

Data underlying research paper “Exploring potential contributions of open data intermediaries” by Ashraf Shaharudin, Bastiaan van Loenen, and Marijn Janssen from Delft University of Technology (TU Delft), the Netherlands

This file is the item #3 of the folder that contains data underlying the research paper “Exploring potential contributions of open data intermediaries” (working title). It consists of:

1. Tentative interview questions (semi-structured interview)
2. Informed consent form template (verbal interview & written interview)
- 3. De-identified interview transcripts**
4. Coding results

Note about the de-identified interview transcripts (and coding results):

We removed personally identifiable information from the transcripts. A few interviewees may risk being identifiable if their organisation is known. Hence, we removed the identification of the organisation and country in all transcripts. Partially disclosing the organisation or country for some transcripts increases the risks of identifying the non-disclosed transcripts.

With verbal communication, some sentences may be less incomprehensible in writing, especially if English is the speaker’s second language. Thus, we did minimal edits when transcribing to improve the comprehensibility where necessary, but the main objective was to keep the transcript as close to verbatim as possible.

All interviewees whose interview transcripts are recorded in this document give permission for the anonymised transcript of their interview, with personally identifiable information redacted, to be shared in 4TU.ResearchData repository so it can be used for future research and learning.

Acknowledgement:



This project has received funding from the European Union’s Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 955569. The opinions expressed in this document reflect only the author’s view and in no way reflect the European Commission’s opinions. The European Commission is not responsible for any use that may be made of the information it contains.

## Interview 1

<b>Code of organization</b>	1
<b>Code &amp; role of interviewee</b>	1.A: Data consultant 1.B: Digital consultant
<b>Date</b>	2 May 2023
<b>Language</b>	English
<b>Interviewer</b>	Ashraf Shaharudin

## Transcript

### Interviewer

Could you first describe the role of <organization 1>?

### Interviewee 1.A

Yeah. Well, we have two roles. Oh yeah, maybe more. But we are representing two roles so, but if <interviewee 1.B> start because that's the overall role.

### Interviewee 1.B

Yeah. And I can say maybe a description would be facilitated by a little historic back view. So, <organization 1> is originally a land mapping and survey institute organization. And during the last ten years, it has moved more and more to be a supporter of e-government and digitization at a national level. But we're still legally mandated to map on land. <redacted: unique information>. And we still have responsibility for some of the main registers in <country of organization 1>. And <interviewee 1.A> knows much more about that than I do. And then we have an obligation, we are mandated by a couple of laws and one of the laws for spatial data information mandate us to be the coordinators of the geospatial infrastructure in <redacted: country of organization 1>.

### Interviewee 1.A

And we also have the role of <redacted: unique information> across register authorities where we are coordinating the cooperation between registries and a call-in order to accommodate user needs. There's a governance across the authorities that we are driving and there are, which is a steering committee and so on, there are processes to take care of the cooperation with the end users and so on. And there is a platform to distributing <redacted: unique information>, which is also operated from our agency, so that's another area where we have a role in the society regarding digitization.

### Interviewee 1.B

And yeah, I could add just that we also have the main responsibility for transporting some EU directives in <country of organization 1>, for instance, the INSPIRE directive, that's our responsibility.

**Interviewer**

But before I move to the next question, maybe I can ask you <interviewee 1.B>. You mentioned about the history of <organization 1> starting as a land mapping survey agency. So, in <country of organization 1> is cadastre and land mapping agency the same agency or different agencies?

**Interviewee 1.B**

No, it split up. It used to be the same but in <redacted: unique information> it was split up. So, we have our sister organisation with whom we work very closely and then we also distribute their data because we have two distribution channels. <Interviewee 1.A> mentioned one for the <redacted: unique information> and another one is more spatial data where we also distribute for other agencies. Among them are the <redacted: unique information> agency, which has nautical charting and cadastral as their responsibility.

**Interviewer**

OK, but <redacted: unique information> agency, which is the cadastral agency is also distributing open data by themselves?

**Interviewee 1.B**

Not by themselves, we do it for them on our infrastructure.

**Interviewer**

OK. My next question, which is the first question I sent to you. Could you please describe your role in the <organization 1>?

**Interviewee 1.A**

Well, I help operate the governance around the <redacted: unique information> as a <redacted: personally identifiable information> and participate in the coordination across authorities regarding the processes and data being coherent. And a large part of my time is also used in strategic cooperation with the end user organizations and the interested organisations such as the IT Business Corporations and so on.

**Interviewee 1.B**

Yeah, Mr. <redacted: unique information>, we used to call him.

**Interviewee 1.A**

Yeah, I spent ten years or something implementing <redacted: unique information> in <country of organization 1>.

**Interviewer**

And you <Interviewee 1.B>?

**Interviewee 1.B**

Yeah, I'm a <redacted: personally identifiable information>, and I call myself a <redacted:

personally identifiable information>. I guess it's the same title as <interviewee 1>. A chief consultant or senior consultant or whatever, never, mind. I work in many fields, but more than half of my time is spent dealing with the EU digital agenda. Both keeping an eye on it, being directly involved, and trying to utilize what's coming from EU in the national infrastructure and data work. So, I'm the <redacted: personally identifiable information>. And so, I'm dealing a lot with the EU Commission. But the other part is actually trying to build this spatial data ecosystem which we have had very fruitful collaborations with <redacted: unique information> and hopefully we'll have more.

**Interviewer**

And how long have you been working in this or similar role?

**Interviewee 1.B**

Oh, plus 15 years.

**Interviewer**

And you, <interviewee 1.A>, as well? It's been a while?

**Interviewee 1.A**

Yeah, it's about the same, I think.

**Interviewer**

OK, now I'm going to move to the topic of open data. You mentioned a bit how <organization 1> facilitates other agencies as well to implement open data, but can you describe a little bit more how long has the <organization 1> been implementing open data?

**Interviewee 1.A**

If open data is interpreted as a free of charge, I don't know if that's really a part of the definition, but if it is, then this year, it's <redacted: unique information: more than 7 years> ago that the government in <country of organization 1> implemented free data across a variety of domains, from cadastre through geographic information to data on the businesses and dwellings and addresses, and so on. And before the provision of data free of charge, there were several years analysing and establishing the decision for platform implementation. So, I guess it's been on the agenda in our agency for at least 15 years, at least.

**Interviewee 1.B**

And what you could say, if I may add is, in <redacted: unique information: about a decade ago> there was this huge political decision about what we call <redacted: unique information> across domains. We also in the agency said, well, let's free all our data. Also the ones that weren't directly under the umbrella of <redacted: unique information> because it made no sense in having a huge pool of data without charge and then some data that we should manage with charging so we freed all our data in 2013.

**Interviewer**

And what do you think is the value of open data to society?

**Interviewee 1.B**

Well, we actually have a couple of reports that show that there is economically. So, there is absolutely a monetizing surplus in that, that you can demonstrate which is also always important when you speak to the Ministry of Finance. But apart from that, of course, it is about accessibility to data has actually spurred on this data-driven agenda, which is on everybody's lips from EU, but we have done it for many years.

**Interviewee 1.A**

And then we also we saved the cost for all the bureaucracy around taking care of the charges and contracts on the users and so on. And we can use our manpower on more productive things also within our agency of course, but also with the end users organization. And when it comes to digital solutions, they can be way more coherent and address problems across domains or organizational differences so you can have a coherent user 'travel', I don't know if that's the correct term in English, but if you have a problem, that's it goes across the municipality borders or across <redacted: unique information: sub-national level> level and municipality level or even into the some private domain, then you don't have any issues with that in regards of: Do the organizations have the right to use data and so on?

**Interviewee 1.B**

If I may just elaborate a bit, because you can say that whole open data agenda was spurred by a huge business case where you can say what we gained with the data was efficiency and effectiveness in the public sector. We gained a new business possibilities, new products in the private sector, which equals growth. And then we can see that it also spurs innovation in small medium size enterprises. Finally there's the democracy aspect that it's easy for citizens to access data not only about themselves, but about their surroundings where they live and dwell.

**Interviewer**

Can I ask for some clarification? So do you mean that implementing open data reduce the cost of public agencies because they don't have to handle all these bureaucracies. And does the cost reduction is compensated by the loss of revenue from charging data, previously?

**Interviewee 1.B**

Yeah, are you asking about the financial setup of the opening of data?

**Interviewer**

Yeah. Meaning, because previously you charged for data, now you don't charge for data and then you reduce costs because you are sort of like simplify the bureaucracy. But that's the cost reduction is compensating the loss of revenue from previously charging data?

**Interviewee 1.B**

Well, and <interviewee 1.A>, here you may correct me or compliment me. The exact reduction, of course, in the public sector was part of the financing of the <redacted: unique information> program. So you can say it was financed up front by the Ministry of Finance, and you freed the data because you knew it would reduce the cost. So you could say it was the public sector who actually brought the business case, but after a few years, then it was the growth in the private sector that was going to finance the <redacted: unique information> program. And now agencies that are within the <redacted: unique information> program are financed yearly on the finance law. So, each year we have to prove our relevance and value to society in order to get money.

**Interviewer**

Interesting. And so do you think then it's quite sustainable to be continued to have to prove the relevance?

**Interviewee 1.B**

I think it's crucial. I don't know, <interviewee 1.A>, what do you think?

**Interviewee 1.A**

Yeah, it's very sustainable, I think. And the businesses we met, operating in <country of organization 1> and operate abroad in other countries, they can see the positive impact it has for the business in <country of organization 1> and would really like something similar in other countries as well.

**Interviewer**

So can I say then then it also encourages and incentivizes public agencies to really help businesses to use open data and generate money from open data? Because then these agencies can make business cases saying that "see open data indeed give benefits to businesses." So, it's not simply just publishing this data and stop it there, but actually making sure that these companies can actually generate profits and innovations from open data.

**Interviewee 1.A**

Yeah, within the <redacted: unique information> domain there is, as I mentioned, the governance around it with the Steering Committee on top, with directors across public authorities and also with some users represented from the municipalities, the Association of Municipalities and also the large private pension company in <country of organization 1> and there, we held accountable for the accommodating or meeting end user needs and they have decided on a strategic framework for the development of <redacted: unique information>. So we are evaluated in that way, around how we meet the end user needs.

**Interviewee 1.B**

If I may add, you touched upon something that I think is a general weak spot. And you can actually see it in our name: <organization 1>. And this has for many years been some kind of strategic guideline. That you supply, you have easy access, you have well documented interfaces. But actually going in and being a consultant for the private sector, to help them

understand how to use the data, we have not done. This has been a task that was lying in the private sector, but what we can see now, lately, within the last couple of years is that there is a huge task here that is not lifted from the private sector. So, this is the reason why we are changing from data supplier to data facilitator. The whole ecosystem thinking that we actually need, as <interviewee 1.A> say, to be much more user driven, much more out there on the other side instead of just supplying, we actually need to facilitate the uptake of data.

#### **Interviewee 1.A**

Yeah, and the same movement as you speak upon within the geographical ecosystem is also undergoing within the <redacted: unique information> domain. And within this strategic framework plan, there are some focus areas around building partnerships with the private sector and establishing ecosystem. So that's the strategic goal on that.

#### **Interviewer**

If I may ask further, do public agencies including <organization 1>, at the moment feel quite vulnerable, that in the future you can't prove the value of open data and the funding for open data then will be, you know, disconnected? I mean, that the Minister of Finance for example, wouldn't give a fund for implementing open data anymore. Do you think it's gonna be an issue or you sort of trust that in the future open data will continue to be even more prominent?

#### **Interviewee 1.B**

I would say we're not threatened, but we will be if you we sit on our hands and we do nothing. If we do not get out there and actually continue to be relevant and then of course there is a risk. But right now, everything is data-driven and you can see from what is coming from the EU, which is in many ways the frame around what we're doing as a public sector. Then, there will only be more data-driven solutions and we need to tap into this and provide what is needed. If we do that, I think it can only grow.

#### **Interviewee 1.A**

Yeah, within <redacted: unique information> we are very aware that it can fall apart, the coherence across the registers and the user value. In <country of organization 1>, we have invested like €100 million in the <redacted: unique information> infrastructure. And of course, like any other area, you have to maintain it and develop it further to meet the future needs. So, currently we are seeking extra funding on the finance law in order to ensure the further development so that the value does not disintegrate overtime.

#### **Interviewee 1.B**

Absolutely, and I think another aspect which I think should be very much in focus when we speak about, well, whatever we call them open data ecosystem or whatever, is the aspect of the domain. I mean, we speak about a spatial data ecosystem, but what we see is that – and we have years and many years of building up an infrastructure, spatial data infrastructure –, but what we can see is that much of the rapid development that is actually creating value right now, is happening outside the domain. So, I think the biggest risk is that we keep on being a

bit siloed, and not well connected. Still being the supplier instead of being well connected part of the development going on in other domains.

#### **Interviewee 1.A**

Yeah, if I may also say that I'm quite confident that we will get the funding – within the <redacted: unique information>– because it is now critical infrastructure in <country of organization 1>. For instance, the finance sector within mortgage and loans for housing and so on, it cannot function without <redacted: unique information> provided for them. So, when push comes to shove in the political context, I'm quite sure that the financial institutions will make the politicians understand how crucial it is.

#### **Interviewer**

Yeah, just for clarification, <redacted: unique information> is open, right?

#### **Interviewee 1.A**

Yes

#### **Interviewer**

I'm now going to move to the topic of open data ecosystem, which is defined as a network of interdependent yet self-interested open data actors. Of course, there are many interpretations of what ecosystem is, and the conversations continue, but this is still working definition that I'm taking for now. My question is, what is your perception of the health or sustainability of the current open data ecosystem?

#### **Interviewee 1.B**

And in a way we already spoke about that, didn't we? The whole finance issue, but also the issue about being a connected to where the technological drivers are embedded in other domains so well open data is here to remain, there is no doubt about that so it's only a question about opening up even more data, which is also the EU agenda.

#### **Interviewee 1.A**

Yeah, within my area of expertise, <redacted: unique information>, I think that we have to go further into ecosystem thinking and also the end users have to go into a more equal system thinking whereas of now, they are just harvesting a lot of value free of charge. So, they're not really giving anything back. So, we have to develop the cooperation further. So it's more also in the mind of the private sector to give back to the ecosystem and maybe in the future also like really help supply or update data in new models of doing business or cooperating together across public and private sector. But I think if we get stuck in this situation where we give this infrastructure with the vast value, just free of charge with no application to give anything back, I don't find that very sustainable in the long run, we have to develop it further than that.

#### **Interviewee 1.B**

Absolutely. And then there's one thing, if we look at <country of organization 1>, which has a



lot of open data, as you already know. Then, speaking about one open data ecosystem, I don't think that really mirrors the reality. I think there is a lot of soft data ecosystems and the linking together of these will be, not only a driver, but it would also be a need in order to provide these more complex needs and well, to save our planet, right? So, the more complex the problems get that we need to solve, the more we need to collaborate across these many open data ecosystem that exists.

#### **Interviewer**

I really like what you mentioned, <interviewee 1.A>, about the sustainability and also what you mentioned <interviewee 1.B> about, you know, ecosystems within ecosystems. So, one of my interviewees also mentioned that spatial data is not special anymore because, you know, everything is actually you need more than just spatial data. Other than these two, are there any other areas that you think can be developed in the open data ecosystem?

#### **Interviewee 1.B**

Say that again, please, I'm not sure I understood you.

#### **Interviewer**

Are there any things that you think can be developed in the open data ecosystem, anything that can be done by other actors or even by data providers themselves to improve the sustainability of open data ecosystem? Anything you want to add?

#### **Interviewee 1.B**

If you really want a sustainable ecosystem, you need to engage also with the private sector, not only their valuable data, but also their take and they're being closer to the end user. And in order to do that they need to be some kind of "what's in it for me", for the private sector. And as I see it right now, at least in <country of organization 1>, there is a lack here. I mean, it's coming, it's growing but very slow and it is difficult up front to demonstrate why should they engage in this ecosystem, I mean, they just take the data and they make business on it and all is good. Why should they feed into this? So, we need to solve that in order to really get it sustainable.

#### **Interviewer**

Anything you want to add, <interviewee 1.A>?

#### **Interviewee 1.A**

Yeah, I think you're right on the money there, and that being a focus we need to address. And then, of course, there are some more businesses like all technical aspects around the ecosystem where you have some issues. Maybe with the platforms distribution channels or maybe a large overall issue, I think, across public data is the data quality that has to be addressed. Also because we are looking now into, or seeing also in effect, that the data are being used within new areas of application not thought about when we established the registers. So we have to work on metadata and the data quality so that we ensure that the quality meets the user needs, and that you do not use data for something it cannot be used for and so on and so for. Yeah, there's a large overall theme around data quality I think also.

**Interviewee 1.B**

Absolutely, absolutely.

**Interviewer**

With the development of SDI's in Europe, especially since INSPIRE, and especially because you two are involved in geospatial data, what would you see are key lessons learned for other non-geo open data ecosystems?

**Interviewee 1.B**

I mean, there are lessons learned even for us. Well, if I should sum up from the top of my head, one thing is “keep it simple”. Don't imagine that you can make a “Model 1” size “fits all” because you cannot, forget it. So, limit standardization at the source, move by neat, make it neat and user-driven in each case. I mean, get data out there more or less as it is, and see if there is a need or use case for further harmonization or interoperability, and then go case by case. You need to be agile and flexible because some of the things we have seen in the public sector is that we have absolutely not met time to market. I mean, it takes much too long. It has to, in some cases -- I mean when we speak about critical infrastructure, as <interviewee 1.A> has done, with the <redacted: unique information>, we need to be its authoritative data. So it should be very solid and robust and well defined and everything. But in many cases, you can do with the less. If you are small medium sized enterprise who has a good idea; you cannot wait two years for us to get data ready for them. And then data knowledge, knowledge about data management all the way around is really, really becoming more and more important.

**Interviewer**

Anything to add, <interviewee 1.A>?

**Interviewee 1.A**

No, I think no.

