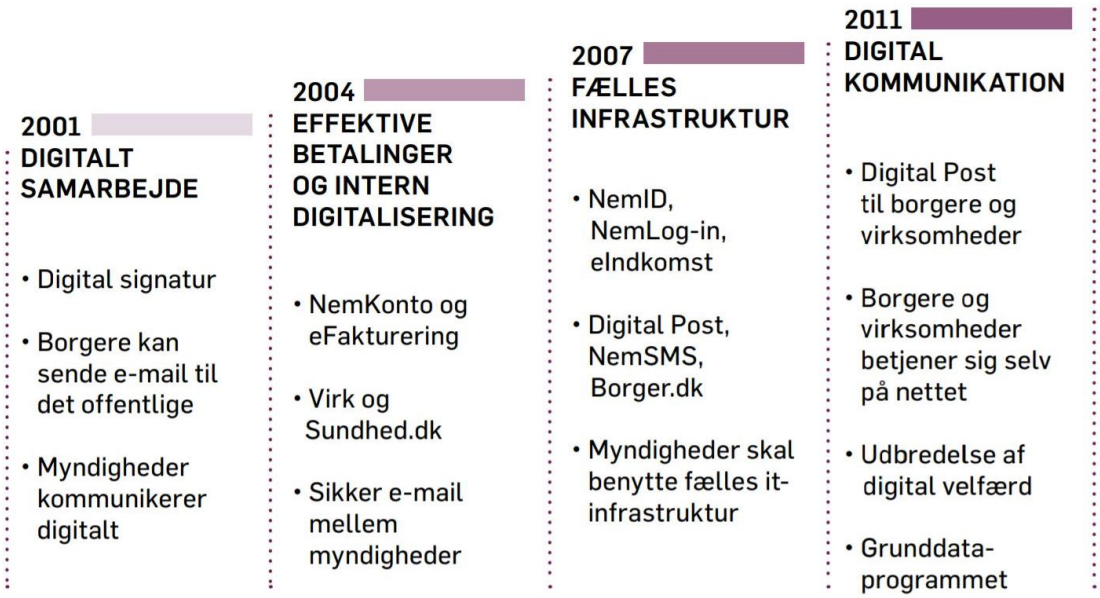
This first step of wider government digitization is pivotal to the way government is run. The scene of digitisation of governance is interconnected with technological developments and practitioners trying to administrate society in accordance to the law. Doing the 1990's and 2000's ICT would spread out through the private sector, into peoples homes, and in the end into the public sector. This was recommended by European Commision and quickly spread throughout european union.

The framework of how this new field came out of already established practises within governments. The conceptualization framework of this transition and the underlying systems, became a interdisciplinary learning journey across academics, practitioners and law-makers. The academics would study the practises of the practitioners, and create solutions that tried to accommodate their practises while still following the current trends within the newly formed academic field of digitisation from 2001 until 2009.

The period for 2001-2009 (European Commission, 2017) have had different areas of focus were the first years of the difitalisations strategy was centered around introducing and transforming the paper based work in the different departments into a digital administration. in 2001 under the banner "Digital collaboration" as seen in the chart above. They modernised by reorganising the Danish governmental communication so now they would communicate digitally, which further enhanced the access for those citizens with internet. By allowing the citizens to use emails as a communications tool to reach the governments on all levels (ibid).
In 2004 they changed the banner to "Effective payments and internal digitisation" which included a primary bank account that is available to deposits from the government's as well as electronic billing such as the "European Article Number" system which made it possible for approved companies to bill the correct governmental entity. This was in a effort to make a more efficient transactional relationship between companies, citizens and governments. They implemented a national online company register where companies can make filings to the government, as well as a national search engine that allowed anyone to look up companies public data, such as ownership and yearly financial reports. This enhanced both the transparency between customers and companies, as well as the efficiency companies relied on to cut down cost associated with tax filings, entrepreneurship etc. Furthermore they implemented a "secure email service" between their internal departments to increase internal security and liability (ibid).
Later in 2007 under the banner "Common Infrastructure" they implemented new national initiatives in order to make a transformation towards digital inclusion with a personalised Digital identity for both citizens and companies. a step towards more efficient communication

between citizens and government, but also a self-service initiative that would decrease the resources spent on both sides of the service desk. All communication with the government would now require a 2-factor login(NemID/NemLogin) and communication through a secure mail service (Digitalpost/Eboks). All government departments where required to use the same common IT-Infrastructure, which would enhance the cross-departmental/cross-border interoperability (ibid).

in 2011 they changed to banner to "Digital Communication" and focussed more mandatory Digital self-services across all public services to enhance the engagement and Quality of services. They allowed citizens and companies to apply for communication through the "Secure mail service" (Eboks/digitalpost) and they began the national open government data programs first steps. both of these to accommodate to more openness and better Quality of service (ibid).




(Digitaliseringsstyrelsen, 2018)

One of the reasons why Denmark have been of the vanguard of implementing trending digitisation strategies is the "small is beautiful" argument (Ko, A. Et Al. 2013 )

When we look through the public representation of digitisation and its role in the public domain, we can identify that the public agenda from the government changes frequently as new visions gets implemented, and as this progression has moved, a trend toward openness and the user has now seemed to be a important factor for government to succeed, as new initiatives unfold.

This idea has been influenced by an American agenda as Obama in his first presidential campaign talked about how the government must use technology for the betterment of the public sector, creating a more transparent government (O'Reily, 2010). The Obama administration categorized the transparency of government information and operations as the foundational pillar for an open government ideal. This ideal is prequisited by two other pillars; participation and collaboration. To realize the transparency ideal in government, data openness is seen as a decisive element (Susha et al., 2014).
Working with these concepts the Danish government started different programmes that were boosted as they exemplified both the efficiency and the transparency goal.

"*... small countries are more flexible if changes are necessary. A further outcome was that a pronounced interest in technology favours progress."* (Ko *et al.*, 2013).

As stated in the quote above Denmark has potential to capitalize on national strategies faster than larger scaled countries which does not have the same flexibility to implement strategies. But as Denmark is a small country we have had the flexibility and the political will to change and restructure large part of our infrastructure. Digitisation have been prioritised on the national agenda the last decade. Here we find *Basic Data Program* as the forefront initiative of this strategy to create digital cohesion and promote openness as a commitment to the Open government partnership(Agency of Digitisation, 2017). Also to keep Denmark ahead as a international frontier in digitisation. One of the initiatives that keeps the competition on its toes and denmark on the vanguard is the national Basic Data Program.

As we have explored different concepts and strategies in the previous section we now move onto the technologies that drive the digitalisation.
Understanding how digitalisation in the Danish context have become a priority and facilitated we will share insights in the development of different technologies that supports the digitisation and the public digital infrastructure. We must understand how computer technology have evolved, both in the infrastructure, hardware, software and why large data centers have become the preferred norm. As we explore digitalisation from the aspect of Techno-Anthropology a technological and historical understanding of the public's need for documentation, categorisation, information and simplifying is necessary to identify the different discrusses and world views we encounter in our meeting with the field. When we studied with digitalisation in the Danish society. We studied how the different agencies, municipalities and ministries are shaping the discourse around digitalisation. It helps us understand digitalisation as contextual and how people are interacting with digitalisation. In

this section we look at which different technological innovation and choices have defined how digitalisation is implemented.

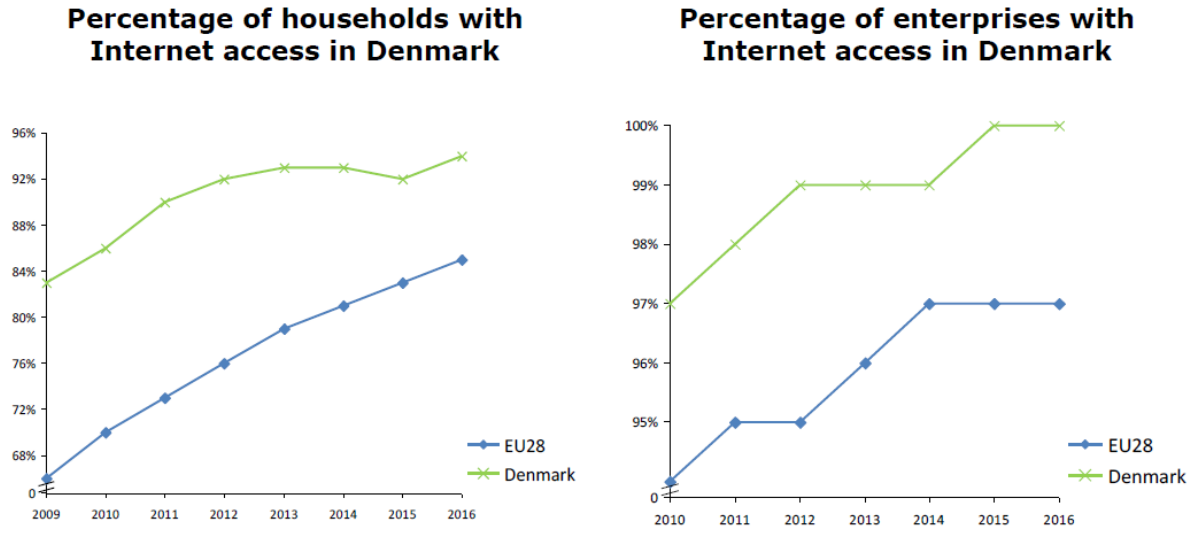
As Techno-Anthropology students we will be working with a technology understanding were we stack the different technologies(Straube, 2016). Stacking is a way of slicing the technologies and examine the different aspects and layers of the technology. Here we must open and investigate how the technology are constructed and have change over time and how these changes are defining our use of technology. Furthermore how they become a central part of the Danish society. When exploring how the infrastructure behind digitalisation and stacking the different technologies which have emerged in the research face. To identify and create our stacks around these technologies. In the first part of this section we focus on how the Danish infrastructure have been laid and how this have defined the digitalisation strategy, as data and the internet becomes an increasing part of our lives, the demand for working physical infrastructure follows.

The national Basic Data Program is internationally first of its kind and is a prestige project within the Danish digitalisation development. In order to acknowledge the complexity of how this project is trying to centralise central parts of the Danish infrastructure. It is important to understand the different underlying formats and platforms that are embedded within the project. Lastly we will look at some of the different data formats being used in the Grunddata, as these different formats are defining the type of data in a data set, and how it can be used. In the end a overview of the different technologies will be described. To understand how this came to be, we will present the foundation of the digitalisation, The Infrastructure.

## *Infrastructure*

The internet infrastructure in Denmark have been highly prioritised (Ministry of commerce, 2018). Internet by fiber and cables are available for 88% of the Danish households (Østergaard, 2017).

When compared to the rest of EU, Denmark are one of the leading countries when looking at the development of a country's citizens and enterprises that are connected to the internet via. Broadband connections, as shown in the graph below, where the green line indicates the Danish development and the blue line indicates an aggregated score of the combined EU countries or EU-28 (Eurostat, 2018-1); Eurostat, 2018-2)

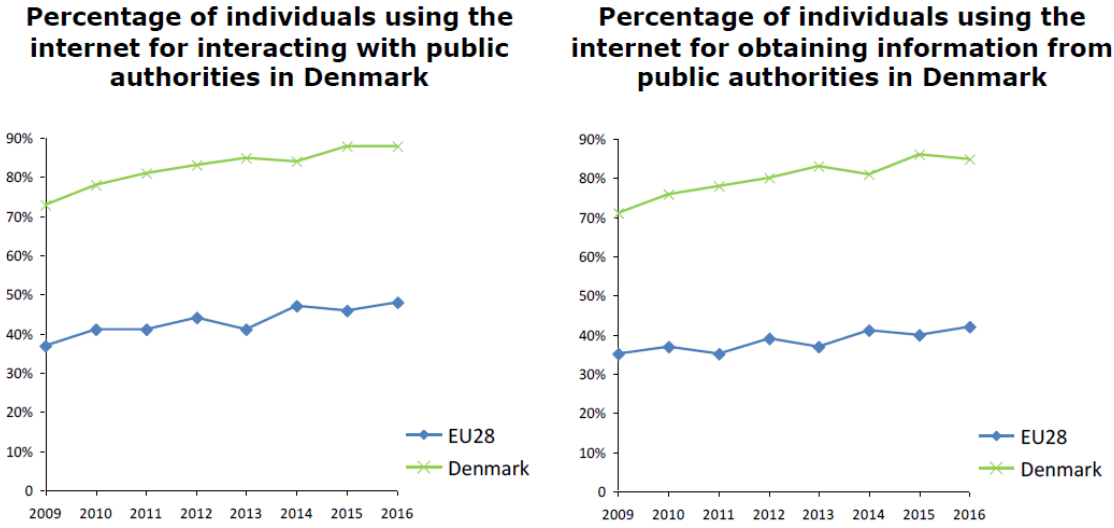



These strategy investments have been part of the different government's policies since the late 1980's. The Danish infrastructure have been prioritised as a way of improving the Danish coherence and as a way of creating a high-technical society which are attractive for foreign investment.

Furthermore the data revolution have created a need and for fast internet and data transport were the prospects for small firms and large companies to use more data in their daily routine are encouraging and are seen as a way to improve the competitiveness of Danish firms (Dansk Energi, 2016).

