The many faces of Open Data

- a socio-technical phenomenon

Diving into the logics of Open Data practitioners –
An Actor Network approach to Open Data in a Danish context.

Master's Thesis

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Abstract

Open Data has become a widespread phenomenon and it has entered the Danish Public bodies and Government. The development and digital implementation of Open Data consist of legal claims and technical solutions which to a great extent assist this development. Hence, this thesis study has a focus on 1) how the Government institutions and Non-Governmental organisations interact and organise themselves, and 2) how the definition and discourses of openness and data might affect the value of Open data. The intention of this thesis has been to provide a picture of Open Data in Denmark and how this phenomenon is understood. This is done by investigating some of the constitutive legal systems, technologies and development programs, to give a clearer look at some of the most essential and influential supportive systems of Open Data. Moreover a descriptive review of each of the studied actors' Open Data identity, obstacle, visions and goals is given. The purpose of this is to provide an understanding and to give an impression of their different approaches to Open Data and in the end how they position themselves in relation to each other. Besides that, this thesis contains the exploration/examination of how the involved actors define and articulate Open data. This is done to highlight the many ways in how Open Data might be handled. This interplay between humans and technology is combined and analysed by using Actor Network Theory. Eventually different topics within this study are discussed to give recommendations and inspiration for further research.

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Abbreviations

Abbreviations:	**Unabridged**	**In Danish**	Misc.:
OD	Open Data		
OGD	Open Government Data not to be confused with OGP (Open Government Partnership)		
Abbreviations:	**Organisation**	**In Danish**	
AAK	Aarhus Municipality	Aarhus Kommune	
AI	Alexandra Institute	Alexandra Instituttet	
CULTURE	The Danish Agency for Culture	Kulturstyrelsen	
DIGI	The Danish Agency for Digitisation	Digitaliseringsstyrelsen	
DMI	The Danish Meteorological Institute	Meteorologiske Institut	
GEODATA	The Danish Geodata Agency	Geodatastyrelsen	
KL	Local Government Denmark (LGDK)	Kommunernes Landsforening	
OKF	Open Knowledge Foundation	Open Knowledge Foundation	
OGP	Open Government Partnership	Open Government Partnership	
MBBL	Ministry of Housing, Urban and Rural Affairs	Ministeriet for By, Bolig og Landdistrikter	Closed after the change of government in June 2015.
VIRK	The Danish Business Authority	Erhvervsstyrelsen	
WIKI	Wikimedia Denmark	Wikimedia Danmark	

1 Introduction

Everyday immense amounts of data and information are being transferred and exchanged digitally. Collaborating across disciplines and gaining new insight from this volume of data reveals new ways of combining information. Along with the development of the internet new digital solutions become possible in the 21st century and thus data make the world approachable in new and interesting ways. The abundance of data is produced through digital devices that we surround ourselves with at home, at the workplace and in public places. Data are produced through the use of social media, cloud computing and the internet of things; through objects that possess software and sensors that exchange data with an operator or a service system. Data comes from all kinds of sources and with the idea of opening data and letting it become public, *Open Data* has become a global phenomena. So what is Open Data? In its most abstract form, it can be any kind of data, published by anyone. The overall idea about Open Data is that it should be open so that anyone can freely extract and use the masses of data.

1.1 Literature review; The phenomenon Open Data

We begin our research with a literature review to get a clearer view of the field of Open Data. This chapter looks closer at what 'open' may mean in relation to Open Data and, further, how this phenomenon has been embraced by some of the pioneers within this field and how it reached Denmark. This literature review is thus set to explore the understanding of the phenomenon Open Data by unfolding the different notions of *openness* in a historical, legal and technical manner that have emerged throughout literature over the last decade. This review shall assist the conceptual clarification of the terms *open* and *openness,* and understanding the interwovenness of technologies, definitions and ideas that surround Open Data. Furthermore, it should direct attention towards different definitions on data and information, and highlight some of the characteristics of data. We do this to bring insight into the landscape of data and draw a picture of how data might traditionally be understood. Finally, it should help in understanding some of the structures that data may carry with it.

1.1.1 What does 'open ' mean in Open Data?

Starting with understanding what *'open'* may mean in Open Data, the definition of the word *open* provides a long list of different dictionary interpretations such as "*being in a position to permit passage"* or *"completely free from concealment: exposed to general view or knowledge"* or *"having no enclosing or confirming barriers"* (Merriam Webster 2015). These definitions of the concept *open* in Open Data, could indicate that openness is about, permitting "passage" to the data by publishing it on different platforms, on paper or in alternative ways, and if some data is not open but "in need of being so", then passage should be granted. Furthermore, openness can be about trying to be transparent in letting the data be free from concealment. Although we can talk about Open Data that is freely available and accessible to use, it is not all data that are open. This is shown in the visual representation from opensource.com beneath.

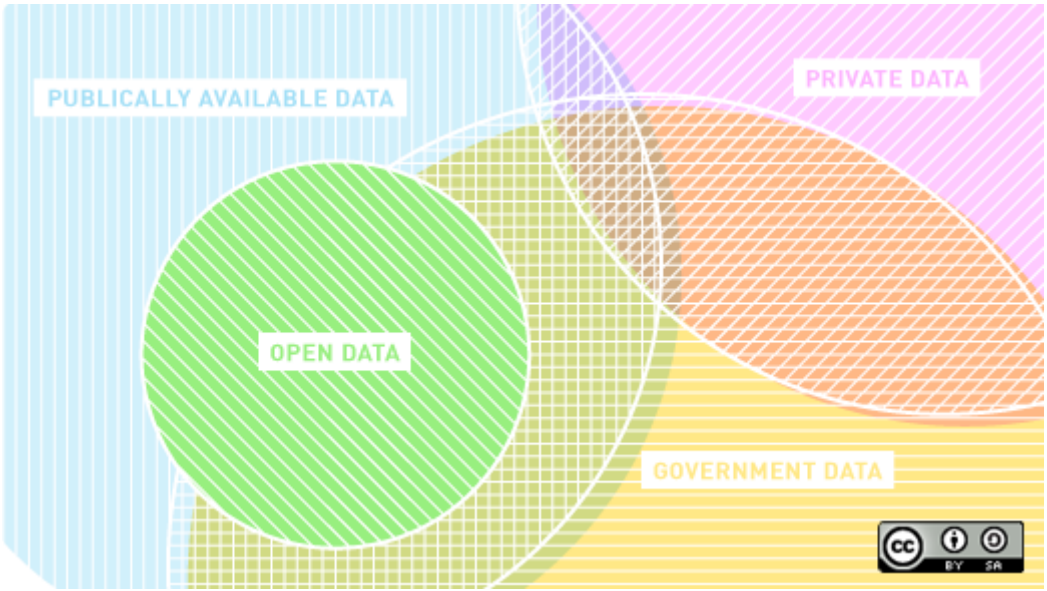

Figure-1: Visualisation of Open Government Data

> *"Simply put, all open data is publicly available. But not all publicly available data is open"* (Chernoff 2010).

The quote by public policy manager Melanie Chernoff along with the visualisation show that the Open Data that is made available is Government data. In general Open Data can refer to Open Scientific Data, User generated data, Private data (coming from businesses) and in general data that is made open. Furthermore research on Open Data has gained more attention because of the Public Sector Information directive (PSI) coming from the

European Commission (Zuiderwijk et al. 2014). The terms Public Sector Information and Open Government Data represent Open Data produced by governments or other public bodies; hence the argument that government data belongs to the public as they are financed by tax funds (Janssen, K. 2012). The quote above encapsulates some of the issues related to Open Data: What does openness mean in relation to Open Data?. As stated by Chernoff, all data from public institutions are not made publicly available and free to use by everybody, but what has been made available is Open Data for everyone to use. This degree of availability or lack thereof is where the notion of openness becomes more entangled in technology, politics and ethics. For instance the Global Open Data Initiative (GODI) who are a collaborative community led by civil society organisations relates to *what* kinds of data that are published, whereas Chernoff states that the importance is more a matter of *how* data is made available (Chernoff 2010; GODI 2015a). One of the main arguments in keeping "some" data closed (*what* data) is done with an ethical mindset. Simply the one that data related to privacy concerns, should still be protected and handled with certain care. Open Data should in this sense be handled with definite and secure control so that the public will not become opposed to the concept openness. Furthermore gaining access (*how* data is made available) should imply and strive for technical and legal standards (Chernoff 2010). Additionally it could be stated that the quote from Chernoff both triggers the question of; *what* data is made open, as well as it triggers the prevalent issue of *how* data is open and accessible. Moreover it could be asked; *why* should data become open?

For this reason we begin with a list of what *open* means because there are at least eight notions of (*what, why* and *how* it should be considered) open in Open Data in circulation. This literature review thus revolves around these questions of *what* data is open, *why* and *how* it is open. And, consequently this thesis focuses on Public Sector Information and Open Government Data which are the keys to this research as it studies the phenomenon of Open Government Data within the Danish public sector. Thus the terms Open Data (OD), Open Government Data (OGD) and Public Sector Information (PSI) are used interchangeably in this thesis.

1.1.1.1 Notions of open in Open Data:

- Initiators in the field
- Open Government Data in Denmark

What is open?

- Public Sector Information (PSI)

Why should it become open?

- Drawing on History part 1: Open involvement, the Right to Access
- Open Innovation
- Recent History part 2: Open Source and Access
- Open systems and application

How does it become open?

- Open Formats: usability
- Linked Open Data
- Open permission

However before looking closer at the different notions of openness, let's start by presenting some at the initiators in the field and how OD has disseminated to Denmark.

1.1.2 Initiators in the field

OD as a phenomenon has become a generally accepted practice within Governments (Gray 2014). In spite of this, a definition of what constitutes OD has not yet found its way to statutes or case law, so, OD principles can be said to emerge mainly from the practitioners from civil society or non-governmental organisations (De Filippi & Maurel 2014:2). For instance the Non-governmental organisation Open Knowledge Foundation (OKF) made their 'Open Definition' around year 2005 (Open Government Data[1] 2007). Their definition consists of a set of principles referring to open knowledge, which are created to define *openness* regarding data and their content (Open Knowledge Foundation[2] 2015a). Other initiatives for defining OD such as the Open Government Data from 2007 were started by a working group from Sebastopol, California, US. They have formed eight principles that describe the process of opening up government data, including many legal aspects (OGD 2007).

In the middle of the 2000's the pressure exercised to governments worldwide to make their data freely available was increased. Some of the front movers in this field of opening up government data are the US and the UK. It happened by the launch of US' data.gov in May 2009 and the UK's data.gov.uk in January 2010 (Yannoukakoua & Arakab 2014:337). Since the launch of the US and UK sites, OD has been globally accepted by different pioneers and

[1] From now on referenced as OGD 2007
[2] From now on referenced as OKF

groups such as technologist, data journalists, civic society organisations, and swiftly it reached governments and the international World Bank and the Organisation for Economic Cooperation & Development (Ibid.). This shows that OD is being embraced by a variety of different players in the field. Similarly, in 2010 Tim Berners-Lee (inventor of the world wide web) suggested five steps for assessing the quality of data. These five steps where one indicates that it should be made available on the web with an open license have inspired several countries such as USA, UK, Australia, Austria and France to adopt OD policies (De Filippi & Maurel 2014:3). With governments providing OD to the society new ways of exploiting data have started a considerable change in how government data are being handled. The idea behind opening up government data is to create utility and forge new ways of working together internally and externally across organisations, further it allows for new creation of information through collaborative networking (Janssen et al. 2012; Kitchin 2014). OGD is thus stated to initiate and support social development, research and innovation (De Filippi & Maurel 2014:2).

1.1.3 Open Government Data in Denmark

The precursor of OD and what enabled governments to think in the lines of OD is the reorganisation of governments becoming E-Governments (digitising government services) (Veljković et al. 2014:276). Through the restructuring of becoming an E-Government in Denmark, digitisation of public services is becoming more and more a part of how the government is running their daily tasks. The Danish Digitisation Strategy 2011-2015 of the government, is a joint collaboration of making the public sector more digital where OD is an essential part of this development (The Danish Government et. al 2011). Written on the European Commission's site about ODIS (Open Data Innovation Strategy, Denmark) is that Denmark is one of the leading countries when it comes to digitising society and the/their aim is, that everybody should be a consumer and creator of digital products and services (ODIS 2015). Also, it is mentioned that government data is a key resource in furthering innovation which can benefit competitiveness and, further, strengthen openness, participation and democracy. The ODIS strategy is carried out in order to save funds that can be reallocated for efficiency in other public service areas such as health, education or increased internal productivity (ODIS 2015). Researching the Danish media we can see that the government would like to see more public-private partnerships for creating innovation around OGD (Skaaning & Andresen 2014). The practises of OD have thus diffused into the Danish government's strategies, and from there to the public bodies. Denmark is partaking

in national and global initiatives and different open government platforms are becoming more visible on the internet along with a lot of events and hackathons using OGD.

What is open?

1.1.4 Public Sector Information (EU)

Public bodies produce OGD that is seen as a resource of geographic, traffic, weather, tourist information, statistics, business, public sector budgeting, and performance levels, to all kinds of data about policies and inspection (food, safety, education quality, etc.) (Janssen et al. 2012:258). All these data that are stored and gathered by different methods, techniques and equipment in digital formats within public institutions are called Public Sector Information or referred to as the PSI- directive. The European Commision has adopted OD policies in which a part has been accounted for by law in 2003, such as the reuse of PSI throughout the European Union (EU) (De Filippi & Maurel 2014:6). The main function of the directive is as stated in the EU site, that:

> *"The Directive on the re-use of public sector information provides a common legal framework for a European market for government-held data (public sector information). It is built around two key pillars of the internal market: transparency and fair competition."* (EU-Commission 2015a).

As stated above the reuse of PSI is carried out to increase transparency as well as to open up for the freedom to conduct business on the basis of the information that the public institutions disseminate (Cerrillo-I-Martínez 2012:211). The governments play a central role in OD and their own roles might change in the implementation of OD. This is further stated in an article by Maureen Henninger who researches the concept PSI from a historical, regulative and political perspective, and further its commercial use within private companies and its effect on the public sector itself. She highlights that the reuse and opening of PSI may create tension on different levels and mistrust towards the government (Henninger 2013). The reason for this could be due to the fact that government data, before being published, is (or should be) cleansed so that it does not contain sensitive personal data and is thereby safe to publish (Janssen et al. 2012:258). The PSI-directive does not concern sensitive personal data, since it is decided by law, but focuses on transparency, economic growth and innovation through non-sensitive data (Retsinformation 2005a).

Why should it become open?

1.1.5 Drawing on history part 1 - The Right to Access

OD is often equated with Open government and the transparency thereof. It can thus be understood as a phenomenon that attempts to democratise, or involve citizens in society. OD is thus often seen in accordance with the Right To Information movement (RTI) as a means to transform power structures between citizens and government. The RTI movement dates back to 1766 in Sweden with the Freedom of Press Act/Freedom of Information Act (FOIA). The FOIA took effect in Sweden and Finland, where the Finnish enlightenment thinker and politician Anders Chydenius (1729-1803) was one of the main characters in creating the FOIA law. The ideas behind this were that citizens should get access to public government documents and to abolish political censorship (Björkstrand & Mustonen 2006). The principles remained central in the Nordic countries although the law was suspended for a period in 1772-1809. As Gustav Björkstrand & Juha Mustonen associated with the Anders Chydenius Foundation write:

> *"Freedom of information (FOI) is a human right. In order to make governments accountable, citizens have the right to know - the right of access to official documents. Freedom of information has been developing at a strong pace only recently, but it is hardly a new concept. The roots of the FOI principle date back to the 18th Century, the Age of Enlightenment"* (Björkstrand & Mustonen 2006:4).

The Freedom of Information movement was adopted by the US in 1966 and made an impact on the legislative tradition around the world (Yannoukakoua & Arakab 2014:334). Norway and Denmark entered in 1970, France and the Netherlands 1978, Australia and New Zealand 1982, and Canada 1983, and now the list contains about 70-90 countries (Blanton 2006; Yannoukakoua & Arakab 2014). As for the EU essential development towards open government was made around the 1990s. Around year 2000 a charter of Fundamental Rights in the EU was made, which contained both freedom of expression and the right to access documents. A regulation about access to documents was further adopted in 2001. When it comes to the matter of transparency and openness of government data, the Nordic countries are considered some of the predecessors (Luhtanen 2006).

The idea behind the RTI movement, that originated from the FOIA, is that citizens have a right to government information and that information is gathered for the benefit of the public. OD can thus be seen as a catalyst in opening up government information, and by the means of technology it is now possible to publish large quantities of data coming from various public bodies. The technological development enables the conversion of OGD to digital platforms more quickly. OGD is thereby seen as a means to increase public participation and to provide the citizens with information from the society they are a part of (Henninger 2013:82; Yannoukakoua & Arakab 2014; Janssen, K 2012). It can be said that the historical ideology of RTI/FOI has become revived and thus "modernised" with the means of technology.

The main advancement of this ideology is that it should create more transparency between the government and the citizens. This rhetoric about increasing transparency is something that has gained ground in the promotion of OGD. The relation between RTI and OGD is explored and further the conceptual effect they have on one another (Janssen, K 2012; Yannoukakoua & Arakab 2014). It is argued that several similarities between the RTI and OGD can be pointed out such as increased transparency, greater participation, economic growth and innovation, which could be said to form a basis for a common language between the two (Yannoukakoua & Arakab 2014:339). To this point RTI could be identified as the fundamental human and civil rights that force governments to a proactive release of OGD and appear as a counterbalance to potentially generated imbalances (Ibid.). Accordingly this can make the more human-rights based RTI and the more technologically driven OGD movement differ in the information and data that the proponents target respectively from the two movements. Specifically this may affect the development of OGD towards a more technically skilled audience (Janssen, K 2012:1; Yannoukakoua & Arakab 2014:337). The point is that there are some fundamental differences in the objectives of the two movements and in the way it is communicated to the public.

1.1.6 Open Innovation

OGD mainly being technologically driven instead of ideologically driven as RTI, also springs from the governments themselves when they saw the power and potential that OD reveals in relation to economic growth and innovation (Yannoukakoua & Arakab 2014:337). Hence, OGD may advance the co-creation between government, citizens and private companies. OGD is seen as having an essential role in doing cooperative work among different public and private institutions as well as among the public. This highlights a collaboration where

innovation is paramount and economic growth the gain. Opening up government data should enable citizens to improve existing systems and services, and create value. The free flow of information should empower citizens to be more innovative and create better and more sustainable solutions for society.

For instance Deputy Chief Technology Officer at the White House Open Government Initiative, Beth Noveck, speaks of how public institutions should be as good as organisations to make people work together in a TED talk called "*Demand a more open source government"* (Noveck 2012). She points out how government institutions could learn from private organisations and the way they reinvent themselves on a regular basis. This might teach government institutions and the public sector to bring out the many talents of the citizens. Noveck exemplifies by mentioning Twitter and how they opened up their platform's API (Application Programming Interface) so that users could create their own applications and extensions that better processes information from Twitter to the individual user's needs. That is why she suggests to open "the APIs of government" to support the co-creation of the process of governance. She believes that this might strengthen the feeling of engagement and democracy and that this development might create more jobs within innovation and entrepreneurship or more involvement of citizens investing their free time and abilities. This movement urges the citizens to participate in their own community and government, where it is possible to make better solutions and where startups and entrepreneurship are supported (Gray 2014:20). OGD can therefore be seen as an idea that stresses openness for all data and information for everyone to modify and redistribute.

1.1.7 Recent history part 2 - Open Source and Access- The tradition of Open Source

The recent technology-driven approach to OD originates from the practices encouraged by the Open Source, Open access and civic hacking communities that all emphasize how to make data available and approachable (OSI[3] 2007; OKF 2015b). The term *open* is often defined as getting *access* and has been used in extension of the ideas coming from open source (Gray 2014:17). As Jonathan Gray writes in his article *"Towards a Genealogy of Open data"*:

> *"([...] "open" is used as a modifier with "data access" or "data formats"), it is not until around 2006-2007 that it begins being used more widely as a distinctive concept"* (Ibid.).

[3] Open Source Initiative

The interest in OD started in the 2000s with the geospatial Open Source community using freely available geospatial data (Ibid.). Moreover the Open Source movement got tangled with other activist groups of "electronic democracy" or "e-democracy" who wanted to use Public Information to create services and build websites for the public, and in the end of the 2000's this idea of developing services to the citizens now cost a lot less as longs as the data was opened up (Gray 2014:19). Then from the late 2000's up until now hackathon initiatives from the government in the form of competitions and challenges to make civic hackers, non-governmental and private companies reuse public information have been a continuous process (Gray 2014:20). According to Gray these different initiatives create new tendencies towards governments acting as data providers instead of providing digital services (Gray 2014:21). Additionally the interest in government data increased along with some of the establishers of the NGO, the OKF in 2004. Inspired by the Free Open Source/Open Access movement they define *OD* in the OKF and their Open Data Handbook, based on the Open Source Definition (Gray 2014:19). The purpose of their definition is to clarify the meaning of *open* and they state that free access and free usage are some of the main characteristics of how it is defined (OKF 2015a). Furthermore, they add that data is seen as information or knowledge that should or can be shared and that OD works should continue being open in all derivative works (OKF 2015b). Moreover the definition includes that the data should be published in an easy to use format and should not require software with monetary restrictions for unpacking or analysis *"or, at the very least, can be processed with at least one free/libre/open-source software tool."* (Ibid.). OGD being influenced by the Open Source Definition puts emphasis on openness as free redistribution and modification of data, the open source tradition lets everyone get free access to infrastructure and source code which concerns: *"[...] reconfiguring software and publishing into open and transparent forms with respect to licensing, copyright and intellectual property rights."* (Kitchin 2014:48).

1.1.8 Open Systems and application

One of the applications of OD is enabling citizens to collect or analyze data in new ways to create new knowledge. Berners-Lee mentions during a TED talk called "*The year Open Data went worldwide",* how data can be used in different scales both locally and globally (Berners Lee 2010). He mentions projects like OpenStreetMap, created by volunteers using OD to help create a better free digital map. He also mentions the GeoEye web application that helped organize an overview of refugee camps for the Haiti earthquake in 2010 (Berners

Lee 2010; Openstreetmap 2015). These are just two ways to build applications and extensions using OD. These mashup projects combine maps with local geodata and create better infrastructures or more detailed maps that can be combined in various ways. An early example of mashup with government data (analogue maps), comes from London and saved lives by bringing down cholera contamination. In the 19th century physician Dr. John Snow combined data about cholera fatalities with the location of drinking water wells and thus discovered a relationship between water pollution and cholera. This discovery lead to improvement of the sewage systems and containment of cholera (OKF 2015c). By combining data new knowledge is potentially discovered. Opening up data from various sources is thus seen to increase the possibilities of making the world better.

Openness is often seen as defined by the open systems from which they can be extracted. However, during our literature study we stumbled upon a description of a Finnish software company that consider even their internally available data to be OD (Tammisto & Lindman 2012). In other words, some empirical findings concern the application of the data rather than the actual process of opening up the data. In these instances the value of OD lies within the reuse and application of data, internally or between organisations (Ibid.). The same authors mention a shift towards open systems, where many non-profit organisations, such as NGOs, lead the way by distributing their data through open systems to make it accessible for everyone; namely a shift from closed to open systems (Ibid.). However, open systems are difficult to control due to unpredictable and external factors. An open system can be guided rather than predefined (Janssen et al. 2012). As a result, new ways of managing OD are required.

How does it become open?