**Interviewer**

On data knowledge, <interviewee 1.B>. So, you mean that not only to data specialists, people who have skills with data, but you also think that general users should be able to also have some sense of data and how to utilize it, right?

**Interviewee 1.B**

Yeah, yeah. At least, I think, it's very important to have, the end user -- once identified -- with you from the start when you do develop something new. But what I see -- what I really meant about the data knowledge -- is that I see the ICT domain, it's really developing a lot of interesting, also ecosystems you could say, and cloud edge and whatever technology and it's super fine systems. But when you then need to add the content, the data, it doesn't fit because they didn't have any data knowledge on board. So, it's quite important that the ecosystems dealing with data are providing that data knowledge very early on to the other sectors, in order in order to get the real value.

**Interviewer**

OK, I see what you meant now. I'm gonna move to the topic of open data intermediaries, which defined as third party actors that enhance the supply access and flow of open data and all relationships among open data stakeholders. My first question, do you think that open data intermediaries are playing an important and positive role in open data ecosystem right now?

**Interviewee 1.A**

Yeah, well, for sure within the <redacted: unique information> domain, they are playing an important role, yeah, and well also, they will play a crucial role in the future I think, because it's crucial for us as public authorities to have intermediaries, because that's really not our role in society: to know about end-user needs and make solutions. We have to make the <redacted: unique information> foundation and make sure that the data are coherent across register domains and provide it in a reliable way. We need intermediaries to take that, and apply it to solutions within different areas of usage. We should not use public spending on knowing everything about it.

**Interviewee 1.B**

But then again -- it's not that I disagree at all with <interviewee 1.A>. A little bit, yeah, I do disagree a little bit. Because I think it's very crucial that we have these specific sector, specific intermediaries who can actually customize the data; this is what I'm saying about, being flexible and time to market and one size does not fit all. But I also think that we, as a public sector agency, might need to step a bit up on not just being a supplier, but also providing a platform that could disseminate the knowledge we have about data. And this is what I touched upon, this data knowledge. How do you actually use them? How do you connect to them? How do you integrate them? How can we make good data models? And things like that. And maybe that's lifting up the thing to a more -- maybe it's some kind of data intermediaries -- but I think we need to step up from being a supplier and to be a facilitator.

**Interviewee 1.A**

Yeah, for sure. I think you're right. But I don't think that means there's no room for intermediaries. It's more a question of us reaching out and enabling intermediaries to bring out the data in a more good manner.

**Interviewee 1.B**

Sure, sure, sure, they could.

**Interviewer**

That's very interesting. <Interviewee 1.B>, but do you think there's a legal challenge for public agencies to be intermediaries? Because I give an example -- I'm not sure how it is in <country of organization 1>, in <redacted> for example, there's a very clear role of every public agency and what they supposed to do, and so, there are certain, I think, public agencies that are quite interested to also provide some services that can be considered as an intermediaries, but they are quite hesitant because they're not sure how it will be perceived, in

legal eyes; are they encroaching what they're supposed to do? So is there such a problem or challenge or issue as well in <country of organization 1>?

**Interviewee 1.B**

Yeah, there will be. It's not actually mentioned in our law that strictly. And we are supposed to create value for society, but we have a law competition, and it was challenged when we freed our data in the first time by a some private sector companies. And yeah, it's always a question about drawing the line and that is why it's so important that we collaborate. And that is why it's so important that we actually expand the ecosystem because it's not one agency or private company that should do it all, we need to do it together. So, forming this new collaboration -- and whether we would then become an intermediary or provider to an intermediary, I don't know, it doesn't matter -- but as long as we kind of, do it together.

**Interviewee 1.A**

Yeah, yeah. And I think, it's not a simple balance between private and public sector because within the private sector, the different interests at play. Referring back to the challenge of freeing our data originally, and there you had a private company that was challenging us, but all other of the private sector were interested in the freeing of data because that has been driving business for them.

**Interviewee 1.B**

Yeah, exactly.

**Interviewer**

Do you have anything else <interviewee 1.B>?

**Interviewee 1.B**

No, I was just thinking about it because there are different definitions about these intermediaries. And especially the EU under the Data Governance Act has one which is a bit difficult to understand where maybe we are an intermediary, as a data sharing. We provide data sharing services. But then again you can discuss what is the data sharing services?

**Interviewer**

Yeah, I totally agree with you.

**Interviewee 1.B**

Yeah, well, anyhow, sorry, it's not to complicate things even more.

**Interviewer**

No, the definition part is actually, it's also an issue. In fact, that's why just to add, one of my first papers is actually trying to find a common definition of open data intermediaries, because people speak of open data intermediaries differently, people have different interpretations and so on.

So back to my question, do you think that current open data intermediaries, however you conceive them, can play a better role? Are there any gaps that they can fulfil better?

**Interviewee 1.B**

Yeah, I think <interviewee 1.A> actually has said it, because this is about customizing data to a specific need or specific use case is becoming more and more important. So, I think they can play that role.

**Interviewee 1.A**

Maybe there could also be some kind of need for professionalization or something where you know if you use public data in a wrong way, it gives problems for the end user. So maybe we could work on the model for cooperation between intermediaries and the public sector so that we get higher quality in the end user applications. I don't know what the model should be, but you have to be qualified in some way without building extreme bureaucracy or anything. We have to ensure that the companies providing solutions containing public data, they have to be qualified.

**Interviewee 1.B**

Absolutely. That's a good point. And also, I think that the data intermediaries could play this bridging role, that bridge the actual user with the data providers. That could be a very nice role for them to also take.

**Interviewee 1.A**

Yeah, we only have so many hours and people. So yeah.

**Interviewee 1.B**

Exactly, exactly.

**Interviewee 1.A**

And thousands of users are out there, so.

**Interviewer**

So, <interviewee 1.B>, when you say “bridging role” doesn’t only mean that open data intermediaries are processing data and give to end users, but actually also facilitating the process of engagement between data providers and users, right?

**Interviewee 1.B**

Yes, yes, that could be a perfect role.

*<The interview proceeded with questions specific about Esri as an open data intermediary. This part is omitted from this transcript as it is not relevant and used for this particular research paper>*

**Interviewer**

Thank you. That is the end of my questions.

## Interview 2

<b>Code of organization</b>	2
<b>Code &amp; role of interviewee</b>	2.A: Information coordinator 2.B: Open data coordinator
<b>Date</b>	10 July 2023
<b>Language</b>	English
<b>Interviewer</b>	Ashraf Shaharudin

## Transcript

### Interviewer

OK, so my first question to you is, could you please briefly describe the function of <organization 2>?

### Interviewee 2.A

Shall I start?

### Interviewer

Sure.

### Interviewee 2.A

I will start with a question. In <redacted: country of organization 2>, are we the only partner that you do interview? Or are there others that will react?

### Interviewer

In <redacted: country of organization 2>, I've interviewed <redacted: unique information> and I've also interviewed <redacted: unique information >.

### Interviewee 2.A

Ok. So probably from <redacted: unique information> you already get some information on how the official mapping and surveying in <redacted: country of organization 2> is organized. Main issue is that the surveying and mapping is not the responsibility of the <redacted: unique information: highest national administrative level> government, but the <redacted: unique information: sub-national levels>. So, activity is with the <redacted: unique information: sub-national levels>. This means, we have in fact, <redacted: unique information> national mapping agencies, one in each <redacted: sub-national level>, plus agencies at the <redacted: unique information: highest national administrative level> level. So we at <organization 2> are with the Ministry of <redacted: unique information>. We have another agency with the Ministry of <redacted: unique information> and we have authorities that deal with surveying, mapping and specialized branches such as hydrography, transport, and environment.

So the situation in <redacted: country of organization 2> is very heterogeneous and that will probably be apparent during the following interview. The role of <organization 2>, so we started as <inaudible> after World War Two, which was a <redacted: unique information>, and 25 years ago, the scope of the agency has been redefined and from that date we are definitely perceived as a provider of geodata to all the institutions of the <redacted: unique information: highest national administrative level> government. So we do not necessarily

produce the data, but we [are] intermediary ourselves. So we get the data from others, in particular from the official mapping agencies of the <redacted: unique information: sub-national levels>, and we process that data, we combine it and we provide it with the <redacted: unique information: highest national administrative level> government.

Apart from that, our role in law is that we are responsible for <redacted: unique information>, in particular, if that needs to fit into the worldwide frame like GPS or VLBI. And we deal with issues of -- international issues such as, for instance, with other nations and the European Commission. So not each <redacted: unique information: sub-national level> has its representative in United Nations or in EC if it comes to geoinformation, but that is handled by <organization 2>.

Moreover, to such -- well, deal with tasks, we fulfill roles by arrangement. For instance, by arrangement with all the <redacted: unique information: highest national administrative level> agencies and the <redacted: unique information: sub-national levels>, we have agreed that those customers in <redacted: country of organization 2> that are in need of data from the <redacted: unique information: highest national administrative level> agencies or the <redacted: unique information: sub-national levels> of more than one <redacted: unique information: sub-national level>, that will be handled by <organization 2>. So in that case, we act as, well, someone who is authorized by the <redacted: unique information: sub-national levels>. But that's not a legal task, it's a task by agreement and arrangement.

#### **Interviewer**

OK, that's very clear. But I have a question, these <redacted: unique information: sub-national levels> that you mentioned, there are <redacted: unique information>, are they obliged to share data with <organization 2>?

#### **Interviewee 2.B**

It's a very difficult question because until the high value data set ordinance (directive), they could decide if they make their data open or not. And now it's also very heterogenous -- some <redacted: unique information: sub-national levels> have open data and some <redacted: unique information: sub-national levels> do not, and some <redacted: unique information: sub-national levels> have half of the data open.

#### **Interviewee 2.A**

So it would be difficult for the <redacted: unique information: sub-national levels> if they would refuse to provide their data for use by the <redacted: unique information: highest national administrative level> government. In that case, it would be a legal conflict. However, in the past, they sold the data so the government did not get the data for free. We have an agreement with the <redacted: unique information: sub-national levels> that we pay each year €2 million and for that we are allowed to get the data from the <redacted: unique information: sub-national levels> and to use that within the <redacted: unique information: highest national administrative level> government. And that, of course, will change with open data.

#### **Interviewer**

OK, that will change or it's happening -- the change is happening already with the open data directive you mean, right?



**Interviewee 2.A**

And yes, probably that will be described when we come to open data and how it is treated, because every <redacted: country of organization 2> <redacted: unique information: sub-national level> does it different even with HVD.

**Interviewer**

Ok. Could you please describe briefly your role in <organization 2>?

**Interviewee 2.B**

Yes, I can start. I'm the <redacted: personally identifiable information> and so, I have an overview about the availability of the open data and I'm the central internal and external advisor and contact person in our authority. And yes, I'm monitoring our open data. I will monitor it when HVD will come in the next year.

**Interviewee 2.A**

So <Interviewee 2. B>, she is <redacted: personally identifiable information> that pushes open data and we are by law advised that each institution of <redacted: unique information: highest national administrative level> government has to name one open data coordinator -- that's the e-government law.

**Interviewee 2.B**

Yes, we have an yeah, an Open Data Center in <redacted: country of organization 2> and yeah, each authority has one.

**Interviewee 2.A**

My role is I'm the <redacted: personally identifiable information>. So I'm more dealing with problems and difficulties with <redacted: unique information: sub-national levels> and, well, Commission is not really a problem, but it's an actor.

**Interviewer**

Ok. And you mentioned that 25 years ago, <organization 2> started to provide geodata, but how long has <organization 2> implemented open data?

**Interviewee 2.A**

Quite early. We have been involved in the INSPIRE directive in -- well, I have been a member of one of the drafting teams on the <redacted: personally identifiable information> and so we had been involved quite early.

We noticed that there had been an attempt by the Commission very early to make geodata open and they failed with INSPIRE because there was much opposition, for instance from the United Kingdom. However, for <redacted: country of organization 2>, when implementing INSPIRE that was in <redacted: country of organization 2>, coordinated by the Minister of Environment, and they have a law that makes all data of environment open data, and they succeeded in transposing this principle to geodata.

So there was a law that all INSPIRE data is open data, but that only applied at that time, to the data that was hold by <redacted: unique information: highest national administrative level> institutions. It did not apply to the <redacted: unique information: sub-national levels> because all of the <redacted: unique information: sub-national levels>, each <redacted: unique information: sub-national level>, made its own implementation of INSPIRE. So the <redacted: unique information: highest national administrative level> government was very

early in stating that all our geodata is open. I think it was, well, not sure on the date, 2012, 2013 -- almost 10 years ago.

Then some of the <redacted: unique information: sub-national levels> followed and 1st in the row was <redacted: unique information> and <redacted: unique information>. So the municipalities and <redacted: unique information: sub-national level> that were the leaders. Others followed, <redacted: unique information>, for instance. At the moment, we have situation that approximately half of the <redacted: unique information: sub-national levels> has open data, others have not. The perspective is that, with HVD from June next year, in theory, any of the <redacted: unique information: sub-national levels> would have to. However, we notice that some of the <redacted: unique information: sub-national levels> try to escape and they find gaps. Such gaps are, for instance, data privacy issues, and such gaps are, for instance, legal mandates by third parties. For instance, some <redacted: unique information: sub-national levels> argue that any data from cadastre can be associated with personal data. That means they will not provide cadastral data for free, even not the boundaries. And others argue, for instance, with the dataset on postcodes, postcodes are well, <redacted: unique information>, is a private company. So postcodes are from private company and they manage that and that is the right by a third party, which prevents such data from making open as well.

We are in discussion on this object, this issue. We hope that the community of the surveying authorities finds a solution. But we are quite in danger that we will not have a uniform solution for the whole of <redacted: country of organization 2>.

#### **Interviewer**

And I'm curious, how is that, providing cadastral data with fee will solve the issue of privacy?

#### **Interviewee 2.A**

No, to be honest, no. Because it does not matter if a data is published by fee or not, data privacy issues apply on both. So I see it a very short sighted solution, but well, the discussion has just started. We probably will run into many issues and the fact that we just now deal with these issues will show you that <redacted: country of organization 2> is not very well prepared.

#### **Interviewer**

And how does open data implementation benefit <organization 2> and the government itself?

#### **Interviewee 2.B**

I think for us, we have the opportunity to develop applications which can be made available for all citizens. Now we have some applications that are only for other <redacted: unique information: highest national administrative level> authorities available, and that's maybe one point which could change; all citizens have the opportunity to see these data and to work with these data.

#### **Interviewee 2.A**

In fact it's data sharing, which is probably the biggest plus for open data. So once data is open, we can combine it with other data which is as well open and we can -- the product can be provided to the public without asking for legitimation. And that's in fact what's government agencies need to do. It eases the bureaucracy within administration.

And moreover, of course, the perception by the society is a better one, because as long as we sell the data and try to make profit of it, it sheds a bad light on the administration. And once we give it away for free, as it already has been paid by the taxpayers in some way, well, it earn some reputation. That's another aspect. So that's the <redacted: unique information: highest national administrative level> point of view, it's EC point of view, but it's not the point of view of all actors.

### **Interviewer**

So I've spoken to a different, well, national mapping agency in different countries and they mentioned that when they have to implement open data, they actually have to also improve the internal data management. So in a way, that's also a big plus for them because they have to make it open, then all the government agencies have to really sit on the table and try to make sure that the internal data management is good. Is that also the case for <redacted: country of organization 2>?

### **Interviewee 2.A**

Well, I don't think open data had many effects on the data management in <organization 2>. Mostly because only very few of datasets from <organization 2> are produced by ourselves. So we produce data at medium and large scale 1:50,000 to 1:1,000,000, and what users are interested in a larger scale 1:25,000 or 1:10,000?

So our data sets that are open, they are not that much. We are more involved in combining data sets and harmonizing data sets. There, open data, of course has an effect because the licensing issue is less difficult. But the technical issues they are not really less difficult that it is open data because the data is still different.

### **Interviewer**

OK. And what are the key challenges faced by <organization 2> as a <redacted: unique information: highest national administrative level> agency in providing open geodata?

### **Interviewee 2.B**

Yeah, I think <interviewee 2.A> talked about some challenges. So yeah, big challenge is a <redacted: unique information: form of governance> in <redacted: country of organization 2>, I think you notice it. And another point is the license, we talked about it. I think these are the two big challenges.

For the <redacted: unique information: sub-national levels>, <interviewee 2.A> said something about the financial situation, it's a point. Yeah, I think the <redacted: unique information: form of governance> and the heterogeneity in <redacted: country of organization 2> is, yeah, big points.

### **Interviewee 2.A**

Yes.

### **Interviewer**

For <organization 2> itself, is funding also an issue?

### **Interviewee 2.A**

No, because the income from the data set that turned open data was less than €50,000 a year. That's marginal, while for the agencies in the <redacted: unique information: sub-national levels>, it may be several millions; for them it's an issue.

For us, it's more the issue of licensing. One issue that now turns out is open data is not open data. For instance, we are trying to combine governmental data with data from OpenStreetMap -- and different license. We have a license on governmental data which is very open, it's similar to Creative Commons. While for OpenStreetMap, you might know, it's an ODBL, the share alike, and you cannot combine open data from a very free license to share like. So open does not mean open -- it's open but it's different. And once we talk open data being the key to use and share data very easily, we now find out that with different licensing in open data community itself, we do not really overcome that issue at once.

**Interviewer**

OK. What is your perception of the health or sustainability of the current open data ecosystem?

**Interviewee 2.A**

First, the term ecosystem is perhaps less known in the community as you might think. So we are aware that in particular, the Commission, they talk very much on ecosystems, while in <redacted: country of organization 2>, it's not that much used.

However, I like the definition you gave in your brief summary, defined as a network of independent yet self-interested open data actors, which addresses to me the key issue that it's the actors that are put into a system, not the data. But I think, still many people that hear the term, they think it's a data infrastructure, which probably it is not. And the key is that we do not just really care on the data, but even more on the data owners. And what I understand more and more is that this does that not only involve the government, but all the private industry and the open communities, which is a good issue for me, but I'm not sure that it's all understood where you use the term data ecosystem.