The Danish communication infrastructure have its first root back to the telegramme age. At a time where large parts of Denmark became connected by cables. This was seen as a way to connect the different areas of the nation. From rural areas to the capital from where the parliament was seated. This idea of connecting the outskirts of Denmark have persisted. In this day and age where an important part of the infrastructure projects focus on connecting the countryside of Denmark to the internet, through fiber and cable. This is seen as a way to provide a existence foundation from were the smaller cities can maintain and grow. Small

and medium sized companies, can attract younger residents (Dansk Energi, 2016). In the later years the technical evolution has become mobile 4G, 5G and wireless signal are enabling rural areas to connect to the rest of Denmark. In these areas the internet coverage have been low. The endemic development of internet access in Denmark has also brought the public services to the living rooms of the Danish households, as the public sector in 2001 opened for the possibility of people emailing them. Which lead to all communication with the public becoming digital in 2014 (Kildebogaard, 2012),




This development is also a part of the government's leading strategy towards a digital public where (digital)welfare is a part of it's digital structure. When comparing to the rest of the EU, Denmark is considerable ahead if measured on engagement with the public authorities through a digital media. This development has put Denmark in a position as one of the international leading countries in terms of digitisation and digital infrastructure, this capability have happened by the cables laying in the ground (European commision, 2018-1).

## Laying the ground

When studying different maps of Denmark in order to understand how the infrastructure are build. Provides insight into how the digitalisation strategy have been performed by the changing governments.

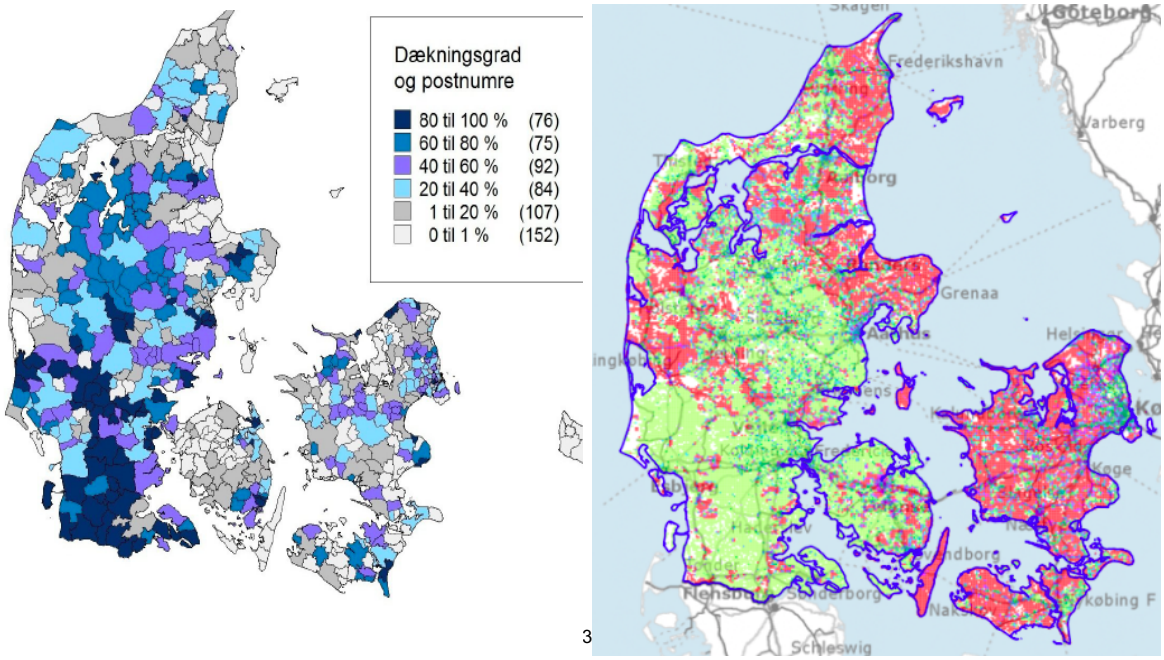
About 97 percent of the world's internet traffic today travels through underground cables. As the internet connects the entirety of the globe more than 420 data cables are connecting the different continents through data cables at the bottom of the sea. This is an important note to understand that the internet is physical (Valeur, 2018).

To keep up with the exponential demand in data capacity involves a strong investment in new infrastructure. Having prioritised a nation wide infrastructure solution in the phone age, can be seen through the development of different technologies and how the world have expanded. In the following section mainly focus on the fiber network as fiber are able to

transform large amounts of data, which are needed in a digitalised society and can be seen as the lowest layer of the stacks. Fiber are the main channel when moving data across Denmark, most households do not necessary have fiber connected into their houses. The fiber network however can be described as the highway. Where smaller data streams are combined, as it is known from the road infrastructure were smaller roads make up the cities and countryside. But when large distances and loads are transported the highways are prefered. Most households connect through a smaller datastream unto the “information super-highway” ie. the fiber network.

Looking at figure (below blue 2010) we can see how the first fiber coverage in Denmark are coming from Germany and moving up through Jutland. Connecting to Copenhagen via a string running through mid-Zealand. And how large parts of Fyn, Northern Jutland and southern Zealand are not yet connected to the fiber network, these areas are connected through the xDSL(broadband) and copper cables, meaning they have access to the internet at this time, however the speed which they can connect are still limited. Looking at more recent maps of fiber coverage in Denmark (below green 2018).

The map  (below green) shows how almost all of Denmark have been covered. The red spots indicates that only few households are connected, where as it is the white areas on the maps that shows where there are no fiber coverage. Examining the map shows how it is the larger cities and growth centers which are connected to the fiber string, this matches the policy of connecting business with high speed internet (Dansk Energi, 2016).




[3]

[3] The blue colors on this illustration indicates the intensity of fiber coverage. scaling from white where there is no coverage to dark blue which is optimal fiber coverage.

Following the data infrastructure in denmark  is essential to  understand digitalisation and how this technology have transformed from punch card systems and magnetic tape. That had to be mailed via snail mail. To a national infrastructure where large data packages can be transferred at a instance. This change in time, distances and quantity when transfering data have changed Denmark into a digitalised era. a natural step for the Danish public sector. As the digitalisation develops, and the extended dissemination of ICTs, the digital infrastructure become more complex. As are part of how the technology have evolved, and how the reliability, trust has become more important issues the demand for political adaptation too becomes more essential. With great connections comes great datacenters.

### *Datacenters*

The use of database before 1970 were divided between the hobbyist and the professionals libraries in particular had been driving the development of databases . The hobbyist was working on small databases which could help the individuel by organising and performing a series of task for the betterment of everyday life. The library researchers were at the same time working with large systems. Systems so large normal people wouldn't have had a chance to understand and use to make searches, The different databases were constructed differently, and knowledge about how the database was constructed were required to use them. These databases were constructed as a way to collect all information, and thereby making information accessible by searching the databases (Driscoll, 2012).

In the recent years the rise of cloud services, have created demand for data storage and a more complex type of organizing your data. This have been rendered possible through the implementation of the internet. The cloud is possible as a service through the access to improved bandwidth and the interminable lowering cost of data storage. These two factors have steadily made cloud storage a widely used solution for both private and public actors. As the cloud comes with certain advantages that can optimize certain aspects of digitisation (Abildstrøm, Kunckel and Grønkær, 2015) .

Working with different types of clouds services, can be divided into two different types. Public and private clouds services, in this section we will focus on the public clouds as they are the ones relevant when attempting to understand digitalisation in the a public sector and its messy field. The private cloud services are countless and all around the internet, where the best known are clouds such as Google Drive, Apple Cloud and Microsofts One Drive (Ibid.). These are huge sets of small individual clouds where the user only can access their own cloud. The public cloud are one large cloud were all of the public data are stored and can be accessed by all, depending on the security permissions the user holds. There is an economic advantage for the different public actors, by moving their data to cloud services (Ibid.). Public institutions use resources on operations and by changing to cloud services the responsibility for data operations and services are moved to the supplier, which is often a considerable expense for an public institution or municipality. There is also an incentive for smaller public actors for cloud services because they can experience difficulties maintaining operations of their IT (Digitaliser.dk, 2018). Something has to control the data centers, in the world of computers, the software controls the hardware.

## *Software*

As digital infrastructure are an important part of the digital public and its development is also important. It is important to note the difference software solutions that drive the imaginaries and concepts within digitalisation. We will in this section explore how different software which have been built upon the infrastructure have defined concepts like e-gov, Gov 2.0 and Open gov. The access and availability to the data which are need in the digitalised society are channeled through different platforms, data portals and databases. As digitisation has been implemented globally, the way we receive data has changed as information is more accessible. We will share insight on how different coding languages have defined how we access data and how the platforms that are used have become public dependable. In Denmark these platforms has become part of the welfare state, and as analog services gets outphased by digital solutions the reliability and security of of the private citizens are depending on the how these solutions are designed and operated. This will attempt to cover these important aspects of digitalisation as they are they are essential for the way access and availability of data.

### How to understand the technology and project its outcomes

In this section we explore the topical applications of digitisation in society. This allows us to understand the evolution and complexity of digitalisation and how the surrounding culture interacts with it.

Most prominent in the academic digitisation discourse of digitalisation stands the ICT field (Grönlund and Horan, 2005). With actors who are both academics and practitioners. The results of this collaboration is a new independent field as well as a pragmatic interdisciplinary development. The main drivers have shifted from mainly practitioners, to academics and especially tech-companies, who develop solutions to pursue the (political) agendas of the digitalisation. It is with this motivation that we hope this piece can shed a new light on the field of Digitisation (ibid). To do this we will share insight in the concept of E-Governance as this term is interconnected to a nation's ability to digitally adapt its government and public services.

As a part E-Governance and countries general digital profile, digitalisation is in this context closely connected to the countries ability to integrate and operate around ICTs. Both in its institutionalized operations and infrastructure. To accommodate these aspects we will disclose how digitalisation is measured by current standards. We will describe how national digital profiles are outwardly connected to its ability to perform on international index rankings of digitalisation. And what constitutes those scores.

### *Electronic government the concept*

The aid from technologies in governance have changed the practice many times over . Where technologies have made practises easier, cheaper, faster and less human-oriented, as ICT technologies have provided a way to engage the public in new ways (Castells, 2014). With the public's access to ICTs we have shifted from a internal-digitisation scheme to a bi-

directional digitisation scheme (Grönlund and Horan, 2005).
The digitisation before 2001 in Denmark were almost purely focussed on efficiency the new strategies focuses on inclusion, participation, transparency and growth. It's about bringing economic and social progress to the people (Buhr, 2017). The more self-service the public have access to, the more autonomous they become - and according to some the more innovative and prosperous we become (Andrews, Criscuolo and Pilat, 2015).
Digitisation is no longer just about freeing up resources. It is a way of freeing the people, it is way to generate and facilitate these freed or recently discovered ressources. And a way to leapfrog into the future.(Pedersen and Wilkinson, 2018)
All of this is a part of a more general discipline Called: E-Governance/E-Government. E-Governance (E-Gov) . In the beginning it were conceived as non-scientific domain to be analysed purely by practitioners. The practitioner took considerations from the pillars of the new public managements agendas of "Efficiency, accountability, decentralisation and marketisation" (Grönlund and Horan, 2005).Doing the 1990's E-Gov became a term that practitioners shared among themself along with other abbreviations. This solution became reality as the field became more and more scientific. This trend where focusses further by the first specialised journals which indicates a certain size of the field (Grönlund and Horan, 2005 ; Misuraca, 2012 ; Greve, 2013).
E-gov is a field still finding its footing, which makes most definitions irrelevant just as soon as they are uttered. E-Gov have presented itself to us in the literature and have worked as a term which have defined how the government can make use of data, computer and technologies. These underlying problem areas have we also encountered in the our field. As we have submerged ourselves in it. We understand that the term is being used in the Danish public sector, as how technologies can help and support governing the nation. Therefore we have chosen to use this digitalisation as catchall for the different uses. It have shown itself to be a integrated part of the field.

## *How is digitalisation measured?*

Through this report we have given a representation of some parts of the network that constitutes the Danish digitalisation field. In this section we will look into how digitalisation is measured by current standards.

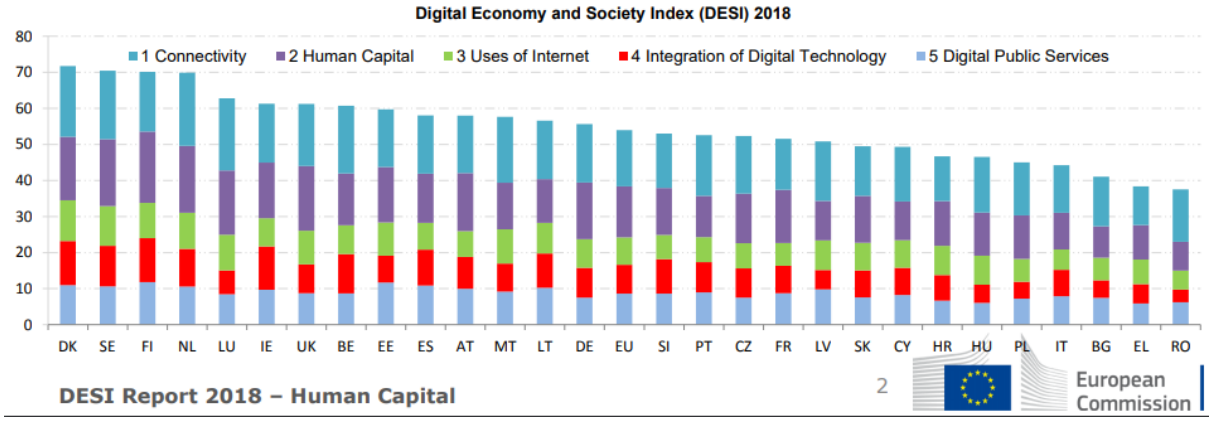
One of the leading factors behind the digitisation from a political point of view, is that digitisation optimizes certain aspects of our society when they are automated through digitisation. This optimization is often grounded in numbers that are presented through different policy papers. They use different measurements that presents and aims to make economic predictions and business cases. Policy papers in digitisation is often build on a statistical analysis of different sectors. Which are visualized through various graphs and then concluded by different recommendations to which direction a political scope should move towards. This position has among other things been conveyed through various analysis' and index systems. This understanding is a important part of the Danish digitalisation narrative, and a prestige topic for many politicians. To understand why this is so important, we need to understand how digitisation is measured throughout different academic fields, and if there are incommensurabilities in what constitutes them.