1.1.9 Open Format; Usability

Openness is also related to many technical aspects that determine the availability and access to data. For instance, file formats determine the way data can be stored and organised, and to which extent it can be categorised as *machine readable*. Machine readable formats such as Excel, CSV and RDF are *"[...] easily read, written, parsed and displayed by a computer."* (OKF 2015d). Formats are important when talking about the use of data, because the formats determine the usability. This means that some formats work as barriers for opening up and reusing OGD, for example if data are published in more rigid formats like PDF (Molloy 2011; OKF 2015e). "Open" formats refer to the fact that everyone can use free software, where

"closed" formats may be less machine readable or require proprietary software (OKF 2015e). This tells us that the idea behind open formats is that everyone should be able to access and reuse data on equal terms.

1.1.10 Linked Open Data

Talking about "good or bad" (open or closed) formats we consider Linked Open Data (LOD) important to mention. LOD are what Berners-Lee sees as the finest state of OD (Kitchin 2014). "Linked" refers to how machine readable datasets can be connected and combined, through *"unique identifiers and mark-up language"* as tables in a database (Kitchin 2014:53). Berners-Lee has created a five star system for rating the usability of different formats (Berners Lee 2006). PDF documents and other rigid formats are assigned only one star, because it is often only readable by humans. One can not edit or mashup rigid PDF files. One star is therefore given to information that is *"[...] available on the Web (any format) under an open license"* since this is the lowest common denominator for OD (Bauer & Kaltenböck 2012:17). Two stars are given when information is structured. Structured means that it is put into machine-readable formats like Excel. Three stars for non-proprietary formats, that is, formats that can be used without having to pay for software, formats that only require free or Open Source software. For a dataset to obtain more stars, the requirements are as follows:

- Four stars - "URI identification is used so that people can point at individual data"
- Five stars - "Data is linked to other data to provide content" (LOD)

As we see the five star system may work as guidance for OD publishers to follow.

1.1.11 Open Permission

Guidelines for legal aspects of the use of OD are usually found in the licenses that accompany most open datasets. It can be discussed if it might become a matter of legislation of what is, can or should become OD. OKF explains licenses shortly: *"The term license refers to the legal conditions under which the work is made available."*, where 'work' refers to data (OKF 2015b). Many different licenses like Creative Commons (often used by artists, writers and researchers) are available for data publishers to use. According to OKF licenses must meet specific requirements such as *"The license must not discriminate against any person or group."* to truly count as good OD licenses (OKF 2015b). Preferably the work shall be easy to download and free of charge, except from possible low one-time production fees. The work shall also be accompanied by the necessary information that makes the user able to comply

with the licence. In addition, users shall be able to split or distribute the data as they like but under the same licence as the original work.

Having a license for the data that is published means that the data providers do not have to worry about how the data is used or cited; it is all in the license. Data publishers can add a license to datasets to avoid misunderstandings regarding the terms and conditions of use. However, there are different licenses to add depending on the content of the data. This means that:

> *"Some data(sets) may be required to be openly available. E.g. subject to a Freedom of Information Act, Some data(sets) may be subject to restrictions. E.g. privacy, national security, third party rights. Some data(sets) may be available for reuse but not for modification. E.g. legal texts, public budgets (if modifications are made, it must be made clear that the data is not the actual authentic version)."* (EU-Commission 2015b).

In other words, when selecting a license there are many to choose from, and one catalogue of datasets may need several different licenses (Creative Commons 2015).

1.2 Data and information

So, now that we have made our encounter with different notions of openness, we need to look deeper at the understanding and definition of data, since data can be just as multifaceted. Often data are defined as information extracted from the world and put onto paper, in bytes, in pixels, pictures or as audio. However, the role of data in relation to OD is not clearly defined but mostly seen as an informational, social, political or economic resource (Janssen & Zuiderwijk 2013; Yannoukakoua & Arakab 2014; Martin 2014). Drawing a picture of data as a resource provides an abstract, and still unclear, definition of the term.

Data is often understood in conjunction with information. It is therefore commonly seen that *government data,* and *government information* is used interchangeably - and the distinction between the two is rarely made. While wondering why many people think of data being equal to information, we find that traditionally the value of data is understood - explicitly or not - in relation to the *Data, Information, Knowledge & Wisdom pyramid* (DIKW)

(Rowley 2007). The well documented and well debated DIKW hierarchy, is often used within information science. Professor of Information and Communications at Manchester Metropolitan University Jennifer Rowley makes an in depth literature analysis of how this hierarchy is explained in literature. She describes how data transforms into information, information into knowledge, and furthermore knowledge into wisdom, to unfold the internal relations in the hierarchy. Rowley draws on Russell L. Ackoff's *Hierarchy of Knowledge* for introducing the DIKW hierarchy in 1989. Since this hierarchical pyramid (see Figure-2) is commonly cited, Rowley sought after a definitional and relational clarity between the four levels in the pyramid. Additionally she states that little attention has been put on the process between the levels and on the term wisdom (Rowley 2007).

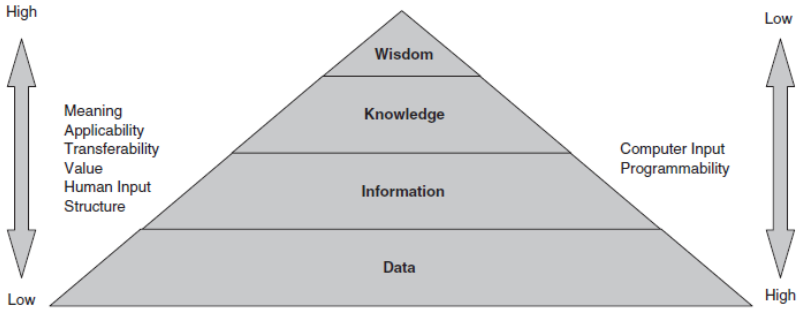

Figure-2: The DIKW pyramid (Wisdom Hierarchy).(Rowley 2007:176).

Defining data is often made on the basis of the hierarchy of the DIKW pyramid where data is seen as being given facts or observations about the world (Kitchin 2014; Davenport & Prusak 2000; Rowley 2007). Each layer of the pyramid is distinguished by an extraction process that adds meaning and value to the data. However, in the transformation between data and information exists an expectation that might emanate from the etymology of information, to inform, which means "to give shape to". In other words, information informs and shapes the person who receives it and changes their outlook (Davenport & Prusak 2000:3). Data, on the other hand, can be defined as *'invariances with potential meaning'* for those able to interpret them (Boahene & Ditsa 1995:193). This indicates that there is a process of using data as building blocks for building information. The hierarchy of the DIKW pyramid generates a transition process where each step is preceded by the former and data then becomes the foundation for information (Weinberger 2010).

Rowley stresses the importance of distinguishing meaning from structure when identifying data and information, due to the confusion that it might bring to the concepts. Namely the question of whether the transformation from data to information is understood as added structure, added meaning, or both (Rowley 2007:178). This paves the way for different

views on which is more valuable. Is it data, in its more unprocessed state, or is it information, that is data in a new context? It refers to the extra layers of context or interpretation as a good or bad thing, depending on the user and the use (Rowley 2007; Kitchin 2014). Further criticism has emerged pointing out that the visual image of a pyramid may provide the 'wrong' picture of how knowledge becomes a finer grained process of each layer below starting with data; instead of a hierarchy it may be more of a process going both ways (Weinberger 2010).

1.2.1 Selected information

What we also need to know about data is its origin and for that we draw on professor of geography and social sciences Rob Kitchin and his work *'The Data Revolution: Big Data, Open Data, Data infrastructures and their consequences'*. Kitchin describes the wider complex infrastructures that data are a part of, how the development of data is changing and thus advocates for new ways of framing and conceptualising data. In other words, one set of data can have many meanings depending on the context in which it is used. Due to the rise of new phenomena such as Big Data and OD we have to keep in mind the wider networks and paradigms in which data also operate. OD is as mentioned earlier often seen as carrying enormous potential and is a very prominent topic in along with Big Data. Joel Gurin from the GovLab at New York University writes in The Guardian:

> *"Both big data and open data can transform business, government, and society – and a combination of the two is especially potent. Big data gives us unprecedented power to understand, analyse, and ultimately change the world we live in. Open data ensures that power will be shared – and that the world we change will, with luck, become a fairer and more democratic one."* (Gurin 2014).

Gurin indicates how various data phenomena are generating new ways of understanding and using data. Both phenomena, as catalysts of change for businesses, government and society, may possess different roles in this process.
Looking at the etymology of data, Kitchin notes that the term originates from the Latin word *dare* which means 'to give'. It refers to what is already given by particular phenomena (Kitchin 2014:2). However, instead of seeing data as already given, Kitchin argues that data should instead be called *capta* which comes from the Latin word *caprere* meaning 'to take'. It means that we should not see data as given or true, but as something that has been

"taken", "chosen" or; *"[...] selected from nature by the scientist in accordance with his purpose."* (Ibid.). Data are thus seen as units that have been selected; they have been chosen and put together for a reason, selected to bring meaning to something. This entails that the logic of the data producer is embedded in the data, in its format and its structure. Kitchin therefore argues that *capta* is more appropriate since it describes how different data units are taken from the bigger sum of all potential data (Kitchin 2014:3). We may say that this makes data contaminated with human idiosyncrasies, in the sense that something or someone prior to choosing the data has had a say in how data is shaped (Marres & Weltevrede 2013).

1.2.2 Small Data

OD can also be defined as small data. The term has rarely been used but is now an oppositional term to big data and refers to smaller amounts of data. Small data is being opened up, reused and shared for new purposes, transformed in new data-infrastructures and seen as a commodity for economic growth (Kitchin 2014:27). The characteristics of small data are that the techniques and methods for gathering data are usually done by sampling which restricts their scope, temporality and size. In terms of volume they could be considered large, but the ways in how they have been produced might be done on an annual basis with a limited amount of questions (Ibid.). Furthermore organising small datasets might be quite roughly divided in for example states and countries, and is thus inflexible in the sense that it is not that easy to change or tweak questions because it would compromise the processing and analysis - thus Kitchin compares this to Big Data where he argues that they: *"[...] are characterised by being generated continuously, seeking to be exhaustive and fine-grained in scope, and flexible and scalable in their production"* (Ibid.).

Though small data might be small and limited in its scope it also has, as Kitchin writes, a long tradition in how it has been produced and the methods behind. Thus, small data focuses on specific cases and tells contextual stories, moreover because they are targeted they are often focused on an issue (Kitchin 2014:29).

1.2.3 Qualitative and Quantitative data

OD concerns both qualitative and quantitative data and varies in structure and sizes, often depending on its origin. To illustrate the two, The Danish Business Authority and The

Danish Agency for Culture are represented below with a data set from each of their data catalogues; one is a spreadsheet with data on SU (The Danish students' Grants and Loans Scheme) and the other is a map of protected and preserved buildings in Holbæk, Denmark (Figure-3 & 4). We do not go into further detail with the content of the datasets, as it is the difference in representation that is the key.

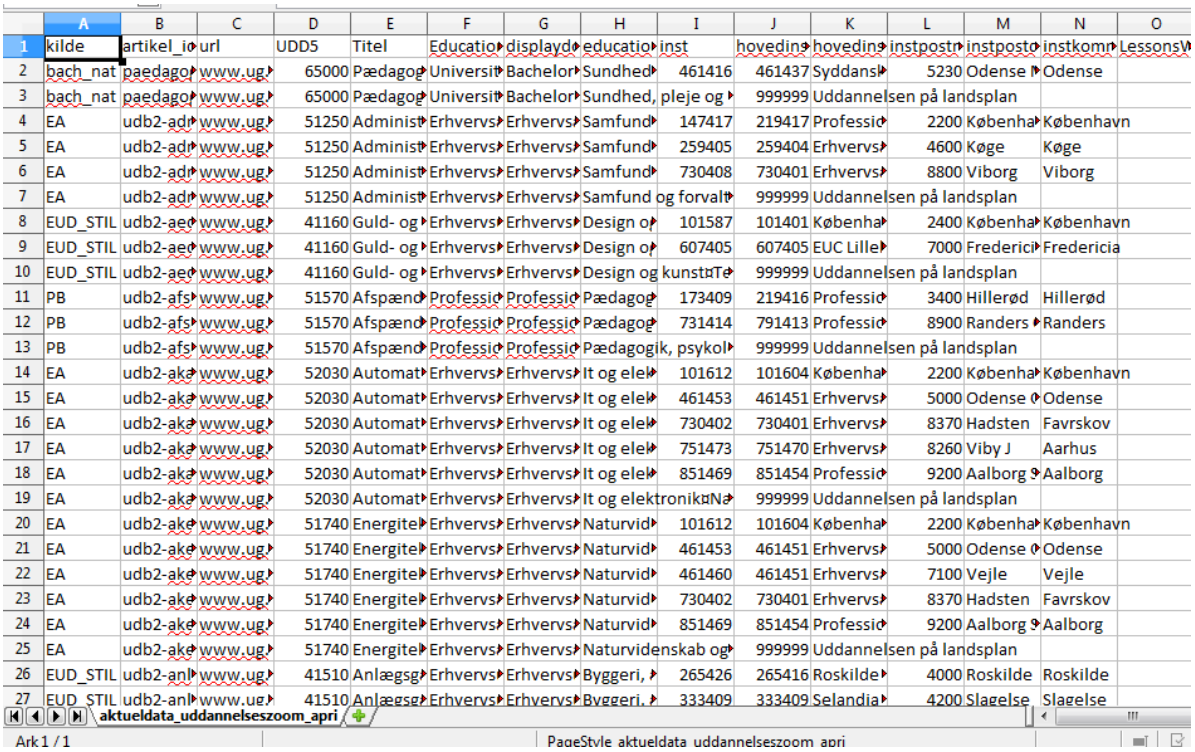

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Figure-3: Quantitative dataset on the Danish students' Grants and Loans Scheme, extracted from the Danish Business Authority Open Data catalogue VIRK.

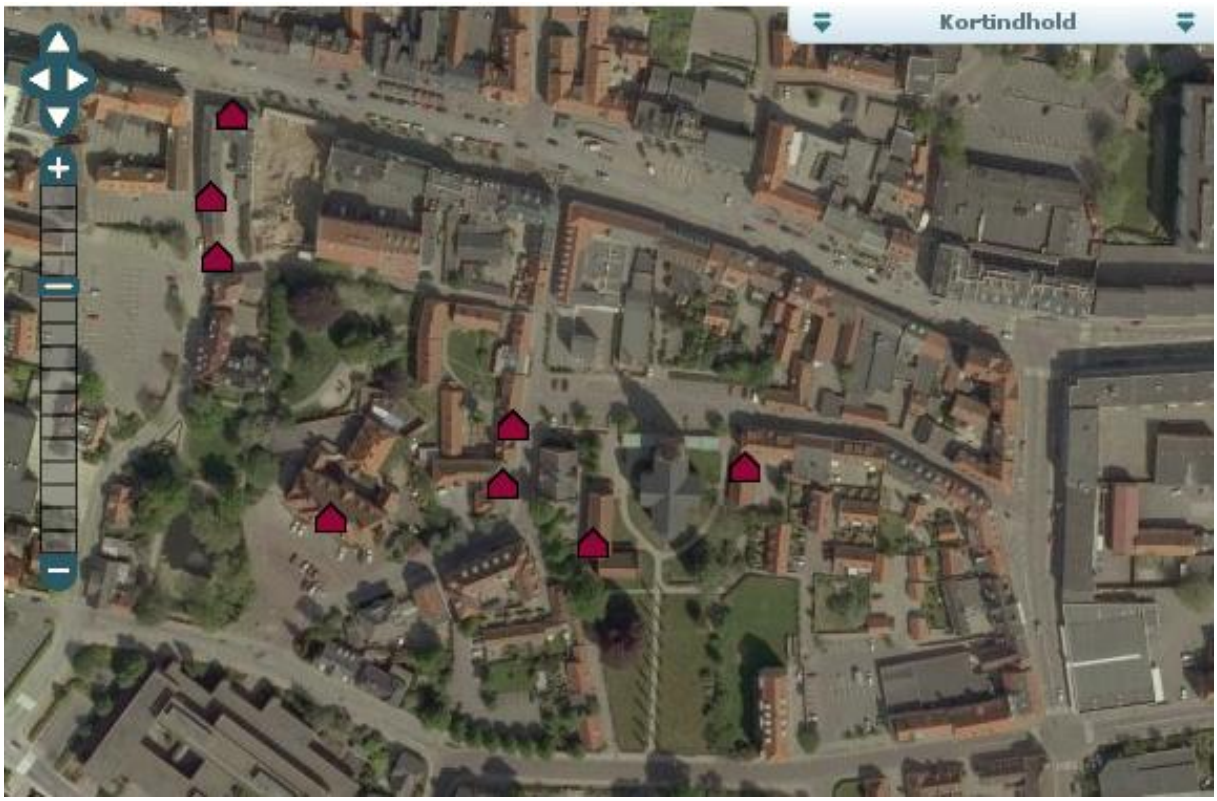


Figure-4: Qualitative data over protected and preserved buildings in Holbæk, Denmark. Extracted from Danish Agency of Culture Open Data catalogue.

1.2.4 The many structures of data

Within the different types of data, we speak of different degrees of structure. *Structured data* are organised in a defined data model and put into tables or systems with common variables such as address, name, gender, date of birth etc. These data can be combined and analysed in a relatively simple way and can easily be processed by computers and turned into graphs, illustrations or maps (Kitchin 2014:5).

Semi-structured data are more loosely structured, and do not conform to formal structures, or come in a predefined data model (Kitchin 2014:5-6). New technologies such as software, file formats and new ways of handling semi-structured data arise, giving data providers and users many new ways of working with data.

Unstructured data often has qualitative characteristics, possibly pictures or narrative text, where each instance (symbols or numeric values) may have a specific structure. This does not imply, though, that data instances have to share the same structure within a data set (Ibid.).

1.2.5 Source and production

By briefly touching upon the *source* and *production* of data, is to give an idea of how data can originate from various sources, and that produced data can be described as available in more or less fixed terms. We do not see this as necessary to unfold in depth, but a general overview is needed to conceptualise and understand data with its different characteristics.
To briefly mention a few sources, *Captured data* can come from observations, surveys, laboratory and field experiments, record keeping, from cameras, scanners and sensors. *Exhaust data* can be a byproduct from a device or system but is often discarded because of its volume or lack of structure, and thus becomes costly to handle. Both Captured data and Exhaust data can be considered what some people call 'raw' data, meaning that they have not been converted or combined with other data. Finally, there is *Derived data* which contains additional processing or analysis of the captured data. As explained by Kitchin: "*Captured data are often the input into a model, with derived data the output"* (Kitchin 2014:7). This shows us that data are generated in various ways. Sometimes it might be generated for a specific purpose and other times it might be the byproduct as with exhaust data or as with derived data.

1.2.6 Metadata

Last but not least in this literature review we include metadata._Metadata can provide different functions according to the dataset and thus describe the content of a dataset. There are two main types of metadata - *descriptive and structural* (Kitchin 2014: 8-9). *Descriptive* metadata include structures such as title, author, publisher, subject and description, whereas *structural* metadata refers to the coverage of the dataset e.g. how the data are created or formatted (Ibid.). Attaching metadata is a way to make datasets more easily understood for the user. It is a way of providing insight into the creation of a dataset and thereby it puts data into a context.

2 Problem Field: Open Data as a socio-technical phenomenon

Many STS (Science & Technology Studies) and ANT (Actor Network Theory) researchers have investigated and contributed to the studies of socio-technical systems (Callon 1986; Akrich 1992; Latour 1992). These studies specifically concern moving beyond the relations and negotiations between people but including physical artefacts and technologies as being equal to people and thereby a part of the negotiations (Latour 1992:151). In other words, a socio-technical phenomenon is a complex interwoven assemblage of humans and technologies. Studying the social aspects of technology became the new approach around the 1980's called *"[...] a sociology of technology."* (Bijker et al. 1987:2). Since then socio-technical studies move away from technological determinism (meaning that development is determined by technology) and attempt *not* to make a distinction between technical, social, political and economical aspects of technological development (Bijker et al. 1987:3). So, in the development of technological artifacts or systems like Open Data (OD) there could be numerous relations between heterogeneous elements at play in creating networks that bring together all kinds of different actors (Akrich 1992:206). Additionally, implementing OD with the means of technology has to be embraced by the world we live in to be upheld. So for a technology like OD to succeed, it must somehow *"[...] interest financers, builders, users. In order for a network to form, associations have to be made. This is hard work."* (Mol 2010:259). For a new technological phenomenon such as OD to be embraced, it can be said that the world is a battlefield where negotiations become a way of expanding or decreasing the relations among the other actors in the network. In addition heterogeneous relations between actors can be described as *translation processes*, and as defined by Callon (1986), it relates to the processes that make an actor gain stability by associating or being allied with other actors in the network. Translation processes might create new constellations and build up the network or, if met by resistance, be staggered. Following these processes is about observing how actors speak, on behalf of several other actors, and thereby gain power (Elgaard Jensen 2003). Translation processes thus indicate certain actions, negotiations, interests and power relations between the different actors. To understand the phenomenon of OD in a Danish context it becomes interesting to understand how the Danish actors assemble in the development of OD.

OD has become a widely accepted practice within governments but is as mentioned still novel in its current state. Making data available and public has gained a foothold in Denmark, especially within public institutions. In its development it therefore relates to both technical, political and social spheres that constantly change and reproduce the phenomenon. This entails that the process of opening up data might be entangled in different discourses and thereby making a wide range of heterogeneous actors come together in organising OD.

This makes it interesting to investigate how OD are actually addressed or defined by people working with OD. Does consensus exist in how to talk about OD or will we find an equal number of definitions as there are people? OD being data that is opened up for the public, makes it interesting to unfold the complexity and understand some of the underlying and different connotations that comes along. OD can be described as a novel digital phenomenon in the making and thence in the process of ongoing construction and reconstruction; new relations appear and others get redefined. So, studying the phenomenon of OD as a socio-technical system is thus a way to unfold and understand some of these heterogeneous relations that constantly reproduce this phenomenon. It becomes a matter of studying relations between humans and technology and how they mutually define and adapt to each other in a given context (Akrich et al. 2002a). This gives us the opportunity to examine some of these relations and how they may be a part of the construction of OD. Furthermore, what might be at stake when handling such socio-technical systems is the many ways in how OD can be *handled*. This may entail that different notions of openness and data are carried out in coexistence with multiple ways of handling problems and framing concerns (Mol 2010:264). We have chosen to use the term *trope* for describing how our actors talk about complex phenomena such as openness and data, because tropes are about how people can be affected by daily logics and the way they articulate the phenomenon OD (Law 2009:154). Getting closer to understanding these hybrid relations and the multiplicity in how OD is being handled and understood may bring one closer to understanding what constitutes the ongoing phenomenon of OD in Denmark.

2.1.1 Research Question

OD has become a digital phenomenon, especially within many public agencies such as governments. This makes it interesting to investigate how the Danish actors - both governmental and non-governmental - associate with this phenomenon. If traditional ways of understanding data such as the DIKW pyramid may influence its development it becomes

interesting to unfold OD as a socio-technical system and look deeper into the definitions and understandings of data and openness to clarify the character of its influence on OD as phenomenon within a Danish context. Therefore we ask:

> *How are the concepts of openness and data defined by our informants and, by applying the term tropes, how do the multiple articulations of openness and data in the daily work of Danish actors affect the phenomenon Open Data?*

Additionally in the interest of understanding OD in a Danish context we ask:

> *How do actors in the governmental and non-governmental organisations in Denmark connect in the development of this novel digital phenomenon, Open Data?*

3 Methodology & Theoretical approach

3.1 Intro; No Via Regia (no standard methods)

This chapter describes our methodological approach to the interviews, our handling of empirical data and analysis. Also, it offers the reader insight into our process throughout the planning and execution of the empirical phase and the following analysis that shapes this research and the interpretation of the results. It describes how this research design is conducted with an Actor-Network approach that constitutes the foundation of our analytical framework.