So given that, I personally think it's a very good approach, given that you now put more focus on the motivation of the data owners. <Unclear sentence> I'm not sure that you will feel go to the goal in <redacted: country of organization 2>, but because there are many. So in <redacted: country of organization 2>, it's a real challenge, we do not really manage it ourselves. We need to see if the European Commission succeeded. For instance, my personal experience is that I am in negotiations with Eurostat. Eurostat is a key customer of data and with the Commission and they of course, would like to profit from the data ecosystem. However, they have clearly told us they would do not want to deal with <redacted: unique information: number of sub-national administration> <redacted: unique information: sub-national levels> in <redacted: country of organization 2>. They want one contact. With a data ecosystem that we put on the situation as it is, they would have to deal with <redacted: unique information: number of sub-national administration>. They do not really like to do, but what is the solution? Does Eurostat needs to adapt? Does the <redacted: unique information: highest national administrative level> [need to] step? Or will there be a third party, say Esri, who does the job and provides -- takes the data from <redacted: country of organization 2> and provide it to European Commission. That's probably are not what the <redacted: country of organization 2> leaders would like. So for me ecosystem still a challenge.

**Interviewer**

So do you think that with the challenges that the <redacted: country of organization 2> is having now, is there progress?

**Interviewee 2.A**

Yes, if it's toward a goal, I can't say. Something is happening. Must happen. Because we have the PSI directive, we have HVD and we have the deadline June next year and legal deadlines are strict deadlines. I don't know exactly what will happen. It would be interesting to know what the colleague from <redacted: unique information> told you because they would be one of the actors, but probably that's one of <redacted: unique information: number of sub-national administration> opinions.

**Interviewer**

Yeah, exactly. And what do you think can be improved in the current -- if you don't want to use the word ecosystem -- perhaps the current landscape of open data in <redacted: country of organization 2>, what do you think are the key things that should be improved?

**Interviewee 2.A**

Probably the issues <interviewee 2.B> said, to get a better awareness of open data and the positive effects to convince those who do not open data to do it, not by force of law, but voluntarily.

**Interviewee 2.B**

And to push open data and get more and more -- I don't know how to say it -- every party is in the topic and everyone speaks about open data. This could be improved in the next time.

**Interviewee 2.A**

This is perfect strategy of the <redacted: unique information: highest national administrative level> government or those people in the <redacted: unique information: highest national administrative level> government dealing with open data -- to underline the benefits and advantages of open data and to make the <redacted: country of organization 2> authorities doing it voluntarily.

**Interviewer**

And so in order for them to do voluntarily, so they have to see tangible value from open data, right, which is a chicken and egg situation as well, because if there's no open data, they can't really generate value. But if there's no value, they don't want to release open data.

And now, with the development of SDI in Europe especially since INSPIRE, what would you say are the key lessons learned, especially for other emerging open data ecosystem?

**Interviewee 2.A**

OK, having been involved in INSPIRE, it's always a challenge to say what worked and what did not work. To say what has worked: it definitely fostered the spatial data infrastructures in the national context. So in <redacted: country of organization 2> we have the SDI <redacted: country of organization 2>, we have the SDI in <redacted: unique information: sub-national levels>, and we have institutions that deal with it. And we have a shared knowledge and a shared network. We have an awareness of data sharing and we have technical installations of the open standards, at that present mainly OGC.

What did not work was the idea to have a uniform data model, so the data specifications they turned out to be too complicated and too inflexible. It's one issue that the Commission now tackles with the revision of INSPIRE. So that environment that we created was not really succeeding in harmonizing the data. That's probably a challenge that will be forwarded to the

data ecosystems. So harmonizing the data is probably to be done with the user in focus and the user, every user, has different application. So there not be one way to harmonize it, there will be several ways. There need to be somebody who does it, and that person, the institution that does it, needs to be funded. That needs to be an interest in something like one.

I understand that the ecosystems, they put a challenge and they just try to find out how the community organizes itself. And that to me is a challenge how will, in principle, the institutions, the governmental institutions, be able to organize themselves without binding law and without perhaps some supervision body that tells them how to do. That is supervision body and INSPIRE was Commission.

All the <redacted: country of organization 2> institutions that installed their national data infrastructures said we do it because we have been advised to by the Commission; there's a law, we must do. Having a law is what easily to say, you need to pay tax money for it. If it's a voluntarily action, and there is no guy, no law forcing you, you need to have benefits and I'm not sure that this works in <redacted: country of organization 2> at least.

**Interviewer**

Anything to add, <interviewee 2.B>?

**Interviewee 2.B**

No, I think <interviewee 2.A> has so many years on the INSPIRE topic.

**Interviewer**

But perhaps <interviewee 2.B>, because again, you mentioned self-organizing is perhaps better than enforcing, but what do you think are the key things that we could do to encourage this self-organization? Little things perhaps. Where do we start?

**Interviewee 2.A**

Show benefits. Show countries, where it works. I think the Netherlands would be a good example because they have open data, they have it nationwide, they have good quality. Still, the question is if it would be a model for <redacted: country of organization 2>. But whatever, it would be easier for us saying all our neighbors can do it, why the <redacted: country of organization 2> is incapable? Like in footballs, <redacted: irrelevant information> are better than us. That's always a challenge, even to <redacted: country of organization 2> agencies, and even <redacted: irrelevant information> does, <redacted: irrelevant information> does, <redacted: irrelevant information> does? If you say all our neighbors do but only we are not able to do it, that probably would be a situation where the <redacted: country of organization 2> would be a little bit frustrated and that would make perhaps them move. But I'm still not sure.

**Interviewer**

Of course, it's still an open question.

*<The interview proceeded with questions specific about Esri as an open data intermediary. This part is omitted from this transcript as it is not relevant and used for this particular research paper>*

**Interviewer**

Then how do you think open data intermediaries, not limited to Esri, can play a better role in ensuring a sustainable open data ecosystem?

**Interviewee 2.B**

Maybe to create more awareness of the national data platforms. In <redacted: country of organization 2>, we have the open data portal and yeah, I think it could help if there's more awareness for these platforms. I think there are much more platforms in some <redacted: unique information: sub-national levels>. And yeah, I think maybe this this could help.

**Interviewer**

And I also like, I think somebody mentioned that <organization 2> itself can be considered as intermediary because you get the data from other <redacted: unique information: sub-national level> agencies. Then how do you see that perhaps a public organization can also take up the intermediary role?

**Interviewee 2.A**

But well, just to look at the situation, if you look at geodata, what happens at the moment, for instance, the data and transport navigation data is not a stronghold of <organization 2>, it's other companies like for instance Navtech, like HERE, like the automobile industry, setting up data sets. And those data sets will evolve and they will soon probably involve -- there will be data added on the environment, point cloud, digital elevation models and so on.

So I'm not sure that only Esri is involved. It's other companies. They are at the moment out of view, but they are active. So whenever you look for other options than Esri, that company HERE is another option and it's already active in the background, not as visible as Esri. I like the visible ones because those can be judged.

**Interviewer**

Before we end the question the interview, anything else that you would like to share with me that haven't been covered so far?

**Interviewee 2.A**

Ohh thank you for the impetus. To be honest, I just started to think over the issue right now and over the data ecosystems. I would be I think we would be very interested in learning of the result.

**Interviewee 2.B**

Yes.

**Interviewee 2.A**

For instance, on what the situation is in other countries. And we are happy that you would provide input to the European Commission because, as you need to steer the process in a way that at least the European Commission needs to make their mind up in what part they want to steer the process or to let it organize itself.

And probably, for instance, the question on how to provide the European Commission itself with data is something that perhaps the European Commission should steer.

**Interviewer**

OK, I'm gonna stop the recording now.

### Interview 3

<b>Code of organization</b>	3
<b>Code &amp; role of interviewee</b>	3.A: Open data officer
<b>Date</b>	15 May 2023
<b>Language</b>	English
<b>Interviewer</b>	Ashraf Shaharudin

### Transcript

#### Interviewer

OK, so my first question to you, could you please describe your role in [organization 3]?

#### Interviewee 3.A

Yes, we have a system in [organisation 3] that we have one open data responsible person. I am <redacted: personally identifiable position>. And we have a law where we have decided that each <redacted: unique information> department and each district department has to announce one open data officer. So, one open data officer responsible person for the whole [organization 3] and in each [government department], for example, department of economics and the district departments like in <inaudible>, coordinating all the open data strategy, actions, measurements.

And I'm responsible for the open data strategy that we have made with a big participation last year in workshops and also on online survey to find out how [government departments], how the [organization 3] is going to develop its ecosystems, and what the administration has to do to open more data. It's open data but [we] also [need] to have an internal data management to provide better data in a good quality and more data. [Besides] rising up the quantity of data that we are publishing, we also want to reuse data -- show how data can be reused -- and therefore, we also have some projects, like prototypes, that we are funding. We have the consultancy that is also working for the [organization 3]. And my job is to coordinate all these actions for <redacted: the administrative area of organization 3>, for open data.

#### Interviewer

OK. And how long have you been working in this or a similar role?

#### Interviewee 3.A

And I've been working for the [organization 3] since the year of <redacted: personally identifiable information>, and for open data, I've been responsible for the topic since <redacted: personally identifiable information: over 5 years ago>. At that time, I [was] the open data officer for the <redacted: personally identifiable position>. I [was] one of the officers that department has, and since the beginning of <redacted: personally identifiable information>, I'm the <redacted: personally identifiable information: higher managerial position related to open data>.

And last year, I started the <redacted: unique information> strategy that is going to be published from in the next few weeks or in the next month. <redacted: personally identifiable information>.



### Interviewer

Hmm, that's interesting. I'm looking forward to read the strategy that you will publish in <redacted: unique information>.

My next question is regarding open data in general. How long has [organization 3] been implementing open data?

### Interviewee 3.A

We are implementing open data since the <redacted: unique information: more than a decade> and so this was introduced in <redacted: the administrative area of organization 3> as a topic for the administration. Of course, open data has history from the civil community like the Open Knowledge Foundation. There are some people who are working on the other side of open data that were always asking for open data from the administration. But [in] 2011, there [was] one worker at <redacted: unique information> who said that <redacted: the administrative area of organization 3> should also do work on open data like in the United States.

[So] since 2011 we've started with brand new open data strategy which we gave as a job to <redacted: unique information>. They've written the first open data strategy. At this time, we [were] at the beginning of open data, so this means we didn't have the open data portal. <redacted: unique information> has suggested how this kind of IT infrastructure should look like, where all the districts and other <redacted: unique information> departments can publish the data. In 2011, we did not have any law or Open Data Act that could give the officers in the administration the permission to publish data because at this time, everything had to be held secret because the administration <redacted: the administrative area of organization 3> had this policy, that information could not be given outside unless there's someone asking for special information which they can give out. But the proactive delivering of data as open data on a website, on an open data portal at 2011 was not yet accomplished. So we had the first strategy that has written down what we need as a IT infrastructure, what we need as law to empower the people to publish, and what of organizational change this means to the workers in the office, like the digitalization, modernisation, organizational changes, also change management workshops and how people can work together in teams to open data. So 2011 we started. 2011, we also accomplished our open data portal.

In 2016, open data was part of the e-government law, of the paragraph <redacted: unique information>. It is [written] that the [public] agencies have to publish data as open data and in one of the paragraphs, it is also written that the <redacted: unique information> department is responsible for the topic of open data and soon has to bring out an own open data law, which is precisising the paragraph <redacted: unique information> of the e-government law. And in the year of <redacted: unique information: several years after 2016>, we have this Open Data Act, it is called a <redacted: unique information>. We have published it also on the website.

And this open data law has some consequences, like the infrastructure, but also the personal development. So in there, it is written that there is one open data officer for the whole of the <inaudible> who's supervising the open data activities, the strategies, [and] also the accomplishment of the open data law. And there are in each district and also department, one open data officer who's responsible for accomplishing, for fulfilling this open data law, who's

supervising other data officers [and] other people who work with data, with IT systems. They have to think about whether these systems or their work has data which could be useful [as] open data, [and] to publish it. Of course, personal data is excluded -- when we see there is a relation between the data and a person, we do not publish it as open data because there's data protection in Europe and <redacted: the country of organization 3> which don't allow us to publish [it as] open data.

And then we had, in <redacted: unique information>, the open data information service place, which is supporting the departments and district offices in the accomplishing the open data law, helping to implement prototypes [and] working with open data officers on data inventory to look which data these departments have, the IT system, [and] whether [they] can implement an API service for open by default publication. We have a lot of networking events like the open data lunches.

Since 2011, we have <redacted: the administrative area of organization 3> open data day, yearly conference where the civil agencies [who] want data can come together with the workers from the administration -- we have an exchange on this topic. We have accomplished also a working group called <redacted: unique information>, where two or three times a year, the open data officers from the <redacted: unique information> departments and the district offices come together to work on projects [on] how they can fulfill the Open Data Act or publish data as open data.

And since 2022, we have started writing a new strategy, and we did a big participation process with working groups for the stakeholders [in] open data ecosystems. There are stakeholders from the economic [sector], the civil agencies, and from the science -- from the universities -- who are part of this working group to tell us how open data has to develop so that the ecosystems is profiting the best from open data. And of course also the administration process [that's] part of it.

<redacted: unique information>, we are [about to] publish our open data strategy, which is written on basis of the results of these working groups and also from the online survey. What we have [to] publish is what has been said by these working groups. <this sentence is unclear> We have published a paper from the Open Knowledge Foundation who has surveyed these participation process to show what was the will of the stakeholders concerning the development of open data.

Yeah, this is the life cycle of our data in <redacted: the administrative area of organization 3>. We work on the IT infrastructure, on the law, on organizational processes with the open data officers. We're working on a new open data strategy which is part of the digitalization strategy and the smart city strategy of <redacted: the administrative area of organization 3>. So we can see open data as one of tools to fulfil, on one side, the digitalization of the administration because there's a lot of data management involved in open data processing, and on the other side, open data is published to the outside, so there's a lot of data which is interesting for a smart city, in general, more on geocoded [data]. Everything which is data on location is very easy for us to publish because there's no personal relation to data and so we can publish this data. So one of the big data deliverers are the Department of Environment and also City Development, [through] the portal called <redacted: unique information>. So

these are main data deliverer departments, which [deliver] data that is the most interesting for smart city.

**Interviewer**

Very, very interesting. And you mentioned three laws in 2016, <redacted: unique information: several years after>, and in <redacted: unique information: several years after>, and these are <redacted: the administrative area of organization 3> level law. So these are not <redacted: the country of organization 3> level law, right?

**Interviewee 3.A**

Yeah, this is a special <redacted: the administrative area of organization 3> law. There's, of course, the <redacted: the country of organization 3> law for open data that have the paragraph <redacted: unique information> of their e- government law. But there is also a <redacted: the administrative area of organization 3> law for e-government, the paragraph <redacted: unique information>, and it says that <redacted: the administrative area of organization 3> needs an open data strategy for the <redacted: the administrative area of organization 3> administration. And this is accomplished in <redacted: unique information>.

I mean, in <redacted: unique information>, we started working on open data because we have to work with all other <redacted: unique information>, department and district offices. So we had in 2016 the e-government law and we had in <redacted: unique information>, our Open Data Act that we have published.

Of course, the open data law of the <redacted: the country of organization 3>, is related to the ministries of <redacted: the country of organization 3>. So the ministries of <redacted: the country of organization 3> has to deliver open data and therefore there is a law. Of course we work on the Gov data portal, so the <redacted: the administrative area of organization 3> is delivering data to the <redacted: unique information> Gov data portal with the API service.

But yes, we have our own administrations, so we are responsible for our departments in <redacted: the administrative area of organization 3> and our district offices, for this data to be open data. The <redacted: the country of organization 3> law is for the ministries, [to ensure]that their ministries are opening open data. <This sentence is unclear> But of course, there is a gov data accomplishment, how different municipalities who also have to do open data, how they're delivered data to the Gov data portal. So there is a relationship, there is a coworking.

**Interviewer**

But when did the <redacted: the country of organization 3> has an open data law. Was it before <redacted: unique information> or after <redacted: unique information>?

**Interviewee 3.A**

It was before <redacted: unique information>. They also have new legislation on the Open Data Act where they want specific data to be open as open data, like [what] they call high value data set. They've also said that they also want to have open data coordinators in every ministries, and this is also something which came in the last two years where they have specified their open data law on the <redacted: unique information> level. So the ministries open specific data. They also have this coordinators in the different ministries. They also have

an open data competence center, which is also a consulting place, like our open data information place, who is helping the ministries, to open data or to fulfill open data law.

There's some similarities that the <redacted: unique information> has seen from <redacted: the administrative area of organization 3> that they have adapted. For example, the open data information place was a good role model that they have implemented also on the <redacted: the country of the organization 3> level.

### **Interviewer**

OK. What do you think is the value of open data to society from the point of view of <redacted: the administrative area of organization 3>'s government?

### **Interviewee 3.A**

One main value is transparency. So we have a lot of numbers, for example, where the money goes. We have household data, for example. It is very important for us to publish this in an Excel or CSV data format. We also [made] a prototype with big visualization, so the civil people can see where the tax money is going, where the departments are implementing money, for example, for schools, or whether there is a support in the health systems.

And transparency is very important for the civil society. And of course, the environmental data is very important for fulfilling the renewable energy law, the renewable energy [adoption] of building [where] we want to have solar panel on the rooftops, for example. This data shows [people] how the departments in <redacted: the administrative area of organization 3> are fulfilling these goals in the next months and years.

And we have an application called pouring the trees where we have data [of] different tree types in <redacted: the administrative area of organization 3> and the location of them; and this is very popular application where [people] can see where and which tree [are] in my environment, in my neighborhood, and they can go and pour these trees in very hot summer time, for example, because environmental issues are very important to the people.

We have also data for air quality, which is very important for the people, where we collect sensor data, the air quality in <redacted: the administrative area of organization 3>, pollution of air -- where is good air, where is more pollution -- and how we can improve our city to [have] a better air quality. This is very interesting for the people -- environmental data.