### How do we measure Digitisation?

Through our research we have encountered countless policy papers. Papers that all draw on the same index scores across the different papers. Many of these papers use the same formulation when predicting how digitisation will impact the economy in the future: "Estimated winnings on digitisation in Denmark" (Digital vækstpanel, 2017, Boston consulting group, 2016).
The most common representation of measuring digitisation is through different index systems that compares different factors across focus areas to a combined number. This section will give insight into one of the most established index systems, we have encountered in our research in an attempt to understand what it means when digitalisation is discussed on macro level.

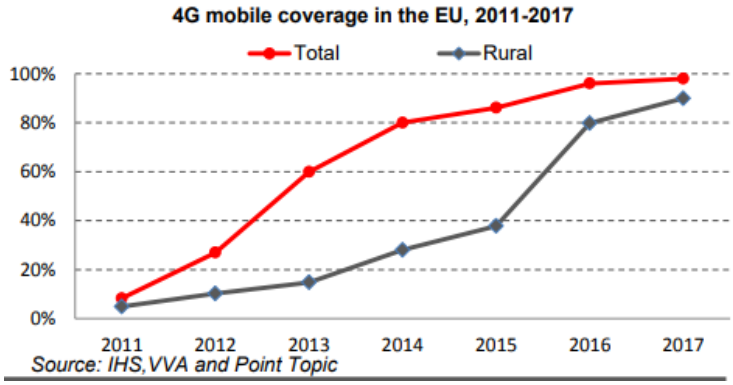
### The DESI index

The Digital Economy and Society Index (DESI) is the index used by the EU and one of the commonly used indexes within the countries of the european nations. It is arranged by five factors which represents over different 30 indicators for how digitised a country is (European commision, 2018 **-1**).




4

The first factor is the country's internet connectivity. This factor is determined through various forms of technology but is mainly measured through the accessibility of fixed broadband and fiber solutions. This is further determined the economical accessibility from the population and its capability to provide broadband and fiber connectivity in rural areas (European commision, 2018 **-1** ).




As the internet capabilities and development is the driving force in this sector, the infrastructural properties of a country is important to keep up with the demands as the sector move towards what visionaries describe as endless possibilities. Here we refer to fields like Internet of things, AI technologies and robotics as the ICT field evolves rapidly (Digital vækstpanel, 2017).

The second factor is the digital skills, or human digital capital, of the population within the respective country. This factor is mainly measured through two indicators basic skills and usage and advanced skills and development. Here the advanced skills and development are ascertained by employment based on ICT competency and graduates within the domain of science, technology engineering and mathematics (STEM) disciplines (European commision, 2018 **-2**).

[4] Each factor is illustrated on the different bars by five different colors, the score is measured on a 1-100 scale and (X) and the different country abridgments is illustrated on the Y axis.

As digitalisation evolves there is a increased demand for digital qualifications in Denmark, which we see are being more prioritised on the political agenda (Digital vækstpanel, 2017). Towards 2030 it is estimated that the demand for STEM competencies in Denmark will grow. Here current projections indicates that Denmark will need up towards 19.000 people with the right qualifications to cover those demands. As political reforms are being constituted continuously through the whole education system to support a digital skill acquisition there is still a demand for increased focus on this particular area (Digital vækstpanel, 2017).

The third is use of the internet in the country, how adapted is the country's population in internet activities for example retail, banking, social media or reading news. This factor is an estimated representative for the degree of engagement that the overall population has with the internet in everyday life (European commission, 2018 **- 3**).

Fourth factor represents how well a country integrate key digital technology in business. Key digital technologies are expressed through business' capability to integrate technologies. These key digital technologies are composited by two different indicators, business digitisation and e-commerce. E-commerce indicates how well small and medium sized business' perform selling both domestically and cross border (European commission, 2018 **- 4**).

The fifth factor is constituted by how well a country is digitalised in its public service areas, and like the other factors this dimension is measured through different indicators that together equals the measurement of the country's digital public service profile. The first indicator is how well a country performs in E-Gov, which here constitutes how well the country's citizens submit digital forms via. internet to public authorities (European commission, 2018-5). Furthermore this indicator is also measured on the integration of digital public services for local business' and how well these are interoperable and crossborder. Another indicator is how well a government commits to open data, so called open data readiness. This indicator is measured on how if the government have policies for open data initiatives and how well the different local authorities are coordinated for open data (European commission, 2018 **-5**). Last indicator is how well health services are digitally integrated, and how well the citizens of the country use the health services that are provided online.

As these conjectured systems and concepts might seem erratic to go through we believe when we talk about how digitalisation is applied and understood in a small municipality in Denmark it is important to understand that those cases are reflected in the outcomes that are being communicated when digitalisation has been inscribed and processed into a number which indicates a country ability to perform digitalisation. When digitalisation is being debated politically and in the media its is established indexes like these that forms their reference.

## *Summary*

As the internet gained a central position in Danish society, we understand how it have come to define the digital infrastructure. As Denmark becomes connected via cables, and fiber the concept of distances blurs. The signs of infrastructure disappear as electricity, telephones and internet were laid into the ground and vanished from our collective understanding. This disconnected our understanding of how we are connected. We must strive to understand that the data we rely on, when we use the internet, are still ever present even if it have become invisible. When debating digitalisation, the technologies gives insights into the intensified technological development. Which have lead to a situation from where data can be collected and then transported over huge distances in a instance. Data centres becomes the focal point from where data travels through the fiber strings and interacts with the public sector. This happens when information becomes digitised, and contact with the public sector are forced through portals such as borger.dk.. The internet have become a integrated part of the Danish society. As danes uses the internet on a everyday basis the internet have transformed how we interact and communicate. These changes have happened over a period of 17 years, and are almost invisible in the landscape. The infrastructure are buried and the data centres are located far away from the main cities, the technology used are packed away in laptops, and the interactions are smoothed on the surface.
With progress of the ICT's and digitalisation, new understanding of how to govern have emerged. These new concept are interconnected making these concept a part of the invisible infrastructure. As the technology becomes invisible we chose to follow the actors and analyse how they interact with the technologies as a method for understand the impacting of digitalisation.These new technologies uses the connections that spreads through different parts and paths. Like a mosaic the technologies and concepts located in denmark makes best sense when see from afar.

# *Agency of Digitisation*

The Danish digitalisation as shown in *above* have been a process over a series of years and strategies. The digitalisation have come into existence the dimensions have become more divers. One of the main actors in the digitalisation of the Danish public sector are the Agency of Digitisation (Digst). The versatile network of digitalisation becomes an international network when working with Digst as their network consist of other actors from EU and FN. These actors have manifested themselves in the network, however during our interview with Digst they were only mentioned in a passing remarks. This have let us to scale our network to only fit the national actors. As the international influencers represents passive actors in our empirical data.

In this sector we will illuminate how the digitalisation strategies have become a network and how the different actors have enrolled themselves in the network. As the digitalisation have moved from an immaterial object into a ideal type boundary object. Where multiple actors can engage the object where it takes shape as a clearly defined actor in the network. Digst have proven itself as a actor which have had a platter of roles in the different stages of Danish digitalisation. Understanding how they have consolidated their roles in the networks can help understand how other actors engages in the boundary object of digitalisation.

## Internet in Danish context

Described by Digst in the interview, digitalisation have happened i stages where different agencies have been created, relocated and dismantled in the Danish digitalisation history.

*"The IT telecom agency was a different organisation we were closely connected to the ministry of sciences, technology and development where the rhetoric was centered around the creation of the internet,[...] making the internet work in an organisational and technical level."*

*Digst 13.04.18 translated from Danish*

The internet have become more available as organisations which are tasked with the construction of the Danish infrastructure have create a networks of their own.

In the quote *IT Telecom Agency section(page unknown)* our informants recount how they started in the IT Telecom Agency, where the main focus was centered around the telephone marked and infrastructure. At this time the telephone market was not connotated with the internet, and the main focus of this agency was the development of the telephone marked and infrastructure. The internet in this phase was still in a stage of problematization were the different actors were aware of each other as connected through the IT Telecom Agency. The different actors at the time were using different technologies for communication such as the fax. The quote tells us about how the agency at this time was a network where the

agenda were focused around preparing the infrastructure to creating the internet. This paralleling where they are focused on creating the internet, can be seen as a metaphor for how they also worked with the construction of the network of digitalisation.
As the internet grew stronger and more accepted the problematization of the network became more clear.
As these different networks align themselves around the internet. They become identified as part of the network where they partake in different roles, such as the different municipalities and agencies which provided the data.

### The content

These actors which aligned themselves with the network around the internet and digitalisation, had different goals which could all be accomplished by digitalisation, be it optimization or profit.

*"In IT Telecom we talked about digitalisation as content, digitalisation which developed new services, so that the internet become useful. So that we could explore the internet's great opportunities, in relation to optimization in the public sector. Also in context to the private sector and society as a hole."*

*Digst 13.04.18 translated from Danish*

The content aspect of the internet, as described in the quote was a priority in the problematization phase of the design. Our informants demonstrates how the content of the internet also was a part of their network creation formation. Coming from IT Telecom Agency, where the telephone have been the priority. The telephone works by connecting people, and creates the possibility to exchange information in real time, where the content on the telephone are monetary. Working by creating a connection between two actors and enabling them to exchange information this temporal network but ceases to exist when the phone have been hung up.
Where as the internet works by inscribing information into databases and allowing other actors to access them. The different actors who gain access to the databases creates a network with the databases. This allows the user to inscribe information to the database. Which is now accessible for others who can access the database. This relationship establishes the new network, and tries to interest new users to enroll. This is a more permanent network which does not ceases to exist when the connection to the databases is terminated. The information have been moved/copied from the central network of the database, into the local network where a stronger connection to the data can be established.

This difference in design between the phone and the internet created a situation where the internet and digitalisation part of the IT Telecom Agency was moved into its own network Agency of Digitisation.

*The common goal*

As the internet part of the agency was being removed a new set of common goals had to be defined. As IT and telecom was combined before, actors which was interested in digitalisation was forced in enter into a network where the telephone was and actor and had a role in defining the common goals of the network. in this new constellation the digitalisation was focused thereby allowing the different actors to undergo negotiations about digitalisation in the public sector focusing on the infrastructure of internet.

*"In Agency of Digitisation the way we talked about digitalisation either rhetrotri or discures are focus on the public digitalisation especially in the beginning. When we started there was a common public digitalisation strategy from 2011-2015 which are focus on the optimisation of the public sector. Also this is where Basic Data Program are introduced"*

*Digst 13.04.18 translated from Danish*

The two agencies now had different areas of expertise and this divided the network of Digst, as this new agency primary task was an optimisation of the public sector. The network had to undergo a transformation which redefined the common goal of the actors, as the quote above exemplifies through Digst's discourse revolving public digitalisation.
These different actors had undergone a translation phases in the period while Digst was part of IT Telecom Agency therefore the later creations of the network surrounding the Digst had a predefined set of goals and actors which were all identified and had created connections with the Digst's. However as the telephone had been relocated in the network to a less prominent actor, the new actors could defined new goals an reorganise in new constellation which was more focused in the new goals of Digst.
Optimization and digitalisation of the public sector became how Digst presented themselves to the technological network in Denmark.
As the internet and the content were understood and it became a tool for optimization in the public sector. The content of the internet were seen as an integrated part of how digitalisation is used.

*Digital strategies*

Looking at how the Basic Data Program (BDP) come into realisation and how the different negotiation have happen in order for this platform to emerge as a viable options for the Digst and the surrounding networks. The actors who had been involved in the creation of the

internet infrastructure had reached large parts of their goal. We describe in *Laying the ground* how the internet coverage and speed in Denmark had increased in such a degreed that platforms such as BDP became a possibility.

*"In the meantime (2011-2015) Agency of Digitisation created strategies for digital welfare. Where the focus was on also creating quality elements of digitalisation, broader needs in society and a wider ray of issues with digitalisation. Not just the public sector was our focus, we also was tasked with digital services and self service, which people could use and benefit from."*

*Digst 13.04.2018 translated from Danish*

Also the content of the internet had achieved a qualitati which made the exchange of this data an upgrade in how the state had previously shared data. Municipalities, regions and agencies had during the years been digitalising their data, these digitalisation efforts had connected the municipalities to Digst. As these actors had been connected in a digitalisation network which had been forced by the politicians. As they have been placed in networks by politicians they have been bound to work together even if their common goals in the beginning of the process were not the same.

They have undergone negotiations related to how data was formatted and the quality of data, how to prioritise digitisation and the need for documentation. Some of these negotiation have been open, and some have been visible in the press, where municipalities had ventilated about how the documentation had taking time away from caring (Rostgaard and Matthiessen, 2016). These two different networks, the municipality and Digst, have during these initial clashes both been locked in to the network by the politicians. These outburst have been overcome by the network itself or the government have stepped in and taken side in these disputes. The quote tells how new digitisation initiative became more focused on the digital welfare and how new strategies moved away from introducing the internet and digitalisation. These new strategies were based on the internet as a stabled of the infrastructure. Where the networks, as introduced in *The common goal* had achieved their goals. Using this success as a method form where to creating intressetment for new actors to enroll in the digitalisation network. These new actors would help define how Digst could answer some of the broader needs in society and the issues with digitalisation as described in the quote above.