3.1.1 Encounter with the informants (Snowballing)

So how did it all begin? Initially, when reading Janssen et al.'s *Benefits, Adoption Barriers and Myths of Open Data and Open Government* (2012) we were interested in finding the users of OD, and understanding OD from their point of view. In search of the user, we carried out desktop research including search results and different rounds of online research that lead us to the event Open Data Day Copenhagen. This event on the 21st of February 2015 in Copenhagen was hosted by the OKF and Wikimedia's Danish chapter (OKF 2015n). Many different people attended this event, people with a general interest in OD, researchers seeking to study it, technical people with an interest in the data being provided and people already using OD in different contexts - but the majority were new to the field and unfamiliar with OD (Appendix A). The aim of this event was to let people come together and gain experience with the use of OD in small groups and workshops.
The datasets provided at the event contained information about Danish politicians who were running for parliament (June 18th 2015), with demographic information about their gender, age, and the year they joined the respective political parties. For working with the datasets everyone was split into groups with at least one technically capable person. Playing with the different information available, every group showed diverse outcomes in small scale statistics or graphic representations, by various combinations of the data.

At the event we paved the way for the possibility of an interview with OKF. Moreover, through a participant from The Danish Business Agency we saw our chance for recruiting them for an interview. From there on by searching websites, and with recommendation from the Danish Business Agency to contact Aarhus Municipality and The Danish Agency for

Digitisation, we started to get enrolled with the public agencies. Overall this led to the snowballing effect of getting informants - through desktop research and recommendations from informants. And, the following time was thus spent planning, intensively recruiting informants from various public agencies, private companies, NGOs and other people involved with OD.

3.1.2 Research design

For this research we chose qualitative interviews. The reason for choosing qualitative interviews is to understand the world of the subject by trying to get into their world and understand it from their point of view. The aim of qualitative interviews is to construct knowledge in the interaction between the interviewer and the informant (Brinkmann & Kvale 2015:4). With that in mind, our goal is to seek the knowledge that can be created between us and the informants since they are the ones practicing and defining OD on a daily basis. With OD as a relatively new phenomenon in Denmark, we chose an explorative approach by conducting semi-structured interviews which leave room to work with a loosely structured guide that can be adapted to each interview and allows posing spontaneous or clarifying questions.

The interview guides are divided into ten themes all of which draw inspiration from both *narrative* and *conceptual* interviewing (Brinkmann & Kvale 2015). A narrative interview might lead the informant to tell stories of their daily work and can be carried out with different purposes. For example, an interviewee tells a story which refers to a specific episode or course of action, or it could be a narrated history of a community (Brinkmann & Kvale 2015:181). Conceptual interviews are a way to gain clarification of conceptions of phenomena such as OD. It helps in exploring some central conceptual dimensions, as for this research: *open* and *data* (Brinkmann & Kvale 2015:177).

Specifically the narrative questions are aimed at getting closer to the informant and their daily work practices with OD, and to understand their collaboration and working relations with other actors. We ask both general introductory questions such as; *Do you have any collaboration partners?, What is your field of work (within OD)?* and *How did you and/or your workplace start working with OD?.* To be more specific regarding the narrative practices we asked question such as; *How do you work with Open Data?* and *What kinds of file formats do you work with?.*

The conceptual questions are more related to understanding of how they define and understand openness and data. Here we asked questions such as: *How would you define data?* and *Do you see a difference between Open Data and Open Public Data?* and questions that in general relate to defining different notions of openness, for example; *"Do you see open data as a democratic approach?.* One of the ten themes is inspired by Janssen et al. (2012) and their point on the lack of feedback from users to data providers, we were interested in seeing whether data providers and users had already established some kind of contact. Do data providers know their users and if not then who do they see as potential users?

In short, the interviews shall give us insight into how the phenomenon of OD unfolds as a network, in concrete work practices, and how it is conceptualised. We want to explore OD as a socio-technical phenomenon to get closer to understanding the notions of openness and definitions of data in a Danish context. What we want to know from the interviews is how OD is currently being understood and articulated.

3.1.3 The informants

As a result of the snowballing process and e-mail replies, most of the informants are public agencies and the rest are two NGO's, a non-profit company, and an independent researcher hired to write a report on Open Government Partnership[4] in 2014. Most of them publish OD, and few are users of the data. Thus, we ended up with thirteen individual informants (twelve interviews as one was a double interview) who in different ways are connected to the development, implementation or promotion of OD in Denmark.

The informants are presented below with aliases instead of names because some were reluctant towards being cited. From now on when referring to the organisations from the interviews throughout this thesis we use the organisations' abbreviations, which can be seen in the far left row in the table below. When referencing specific interviews we put "I" in front of the abbreviation e.g. "I-GEODATA". Additionally, translations of all used quotes from the interviews are found in Appendix D.

[4] The OGP is initiated by eight governments: Brazil, Indonesia, Mexico, Norway, the Philippines, South Africa, the United Kingdom and the United States, and it now has around 66 participating countries (including Denmark).

Organisation	Informant	Work	Background
Public institution: The Danish Agency for Digitisation (DIGI)	Line	Disseminating OD	IT & Communication
Public Institution: The Danish Business Authority (VIRK)	Nikolai	Disseminating OD	Information studies
NGO: Open Knowledge Foundation, Denmark (OKF)	Morten	Using and defining OD	Political science, computer science
NGO: Wikimedia Denmark (WIKI)	Hans	Using OD	Political science and Computer science
Alexandra Institute (AI)	Jesper	Technical consultant	Informations science and programming
Independent Researcher for Open Government Partnership (OGP)	Jeppe	Independent Researcher	Journalist and Computer Science
Public institution: Local Government Denmark (KL)	Frederik	Organising OD	Computer Science and E-Business
Public institution: The Danish Agency for Culture (CULTURE)	Mogens	Disseminating OD	Geographical Information Systems and databases
Public Institution: Aarhus Municipality (AAK)	Mette	Disseminating OD	Media Studies
Public institution: The Geodata Agency (GEODATA)	Rikke	Disseminating OD	Geography
Public institution: Ministry of Housing, Urban and Rural Affairs (MBBL)	Lars and Henrik	Partly disseminating OD	Lars: Economics Henrik: Law
Public institution: Danish Meteorological Institute (DMI)	Sune	About to open up data	Meteorology

3.1.4 The interviews

The interviews were carried out between March and May 2015. Every interview began with a short briefing to prepare the informants for the overall framing of the interview. A few informants requested to see the questions in advance. The interviews, lasting between 45 minutes and 2 hours, were executed in Danish since it is the mother tongue for all informants and creates a more natural flow in the conversation. Half of the interviews are carried out face to face with the informants at their workplaces or in cafes. The other half are carried out via Skype video calls so that we were able to adapt to their schedules or because of geographical distances to offices in Aarhus.

Most of the informants are what we may call OD professionals/elites, meaning they might be used to answering questions or expressing their thoughts and opinions on this topic (Brinkmann & Kvale 2015:171). In order to keep some sort of symmetry of power the interviewer should have some knowledge of the topic (Ibid.). Seeking this kind of symmetry we draw on our findings from the literature review as well as articles, journals, reports and information from Danish institutions' websites, and desktop research on our informants, their workplaces and corresponding OD agendas. The literature is thus gathered continuously throughout this thesis. Moreover, the experience of observing an OD workshop (Appendix C) held by DIGI serves, too, as a part of the empirical material.

3.2 Theoretical approach: Explore relations with ANT

The overall framing of this thesis is strongly influenced by the Actor-Network Theory (ANT) as we study OD as a socio-technical phenomenon. Some of the main developers of ANT are Bruno Latour along with Michel Callon and John Law. ANT is furthermore connected with the interdisciplinary field of Science and Technology Studies or Science, Technology, Society (STS). ANT is thus related to a long tradition of other fields such as feminist theory, cultural studies, social and cultural anthropology and branches of post-structuralism (Law 1999). ANT is often portrayed as an utterly constructivist ontology that sees the world constructed through actions in actor-networks (Blok & Elgaard Jensen 2011). This implies that a fact is not a given universal entity, but rather that it has a specific material and social history of production (Blok & Elgaard Jensen 2011:168). This has led to the pursuit of bridging an ontological gap between "nature" and "culture"- science and politics, technology and society, which is brought into question. ANT seeks to overcome the divide between nature and culture (Blok & Elgaard Jensen 2011:vi). Through ANT, "nature" and "culture/society" have never been separate; they are rather interwoven in networks of human and non-human actors. For instance, technologies are treated as hybrids constituted by human and non-human relations. ANT therefore promotes studying the practices that carry and characterize the material. In this context it is written that:

> *"Constructivism implies that scientific facts have a specific, material and social history of production, and that this process should be seen as constitutive for the validity of scientific statements. Unlike philosophical realism, constructivism does not perceive reality as existing independently of the technical and symbolic*

> *activities of humans, but instead as constituted through such practices"* (Blok & Elgaard Jensen 2011:168).

This interplay between the material and human factors is emphasized in the relationship of scientific knowledge and society (Akrich 1992:206; Blok & Elgaard Jensen 2011:168).
ANT also springs from a tradition of semiotics (Ferdinand de Saussure) where words are nothing by themselves, but in relation to other words they create meaning (Mol 2010). Semiotics in this sense is expanded from the traditional linguistics to include material things, the relation in how materials are being translated and constituted in a *network*. As written by Annemarie Mol:

> *"In ANT this semiotic understanding of relatedness has been shifted on from language to the rest of reality. Thus it is not simply the term, but the very phenomenon [...] that is taken to exist thanks to its relations."* (Mol 2010:257).

In an ANT perspective this means that a phenomenon like OD is constituted by the relations to other words, actors and entities in the network and that this configuration constitutes the meaning and form the phenomenon. The significance of the word data is then related to the word open and to definitions of data. Carrying out ANT analysis is particularly about identifying the relations in the network through the empirically grounded negotiations and practices (the interviews).

3.2.1 Central concepts

Before unfolding the analytical process of this thesis we will explain a couple of central terms that accompany the actor-network approach. In Latour's text *'On recalling ANT'* he emphasises some issues that he describes as being continuously present throughout the understanding and application of ANT. The text is an attempt to break with some of the connotations that are being associated with ANT. Latour speaks of four difficulties with Actor-Network Theory, *"four nails in the coffin".* They are the word *Actor*, the word *Network*, the *Hyphen* and the word *Theory* (Latour 1999).

The difficulty with the word *actor* is that it is often used to analyse human actors and their intentional actions instead of dividing attention to both human and non-human actors (Latour 1999:16). Actors are referred to as someone or something that acts and is attributed

to action (Callon 1986; Elgaard Jensen 2003; Law & Mol 2008). An actor acts with its related actors in its "web" or network - they enact each other and actions are chains of enactment from complexly linked entities.

The connotation that comes with *network* is that it is often being understood in its "common sense" understanding along with the development of the internet (Latour 1999:15). The term network relates to processes that represent the ongoing actions and relations between actors. According to Law (1999) the network is endless and uncertain in its possibilities to mobilise actors, but should, according to Latour, not be all inclusive. In other words, ANT concerns the description of ongoing processes to see how they stabilise certain relations between entities (or not). This is how Latour thinks ANT attempts to break with the tyranny of geographical distance in how it offers a way of analysing the connections between entities that might be more closely connected in the actor-network but far away physically (Latour 1990:4; Elgaard Jensen 2003:22). Exploring these relations and practices grounded in empirical studies is also a way in which ANT separates itself from traditional sociology where it is common to analyse according to thinking in lines with regions (Elgaard Jensen 2003:25). So, actors might be physically located in a local context and still be closely connected globally, so instead of actors being closely connected physically it is rather constituted by a relation (Elgaard Jensen 2003:22). This also indicates that networks should be studied as hybrids, an assembly of heterogeneous elements. Working with ANT is then about finding the relations between the entities in the network. The limitation of the network still remains open in a wide sense and moving in on an ANT-analysis is therefore constructed between the researcher and the research object where the context can be said to be provided by the given network (Latour 1999:18).

The problem with the hyphen between actor and network (Actor-Network) is about combining and separating the two words actor and network, agency and structure, micro and macro levels and/or inner and outer relations which social sciences have paid much attention to (Latour 1999). The hyphen can be said to indicate the view between the two (Actor-Network), or as a way to alternate between them. Instead of using the picture of a panopticon Latour now goes for an 'oligoptica' view (Latour 1999:18). This refers to the earlier mentioned way in how ANT allows for considering the network consisting of points and relations as stated by Latour: *"[...]summing up of interactions through various kinds of devices, inscriptions, forms and formulae, into a very local, very practical, very tiny locus"* (Latour 1999:17).

As for the notion *theory,* ANT should not be considered a theory (Latour 1999; Law 2009; Mol 2010). Theories have a tendency in bringing forth hypothesis about the world. As Law argues ANT can in contrast be seen as a pragmatic way of dealing with one's analysis, thus as a toolkit to tell stories; *"[...] about "how" relations assemble or don't"*, which again puts attention to; *"[...] the messy practices of relationality and materiality of the world"* (Law 2009). It is a way to actively engage in the field and the world that is being studied (Mol 2010). In not providing a hypothesis and a conceptual apparatus ANT may create confusion, since every "theorist" working with ANT use their own terms. ANT is not described as a theory but rather as a pragmatic way of analysing *actors* and *the network* in one's empirical work.

3.2.2 Methodological principles

Working with ANT as an analytical tool box also includes a methodological and analytical sensibility which can be explained by the three methodological principles: the generalised agnosticism, generalised symmetry and free association (Callon 1986a). Placing the three principles in this paragraph is also to describe our methodological and analytical approach in this research. These principles are obtained from Callon's in the text '*Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay'* (Callon 1986). In short: the first principle *generalised agnosticism* urges the researcher through method and analysis to relate agnostically to science. Meaning that the researcher should to be able to include different scientific perspectives (Callon 1986a:2). The second principle *general symmetry* relates to the notion that the researcher should choose to describe conflicting viewpoints in a scientific or technological controversy in the same terms. This is due to the idea that controversies are constituted of a mixture of aspects concerning both Society and Nature and that negotiations arise from both the social and material domains. The researcher thus has to choose a vocabulary that assists the research instead of choosing the vocabulary of the studied actors (Callon 1986a:4).

The third principle of *free associations* indicates that the researcher abandons all a priori assumptions between natural and social arrangements and events. This further indicates that the researcher must contradict the hypothesis of a certain boundary which distinguishes the two (Callon 1986a:4). The aim of this principle is that the researcher is able to identify how the followed actors define and associate different elements, whether they are social or natural.

3.2.3 Analysing the interviews

An actor-network analysis does not provide any analytical formula for how to understand the different elements in a network. Working with actor-networks is about following the actors and providing descriptions. The analytical approach is descriptive meaning that the analysis becomes about conveying the relations between the actors and network. In the article '*On using ANT for studying information systems: a (somewhat) Socratic dialogue'* by Latour (2004), a professor leads a conversation with a student talking about ANT. Their conversation revolves around how ANT is engaged with the art of description rather than explaining (Latour 2008:67). Description provides a picture of how things are in the study or fieldwork. As further described in the conversation the actors in a network create their own theories, contexts, frames and even ontologies (Latour 2004:67). The context is provided by the actors and their network, this is the relativity that ANT embraces.

Transcribing the interviews allowed us to transform our recordings into material that is more easily workable, transferrable and in the end more understandable. The transcription process made the interviews ready for the analysis. To unfold the analysis, the re-reading of the transcriptions is done to get an overview and overall understanding, to bring it all together, to tell a story of how the followed actors understand and define OD.

3.3 Joint relations: a preliminary analysis

Callon's analysis, called a *sociology of translation,* is an account of finding out how production of knowledge and construction of a network simultaneously evolve (Callon 1986b:59). This analysis is as mentioned referred to as a translation process, or in other words as a series of events. It is within these events that different negotiations between actors take place. These translation processes look into how the actors interact, are being identified as well as how their activity and operations are being negotiated and delimited, in other words how the *"[...] network of relationships in which social and natural entities mutually control who they are and what they want."* (Callon 1986b:59). Leaning on Callon for the first part of the analysis springs from the interest in unfolding the roles of the different public agencies and organisations to see how they position themselves among each other in relation to OD. In other words, we want to understand how and if they "join forces" at this point of the development. We thus seek to identify what the different actors want and how they further uphold these goals. We therefore want to look closer at the process of how

actors might come together or distance themselves from one another in the way they collaborate and work with OD. Using this approach lets us identify actors and how they constitutes each other's and their own "identities" in the network. So by following the actors we wish to pinpoint the actors' different identity, missions, obstacles and goals in their work with OD. These translation processes of becoming a stabilised network is by Callon constituted by four events which in some cases might overlap. These events are called 1. Problematization, 2. Interessement, 3. Enrolment and 4. Mobilisation.

3.3.1 The four events of becoming a stabilized network

The first event, called ***problematization,*** is an expression of identifying some actors' and their individual problem reflected in a common problematization. These individual problems might be related to different aspects of the same issue, which in the end are related to one another (Callon 1986a:6). Once an initial actor network is identified, the problem has to be defined via an ***Obligatory Passage Point*** (OPP). The OPP can be seen as the common goal of the network established by one or more key actors. The passage point being obligatory refers to a development of the network, that the involved actors more or less have adopted a common goal or the same problematization. If the actors recognizes and adopt the OPP as being their own problem they are then in a situation where they wish to fulfill the networks interests and at the same time the actors wish to fulfill their own interests (Callon 1986a:7). This common goal/problematization is constituted by the interest of the actors and has to be adapted and negotiated so that the network becomes indispensable. This might draw other actors into the network and make it stronger and more solid, though they first have to align their interest to the common OPP. This process entails that some of the actors adopt certain roles/identities provided by the other actors in order to make the network stable. The network has to work together in order to fulfill everyone's interest which they cannot obtain by themselves. However, it is not certain that the actors act according to the OPP, which could make them find their identity elsewhere.

The second event called ***Interessement***, is about making other actors' identities part of the network. Interessement is a set of actions where an actor attempts to stabilize the identity of other actors in the network by "locking" them into the role that is proposed for them in the process. This can be done by placing so called interessement devices meant to define the actors' identities or roles in order to maintain certain interests. As Callon writes, interest is about being interposed in between (inter-esse) different interests and possible alliances

that can be made in the network (Callon 1986a:8). Interessement devices can for instance be physical devices, political regulations or technological systems.

The third event is called ***Enrolment*** and takes place after the moment of interessement. This moment describes the power relations and negotiations that are a result of the interessement. Different identities are provided and accepted by the actors as a result of previous negotiations. For the alliances to succeed the actors have to commit to each other and the appropriated roles. Interessement is therefore achieved if the enrolment can be completed (Callon 1986a:9). It means that if the actors accept the roles that are distributed and designated by the device, it is possible to achieve success in sustaining the network.

Mobilisation, the fourth and last event, is when actors, who were not mobile before, transform and become mobile through the displacement that the three other events (translation processes) implicate. This is about making one actor spokesperson for the network; either a human or non-human actor (representing a meaning or message). Mobilising the actors is about making them act: *"[...] as a unit of force"* (Callon 1986a:14). This indicates that they form alliances and mobilise, and that the representations are accepted by the bigger network.

If these four moments are present and successful in making the network work together, it is more likely that the network becomes stabilised. Still, any actor can act differently and make alliances with other networks. They can get involved or reject a plan or even choose other actor-networks. Translation processes describe the relations between the involved actors, what they want, and how they are allied or not. It is the processes among the actors that constitute the network. It helps in understanding how networks emerge and transform. The bigger the network becomes the stronger, more stable and successful it becomes. However, worth mentioning is, that we in this thesis see these events as overlapping in a sometimes unorganised order and not as chronological events and thus put attention to the event of interessement and enrolment.

3.4 Open Data as Socio-technical system

To dive even deeper into studying OD as a socio-technical system we therefore want to take a closer look at how our informants define data and articulate different notions of openness

and how this shape OD as a phenomenon in Denmark. To do so we draw on other ANT concepts such as *Script, Multiplicity* and *Tropes.*

3.4.1 Socio-technical relations; the user is present in the script

Already using Actor-Networks to describe the relations of the OD landscape, we further draw inspiration from engineer and sociologist Madeleine Akrich text: *The De-Scription of Technical Objects* (1992). In her text she study how the development and transfer of technical objects (to developing countries) participate in creating heterogeneous networks constituted by human and nonhuman actors (Akrich 1992:206). Developing technical objects tend to be entangled and interwoven in other parts of society rather than in just its impending surroundings which indicate that all kind of different actors could in principle be seen as co-developers. For this reason we find it interesting to see how the users may be included as co-developers of OD.

As Akrich et al. write we have all seen innovations that either led to the creators fortune or downfall. All inventions carry the risk of falling apart or it might even turn out to be an innovation. When developing or implementing a technical object/system it can be seen as a new idea that has to solve and meet the challenges it was developed for, by successfully translating it into practices (Akrich et al. 2002a; 2002b). Developing new ideas, getting them realized and successfully turned into practices might be the very turning point of an innovation. The distinction between invention and innovation is by Akrich et al. stated as being two extremes (Akrich et.al. 2002a:187-188). This indicate that the invention on the one hand occurs/acts as the ideas, projects, plans that exists prior to the actual innovation, which could be considered the successful launch or the connectivity of the users. Additionally the text: *Configuring the user: the case of usability trials* by the sociologist Steve Woolgar is about the putative user of a new entity/technical object. The putative user is influencing the design process and configuring the user means a process of defining the identity of the user (Woolgar 1991:59). The work is thus focused on the 'designers', though it could be said that the aim of both Akrich and Woolgar is to demonstrate that the user is apparent in the design process, both during the development process and after when the real-world use enters. If invention and innovation represents two extremes it is the invention in the making, or the so-called *script*, that becomes interesting. Meaning that this is where 'designers' or different actors negotiate, meet, becomes allies or not, while for example trying to 'design' OD in Denmark.

Akrich operates with four different terms called *script, inscriptions, prescriptions* and *descriptions.* Starting with *inscription* this relates to the notion that the 'designers' already carry several understandings of the world. This being for instance presumptions of how the world progresses in relation to e.g. technology, politics, economy, science and morality (Akrich 1992:208). Furthermore the 'designers' have some presumptions about the users and their competences, taste, motives and political prejudices and so on (Ibid.). The designers understanding of the world and different presumptions, both intended and unintended, is thus a part of the design, along with the imagined interaction and use of the technical object. The designers have an idea and expectation of implementation, settings and use or said in another way they have an imagination about the technical object and the (ideal) situation of use. The process of *inscription* then refers to the action of including (some of) these presumptions into the technical object. Once the design is realised (e.g. an OD platform) it comes with a so called *script* or scenario that constitute the 'total' of a technology, and carry a claim of action by the designers in the world that the object is (going to be) part of. The *script* could then be referred to as the stage created with specific settings and instructions that the actors/users can act upon (Akrich 1992). *Prescription* should then assist the design and can be seen as agreements, contracts and manuals for how to exploit the overall use of the certain object. *Description* on the other hand is when the design or technical object meets real life or the users. It is the user's interpretation of the technical object and this is where the script becomes unforeseeable and perhaps "rewritten". Meaning that the intended use might not be followed by the users (Ibid.). The process of *inscribing* the user in the interaction of the invention is something that reaches beyond the design process and even when the object is taking real-life form.

As Akrich et. al. states, inventions do possess broad heterogeneity and complexity. They argue that this is why rigid models must be avoided (Akrich et al. 2002a:189). Being innovative as an organisation therefore is about the process; it is about being flexible according to the surrounding, comings and goings and moreover it is about favoring interaction with other organisations (Akrich et al. 2002a:189). If the system is too rigid in its design, there is a bigger risk of a potential breakdown, but on the other hand if the different elements in the design are more loosely structured and flexible it becomes easier to fit along the way (Akrich 1992).