There is also one data set which is showing them seas around <redacted: the country of organization 3> and also the swimming spots, for example, where there are swimming spots, dogs or family friendly places, and how is the water quality in these swimming spots. This is also very important data.

So on one side, transparency of the administration is very important with open data, and [on another,] fulfilling the environmental goals with open data -- the sustainability goals that we have. This is very popular for the civil [agencies] to know what is happening in their city, how the city is developing the infrastructure, developing -- the blue and green infrastructure. This is very important for them and this is where open data is taking a very important place. This is where we also can get good data and tell the people [in] the administration, we need this data because people want to know what is happening in their city and how the

government is managing these environmental issues and how we can improve ourselves in fulfilling these environmental issues.

### **Interviewer**

How does the implementation of open data benefit <redacted: the administrative area of organization 3>'s government itself?

### **Interviewee 3.A**

We started with open data in 2011, where open data was in the Department of <redacted: unique information>. And at this time, we looked at the open data ecosystem [in a sense] that we need to publish open data so that the economy can profit from it, so start-ups can implement business applications, apps or new business models with data. So we look more on the outside.

Then, it developed over the years that open data was part of the e-government law and suddenly, it was also an issue for open data being important for the internal data management. So this digitalization of the administration became more and more a process where we have open data that we want to publish to the outside, but we hadn't process internal data management that came to surface the problems that we have, that we needed a good organizational systems, that we know where we have data and which department has which data. So we had to do a data mapping, this data inventory, and the administration profited from this open data process by knowing themselves which data has [in which] department and how do we work in the government with the data. So there are data going from the district offices to the <redacted: unique information> departments which are collecting it in IT systems. And then we said we can see how data is flowing and how we can improve our processes and working with data. And we said we need new data systems where we can collect data at one place and everyone has access and see there which data do we have to work with to work better. And to use data for the government itself.

So at the beginning, we looked at what prototypes can we do to show the use of open data for the economy and which prototypes can we do -- on the basis of open data -- where the government can profit, where they have a better workflow or easy work. So there are prototypes like knowing the school districts. So there are schools in <redacted: the administrative area of organization 3> where the pupils have to go and there is a system for the government to decide which pupil has to go to which school. This was something that they did in Excel or on paper to decide this, and we did a prototype, it is called, school catchment area calculator, which the Department for Education delivered to the district offices, so the districts can calculate which pupil has to go to which school. So, on the basis of this open data -- which is already published as open data -- we made prototypes so the work is easier.

Also for the elections, we had a tool for the European elections, for example, <redacted: unique information>, it is called. So the places where we have constituencies (the constituency #1, constituency, #2) -- this is the area where one political person is responsible for and he gets elected for this area in every four to five year. <redacted: the administrative area of organization 3> changes a lot; people are moving away from <redacted: the administrative area of organization 3>, coming into <redacted: the administrative area of

organization 3> and thus it always has to be calculated on the basis of how many people are living in this area and where this area is going. Yeah, these are some that we did.

Also the tool on the household. There was something that the civil community, the civic tech community, has established -- a visualization of households -- [but] they've stopped. And then the Department of Finance said they want to do its own prototype to have this kind of a tool visualization to show the people where the money is going concerning, for example, the school buildings in the future, or generally building, or for example, where do we invest money in education or healthcare systems.

So the administration has profited from open data. When the e-government law came in, we have to do internal data management. We have implemented our own prototypes where administration can profit; not only for the economy. This is one part of open data strategy that we want to focus: on the profit of open data for the government, for administration.

### **Interviewer**

OK. And then how does the implementation of open data cost <redacted: the administrative area of organization 3> government, financially or others?

### **Interviewee 3.A**

Yeah, as open data is part of the e-government law of the paragraph <redacted: unique information>, and there is one -- how to say, in <redacted: the country of organization 3> we call it a single plan or a budget -- there is one budget, e-government budget, for digitalization in general, for the <redacted: the administrative area of organization 3> government. As open data is part of digitalization or modernization of administration, it is financed from this budget that each department and district office has the availability to decide what to do with it, to develop better digitalization.

And we do have from the department which is responsible for open data in <redacted: the administrative area of organization 3>, this big budget where we finance the open data portal <redacted: unique information>, [and] the IT infrastructure. This is delivered [from] the budget for the fulfillment of the open data law. And we have a budget for the consultancy people who are working in <redacted: unique information> to support open data officers in different departments and district departments. So there's one big budget [for the] support of IT infrastructure, and [for the] consultancy or change management, from the <redacted: unique information> department that is now responsible for open data

And then, as it is an e-government measure, or one of the steps of actions of e-government, there is a separate budget for each department in district office available for implementing open data or open data projects, [and] also financing projects prototypes. Maybe they can do on their own different kind of organizational things. For example, the open data officers, these people had to be announced in each Department, District office, but the money for these people, there was no extra budget, but the departments could decide which people can do this job. And mostly these are the e-government managers in each department district who are already responsible for digitalization in their department or district office. So they had this budget already calculated from this e-government budget and they can use this for their open data projects.

### **Interviewer**

Do you think it's like an added responsibility to the existing e-government officer that now they have to also do the open data implementation? Do you think it's an added burden to them?

### **Interviewee 3.A**

It is an added job. Why it is an added job because it cannot be a full time job to look for open data or to do this open data management as these people are coordinating open data in the department or district office. Each department or district office has [different] quantity of data -- so the Department of Environment has a lot of data from the first broker, for example. The Department of Cultural, Department of Economics, they have two big systems -- IT systems like the energy portal or the company registration portal -- where they implement an API for delivering open data and they don't have so much single data sets that they have to publish.

So that's why each department can decide itself how much work this job is for them. Of course, because of this, it is an added job on the job they're already doing. In the district offices, they are data coordinators who are also doing added job to their normal job, also open data officers, which makes sense because they're responsible for the internal data management of the district office and they can decide which data they want to publish as open data. Each department [and] district office can decide themselves which data they want to publish as open data, and they have different kind of project management systems. In some departments, open data officers are centrally responsible for looking for data and publishing it, and in others, the open data officers are a coordinating person who helps others to identify data but the data officers themselves who are responsible for this data, they're publishing this data on the open data portal.

So on one hand, the difference in quantity of open data jobs in each department offices, and then there is a different kind of delegation of this job between the open data officer and the data officers. So this is why every department [and] district office decides themselves and mostly in all of the cases, it is an added job on the job they're normally doing. In some job profiles, it is written down as a job which is needing 20% of their working time, in some it is 10%, in some it is 5%. In some other IT departments they give this job the focus of 50% or 75%.

As the department who's responsible for open data, we are not allowed to tell them where they have to implement this job as an added job. We can consult them, we can tell them what makes sense, where the people are mostly in touch with open data or where the people have a coordination functioning looking after the digitalization -- because there are also offices for digitalization for in the departments. For example, it makes also sense to implement the open data officer as a function, so this person can also look for digitalization on the side of open data. Yes, it is an added job and we are not yet on the level that we can say it is one person who's completely doing open data as the open data officer themselves. It is just coordinating. She or he is not the person who's holding this data, so a lot of the job they're doing is in a coordinating function, in consulting or doing more [of] project management. You have to be - - you need to be informed about the law, you also need to be in a good networking position of the department or district office, and then you need to manage this project management team to decide who is publishing this data and somehow also giving them enough knowledge so

they can independently publish or do open data. Because in every work there is a little bit of open data, every time something is producing data they have to decide: is it relevant for open data?

That is why this function is more in a coordinating position and more an added job that we have implemented, which is of course very important for the civil people or the economy people to look at the website and to know who's the open data officer of the Department of Economics whom they can contact if they have questions: if is this data already published? Who's responsible for this data? And where can I get this this data form? So this has a very big function from the outside, this open data officer, but also for a network between all the departments and district office. These open data officers can come together to network, look and tell best practices how [to accomplish] open data law.

### **Interviewer**

OK, now I'm gonna move to the topic of open data ecosystem. What do you think is the -- how do you perceive the health and sustainability of open data ecosystem in <redacted: the administrative area of organization 3>?

### **Interviewee 3.A**

Yeah, we have an open data ecosystem which is born from the civic tech. We have the civil society, the Open Knowledge Foundation, the technology foundation who looks at the topic of open data from the side of using data, giving open data [to] the economy.

So at the beginning, we had this civil society who had a big demand on controlling the government, to have more transparency from the open government perspective. And then we looked -- when we had open data in 2011, we looked at open data, giving [value] to the economy. So we have the stakeholder [from the] economy [established] from that year. [For example], companies like Google Maps profiting from our data that we have delivered. And more and more, it is also now coming to the science, the open science, the Open Access initiative. People from the science industry, from the universities, [say] we want good quality open data so we can do artificial intelligence or we can do prognosis, predictions for how something is going to develop, for example, how renewable energy is going to develop, and there we need a good databases.

So the ecosystem is now at a stage where the science is also more and more trying to profit from open data, but we have an ecosystems from the civil society to economy to the science and back to the government, which is working in a good cycle. And now we have opened, as a government, to these ecosystems so they can take part in our open data strategy and a lot of things. Of course, when we're talking about open data we want on one side, we've worked on open government data that the government is opening data as open data, but the open data ecosystem is not yet on the level that the economy is publishing data at our open data portal in the big mass. The science for example, they say we cannot work with this open data portal, because our data is in a different way, we work on Zenodo, where we publish our open data information or transcripts or diploma work. So, in the future, we have to work more on that the economy is publishing open data, not only profiting from our open government data.

And we want to work with the civil society because the civil society was a pioneer in open data when they did the civic tech projects. There is a civic tech community who has sensors



to measure the air quality. There was a civic tech community who did household visualization themselves. They were hackers [from] civil persons that came together and said how can we visualize the data which is published by the government and they came up with this household visualization and suddenly they stopped. And then the government said we want to work on this, we want this household visualization ourselves and they have given a job to a company who has performed this.

My goal as an open data officer for <redacted: the administrative area of organization 3>, is to improve the work of this civic society -- the civic tech -- to have certain kind of exchange where they can tell me on which civic tech projects they're working and which civic tech projects need to be implemented from the government themselves. From the past, there was a learning process that they have shown us what can we do and they did it themselves. And then when they stopped, then we said we can -- we have to do it ourselves. But there has to be more network with the civil society that they can approach us and tell us what they're working for.

Therefore, I [organize] hack days where I have a good exchange on which ideas they're generating to profit from it and go into the government and tell them these are projects where we can put money into and we can implement. Therefore, we also have our platform where we also proactively ask the civil society to participate in questionnaire, in survey, so we can find out what is important for them, which data is important for them, which projects they want to be included. For example, there were these bike projects, bike hangers where people can put their bike on and then we, the government, did not want to decide ourselves location of these bike hangers. So they did a survey participation where the civil people can decide where they want these hangers, for example, when they're [riding] bike to the [train] station, they can decide they need a bike hanger because I [ride] my bike till there, then they use the public transport until station trip to a park, for example, and from there I need to rent a bike to ride the bike to my workplace.

So we want to know what the civil people need so the government can implement this. We want to know where a lift doesn't work so we can repair these lifts. So we want to collect this information, this data from the civil people so we can do better services for the people and not only work on: we have money and we think about where we can be implemented. No. We want to know which projects we can do. Of course, one of the possibilities were these strategies that we accomplished, like the digital strategies, Smart city strategy, also the open data strategy where we did these workshops to get these ideas what we can improve. And this is something we want to work on open data the whole year. So we have this exchange formats, these online platforms where people, where civil people can tell us also not only single people, but also organizations who work on altruistic data use for example.

This is something that we need to improve in our ecosystem: civil society projects and also the economy [sector], need to do more open data so the government can profit from it or other companies can profit from [other] companies delivering open data at this one portal. And they can generate with a mix of governmental data and the economy [sector] data for big projects. We have for example, from the economy side, we have a project with one company which is doing the registrations of companies. We do the registrations of companies because everyone who's doing a hairdresser salon or even a shisha bar has to register with the

government their name and where they open this business. And there are a lot of economies like from the startup company, the coworking space like WeWork or Social Hub, where they collect data from the new startups [established]. And when we put all this information together, we have the companies and the businesses in the streets, but we also have these startups which are working in this coworking space and suddenly we have picture of <redacted: the administrative area of organization 3> economical potential, which shows us more information. So these are a little projects that we are doing.

In the field of renewable energy, we could profit from [data of] the private solar panels implemented on the rooftops. We could profit from the companies who are also using our solar potential map. They're profiting from our solar potential map, but we would also like to know from these companies, where did they implement solar panels or how are their business developed so far. So there are some information that we want to get from the economy [sector] but we don't have this open data law for the ecosystems. The law is just for us, for the government to do. But we would also like to have cooperation with the economy [sector] where we could say if we have a certain order -- how to say -- a contract with a company, for instance, we can put in a contract a few sentences, like clause, open data clause, where we can decide if you're working on this project, we want to get data which is generated in this project as open data in machine readable versions as Excel format or CSV format so that we can publish this data as open data in an open data portal. But this is only possible when the government is working with private companies, or companies in general, on a project or when we're funding a project for them, so we can say as a return, we want some data from you.

But in general, we don't have a law yet to say these companies have to do open data, or have to deliver once a year, this kind of data because the government needs this information. This is where we are not there yet. But for the civil agents, for example they can also do open data. We have <redacted: unique information> where everyone can get an account and if they want to do open data or collecting data on some project, they could also publish it as open data. So this is also possible for companies and also for civil people to use our open data portal on a publishing side, not only using.

And we want to work on more visibility of the reuse of data. We publish data as open data but we don't get in return what this person did with this data? How they used it? Because some civil workers in the administration, they would like to know in certain time what happened with the data that they do a visualization, that they do a platform. This is also good for them to motivate them. But also to see what has accomplished out of it, what they can use for their work. Maybe there is something developed that they can use for their work. So there is a more problem of giving and getting in return concerning open data. We do open data but we don't know what [and] how they using it. So this ecosystems has to be improved. We also have to work on this ecosystem.

At the beginning, like I said we worked on the ecosystem on the economy stakeholders. Then there was a time with the e-government law, we had to work on ourselves. But if we want to do good open data, we have to work on this ecosystems and we need to have an open data life cycle. We need a good open data relationship in <redacted: the administrative area of organization 3>. But at the moment, only the government is responsible for open data and

this civil tech community is the one who's desiring a good open data work. But on the other hand, they could support us. The government has to do their work, of course. And we look at what can we do for open data, but we also have to [do other] job we do beside open data. So it is too much pressure on the government at the moment and the ecosystem itself. The economy [sector] wants data from the government for their business models, the civic community wants to know what happens in the government for transparency reasons/goals of open data. But we need to learn to work in this ecosystem together. So this is where I'm also asking the economy [sector] not only to wait for money from the government to work on something, but to deliver open data and do projects with us.

**Interviewer**

So my last question, I would combine the last two questions regarding open data intermediaries. So do you think that open data intermediaries are now playing an important and positive role in the open data ecosystem? And how do you think they can play a better role?

**Interviewee 3.A**

I have to look it up, intermediaries, whether we have it in <redacted: the country of organization 3>. You mean these intermediaries in the government or between government and the stakeholders of the ecosystems?

**Interviewer**

Can be both.

**Interviewee 3.A**

Ok. Somehow I see this open data intermediaries as our open data officers. And that do this job as an added job.

**Interviewer**

Not necessarily. It could be like Open Knowledge Foundation as you mentioned. So they are sort of people in the ecosystem that try to enhance the access and use of open data, they can develop apps so that citizens can use these apps, and these apps are based on open data. So they can also be like organizations like Open Knowledge Foundation as you mentioned. So do you think they are playing an important role now?

**Interviewee 3.A**

Yes, they are playing an important role. On one hand, in the past, they played a very important role doing pressure on politics or senators or state secretaries to say this is an important topic and that we want open data and open data is useful. So they were good intermediaries to do pressure in the government so that we can get money for open data and that we can get organizational change, so we can implement this open data officers and of course, show always the use of open data for the economy and also the civil community.

And then we have accomplished the Open Data Information Center, <inaudible> which is also good intermediary between the department whose mainly responsible for open data, it's now the Chancellery and [other] departments and district offices. So they were helping -- they've been the chain between us and the other department [and] district offices to persuade them, to tell them why open data is good, why they need to do it, which law there is that has to be fulfilled. That is forcing us to do open data. So intermediaries have always been useful

for open data, they are still useful for us, especially also the politicians for digital topics that they're talking about open data more and more -- open data is important for artificial intelligence. So there, we always have good partners for open data, for opening data, for other new technologies that are coming, that are profiting from open data. At the beginning these intermediaries were very important to show the profit of open data. And they're still important for the ecosystems that we are working in.

They can play a better role in this ecosystem, where they can not only have this pressure on the government to open data, but also maybe on the side of the economy [sector], that we can say, why does the economy have to do open data -- when they do give us open data to the government, the government can do this and this. So the intermediaries should be also from the other side. But we also have a consultancy, the Open Data Information Place, for example consulting the e-government, the departments and district offices because of the law. But a lot of companies from the economy [sector] asked whether there can be an open data consultancy also for small and middle sized companies and also for startups, showing them how they can work with data and why open data is very important for the ecosystems of renewable energies or the ecosystems of mobility. Because the ecosystems of mobility in <redacted: the administrative area of organization 3> is profiting from publishing their data of lending bikes or just different kind of mobilities, where they can build up a good infrastructure to see which bike service is located where, where there's an e-scooter. So they see the need of a central mobile platform and they wanted <redacted: the administrative area of organization 3> to accomplish a central mobile platform for all these companies. And what we need to get in return of this economy companies is that they publish data on this portal for other people who work in this -- how to say -- a data pool.