### *Basic Data Program*

The digital welfare consists of different self services and portals These can be services to citizens such as borger.dk, SU.dk and sundhed.dk. The introduction of technologies in different practices such as the iPad in the kindergartens. We will in this section focus on the

BDP, a data portal which are constructed on the basis that data have value when being shared and used. We have chosen to examine how the BDP were created, and how different actors in the process have been enrolled in the network of Digst. As BDP consist of a cross platform, where different municipalities and agencies have joined to create a platform which have large storages of data. Creating a new OPP where information must travel through. Information have been located at the place from where the information had been created. When a agencies made inquiries into its own field and creating data, they had control of this data. Other agencies who wished to gain access to this data was forced to engaged with the agencies who had controlled over the information. Thereby the agencies where OPP for this data, as all other actors is forced to engage in translations when wishing to gain access to this data. With the introduction of BDP the OPP have been moved away from the agencies who create the data, and into the BDP as all data are channeled through this data portal.

**Digitalisation through Basic Data Program**

The public sector generates and registers great amounts of data across all of its activities, these can be on the citizens or the businesses around the country, these could be CPR-data, Geo-data or map registers. These data are used frequently by the different public sectors and are essential for the way the public serves its citizens.

*When devising the Basic Data Program we thought the thought we possess some basic data which we need til deal with. Like a company who needs to process their master data. So we almost define the public sector as: We possess data which we need to use again and again, making it important that the data is validated and standardised. As this will reduce the cost of processing this data.*

*Digst 13.04.18 translated from Danish*

The concept behind the BDP is to centralise these data across the sectors to one platform. Having explored how the different parts of the digitalisation have come together and have formed networks we here come at a point where the networks are joining making accessibility into the data more simplified. That functions as a central distribution hub for all core data thereby creating efficiency, shareability, connectivity and saving money by automating different processes that would otherwise be necessary when sharing these data. Besides creating efficiency in the public sector the idea is also that by making these data publicly available the private sector will benefit and create growth through innovation. This perspective is also why the government sees these data as raw resource, exemplified here in a quote from the basic data programs website:

*"The basic data program refines the Danish digital raw material and courses the way for new opportunities" grunddata.dk translated from Danish*

The BDP have been in development since 2012 and is a prestige digitisation project between nine different institutions, ministries and state departments. The program is a joint operation between the Agency of digitisation, SKAT, the Danish business authority, The Ministry for Economic Affairs and the Interior, KL, Agency for Data Supply and Efficiency, agency for geodata, ATP and the Danish regions (Grunddata, 2018). These different actors have been tasked with centralise their data through the platform so that the data they supply can be distributed from one single entry point. As these different agencies all originate from different areas of expertise, we have during our research learn how the networks enrolled themselves in this network.

*In the first meeting between the 5-6 different permanent secretary all showed up, with large folders under their arms with objections from their department. As the first sat down and said "I have this folder from my department, how about i put it aside"*

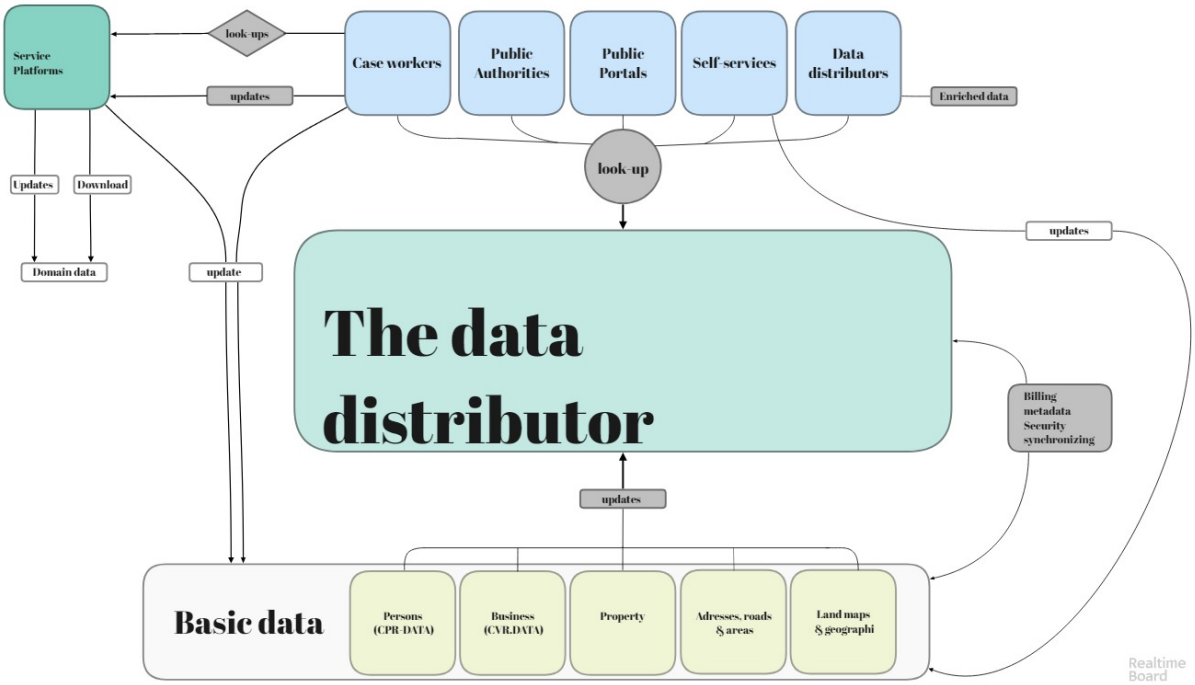
*Adam Arndt 23.04.18 translated from Danish"*

The public optimization aspects of The BDP alone is envisaged to deliver economic benefits for 250 million DKK a year (Grunddata, 2018). Integrating these different actors in a network as described by our informant, they have use a metaphor from about how a single company must use their master data. In the case of BDP there are multiple different agencies, who collects data and standardizes it to make it possible for cross connections in the data. Creating networks which branches the many agencies and agendas shows how the overlying narrative in the Danish state was one of effictivitisation and cross agency connection as show in *What is digitisation and how has it change.* These spokespersons all chose to enroll their own respective networks in this new network which problemasations had centered around the concept of simplifying sharing of data via the data distributor.

The data distributor.

The data distributor is the key platform in The BDP. It is a "one-stop-shop" that connects inquiries with data. it's main function is to distribute different data from the different governmental administrations, to different users. This data are divided into five categories: Personal data from the CPR register, corporate data from the CVR register, property data from the BBR register, and geographical data from public geo databases, road and address data from Agency of Map and Land. These different data is mainly to be distributed internally when different public institutions inquire for public data. For example if SKAT, which is the governmental institution that maintains the collective tax data. Needs to harvest data for their operations,They go to the one-stop-shop og BDP and receives data from all the central databases. One of the many arguments for a centralised platform; is that if you need public data you only has to do one inquiry. This can optimize the procedure for many of the public

authorities, that deal with public data. These public actors can now communicate from a common reference point by having a the same interface.




The illustration shows the flow on which data is moved around different authorities through the platform and distributed. Here it can be accessed through queries from others, both public, private and corporate. Agency for Data Supply and Efficiency(ADSE) maintains the operations for the site and receive updates and feedback from the different public authorities and can adjust the platform.

*"Basic data should be a source of growth and efficiency. Data Distributor must therefore provide reliable data easily and stable." - datafordeler.dk translated from Danish*

As the Data Distributor works by providing a platform from where the public data can be distributed to different parts of the public sector and private actors who wishes to use the data. The distributor can be seen as a shopping mall, where data or goods are brought together from many different brands or departments, and sold under the same roof, making the data more accessible and sharing more simple.

## Simplifying

When digitalisation initiatives such the BDP reaches stages in its process and developments in the different outcomes become clear, new ways of understanding digitalisation also becomes illuminated. As we have shown in this section with the BDP where different networks had to be negotiated as a method for prioritising a certain technology. By following the BDP in the network of digitalisation we have explained how the networks have been created by actors, who has had an interested in the development of these technologies. As

these negotiation have been anything but simple in the different moments of translations before. they were ranging from the selection of technologies, which provides the backbone of the Danish infrastructure, to choosing how data should be standardised. The networks how reaches a stage in its common goals where the BDP have become operational and as the BDP have been introduced to us from different actors how have all had a connection to the network around BDP. A phrase have manifested itself in the discourse; simplifying. As different terms such as efficiency, optimisation and reliable have entered the field these terms have also been used when describing the BDP. They have all been used as a way of describing how smaller parts of the BDP can assist their work. Moving through the field and engaged with different actors a new term have emerged and shown a more resilient definition of how BDP can be understood. The sharing advantages of the BDP have demonstrated the potential for simplifying the work process of the different agencies and ministeriums. As the access to the data have been joined in one data portal, which have made the task of collecting data when working with data from multiple agencies simplified. As the BDP have worked with standardising the data output from these agencies making the data uniform creating a situation of interconnector. Data from multiple sources can be merge, and worked with in the same project enabling thereby simplifying the work.

### *Summary*

Digitalisation have become an integrated part of how we understand the world. The technologies being used with digitalisation, have become an invisible truisme. As we have demonstrated with these negotiations the different technologies were implemented as a result of which technologies had enrolled themself in the networks of Digst. These negotiations created a basis for how new technologies was to be introduced into the Danish digitalisation, however at that time of these negotiation they were fare from invisible.
BDP will become a integrated part of the public sector and will open for the sharing of data between the municipalities, agencies, private firmes and citizen. The network of Digst occupying digitalisation have moved from the IT Telecom agency into their own. Creating a situation where they became more agile and adaptable when negotiation with other actors. As described the network started by being detached from the larger network, transforming into a smaller network which was able to engage with other actors in the digitalisation. As we described through this section digital solutions was created in a messy field were the different actors was in a ever state of negotiation. As the Digst becomes their own actor more stable networks could be created and the different actors join around a single problem. Having understood how the BDP could acceblise the goal of create a more connected and standardised public sector the different actors accepted the OPP of the data distributor. As the planes become more elaborate and stable the advantages of this platform become clear, making other actors enrol in the network. As the platform have been launched and working the network have mobilized itself. As we have learned in this section, as the infrastructure have become matured developments in internet and content have become a part of the Danish digital welfare. We have seen how innovation goals have changes and goal post have moved from optimisation to simplification. This have shown the relevant of content when trying to understand digitalisation and technology.

## *End of chapter 2*

In this chapter we have focused on how networks have been created and how actors have arranged themself in these networks. Beginning with the debriefing of our trip to Aarhus where we met a who's who of the people in the Danish digitalisation.
As we contemplated which experiences we have collected from our trip, we started visioning a field which have become overly messy. Where the people who was a part of the digitalisation had created a understanding in how they used the word digitalisation. This understanding were only used in their own field. Creating the need for ideal types of boundary objects, where the definition have become flexible enough to contain all the different understanding of a single word. This was a part of our confusion of the field, and we started treating digitalisation as a messy field.
As this messiness started dawning upon us as we began to look at how the interviews we had conducted described their definitions of digitalisation. We followed their descriptions of digitalisation, to better understand how the different discourses were created. As we started with the Dragør case, that showed how the data we have collected can be understood, explained and followed with ANT and moments of translations.
ANT allows us to interpret how the parents and kindergarten teachers introduced a ipad as a interpreter to simplify their communication. The introduction of the the iPad means that they no longer have to rely on a interpreter being available. ANT brings meaning to this the idea that this is digitalisation, by following the technology we explained how it became an actor that benefits all actors in the network.
Our interview with Digst brought another focus. A new definition of the word digitalisation, which were centered around technology in a lot more comprehensive and less tangible way. Introduce the technologies which are the backbone of digitalisation, and followed them to understand how this was crucial for the digitalisation. Digitalisation are part of a larger network of many human and non-human actors, which it rest upon. Working with the iPad the infrastructure must be in places as these uses of the Ipad demands the infrastructure to become mature. An as the infrastructure have matured, it have become invisible, which allowed the different definitions of digitalisation to also become invisible.

In the Digst interview they describe how they have used all aspects of the infrastructure as a part of the platform. Using the fiber cables  to transfer large sets of data. meant that the data storage could be centralised, utilised and connected. This is a key factor for the data to increase its value. When the data is shared they uses a standardised format thereby allowing all participants in the network to understand the data. The focus of the interview with  the BDP gives insights into how Digst uses the term digitalisation. They describe how the BDP's have been a process which have taken years to accomplish thereby allowing boundary object to solidify the understanding of how it have been used in this project. And how they see themselves as simplifying the process of sharing data. Simplifying have in this case become the goal of the BDP, creating a situation where their understanding of digitalisation have been woven into this goal.
We have worked with moments of translation as a method for understanding how networks have been created, and how different networks understanding the term digitalisation. We will in the next chapter work with how other networks have experimented with digitalistion. And how design thinking are being used in the Danish digitalisation field.

# *Chapter 3*

## *(it is messy but why)*

In our fieldwork, we have come to understand that digitalisation has a variety of connotations. Each actor seems to have their own understanding and purpose, which they follows in order to achieve the main goal of the digitalisation network. Some actors deliberately contributes to the messiness by experimenting with new ways to interpret the word digitalisation.When the the structures are so vague they become imperceptible, the goals and context becomes king. If the goals move at a faster pace than the actors act, or the context shifts more often, it might be impossible to crystallize the meaning. This becomes a problem in some of the messy fields we have encountered. but by following the context, and how the actors acted, we might be able to follow the movements of the goals. In order to understand these presumably irrational movements, We have taken a page out of the design book, and followed the phases of design thinking. The following chapter will dive into how innovation is done by different actors, and to what ends.