Drawing inspiration on Akrich and her notion of *script* and *inscription* we might be more aware of how the different informants/actors presumptions of the intended user are part of the 'design' of OD. The *script* might both meet, but also limit the user's ways of engaging

with for instance the design of OD. As mentioned before OD being a fairly new phenomenon this also gives us the opportunity to take a glimpse into how the user may be a part of the making of OD.

3.4.2 Notion of Multiplicity

In the case study by John Law and Annemarie Mol about a controversy regarding Foot and Mouth Disease (FMD) among sheep in the UK in 2001, they ask themselves if a sheep is an actor. To answer that question they go through the different roles a sheep can have in that specific controversy.
Doing so they find, that a sheep simultaneously can be Veterinary, Epidemiological, Economic and a Farming sheep depending on the context and point of view (the view of a veterinary, epidemiologist, economist or a farmers). When we describe a sheep through a veterinary's eyes, the sheep has certain characteristics that are important to that actor, the veterinary. Those characteristics could for instance be symptoms. For an epidemiologist, the sheep has different characteristics and qualities, e.g. it can be calculated with as a collection of entities to find out how the disease is spreading. For an economist, the sheep could be calculated with, to see how many should be slaughtered to make the smallest loss. And lastly, for the farmers, sheep are a unique part of a flock that contains breeding purposes that can secure the future of the flock.

The issue of the sheep being able to have several roles at the same time is that the coherent logics of the actors that come with the multiplicity of a sheep can be conflicting. If comparing veterinary and epidemiologist practice, one of them is overall deemed more efficient, and thus, that logic wins. As expressed by Law & Mol, this can create tension between actors who were supposed to be working together, because some actors might think that their interest is not taken into account. If this happens it might create unpredictable outcomes for example as for the farmers in the FMD-case who started to hide the sheep because they thought it was unnecessary to slaughter the healthy ones for the benefit of the cause (Law & Mol 2008:65-66). Where economists saw the need to slaughter a large amount of sheep, the farmers saw that as unnatural. This is why the sheep is seen as multiple, not plural; because one sheep can fill many roles in one single moment (Ibid.). The sheep is enacted by many logics and actions. The actor is enacted into being by numerous actions and represent a web of relations as stated: *"They are made to conceal and stand for the web of relations that they*

cover." (Law & Mol 2008:58). And thus, it becomes interesting to understand the enacted multiplicity that the actions and logics of openness might have according to our informants.

3.4.3 Tropes & Logics

Leaning on ANT different terms have been accounted for when portraying multiplicity or the idea of *'creating realities'* (Law 2009:154). As written by Law in his text *"Actor Network and Material Semiotics"* (2009), some ANT researchers (Donna Haraway) use the term tropes, Latour uses "ontopolitics", Mol talks about "ontological politics", Law himself talks about "modes of ordering" (Law 2009). For instance in Latour's way of working with actor-networks and multiplicity is with the notion in mind that one actor can be related to several regimes of truth; each with their own ontology. It is a way to be; *"[...] attentive to several regimes of truth [...]"* and this idea of multiple truths makes it possible to respect different ontologies (Latour 2013:287-288).

In this thesis we borrow the term tropes. By working with tropes as an analytical tool, it leaves room for multiplicity and multiple logics. The idea of OD (data that is being made available and opened up) might be one thing, but in practice as Law & Mol quoting Marilyn Strathern's *'Partial Connections'* from 1991, states it might be: *"[...] more than one but less than many."* (Law & Mol 2008: 66). To illustrate, OD is not singular, but in this context less than many. Being more than one can so far be exemplified by the different notions of openness from the literature review. There is more than one way in understanding openness of OD. Being less than many relates to the idea that these realities overlap are partially connected (Law 2009:153-155). It therefore becomes interesting to understand the differences but also the similarities of these versions of openness and how they connect. As stated by Mol:

> *"But as actors come to participate in different "networks", discourses, logics, modes of ordering, practices, things get complex. The "actors" start to differ from one network, discourse, logic, mode of ordering, practice to the other"* (Mol 2010:260).

By looking at OD through our informants' eyes we aim to keep attention to the logics of our informants and how they "do" openness in relation to the materialities. Openness is thus performed and articulated by humans in relations to the constitutive actors for instance technologies and legal aspects that may affect how our informants practice OD. It is the

switch between logics or practice that leaves room for change. Studying specific logics devoted to materialities might specify the issues of difference and thereby render the problem more specific (Law 2009:155). Understanding the enactment and understanding of OD could provide a view into the multiple realities, or how the actor-network enacts the real, which allows for different configurations of OD to co-exist. Further OD being understood differently would be a way in how openness is encountered in our informants' daily work with OD. This thesis will for that purpose explore the socio-technical assemblages of the different actors involved in the constitution of OD and, further how this might contribute to the development and understanding of OD as a phenomenon.

Working with ANT will hopefully allow us to look at and describe dispersed or multi-sited logics (Mol 2010:263). Our goal is to end up with empirically supported tropes (by the use of interviews, reports, literature and websites). Instead of defining rigid categories to work with we work with tropes that help define the different logics related to the notion of openness in the chosen field of study. The tropes thereby act as dynamic and overlapping "categories" that might fit better alongside our ANT framework.

Analysis

4 Network relations

In this chapter we use Callon's events to understand the heterogeneous relations and how alliances are constituted between the chosen actors of OD in Denmark. Since OD is sprouting and the actors have different goals it can be argued that the actors have not yet reached an Obligatory Passage Point (a common problematization), in which the actors of the network have to assemble in order to achieve success. So far it can be stated that the actors interested in this movement of OD are realised simply by the common use of the term *Open Data.* In particular, the interests of the different actors are still about relating to the term in itself. So in the following we explore the prominent devices being mentioned by the informants throughout the interviews and by desktop research. We speak of them as interessement devices; non-human actors, which can be placed by other entities who may be interested in defining the Danish actors OD-identities. Because of these devices the actors may exist in-between possible identities within the phenomenon OD. The devices are part of how the actors might ally and possibly get more allies in the strive of extending the network. Actors might choose to get involved with other actors as well as providing (alternative) roles, which leads to negotiations. With this in mind, *"[...] what remains is the thousand ways to interact and to choose whom to interact with."* (Akrich et. al 2002a:190). Therefore we have chosen to describe some of the occurring devices and/or non-human actors in the following paragraph to provide a picture of devices that are entering the Danish landscape and furthermore how these may interest the different actors in the aim of stabilising the network.

4.1 Non-human actors/ interessement devices

4.1.1 Re-use of Public Sector Information

Mentioning the PSI directive once more it is as stated created by the European Commission and works as a political dimension or interessement device that could be said to initiate the opening up of public sector information in Denmark and other European countries. The directive is released in 2003 (in EU) to promote the reuse of open government data. It is also a part of the European digital agenda for 2020 (EU-Commission 2015a).

The Danish Government data, is regulated by the PSI law which is implemented in Danish governance in 2005 - a further revision is adopted in 2013 based on a study made by the European Commission from 2010. One of the changes in the newer revision is that PSI is expanded to contain data from libraries, museums and archives. The revision also makes limitations according to charges and fees for the reuse of public data (Digitaliseringsstyrelsen[5] 2015a). Implementing the PSI directive makes it possible for government institutions to publish government data and charge production cost and use the all rights reserved Copyright Rule (LAPSI[6] 2015). The PSI is constituted as a *possibility* that the public bodies, regional, local and governmental authorities, *can* open data (Retsinformation 2015b). It has different obligations that public sector bodies have to provide and make data re-usable for commercial and non-commercial purposes. The directive focusing on economic aspects of the reuse of data rather than on access of citizens to data (LAPSI 2015) should be mentioned when talking about the OD identity of the Danish public bodies. The PSI can therefore be seen as an interessement device (political force) that have defined the public sector bodies in Denmark to have a focus on making the reuse of public sector information profitable in one way or another. Thus, this directive defines some of the OD aspects in the Danish landscape, by making certain guidelines and definitions.

4.1.2 Spatial infrastructure in Europe

The INSPIRE directive (INfrastructure for SPatial InfoRmation in Europe), is as well as the PSI directive a part of the European digital agenda for 2020 (EU-Commission 2015c). It is set in action due to a flood in Central Europe. For handling natural disasters across borders and sharing data, INSPIRE was developed (Mazzoli 2014). This directive is put in effect in Denmark in 2009 (2007 in EU) and promotes using and re-using geographical data/spatial information among different public sectors both locally, nationally and on an European level (Geodatastyrelsen 2015a). To create an infrastructure for spatial information across European countries, certain standards and Implementation Rules (IR) are made. On the European Commission site it is stated that: *"These IRs [...] are binding in their entirety"* and further that the specific areas in focus are: *"[...] Metadata, Data Specifications, Network Services, Data and Service Sharing and Monitoring and Reporting"* (EU-Commission 2015d). This is to ensure that the information is digitally compatible across the European borders (EU-Commission 2015e). To share and optimize the distribution and reuse of Geographical

[5] From now on referenced as Digst.
[6] Legal Aspects of Public Sector Information

data among European Public administrations the Interoperability Solutions for European Public Administrations (ISA) are made. This program supports effective digital collaboration between public Agencies across Europe (Mazzoli 2014:15). Within ISA an activity-program called EULF (European Union Location Framework) shall help identify best-practice methods based on the user's need and concrete application (Mazzoli 2014:15). Moreover the INSPIRE directive is to be fully implemented in the European countries by 2020 where the aim is to create a European geoportal with access to the member states' spatial datasets (Mazzoli 2014:14; EU-Commission 2015e). This directive can, just as the PSI directive, be seen as an interessement device that makes European standards for spatial data and information concerning mostly public agencies working with geographical data.

4.1.3 The digital cultural heritage portal

The EUROPEANA portal gathers European cultural heritage. It provides digital access to different cultural data such as books, paintings, photographs, video and museum objects (Europeana 2015). The platform is organised as a knowledge sharing network that arranges seminars, workshops and conferences (Kulturstyrelsen 2015a). Since its beginning in 2007 Denmark has been part of the project. EUROPEANA acts as a digital library that links users to the national servers of the country and thereby it is possible to gain access to the different artwork. So far the portal provides access to around 30 million objects from approximately 2500 institutions across Europe (Rahbæk 2014:8). Different partly EU funded projects are initiated to help develop this portal. One of them is the CARARE (Connecting Archeology and Architecture In Europeana) project funded by the European Commission to help develop and expand EUROPEANA. It started back in 2010, and it is also a part of the Digital Agenda for Europe 2020 (Carare 2015). The CARARE project is to give access to cultural and scientific resources such as archeological and architectural data in EUROPEANA and it consists of a collaboration between 29 different cultural institutions in 20 European countries that have contributed 5 million objects to the portal (Rahbæk 2014:8). These are just a few projects developed and funded by the EU Commission thus the project CARARE have been funded with 32 million DK (Kulturstyrelsen 2015b). Being funded and further being a part of the European digital agenda it can be said to be a political and economical interessement device implemented to further and make the cultural heritage across Europe available.

4.1.4 Registration system between Danish museums; SARA

The joint museum IT project SARA[7] is initiated by the Ministry of Culture in Denmark in collaboration with the National Museum of Denmark and the National Gallery of Denmark (Rahbæk 2014:3). This project is to enable that data is made available for all the museums in Denmark and furthermore to promote the reuse of data for communication and research. SARA is to replace the existing system called *Regin* and is expected to run in 2016, where data from other museums and different collections is to be registered and converted into the system (Rahbæk 2014:3). The interessement device SARA may be a way to collaborate between the museums and make the infrastructure easier and more manageable from one central system as well as to make it easier to disseminate data to research.

4.1.5 Key data in Denmark & the distribution thereof

The Basic Data Program[8] is a part of the Danish E-Government strategy (2011-2015) (The Danish Ministry of Finance & LGDK[9] 2012:20). Basic Data are seen as a good resource that has been produced and gathered throughout the years by the Danish public bodies (The Danish Ministry of Finance & LGDK 2012:4-5). Some public Danish bodies are identified to contain/operate basic data. The Basic Data is divided into five pillars: Geographic data, Address data, Real Property data, Business Data and Personal Data (CPR). Some of the main goals of developing good Basic Data are to provide good quality data, in the view/perception that the data need to be correct, complete and as up-to-date as possible (The Danish Ministry of Finance & LGDK 2012:6-7). Basic Data shall be made freely available for everyone (private companies, public institutions and citizens) to use as a digital resource, and they shall be distributed efficiently and meet the needs of the user. The revenue of the Basic Data initiative is set to be 800 million DKK annually and the program is expected to be fully implemented in 2020 (Ibid.). Further the plan is to make a joint management (cross institutional) in a Basic Data committee (The Danish Ministry of Finance & LGDK 2012:10). Basic Data is to be disseminated through a new initiative - the Data Distributor (platform), which aims to increase the efficiency by using the data in the day to day case processing among the public bodies and increase productivity and growth in the private sector. It is expected to launch in 2017 (Datafordeler 2015a).

[7] SAgs-Registrerings-Administrationssystem. Roughly translates to Case registration and administration System
[8] In Danish: Grunddataprogrammet
[9] Local Government Denmark (KL – Kommunernes Landsforening)

Some of the public bodies that will provide data for the Data Distributor is GEODATA, VIRK, The Danish Tax system (SKAT) and The CPR office (Datafordeler 2015b). Implementing Basic Data in the Data Distributor can work as an interessement device made by a collaboration of the Danish public bodies; a device made to create efficiency, innovation and further the collaboration with the private companies.

This illustrates the three steps for implementing Basic Data in the Data Distributor. The first step (2015) is selected Geodata, the second step (2016) is CPR, CVR and more geodata, the third step (2017) is the rest of the Basic Data (Datafordeler 2015c).

4.1.6 Platform for national municipalities; opendata.dk

The *opendata.dk* portal and platform is a collaboration between five municipalities in Denmark (Aarhus, Copenhagen, Vejle, Odense and Central Region Denmark[10]) which is established in 2014. The project aims to function as a national platform for OD as well as encourage other municipalities to start working and publishing data on the portal. Each of the five municipalities can work as ambassadors for surrounding municipalities in helping and sharing knowledge about formats and licenses (Opendata.dk 2015a). The purpose for *opendata.dk* is to create one national platform. The *opendata.dk* platform as interessement device constitutes the gathering of municipalities and their different datasets.

4.1.7 Open source software; CKAN

The open source software CKAN (Comprehensive Knowledge Archive Network) is an open source platform developed by OKF. This software is used for making online data catalogues

[10] Region Midtjylland

by many data publishers such as governments, organisations and companies both nationally and internationally; it is implemented the UK Government, the European Union, VIRK and many others (CKAN 2015a & b; Data.gov.uk. 2015; EU-Commission 2015f).
On the website CKAN.org it is possible to freely download and use the software. Furthermore, since the software is open source, it is possible to modify the source code and adapt the software to custom needs. CKAN is designed so that each publisher within an organisation can have their own data entries, a so called distributed authorisation model named ´Organizations´. This means that the management of data is eased for each department by not having one central entry (CKAN 2015c; Erhvervsstyrelsen 2015a). On a more technical level, implementing CKAN makes it possible to share data across data catalogues (CKAN 2015d). CKAN as interessement device can be to make coherent platforms that further ease the technical linking of datasets, which can be seen as a way to make uniform standards within the layout and thus the use of OD.

4.1.8 International platform Open Government Partnership

The OGP is initiated by eight governments: Brazil, Indonesia, Mexico, Norway, the Philippines, South Africa, the United Kingdom and the United States, and it now has around 66 participating countries (including Denmark) (OGP 2015a). The international partnership is striving toward making national governments act more openly and to be more accountable and responsive to citizens. Further they state on their site that the member countries are to work together in a collaboration between government and civil society in developing and implementing open government reforms. The OGP is an international partnership but also an international platform launched in 2011 (Ibid.). On the partnership's website the different participating countries' National Action Plans are presented i.e. the plans each country has in the development of Open Government Data. The principles behind OGP are integrated in the Universal Declaration of Human Rights and the UN Convention Against Corruption. The main aspect is to help improve governance and increase transparency by granting access to government activities (OGP 2015b). Moreover it is about letting citizens partake in the technological development. OGP acknowledges that the participating countries have different opportunities according to technology and thus lets it be up to each country to implement OGP principles in the best possible way. Furthermore it is a matter of upholding the value of openness and engaging collaboration with citizens as means to create safer communities, better conditions, make new services, and promote innovation nationally and internationally (Ibid.). The OGP initiative and platform as an

interessement device can be seen as a political principle that are to change and work toward improving the roles of government by opening up data.

4.2 Identifying the actors' identity, internal obstacles and goals

Having gone through different interessement devices, we describe, in the second part of this chapter, how the actors (organisations, institutions and public bodies) got involved in OD and how they are related to the aforementioned interessement devices. In addition we also present the professional backgrounds of the informants, and we examine their obstacles and goals in the process of opening up and disseminating data and to describe it to get a better understanding of some of the issues they each have in becoming part of OD, which can further be part of the overall issues when implementing OD. Furthermore we describe some of the platforms and databases which they maintain and use in the development of OD, as well as some of the different events, initiatives and hackathons they execute. However, we do not attempt to mention all the different initiatives and databases; instead we wish to provide an overall picture of the network in question. This is to get a better understanding of their roles and identities. Identifying the actors is to understand what they want and how they position themselves to obtain their goals, needs and acceptance of roles in the development of OD. Moreover we want to provide an overall understanding of the interrelations between the actors and interessement device. Eventually this is to see how the different actors *enroll* each other. This is done with the use of the empirical material as well as their websites.

4.2.1 Danish actors

Public authority

2001: MBBL - *The Ministry of Housing, Urban and Rural Affairs*

Identity: MBBL is established in 2011 and maintain different tasks within urban and housing areas, and cases about regional and rural areas (MBBL Ministry 2015a). MBBL started working partly with OD back in 2001 via the public information server OIS[11], a governmental database that gives access to around 1400 instances of publicly collected

[11] In Danish: Offentlig Informations Server

information about every property (MBBL Ministry 2015b). OIS gives a way to make an overall infrastructure by giving easy access to public bodies' property data. OIS is aimed at creating better management between the public and private sectors (Ibid.). The OIS server, distribute some of the datasets from the nationwide BBR[12] (Buildings and Housing Registry) registry, which has operated since 2009 and contains information about Danish buildings and residences (BBR 2015).

Informant's background: The two informants from MBBL do not work with OD full time: Henrik, a lawyer, takes care of the legal aspects of OD. Economist Lars works in the health board and then gets into IT does the technical and economical project management. However, they express that they do not see MBBL as having an explicit OD agenda and mentioned that they therefore do not see themselves as such in the OD development (I-MBBL).

Obstacles: The data in MBBL's is still maintained by fees (I-MBBL). An issue for them is that they have to be more "open" in the sense that the fees should be removed, this is something they are working to resolve. As mentioned before they distribute public data to private and public institutions via the OIS platform. However, as expressed by the informants, this may be limited in the sense of openness and in the reuse of data because of some ethical implications such as the data being easily referred back to individuals in the form of personally identifiable data (I-MBBL:2). Much of the process and development of openness around OD in MBBL is seen as being prevented by a lot of the regulations as well as the Act on Processing of Personal Data[13] (Datatilsynet 2015).

Goal: A part of the goal for the OIS platform is to disseminate and improve the data. Equally important, is to create freedom to compete. A part of future plans is that the distribution of these data (from the BBR registry) is to be accompanied with the Data Distributor in 2017 (Datafordeler 2015c).

Public authority

2002-2003: *The Danish Agency for Culture*

Identity: CULTURE maintains areas within arts, ancient remains, sites and monuments, literature, music, landmarks and protected buildings (Kulturstyrelsen 2015c; Erhvervsstyrelsen 2015b). Stated by Mogens they started working with OD around 2002-

[12] In Danish: Bygnings- og Boligregistret
[13] In Danish: Persondataloven. Law about how personal information should be handled.

2003 (I-CULTURE:1). The agency maintains and manages four main cultural heritage registres, none of which are translated to English. These consist of the databases Fund & Fortidsminder[14] and Fredede & Bevaringsværdige Bygninger[15], which both contain information about archeological findings, protected buildings and landmarks in Denmark. These are used among the Danish municipalities within building permits and physical (city) planning (Rahbæk 2014:4). From these two databases the agency delivers (archaeological & architectural) datasets to the European project CARARE which is further distributed on the EUROPEANA portal (Kulturstyrelsen 2015a). The CARARE project is coordinated by CULTURE along with other agencies (Rahbæk 2014). Two other databases are created in relation to Danish museums and consist of two central registries[16]. Furthermore their own OD catalogue on their website consists of the first two databases (Rahbæk 2014:2).

Informant's background: Mogens has throughout his employment with the agency worked with geographical information systems and has been responsible for different databases and web services (I- CULTURE).

Obstacles: The agency is still being more digitised based on the Ministry of Culture's digitisation strategy for 2012- 2015, which shall help in the development of providing and disseminating cultural information and in making it available for scientists, private companies as well as citizens (Rahbæk 2014). As expressed by Mogens, CULTURE is not completely digital since they have a lot of analogue data on paper stored in massive archives. These documents await being OCR (Optical Character Recognition) scanned and put into their digital systems so that cross system queries become possible. Scanning and structuring the data for their digital systems is under way but needs more funding to be completed. Screening documents and data into the system is also a lengthy and costly process (I-CULTURE:5). Our informant also sees the Act on Processing of Personal Data as the hindrance for opening up data.

Goal: Apart from improving their own site they partake in different European and Danish cultural initiatives. They work to improve the digital infrastructure among the different cultural institutions in Denmark and Europe, to make cultural information available. Their main mission is to support social capital, identity, cohesiveness and democracy as well as

[14]Roughly translates to Sites & Monuments
[15] Roughly translates to Landmarks & Protected Buildings
[16] Museernes Samlinger called Kuas.dk/Mussam (Collections from Museums) and Kunstindex Denmark called Kid.dk (Artindex Denmark).

supporting product development and events that constitute the frames for tourists (Kulturstyrelsen 2015d).

Public authority

2009: ***Agency of Digitisation***

Identity: The Agency starts working with OD back in 2009 when it is still called the IT & Telecom Agency (I-DIGI:1). The name changed to the Agency of Digitisation (DIGI) in 2011 when merging the former Agency (IT & Telecom) with the Economic Agency. Among other things they work towards the Ministry of Finance's agenda of growth and efficiency in the public sector (I-DIGI:1; Digst. 2015b). They have the overall responsibility to coordinate and carry out the current (2011-2015) and future (2016-2020) digitisation strategy called E-Government (Digst. 2015g & h). They are one of the main actors when it comes to digitising the public sector in Denmark and they play a central role in informing and guiding other agencies and municipalities in opening up data under the right regulatory conditions (I-DIGI:2). DIGI is active in informing about the PSI-directive and its effect in the Danish law, both on their website but also at different workshops (Digst. 2015a). Furthermore they take part in creating OD initiatives in Denmark such as ODIS (Open Data innovation strategy/Open Data i Spil). They also integrate other international programs such as the OGP program and part of the daily agenda is to develop the Basic Data program 'Good Basic data for everyone'. They are active in planning and hosting different OD events and are themselves publishers of data.

Informant's background: Line is educated in Design, Communications & Media and has since worked with innovation and strategy as well as OGP, ODIS and Big Data projects. Line works nearly full time with OD, trying to communicate its importance and benefits to organisations and citizens, although she does have other functions as well (I-DIGI).

Obstacles: DIGI has a communicative task in presenting OD to make public and private bodies interested in opening up their data as a resource toward innovation and efficiency. The task is to communicate, inspire and guide how to open up data under current legal conditions. Some of the obstacles expressed by the informant are that other actors often work with OD in isolation - meaning that no collaboration is established (I-DIGI:3). As a result, one of their tasks is to make interested actors collaborate more, both internally in the organisations as well as across organisations, and for instance with NGO's such as the OKF, in order to benefit from each other in the development of OD. However, OD being constantly

developed, it is expressed by Line to be difficult to provide precise information on how to open up data and inform other public authorities (I-DIGI:2-3).