So the intermediaries can work also from the economy side or the civil side on working with open data, on returning open data to the government and also showing them, what they can do with open government data. So this is also something that we were working on since the beginning to show them: look at their open data portal, there are these kind of data. The COVID-19 pandemic for example, this was a very good example where we can say look, we have this COVID-19 pandemic incident numbers on this website and certain startups like the Luca App and others profited from these kind of data to work with the government, for example to develop their apps that the restaurants need for registration of the people that had visited there. If there's an incident of COVID-19 they could reflow which people they need to inform because they could also [at risk] of it. So there are some kind of peak situations where the government data is very precious, useful for the economy, like the COVID-19 pandemic, but it's should be on a normal level, every time that the economy sees the profit on looking at our open data portal and using our data, also delivering data at this portal from their own projects. So there the intermediaries could be implemented on this side too.

#### **Interviewer**

OK. Thank you. That's the end of my questions. I'm gonna stop the recording now.

## Interview 4

<b>Code of organization</b>	4
<b>Code &amp; role of interviewee</b>	4.A: Data manager
<b>Date</b>	28 June 2023
<b>Language</b>	English
<b>Interviewer</b>	Ashraf Shaharudin

## Transcript

### Interviewer

So my first question to you, could you please describe your role in the <organization 4>?

### Interviewee 4.A

OK, well, <area of organization 4> itself is the <redacted: unique information> in <country of organization 4>. I think it is the <redacted: unique information> in the European Union in population. So in terms of population, <redacted: unique information>, and we have a <redacted: unique information>.

So we have an approach to dividing our tasks. First of all, we have a territorial division as we think that this kind of administration is closer to citizens. So, the first approach is that we have <redacted: unique information> boroughs inside <area of organization 4>. And the second division is those that came from different businesses that we have inside our <organization> like environment, town planning, mobility and so on, IT of course, and human resources, and this kind of stuff.

So we have a two different approaches when delivering data to citizen. I am in one of the areas specialized in town planning, so we deliver every town planning, document or rules that apply to get the permits for buildings. So we are running the spatial data infrastructure of <area of organization 4>. We serve it through the portal geoportal <redacted: unique information>.

So I think it's what you are looking for. As I told you, and I told the person who put -- who was the intermediary between you and me, <area of organization 4> is very big and we have an open data unit that is specifically designed to deliver open data. We have another unit, administrative unit, in charge of statistics with data related to population, voting, and so on. The third branch is ourselves, who run the geoportal and the spatial data infrastructure, everything related to geographical systems information, within the IT colleagues, of course.

So we have ... is it enough for you?

### Interviewer

You can add more information if you want, yeah.

### Interviewee 4.A

And we started looking -- we are harvesting every kind of information of cartographic information of buildings and environment and so. We collect it and then we serve, we create the web map services to have it in our geoportal. But we are in a town planning area, so town planning is very important for us and for our chiefs of course. So we build many web map services relating to this kind of stuff, like town planning or what can be the permits and so.

And as we made, we thought that the spatial approach to data was very bad known inside the organization. So we started to teach our colleagues in other areas and boroughs to use this kind of information and to share our point of view and how the best way to approach data when you don't have data available. It is just pointing in a map and you get what's available.

**Interviewee 4.A**

So we are trying to involve the whole organization in this kind -- in this idea -- to provide and -- we are trying so that they became producers of data that they can serve throughout geoportal.

**Interviewee 4.A**

So we are we are like an orchestra director that we keep the infrastructure, and every division can play the part he's specialized in.

**Interviewer**

OK, so meaning that your business unit is also helping other business units to release spatial data.

**Interviewee 4.A**

Yes. And we are much concerned nowadays that -- probably you ask me later. But we have been running this geoportal only four years. And in four years we became the main information system within the city council because the point of view that everything is everything happens somewhere, as we used to say, is the main idea that we deliver to our colleagues. So we want to spread it through the city council. I think it's a very big idea and a good one because of what we are -- sorry I didn't find the word -- our colleagues have been giving feedback to us. So they say that running their own businesses have changed since they started to use geographical information system because they had numbers, they had a total amount, they have distributions in boroughs. For example, it's very clear when you see an image of what you are spending money in and how it's related to some boroughs, and some other boroughs are not given the same amount of money, maybe they are suffering from worse city conditions. So you have to put more money in them instead of the other ones. So it's another way to keep vulnerability away and to equal the efforts in the different boroughs of the city.

**Interviewer**

Meaning that by doing open data, they themselves actually benefit from this data?

**Interviewee 4.A**

Yes, but not only open data, but geo open data. Once you get the position of every data, you get more information of data itself. Maybe data by itself are some kind of abstract and with geo position, this data in a map, you see what's happening in the city. And there are problems that data are related to data, but you can make a classical join like in a database, with this field is joined with this. But now the joint is spatial. You see things are happening in the same point of the city, and that's what we are thinking about.

**Interviewer**

Is it because when they have to make data as open data so they themselves have to manage the data internally before they can publish it? So that's why the data becomes clearer to them?

**Interviewee 4.A**

Yes. And because -- we work with our colleagues in many ways. At the <inaudible> they need. If they are GIS -- they know how to deal with ArcGIS or so, they do everything. If they don't know nothing, they give us the data, we find the -- if it's structured or not -- we talk to them and we clean them and position them in a map. And between these two positions, whichever the point you are, we give you the tools to deliver data to citizens and of course to our own city council.

**Interviewer**

And you mentioned that it's only <redacted: unique information> that geodata portal has exist but has the implementation of open data has started even before that, or it's indeed just <redacted: unique information> years ago.

**Interviewee 4.A**

No. We have open data since <redacted: unique information> ago at least as a portal. But we have data many years ago. The statistics one was, I think they have almost 25 years. So we've growing and we've done the sharing our information.

**Interviewer**

Yeah, but the geodata portal started <redacted: unique information> years ago?

**Interviewee 4.A**

Yes.

**Interviewer**

And before that, how was the geodata disseminated or published?

**Interviewee 4.A**

We had... Well, first of all, we had an ArcGIS infrastructure for serving data and we have it since 1998 or so, I think. But with this kind of software, we started to deliver information over the Internet at the early years of this century. And we built separate viewers for each business. I mean, we had cartography, so we had a cartographic viewer, and we had later town planning information, we developed the town planning viewer. But then we noticed that we didn't have enough. We wanted more and more and more, and then we started thinking about what we wanted. There was the European directive INSPIRE -- do you know?

**Interviewer**

Yes, yes.

**Interviewee 4.A**

So when the INSPIRE in 2007 came out, then we <country of organization 4> as a country member of the European Union had to translate this directive to our own legal system. So we wrote a law in 2010. And then we thought, this is the moment -- we have to develop a spatial data infrastructure, so we can comply with this law and directive. But because of political affairs, we had almost five years delay. So we started thinking seriously on how to build it in 2015 and finally it was developed in 2017, 2018 and we started delivering services in the <redacted: unique information> 2019.

**Interviewer**

Alright, that's quite recent. And would you say <area of organization 4> is one of the more

advanced municipal or city council in <country of organization 4> in terms of providing geospatial data?

**Interviewee 4.A**

I think that -- Well, main cities, the bigger cities, we have a similar approaches to the problem. But maybe we are more advanced in town planning and maybe <redacted: unique information> is delivering cartography products in a better way -- well, I don't know really. We share information with many city councils and the main cities. But we don't -- there is no contest.

**Interviewer**

Yeah, for sure. But there is a conversation among city councils on how to ....

**Interviewee 4.A**

Yes. We have several groups in that we share information and share ideas and what we think. One of the forums is the Esri conference that take place here in <area of organization 4> every year. And we share information with many, not only Esri, but his partners and other administrations. We have another event that is intended for a local and state administrations and we share information with our fellows also from <redacted: unique information>. And there are cartographic events that take place every four years in a different city in <country of organization 4>. Well, yeah, as soon as the there is an event to share information there we go.

**Interviewer**

And how does the implementation of open data cost <organization 4> in terms of financial, in terms of human resources -- like do you have to actually come up with a lot more budget for the implementation of open data, especially geodata?

**Interviewee 4.A**

No. And I think I can tell you this term as well. We are a very, very short team. We are no more than 10 people. And data producers have their own resources, so we don't take care of that. When we have to upgrade the infrastructure, we don't mind as we have IT team, that have his own budget. And so it's very difficult for me to tell you how much it costs.

**Interviewer**

Because you mainly play the role of like facilitating other producers. So, providing consultancy if they need help and stuff?

**Interviewee 4.A**

OK, we produce cartographic products. The rest of information, we work with other colleagues or we have our own information. In town planning, we have our own information, but we don't spend much money or budget in it.

**Interviewer**

OK. Now, I want to talk about the open data ecosystem, which is a network of interdependent actors that are self-interested. What is your perception of the health or sustainability of the current open data ecosystem?

**Interviewee 4.A**

Well, what we have seen in the last four years is that the speed in open data distribution inside our organization has been much increased with the insertion -- by using geographical information systems. Maybe my colleagues were concerned about the importance of using



open data, but they see much more information when they get data georeferenced and put on an app.

So we've seen that, for example, three years ago, we called another unit and we talked to them: Well, we have the portal, why don't you use it to position this kind of stuff you're running and so. And they said no, maybe later [because] now, data is not very accurate and so we have to wait and maybe later. This year, they come to our door and knock on the door and say: please, can you publish my data? Because they have found the main benefits of this kind of information. So things are changing, but not in terms of infrastructure, but in people's minds. They are thinking other way and they are realizing that things can be done in in other way.

**Interviewer**

And so what do you think can be improved further in the ecosystem?

**Interviewee 4.A**

Well with I think that -- first we are dealing with that -- people see that when you are talking with this kind of stuff, the georeferencing, they understand that there's another task that you are putting into the management of the data. And what we understand is that data since the very first start must be georeferenced. So when you manage it in your app, you are given an added value, but the position is from birth. So you don't have to do anything that you aren't doing now. But the benefits you get after is greater because data is georeferenced from the start.

So we are trying to involve our areas in understanding that the since the very first moment they start a task, instead of writing a next row in a database, they think in a position in the map. And they start to grow the business with that position, because with that position, they can access much more information than just a row on a database.

**Interviewer**

Excellent.

*<The interview proceeded with questions specific about Esri as an open data intermediary. This part is omitted from this transcript as it is not relevant and used for this particular research paper>*

**Interviewer**

So those are my questions.

## Interview 5

<b>Code of organization</b>	5
<b>Code &amp; role of interviewee</b>	5.A: Product manager
<b>Date</b>	25 April 2023
<b>Language</b>	English
<b>Interviewer</b>	Ashraf Shaharudin

## Transcript

### Interviewer

Now I would like to start with my first question. Just to get some background about you and also <organization 5>, could you please describe your role in the <organization 5>?

### Interviewee 5.A

Yes. I am responsible for the unit of the <organization 5> in charge of the dissemination of product produced by the <redacted: unique information> and <organization 5>. And this concern both products in paper format which are sold in physical shops and in a virtual store as well, and also digital data which are distributed through a geospatial information download platform. Also in my area, there is the photo library of the institution which has orthophotos from the <redacted: unique information> and from other institutions that give them to us for conservation and dissemination. And we have also a virtual platform that allows the consultation of -- personal consultation -- to the public for the consultation of the photographs.

### Interviewer

OK. When you mentioned digital data, do you provide it for free or this one is also charged?

### Interviewee 5.A

No. All the digital data are for free. Only if there is a special demand of a huge amount of data, which have to be stored in disk or other format or we have little tasks for the service. But if user goes to the platform on the Internet it is everything for free.

### Interviewer

OK, alright. And how long have you been working in this or similar role?

### Interviewee 5.A

In this role, I only have been working for nine months, but my experience in <organization 5> is <redacted: personally identifiable information: over 15 years>, in positions related with the geospatial information system, with INSPIRE implementation, cartographic viewers, geographical educational resources -- it was very interesting -- and that kind of works.

### Interviewer

OK. And I think you mentioned a bit, but could you please elaborate more how your role is related to open data?

### Interviewee 5.A

I think the main connection between my role and open data is the <redacted: unique information>, which is the name of the download platform. And as I mentioned before, that platform allows to download data from the <redacted: unique information> and other

<redacted: unique information> government agencies. Having in my unit the virtual photo library, and thanks to my previous positions, I have been in contact with other ways to disseminate geospatial information, not only downloading, but also through viewers, APIs or standard web services, and metadata.

**Interviewer**

OK, alright. And this <redacted: unique information>, do you spell it as how you spell it in English?

**Interviewee 5.A**

Yes.

**Interviewer**

Yes. OK. I'm just gonna check it later.

**Interviewer**

OK, now we're gonna move to the topic of open data....

**Interviewee 5.A**

I can send you the link if you want.

**Interviewer**

Yeah. Yes, that would be great.

**Interviewee 5.A**

I think I have sent, yes.

**Interviewer**

OK. Thank you.

**Interviewee 5.A**

Some parts are produced into English, but I think not everything is in English, but I think you could understand.

**Interviewer**

Yeah, it's fine. Thank you.

**Interviewer**

So we're gonna move to the topic of open data. How long has <organization 5> been implementing open data?

**Interviewee 5.A**

Well, long before. Since 2004, we began building our spatial data infrastructure, publishing standard web services and metadata to locator information that could be freely consumed from any GIS client, geographic information systems client. And this, regarding to a web online information. But regarding downloading, since 2015, practically all the digital geographic information is available for free of charge in our download center.

And although previously there have been different degrees of openness of our information, 2015 was the absolute open data. And in 2017, we changed the platform, the usability of the download center, and we realized that it increased highly the amount of downloading files.

**Interviewer**

OK. And what happened in 2015 that you started to make it open? Was it through national legislation? Was it something through national policy?

**Interviewee 5.A**

Yes, yes, it was a law published. Well, no, not exactly a law, because it was order of our ministry, the Ministry of Transport, which <organization 5> belongs. And the ministry decided to do the step, and I think it was a significant step because in some other regional cartography agencies -- sorry, because I have a cold and my voice is not perfect. I was saying that there are all other regional cartography agencies and some of them gave data for free and some other not. It meant a starting point for some of them because, one after another, I think all of them are having open data policies nowadays.

**Interviewer**

OK, so <organization 5> is the umbrella of all these regional cartography agencies or it's a separate entity altogether?

**Interviewee 5.A**

It's a separate entity. It's a state agency. The <organization 5> is an organisation close to the <redacted: unique information>, and both of them belong to the Ministry of <redacted: unique information> and the competencies are at a state level.

But also there are other institutions of the state level who produce geospatial data, for example the cadaster which belongs to other ministry, the Ministry of <redacted: unique information> who produce a lot of geographical data as well. And also, we have different agencies or other kind of institutions at regional and local level, which are different, but we collaborate under the umbrella of the national system. Sorry I am going to check, because I have here the name in English, it's the national cartographic system. It's the umbrella under all the national plans for cartography are decided and in this system, all the institutions are represented and we decide together the production of cartography, I think, every two years. Each one of the agencies produce data of their level of, the scale of resolution.

**Interviewer**

OK, so the governance structure is more of like a collaborative decision making instead of like top down where <organization 5> ask people to do stuff? It's more of like we discuss together on how we do stuff?

**Interviewee 5.A**

Yes, it is discussed and it is co- financed because -- before, in 2004 with I think it was when - - well the national cartographic system was established in 2007 -- but from 2004, some national plans started. And before that date, before 2004, maybe the <redacted: unique information> local agency was doing cartography at the same scale as we were doing and we spent a lot of money in the same things, we duplicated information. And thanks to the establishment of the national cartographic system, everything is regulated in the terms of collaboration model. It is not an imposition because it is clear that each of the agencies have their own competencies, as I said before, because of the scale of the data and the resolution.

**Interviewer**

What do you think is the value of open data to society from the point of view of <organization 5>?

**Interviewee 5.A**

Well, first of all, it's an obligation. I think that on one hand, the citizens are offered free access to the <country of organization 5> geographic information and not only because it is for free, but also because we try to facilitate the access to different channels, not only online, but also downloading.

And on the other hand, this accessible and free information is of great value for other administrations and for companies of the sector. It allows them to create value added data and services from the basic information which they obtain for free with the cost savings that it entails. And I think in the report I sent you yesterday of <redacted: unique information>, you can see the geospatial information companies leading number turnover, number of employees, over other fields of work.

**Interviewer**

But the implementation of open data also costs the government because you -- in providing this data you have to incur cost. What do you think are the benefits of open data to your organization itself? Is there -- do you see any value return back to you as a data provider?

**Interviewee 5.A**

We think that, on one hand, it increases the prestige of the institution and public administration in general, and that's important for politics. But it allows the geographic data to reach a border audience, and that also means that we receive more feedback from our users. That brings us a quality control of data because every day, people contact us to say, I see this error or that other. It also allows us to direct our strategy towards what citizens and other public administrations and even companies are demanding. So it's like a contact between the public and us.

I would like to tell you a curious detail. Sometimes it is more expensive to charge for the service than to give it for free because you have to implement payment and to be checking out that no one is doing with the data what you are not allowing. So giving it for free and with very less restrictions, it is less work for us in that sense.

**Interviewer**

Yeah, that makes sense.

**Interviewer**

What are the costs of providing open data to <organization 5> in terms of financial, in terms of human resource?

**Interviewee 5.A**

Yes, we don't receive so much money for the data, that's clear. But as a public institution, financially, we have funds from the government, from the state. The higher cost of not having a return means, I think we have a decrease because of the national system I have told you before, it is co-financed between several parties, [thus] the costs are lower and in some way we are balancing in that way.

Another thing to take into account is that as users get used to have more and more information, they demand the information to have great quality, great updating. The technology goes so fast and they ask to have it more quickly and it is the cost for us to be up to date in the newest technology and progressing day by day.

**Interviewer**

Yeah, but in general is the cost constant over the years or it's increasing?

**Interviewee 5.A**

It's quite constant. Yes. Because the plans are programmed for long, a lot of years. So I think it's quite constant.

**Interviewer**

OK, now I'm going to move to the topic of open data ecosystem. What is your perception of the health or sustainability of the current open data ecosystem? And it's up to you how you want to conceptualize open data ecosystem. It could be spatial data ecosystem. So how do you see the sustainability, the health of the ecosystem?