We analyse how the historical process of establishing and implementing NemID went back and forth in the different phases of design thinking. And how this was a key ingredients to make it a key to digital welfare in Denmark. This process is significant for most of the innovation by Digst. Our analysis provides insights into long sighted expensive experimentation throughout the entire country reiterate, and how they went from experimentation to a streamlined obligatory product. Our analysis of the innovations in Copenhagen Solutions Labs shows how a municipality can experiment on a smaller scale, yet still introduce visionary ideas and international actors. And how the phases of design thinking are a clear part of their process. At last we dive into the municipality of Dragør and how they use the same principals to create low cost innovations on a small scale. These are mainly driven by a few actors with more enthusiasm than expertise and a more les affair approach to management.

We use the tools from design thinking to analyse the innovation process in Danish digitalisation. This should pull the curtain back on the topic of “why is digitalisation so messy” and by analysing the different stages of the innovation we should be able to understand why we digitise, and why the outcomes are so varied that the concept becomes intangible.

## *NemID.*

The deployment of internet technology throughout Denmark, and the co-occurrence development of the relevant infrastructure, created new possibilities both politically and for the citizens. Many of these emerges from ideas and visions popularised in the Dybkjærrapport (Forskningsministeriet, 1994) from 1994, as we will describe below. Of of the key innovations that have let to the digitali-nation that we know, is the innovation in e-id and implementation of NemID.
In order to understand the key elements of this innovation we will break the historical events into the phases of design thinking.

One of the main features of the national digitalisation in Denmark, is the public-private-partnerships. One example of how this manifests themself are the case of NemID. The project spawned from a vision all the way back in 1994, to the most used e-id system in the world 24 years later (Dutch Ministry of the Interior and Kingdom Relations, 2015; Nemid.nu, 2018). The story shows the relationship between private actors, and the public. What is more important is that it shows the importance of experimentation with different approaches, actors and solutions. After 17 years of experimentation, competition and heavy scrutiny, NemID became the obligatory tool to communicate with any public entity, as well as some private actors, such as banks and online casinos.

The empathize phase, being the period where the designers venture into the world and try to learn about the problems and how people are reacting to these. In the case of NemID where mainly done in order to influence the relevant politicians, In Dybkærrapporten one of the many visions is to provide every citizen with a opportunity to identify them self online.

In the visionary Dybkærreport for Denmark's future in 1994 the first infantile concepts of a national electronic identification card (e-id) were introduced. This card would contain a security chip with a specific key for each citizens, along with picture verification and other security measures. The ministry of science spend 5 years gauging the prospects of a system like it is described in Dybkærraporten, but ended up deeming it unfitting for the Danish society. This was demonstrated the year after when they created a fund of 10 million dkk to fund experiments into digital signature uses and implementations. These experiments were shrunk while in process and in the end finished prematurely, due to high costs. According to the Palle H Sørensen the director of IT Telecom Agency at the moment, all involved actors gained valuable insights and experience (Sørensen, 2015).

With the rapid expansion in the use of the internet in the late 1990's and the early 2000's (See *infrastructure*), and implementation of e-banking and e-commerce prompted showed the way for new possibilities and new problems (Arora et al., 2008). In order to establish a safe single market for online commerce the EU began developing a framework for online identification and signatures. In 2000 an EU directive states that a trustworthy electronic identification and signature is a necessity for electronic communication and commerce(The European Parliament and of the Council, 1999). Denmark followed through with the directive and echoed the wordings from the EU. In order to create a procurement for a national online ID and signature for both citizens and corporations (e-id). The procurement were initiated by the Helge Sander the sitting Minister of Science, Technology and Development (2001-2010). Before the launch of this national id, called 'Digital signature' (in 2003). Each service

provider had developed their own solution with a variety of standards, security issues and user abilities. They operated by a single password login, sometimes with the help of a locally installed certificate (Kristensen, 2004).

The define phase, indication when the designers have been out in the empathize phase, coming back with knowledge about the problem and the solutions. Nem-ID were developed in the IT Telecom Agency under Helge Sander, and resulted in tender with competing bidders. These bidders created low-fidelity prototypes as part of their ideation process and included them in their bid.
In 1999 the IT Telecom Agency made a pilot-project competition where several prototypes where tested in real life scenarios (Petersen, 2016). The knowledge gained from this became a part of the define phase for the major procurement in 2003.
The Tele Conglomerate TDC won the tender. TDC introduced the 'Digital Signature' That should create basic trust in the use of ICT, electronic media and channels, become the 'Missing link' between society and users on the internet. Establish a dynamic and secure electronic verification of citizens and companies and provide a safe and individualised access to the public sector, from everywhere and anytime (Wang, 2004) 'Digital Signature' Were only meant to identify and authenticate the identity of the user online, and had as few as possible markers taken from reality, in sharp contrast to how other european countries imagined it (ibid).

The ideation and prototyping phases intertwined at this time, several different solutions had been iterated upon. The real world testing began, based on this experience, the testing would turn out to be gruesome however.

A decision that would make TDC the only provider of digital signatures for Danish citizens for at least 4 years. This solution should become a stepping stone for major cost reduction for the Danish municipalities (Jensen, 2004-1). This cost reduction however were not realised and the municipalities blamed the low use of 'Digital Signatur' who at the time had 175000 users (around 3,5% of the Danish population). Some of the stepbacks for the integration where the relatively high user fee of 175,- dkk and the quite challenging process of setting up the system on the user side. An issue that became clear when the first digital 'tax returns' where introduced with the help of 'Digital Signature' and only 7000 decided to use this possibility (ibid). The Danish finance sector declined to use the new public standard, and went on to use their own NET-ID solution which had around 2 million users (Jensen, 2004-2, Jensen, 2003) Even the municipalities considered joining the finance sectors solutions instead of the official Danish 'Digital Signatur' as a consequence of this. (Andersen, J. 2004,). When the procurement was announced for a renewed version in 2008, the user numbers had increased to a million people, still far behind NET-ID.

The realisations of the testing, and the feedback from the users became a part of the bidding for the new procurement, in the end TDC lost the tender, and with that 30 of their staffers moved with to NETS who won the tender (Bang, 2008).

The new tender were won by the company behind NET-ID and introduced a new solution called NemID in 2010 to it's users that used 148 single-use pin codes on a piece of cardboard instead of the former locally installed signature (Petersen, 2016; Sørensen, 2015). Even though NETS (The company behind both NET-IT and 'Digital Signatur') now owns both

e-id solutions the finance sector were hesitant to integrate NemID to their platform (Jensen, 2011).

Nets restarted the design thinking phases here, however the second iteration of it, were much quicker than the first.
The empathize phase concerned around the experiences gained from having Net-ID. The define phase concerned how to implement the same user experience into NemID, The ideation and prototyping phases where taken from Net-id (Anders Vinge spokesperson Nets pers. comm, Petersen, 2016, Sørensen, 2015). The testing phase became a major event with thousands of participants.

Even so Nets expects to convert around 600000 users each month from NET-ID to NemID (Bang, 2009). In the spring of 2011 Nets declared that they had sent out cardboard pincode cards to every citizen, and that they have been activated. (Devantier, 2011)

While the switch from Digital Signature to NemID went fast and promised easier usability (Petersen, 2011). It sparked a lot of backlash among the public. The architect behind the initiatives describes the backlash as lead by nerds with expertise in security, whereas his department were filled with people focussed on compromises and economy. The backlash was spearheaded by Rasmus Porsager the webmaster behind the site NejTilNemid.dk along with the community of two major Danish technology magazines and blogs (Andersen, 2016). Many of the activist remarks that the “Success” of NemID is a result of mandatory self-service which was introduced in 2012 (Møllerhøj, 2018). A collection of signature to cancel the mandatory NemID from “NejTilNemID.dk” collected upwards of 7000 signatures (Pers. Comm Rasmus Porsager). A videos of the highest paid Danish comedian criticizing NemID have collected upwards to 200000 views on youtube (Matthesen, 2011). While the criticism went on the use of NemID grew up to 80 million logins a month (NEM-ID, 2018). Most of the criticism were downplayed by the government, who pointed out that it wasn’t so complicated to use, and had solutions for universal access, such as speech to text, and bigger font for those in need (Jensen, 2010). The minister of science made a statement praising the initiative, and claiming that NemID is the key to Denmarks digitale future. While dismissing the criticism as classic Danish conservatism along the lines of the criticism of the Great Belt Bridge (Jørgensen, 2010).

NemID used the testings, and the feedback to begin new innovations process, that have been defined by this feedback. A part of this process where group usertesting and town hall meetings. They support a variety of solutions for people with disabilities (Handicap.dk, 2015), and a App for people who don’t like the cardboard card (Service.nemid.nu, 2018).
The spokesperson from NETS proclaims that the danes adapted to use the of NemID can be attributed to the high number of logins to non-governmental sites which is a part of these statistics. Right now up to 80% of the “transactions” are non-governmental and they expects them to rise even further in the future, especially through online gambling sites that are now required to confirm the identity (and age) of the players through NemID (Pers.comm Anders Vinge NETS).

The history of NemID tells the tale of structured experimentation. A strong actor (like a ministry) sets up very strict parameters for success. The goal of the experiments for the ministry is to change a key part of governance, such as the infrastructure, or in this case how

the state and citizens communicate. The actors who perform these experiments take a high financial risk in order to compete. We see this when the development often take up a large sum of ressources. They are incited to participate by the promise of a large reward as the proprietor to the state of their solution. These deals can often make or break a company, and for most companies getting a statedeal makes up a major part of their budget.
This high risk and high reward opportunity means that a lot of investment could go into securing contracts like these. In order to find the best contractor the government issues tenders comprising of parameters the contractor must ensure to meet. The contractors then compete with each other to find the best (often cheapest) solution.

What is significant about this innovation of NemID is the long process leading up to its success. Several different actors bid for the tender, and different approaches were tested. The following procurement ended with a company running a parallel solution to the tender and merged the two, taken the users from the hundred thousands to the millions. Later this merged solution became obligatory and is now one of the most used e-id solution in the world. According to Anders Vinge from Nets, this couldn't be achieved without the different experiments conducted by competing actors.
The high risk issue creates a demand for a highly structured experiment, with a set goal and reward. The procurement principles tries to make different actors compete, while creating several products to solve the same issue. In the case of NemID we see that this for a while created a very messy field, with competing solutions and national solutions having difficulties establishing itself within their own field. This messiness where in the end solved by making the solution obligatory, and have since gathered tremendous support.
In this case the interpretation of digitalisation let to several procurements in which different actors competed to win, and laid the grounds for further developments towards a digitalised nation.

## *Summary:*

If we look through the processes that has been described through the case of NemID we can see these ideas within design thinking to describe the activities.
Empathize: This step can be transferred to the stages of development where the government found a need for a electronic identification card. Here the concept was born from the empathize that was stated in the Dybkjærrapport. As stated above a concept like this was not manageable financially or functionally. Only when the internet was implemented in society to such a degree that a vast majority of the population had access, the idea of a digital solution became more solidified. It was this moment that defined the problem enough to rethink the concept towards a solution that was close to the platform that we know today. The goals set by Dybkjærrapporten have been moved several times, along with the phases of design thinking, and the introduction of other powerful actors. As we explained the ideation and prototyping phases reoccured several times, and everytime they shifted the context. Over the same period as we see in the 'A montage in digitalisation' the term were deliberately diffused, in order to follow a bigger trend in the field. Most of the actors in Digst. stayed the same, and this have anchored the meaning in a way. But as the goal posts moved, so had the actors.
As the problematization had become clearer within the policy makers dreams of introducing a product that connected the idea of the Electronic identification card and digital use and as the EU had given incentives for creating online identification in its nations. Here we identify the moment of ideation as there was a decision for an invitation to tender, here different ideas could present themselves in order to find a solution that completed the definition for the project best possible (THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION, 2000). Furthermore the next process in the NemID case fulfills the idea of prototyping when different solutions was experimented with from the tenders. After this process Digital Signature won the invitation, and a iterative process could repeat with more testing, until a final product could be established.

This process is a example of how digitisation projects like NemID are not projects that appear overnight, they are often born from iterative processes that requires large amounts of resources to develop. These form of development projects are constituted by their design and some actors within digitalisation. The use of design thinking have kept the development of digital signature, and net-id at a steady pace. The rule to make it's use obligatory, and the continued innovation of it have ensured that it is a renowned solution that is still a core of the public Danish digitalisation.

## *Copenhagen Solutions LAB*

One of the more deliberate reasons for the messiness of digitalisations is the introduction of design thinking which pervades through Copenhagen Solutions Lab (CSL). Copenhagen writes in their digitalisation strategy "Digitalisation is the most important lever to pull, when we need to streamline welfare in the coming years" (Københavns Kommune, 2015). One of the ways this happens is through a cross platform data sharing solution. This is a part of the cities dedication towards becoming a smart city.
In the CSL the goal post are moved at a erratic pace, while the actors pretty much stay at the same spot. This is a part of their epistemological imperative. No matter how much activity there is in the field we are still able to follow the membrane and understand the constraints of the field. This ensures us that their understanding remains the same. The erratic behavior of the goal post comes down to how they interpret the five phases of design thinking.
The empathize phase of the data sharing experiments they run at CSL is grounded in a political motivation based on Tim O'Reillys concepts of government 2.0, which were big in the Obama administration in USA (Chafkin, 2010). This kind of empathize phase relies on the same being true in the USA as in Copenhagen.
The define phase is based on the assumptions from the empathize phase. This leaves the CSL a lot of room to ideate, prototype, test and repeat. This however is the entire point of the laboratory. In CSL the experimentation takes a different meaning. They create an experimental setups that aim to combine private and public actors. They focus on creating future proof, longevous and avant-garde solutions. This focus from the laboratories side shifts the focus in the five stages of design thinking. They have inserted a small loop of iterations of ideation, prototyping and testing. To what is called a "Develop and Improve loop"(Palo IT, 2018). A off-branch of design thinking. O'Reilly promotes this model as a new type of governance in phrases that closely resemble the concepts from CSL.