Goals: DIGI is a member of different international programs such as the aforementioned OGP, and supports the international OD Charter under the G8 countries[17] since 2013. The G8 countries have established five strategical principles towards the quality, reuse and volume of OD (Digst. 2013; 2015c). Thus their aim is to take part in and implement international programs into the OD agenda in Denmark and to work toward the constituted goals.

Public authority

2009/2011- *The Danish Geodata Agency*

Identity: GEODATA (part of the Danish Ministry of Energy, Utilities and Climate) carries the responsibility to maintain and structure the infrastructure of geodata among the different Danish public agencies (Geodatastyrelsen 2015b). Furthermore the Minister of the Environment[18] has authorized the INSPIRE directive to launch in Denmark. The aim of standardized measures of INSPIRE is to make data available and to make a coherent infrastructure across Europe (Mazzoli 2014:7). The fact that GEODATA is governed by the INSPIRE directive entails regulations according to how they publish data on the agency's portal geodata.info.dk (from approx. 2010) Geodatastyrelsen 2010; 2015c). GEODATA started working with OD back in 2011 and the portal provides geodata with corresponding metadata standardised according to INSPIRE regulations (I-GEODATA:1; Geodatastyrelsen 2015d). Moreover GEODATA has since 2013, as a part of the Danish digitalisation strategy (2011-2015), contributed to the development of the Danish Basic Data program (Geodatastyrelsen 2015e). They publish data on their own website gst.dk; data that are subsequently made available on the website called kortforsyningen.dk run by GEODATA. All this is to be implemented in the Data Distributor (Geodatastyrelsen 2015f). On kortforsyningen.dk it is possible to download topographical and cadastral data, some of which are too considered Basic Data (Geodatastyrelsen 2015g). The data are made available for citizens, private companies and public bodies.

Informant's background: Our informant from GEODATA, Rikke, has a background in Geography and has later on worked with their private customers and citizens, helping them access the paid datasets (before they became free)(I-GEODATA).

[17] Canada, France, Italy, Japan, Russia, Germany, Great Britain and the US
[18] Currently called Minister for Environment and Food

Obstacles: In the beginning GEODATA had a service system maintained by small user fees. This made the distribution of data more complicated, since the data could be used internally between public bodies but it could not be shared with third parties such as farmers who had to officially apply for the data. These are the early negotiations toward free purchase of data (I-GEODATA:1). Free purchase of data makes it possible to share data to third parties which ease the administrative workload. Even though a big part of their data is freely available, there is still some international financial restrictions for nautical charts and maps, some of which are owned by Mærsk and other Danish and international private organisations. Data being owned by third-parties complicates and hinders free access. GEODATA furthermore has special products made for e.g. the Military; data which is subject to special restrictions (I-GEODATA:8).

Goal: GEODATA has worked with OGD for some time, their goal is therefore to keep themselves oriented in the Danish OD landscape and to keep up with their platforms in order for users to be able to download Basic Geographical data freely for commercial or non-commercial use (Geodatastyrelsen 2015e). Furthermore they partake in the development of Danish Basic data program and lead the development of the Data Distributor (Geodatastyrelsen 2015f).

NGO

2012: *Wikimedia*

Identity: Wikimedia Denmark (WIKI) is the Danish charter of the Wikimedia Foundation; an NGO located in the US. The foundation hosts projects and websites such as Wikimedia, Wikipedia, Wiktionary, Wikiversity and Wikinews. WIKI is a nonprofit organisation who wants to encourage the development and growth of multilingual and educational content by providing their Wiki-based projects free of charge for the public (Wikimedia 2015a). The foundation being an association acts as an agent (as other associations) in society, meaning that they are able to play a role or participate as a union. They arranged the international hackathon event Open Data Day in 2013 (alone) and in 2014 in collaboration with OKF and a few municipalities. In 2015 they again collaborated with OKF around Open Data Day (Wikimedia 2015b). Moreover, they have a role in pushing public agencies and organisations to open up data.

Informant's background: Hans has a background in political science and computer science, and has since worked as a system developer and acts as chairman of WIKI Denmark. Hans works with OD on a volunteer level and dedicates part of his free time to WIKI.

Obstacles: Since members are volunteers running the foundation in an organic manner, things do not always develop according to the plan, and since WIKI is a non-profit foundation the economical resources are sometimes limited. There will always exist natural limits that will shape the work in a volunteer foundation, making the process develop according to the volunteers' time and resources (I-WIKI:5).

Goals: WIKI is born out of an open source tradition and supports the agenda of data and information being freely accessible. The aim is to gather and share the knowledge that exists on Wikipedia. They support a broader approach about making services and products based on the available data. It is about creating value and sharing knowledge which is realised through the hackathon get-togethers among other things (I-WIKI:3).

Private Institute

2012: *AI - Alexandra Institute*

Identity: AI is founded in 1999/2000 and is a non-profit organisation in Aarhus, where all profit goes towards IT research at Aarhus University. The company is owned by Aarhus University Research Foundation and has worked with OD since 2012 (Alexandra Institute[19] 2015). AI performs technical consulting work and has developed the data platforms of respectively AAK and VIRK using the open source system CKAN. In 2014 AI develops an extra feature to the CKAN platform (Alex. 2014). As a company with technical expertise they have advised Copenhagen, Aalborg, Odense and Silkeborg municipalities according to our informant they are the ones that mostly pushed the CKAN platform in Denmark (I-AI:5). They do not themselves provide data, but they have joined forces mainly with AAK in organising different OD events (I-AI).

Informant's background: Jesper's background lies within information sciences and programming (I-AI:2). He has worked at AI since 2012, when the institute begins their work with OD. The amount of time spent working with OD depends on the current projects they are running.

Obstacles: They have an interest in making data technically available and making uniform interfaces for their clients. Although the technical aspects are somewhat easily achieved, what is difficult is to navigate the policies and regulations, and keeping themselves abreast

[19] From now on referenced as Alex.

with new policies from the EU such as the Act on Processing Personal Data which is taken into account when publishing OD (I-AI:19). Concerning the handling or misuse of sensitive personal data, a new directive coming from the EU is on the way. This directive includes a 100 million Euro fine for misconduct, and it is currently (2015) being negotiated whether it shall be implemented in all European countries (EU-Parliament 2015). The informant explained that so far they have avoided working with sensitive personal data such as medical history data (I-AI:19-20).

Goals: The overall mission is to provide good, specialised service. The AI is one of the nine GTS (Approved technological Service) institutes which means that they are approved by the Minister for Research, Innovation and Higher Education[20] to further the newest research in Danish organisations. As stated on their website they help develop the technological infrastructure as well as technological services in Denmark (Alex. 2015).

Public authority

2012: *AAK - Aarhus Municipality and ODAA*

Identity: AAK started working with OD around 2011-2012. Their platform ODAA (Open Data Aarhus) that was launched in 2013 is part of one of their main Smart Aarhus Initiative, about creating a smart city (Smart Aarhus 2015a). ODAA is at the same time part of *Open and Agile Smart Cities* (OASC) initiated by cities in Denmark, Finland, Spain, Portugal, Italy, Belgium, Portugal and Brazil, focusing on common standards in how to open up data (Smart Aarhus 2015a & b). This initiative deals with being innovative in developing Smart Cities and strives for interoperable systems both within and between cities (Brynskov 2015). Through this project AAK hopes to attract partnerships among different actors (private and public) where they see OD as a solution to developing sustainable cities and solutions locally and globally (Smart Aarhus 2015b). Furthermore AAK is part of developing the coming platform opendata.dk, a nationwide portal for OD (Opendata.dk 2015b). Both platforms, odaa.dk and opendata.dk, are built on CKAN. Moreover they participate in and organise different events and hackathons, such as the Aarhus Data Drinks which runs regularly, where they try to get the private companies, other municipalities and citizens to participate (ODAA 2015a).

Informant's background: Mette has studied media studies and started working with OD when she was an intern at AI (later on she was full time employed at AI) - this tells us that

[20] Currently called Minister for Higher Education and Science

there is a connection to that actor from before she started working at AAK. Inspired by Copenhagen Data Drinks, she started the similar networking events called Aarhus Data Drinks. Mette works as project manager for ODAA and Smart City Aarhus.

Obstacles: Our informant states that in her task of internally collecting data in AAK it proves difficult to communicate to colleagues why and which data shall be published (I-AAK:6). With AAK being a magistracy system and being split into what our informant calls "silos", means that she has to contact each silo/department and ask for their data. This usually requires a small presentation of what OD is before even talking about making it available.

Goals: Nationally the vision and goal of AAK is to reuse public data by making it freely available to support efficiency and innovation, where different users such as companies, institutions, entrepreneurs and the citizens can create new services and applications (ODAA 2015b).

Public authority

2012: *KL - Local Government Denmark*

Identity: KL is an *"[...] interest group and member authority of Danish municipalities."* (LGDK 2015a). They maintain the interests of the 98 municipalities and provide political and administrative solutions. KL wants to maintain local democracy and constitute the basis for unified collaboration, initiatives and decisions between the municipalities (LGDK 2015b). In 2012 KL joined the Basic Data program in order to improve the registrations of Basic Data and improve the infrastructure thereof to provide basic data for citizens. By sharing data across the different public bodies they aim to improve service systems and to make the public sector more efficient (LGDK 2015c).

Informant's background: Frederik is educated within computer science and e-business and now works with business architecture and IT. He has been part of projects concerning data standardization for data from the municipalities, and he is quite familiar with the processes of opening up data and making data available.

Obstacles: Our informant explains how the process of making data available is about explaining OD in technical terms to the different municipalities and other public bodies. This is done to create and provide standardised solutions for how the municipalities can open up their data. Thus, they focus on the qualities of the openness of data. Consequently their task

appears to be creating a common language and structure that makes it easier to understand and use OD (I-KL:9).

Goals: The key goal is to make everyone participate in OD. They are responsible for securing the implementation of Basic Data into The Data Distributor. KL is interested in making the quality of Basic Data good enough for the municipalities to use as a resource in their daily work; thereby making it valuable for the intended users (LGDK 2015c; I-KL: 5). Their aim is to have an influence on the municipalities to benefit the citizens and society (LGDK 2015b).

International open data project

2012: *OGP - Open Government Partnership*

Identity: One of our informants has worked with OGP as an independent researcher (in 2012). In OGP, participating countries must commit to independent reporting on the progress (OGP 2015c). This is among other things done by delivering the aforementioned National Action Plan (that covers two years) that contains different commitments to further some of the main goals (OGP 2015d). Denmark is a member of OGP (since 2011) and by that the Danish National Action Plan is focusing on strengthening the local democracy, innovation and efficiency, and further enhancing the quality of life by the possibilities of technology and digital welfare. It is expected to run until 2016 (Digst. 2015d). Moreover this is a way for the public sectors to more widely work toward involving citizens, companies and society through OD in general (Digst. 2015e). As mentioned by our informant Jeppe, the Danish Government becomes responsible for defining and developing the National Action Plan when committing to the OGP.

Informant's background: Jeppe is educated in journalism and computer science and works daily at Roskilde University, Denmark. He was hired to write action plan reports for OGP in 2013 and 2014, and as far as we are informed, also in 2015.

Obstacles: As expressed by our OGP informant his/their task covers explaining the progress of OD in Denmark to the OGP, with a focus on understanding the transparency of the Governments and involvement of citizens. The informant mentions some difficulties in how the definition of Open Government has been used to improve digital solutions (so far) in the means of making it easier to be a citizen. That is why there seems to be an obstacle in the translation of OGP and how it is implemented and understood (I-OGP:4).

Goals: The goals of the OGP are to improve governance, by urging governments to be more transparent and responsible through the citizen participation. They also call for making better digital services for the citizens - the ideology is that both parties (government and civil society) collaborate in making innovations for a better society (OGP 2015c).

NGO

2013: *OKF - Open Knowledge Foundation*

Identity: The international Open Knowledge Foundation (from 2005) with its smaller Danish charter (Open Knowledge Denmark) started working with OD around 2013-2014. On the website they describe themselves as a not-for-profit network of voluntary people trying to promote open knowledge through all kinds of different public cultural, scientific & research data, statistical data and more (OKF 2015f). Our informant tells us they have a strong international network in which they can recommend prominent people or projects in other countries to each other, to further collaborations and new partnerships around OD. Instead of economic growth as their main priority, they put focus on the civil society and open source in the sense that they find it valuable to reuse and share knowledge (data) (I-OKF:7). OKF wants to promote openness and make data more usable for all citizens (OKF 2015f). They organised and hosted the event (hackathon/data sprint) Open Data Day in Copenhagen in 2015 in collaboration with WIKI Denmark. They communicate news and events through social media and mailing lists for everyone interested in OD (OKF 2015g).

Informant's background: Our informant at OKF is educated within political science and computer science. Morten has experience within IT, politics and statistics he is the co-founder of the Danish OKF charter and works as an analyst by day. As OKF is an NGO driven by volunteers, the work hours put into it are on a free time basis. Our informant's areas of interest for OKF are politics, the public sector and how to use OD to make moves towards democracy and a transparent public sector.

Obstacles: Morten mentions that the barriers and restrictions that exists for OD makes it less usable for people in order to feel legally secure to use the data. For this reason, they try to create awareness for OD for people to use it and make sense of it, but also by contacting different public bodies and encourage them to open up data. Morten expresses that from the great amounts of public data that exists very little is made available or released under (legal) user-friendly conditions; much of it still needs open licenses (I-OKF:13).

Goals: As mentioned by our informant they want to encourage different joint groups and individuals to work with OD in Denmark and connect them to other countries. This has been done with great success in other countries such as Finland, Germany, UK and Switzerland. People from different institutions with different backgrounds get together which creates a strong organisation and network. This is to have greater influence on the outside world (I-OKF:4). OKF are in favor of the ideological ambition behind OD that is to create a better society by giving the public access to information and to know more about the processes in the public sector and everyday practices in politics. The idea is that openness creates a better foundation for people to be able to participate in the political agenda or create better solutions themselves (I-OKF:7).

Public authority

2014: *VIRK - The Danish Business Authority*

Identity: The Danish Business Authority (VIRK) hosts a data catalogue called VIRK DATA that launches around 2014. It consists of OD such as CVR-data, accounting, telephony and addresses provided by a range of Danish authorities (Erhvervsstyrelsen 2015c). VIRK's main function is to make it attractive to run a business in Denmark. With VIRK DATA, which is built on CKAN, they wish to provide better access to public data for private companies and others who may be interested in working with OD. Furthermore VIRK has made an OD School e-book that provides information about OD and how to use it (Erhvervsstyrelsen 2015a & d).

Informant's background: Nikolai is educated in information studies and now works as part of a two man team focusing on OD within VIRK. He develops VIRK DATA's data catalogue and seeks out new data to be described and published.

Obstacles: Nikolai mentions how their task to find enthusiastic people who want to work with OD can prove difficult at times since they do not have the mandate to "force" anyone to cooperate. They instead have to actively look for people and businesses who find OD interesting and worth working with. For VIRK it is a matter of sorting out where to start and what kind of data that may have value for potential users. Another main challenge is to make OD develop as a sustainable solution for businesses to keep it growing (I-VIRK:20).

Goals: VIRK wants to make OD more approachable and display public data for people to get better insight in the information that is being gathered by the public authorities. Furthermore they want to create public-private partnerships and attract users such as it-

developers, data analysts, researchers and others interested (Erhvervsstyrelsen 2015a). Furthermore it is about narrowing down business needs and supporting businesses in using OD (I-VIRK:20).

Public authority

2014: *DMI - Danish Meteorological Institute*

Identity: The DMI is an institute under the Ministry for Energy, Utilities and Climate (DMI 2015a). DMI houses information from the Aviation Weather Service and the Armed Forces Weather Service (DMI 2015b). They operate the meteorological attendance of the commonwealth of Denmark, which includes the Faroe Islands and Greenland (DMI 2015c). DMI is committed to making part of their observation datasets freely available. These data are called essential data within meteorological terms and refers to measurement times (every three hours from 3 am.) which is reported to the World Meteorological Organisation (WMO) under FN. The essential data are the minimum measurements for what is shared across nations (I-DMI:2).

DMI has not yet made their own OD platform, but has published around four INSPIRE regulated datasets on the GEODATA portal (geodata-info.dk). So, at the moment DMI sells data. DMI receives much interest from private companies such as Mærsk (Shipping) and DONG (Energy) for its already existing data. Also private customers have an interest in using data from DMI in legal issues this could be a case where citizens have to document the weather conditions on a specific day to e.g. insurance companies (I-DMI:4).

Informant's background: Sune is has a MSc in meteorology and is hired by DMI where he works in the department of Collaboration and Innovation (I-DMI:2-3). In this department he has a communicative task in advising people, furthermore he handles customisation of products for different customers and has experience with external customer needs.

Obstacles: In order to continue the work of opening up data, Sune expresses the need for a grant (from the Ministry of Finance). Hosting public data which in principle is owned by the Danish taxpayers, DMI has as well data that are owned by private parties e.g. the air traffic. The air traffic collect data which are shared with DMI, and others pay DMI for a quality check of data (I-DMI:4). Hosting both public and private data may require a certain organisation before making data public and open. In the meantime they keep themselves oriented and updated on OD.

Goals: Their overall mission is to convey information to the Danish society about weather, climate and oceans, for the safety of the citizens (DMI 2015c). They aim at this moment to share knowledge/data and make their data freely available for everyone; so that the citizens are able to use it and learn from it (I-DMI:3). DMI will in the future also provide data for the Data Distributor (I-DMI:6).

4.3 Enrollment

The moment of *enrollment* indicates that certain roles are defined and to some extent accepted by the actors. As shown by the interessement devices and identification of actors, certain negotiations are taking place and it can be argued that certain alliances are about to be made. These devices may in some instances bring the actors closer together or make them move further apart. Alliances are about to be created through the different interessement devices or platforms that are gathering the different actors which will be described in the following.

4.3.1 Alliance 1: Professional disciplines across Europe

The first alliance defines a part of the OD landscape in Denmark, meaning that the PSI-directive implemented in the Danish law, define OD as *Public Sector Information* and make the public bodies act towards this directive. Furthermore the PSI directive and the INSPIRE directive are part of the European Commission's Digital Agenda plan for 2020, along with the EUROPEANA project that is funded by the European Commission. These directives and projects can be seen as interessement devices coming from the EU and can result in new alliances across Europe. This tendency appears when going through the different actors' identities. It shows that actors are joining forces internationally with other organisations/public bodies within their professional fields (e.g GEODATA are joining forces on an European level with the INSPIRE directive in creating better spatial infrastructures as well as CULTURE who are joining EUROPEANA to establish a collaboration in gathering cultural data). This tendency can happen for DMI which is partly involved in the INSPIRE directive. The identities of some of the public bodies can be said to be identified by different European directives and projects. Furthermore the public bodies accept these roles by taking part in opening up their data within their own disciplines in a greater European collaboration.

4.3.2 Alliance 2: National promotion of OD

Public bodies join forces based on the Basic Data initiative that is to be a part of creating an infrastructure for the Danish authorities in Denmark; all this is supposed to happen via the Data Distributor. Basic Data is so far being identified within 5 main areas (Geographic data, Address data, Real Property data, Business Data and Personal Data (CPR)) which could automatically exclude some authorities and municipalities who could be said not to provide basic or key data. The Basic Data program can be seen as device that maintains some of the identities and roles for the (basic) data providers in this program. So far it seems as if the different actors are joining forces such as the DIGI who was a part of making the Basic data program (which is part of the digitisation strategy 2011-2015). KL is going to be part of the acquisition of the data (LGDK 2015d). GEODATA providing geodata, VIRK providing CVR-data, and the BBR data register which was made freely available in 2002 are also to be implemented (The Danish Ministry of Finance & LGDK 2012:14) and behind this program are among others the MBBL (BBR 2015). This network may be expanded when up and running and e.g. DMI (and others) may also join (I-DMI).

4.3.3 Alliance 3: Municipalities in Denmark (Open data.dk)

Another alliance that can be taking place is with opendata.dk as interessement device that assembles the municipalities and regions that help initiate and maintain it. This is a national portal directed towards the different municipalities to make their data available on a common platform. Again this interessement device can be said to strive for actors in the common professional work area (other municipalities) who probably host data similar to the five initiators. As stated via opendata.dk, their focus is to disperse OD and the potentials thereof to the other 93 municipalities and the remaining four regions in Denmark. This is to disseminate, share and open up data across these municipalities and regions (Opendata.dk 2015b). This device can thus be a way to identify and provide some roles for the other municipalities and regions both by using CKAN and by gathering public bodies within the profession.

4.3.4 Alliance 4: CKAN infrastructure

OKF has built the open source platform CKAN which is so far implemented in collaboration with the informant from AI. It is used by VIRK, AAK and is to be implemented on

Opendata.dk which could include making all the participating municipalities learn to work with CKAN (Opendata.dk 2015c). CKAN is used internationally and as it contains uniform infrastructures this may make it easier to handle and use in the long run. It also contains features that make it easy to customize to each institution.

4.3.5 Alliance 5: Hackathons (OKF, WIKI, DIGI & AAK)

WIKI Denmark and OKF Denmark organise hackathons and events such as the Open Data day, where people can meet and get together. So does public bodies such as DIGI and AAK. Placing interessement devices such as hackathons is a way to attract and inform other actors. Moreover by arranging these events they (WIKI & OKF) sometimes initiate and in some cases push the governments to open up their data (I-WIKI; I-OKF). Different interests are at play, for example WIKI are working with Copenhagen municipality on the hackathon event Open data day in 2014. They experienced that they have too many public agendas and thought that this became too bureaucratic and did not invite them to the next one (I-WIKI:2).

4.3.6 Alliance 6: International roles

DIGI is part of the OGP who values a process of better governance by involving citizens. The agency is in a position where these values are to be implemented, followed by an National Action Plan. This partnership and the subsequent action plan can be said to be an interessement device that provides roles towards international partnership and further the aim of increasing democracy. In addition the AAK is using OD in promoting the international smart city (OASC) project which is working towards developing smart and sustainable cities together with prominent partners (Smart Aarhus 2015b). Joining this project (interessement) the AAK more or less accepted this project as an OD identity.

In sum, certain tendencies and roles are taking place in the Danish OD landscape. Considering the different actors, the development of OD points towards different identities where some overall alliances and negotiations could be pointed out. On one hand the actors assemble through national projects and programs such as e.g. the collaboration between the Danish museums with the SARA project and the collaboration between municipalities with the Opendata.dk portal and the Basic Data program which make actors assemble around key

data or in their professional discipline. On the other hand this is visible in the constitution of alliances being made within professional disciplines moving across Europe, such as e.g. INSPIRE (geographical infrastructure) and EUROPEANA (the cultural portal). Many of the actors thus participate in both national programs as well as in European or other international programs such as OGP (increasing better governance) and OASC (smart city development).

By making new platforms and events it can be a way to *mobilise* other passive actors in the field. If for instance the collaboration between the municipalities manages in negotiating and *enrolling* other actors (other municipalities) in participating with opening up data on the Opendata.dk portal, they have to mobilise in the given identity. The same thing can be said about the other platforms, portal and programs that they work as a device in which the actors may mobilise and expand the network and come closer in acting as one unit.