**Interviewee 5.A**

Yes, I will focus most on geospatial ecosystem, which is what I know better. And I think it getting better every day. In <country of organization 5>, we have a general open data portal at the state level and others are the lower level of administration. This is for the general data, not only for geospatial data. In the geographic information sector, the fact that the state level institution, which is ours, offers its data as open data, serve as an example for other administrations, as I told you before. Sharing information within that, enables to grow, to save money, and to create added value products. By using information from other organizations, the quality of this information increases as the organization responsible for the data is informed of errors and improvements -- the feedback of the information.

**Interviewer**

Yeah. What do you think can be improved in the current open data ecosystem?

**Interviewee 5.A**

I think there are some points to improve. Some users or organization, don't know how to use interoperable formats such for example GML. I don't know. Maybe you don't know it because it's very specific. Or GeoPackage which are open formats. And other downloads services. This lack of knowledge forces us to publish geographic information sometimes in non-interoperable formats because we are very committed to offer in open format, but user, non-specialized user sometimes doesn't know what to do with that kind of information.

Then there are some mess with too much regulation and different formats. And some organizations, even the organization doesn't know the proper regulation to apply in every case. And that happened, for example, in the case of metadata, which there is a European regulation directive. Sometimes they are difficult to implement for some local level organization who don't have some means to implement that regulation. We think it is necessary to capture more data. As I told you before, with higher quality and precision, with a greater frequency to give answer to the questions of the users.

Once we provide the information, we have to give a step more, allowing to taking advantage of the big data based technologies and allow to create automatic processes through artificial intelligence and using clouds as technological support.

And it's also important that data and services from the private sector should be integrated with the public resources to span the number of problems that can be solved -- for telecommunication companies, energy companies, banks, etc.

**Interviewer**

There are a lot of good points there.

**Interviewee 5.A**

I was thinking yesterday a lot about them.

**Interviewer**

Yeah, this is very good.

**Interviewer**

Yeah, I have follow up questions to several of them actually. So you mentioned that you also have to provide data that is not in an interoperable format because some users do not know how to use this format. So for example you provide data in shapefile for users of ArcGIS?

**Interviewee 5.A**

Yes.

**Interviewer**

Yeah, OK. And then this complex data standards. Do you think that's because of INSPIRE overspecify the standard?

**Interviewee 5.A**

Yes.

**Interviewer**

Yeah. And also regarding the private sector data, so at the moment, is there any platform for them to share data?

**Interviewee 5.A**

For private companies?

**Interviewer**

Private sector, yeah.

**Interviewee 5.A**

I don't think so.

**Interviewer**

And do you think that they have incentive to share data? Do they want to share data do you think, in general?

**Interviewee 5.A**

I don't think so, because sometimes I know that -- I think the telecommunications and energy companies have very good geographical systems, geographical information systems, and they don't share this data. Maybe in interchange of information or some way they could give it to the public, but I don't think they [do it]. Maybe they would sell it to other companies. I don't know. Maybe it's there, I don't know the case, but I don't think they give their information as open data. I don't know.

**Interviewer**

So my follow up question with the development of SDI in Europe, through your experience,

especially since INSPIRE, what would you say are key lessons learned for other non-geo open data ecosystems?

**Interviewee 5.A**

I think that there are a lot of lessons learned because we, in <organization 2>, think that INSPIRE was a great directive that make interoperable geospatial data. It was very important for organization to bring to light a lot of geographical data that was on the desk.

But on the other hand, it has been very hard to implement, so I took note of some of lessons learned and that is one of them -- the importance of having standards and models to allow data interoperability. If no standards are defined, it's impossible to share data. But in the definition of the standard, we think it's important to agree on common minimum and without too many requirements that at the end they are difficult to meet. That I think was one of the problems of INSPIRE, a lot of little requirements and not so many organizations have the money and the time enough to implement it.

Another thing is to correctly choose the data format and related to what we were talking before and so that they are easy to implement and easy to use for users. And also to communicate to the sector in the simplest way possible the requirements to be met and highlighting the benefits for society, the adoption of all the open data, and not only for society, but also the benefits for the organization itself.

The last, the need of focusing attention on users and the use cases, the problems to be solved rather than focusing on the data provider. Sometimes we forget the use cases and the user and their needs -- and I think that's an error.

**Interviewer**

Great. Thank you. Now I'm going to move to the next topic, which is on open data intermediaries. Do you think that open data intermediaries are playing an important and positive role in the open data ecosystem right now?

**Interviewee 5.A**

Yes, I think they are. They are playing an important role since they have been adapting their tools to open data format. Although it is true that sometimes it has been difficult for them to get out of proprietary formats such as shapefile, as we talked before. But the role I think, is essential to adapt, to transform, integrate geospatial resources, both data and services, so they can be used by society in an easy and intuitive way that maybe is lacking in public organizations. Maybe public organizations are not so close to the final user as intermediaries are.

**Interviewer**

Yeah. And how do you think they can play a better role in the ecosystem?

**Interviewee 5.A**

I think they could be more open to adopt, for example, INSPIRE standards, which has been very difficult and also providing greater knowledge about the needs of society to public administrations to direct our strategies to solve the real problems of citizens; that could be a good point.



**Interviewer**

So, meaning, you think that they can be the bridge that provide the feedback from users to data providers?

**Interviewee 5.A**

I think they are in fact.

*<The interview proceeded with questions specific about Esri as an open data intermediary. This part is omitted from this transcript as it is not relevant and used for this particular research paper>*

**Interviewer**

Yeah. OK. So that's the end of my questions. But I would like to get back to one of the things that you have said with regard to open data ecosystem. You mentioned also that perhaps INSPIRE from the start, it should have highlighted the benefits the only to society, but also to organizations.

**Interviewer**

Who do you think has the role of this? Disseminating, highlighting the benefits, do you think that you should have done more. Or do you think, the Member States, should have done more?

**Interviewee 5.A**

Well, I'm not sure. I don't know if the EU, but the state organization should have done more to facilitate. Maybe we have been in a very computing level, an abstract level, and maybe we haven't known how to get to the users level and to put in the data accessible for them.

**Interviewer**

OK. Thank you. So that's it from me. But before we end the recording, do you have anything that you would like to share with me with regard to open data, open data ecosystem or intermediates or asking anything that you haven't mentioned that you would like to?

**Interviewee 5.A**

Nothing. I would like to see the results of your study. It would be great if you could share with me your investigation because I think it's very interesting.

## Interview 6

<b>Code of organization</b>	6
<b>Code &amp; role of interviewee</b>	6.A: Product manager
<b>Date</b>	6 April 2023
<b>Language</b>	English
<b>Interviewer</b>	Ashraf Shaharudin

## Transcript

### Interviewer

OK, for the record, you have read the consent form and you agree with all the items, yes. OK.

### Interviewer

So let's start with the first question. Could you please describe your role in the <organization 6>?

### Interviewee 6.A

Yes. I'm a product manager. And I'm a product manager of four groups of products and services. First is the key register of topography. Are you familiar with <country of organization 6> <redacted: unique information>?

### Interviewer

Not so much.

### Interviewee 6.A

Not so much. OK, so... <redacted: unique information>.

So that's the four groups of data which I'm involved with and they are all open data. They're only available through <redacted: unique information: geodata platform> and I hope you are familiar with the <redacted: unique information: geodata platform>. I don't have to explain it.

### Interviewer

Yes. And how long have you been working in this or similar role?

### Interviewee 6.A

In this role, I'm roughly about 10 years, but at that time, 10 years ago, I started with only one group of products and services, which was the large scale topography, so this one. And that was because before that I was also involved in another role connected to large scale topography, and gradually that role declined and my role as product manager grew by getting more products and services.

### Interviewer

OK, so if I understand correctly, so your role right now is really just about open data?

### Interviewee 6.A

Yeah, that's correct. That's probably also why <redacted: personally identifiable information> brought you in touch with me, yes. So open data is very relevant in my job.

### Interviewer

If I may ask, how long has <organization 6> been implementing open data?

**Interviewee 6.A**

That's a good question. I'm not sure about all but for my product, the first one, the small scale topography, that was since <redacted: unique information: over a decade ago>. Then the large scale topography was since 2016. Aerial imagery has been somewhere around 2015 was the first one and the important, most important one, the large scale imagery, at high resolution, is available since 2021 as open data and 3D information since 2020.

**Interviewer**

Quite recent.

**Interviewee 6.A**

So all quite recent, yes.

**Interviewer**

OK. What do you think is the value of open data to society from the point of view of <organization 6>?

**Interviewee 6.A**

Yeah, well, the value of open data for society is that everybody can use it for the purpose they need it for. So it's cheaper for them to use, it has less transaction costs, of course, nobody has to worry about paying and billing and all kinds of administration that's left out. And you also have businesses develop services on open data, and that generates taxes, of course. They have income, value added tax and so on so that.

And the broader it is used, the more feedback you get on the quality of the data so that's also helpful. And we've got a feedback system where people can report any errors in the maps or in the information, which is also open to everybody. So that's all advantages.

And there are also disadvantages, of course. I don't know if you want to know them too.

**Interviewer**

Yes, yes. If you want to, yeah.

**Interviewee 6.A**

First of all, of course, there are costs involved in open data. Somebody has to pay for them. At the moment we get our budget for this kind of open data information from the Ministry of <redacted: unique information>. So they provide the budget. But society, and the Ministry and <inaudible>, they always want more. But the budget is usually don't grow accordingly. Sometimes, there is budget for development as well, but most of the times, that's limited. So, that hinders you in the development sometimes. If you have for instance paid products, then you can talk to the people who want the development and they can start paying for it. In this case, with open data, it's not possible.

**Interviewer**

So does it mean that every year then you have to request for this budget? Or do you get a fixed amount?

**Interviewee 6.A**

No, it's a long term agreement between <organization 6> and the Ministry of <redacted: unique information>. But every five years that's renegotiated.

**Interviewer**

And for every renegotiation, meaning that you have to show the value of open data?

**Interviewee 6.A**

Not specifically the value because they are also aware of the value and they are fully supportive on open data. I mean they make new laws, like the law on large scale topography, and they specifically write down this has to be open data, so they are in favor of open data. And so we don't have to show the value of the open data. But they have limited budget and then, yeah, it's a struggle both for them and for us. They will have to apply for the budget at the Ministry of Finance, so to say. They want to grow but they not always get the possibilities and if they don't get the possibilities, we can't get the money.

**Interviewer**

Yeah, yeah, I understood. I wanna get back to what you pointed out as the feedback loop, meaning that people can get back to you and for example, they can tell you that there are some mistakes in the map. So far do you get a lot of feedback?

**Interviewee 6.A**

Yes, yes.

**Interviewer**

And are this feedback, mostly from companies, from big companies, or they are also from individuals researchers?

**Interviewee 6.A**

They are mostly from professional users, so to say so, rarely from citizens, but that can be really small companies like independent -- how do you call them in in English -- the people who are a business owner so to say, one man business. But also large companies and also all kinds of government users because the government users, they are obliged to report back if they encounter a failure. There are lots of lots of reports come from the professional users within the government.

**Interviewer**

OK. And this feedback avenue is in the <redacted: unique information: geodata platform> platform? Or do they reach out to you by e-mail?

**Interviewee 6.A**

No, no, no. We've got a website for that. And it's called <redacted: unique information>. I will put it in the chat.

**Interviewer**

Thank you.

**Interviewee 6.A**

I'll put the link in there then you can directly go to it. That's easier.

**Interviewer**

All right, my next question, apart from the...

**Interviewee 6.A**

Before I forget that there's also some disadvantage about open data. In terms of, for instance, our aerial image is open data, and there are companies who are providing services with that

open data. We now encounter the situation that we want to do similar services for the whole country and we are not allowed to because we've got a law in Europe which says there has to be fair play between governments and companies. They make the products and services, they earn money with it, the government is not allowed to give it away for free. I don't know how, how to say it. And the translation is the law on market and government. Yeah, <redacted: unique information>, it's called. And because of that law, it's not allowed to provide certain open data products although we could and we want to. That's the disadvantage of about open data, because there are those companies that can get the aerial image, can do their job and earn money with it, which is perfectly fine, I'm not against it, but it limits us in our possibilities.

**Interviewer**

But do you think it's possible for the <organization 6> to also release this products and let whichever products are preferable to consumers, let them decide. Do you think that's a possibility?

**Interviewee 6.A**

No, no, no, no, no. The only way for us to provide that kind of products is when there is a legal ground to provide those products so that we can say it's not based on this law anymore, it's our task as a government to provide this kind of product. And so far, this list of products which is legally allowed is very limited. And together with the Ministry of <redacted: unique information>, we are looking at how can we broaden this open data family, so to say, but it has to have a legal ground.

**Interviewer**

Very interesting. It means that it's sort of like limits public organizations from being open data intermediaries?

**Interviewee 6.A**

Yeah, yeah, yeah. Which is not what we want. We want to be open with open data. So yes.

**Interviewer**

OK. Let me move to the next question. What is your perception of the health or sustainability of the current open data ecosystem?

**Interviewee 6.A**

Well, it's very profitable for the whole country. I'm very sure that we generate value for the country by providing open data information. But it does cost something and we have to get the information and we have to make products and we have to service it and the platform like <redacted: unique information: geodata platform> costs quite a lot of money too. So as long as there's enough budget to keep that running, then it's very sustainable. I mean, but yeah, it depends on the budget.

**Interviewer**

So you would say budget is one of the main concerns?

**Interviewee 6.A**

Yes, yes. I mean there's no argument against open data. There's no argument against the <redacted: unique information: geodata platform> platform. It's fully accepted in the <country of organization 6>. But to keep it running, we have to do something.

**Interviewer**

Do you have any idea of apart from budget, what are other actors can do within the ecosystem to improve the ecosystem?

**Interviewee 6.A**

Well on the terms of <redacted: unique information: geodata platform>, there are quite a lot of governments and other actors who are providing their open data, so that that helps. Of course, the more open data is available through very well known and very well used portals that's good -- we've got a concentration of all the open data through one portal, which is always better than 20 or 30 or 40 different portals, because then everybody gets lost, of course. So that's what helps that all actors provide their information through one portal.

But the only limit for <redacted: unique information: geodata platform> is that it's a geoportal, it's all about geo information. And of course there's a lot of other types of information as well and <redacted: unique information: geodata platform> doesn't provide it. So there, you have to make a connection for people who want combinations of geoinformation and administrative information or all kinds of other useful information they need. And the Ministry of <redacted: unique information>, of course, has to provide the legal regulations for combination of that kind of information together because now there's quite a lot of information available and people start combining this information and through combining you can draw more specific conclusions, you get more specific results. And which also enter into the privacy of people. And we've got maps and there's data set or open data of buildings and addresses and combining buildings and addresses and maps and aerial images and whatever you can easily get to where people live and how the environment is and whatever is possible. And that has to be regulated, of course.

**Interviewer**

But do you think, like other actors are contributing enough data, apart from public organizations in the <redacted: unique information: geodata platform>.

**Interviewee 6.A**

I don't know. It can always be better, of course, but it's quite a lot already, but I'm not really on the <redacted: unique information: geodata platform> side. So I don't know if there's a big demand on specific data which are not available yet. At least all the key registers at the geo side come through <redacted: unique information: geodata platform>, so that's arranged. But also all kinds of other organizations like the Central Agency of Statistics, they provide all their information, which is open -- there's also limited information, but all their open data goes through <redacted: unique information: geodata platform>, so I think it's pretty much quite a lot.

**Interviewer**

OK, alright. Let's move to the next question, regarding open data intermediaries now. Do you think that open data intermediaries are playing an important and positive role in an open data ecosystem right now?

**Interviewee 6.A**

Yes and no. No, not because they don't do it, but it can always be better, let's put it that way. They play a role and it's an important role because in terms of, as an example Esri, they provide to all their customers -- they get all the open data and they provide them in a format

which is for their users and their software users. It's easier for Esri clients to use the information from Esri and to download it themselves or have the web services themselves and so on. So they make it easier for their clients to use open data, which is what we want. And we want any market party and it can be an intermediary or any other party to develop services with open data. That's what it's meant to be. So it's positive and there are more doing that kind of things.

**Interviewer**

When you say that they can do better, is there any specific things that you think they should do better?

**Interviewee 6.A**

Well, one of the things users of our open data information always ask is to give it in different formats. And we provide information in internationally recognized standard formats so that it's open to everybody. We don't do any industry specific formats or company specific formats. We just don't do it. It's not that we are not allowed to, but if we do one, we have to do them all and it gets messy and troublesome and so on. So what we want is we provide it in an internationally recognized standards and we want the companies, the markets, to provide it in all the industry standards because we also recognize that our format is not always the most useful for all kinds of users, architects and building companies and whatever they want it in DXF and anything. Now we've got 3D and they want it in BIM IFC and whatever, that's fine with us, but we we're not going to do it. And there, in general, the industry and the market can do better.

And Esri, to be honest, is the good example. For their clients, they provide a lot of information and their industry specific standards. But all the other software companies don't do that -- at least less, let me put it that way. And then architects and building companies start asking us why don't you provide it in DXF 11 and 12 and 13 and 15 and whatever. And then we say, well, we don't get the budget for that. It's not our task to do that. That's for the market.

And there, you can't force any of those companies to do it, because of course they have to find a way to earn money with that as well so that customers have to pay. And of course there they're happy that they get the information for free, but they are not happy that they have to pay them for the translation in their preferred format. There's always the discussion.

**Interviewer**

Apart from the format, do you think they can do better in other regards?

**Interviewee 6.A**

Of course there are wishes from users to do better together, right? At the moment, the developments in the 3D side on digital twins and so the developments are really starting to catch up, so to say. So there, has to be done a lot on our side for the data and on their side, with software and the translations and whatever. So it can always be better, but I can't mentioned specific things, let's say.

**Interviewee 6.A**

Do you also interview users?

**Interviewer**

Yes, I will.

**Interviewee 6.A**

Ok, ask them what we can do better together.