*"it's about what we can learn from those businesses to improve virtually everything we do. I imagine lean startup principles applied to government programs, to healthcare, and to solving the world's great problems. It's ultimately an answer to the question "How can we learn more quickly what works, and discard what doesn't?" (Ries, 2012)*

The experiments often consist of switching some, or all of the elements of a prototype in order to test what works best. They experiment with many different approaches in rapid succession.
One of their projects, the Data.kk.dk project, experiments with the best solution to exhibit data (Data.kk.dk, 2018). Data.kk.dk is a sibling project to the joint municipality open data platform Opendata.dk and in parts to the data-broker platform citydataexchange.com. CSL becomes a central point for knowledge-sharing between the different initiatives.
The publication of data is an important part of the digital society, O'Reilly in *Government as a platform* describes how the data created in the digital realm most be funneled back into society. This way of thinking makes the argument that when public data becomes publicised, new companies can emerge and create a better and cheaper public sector using this open data. As the Danish data have become digitalised, there have also been a move for publicising the data, in charge of this publication of public data from Copenhagen are Frans La Cour project manager of open data in technology and environmental management.

The data comes from the citizens interactions with the city. This relationship is explained as such.

*"Citizen are co-owners of the municipality, and the data the commune collects belongs to the citizens. Therefor the act of publicising the data for free, are giving the citizen back their own data which they are a part of."*

*Frans La Cour d.28.03.18 translated from Danish*

Frans La Cour opens the digitalisation to a new understanding of how the term can be used where Kenneth (the municipality director of Dragør) was talking about a digitalisation where either an artifact as the iPad was introduced in the kindergartens. Frans in this quote sees digitalisation in a different light where the data generated by digitalising also becomes part of the digitalisation. In this context the term are not seen as a technology, but as a way to create transparency, and the reason for doing this is the digital strategy 2016-20 (*see Problem area*). Which underline how the digital government must become transparent a method for showing the public how the data generated and gathered by the public presents itself. Frans here introduces the public in the digitalisation network, working with the public as the receiver of digitalisation. The citizen are given a role in the network as active contributor when introducing the public in the network. Opening the network to new actors whose role and connection to the network are under constant negotiation
Opening the municipality to the public as co-owners also increases the complexity in the network where different actors take multiple roles. The public in the network are enrolled by their present in the city, as the exist in the city the created data, and as citizen they have demands for the city such as green spaces, roads and clean streets. These demands are are creating new actors in the network, every time an improvement happens new data are created. This constant creation of data by the municipality on behalf of the citizens in the city.

The access and availability of data opens for situation where the municipality can insert a platform in its place in the network between themselves and the citizens, this creates a situation which we will later see in Dragør where a system are the contact point between citizens and the municipality. The dataportals acts as a mediator between the reality and the self-services in the city. The result is a faster and more accurate experience for citizens and the municipality.

*"Datapotals have become a tool we use to create a more effective, fast response and help to citizens. This have resulted in new self-service options, "council over road" which before took up to 3 months, new only a couple of days."*

*Frans la Cour d.28.03.18 translated from Danish*

The dataportal provides a effective information distribution system underpinning the self-service solutions the municipality provides. The combination of these systems have created a quicker solution, that provides the citizens with greater autonomy (Københavns Kommune, 2018). This is a result of the collaboration between the municipality and CSL.

CSL is tasked with experimenting and developing the best data portals that suits the municipalities needs.
The findings from CSL experiments, with different ways to create platforms. Reveals a distinct understanding of how digitalisation is a part of the relationship between governments and the public. The project manager explains that the goals for sharing data as a tripartite. This helps us understand how the experimentations works.

Copenhagen municipality have different approaches to its data, and how it is published. When asked how they perceives data usage in the context of CSL Frans la Cour divides it into three different categories. Open data is perceived as data that have being gathered already and subsequently published. These are also data that are confirmatory, which la Cour conceives as data that are evident and can be observed by anyone. This conception can be exemplified through the process of how urban environment are digitised, and how these forms of data be observed freely in their physical dimension and not only its digital representation.

*"1: the data originates from the citizens, it is journalised and utilised by the municipality, hence there should be no issue by sharing it."*

*Frans la Cour d. 28.03.18 translated from Danish*

As the municipality generates data from the citizens and tourist in the municipality. CSL considered them both, as original owners of the data. All the municipality did was collect and analyse on knowledge that the citizens and tourists created. This is significant to understand their reasoning for "giving the data back", as it were never the municipalities to begin with.

The citizens and tourists who "live" in the city, they want the city to be livable. Liveable in this case means a city that provides a high standard for living, such as infrastructure, activities and security. In exchange they pay taxes and spend their money locally which funds the municipality.The municipality wants to provide a liveable city, where tourist and citizens wants to live. If the people live here they will pay taxes and VAT. In order to provide this, the city needs to create a high standard for living.

As a measure to ensure the high living standard, the municipality have begun a transformation to become a "smart city". The smart city concept comes in many different shapes and sizes, yet the overarching concept is to gather data and digitalise the cities, in order to make them increasingly more effective to manage and live in. The effort so far have resulted in a "World Smart Cities Award" (Jakobsen, 2015).

Internal data is also data that are more or less confirmatory, and is being gathered continuously, but is only used internally.

*"2: The datasets are collected by the municipality in order to create internal growth and innovation"*

*Frans la Cour d. 28.03.18 translated from Danish*

These forms of data are not usually published but we are now, according to la Cour, moving towards a time and ideology where there is a incentiment for publishing them.

When la Cour talks about internal data it is in the context of CSL and data that are being produced for the use of the municipality in general. This context often comes in the form of the continuously integration of different data within the scope of optimization. This agenda are presently under the development of being transformed into a more public approach. Which has influenced the current discussion on which data can be published and how to do it. According Frans this can be done through a self service solution that can inform the applicant if the data that they are requesting is available or if the data have been accessed earlier by others.
Internal data is often measured on it ability to create internal growth and innovation. Here growth is often represented by its ability of optimization thereby releasing resources that can be used elsewhere, where as innovation is spawned in the process of publishing data that can be used externally.

According to Lacour there is a firm expectation from the government that by moving towards a open data approach, data can be used as a resource by business creating external growth. Here external growth needs to be created through the possibility of people engaging and using the data that are being released to the public. This availability by itself have the possibility to encourage people to use it in new ways.

*"3: There is a expectations that sharing data could create external growth and innovation"*

*Frans la Cour d. 28.03.18 translated from Danish*
This expectation creates different aspects of what open data should do in order to accommodate external growth. Here la Cour explains that data can be seen as a resource but cannot be upholded as a currency or collated with money by current standards. When data is created for internal usage by the municipality it is often generated for a very specific purpose. He elaborates that it needs to mature and cannot be incorporated to the financial market in its current form. Data sets need to be more universal which leads to incremental utility, in order to attain this form of financial benefit.

*3B: there is a expectation that (easy) public access to the datasets could help with quality assurance, and prevent the need to generate the same data twice."*

*Frans la Cour d. 28.03.18 translated from Danish*
*If we look at how la Cour describes his visions for open data and its possibilities there is still condition where the ideology of open data is not ready to thrive. We see this is caused by both a technical immaturity, like stated by la Cour, and a societal protractedness in its ability to convert to the implementation of open government data. In attempt to look closer to this condition, there is a argument of looking at governmental services like these, as platforms, that supports the present needs in society. Here we return to O'Reilly and his conception of looking at government as a platform. He states that platforms should uphold their value in their ability to adapt to public state of demand, and that their capacity to do so is essential to their continuance (O'Reilly, T. 2010). Within the CSL this understanding of open data means that even if the citizens and business retain from joining their open data platform, the benefits to the internal operations outweigh the costs of the solution, even when the data is published for free to the public.*

This approach to data sharing is concurrent with other municipalities. Yet the results of Data.kk.dk shows that they have had little engagement from private actors. Internally the system is used a lot, as intended. This internal/external usage pattern forms what data gets uploaded. In the future la Cour estimates that the municipality won't expand or elaborately on the content of the system. If some data becomes highly requested they might add it, but for now they mainly just update the data they already feed it.

On the platform there currently are 243 datasets available. La Cour explains how they already have great traffic data on car-traffic. Bicycle data on the other hand are trickier. Right now in order to get reliable bicycle data they might have to use infrared sensors[5] . Another solution they have used previously is to rely on a human actor to stand on a street corner and manually generate the data. On a project that relies on reliable, frequently data from a large field it is too expensive to rely on human monitoring. Until they come up with a better system to monitor bicycle traffic this data won't appear in the system.
Even if they could find a solution to register the bicycle traffic another issue comes from the layout of the city. The city within a city; the municipality of Frederiksberg is placed right in the middle of Copenhagen, while having absolute independency. This prompts some issues when monitoring the traffic in Copenhagen.

*"We have had issues when people viewed our data of Copenhagen, especially for those who weren't locals, and they saw a big black hole in the middle of the city"*
*Frans la Cour d. 28.03.18 translated from Danish*

This issue of "missing data" in the middle of the city, have generated issues with tracking movements that often can't be solved, and then the data remains unobtainable. In order to solve these "black holes" they have begun migrating their datasets to the collaborate public data platform Opendata.dk. This platform is a association founded by several big municipalities in Denmark, including Copenhagen and CSL Currently Opendata.dk contains

[5] most are cameras without the infrared sensor

approximately 900 datasets. The migration of datasets, have meant a shift in the focus of Data.kk.dk. In the future the Copenhagen data platform will still be active, and updated, but it will mainly be used internally. CSL instead focus on the goals of Opendata.dk to:

*"Create transparency in the public administration and a foundation from data driven growth. The goal is to put open data on the national agenda, and to create a national portal, wherein data from public institutions are collected."*

*(Opendata.dk, 2018-2).*

OpenData.dk provides a guide to 15 use cases from startups based or partly based on the opendata.dk datasets(Opendata.dk, 2018-1).
In the end the experiment meant to develop a platform for sharing data that would engage the public wasn't a success. They did succeed on other crucial areas, but in the end the manager conceded. "In the end the data sharing platforms were never meant for madam nielsen, or any other private citizens, it is a computer to computer platform. This is why only few private actors use it." he tells us.

## *SUMMARY CPH SOL*

In Copenhagen, CSL is tasked with doing experiments on how to best interconnect and share data throughout the municipality and across private actors. This have required a experimental approach to figure out how to create a practice involving data portals that utilizes the ceaselessly collecting of public data in order to create growth and innovation. This comes from O'Reilly's ideology of transparency and the openness of data being be publicly available if it is already public. We see that CSL has hopeful visions for creating solutions that supports this, but runs into a barrier when trying to implement them. A barrier consisting of data being to specific for use outside the municipality and missing interest from the public in engagement. As we have unfolded their operations and the visions behind them in this section we see that these difficulties show themselves differently in separate projects but are consistently creating a situation where CSL, true to their visions and ideology creates new content and solutions for smart city technologies. But essentially fails to find a shared interest from their public users. As CSL involved themselves with the experiment of Data.kk.dk this forces them to conclusively retract from their mission and shift the experiment into internal usage. The impression that we have experienced from our dialogue with la Cour from CSL is that he believes that these failed experiments to create efficient platforms. Are bound to an immaturity in the market, private firms who was the intended user, the public and to some extent the technology. The use of design thinking with the additional "small iteration loop" have provided knowledge for CSL. The narrow focus on testing might however prevented the projects from being integrated into their external user base (the citizens). If they had stuck to a more conventional approach in the design thinking they have gained a better understanding of the empathiz phase, and the users needs. As a political project, that have earned Copenhagen the "World smart cities award" it might have served a different purpose than the one originally stated by CSL. So far however there is not enough interest from the public to maintain the original goal about public access and utilisation of the public data platforms, such as Citydataexchange and Data.kk.dk. It is not only an expression that is grounded in data sharing within the field of smart city technologies, but for external use of open data essentially.

As the network tries to involve the public by facilitate open data through initiatives such as CSL. It is still data that functions internally but when la Cour states that there is absence of engagement from the public it can be perceived as a case digitalisation just for the sake of digitalisation from the municipality which is the actor that commissions the experiment. The power of the Labs seems to be in their persistent understanding of digitalisation, and how their experiments moves the context and the goalposts within the field.
CSL is purposefully stirring up the mud in the digitalisation discourse. They place them self i slipstream of O'Reilly's ideas about governance 2.0, and experiments with the premise. By using a small iteration loop they have created a lot of knowledge, yet little understanding of why it's not as popular as assumed. This have resulted in three different platforms where as two are on the retreat.