5 Data definitions and value

As seen from the literature review it can be argued that OD as a phenomenon is generally considered to be the act of sharing data or information. It is seen as digital data that can be shared for easier extraction of value and information to prosper, among other things, economic growth and democracy. Data can thus be seen as a potentially valuable source of information which can be transformed into commercial and non-commercial value. Accordingly, data are often identified as the key ingredient for innovation and sense of the world (Kitchin 2014:12). For this reason it becomes interesting to focus on the informants' definitions of data. This is to understand how data is being shaped by the actors in the field and how this may co-construct and constitute OD. In this chapter we compare descriptions and definitions of data from our informants with the traditional view on data, the DIKW pyramid and to the notion of Capta, both found in literature. We choose to assign the data definitions from our literature (DIKW and Capta) as ideal types to easier underline the differences and nuances of the informants' definitions of data. In other words, the purpose of the ideal types are to underline which characteristics that are common (or different) in data definitions within the empirical material for this research. An ideal type does not describe a perfect state, but helps us uncover an image of our informants definitions. We therefore look at how articulating and defining data may be affected by their individual logics. Furthermore we describe some issues of how different participants and some of our informants talk about data at a workshop we attended to (Appendix C). Additionally we asked our informants when they saw data to be valuable and we wished to understand how our informants *attach value* to data. To accomplish that, we went through their different *definitions* of data and *attached value* since we view the two aspects to be interdependent. Finally we look at how the inscription of OD may be regarded in relation to data. To study the informants' understandings of data is to try and grasp the complexity that occurs in the heterogeneous relation between the informants' conceptual understanding of data as material and as technology. Studying OD in the making can be a way to scrutinizing the definitions of data because with the development of OD, data might be negotiated anew.

5.1 Why is data so difficult to talk about?

5.1.1 How is data defined- Similarities and differences

In the interviews we asked our informants how they define data and most of them found the task difficult to do. Most of our informants still describe data synonymous with *information* with variations to it, whereas others relate more to the notion of *Capta,* and some look at it as intertwined. Our informant from KL having a background within Computer Science and E-Business describes how he sees data as digital structured information, and the distinction between data and information is not that important to him. What is important to him is whether the data is structured or unstructured (I-KL:11). The informant from DMI, Sune who has a background in meteorology states that the foundation of data consists of numbers (ones and zeroes) that represent the world in one way or another, and he adds that data can be transferred to satellite pictures which also consists of numbers (I-DMI:5). The informant from OKF who has a background in Computer Science and the informant from GEODATA, with a background as Geographer both state that everything is data, that data is a representation of something, it describes the world in pictures, letters, numbers, audio or video. Our informant from CULTURE with a background in Geographical Information Systems and databases, works with data in both analogue and digital formats and in particular how analogue data can be digitised. He explains how he sees data as *"well organised snippets of information"* and "*one of the building blocks of information*" but adds that these data not necessarily have to be well structured (I-CULTURE:16). From some of these definitions we see common traits in defining data as potentially valuable information; a representation of something that can be decoded or understood.

A few of our informants express that data are already produced into a human context, and thereby already valuable when *selected/chosen*. When asking: 'Does OD have value in itself?' Our informant from DMI responded:

> *"Yes. If we get weather data from a weather station we can already use it and understand what it means. But it is clear that one can also start to interpret and analyze the data and in this way add even more value."* (I-DMI:6).

From the statement above data can be seen as ready to use mainly within his trade. Furthermore this statement could indicate that data are being created in a system, created by humans and have a certain structure in which the data become usable. This definition is

closely associated with that of Capta where data are always selected by humans and born into a specific system.

More than once during the interviews we encountered the terms raw material or raw data. Although the term “raw” is charged with multiple connotations, we mostly experienced it as having its own significant meaning in every work place. So even though it might be a little complex, some of the informants explained how the term “raw” has adapted to their workplace and is, in a more common sense interpreted version, a part of the common work vocabulary. Additionally our informant from AI with a background in Information Science and programming defines data as a quantifiable “raw material”, something that you can “hold on to”, something that is registered in some way that you can analyse such as a measurement from a sensor (I-AI:18). When our informants talk about raw data, the term “raw” often reveals an understanding that considers data as having been in a raw, true, untouched state. That is a state without human interference or processing and thus something pure or given. Other informants are leaning on the opposing understanding that, in the eyes of Kitchin, would thereby be considering data to be Capta which by its definition can not exist in a raw state since it is selected by humans, and therefore has inherent meaning. All in all it seems as if the term raw data carries different understandings in relation to how it is understood as raw, eventually it seems to be valuable data which some of the different public bodies try to get hold of (I-AAK:12). Several of our informants refer to data in conjunction with information as if the two are difficult to separate or distinguish in terms of which comes first or which is the smaller building block. It seems that there is an implicit agreement that data are related to information in one way or another and that data become valuable when put in use and that data in terms of raw data are valuable in itself.

5.1.2 Work related Open Data definition

OD seems to be defined also in relation to the different informants’ work practices and furthermore the ways in which it is part of their vocabularies. Additionally it appears that the understanding and definition of data depends on their professional background, experiences and field of work. For instance the informant from AAK with a background in Media Studies points out how she explains data differently when she talks to an IT person or an employee in a e.g. a cultural institution (I-AAK:15). This can support our hypothesis on data having different characteristics depending on the individual (institution) defining it

and how it is explained. The initial ideas leading up to the hypothesis is partly confirmed by an initial interview with our informant from DIGI, she explains:

> *"[...] it also has something to do with that it's actually when you think about it hard to define what data is [...] I am so, so lucky that I, for example, have legislation defining roughly what data is, uhm, inside my world, but I am perfectly aware that I still have to relate to what everyone else thinks when they talk about data [...]"* (I-DIGI:5).

From this statement it can be seen that data in her work are defined by legislation. Furthermore she is aware of the different connotations and definitions that data may carry at other workplaces. She thereby recognises the challenges that different data definitions can cause.

5.1.3 Comprehending the value

On the 21st of April 2015 we were invited to join a workshop with our informant from DIGI. The four hour workshop for the European Commision was hosted by DIGI and carried out by Pwc (PricewaterhouseCoopers), a private consultant company, and people from different public and private organisations participated (Appendix C; European Commission 2015b). The eighteen participants worked for nine different public or private organisations[21]. The workshop, run by our informant Line from DIGI and a speaker from PwC, was supported by a technical expert and a lawyer who was present for all the technical and legal issues that might arise.

PwC presented political directions coming from EU, such as the PSI directive and licenses used for Open Government Data in Denmark. Initially there were some small exercises on how to talk about which data sets the agencies could open and the corresponding practices to that task. This gave us the possibility to observe people from different public agencies talking about OD as something that is entering their workplaces, how to deal with this phenomenon, their opinions and understandings. The presentation given by PwC revolved around questions like "What is (open) data" and "How should one try to understand and

[21] DMI, VIRK, LGDK, Citizen Services in Gentofte (Borgerservice), The Danish Environmental Protection Agency (Miljøstyrelsen), Energinet.dk (Independent public company who owns and operates the Danish electricity and gas transmission networks), The Danish Road Directorate's IT department (Vejdirektoratet), Stevns Municipality and Lolland Municipality

work with it?" (Appendix C). The workshop also included talking about the value of data and metadata which seemed equally important in the process of opening up data. Most participants spoke of OD being of value as a means of transparency or economic growth (Appendix C). Though at a more conceptual level it became more difficult to define what data is. The man from PwC at some point asked: What is a dataset? On the basis of no actual answers he then asked: How big or small can a dataset be? Again he received no answers which further indicated that data can be difficult to talk about or define in the given context (Appendix C). The workshop also pointed out that the data providers (participants from the public bodies) saw different technical barriers, and legal insecurities to exist which in some cases added to the complexity of opening up data. Furthermore the workshop and the exercises continued to address the questions of which datasets to open and where to start when not having much experience. It seemed as if this exercise to a certain point related to imagining the use and value of the dataset. This we also recognise from our interviews where our informants from AAK, VIRK and GEODATA each point out different aspects of the value of data. Our informant from AAK estimates that the value of data depends on whether it is properly disseminated to the users, and mentions that she often experiences the case of the chicken or the egg from data providers - that they wish to see good OD use case before they want to open up their data but that use cases need OD for that to happen (I-AAK:15). She explains that many data owners are not aware of the potential value of their data, and for this reason hopes that data owners, providers and users can meet through some of the OD events to create links, relations, alliances and discuss supply and demand, needs and more, since it appears that value sometimes only can be demonstrated later on with good use cases. When you know more about the use, effect, results, - Nikolai from VIRK mentions that it can be difficult to assess if their work is worth the effort since they have hardly any way of measuring the value (I-VIRK). It was clear that many of the participants had several and varied doubts about the practices and benefits of OD. The overall value of publishing data is connected to the visions of creating transparency and commercial value. However, it appears that there is a difficulty in seeing the potential value of publishing their data in relation to the concrete dataset.

5.1.4 Context

There are many different attitudes to when our informants think data are valuable, but one thing seems certain, that data and their potential value is a matter of context. It can be the context in which data are produced, the context in which they are processed or published,

the context in which they are understood or used. Some of these attitudes towards use and context can be found in the data definitions and coherent logics of our informants. They may in some cases be quite implicit. It can be said to be widely accepted among our informants that information consists of data in a certain or new context. This indicates a logic that says that the difference between data and information is found in the respective functionality and not in the content.

An opinion that we meet several times with the informants is, that data is only valuable if put into context or use (I-AI:18; I-KL:12; I-MBBL:16; I-OGP:16). This attitude is mentioned in the writings of Janssen et al. who discuss if one can calculate actual 'return on investment' with OD, and write: *"Open data has not value in itself; it only becomes valuable when used."* (Janssen et al. 2012a:266). In case there is a difference between used and unused data and that unused data has no value in itself, it could be argued that there is an implicit understanding that data in itself must possess potential value. This opinion that data have no value in itself may emanate from the DIKW pyramid which includes the idea that the bottom layer (data) is without much system or structure, meaning that it has not been organised within any context. Though, Rowley's point is how the common perception of the pyramid is that for each step you move up, value, meaning and context is added. Specifically it translates to: when data is put into context it gets new meaning and through that, more value. The pyramid, being a fairly traditional, model might therefore be rigidly but implicitly incorporated into people's vocabularies, and thereby easier to use in daily work practice just as with "raw data". However, there seems to be an overlapping understanding between our informants that the value of data is added when put into context and that as a user of the data one has to understand the context that the data is provided in.

5.1.5 Users' technical prerequisites

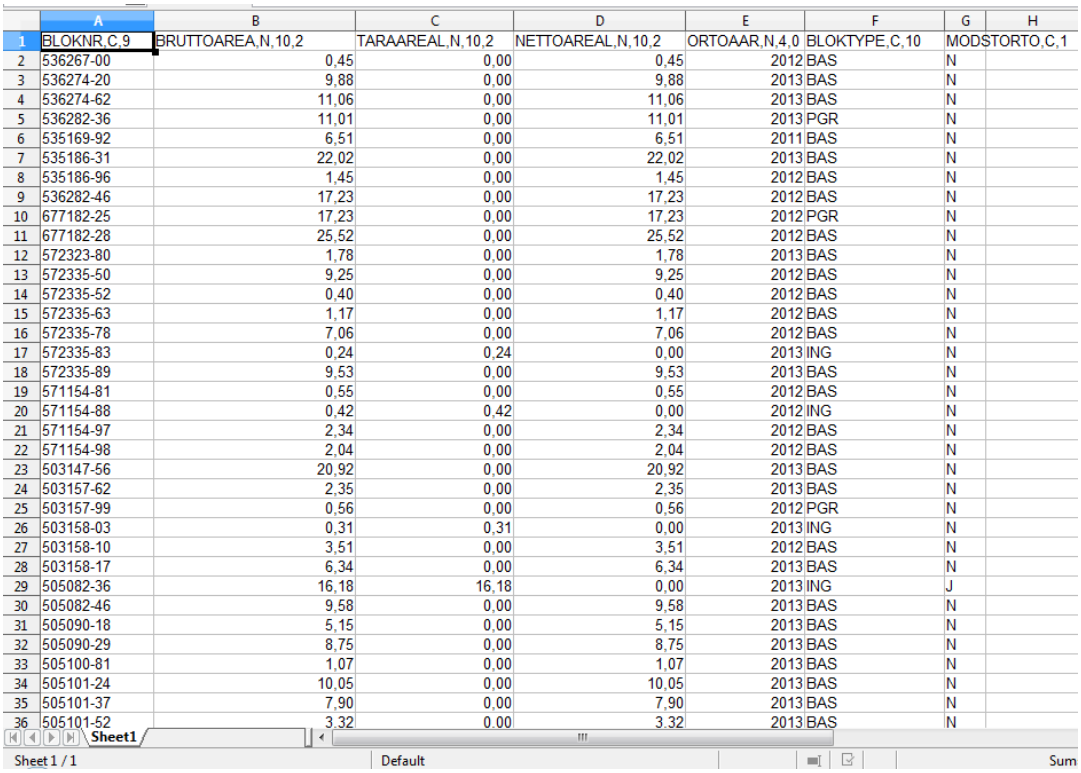
When our informants being interviewed about whether there are equal terms for all users of OD most of the informants agree that in principle the conditions for extracting and using OD are equal for all. But they admit that in reality it is a different story because even though in some cases there are equal terms, people (data providers and users) are different; they have different levels of technical abilities and different backgrounds. For this reason users of OD have to possess a certain level of technical skills to be able to use and understand OD. This prompted us to reflect on how the script/inscriptions of the OD platforms and catalogues could be argued often to be designed for "data professionals". As expressed by our informant from WIKI he states that:

> *"So, in theory there is, but in reality there are not equal abilities. [...] And that's just where we are different people and where it makes very much sense to open up so that people can make these different things based on it (data ed.) and then find out what they can get out of it and a few times then there's also someone who actually creates something that makes business sense and it's really, really good and such; more power to them."* (I-WIKI:9-10).

What we hear our WIKI informant expressing is that we can not really evade the difficulties of setting standards that fit all types of users, and that instead we should just publish as much data as possible and see how people use it. It could be argued that he calls for a test phase which in our minds is maybe exactly what is happening for some OD actors at the moment in Denmark. Though as expressed by the informant from KL, the user has to know the "data language" and how certain types of data are usually organised and put into system to be able to make sense of the data - nevertheless, there is a need for the data provider and the user to speak the same language. He points out that the difficulty is to make an infrastructure that makes it easier to understand the data (I-KL:9-10). Metadata is thus among our informants seen as being very important information to have, since it describes the data and the content of the OD. It is a way to trace the source, the author, the publisher (an agency, a department or an individual), the content and the purpose for creating the dataset. In general among our informants and as expressed by Hans from WIKI, all these factors are what makes an open dataset more valuable and useable (I-WIKI:15). To illustrate how the metadata may come about the figure-5 below is a screenshot of a dataset from VIRK's OD platform. The data contains information about fields in Denmark coming from The Danish AgriFish Agency. Part of the meta-data description reads:

> "*Data derived from field block map for each year back to 2007. A field block is a geographically coherent agricultural area bounded by essentially permanent physical boundaries (rivers, roads, stone walls, etc.). A field block can contain one to several fields, which can be cultivated or uncultivated land*." (Erhvervsstyrelsen 2015e, translated by authors).

Though the metadata or the description of data (as the one above) might for some people be easily understood but the structure and meaning of the data itself, the columns, the categories, the abbreviations, the professional/technical terms are not explained anywhere on the site which may make it difficult for "non-professionals" to use the data.



	A	B	C	D	E	F	G	H
1	BLOKNR,C,9	BRUTTOAREA,N,10,2	TARAAREAL,N,10,2	NETTOAREAL,N,10,2	ORTOAAR,N,4,0	BLOKTYPE,C,10	MODSTORTO,C,1	
2	536267-00	0,45	0,00	0,45	2012	BAS	N	
3	536274-20	9,88	0,00	9,88	2013	BAS	N	
4	536274-62	11,06	0,00	11,06	2013	BAS	N	
5	536282-36	11,01	0,00	11,01	2013	PGR	N	
6	535169-92	6,51	0,00	6,51	2011	BAS	N	
7	535186-31	22,02	0,00	22,02	2013	BAS	N	
8	535186-96	1,45	0,00	1,45	2012	BAS	N	
9	536282-46	17,23	0,00	17,23	2012	BAS	N	
10	677182-25	17,23	0,00	17,23	2012	PGR	N	
11	677182-28	25,52	0,00	25,52	2012	BAS	N	
12	572323-80	1,78	0,00	1,78	2013	BAS	N	
13	572335-50	9,25	0,00	9,25	2012	BAS	N	
14	572335-52	0,40	0,00	0,40	2012	BAS	N	
15	572335-63	1,17	0,00	1,17	2012	BAS	N	
16	572335-78	7,06	0,00	7,06	2012	BAS	N	
17	572335-83	0,24	0,24	0,00	2013	ING	N	
18	572335-89	9,53	0,00	9,53	2013	BAS	N	
19	571154-81	0,55	0,00	0,55	2012	BAS	N	
20	571154-88	0,42	0,42	0,00	2012	ING	N	
21	571154-97	2,34	0,00	2,34	2012	BAS	N	
22	571154-98	2,04	0,00	2,04	2012	BAS	N	
23	503147-56	20,92	0,00	20,92	2013	BAS	N	
24	503157-62	2,35	0,00	2,35	2013	BAS	N	
25	503157-99	0,56	0,00	0,56	2012	PGR	N	
26	503158-03	0,31	0,31	0,00	2013	ING	N	
27	503158-10	3,51	0,00	3,51	2012	BAS	N	
28	503158-17	6,34	0,00	6,34	2013	BAS	N	
29	505082-36	16,18	16,18	0,00	2013	ING	J	
30	505082-46	9,58	0,00	9,58	2013	BAS	N	
31	505090-18	5,15	0,00	5,15	2013	BAS	N	
32	505090-29	8,75	0,00	8,75	2013	BAS	N	
33	505100-81	1,07	0,00	1,07	2013	BAS	N	
34	505101-24	10,05	0,00	10,05	2013	BAS	N	
35	505101-37	7,90	0,00	7,90	2013	BAS	N	
36	505101-52	3,32	0,00	3,32	2013	BAS	N	

Figure-5: Dataset: Data about fields in Denmark coming from The Danish AgriFish Agency from VIRK.

So for once, people have different backgrounds and will therefore have a tendency to understand some types of data better than others. Making the data understandable is an essential task. This is expressed by our informant from OGP, who stresses that if the user can not use or understand the data the whole process is pointless (I-OGP:17). If beginners were to take on the task of working with OD they might need some sort of tutorial or guide. Uncertain of the level of technical knowledge of the users, a few informants expressed opinions on whether OD is for professionals or for all citizens (I-AAK:3). This gives way for further complications when trying to fit OD into standardised practices.

6 Tropes of Openness

Now that we, in the previous two chapters, have looked at the alliances of the network and the definition of data, we take a look at the actor's/informants different notions of openness. As stated by Mol: "*What is at stake is rather the co-existence of different ways of handling problems, framing concerns, enacting reality."* (Mol 2010:264). The quote implies that OD as a phenomenon, may be the result of different logics which materialises in the digital platforms and other technologies. We find it interesting to examine the logics of our informants through these narrative practices of OD. We do this in order to provide our angle of the current state of how OD is understood, imagined and performed among our informants. With a desire to describe how openness is handled and understood, we look for ramifications of openness in line with the notion of Inscription/Script, how the informants inscribe openness into OD. In other words, the informants are the ones "designing" and constantly reproducing OD in their everyday work and therefore it become interesting to understand how they handle OD. In this chapter we use tropes to analyse different realities of openness. Tropes are not mutually exclusive but complexly interwoven in our ecology of OD. We did though see the benefits in defining them individually, and the necessity of an intervention into our empirical material. Furthermore this is done with the support of information from the different actors' websites.

6.1 Openness as communication

6.1.1 Data owners: open data on the floor a pragmatic approach

When asking our informants how they work with OD it appears that OD work is carried out as a part of the daily functions for the majority of our informants. Only a few of the informants such as Line from DIGI, express that working with OD is her main function. Usually at VIRK and AAK OD projects are carried out by one or two project managers and it is usually not their main task. Often it is expressed that the work with OD is carried out pragmatically in how they operate within the given frames, trying and testing, and seeing what works. They keep abreast of what the other agencies are doing; some via OKF's mailing list, or casual meetings and events (I-VIRK:6; I-AAK:15). As expressed by Nikolai from VIRK this means working ad-hoc in the process of implementing and developing OD, and embracing the unexpected aspects that might follow in the process of opening up data. Trying and testing is a big part of the workflow (I-VIRK:5). Therefore, there is no specific way, priority or order in which datasets should be made available, only that it is non-

sensitive data, which is a common view among our informants. The process of publishing data consists of releasing the data that are available and possible to obtain. This is a very common approach among the informants who work as project managers (AAK, DIGI, VIRK). To obtain data is expressed to be a communicative task and is carried out by contacting internal or external data owners or visiting the different data producers internally in the public bodies, discussing the possibilities of opening up different datasets. Communicating the concept and idea behind OD reveals the obstacles they meet in the process of opening up data. For instance, Mette at AAK moves around internally in the municipality to each possible data provider and talk to them. She describes her approach to colleagues and experience as such:

> *"Hi, do you know about Open Data and know what it is? No they do not. Ok then do you know why it is good? No they also do not know. We have to explain all these things. [...] This thing about changing the data provider's mindset, and talking about why it is good, is something that we spend the most time doing. Most of the time when we ask if we can get some of their data, they say no- and it is because they have a tight time schedule, because if they spend extra time, they have to use extra resources and extra people to open up the data, they naturally ask; What's in it for me? And we cannot say you get x amount of money back by releasing your data, we cannot guarantee that. Then they ask, who uses our data? We say that we do not know because it is open. Then the other day I talked to someone from the magistry from social affairs and employment. He said: I have been using the last 20 years to close my data, make them secret and unbreakable, so that no one can get into them and now you want to open it, what are you up to?"* (I-AAK:6).

Mette clearly meets obstacles in her work, breaking with old systems and changing the mindsets of their colleagues. For Mette these tasks have to be cleared with the head of the divisions and the person who is responsible for each dataset. Hence, this is done by project managers themselves or sometimes in collaboration with a technical adviser to be able to talk about releasing the data on a technical level. For instance, Jesper from AI worked on an OD project for AAK, where he attended meetings as a technical consultant. Some of the issues and concerns he meets revolves around data security and the extra workload that would be placed upon the technical adviser within the public bodies' different divisions (in this case AAK)(I-AI:2). If they manage to convince someone within a specific internal division to hand over their data for publishing, they will have to familiarise themselves with

the technical infrastructures of that division. For example how do they store the data and what kind of file formats are the data kept in, how and how often is data updated, and is it done manually or automatically. To ease some of the technical advisers' tasks further, they (Jesper and the OD team from AAK) negotiate getting automatic access to the databases in each division to both facilitate the task of manually uploading data and automatically store it in their own data catalogue; in this case a CKAN based platform (I-AI:9-10). Apart from talking about the technical infrastructure of the data in the division, it is a matter of trying to make the data providers ascribe the right license and metadata (I-VIRK:2). For Rikke from GEODATA, this communicative task is a matter of articulating formalities on the website so that users hopefully are able to understand the conditions under which the data have been made available. During a meeting to agree upon a license for their OD, GEODATA ended up sending the attorney outside the door to be able to write down the conditions in a 'common' language (I-GEODATA:2)**.** Once opened up, the datasets should in principle contain a license, information about the data (metadata) and information about the publisher. To illustrate, we find in VIRK data's OD catalogue, a dropdown menu with specific contact information to either a public body or a specific person responsible for each dataset (Erhvervsstyrelsen 2015f). This indicates that the communication between data owners and users stretches beyond the release of data in making the contact information available on the websites.