**Interviewer**

Do you think that in terms of providing feedback, do you think that open data intermediaries can do better in providing feedback back to you as a data provider?

**Interviewee 6.A**

We can always be better in touch with each other. And we are open to it, but also to a certain limit. We can't talk every week to every software provider or intermediary or whatever. So we organize our user community a little bit on regular meetings and there they are welcome and then they can give their feedback. And lots of those feedback is very welcome because then we can improve our products and our services. And sometimes, when they keep asking, do me this format or give me that part of the information ,which we don't provide as we we're also limited by law to what we provide, we don't provide every everything. But to the extent what we allowed to then we try to fulfill the wishes, within the limitations of possibilities and budgets, of course.

*<The interview proceeded with questions specific about Esri as an open data intermediary. This part is omitted from this transcript as it is not relevant and used for this particular research paper>*

**Interviewer**

OK. Thank you. I think that those are the questions that I wanted to ask. Do you have anything that you want to tell me or you want to share?

**Interviewee 6.A**

No, I think I've read through your questions. I probably have told all the important things on open data.



## Interview 7

Code of organization	7
Code & role of interviewee	7.A: Digital coordinator
Date	Response received: 17 May 2023
Language	English
Interviewer	Ashraf Shaharudin

## Written interview

### Background

#### 1. Could you please describe your role in the <organization 7>?

I am the coordinator of the <redacted: personally identifiable information> and the <redacted: personally identifiable information> platform at <redacted: personally identifiable information>. I joined the organization in <redacted: personally identifiable information: over two decades ago> and since then I have participated in digitization and innovation projects in different areas. In the last <redacted: unique information: over a decade ago>, I have coordinated numerous actions aimed at promoting the publication of data as open data by the public sector and its reuse for the development of advanced digital services and the improvement of existing ones.

#### 2. How long have you been working in this or a similar role?

I have been working in the context of open data for 11 years.

#### 3. How is your role related to open data?

My role is to coordinate the actions carried out within the framework of the <redacted: personally identifiable information>. Mainly actions of dynamization, dissemination and support to the publication of data.

## Open data

#### 4. What do you think is the value of open data to society?

In my opinion, open data is a tool that allows society to maximize innovation through sharing and collaboration. Of all the existing definitions, I like the way the concept is defined by the International Open Data Charter: it is a good that people should be able to access to generate value, knowledge, ideas and services in order to create a better world for all. This definition, which may sound somewhat grandiloquent, highlights the potential that universal access to data can have.

In the datafication process in which we are immersed, a wide range of information is generated as quantifiable, machine-readable data that can be used for aggregation and analysis. The fact that these data are open will allow anyone with the right knowledge to contribute to answering what is happening and why; what will happen and what must be done for something to happen or not to happen.

## **5. How would you describe the vision and current landscape of open data in <country of organization 7>?**

<Country of organization 7> is a country with a very good rating in the field of open data. It is positioned as one of the <redacted: unique information> countries, according to the latest annual report of the European Public Data Portal, which analyzes 34 countries of the old continent.

This healthy situation is the result of the efforts of a very active open data community. On the one hand, the efforts of the administrations, which, under Law <redacted: unique information> on the reuse of public sector information, are developing numerous open data initiatives aimed primarily at enriching supply and boosting demand. To date, it is possible to identify more than 300.

In addition to this effort, there are the actions carried out by <redacted: unique information>, a government project that serves as an umbrella for the actions that have been developed in this area in <country of organization 7>. In fact, <country of organization 7> was one of the first countries to have a successful coordination project, awarded in 2013 by the European Commission with the Prize for Innovation in Public Administration.

In addition to the actions of the administrations, there are the data reuse companies, a relevant group in our country, with a turnover of more than 2,000 million euros according to the 2023 report of the Multisectoral Association of Information.

And last but not least, the efforts of civil society:

- independent pro-transparency organizations such as <redacted: unique information>,
- media specialized in data research such as <redacted: unique information>,
- developer communities such as the R and Phyton communities
- communities driving the data movement such as <redacted: unique information>,
- or simply inquiring minds calling for the opening of data for later reuse.

## **6. How does open data implementation benefit <country of organization 7> government?**

Open data is a source of information for the development of smart services, as well as for decision-making and policy-making. It is therefore not surprising that an increasing number of public bodies, in addition to opening data - for reuse by others and for reasons of accountability and transparency - are also reusing their own data for different purposes.

In this sense, the rise of smart city management platforms is encouraging many city councils and autonomous communities to develop smart applications and tools that take advantage of the use of data and analytical techniques to innovate and improve the public services they offer to citizens. Below, we show you several examples: <redacted>

## **7. How does open data implementation cost <country of organization 7> government (financially and others)?**

I do not have exact information on the economic and human resource costs for the <country of organization 7> administration in the implementation of open data policies. In the specific

case of the national open data policy linked to the <redacted: unique information> platform, in 2022 the official figures are:

An FTE of 4.75 and an annual budget between 400,000 and 600,000 €. To these figures should be added the cost of implementing open data policies for regional and local administrations.

### ***Open data ecosystem (defined as a network of interdependent yet self-interested open data actors)***

#### **8. What is your perception of the health or sustainability of the current open data ecosystem in <country of organization 7> (and beyond)?**

In my opinion the open data ecosystem in <country of organization 7> and Europe is in one of its best moments. Open data is a key part of the data spaces, the federated data ecosystems based on shared policies and rules that both Europe and <country of organization 7> have been working towards in light of the European Data Strategy. However, government open data sources, open data portals and the professionals who have been working for years on publication, metadata management, federation, the establishment of discovery mechanisms, and the promotion of reuse, can and should play a key role in this new field of action in which the Commission plans to invest nearly 8 billion euros until 2027.

#### **9. What are the shortcomings and challenges of the current open data ecosystem in <country of organization 7> (and beyond)?**

At present, in my opinion, the three main challenges that <country of organization 7> public administrations must face when implementing open data strategies are:

1. fostering inter-administrative collaboration to generate data exchanges and facilitate their openness, identifying some datasets to work on their quality and on the use of standards to really be able to obtain all the value they provide.
2. Implement processes to improve the management, quality and governance of open data in the context of the overall data strategy of each administration.
3. Ensure that public workers develop the knowledge and skills necessary to promote the dissemination of open data to improve public policies, incorporating citizens and businesses in the whole process of opening.

These barriers are aligned with the results of a 2023 report that reflects the barriers identified by the different groups that are part of the open data ecosystem in <country of organization 7>. The results can be found on page 29 of the following report: <redacted: unique information>

#### **10. What do you think can be improved in the current open data ecosystem? You are more than welcome to describe more than one aspect.**

In order to respond to the barriers mentioned in the previous question, in my opinion, there are three key actions to be carried out:

1. Establishment of a data governance model in each of the public organizations that integrates the concept of open data.
2. Evolution of existing open data infrastructures aimed at the creation of sectorial and interrelated data spaces.
3. Development of training actions aimed not only at learning how to work with data, but also at understanding the leading role of data in today's society, as well as how to challenge existing power imbalances around data in order to better adapt them to public interests.

***Open data intermediaries (defined as third-party actors that enhance the supply, access, and/or flow of open data and/or relationships among open data stakeholders)***

**11. Do you think that open data intermediaries are playing an important and positive role in an open data ecosystem right now? Kindly explain your answer.**

In my opinion, data intermediaries play a key and growing role in the data economy in <country of organization 7>. This reality is supported by the results of the study carried out year after year by the <redacted: unique information>. In the eleventh edition of its Report on the Infomediary Sector, which reviews the health of companies that generate applications, products and/or services based on public sector information, it is concluded that the 710 infomediary companies analyzed generate a turnover of more than 2,278 million euros. This is a sector that has grown by 60% in a decade. See more information here: <redacted: unique information>

**12. How do you think open data intermediaries can play a better role in an open data ecosystem?**

Public-private partnerships are in my view a key mechanism for enhancing the role that data intermediaries can play in an open data ecosystem. They could be defined as long-term contracts between a government agency and a private entity with the objective of providing a public asset or service and in which the private party assumes a significant portion of the responsibility, risks and, generally, the potential benefits.

While such partnerships have been used successfully in many more traditional and long-established sectors, such as large public infrastructure, it is a field that has not yet been fully explored when it comes to working with data. However, public and private entities share an interest in having high quality, accessible and cost-effective data, and that is why they are beginning to explore the new opportunities offered by these collaborative models when sharing and exploiting data, and take advantage of the potential of using private data to solve public problems, particularly in the area of Smart Cities.

## Interview 8

Code of organization	8
Code & role of interviewee	8.A: Information manager
Date	18 April 2023
Language	English
Interviewer	Ashraf Shaharudin

## Transcript

### Interviewer

OK. Just for the record, you've read the informed consent and you're fine with everything.

### Interviewee 8.A

Yeah, yeah, I am.

### Interviewer

Thank you. My first question, could you please describe your role in <organization 8>?

### Interviewee 8.A

Yeah, currently I'm a member of the management team of <organization 8>. We're also reorganizing a little bit, so in a couple of weeks I'll be <redacted: personally identifiable information>. And we have two members of the board and a director. So currently I'm more in management role within <organization 8>.

I've been working there since <redacted: personally identifiable information: over 10 years>, I think, almost 10 years. I've always been involved in different topics, but one of them that is relevant for this research is that the advice report for <redacted: unique information>. Basically the open data for geospatial data for <country of organization 8> government.

I've always been a strategic and tactical adviser there, both to the <redacted: unique information>, who is the former owner of this platform, and the <redacted: unique information> who manages and runs the platform.

Are you familiar with the general role of <organization 8> within <country of organization 8>?

### Interviewer

Maybe you can explain it.

*<Here, about 7 minutes 5 seconds of the interview is redacted from this transcript because it contains a lot of unique information that poses risks of reidentification of the individual>*

### Interviewer

What is the value of open data from the point of view of <organization 8>?

### Interviewee 8.A

I think we see two main values. On one end, it's the perspective of openness and transparency. Government should always be as open as possible in order to act and to function properly from a democratic point of view. With the economic drivers there as well. I think it depends who you ask within the government. We are both cooperating with for

instance, <redacted: unique information> and they are really into the second pillar of that. And when we're working with the <redacted: unique information>, they're really into the first pillar. So I think both values are valid.

And we basically, we always try to do -- because we're a <redacted: unique information>, we always try to make standards actually work and function in real life and solve problems. So it's always really has a strong user focus. It's a user-driven development.

And it should [be] both cases are valid because basically, first, it doesn't matter whether you are a company that wants to create some added value on top of the data, or you're a journalist or researcher, or just carrying out your work process within government more efficiently because you're reusing data. It's cheaper. Basically trying to facilitate all kind of open data use.

### **Interviewer**

OK. Thank you. I'm going to move to open data ecosystem, which is defined as a network of interdependent yet self interested open data actors. Before I move to talking about what you think about the current open data ecosystem, I want to refer to report <redacted: unique information>. Because the report mentioned that for SDIs to remain fit for purpose, they need to evolve towards flexible, open, agile and self-sustainable data ecosystems. I know that this is SDIs and not necessarily open data, but there's the word sustainable, which is quite interesting to us because we're also talking about sustainability, so could you please elaborate on this vision?

### **Interviewee 8.A**

First small side comment, as you put SDIs are not necessarily open, I think within <country of organization 8>, the general opinion is that SDI should be open. But it's true that there are variations between different countries within Europe. But I think also if you have a look at INSPIRE data, almost all INSPIRE data is available publicly, available from <country of organization 8> data sources, whereas in some other countries you have to request access and request the data. So I think the perspective that we're working with on a day-to-day basis is that the <country of organization 8> SDI, at least, should be as open as possible.

And to elaborate on the flexible, open, agile, and self sustainable data ecosystem, I think it's important to compare this to the current state of INSPIRE, because INSPIRE was always meant to be an open data ecosystem and that has been designed with specific purpose in mind, [e.g.] sharing environmental data in case of some kind of disaster, and the idea was disasters never stopped at administrative boundaries, so it should be -- you should be able to combine data across borders and it need to be available because as soon as the disaster hit you don't have time to start thinking about the creations of data or publication of data, it should be made available already. So in the case of emergency you can just access the data immediately.

But at the same time, although it was a specific use case, it was also designed to then how to drive the reuse of this open data, because they already have the idea: OK, there is a use cases more qualified, it's a high quality, it's something you should do because it's necessary. And not necessarily a quantifying use case where we say, OK, we are adding value and you can really measure it in euros. But it has always been idea that data should be made available for reuse as well. But there, some changes were made.

I think looking back, the INSPIRE, current state of INSPIRE is quite specific to geospatial specialists. You have to be specialist in order to understand the data, to understand the services involved in accessing the data. So basically it's quite a high threshold for reuse of open data. You need to be specialists, only focusing on a small niche of geospatial experts. And if we have a look at the infrastructure, that's basically -- the main cause for that is that the standards that they adopted already existing international standards, but they made more specific, they create almost an add-on, if you want to comply with OGC WFS service, you have to do this but for INSPIRE, you also have to do this, this, and this. So they come up with additional requirements and these additional requirements lead to the situation that you could not use any tool that just supporting the international standards. You had to look for a tool that was adapted to this additional requirements that were INSPIRE specific.

And as a result, the market was less interested because it was only a small usage that really specific INSPIRE, points are, I think almost valid from theoretical academic point of view, but for most users they don't care whether it's done like this or like that as long as they can access the data and use it. So basically in hindsight, the current INSPIRE infrastructure is too complex, it's almost too regulated.

And that hinders easy access, and it's really high threshold to enter the system and to be part of it. So what we saw in -- oh, and another thing in the current standards of INSPIRE, all these different standards are part of the INSPIRE directive. So it's written in European law. You should use this standard and that standard. But changing the law takes years and years and years. Technology, it's going much faster and much higher pace. So, basically, the legal part of the framework cannot keep up with the developments on the technological point of view. So now we have a directive that basically says, you should use outdated standards, you should use complex standards. There are already lighter, easier, more generic standards available, for instance if you have look at the web feature service, the way how you can transport vector spatial data from one system to another.

Basically have to be specialist to work with it. It's a PDF document 500 plus pages and you almost have to read it as a newbie from the beginning to the end in order to be able to understand how works and how we should create a query to get some data out of the system.

Basically, the new generation of standards is completely based on the Rest API design principles, and basically everybody that's used to working with data on web, regardless whether they are geospatial experts or not, as long as you're working with data as a developer, basically within 5 or 10 minutes, you have this API up and running because it's a more predictable way of interacting with the data. So what we mean with being flexible and adaptive is that as soon as these new standards emerge, they are lowering the threshold to participate in this ecosystem. Then it's really important that you organize your infrastructure in such a way that you can adapt, that you can say: OK, we are no longer only using the old standards and it's also OK, in order to fulfill all the legal requirements, if you choose the new standards. So we have to be flexible.

And the same thing, I think, from really detail point of view, core additional requirements are valid. I mean there are not nonsense but basically, their mindset was: let's think of the most complex use case that we want to serve with this infrastructure. OK, what requirements does the infrastructure has to take in order to be able to serve this most complex use case. And as a result, there's a lot of complexity through the infrastructure that's only really needed in the

most complex use cases. But in other 90% of the use case they are much less complex. They are quite straightforward and even if you want to do something that's quite straightforward, you're confronted with all this unnecessary complexity. So basically they added all the complexity for just the few rare occasions that also the use case is really complex. What we also mean with this adaptive and agile ecosystem is that it should match up, for instance, we see that within OGC standards nowadays being modularized. Otherwise, the standard was huge and basically it has so many requirements in order to show off all use cases. Now the new <inaudible> standards to have <inaudible> as the core, just a small set of requirements. And with a small set of regulations you can serve say 80% of the use cases. If you want to support more functions case, you maybe need to implement an extension or two extensions. So basically then, there's more of a balance. If your use case is more complex, your implementation will become more complex as well because you have to implement more of these extensions or modules in order to also serve some more complex use cases. But the nice thing is that as long as you have simple use case, it's enough to work on with the core.

And that's also like being this adaptive thing, because it's basically the requirements to participate in ecosystem are now more in balance with the complexity of your use case. So if you want to do something simple, it has to be simple to participate in the ecosystem, and that's really I think the core message of this. Because it has repercussions for the way how it's organized from a legal perspective, because if you write a certain standard within a law, you know that it takes 5 to 10 years to change the law, you know that you will hit some problems within three years time.

So it's necessary from a legal point of view, say OK, there will be standards, and they are managed over there on that list, and that list can be updated twice a year, for instance. And make it less heavy legal process to change, for instance, the technical requirements. It also requires in the technical point of view that you have an open eye: Ok, what are the current developments in standards, in ways, in technology, and how people interact with data to be more in line with what data users expect, and really adapt more to the current state of user needs. I think one of the drivers also from <organization 8>, I think also within Europe, we are one of the front runners in that we really try to transform from only our geospatial needs into making geospatial data available through the standards of the web. Because the web is already a federated system of data, it is an ecosystem, it functions with millions and millions and millions of users. Whereas the geospatial part is just a tiny, tiny fraction of that.

And the more that we can align with those more generic standards of the web and how we describe data and how we make data discoverable, how we describe it, it would make metadata easier to get. Because I think for most use cases, if you want to work with geospatial data, you need the developer that's used to working with data. But the geospatial aspect, which is really important in the actual collection of the data, for creating the use case for the developer, I would say 90%, it's not relevant to understand how spatial works but you can create of offer kind of query or whatever kind of service you want to build. Especially to make the data ecosystem much more open and inclusive, so that it should made easy for all data developer, basically everybody who has some kind of experience with data, whether you're a journalist or a developer or a company, you should be able to work with the data.



The whole idea is that by making the standards easier, by making infrastructure easier, it would lower the threshold of engaging in the system and taking advantage of the availability of open data. That's really a thing that we're standing for.

**Interviewer**

Yeah, that's fascinating. But I probably missed it. This new standards that you mentioned, is it already in the pipeline?