## *Dragør*

On the edge of the island Amager in the municipality of Dragør, digitalisation is both, a very near and tangible thing; And a very abstract and distant thing. Digitalisation in the Danish context as we are told by our informants is a term for when something have been digitised. This is evident from our interview with Kenneth Kristensen, the municipality director of the fifth smallest municipality in Denmark, both in terms of size, inhabitants and budgets (Dst.dk, 2018). He describes how a kindergarten with iPads, among other things, is digitalisation. What we found significant about Dragør, is their approach to experimentation with tangible digitalisation, and pragmatic solutions. When we followed the membranes to understand the circumference of the field, we realised that in Dragør plenty of different messy fields happen all at once, All of these are collected in Kenneth's ledger, in here digitalisation diffuses between projects, changing its meaning, context and actors every time. The ledger in this case can be seen as a map that charts how to understand digitalisation in different context. They are all kindred by being small innovations with flexible goals and very few actors. We will accentuate how these aspects affect their concept of digitalisation. With Kenneth as with a lot of our other informants, Digitalisation have been used through the different interviews as a way to describe how introduction of technology into any network is digitalisation.

*“ Some kindergartens have become digitalised this have happened with we have given iPads this have help with keeping track of attendance, while some others have chosen not to use a iPad.”*

*Kenneth Kristensen d. 06.04.18 translated from Danish*

Kenneth describes how the introduction of technologies such as iPads is an example of how digitalisation impacts networks. When Kenneth acts as a spokesperson for the town hall of Dragør; we understand that one of his ideas of digitalisation; is when the kindergarten teachers use iPads. This very tangible and artefact-centric understanding of digitalisation, where an artefact, such as an iPad is introduced to a kindergarten, became one of our best examples on a very simple digitalisation scenario. We used this simplicity to demonstrate the moments of translations earlier.

In a commune like Dragør, where the main objective of the municipality is to provide care in the form of kindergartens, schools, daycare centers and nursing homes, with very limited resources and infrastructure. In these networks increased digitalisation can be interpreted in many ways and the degree of digitalisation varies. Some network choose not to introduce new artefacts at all.

This attitude to digitalisation is viable as a consequence of the relatively small networks with closely connected actors who still moves towards the common goal of providing care to the citizens. The municipality is understanding towards professional arguments to why some institutions should be exempt from certain digitalisation networks. The common goal of the network in the municipality of Dragør, are focus on providing care, as the individual actors see it best fit.

The option for choosing to adopt a new technology in the network are still a debatable topic, where the different actors by their own accord can make a decision and still be connected to the rest of the network.
As the different actors in the network are still all connected through the common goal of providing care, there is a understanding from the municipality. That the decision of choosing to adopt technologies must be based on a decision of enlightenment.

*"They(kindergartens) can choose if they want to use the different technologies, but they can not just say no. They need to have a pedagogisk argument, this can be "looking the kids in the eyes before they go home""*

*Kenneth Kristensen d. 06.04.18 translated from Danish*

In the case of kindergartens the professionals have reasoned that in some cases a non digitised approached is better. Especially human-to-human interactions are prioritised. The municipality are required by national law to enforce some digitisation. In order to achieve both the favorable human-to-human interaction, and digitise some aspects of the bureaucracy of the kindergarten.

The kids can be signed in and out in a paper protocol, while a kindergarten teacher later inscribes these into a digital platform. This freedom to independently decide to what degree they wish to adopt or integrate digitalisation. It allows for the professionals to be professionals in their own field. It allows them the idependency to decide what best accomplishes the main objective of care. Kenneth explains how the kindergartens have a choice when opting to use different technologies, as the technology and the following digitalisation becomes more present there are situations where the human interaction still is prioritised. This leaves a lot of room for experimentation at a very small scale. One of the ways they experiments with using digital tools to enhance the human interactions are at one the local daycares.

*"A new thing they do at a daycare, is that they record short movies of the children's eating situations. and then use them for collegial sparring."*
*Kenneth Kristensen d. 06.04.18 translated from Danish*

In the daycare, they often worked alone. the nursery assistants needed a way to spare with each other without leaving the kids unattended. They solved this issue by giving their colleagues a glimpse into their reality through short videos.
To understand how "the five phases of design thinking" applies in Dragør. We must understand that the empathize phase is a part of their everyday life. Most if not all of the innovations in Dragør begins as workarounds. It is possible to divide workaround into to phases of design thinking. Since the workarounds are intended to solve a issue they themself encountered in their work. The work becomes the empathize phase. The "around" then becomes the define phase, where the employee defines the problem experienced in the empathize phase. The ideation and prototyping is often carried out without supervision, and rarely documented. This leaves the employees the opportunity to go straight to testing, and iterate on their own pace.
At some point, once a year. Some of the town hall staff collects all the workarounds that have anchored itself to the network in a little ledger (5 pages of titles of different ongoing

experimentations). They asks the staff/inventors to evaluate it; Using 'If it works it works, if not it is abandoned'. Kenneth, recognizes that it might not be the most comprehensible evaluation, but its the best they can do with the resources available. This idea falls in the same lines as If the staffers have an idea to a workaround, or a project but need some ekspertise which the municipality will happily provide. He calls this micro-development of digitalisation. To Kenneth it's a "anti-IT project" without committees, gantt charts and a set deadline. The success criteria is to create more quality in the welfare they provide to the citizens, *"That's our job as a municipality"* as he says. Even so, some innovations are more supervised that others, an example of this is the Virtual Reality project.

As Dragør is a small commune and the different social institutions are closely connected in distance, as the networks are closely together, they can be assigned a degree of independence. This enables the different actors to choose which different digitalisations degree they which to take part in. When we asked him to tell us about how these different decisions express themself in the network, he told us about a project that began as a staff-fieldtrip. After a recommendation from a volunteer group of older video enthusiast.

This case describes how the empathize phase became a part of both the field trip and the invitation. If nobody wanted to join Kenneth, then he would have stopped the innovation in its tracks. Instead the field trip became a part of the empathize phase, as those who have their daily tasks with the elderly could testify to the situation, and empathize.

The director invited the entire staff, middle management and everybody on a field trip to Copenhagen, to visit Khora virtual reality production house. Khora have experience in providing care for elderly people struggling with dementia, and up to 360 movie projects (Khora, 2018). Initially the field trip were meant as a employee leisure trip. The experience however sparked some ideas for some of the staffers, and on their way home, they agreed with the director to order to VR sets. One for the After-School-Center and one for a elder-care-center.

The define phase were reliant on the already established solution from Khora, and sparked a ideation phase for how this could be customised to improve the quality of the welfare in dragør. At the elder care-center they elaborated on the ideation by creating different low-fidelity prototypes and interviews.

At the elder-care-center a volunteer group quickly adopted the VR headsets, and set forth to develop a solution for the cities elderly. The group consisted of pensioners between the ages 65 to 75 with a enthusiasm for video and "the old dragør town". They wanted to help the occupants at the elder-care-center, with tools to experiences they can't have anymore. One of the projects were to record a 360 movie, like the one they just saw at Khora, at the "old dragør harbour" a famous tourist spot. The project was inspired by talks with the occupants. unfortunately the project came to a halt when the chairperson had to step down, and the project were abandoned for a while but are now running again.

This have set the prototyping and testing phases in motion, in a year Kenneth's innovation ledger will tell about the results.
The volunteers are currently installing, testing and developing material, the director of the municipalities have big hopes even though the development hits some rocky patch from time

to time. If the testing is successful Kenneth imagines a new iteration of the design thinking phases where the scope is even bigger. If not to have a system in every elder-care facility, then at least to encourage the passion for innovation.

*Imagine that it could be a part of every nursery home, and help everyone with walking disabilities. That could give them some experiences that can be hard to have if you are 80 years old and have a hard time walking(…) The next step is to keep this enthusiasm, energy, movement and passion that lifts the project, and give other volunteers and staffers the opportunity to "play on". But the next step is also to bring the great ideas all the way home. This requires a little bit of structure, and a little bit of classic project management. How labouris is it to set up, does it require trained personnel or can a relative do it ? That's how we take the next step, that's how we get volume into it.*
*Kenneth Kristensen d. 06.04.18 translated from Danish*

The key concept of this micro-development digitalisation, is to allow the personnel in dragør to create workarounds, evaluate them, implement them, and then work to expand them throughout the municipality. They can receive supervision and sparse funding, but they are encouraged to use the tools already available in a new way.
This tells the tale about the municipalities idea of innovation and experimentation through digitalisation. The municipality beliefs that the professional employees and citizen are the users, and the users are best capable to determined which degree of digitalisation they want.

There are some digitalisation that Dragør has to be a part of, in order to be a part of the national network. As there are different rules which applies nationen wide, there exist some degrees of forced digitalisation.
The kindergartens can select to have the children sign out on a piece of paper, where the adult can ask questions about the day. However at the end of the day, there is a law requiring the digitalisation of attendance for kids in kindergarten.
In Dragør the compromise between the cross section of digital and non-digital solutions became clear. As long as the main objective of care were being met, the different actors were allowed to negotiate and experiment with the concept of digitalisation. This also let to an interesting controversy of digitalisation, and how the concept were understood within the same network.
The different means to, how the common goal were achieved when placed in the hands of the institutions, iPads or otherwise this let some actors to experiment with digitalisation in new ways. These experiments have let to some unusual findings as well. the two quotes above demonstrates how the actors in Dragør are aware of the digitalisation trends which orruce in the broader society. The actors choose how they best provide care to their network, and what kind of digitalisation provides the best care in their situation.
However they have to opportunity to make a decision on whether the technology and the following digitalisation are what can bring the most care into their situation. The independence for the different actors was prioritised by Dragør municipality, as those who wished for technological assistance for problems, could ask and receive help from the municipality.

*"Interviewer; How does digitalisation consolidate itself in Dragør*

*...Some kindergartens where there are immigrants parents, they have created small videos showing what happens at a children's birthday in Denmark. An iPad and the video is then given to the parents so they can see what a birthday is and feel more secure sending their child. This way of using technology we support"*

*Kenneth Kristensen d. 06.04.18 translated from Danish*

This shows how there is a close relation between how the technology is being used in the public sector and digitalisation. This quote gives and understanding of how digitalisation are understood in the small networks. When networks such as Dragør talk digitalisation, the negotiation becomes a less about how to use the upsides of digitalisation as presented in *Technology chapter* but more about how the technology can help in the everyday life of the network.

According to Kenneth; Dragør sees itself as a commune that have become digitalised. The steps it have taken are based on what a municipality such as Dragør needs to obtain it's main objective of providing care.
Dragør have provided an arena where we have encountered a network of different actors, who uses technologies, platforms, connectivity and uses the term digitisation to describe that. However as they have demonstrated in their use of the term, it is a different form than other uses of digitalisation, what we have encountered in other interviews and fields. These different uses have show how a term are being translated differently when it moves across different networks. How the translations have become unclear as the common goal of digitalisation have been reinterpreted as it have entered new networks.

In contrast to the national digitalisation strategies, initiatives and so on. Digitalisation in Dragør were a more enclosed network, with fewer and more equal actors, relying on one big actor who were in charge (the municipality) who then again relied on a even bigger network (The Danish government). In this situation digitalisation became severely pragmatic.
Our interview with Kenneth tells a story about how a municipality as Dragør have taken a term such as digitalisation and applied the best meanings of this multidisciplinary and ambiguous term. They have used the meanings that provides most meaning to their network. The term digitisation itself have become a *boundary object* where meanings have become diluted though it's results are well understood. Within this local network digitalisation have been attached to a variety of initiatives, and allowed Dragør municipality to become a digitalised commune. Dragør have used the term digitisation as a way of describing how the use of different technological artifacts have help in the daily life of the care sector. A part of being a digitalised commune is to allow digital self-service. This have been a massive change to how the networked is formed.

*"Before (the digitalisation edt.) we had Jenny sitting taking calls from parents, whose kids was beginning in kindergartens. She had too look up in her roster if a spot was free, then call the institution to make sure the record was correct and then call the parents back. Now we have a system where the parents can log in a see which institutions have a free spot."*

*Kenneth Kristensen d. 06.04.18 translated from Danish*

The self-service platforms are a more classical approach to digitalisation. This platform provide a service to the parents which they wouldn't have otherwise. The parents can browse between kindergartens in their area from the confines of their home. Kenneth describes this platform as a way of releasing resources. Dragør have stated that it wishes to be a part of digitalisation, as it sees how some digitalisation have made certain task easier. Before the introduction of the self-service platform, Kenneth recalls when all parents had to call the municipality in order to register their kids in kindergarten. When they called they were connected to Jenny. Jenny became the gatekeeper of kindergarten registration. She administered the open positions in the municipalities kindergartens through a wide network of protocols and phone lines. When a parent called, she would answer questions to which direction the different kindergarten had, and if they had open positions. If the parents were looking for a specific direction such as a musical kindergarten, she knew. Now parents can gain similar knowledge through the self-service platform that shows the local kindergartens af if they have open positions. The parents can then on their own therms research which kindergartens they find suitable.

The old system had a tendency to be incorrect. In these cases Jenny had to call up the institutions and make sure that the open positions still were open. She then would call the parents back and either give them good or bad news.

This human-reliant system where replaced with the new self-service platform. A system that followed all the rules of digitalisation, where citizens can interact with the public in a less complicated fashion. There were literally 'Cutting the red tape'.