Another example comes to mind where Mette from AAK, functioning as mediator in trying to make the data owners understand the perspective on opening up data on a more practical level. The story goes that many data owners do not see the potential uses for their data. The data owner in the Health and Care Magistracy (in AAK municipality), wanted Mette to ask interested entrepreneurs what kinds of data they wanted. Mette is not aware of the kind of data that they produce and the same goes for the entrepreneur which made it difficult for them to ask for anything specific. Again we are reminded of the case of the chicken or the egg. Mette then asked if the Health and Care Magistrate could provide a list with the data that they have. Providing a list required more precaution both according to the use of the data and because of the data coming from the Health and Care Sector which means that it can contain personal or sensitive data. The argument was that this would be difficult execute, because they have so much data, providing a list would be an extensive task due to not knowing what the entrepreneur wanted. It ended up with the two of them meeting, the data owner and the entrepreneur, and they agreed on some specific datasets on health care assistive. In short, this is a story about meeting across institutions and operating interdisciplinarily in trying to reach a better understanding of the existing datasets as well as their potential (I-AAK:10).

All in all data owners appears to be key actors in opening up data. Moreover it indicates a sort of "personal ownership" over each dataset and it corresponds to, as mentioned by Jeppe from OGP, that somebody has to make an explicit decision to open up the data. Further he expresses that the practical issue related to this, is the fact that if anything should occur, the one held responsible in the end, is the person who published the specific dataset (I-OGP:6). This generates other issues of uncertainty about the use of the data, meaning that not knowing who the users are makes the data providers more hesitant towards releasing their data. For the data owners the possible use of their data may be difficult to imagine and the misuse sometimes easier. This was a general concern between participants at the OD workshop we attended (Appendix C). The process of opening up data can thus be seen as a communicative task about internally talking about OD as an idea or concept, the technicalities, in informing the data providers about license and metadata. Changing the mindset and making the internal employees aware of OD is a communicative task that takes time.

6.2 Openness as being altruistic: The single case of consistent user feedback

We found throughout the interviews that producers and publishers of OD rarely get feedback on how their data is put to use. Though, feedback is something that many of the informants expressed as a good way to make progress. The idea of user feedback would provide direct contact between data provider and users, so that users can request data, and the provider can get knowledge about their users to improve e.g. their platforms and development in the field. Rikke from GEODATA explains that they (as one of the few) use feedback processes in their daily work by having users registered with a login for their data catalogue. To be able to extract data from the GEODATA's platform *Kortforsyningen.dk* it is necessary to register as a user but can be done anonymously (Geodatastyrelsen 2015h). GEODATA has 34.000 users in their database system and thus adapts their development to their way of use (I-GEODATA:2). The user registration process, and its possible outcome, was an initial attempt to get rid of the payment fees that were imposed by GEODATA's financial model. Rikke explains how the login does not require the user to give away their true identity (Name, CPR etc.); only your email address (I-GEODATA:2). This provides GEODATA with log information of their website traffic and enables them to see which data sets are more popular. Additionally it enables them to know which data might be a good bet

for the future development of the platform. At first, when implementing the login on their platform, Rikke explains how they received questions such as "*How do I open a ZIP file?*" (I-GEODATA:9). The process helped them realise the technical level of some of their users and showed them that maybe it wasn't yet time for an API for LOD[22]. The issue here is, as Rikke mentions, that GEODATA were seen upon as a bit "different" for implementing this solution though it seems as if the login system is catching on with other informants (e.g. AAK), it is also as explained by Rikke, seen as conflicting with the notion of openness. If a platform requests login information from users or cookies, it is no longer seen as completely open. Rikke therefore often has to explain this logic at conferences and in her work with OD.

6.3 Openness as better data quality and efficiency

This idea for this trope was ignited when reflecting on the interview with DIGI, as it became obvious that the OD agenda in Denmark is a vision of efficiency within the public institutions. Launching OD projects can be seen as a means to create efficiency and to ease the workflow across the public bodies more effectively.

6.3.1 Openness as better data quality: Data Cleansing - The more the merrier

Initially, as stated by Line, the Danish *Basic Data Program* sprung from the need of sharing data internally in the public bodies. Because of authorities using a lot of the same Basic Data, the free sharing of data among them would also help in minimizing some of the administration issues such as sending datasets back and forth, waiting for the payments to go through. In the beginning OD was thought of as being made free of charge internally within the public bodies (I-DIGI:3-4). Focusing on opening up data and sharing basic data across the public bodies is seen among our informants as an efficiency strategy. So by opening up data digitally and making it freely available without any or minimal cost is seen to aid in lowering the processing time, compared to previous manual processes (I-MBBL:11). Drawing on experience from the former systems showed that using data across the public bodies required much more control and administration in the sense that they e.g. had to send invoicing back and forth between the different bodies when they needed data (I-

[22] Linked Open Data

DIGI:3). This was beneficial in the sense that the use of the dataset increased according to the popularity when buying it. The other less beneficial part was that expenses often made the public bodies or others buyers keep the dataset for a longer period of time and if new changes were made it was not updated. This resulted in what they call '*shadow registers'* (I-DIGI:3). These registers created a great deal of uncertainty about the quality of the data, by continuing using unupdated data sets in their work.

Another way of organising OD as efficiency is done in more or less technical measures, meaning that it can aid in improving the data quality. When being open and accessible everyone can in principle improve the data by correcting 'mistakes' found in the data. Or said in other words *correcting* could be referred to as *data cleansing*. This might be due to the fact that some of the dataset in some sense are incomplete or carry smaller mistakes (I-VIRK:16). The cleansing of data can in reality go both ways, meaning that the public bodies can cleanse their own data, by correcting and filling out possible gaps in the data. But there is a view among our informants that this can be performed by the users of the data. Additionally on the BBR-website it is also mentioned that; *"Data becomes better when used"* (BBR 2015). In other words this can become a joint task for everyone to correct and cleanse any mistakes. Further as stated by one of the informant at MBBL they have the citizens correcting the data sets:

> *"I have people older than sixty, writing me emails to say that e.g. Markskellet (street name red.) nr. 7 in Hørsholm is not in cadastre 8, it is now in cadastre 6G. So we get to tidy up things that I did not know… so it means something for the data quality"* (I-MBBL:5).

This action is performed by e-mail communication, whereas in other cases when talking to some of our informants is seems as if there is some uncertainty about correcting the OD and how it might work in practice. It varies between agencies which kinds of communication they have for users' suggestions, and it sometimes depends on what is "allowed" through their licenses. An example is given by Nikolai from the VIRK, where the Itinerary[23] for public transportation in Denmark, has a certain license for their data. The license includes that it shall not be possible for users to alter the data due to the content which in some cases consists of timetables for public transportation.

Consequently, the cleansing of data depends on the content. Actively finding and cleansing data sets for some people seen as a potential business: selling the corrected data back to the

[23] In Danish: Rejseplanen

municipalities (I-AI:21). According to Jesper this is not an honorable business since it conflicts with the openness of the municipality (I-AI:21). In general using and opening up the data is as stated by Nikolai from the Danish Business Agency, not a matter of infallibility but more that the data is improved and human mistakes are corrected (I-VIRK:11). By increasing transparency of the data it can minimize possible mistakes that may affect e.g. election results. In Denmark during the election for entering the EU patent court in 2014, a school in a small town (Taarbæk) switched the yes and no votes by mistake. The mistake was discovered by OKF during a data workshop a couple of days later where it was posted on their website (OKF 2015h). Letting more and more people participate in improving the data triggers the question about how this is going to be performed in the long run. Presumably technical solution might be, as Jesper suggests, that in principle one can do whatever with the data, even manipulate and falsify. That is why in order to put it back up as OD on the platform, it is the data owners that have the last say (I-AI:21). Does this mean that the data owners or somebody else have to double check the data in the sense that data to the widest extent represents the reality that data tries to encapsulate? When making everyone a part of cleansing the data new practices and change of roles might be established.

6.4 Openness as availability/accessibility

When asking our informants how they would define OD with their own words the statement beneath from our informant from WIKI sums up quite well, the way in how the majority of our informants defined OD:

> *"It is data which can be used by anyone for anything without asking first"*
> (I-WIKI:8).

The common view among our informants is that OD is data that is made *available* and *accessible*. It then becomes interesting to understand how openness is understood and organised as availability and accessibility. Additionally asking our informants about some of the ways in how they work with different file formats, helped unfold some of the ways in how openness is being understood in relation to how OD is organised and made available.

6.4.1 Openness as machine readable files

Accessing the data is as mentioned in the literature review related to, among other things, the formatting of the data. This relates to some extent to the machine readability of the data. To unfold this matter it emphasises a general understanding in the literature and among our informants of avoiding rigid formats such as e.g. (scanned) PDF files, since that format is less flexible to work with. Furthermore this may correlate with the ideology and main agenda of OKF that data should be opened up under non-discriminatory terms. It should be available on equal terms (using open source software to manage the data), for every purpose (commercial as well as non-commercial). The idea is that it should not be made available for only some (e.g. private companies), it should be made available for all (OKF 2015i). The OKF endorsing the Open Source tradition of working with data through free software programs also include the effort that one should be able to open up data on any computer without help from proprietary software. Therefore it could be argued that in relation to the formats of how OD is released it generates certain expectations toward the usability and demands of the users IT-systems. As written on GEODATA's website they try to meet these demands as stated:

> *"Kortforsyningen (their data catalogue ed.) builds on international XML and OpenGIS standards (ed. file formats). This means that there are no special requirements for the user's IT systems"* (Geodatastyrelsen 2015i).

In principle all formats can be used, though the impression we got from some of our informants (AAK, DIGI, VIRK), is that they strive for machine readable file formats. This notion may also depend on the platform that the public bodies are using. For instance with the CKAN platform based upon Berners-Lee's five star system, highlights that publishers are able to rate the format of each dataset (CKAN 2012). The five star system can work as a guideline for determining which file formats are more appropriate (see figure-6).

Figure-6: Visualisation example of the five star system

It could thus be argued that certain standards for file formats are favored when using CKAN. Furthermore it can be argued that CKAN aids in implementing technical solutions to create a good infrastructures and thus future perspectives in thinking of LOD as seen above below the five stars. Being able to link the data, as mentioned by Jeppe from the OGP, may also generate a better understanding of coherence between data. LOD can be seen as a technical solution to structure the data in manageable ways and ease the analysis and comparison of data across different platforms. The script (the software chosen to build these OD platforms) may strive for certain file formats and standards, which again may affect the way openness is understood in relation to data collection. Then the file formats may be of first priority compared to e.g. content of the data when gathering it.

6.4.2 Openness as open standards: working with formats

Even though certain file formats are advocated for as with the five star systems, one can come across a variety of data formats in the OD landscape and it may reflect many years of working practices. The formats released on their internal platforms are also the formats that the public bodies work with on a daily basis. For example, some of the agencies e.g. CULTURE who works with GIS and CSV files, have a tradition of working with qualitative data like pictures and videos (I-CULTURE:9). When asking Rikke from GEODATA about

which file formats they use in their work and if some have a higher priority, she replied that GEODATA of course mainly work with geographical data and map data which comes in GIS formats. DMI works with file formats such as XML, JSON and ASCII among others, but they have considered changing some of the file formats to more 'open' formats (I-DMI:5). This indicates that the practices of gathering data might not always align with common OD standards.

Apart from being interested in the different file formats that the public bodies are working with, we wondered if this is a matter of converting the files to 'open' standards. Asking Rikke from GEODATA if they convert some of their files; it was mentioned that a lot of the data is being used in geographical information processing programs, which is available on the market. If it is not available, they have made a small transformation program in order for it to be used (I-GEODATA:12). However, they did experienced formatting issues with the architects as user group who works with file formats such as CAD (ref.). This became a matter of sorting out the need for this kind of file format, instead of just uploading a lot of CAD files to the many other users who might not know the specific format (I-GEODATA:12). Additionally, Hans from WIKI expressed that they sometimes make requests for some of the public bodies to convert their formats to WIKI standards, for example converting MP4 video files to a different video format called OGV (I-WIKI:13). Eventually this poses a question of the quality of data and if the conversion of files magnifies the risk of decreasing value or losing meaning embedded in the data. In addition it can be a matter of demand since there are different individual user preferences and opinions on what is the most useful format. Indeed these negotiations show us that openness in relation to file formats is also a matter of different preferences and work practices.

6.5 Openness as transparency & democracy

6.5.1 Open Government Data; a good starting point to democracy

From the literature review we discovered that there are certain similarities between the FOI/RTI-movement and OD. This movement indicates that it is favorable for democracy to promote transparency between government and citizen. The recent phenomenon OD drawing on these old ideas could thus be said to have gained new possibilities with the means of technology. Even though this movement (RTI) is only associated with by a few of our informants when asking if they saw OD as a democratic approach, it is still visible in the

common *inscription* in describing OD on their website. Apart from innovation and economic growth (which is a very pronounced approach among our informants coming from the public bodies) OD is also related to an ideological measure. For instance the reason for opening up data on Opendata.dk is additional to innovation seen to "*[...] secure transparency and support democracy"* (Opendata.dk 2015a, translated by authors). Striving towards furthering democratic value thus lies in a mutual trust between citizens and government and, further, that the government acts transparently, as stated in FOIA:

> *The transparency of government is a core issue of the democracy principle and a precondition for bringing any government closer to its citizens. If a government does not trust its citizens, how can one expect the citizens to trust their government?* (FOIA: Leena Luhtanen 2006: 57).

The general attitude among our informants is that Denmark has a well developed democracy and that the public sector is seen as representing the common interest of the public. According to the statement above it can be argued that the democratic values include having a government that operates in open terms, which in relation to OD could include sharing data and information with the citizens. This is also the understanding among some of our informants that the public bodies do not withhold information from the citizens as such and that the Danish citizens in general are very trusting of the government (I-DIGI; I-GEODATA). Based on this, it could be understood that through the public bodies the Danish government has a good relationship to its citizens. Further it is this inclusion of citizens that is a pronounced democratic value in many of the interviews.

OKF and WIKI are some of the actors that openly urge public bodies and others to focus more on inclusion of citizens and it could be said to be the daily agenda of the OGP. Moreover Morten from OKF stated that they have been in a dialog with DIGI to debate the concept of openness, both to include the public sector and to include the citizens in the development of the digitisation of the public sector and it is further stated: *"[...] This is pretty much up hill, because it is not really on the political agenda, but we get to pose the question and make them take a stand, and constantly push"* (I-OKF:4). Additionally, Jeppe from OGP has a task in understanding how the Danish public bodies include the act towards transparency in their work, which according to him is not that profound. Due to the wish to increase transparency and democracy the argument from Morten is that OD coming from the government is a first priority to open, because of its relevance to the development of society (I-OKF). Government data is in that sense a potential source to letting citizens co-

govern. This means that by sharing data, the public is invited to participate and have a say in the development of society. Openness, and especially an open government, which maintains the public services in society, would then be constitutive in the retention of democracy. In sum acting transparently is a good starting point to include the citizens.

6.5.2 Openness as a Technological act of Transparency

So, what does it mean to act transparently? Once again looking at the historical tradition of FOI/RTI entering Denmark around the 1970's it has had an impact on the legislative tradition. This is enforced by the new Information Act 2014 (Denmark), where people as well as media (e.g. journalists) can, by law, request access to public information. In this context the media have the possibility to disseminate information and the deeds of the government to citizens (Civilstyrelsen 2015). In extension of this some of our informants kept referring to this law as if it would be pointless not to open up government data now that everyone has legal support in getting access to the information held by public bodies (I-DIGI). In some aspects this law is used as an argument among the informants for pushing OD. Moreover being able to digitally open up data is understood as a technical solution that could further transparency. As stated by Jeppe from OGP the opportunity to increase transparency is connected to the overall global technological possibilities (I-OGP:4). This indicates that with the means of technology transparency might appear (nationwide) on a wider scale. Uploading data via online data catalogues on the internet seems to carry a great potential for the governments to act more transparently. For every document/dataset being opened Jeppe states that a layer of transparency follows (I-OGP:11). Though hypothetically having all government documents available and open, one could ask whether this could be equated with being 100% transparent, if this is even possible. This is on the contrary expressed by Mette from AAK:

> *"It could be cool if you could measure transparency as in Photoshop, pushing a button where you could see that it becomes more transparent, and then the percentage rises. [...] At the moment we cannot say that the municipality has become x percentage more transparent by publishing one more dataset. [...] It is a necessary tool to become more transparent. [...] To open and understand the dataset… we can reach further, but there are still a long way to go, so in a way it is an infrastructure that enables transparency - which is important"* (I-AAK:13-14).

This statement indicates that the act of opening datasets is not enough to be transparent, but that OD is a good technological system for enhancing transparency. The script or imagined use of OD as transparency according to Mette presupposes that the citizens understand the data. One target group that continuously have been used among the informants as an example to illustrate some of the issues when it comes to understanding and using OD is the older less technology-savvy generation. Nikolai from VIRK expresses that OD *may* create transparency but mostly for data professionals - meaning people who are able to understand and use the data provided in a certain context (I-VIRK:10). This attitude is in general supported by the different informants when asking if OD is a democratic approach. Jesper starts saying that it is but that the data have to be understandable and expresses that OD is mainly for experts, and might be difficult for the general public to understand:

> *"When is one even open, when providing data on an open data platform - I mean no! I actually think it is a huge smokescreen, because uploading data is not really useable, you have to be a domain expert or somehow able to mess around with all these data in order to even understand them, because if you simply just look at a spreadsheet with data, then ehm ok what does 793 mean? - I don't know"* (I-AI:14)

Some of the more technical informants such as Jesper, Jeppe and Morten mention that this issue could be solved by placing mediators such as data journalists or different visualisation services can make the data transparent for everyone. OD is therefore seen as a support for increasing transparency, even though it might in some instances mean that journalists or citizens have to "interpret" the data provided. To provide an example this could be shown with the website from the OKF called *Openspending.org*, a site that based on OD provides insight into how governments are spending their money (Openspending 2015). This website is an example of trying to communicate the data via visualisations and statistic to the general public. In one way or another it could be said that OD is seen to aid in creating a more transparent government, though this is also very much entangled with the actual use and understanding of the data. It could be argued that opening up data on different platforms and portals create access to a pool of data that still needs to be used and in some cases translated for the wider public in order for it to be transparent.

6.5.3 Transparency to what?

Talking about transparency poses questions to the content of the data. The general approach in opening up data is to steer around non-sensitive data that is data that has less to do with information about people and more about e.g. spatial information, geo-locations, buildings, street names and the like. Talking about OD also indicates as expressed by Jeppe that when there is OD then there must also be "closed" data (I-OGP). So going a bit further what should be opened up in order to increase transparency? This is a complex matter and it seems as if transparency as a "topic" is not a united prioritization among the public bodies as such. Due to the political agenda of innovation and economic growth this is where their resources are being put. Talking to our informants about OD leading to more transparency portrayed different understandings of the content regarding the data and which data that would be interesting to open. Informants from MBBL and DIGI refer to how citizens might benefit from being able to find out just what kinds of data are registered about their own lives; a service like that could enhance the trust in the government's transparency (I-MBBL:3; I-DIGI:16). On the other hand the general attitude of what is being opened up is from the NGO's and Jeppe from OGP's point of view a matter of what is politically "safe" to open, meaning data that do not display the daily work and agendas of the politicians (I-OKF:18). Examples of data about politicians' taxi receipts, public bodies' finances and so on (I-OGP:8). This indicates that citizens should be able to see how the government works and their daily agenda. So according to Morten (OKF) the OD is somehow "selected" because as further stated: *"Once opened, it becomes harder to close it again, compared to keeping it closed"* (I-OKF:18). Additionally, Morten suggests that every dataset in reality can be a potential political topic. In principle all kinds of open datasets are potentially increasing transparency and preventing further misuse because once opened, the data are displayed for everyone to see (I-OKF:18). This somehow supports the point that once opened up "all" datasets could in principle be of use.

6.5.4 Privacy regulation: a barrier to transparency

Jesper from AI points out that if OD is to resolve transparency and further democracy a practical barrier might occur in the way that data have to be anonymised. One of the issues that become visible during the interviews with AAK and AI is that OD is related to issues about anonymisation of sensitive personal data (I-AAK; I-AI). Jesper from AI explains:

> *"[...] the definition (of Open Data ed.) is still in the making and the fundamental idea is to get data out to the wider population to get some sort of insight, whereas OGD is something coming from public bodies and that contains a lot of privacy issues e.g. with the whole healthcare system where there is a lot of private information, which is something the Regions take care of. It becomes the public bodies task to make sure that private data does not end up in the wrong hands"* (I-AI:13).

OD still implies elements of privacy regulations as well as being a technical matter that has to remove this information if visible in data sets. If information has to be "hidden" digitally because of privacy matters/laws there might still be a long way to increase transparency as well. However, both politicians and citizens may still be reluctant to show private "agendas". OD is being defined as data without personally attributable (sensitive) characteristics (I-AAK). Some public bodies are more affected by the characteristics of the data than others and have to work more to anonymise the data which demands a greater awareness of (and thereby closer relation to) the Act on Processing of Personal Data law. As stated by some of our informants they are not completely open due to this law (I-MBBL:9). Therefore these ethical concerns of how OD can be made available for others might differ in practice according to what kind of data and institutions we are talking about as well as the datasets themselves.

The public bodies such as GEODATA and DMI may be less concerned with sensitive or personal identifiable data because of the types of data they produce that are less likely to contain personal information, whereas MBBL has others types of data that more often contain information which can be linked to specific individuals.

6.6 Openness as global mobility

We ask our informants *"How widely should data be shared to count as open?"* and *"Do data have to be shared across countries and be globally accessible to be called open"?.* As an answer for these questions some of the informants emphasize the global scope of OD and how the development in Denmark should be seen in relation with opening data across Europe**.** Many informants agree that OD in principle should be shared internationally; otherwise it would not make sense to define it as open. Consequently talking about the reach of OD a question

of language appeared in our empirical work. It was an issue of translating datasets into other languages.

6.6.1 Openness as global endeavours

OD evidently being a part of global endeavours is both seen in relation to how different countries join the OD movement and initiate new international projects as for instance the OGP. Different organisations are working towards improving and expanding the global mobility of OD. And, others are visualising the global span on different sites. For instance on OFK's website, an index survey shows the availability of open (government) data in different countries. This is shown in relation to OKF standards, under certain openness measurements; that the data are open licensed, machine readable, free of charge, publicly available, and digital (OKF 2015j). The index (see figure-7) contains around 132 countries, and 15 different key datasets (the horizontal divide) of different areas such as e.g. *Government Spending, Election Results, National Maps, Health Performance* and *Weather Forecast*. It is then possible to click on the areas and see the openness ranking, the greener the box is, the more measurements of openness are fulfilled. Denmark is ranked 6th and there are still some areas that are not open, e.g. such as the *Weather Forecast* and *Health Performance* as seen below.

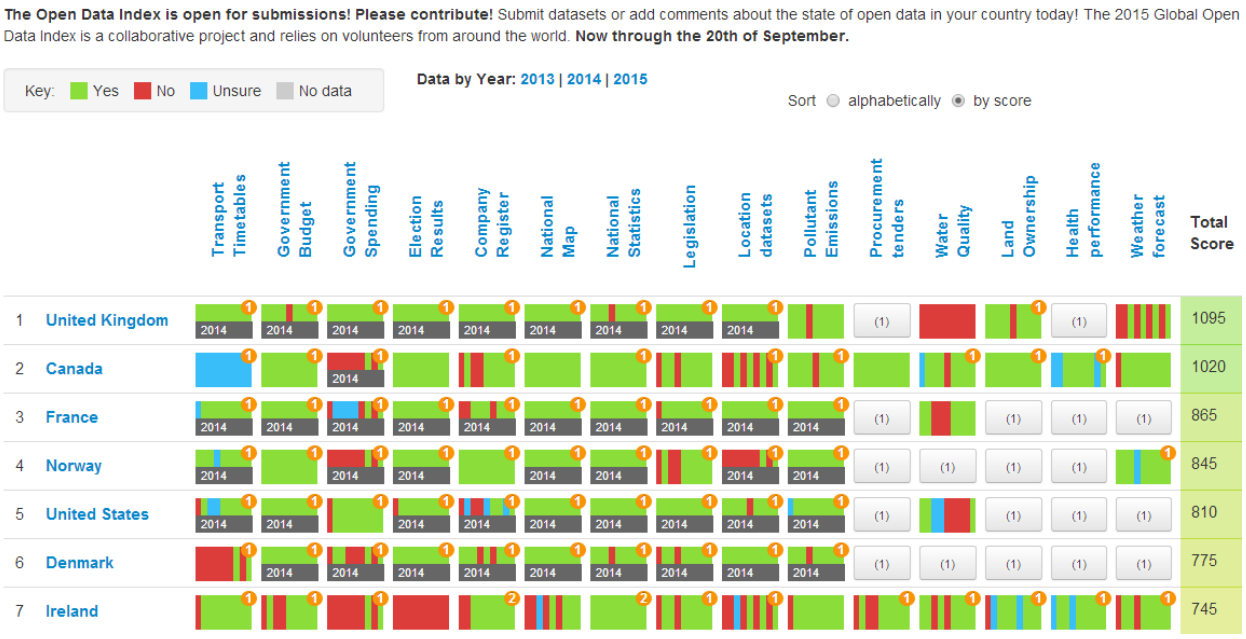


Figure-7 - The Global Open Data Index

This OD index is made by volunteers around the world and provides an overview (from 2013) of the different countries and as written on the site it tracks: *"[...] whether this data is actually released in a way that is accessible to citizens, media and civil society"* (OKF 2015k). The intention of the site is to provide an overview of openness in each country and to be able to compare the condition of open government data between countries (OKF 2015l).
Additionally, GODI (Global Open Data Initiative, led by civil society organisations and the OKF being one of them) state on their website that among other things, they aim to; *"Serve as a global guiding voice on open data issues"* (GODI 2015b). On the website they express an interest in increasing awareness of OD and focus on the global potential (GODI 2015b). The scope of OD is thus about integrating and implementing it within a wider use. This is also mentioned at the PwC workshop that we attended to that when working with OD and the PSI-directive this is also about thinking in lines with EU rather than just on national terms (Appendix C). However, if opening up data is seen both to be for a national audience as well as for a European/global audience this may imply having data in many different languages or eventually translating the data. On the European Union Open Data portal it is written that there are 8810 available datasets, which are published in different languages, some translated into English which is the language most of the datasets are in an as seen in the picture below (European Union 2015).

Figure-8: European Union Open Data portal: available datasets in different languages

To make use of OD in different languages the OKF's gives an example in their "Open Data Handbook". In the handbook they describe how *"Google Translate uses the enormous volume of EU documents that appear in all European languages to train the translation algorithms, thus improving its quality of service."* (OKF 2015c). The text documents/OD in different languages improves the free translation service by Google so that it will continually be more accurate. This could be seen as way to benefit from the data being kept in their original language. However, as Nikolai from VIRK highlights, having access to a great amount of datasets (as with the EU Open Data portal) which are in many different languages leaves the definition of openness more imprecise (I-VIRK:12). This indicate that the data in some cases may have to be translated in order for it to be used by other countries, which could be argued, makes it "less" open to use.

Additionally, Jeppe from OGP mentions that it is predefined that OD should be used internationally, but from what he sees much of the OD in Denmark is still in Danish (I-OPG:14). This may correlate with OD being produced and gathered in connection with the daily work of the public bodies and moreover in a Danish context. For instance Nikolai explains that they focus on Danish businesses and much of the data they generate or gather from other departments in VIRK or other public bodies are produced in a Danish context, with a specific purpose, and thus consequently in Danish (I-VIRK:11). As stated:

> *"[...]Much of the data we can get from the public bodies is deeply grounded in some sort of practice[...], it is not made to be public (ed.), it is made in a specific context in an IT system or whatever it is made in, so I think it will be difficult to compare the data across Europe"* (I-VIRK:12).

Much of the data produced and published by Danish public bodies may in an international context meet some barriers due to language. Additionally Mogens from CULTURE explains how all their documents are digitised in Danish - directly translated with original ways of spelling (Old Danish) not to lose any of the intended meaning. Since the main purpose is to preserve the meaning of the documents, their first priority is digitisation and not translation. Instead they make what Mogens calls *"on-the-fly translation"* for individual inquiries (I-CULTURE:14). This of course calls for international users to be able to know which data they need from the platforms. So far all of the data from CULTURE provided to the EU databases is uploaded in Danish. Moreover Mogens mentions that translation of the many datasets will be a demanding task and that in e.g. in the EU databases it is possible to search for keywords in the datasets in your own language and then still be directed to e.g.

CULTURE's dataset (I-CULTURE:14). On top of that, Jeppe from OGP mentions that opening up data and making it digitally available, makes it difficult to control the span and further international access (I-OGP:14). In light of a global vision for OD, the specific datasets may not always be of use due to the barriers of language and furthermore the process of translation can in itself be a delicate matter where some things might get lost in translation, though being digital available one can still access the data.

Tropes of Multiplicity - the interfaces between the tropes Openness

Tropes:→ ↓	Openness as communication	Openness as being altruistic	Openness as better data quality and efficiency	Openness as availability and accessibility	Openness as transparency and democracy	Openness as global mobility
Openness as communication	X				Intermediaries	
Openness as being altruistic	Reluctance towards registration of users = lack of feedback	X			Collecting information on users may compromise the image of being transparent.	
Openness as better data quality and efficiency			X	Making data internally available (within the public bodies and their professions) can improve data quality	OD should be useful	
Openness as availability and accessibility	Pragmatic approach in OD - targeting low hanging fruit	Everybody should be allowed access	Everybody can co-develop OD by cleansing data	X	Attitude towards low rated, rigid file formats as mainly informative as opposed to useful	
Openness as transparency and democracy				Machine readability → for as many as possible	X	Language barriers may disrupt global outlook for transparency within OD
Openness as global mobility				International standards → file formats		X

In this table we try to find where the tropes overlap or connect.

7 Discussion

The analytical focus of this thesis has been exploring OD as a socio-technical phenomenon in Denmark. We explore the relations of the network via the placement of interessement devices as well as understandings, definitions and multiple logics of openness that relate to the process of constituting OD. The multiplicity of OD indicates a difference in logics connected to OD and thereby the complex relations between logics, as written by Law & Mol on the multiplicity of a sheep: *"Instead there are complex and intricate relations between the various versions of a sheep"* (Law & Mol 2008:66). The multiple relations in how OD is understood show how the definition of *Open Data* is constantly being redefined by its practitioners. In this chapter we discuss how the different interessement devices may gather professional areas and how this may strive towards a certain user group. Furthermore we discuss and highlight central analytical points and through them discuss the logics of openness and understanding of data and how it might affect the value and further constitution of OD.

7.1 Devices that gather like minded professionals; reflected in one's search

As seen from the chapter 'Network relations' there is a tendency for OD practitioners from similar professional areas to gather around national or European/international initiatives. It appears that they cluster in their professional or like minded working groups when it comes to making online platforms. Many of the European platforms are constituted via topics such as e.g. Culture or Smart Cities, whereas in a Danish context they are either "alone" as their own institution, or gathering data in projects such as the Basic Data program, or with professional areas such as the Opendata.dk (the municipalities). We imagine that similar professional areas of work might be correspondingly alike and therefore easier to unite. Even so when looking through the data catalogues on the different public bodies websites, they may still link to other data sets across the different public bodies. In other cases it could be argued that some of these assemblies between work areas are constituted via directives such as the INSPIRE directive. Within the INSPIRE directive common standards have been made for types of data, such as geographical data, maps and weather data. This could be an attempt to stabilise actions by promoting uniform metadata through the online data catalogue for the INSPIRE directive (focused on spatial information). This may indicate that

certain devices gather actors in clusters that enable them to standardise their work more easily. This may be transferred to how in some data catalogues, data sets are tagged with keywords that are supposed to make it easier for users to search for the right kinds of data. However, as some of these keywords are often generated from professional vocabularies they may cause confusion for laymen users but strengthen searches for professionals. The different vocabularies at play may seem as a totally different language for some users. Additionally during this research we got a bit of insight into how to search for data on various Danish platforms. It turned out to be more complicated than first imagined. The idea of datasets as available and accessible holds true, though it proved to be difficult to get an overview of which types of datasets that were available because there were so many datasets. It showed us that a user of OD may have an advantage if they know what to look for. Then again as stated by Nikolai, in a case of too many datasets to browse, many of them might not get used at all (I-VIRK). Then the datasets are a reflection of the professional work areas and one could say that they promote certain use, or attract certain users. Thus it could be argued that as a user of OD one has to have a certain understanding for the work context that the data are provided in, and this has to be done along with understanding the technical specificities, such as file format, the legal aspects such a license and the descriptive metadata.

7.2 A pragmatic approach: Quantity vs. Quality

In **'Openness as communication'** we have tried to bring forth how there is a logic that concerns the change of mindset, internally in the public bodies in order to make data owners open up data. Data owners seem to play a central role when talking about OD. As it is now, data owners are the ones who have to be "persuaded" into opening up their data, they are the ones who have to attribute the right metadata and license, and they are the ones responsible if something has to be changed. This could give data owners more power than data publishers in relation to data being opened or not. In some cases the same individual(s) play their part in these two roles, but when that is not the case, data publishers can only hope to get what they wish from the data owners, or possibly get data owners to understand their needs in terms of OD. Our impression is that the data publishers or project managers have to "convince" and talk to a lot of data owners in order to get datasets opened. The way this is done is described by the informants as being very pragmatic, and as indicated by a pragmatic approach, and the term in itself, it may relate more to what is possible rather than on focusing on the ideology behind. For some of the informants it

becomes a matter of publishing whatever is possible, and as they state, they take whatever data they can. This could relate to the fact that they both take whatever file format they can as well as the number of datasets they can get. They can only strive for some of the preferred formats and wanted data. Working under these conditions it could be discussed how the actors working with OD work towards publishing as much data they can and as fast as possible. This pragmatic approach can be seen in accordance with the argument coming from the OKF who states that it is better to *"[...] move fast, keep it simple and be pragmatic.*" and *"In particular it is better to give out raw data now than perfect data in six months' time"* (OKF 2015m). It could be argued that this statement prioritises some sort of logic that focuses on the fact that data being able to be made open should be made open. Opening up data and striving for this approach could then be reflected in the amount of data that is being opened up. It appears that this becomes a good indicator with regard to openness. So far the accomplishment of OD is often specified and described in different papers and presentations as the number of provided data sets. For example the aim of CULTURE is to provide 5 million different objects in the CARARE project (Rahbæk 2014:8). As the logics of openness could be said to be manifold, it seems as if the definition and the everyday OD work is carried out quite pragmatically focusing on the number of datasets which are to be opened or are opened up.

It seems as if there has been made a division between the number that is the quantity, of datasets being opened and the quality of the data. We choose to call this division *Quantity vs. Quality*; not implying that one is better than the other. In addition to the quality of the data there seems to be another approach or logic that prioritise publishing data of a higher quality with less importance towards the contemporaneity. It could be discussed that the quality of the data is an expression of the public bodies image and this attitude of providing "perfect" quality data is an attitude that Line from DIGI tries to work away from. Additionally as seen from the trope 'Openness as better data quality and efficiency' there is a certain logic that strives towards improving the data quality in collaboration with the citizens or public bodies. Even though there may be certain logics that call for improving the data quality in collaboration with the citizen and other people internally in the public bodies the quality of the data may both be a matter of cleaning the data and for instance striving for machine readable data. The value of OD still depends on the context and objective of its use.

7.3 Dynamic Flow; Update Frequency

In the trope 'Openness as better data quality and efficiency' there exists a logic about sharing the data with the public and in general internally with the public bodies in order to change the quality of the data. The data will be improved and human mistakes corrected by letting others have the possibility to "cleanse" the data. This means that correcting or cleansing the data consists of a mutual process of value creation. The interface of this trope also touches upon the logic of transparency. The public bodies opening up data make it possible for the citizens to interact in the correction of data and keeping the datasets up to date in correspondence to the ongoing change of society. As seen from the trope there are some good examples such as the one about the election votes that got noticed at Taarbæk School. Another example provided by one of the informants was about improving their own data by comparing the data. Copenhagen municipality took some of their own maps and made an overlay with some of the maps from Openstreetmap and made a comparison and analysis on where the maps did not correspond. The Openstreetmap showed that a road was changed to a one way road for a period of time, due to roadwork. This came to the attention of the Copenhagen Municipality who could then change the information on their own map (I-DIGI:22). It could be asked whether or not the outcome in correcting the data in the end could lead to new tasks for the public bodies, because they become more attentive to their own data. Additionally it could be argued that by correcting the data a process of handling the communication and informing about the "mistakes" may enter. In the end this might lead to negotiations going back and forth in order to double checking the need for correction and it could further be argued that this action of being able to correcting the data can only be done under the precondition that one understands the data. Eventually the above mentioned examples indicate that the flow of information and the datasets have to be considered in a dynamic process where the open datasets might change continuously. To make the data quality better by cleansing the data is a complex matter which also draws attention towards a certain sensitivity regarding the purpose of use. If the data is being opened up to be *improved* in an ongoing interaction with the citizens, it supports that OD should be thought of as dynamic. We therefore wish to emphasize the importance of the update frequency (mainly in relation to quantitative data sets), because of the different purposes of use. For instance being an entrepreneur wishing to use the data to design something, the changes/cleansing of the dataset is thus worth putting attention to.

7.4 In need of translators

Referring to the trope Openness as Transparency and Democracy there seems to be different logics about which information/data should be made open in order for the public bodies to become transparent. The public bodies themselves tend to have a focus on the information that tells the citizens how they are registered in their systems and what their data are being used for. On the other hand the NGO's and other actors outside the public bodies tend to focus on the information that tells something about how the public bodies or politicians are using e.g. the citizens' tax money and so on. In both cases this has to be done without breaking with privacy issues. With this division of interests in which data helps increase transparency it could be pointed out that transparency should be understood in relation to one's technical ability. Additionally as stated in the literature review it appears that OD might tend to address to a more tech-savvy audience rather than just being the access to information. This may be echoed in the logic of some of the informants who state that transparency in principle follows in accordance with every dataset being opened. Hence, it could be argued that this statement may be influenced by the informant being more familiar with the structures of OD due to his background. As we have seen there is an attitude towards OD not being that understandable for all people and therefore it could be stated that the tech-savvy audience has to work as intermediaries. As some of the informants pointed out they definitely see the possibility of intermediaries or translators; either as a product, an informative visualisation or in giving news to the people by data journalist and other tech-people. One could ask how many joints on the chain there must be made in order for ordinary people to understand and use OD.

7.5 Data: Useful or Informative

During the research there is a recurring understanding that touches upon all of the tropes. It is how data in many cases is understood in relation to the DIKW pyramid. It means that data is often seen as the bottom layer that presupposes information. It could be discussed whether or not this affects the overall understanding of OD that it is seen to be informative per se. Though on the other hand there is an expectation that OD should be useful in order to create commercial and noncommercial value. This creates an entanglement of OD as being informative and useful at the same time. This could be the case in some instances. Moreover it could be argued that this in other cases presupposes different approaches and to some point that the technology constitutes some restrictions or frames under which it is

possible to act. For instance a PDF- file may be limited in its use (within OD) but it might be informative in its content. Furthermore OD might come in mostly *structured* and *unstructured* data - to repeat, either in organised models/systems or as pictures - which in the end depends on the very file format that the quantitative or qualitative data are uploaded as. For example if CULTURE uploads a picture in a compromised file format or as a scanned picture in a PDF file format, not being machine readable one could be inclined to say that its function is more to "inform", than to promote use. It appears as if there is a subtle division between the notion of whether OD should be informative or useful and that this is related to the technological framing. So in a way one could say that all data formats and structures are "unique" because of the content and because of its composition. Some people are interested in qualitative data, some people in quantitative data, others in raw data and so on. So depending on what the data should be used for it seems as if there are different approaches for "each dataset", which may either promote use or be informative or both.

7.6 Some reflections

7.6.1 Openness as all embracing

In some instances it appears that the notions of openness are connected to connotations that lead to the understanding of being altruistic and include everybody. For example the trope 'Openness as altruistic' bears a certain understanding that when being providers of OD it is "wrong" to want anything in return, in this case the user information. It could be argued that not striving for this approach of a login system and in some way being in contact with the users may hinder the process of valuable user feedback. Moreover openness seems to the have some connotations to include everybody which emphasizes uncertain and unexpected factors by data being open. This can be retrieved in the statement coming from Mette from AAK in the conversations with the data owners: *"[...] Then they ask, who use our data? We say that we do not know because it is open [...]"* (I-AAK:6). The understanding of openness in this case leads to the fact that it may be difficult to target the users and the use of OD. It could be discussed whether or not the target of users could be narrowed a bit to the tech-savvy people with a certain understanding of the professional work areas.

7.6.2 Openness as a decrease of competition

The logic within 'Openness as better data quality and efficiency' shows that OD can be used as a means to be more efficient within the public sectors using Basic Data. At the same time Basic Data are made available for the public to create innovation and economic growth (Digst. 2015f). The latter being a very dominant discourse within OD we find this story from Jesper by the AI quite interesting to share. The story goes that Jesper talked to a small developing company making apps. He asked them if they had tried to use OD, which they had for the fun of it and out of curiosity. In doing so they experienced an issue. The issue relates to the functionalities on a smart phone and how it is easy to see the functions of the developments behind the app (again for some maybe more tech-savvy people). By downloading the app it becomes easy to replicate the flow in the graphical interface, and the point is that the data used is usually not available. But by using OD it becomes possible to get the foundation of the data. This is, as Jesper mentioned, a matter of thinking in new ways because the data used to make the app that was once "specialised knowledge" is now freely available for everyone. And as stated by Jesper a solution to solve this issue is to be found (I-AI:7). This story indicates that promoting innovation and economic growth with OD may affect app-makers and the competition between them.

7.7 Discussion on Methodology and theoretical approach

Exploring the phenomenon of OD by doing an interview study might not always cohere with how the interviewees present conscious thoughts (Kitchin 2014:13). When doing an interview study people might not always tell in accordance with what they are actually doing or describe in detail how they work with OD, where an observation study may have provided more insight into actual practices. Furthermore this interview study might favor those who in one way or another are used to working with OD. It means that our informants are the ones that actively are able to reflect upon their work with OD. Many of our informants coming from public bodies or in some way being connected to this area might reflect in some of the tropes on how openness is portrayed in the analysis. Meaning that for example the trope on 'Openness as better data quality and efficiency' is an outcome of how openness as efficiency and better quality is being articulated in relation to the ideas that flourish among the public bodies. The public bodies want to be more efficient with the use of OD and relate it to their daily work. The trope on 'Transparency and Democracy' may be more common sense as it is already prominent within the articulation of OD. Therefore

there may be some blind spots to this thesis in order to see how other actors who are working with OD might be influential on the phenomenon. This could be connected with ANT in how one gets a view of the actor-network which is contextual and empirical grounded. Being an ANT researcher and working with some of the mentioned methodological principles is not always that easy to do. In the attempt of letting go of a priori assumptions (within the principle of free associations) and furthermore describing the field of study in a chosen vocabulary instead of that of the actors (the principle of generalized symmetry) may be influenced by numerous factors. We as researchers may consciously or unconsciously interpret what we see with the interpretation framework that has been built during our lives; that includes life experience, political beliefs, ideologies, environment, professional and scientific education and experience. So when we study the field of OD, we constantly interpret our findings through our individual frameworks of interpretation which therefore are part of our abilities and idiosyncrasies. These personal idiosyncrasies are by American sociologist Howard S. Becker called *Imagery* (Becker 1998:10). The images we carry are evolving and changing with everything we learn, events in our lives, attitudes and more. Hypothetically our own *imagery* may be quite influential in the process of understanding OD as a phenomenon, when carrying out interviews and analysing the empirical material.

Moreover following the actors in one's research might carry the risk that much attention is devoted to the human actors it might lead one astray in which actors to follow as well as the art of knowing when to stop expanding the network. Doing an ANT analysis of portraying the network and following the actors and the associations of the network may both contribute in the richness of the network, but it may also result in an endless network. Therefore we have to at one point “leave” the analysis of the network and dive deeper into the empirical material and devote more attention to the actions of the different actors.

8 Conclusion

As seen from the analysis many new national, European and international initiatives are taking place within the development of OD. Many of the projects being funded by the European Commission and different directives from the EU draws attention to the European collaboration that is initiated by the phenomenon of OD. It seems as if the different Danish actors (governmental and non-governmental organisations) partake in both a national and a European/international project that is mainly constituted within the professional work areas. This affects the ways in how the OD catalogues may call for certain users that are able to understand the professional contexts of the data.

Defining data can be said to be an expression of the individual actor's attitude to OD. Furthermore in defining and understanding data there is a tendency that the involved actors define data in relation to the DIKW pyramid which might define the overall understanding of OD, namely that it is available information. Data being seen as information may influence the current development of OD and create a gap between OD as being informative or useful. What is important to note is that even within the similar definitions there are always nuances which are defined in relation to the different actors' areas of work. Every OD practitioner is different and brings their individual and professional logic and vocabulary to the everyday work with OD some of this being more valuable than others (e.g. machine readable and raw data). Furthermore throughout the research we saw that multiple logics of openness appear to coexist. We could say that the use of tropes has contributed to unfolding this view of the actors being affected by daily logics used when they talk about and handle OD. The different logics show that there at this point is an understanding of the word openness that may relate to being all-encompassing, due to the word itself. The different ways in articulating openness thus affect the different actors' practices and how they handle OD. On the other hand there are technological measures that set certain frames upon how OD can be handled. The constitutive technologies and legal aspect constitute certain frames that make the actions of openness exist to a certain limit, even though these frames are still unclear and thus up for discussion. In order for different logics of openness to coexist we may be more aware of the way in how data is conceptualised/defined and further how openness carries different logics that all have to come together. The complexity of OD and the different settings call for a variation in use of OD and it may require a broader notion of how we define data and openness in order for it to be used and to be valuable.

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Figures:

List of Appendices; available on USB

Appendix A: Notes from the Open Data Day workshop, held by Wikimedia and Open Knowledge Foundation, on the 21th of February 2015

Appendix B: Data collection scheme, keywords used for searching Open Data

Appendix C: Notes from the Workshop for the European Commission, carried out by PricewaterhouseCoopers (private consultancy company) held at the Agency for Digitisation, on the 21st of April 2015

Appendix D, Interview:

1: I-DIGI: The Agency for Digitisation, *24th of March 2015,* (Line)
2: I-VIRK: The Danish Business Authority, *8th of April 2015,* (Nikolai)
3: I-OKF: Open Knowledge Foundation, *8th of April 2015,* (Morten)
4: I-WIKI: Wikimedia, *10th of April 2015,* (Hans)
5: I-AI: The Alexandra Institute, *15th of April 2015,* (Jesper)
6: I-OGP: The Open Government Partnership, *16th of April 2015,* (Jeppe)
7: I-KL: Local Government Denmark, *30th of April 2015,* (Frederik)
8: I-CULTURE: The Agency for Culture*, 30th of April 2015,* (Mogens)
9: I-AAK: Aarhus Municipality, *6th of May 2015,* (Mette)
10: I-GEODATA: The Geodata Agency, *12th of May 2015,* (Rikke)
11: I-MBBL: Ministry of Housing, Urban and Rural Affairs, *13th of May 2015,* (Lars & Henrik)
12: I-DMI: Danish Meteorological Institute, *17th of May 2015,* (Sune)

13: Used quotes from interviews in Danish

14: Interviewguide