Kenneth explains that this have had positive effects. It has freed up resources, and let Jenny take up other tasks. He elaborates to tell us that it generally have received positive feedback from the parents. Behind the scenes the kindergartens and other institutions relays a message to the system when a positions opens or closes. It too ended up to be somewhat unreliable. Parents would pick their favorite kindergarten only to be told that the position had been filled. This would result in Jenny once again having to recheck the kindergartens positions. In some situations it created an atmosphere of distrust to the self-service platforms, from all the actors involved. The parents, the kindergartens and the municipality instead ended up relying on Jennys ability to gather the correct intel. The self-service platform ended up betraying the network by having just enough slip ups to create a distrust. Instead of trusting the system the networked patched itself by creating a redundancy via a human actor in the form of Jenny as a spokesperson for the municipality. Jenny had the ability to work around the cracks and provide a reliable solution for all the actors. In the end Dragør have a hybrid solution where Jenny and the self-service works in unison. The self-service platform handles the lion's share of the parents request, but when it slips, she is there to carry it.

As these different quotes demonstrates how digitalisation of Dragør commune have become a quilt of different strategies, methods, tools and technologies. The experience and degree of digitalisation have been determined by how the actors interacts with technologies. When a new technology have been introduced into the care sector, networks have been renegotiated or created, boundary objects have been produced as a way of relating to the changes which have happened in the networks. The kindergartens are a part of the digitalisation through the use of a centralised registration system and iPad's. The digitalisation have introduced new challenges and advantages.
Centralising the registration system on the self-service platform have created a digitalised Dragør where the platforms have replaced Jenny as a gatekeeper for the kindergartens at Dragør. These changes how been shown to become more complex as the temporalite of the network became apparent. If the platforms didn't perform as intended, humans had to take over. The platforms did not perform as intended when they were fed wrong information, or wasn't being used at all. Then the reliance and trust in the platforms had to be renegotiated. Jenny became the spokesperson on behalf of the platforms in order to restore the trust. IPads have proven to assist the kindergarten teachers as a technology which can mediate cultural meanings when dealing with people who are unfamiliar with Danish culture. In Dragør digitalisation have come to have several different meanings. Sometimes it is to provide iPads to signin the kids in the kindergartens. Or to mediate a certain understanding of a tradition. Elsewhere it can be to trust (and support) a self-service platform in order to free up resources and provide a better service. For Dragør digitalisation means opportunities to experiment, and to do better.

Small municipalities can dream big, and sometimes Kenneth plays with what kind of digitisation they could achieve without the limitations of a small comune.

*Some (bigger) municipalities provides data about all sorts of things: Where people park their cars etc. If used sensibility this could help optimize how we use the city, where to make bike lanes etc. We (Dragør municipality) are too small both in size and resources to be a part of all that. The essential idea of providing other municipalities, private actors and citizens with this data is exiting.*

*Kenneth Kristensen d. 06.04.18 translated from Danish*

The promises of data driven decision making, in a era where innovation in data collection and data procession has exploded, are dreamy for a small municipality, but for bigger cities it begins to become a reality.

# Dragør SUMMARY

In one of the smallest municipalities in Denmark, digitalisation is depending on two major factors. The national and EU initiatives that requires enrollment in order to stay in the alliance. And the close to heart local innovations crafted by users who experiment with workarounds, and anchoring technology in their daily tasks. It has become clear how the demand for increased digitalisation have let to innovations that have simplified, new or otherwise complicated tasks. Tasks that were complicated by language barriers and distances, as we saw with the daycare centers and kindergartens have seen great use of the micro-development of digitalisation. The experimentation ledger helps the director keep tracks with how these micro-developments progress. This provides an annual overview which he can later reference when they evaluate. If the evaluations are promising or shows potential. The municipality relies on their employees to understand the principles of innovation in workarounds by themself. Innovation is advocated by the director by the *les affair* attitude to the workarounds. The “five phases of design thinking” can provide a valuable insight into how these comes to be, but becomes truly relevant with the more structured innovations, led on by the municipality, like the VR project. A new idea can easily come to fruition in this system. However due to the small size of both the local governance and budget, they rely heavily on the persistence of the individuals. The experimentation ledger, only provides a few headlines for each experiment and is not enough to sustain a handover. The VR project overcame this as another enthusiastic individual took over due to personal interest, not due to a handover. This is one of the major fallacies that Kenneth have decided to live with, as he rather protect the passion of innovation, than have it become “just another IT-Project”. Due to the low cost of the experiments they can afford to abandon those who doesn’t simplify the tasks.
We have seen how the individual institutions are able to decide if it is the best solution for them, and adopt the solution. The director put a lot of emphasis on this choice, and leaving it up to the professionals to decide what is best in their respected fields. They do however need to comply with the national strategies and initiatives.

In order to comply and still maintain the relative independency to choose if to adopt digitalisation with a individual institution. In Dragør they solve this conundrum by allowing the staffers to create work arounds in their own network, as long as the workaround that they comply at a later time, as with the kindergarten that would check the kids in, first eye to eye with the kids, and then again at a later hour on the computer.
We have also seen how this approach can impact the result down the line. with the story of the registration platform, that relied on a centralised database, showed great potential to simplify a otherwise convoluted process, but in the end they had to create a workaround to reach the potential.

The experimentation process; micro-development of digitalisation in Dragør provides pragmatic workarounds driven by passion rather than money. The process aims to raise the quality rather than save money, the by product is often significant simplifications.

## Summary End of chapter three

Through this chapter we have explored different cases of digitalisation born from different experimental approaches. We have applied the five different design thinking phases to these experimentations. This have given us a unified way to interpret which parts they focus on. We have seen that the success of innovation is not necessarily determined by the rigours use of design thinking. The success isn't necessarily determined by if they reach their goal either. Instead the nature of the innovation process allows for the goal posted to be moved to where the success is. This allows for workarounds in Dragør to become useful even if the personnel have a different idea of what should be digitalised. They let the professionals make a decision based on their profession. The movement of the goalposts also allowed NemID to become a success, when they changed the law to improve the penetration. By applying a plastic version of "five stages design thinking" it was possible to gain insights into the process.

NemID was developed as an experiment to a national standard platform which now stands as a prestige project within digitalisation. This as an example of how digitalisation succeeded, after a state of messiness in its development.
Followed by a description of how CSL endeavours to create experimental open solutions that engages the public, from a believe that data should be available for the public if it is already generated for the municipality. This vision comes from a perception about creating innovation and growth through public transparency. As CSL tries to roll out different experiments to support this they fail to obtain the public's interest. Thirdly we have dived into the digitalisation approach in Dragør explained by Kenneth the municipal director. Here we look into how the development of digitalisation in Dragør is linked to a more pragmatic experimental approach bound in passion for local needs. This approach is different from the other approaches described in the other networks, which are more replient to be driven by innovation.

Overall we see that these different approaches to experimentation are bound to the actors different understanding of what digitalisation is for them which leads to the ambiguity of digitalisation. But when we look closer to how these different actors explain their conditions for their approach to digitalisation it forms a clear apprehension of digitalisation contextualised through the perception of its visions.

# *Conclusion*

As we come to the conclusion of this report and try to answer the questions that we had set forth, we can divide the field of Danish digitalisation into four different messy fields.

1. Through this thesis we have documented different perspectives on the Danish digitalisation in an attempt to understand why we digitise and its importance. We see different forms of public digitisation have been grounded in the movable goals of the actors, thereby creating a situation where the goals have become interchangeable and messy.
As the crescendo of digitisation and its possibilities encloses upon us, these goals has become obscured from the public eye. We see that for some public actors the answer to the question "Why do we digitalise" have become digitalisation for the sake of digitalisation, where outcomes of digitalisation are designated to second priority in the digitalisation discourse. Here digitalisation is a goal in itself.
During digitisation the goal has been, through recent time, an objective of delivering **internet** as a public property that everybody can access. As the internet have become available for everyone the demands rises. Here we have merged with a new objective that pushes faster internet throughout the nation. The internet and the anonymity which have followed have created a need for documentation, which have provided a new resource for the public. As the internet develop, data has become a instrument for the government to provide solutions that optimize their operations of serving the people by simplifying how the solutions a designed. For others digitalisation **provides welfare in new ways** which were not possible before. The digital strategies 2016-2020 outlined how the public sector is too continue its implementation of digital services. Understanding how different actors work with digitalisation, these strategies have shown themself as central actors. As our informants have shared their own understanding of appropriate digitalisation, the key elements of these strategies have been retold as our anthropological object of study..

2. As we have navigated through the field of digitalisation we see that our contribution can be defined in our ability to conduct empirical driven inter-disciplinary dissemination of a field that is in itself messy. Uncovering how the different actors move through the membranes enclosing the field.
There is a need to connect the different perspectives that are being spoken by this field and provide overview of the different issues that consists within Danish digitalisation. Having worked within the messy field, and uncovered how the perspectives of the actors changes depending on how they are situated in different networks. The knowledge of how the perspective define the term digitalisation, demonstrated how an ethnographic study of the field carries a validity.
Here we see how our methodological approach and understanding of networks and actors as an method to create this overview for the field as a way of compressing the complexities that subsists within the translations between networks.
This overview provides insight in the different layers that exist in the field and create a better ground for interpretation between the actors within the messy field. This way of interpreting the field can provide insight for immediate and future issues involving Danish digitalisation.

As we shown in this thesis the actors operating in this messy field have used the term digitalisation as a means of enrolling themselves in the respective network of digitalisation.

Where the pressure for digitalisation have become more dominant as the field have applied a broader definition of digitisation when implementing new technologies. As shown with Dragør the term have become applicable when introducing iPads in the kindergartens, where as the Digst uses the same term when describing a standardised platform for the collective data in the public sector. This use of digitalisation have proven to construct a field in which different actors use this term as a description of compliance rather then a applicant of technologies for improving the service in the Danish public sector.
We have come to understand the actors and their use of digitalisation by looking at how the different actors move through the membranes created in the different networks. Understanding how their roles in these networks changes when they move between the different membranes have showed how the simplification of complex situation have defined the digitalisation we have seen.
Open solutions lab and Basic Data Program have both created a single platform from where information can become available. In the case of Copenhagen solutions lab we have showed how their experimental approach to development can be seen as a iterative process of design thinking. We see that despite their best efforts to promote external growth through innovation they strain to attain the public's interest in their solutions. This questions the idea from the national strategy in transparency of government information as innovation driver.
Dragør have eased the language and cultural translation process with the help of iPads and created a self service which are well liked by the parents. These points from Digst and Dragør shows what resourceful and skilled actors working with digitalisation can accomplish. This have given the chance for other actors to use digitalisation as a way for accommodating the prestige of index rankings. This is a political incentive for approaching digitalisation that is different from the case of Dragør where cultural context is more evident. The field of digitalisation where the application of technology have become more dominant as the term have diluted and the result presents itself as a messy field.

4. We see a need for a more context oriented approach to the term digitalisation as its meaning has become flooded with different understandings. We have experienced a field where the term is loosely used and have created a state of incommensurability. Through a Techno Anthropological perspective and by opening different networks, and subsidizing different aspects of the technologies that are connected within these networks. We contribute to a better foundation for understanding the messiness of digitalisation. It is our conviction that this contribution can assist or incite a interdisciplinary debate in Danish digitalisation. Demonstrating how digitalisation have become a messy field, allows for the Techno-Anthropologist to make claims about how certain definitions of digitalisation are situated while others are based upon partial perspective of the actor.

## *Perspectivation*

This thesis has been developed through the scope of public digitalisation, as we have shown how the field of Danish digitalisation is messy, vast and complex. We have given a picture of the many understandings of digitalisation on the basis of the empirical research that we thought was the best fit to give a wide representation of how digitalisation is perceived across different public levels of interaction. In this particular case the research has been conducted exploratory and our informants have been identified, contacted and interviewed throughout the process. Which has opened to a realm of information on how people throughout the public institutions understand digitalisation. It has also given detailed insights into specific digitisation projects they have interacted with. As we choose to take a step back and look at digitalisation from a wider angle than what we are use to, as Techno-Anthropologists, it is founded in a genuine perception of the messiness that we have encountered in this field. Here we found an urge to unfold it. In this section we will explore two different ideas on how we believe this field could be investigated further.

As Denmark is on the frontier of Digitalisation we recommend that the approach to researching the field should be wider than how it is currently dominated by policy papers. During our master thesis we have encountered a field of specialist, where the public are left as an outside interest. ow different interest groups such as microsoft, google and other tech companies have shaped the conversation, by producing these policy papers. We believe that there is an interesting field from an Science and Technology Studies point of view to investigate the public Danish digitalisation in an attempt to get further understandings of the different contexts that lives in technologies that are being developed in this sector.

If we should arch this idea onto the digitalisation we have encountered we believe there is an aspect in the research into the Basic Data Program. Building to the text of Akrich;The description of technical objects (Akrinch, 1992). And how new technologies create and reshape the social contract. We would study the connection between how implementing a open platform that shares public data can be perceived as the formation of a new social contract between the public and the government. Here we would dive deeper into the ideas and political incentives behind the constellation of the platform.

We see that there is an interesting field, from a participatory perspective to be apart of a digitisation project from concept to test. In order to get an understanding of how different understandings of digitalisation meet in the development of a digitisation project.

Here we see an opportunity to use design anthropology in the development phase of a project. Here we would intervene through the injection of developing such a project with the user. In the case of Copenhagen solution lab there is an distinctive issue in their ability to create a data sharing platform that creates an interest for the user. We see that their design approach is based in a context of a perspective that is user centered (Sanders and Stappers, 2008). It is our conception that by inserting a techno-anthropologist in the development phase with assignment of first mapping the different understandings of digitalisation that are present from the designers, to create a better understanding of how digitalisation is perceived differently from the different developers and designers. This to support the mediation of the problematization and could mediate an understanding of how

improve the implementation of users in the design phase. We think that an user centered design approach with the user as a partner (Sanders and Stappers, 2008), could create a better basis for creating a more universal approach to the external use of open data initiatives in Copenhagen solution labs.

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