**Interviewee 8.A**

Yeah, basically OGC is working on it in really high pace. Some of the standards, they created specific website for it, ogcapi.org. What they're doing -- because the old family of standards, they were all W dot something service -- the web feature service, the webmap service, the webmap tile service, and basically they are all from, say, the early 2000, 2005, basically that time period. And they are now are all being transformed into API versions. I think the web feature service is also I think one of the two important services within INSPIRE. There's already the OGC API features, but the core and two of four, I think they're <inaudible> for extensions. Two of them are already ready and released. Others, which is OGC API standards are almost complete or only the core is complete. So basically in this year, next year, I think the majority of the standards in this more modern API version will become available.

INSPIRE is already doing some small experiments. And how can we or how can you benefit from applying these new standards and basically everybody is enthusiastic from a functional point of view. But basically the huge task for the European Union is to come up with enough security for data providers. In the law, in the directive, we still mention web map service, web feature service, but it's also acceptable <inaudible> trying to create legal loopholes so that you can also use this more modern standards.

**Interviewer**

Alright, with the development of SDIs in <country of organization 8> and Europe in general since INSPIRE, what would you see are key lessons learned for other non-geo open data ecosystem? What should and shouldn't be done?

**Interviewee 8.A**

I think one of the key lessons is keep it as simple as possible because geospatial data, it goes back to land surveyors, and they're really focusing accuracy -- centimetre, millimetre -- so it's always -- there's this drive, they're driving for even more accurate, more reliable data, almost striving for perfection. And if you want to serve as many users as possible, and also if you want to serve use cases that are relevant from a societal point of view -- for instance in <country of organization 8>, we have this housing problem, we have nitrogen problem, climate problem, energy problem -- if you want to be able to use open data in that field it will -- because basically everyone says that they're all spatial problems, where you want to build, you don't have room for nature or to create solar farms, so basically we don't that much space in <country of organization 8>, so it should be data-driven approaches. But I think still not enough people realize that it will only happen if the data is so simple to use that climate specialists or agriculture specialists can use it.

As long as we say, oh, we have great data, but you should ask us to help you, then it's never going to run. So the whole idea of having successful infrastructure from a user perspective is to lowering the threshold to use it as much as possible. And I think going to the way of web

standards, more generic standards. Spatial is not special anymore. That's also really valid for technology and for standards and how you interact with the data.

Reference discoverability is also a nice thing. I think for a long time, and also the INSPIRE directive states you should describe your metadata according to ISO standards. ISO metadata is brilliant in describing spatial metadata but basically it's non-existent for generic administrative open data, they're working with DKAN and all kind of other formats.

So I think the lesson is always to have a wider focus, understand that you're part of a broader ecosystem. I think there was also a period where we thought they would have to basically let go of the geospatial standards altogether and focus on these more generic standards solely because it's the only way to gain access to this wider audience of data user.

I think we now have also concepts like federated architectures that we see that it's OK to have multiple platforms, to have multiple access points for data, and maybe some access points is more from geospatial perspective with those kind of standards, and others more from administrative point of view. And it's OK that they are both there as long as they interchange as much as possible with their data. They link to each other, for instance. So there's the principles calls in some <country of organization 8> government documents: no wrong door principle. It doesn't matter where you enter as a user, the important role of the infrastructure, it should help you regardless which door you enter. So for instance if you enter the administrative door because you don't know that there's also a geospatial door when looking for data, you should be able to discover also spatial data behind that door.

And maybe, for instance data in metadata DKAN format, where you will need really specific method that's only in ISO, it should link you to the register where the method is recorded or published in ISO standard so that you can have a look at it small additional fields that are maybe really crucial for you as a user. It's also the other way around, if somebody enters the geospatial door and said, well, but I'm looking for administrative data, you should not say, well, so we don't have data. You should still link them and help them, and basically it's not the fault of the user to take the wrong door.

Basically everybody that's working on this ecosystem, they have the responsibility to make it work. So it's a collaboration and I think especially the nice thing about this whole idea about federated architecture is that there is not one single central platform. And because if you think my ideal solution is 1 central platform, yeah, as long as there are two well, which one to pick? Is this one more important for the administration, is this one more important for geospatial, which one? With federated architecture, we understand, they both have valid reason to exist. They both have additional value to the users. The only thing that we should take care of is that the user is not hindered by the fact that there are two separate solutions. So they should link, they should cooperate and they should serve the user regardless their background. So I think that's an important lesson.

When talking about federated architectures, the Internet is the federated architecture. It's proven it works. It works for documents and it's working for data more and more. It's one of the big steps for the Internet from the web document where Web page change to web with data where an object links to another object which links to another object. This building may link to university, but it also may link to this address, it may link to the municipality. So basically how you can navigate through pages, you can also navigate through data.

And think that we should understand for instance, the INSPIRE, the old INSPIRE structure, they say, OK, we'll start to create something almost like a green field, we start from scratch, let's build something. And now we understand, we should be really cautious of what's already there. The Internet is functioning, so you have to adapt and make sure that it functions as much through those kind of standards. There are already a lot of data usually user, so instead of saying we should have more data users that understand this geospatial niches, no, we should make it simpler. Accept the fact that the majority of users is not geospatial expert. They're just interested in data that might or might have no spatial component. And it's just an attribute. So you should deal with that.

And I think the last importantly from infrastructure point of view is that we could basically say governments that are running these kind of infrastructures, they take the initiative and of course they design it and companies participate in the ecosystem. But basically they're quite strict dividing between public parties, they come up with the design, they make the rules; and private parties as long as they play according to the rules, they can be part of the ecosystem, but they do not have a real influence in the way in how the infrastructure is going to develop.

And the problem with that the governments are, in general, not the most adaptive organizations. I think private parties are much more capable in adapting to changing circumstances, to changes into technology. So there should be -- I think you cannot create completely equal playing field, but it should be made more effort than now. We should acknowledge the strong points of these private parties.

Because I think the old way of thinking within government, which, for instance in <country of organization 8> we have the base registry large scale topography and I think of all the trees that are in <country of organization 8>, only about 4% of the trees is registered in this open data set. Now if you want to do an analysis on heat, heat islands within urban environments, basically, if you have only 4% of the trees, you can't say anything about the impact of having more or less trees on these heat islands within the city. There are at least two private initiatives as run by small combination of Lidar and all kinds of data, they created data sets of basically 99.5 or 99.9% of the trees. So the data is already there. I think the whole reaction of our government, oh, we lack data, we should collect it. Whereas, especially in this federated system, OK, other parties have already have it. They are willing to make it available. Just make clear how they can be part of this federated system and then some of the data sources are public, some of the data sources are private, maybe some data sources are released in some kind of public private partnership.

I think the realization is really down that that we need all these data sources in order to solve these actual factual problems. Now, for example, if you want to have a look at mobility, the charging stations for electric cars, they are currently not in the base register because at that moment when it was created 10 years ago, you had phone booths on the streets, but no electrical cars. There are already quite a number of parties have the state-level available, but if you want to make policies on municipal level one, do we have enough of these charging stations to make sure that we create more sustainable mobility? But when you're looking on your own data, we do not know. But the data is there. So I think it's really important that the next step of this ecosystem, private parties are not only allowed as a user, but also as a data source. So that's important lesson.

And I think this whole concept of federated architecture, federated structure, it's really beneficial to organize that. And I think it's -- because I see this idea emerging all over national governments, but basically the concept of the data space, from Europe data space, also the federated system. If both private and public data sources, they should be able to connect all these sources and I think the laws should make it more user friendly.

I think in the beginning, the <country of organization 8> open data policy was really strict. You can only publish open data as is and as soon as you make it a little bit more adapted, a little bit more to what user needs, there's this discussion of only private parties are allowed to do that, you should not compete as a government with private parties. I think the way and how people think about what's the role of public, what's the role of private, it's also shifting a bit.

I think the last thing is making data available in a way that it's more user friendly. Because still the biggest user of governmental open data are other governments, other governmental bodies. So in a way it's quite weird in the way of thinking, the government was not allowed to publish data in such a way that another government was not able to use it -- to say no, if another government wants to use my data, you should hire a private company to adjust it, make more flexible or have a little twist. It's just weird. So I'm really hoping that in this current movement into data space, or federated architecture, whatever you want to call them, there's much more collaboration. And it's an understanding that private parties need the government to sometimes say, OK, this data, this is most important data. For instance, if you are applying for building permits or do your analysis based on this data source, this data source is the data source. We will guarantee you that -- we will not say you're using the wrong data and as a result, you're not getting your permit. I think we're really creating a more level playing field for all actors and they're, I think public and private parties, really need each other.

#### **Interviewer**

I have two follow up questions to what you said. So the EU data space that you mentioned, is it the same vision of federated architecture that you envision?

#### **Interviewee 8.A**

Yeah, basically the concept of data space is a bit more from thematic approach, the European Green Deal data space, the idea is that INSPIRE infrastructure already holds a lot of data free and make it more rich. They basically have the data-driven approach for the Green Deal, there's a Green Deal data space on mobility, on healthcare and I think 2025 or something like that. So although it's described more from a thematic usage, I think if you're going to compare it, they both say we need to have access and to organize and to make common operational rules and regulations to make it possible that we have access both to public and to private data sources. So if you have a look at their architecture document, then it's basically the same as a federated architecture. In <country of organization 8>, it's a bit more architecture driven because then it's seen as a solution because I shouldn't compete your platform or my platform, oh wait a second, both platforms are valid, which you should just improve the way and how they interact and how they make each other stronger and easier to use. In Europe, it's a bit more user focused or use case oriented. But in the end I think if you compared to the architectural ideas they're pretty much the same.

**Interviewer**

But do you see the risk of arranging it based on themes would create ecosystem that do not interact with each other for example?

**Interviewee 8.A**

There is, I think an actual risk. At the same time, I think you can – one of the best ways is to adopt standards of the web. If they all use comparable standards in how to access data and how to discover data, use the same API patterns this time, maybe in five years time, it's something else, maybe it's linked data or it's both, I don't know. I think both approaches are valid and they will find each other because basically they are trying to do the same thing.

And I think it's almost use case dependent. In the current <country of organization 8> case it's quite helpful, but it's coming a bit more from an architectural point of view because it solves some of the current problems that we see in <country of organization 8> or the obstacles that we encounter in <country of organization 8>. But I think it's European goals that they are more thematic this is also valid point of view. Basically, they're both valid. They're more user interface let's say, more of the higher <inaudible> of why are you working on this data, on this architecture or anything -- it's a synergy between the two.

**Interviewer**

OK. You also mentioned about allowing private parties not only to be data users, but also data providers. Allowing is one part, but do you also think like the incentive for private parties to share data is also not there.

**Interviewee 8.A**

I think the way you know how private parties are looking today is changing and that's the result for open data policy. I think 15 or 20 years ago, data was an asset and people were selling data. And even quite generic data, base maps, also <redacted: unique information> was selling their products. Now all these are in base register and are usually free. So if you see business models with private parties to add value doing smart things with data. And I think that's really good. Because in the end, the real value of data is in the use of data. So when they come up with smart solutions for digital twins or whatever, when they shift to more advanced operational data, where is modeling or analysis or visualization, that's where these companies excel. And that's where we need most of the developments. And I think private parties are better at these developments and improving technology. That's really what they have to offer to us.

So I think for a company, it's attractive to be part of this ecosystem. If lots of people use their data because basically if they want to do use your data, you can sell them some of your functionality. I think that's also the case with Esri in <country of organization 8>. I think in the beginning, for instance people in the <redacted: unique information> was thinking, Esri is a competition for us because we try to distribute as much open data as possible. But every Monday they come to <redacted: unique information>, they get the base registers, they shoved in their own serving their own clients. Ah no, all clients should use our system. Why? Basically the results of open data is the sum of the use. We have billions and billions of hits in <redacted: unique information> and about the same number again in the Esri environment and the sum of it is the success of open data. As long as the data sharing is a part, they are paying for server in the cloud storage, everything. Let's help each other and from that point there was really a change of mindset and basically <redacted: unique information> started

talking to Esri: we see that you update now on a weekly basis, but we're getting more and more data updates, it's getting bigger. Is it okay the way we serve you? Is it still OK for you or you need some tweaks so it's easier for you to update your data and transform it into your own format. It shift really way of changing and how you think about data?

So I think really from the open data point of view, the mind shift is already there. And where there's still a bit more debate or the debates undecided is, OK, when governments publish open data, they're always in open formats. For instance, Esri is using open data that should have proprietary formats, and they are serving their own users. That's their own right but from a reuse point of view, if their client use it in their own process, well why would you care about. For instance, if it's municipality that's using Esri software, they use this open data that's maybe originally published original sources <redacted: unique information>, it's harvested by Esri, it's served in their proprietary format to municipality and municipality creates some kinds of open data service for their inhabitants based on a proprietary Esri format.

Then the open data or and the derived open data set is a little bit less open. I mean, the data is still open, but it's not an open data format. So then suddenly people, for instance citizens if they want to interact with this data, and there's a lot of web technology now, so it's not that complex, but the problem is there are municipalities that use Esri software, so if you want to apply for a permit for an event, we have a tool that we provide base map and then you have to draw, OK, here is the podium, here is the first aid thing, if something go wrong the ambulance can still enter from here and from here but there will gate over here, and then suddenly people have to use a proprietary format and proprietary system to do it.

Is that a problem or not, I think that's still undecided. I think the people that are most strict say no, it should always be open format because they're still in a way, if they're lucky, if you knew if it's getting too expensive, I want to go to their competitor. It's almost impossible to change vendors because it's everywhere in the processes and in a way that's may hinder -- not saying that it's actually happening -- but it may hinder the way our government works may because it's almost impossible to go to another vendor, it's becoming more expensive. Because there's no real competition on price anymore because the cost of changing is so high that you accept that basically, your monthly fees are 10% higher than with your competitor because it will cost you an enormous amount to have the whole transformation process done. Then it's something that is frowned upon within the government.

So if that's still in a way difficult. On the plus side, and that's really true for Esri, I think 10 or 15 years ago they were not interested in open standards at all. They said we do have the standards, it's called shapefile and it's the standard almost everybody uses it, everybody can read it, it's the standard. It's not something OGC standard or ISO standard <inaudible> Everybody uses it. Same thing with them. I think now they are more interested in metadata, they created some of them, they have developed on their own. They made it OGC community standards that is recognized as an open standard and also it's judged as an open standard in the way how it's organized.

And their uptake of modern OGC standards is much better than old generation standards. And I think in the old generation, they also had point, sometimes their own format, which are own proprietary formats had better performance. Yeah. For the sake of doing derive thing, offer something with less performance. Yeah. I mean, I completely understand why they did it. And

that's also a thing that is a challenge to standardization organization. It should not only be a derived thing from a theoretical or academic point of view, but it should also work in real life. And not only on one machine, but the standards should work in the cloud, it should be scalable and it should also work when there's like an immense peak usage. For instance, <redacted: unique information> in the in the beginning, there's some quite nice examples, there was a map with the quality of surface water if you want to go swimming. In the summer it was first day of 25 plus degrees, and one of the news I think at <inaudible> starts with an item, there's now these websites, it's <inaudible>, so you can check your local swimming spots, you know the water is actually healthy or not. Within 5 minutes, they had two million users. So you need to be scalable. And then it pops out, OK, some of these standards, they work nice with one user, with five users, with 1000 users, maybe 100,000 users, but 2 million, it's not going to scale anymore. Basically if you want to have a real sound and grown up ecosystem, you have to be able to do that. You have to be able to scale, to deal with these kind of big requests. And I think new generation of standards does it, and so being model. Esri now is OK, we have our own standards because we know them in and out and we can optimize it for our own range of products. But if you want to publish something in open format, just click the box, it's possible as well, so there's also a real uptake of open standards within Esri as well. And that's important to mention. And if you again -- good news for certain municipalities that run most of their spatial processes on Esri platform, it's becoming more safer to do it because they're still in line with all kinds of legislation about open standards and open formats. So I think they're shifting in the right direction.

### **Interviewer**

Alright, yeah, I'm going to ask you more about Esri, but before that I just want to ask you about open data intermediaries in general. Do you think that open data intermediaries are playing an important and positive role in the open data ecosystem right now?

### **Interviewee 8.A**

Yeah, I think the most important intermediary I can think of in the <country of organization 8> case is <redacted: unique information>? And I think <redacted: unique information> are service providers, not data providers. They're service providers so that the individual data providers don't have to take care of the scalability issue, the performance issue and time issue. The nice thing is the data provider is really into their data, they have some more knowledge, but what you see happen in reality is that <redacted: unique information> is much more aware of the user needs.

And there you say, OK, of course I want to access, for instance, the building registry, but I want to combine the data with another source because I have this question a million times a day. Those kinds of user request always pop up on a service provider and not on the individual data provider. I'm only concerned with addresses, so combining it with other data, yeah, don't ask me. So basically this intermediaries playing a really important role in the transformation being the supply driven infrastructure into a much more demand driven infrastructure. Because now users have an entry point where they can post on request where they can say OK this is not nice format but it would really be helpful if the data is available in that format as well. And when you're serving it for hundreds of data sets it is much easier to see those kinds of trends and to understand what kind of formats you should invest. So I think these intermediaries like <redacted: unique information> are really important.

And at the same time, an intermediary like Esri is also really important because although they're a huge driver towards open standards and open formats and maybe even more open source tooling in the future, the reality is that a lot of the municipalities and governmental bodies that have to work with the data, they are not capable of creating everything from scratch. They don't have the funds, they don't have the staff that's capable of creating a local infrastructure on their own. So they rely on basically, these full service providers like Esri and other competitors. They can say, OK, we know that your task is this, this and this, we can help you with it. We take care of data storage, we take care of visualization, we take care of how you combine all those, all these different data sources. So I think Esri also played an important role in lowering the thresholds of using data.

#### **Interviewer**

OK. What do you think <redacted: unique information> and Esri for example can do better?

#### **Interviewee 8.A**

I think the shift that's currently topic of debate is offering services that integrate data. We have a lot of different data sources, we have different base registers or even more data sources of course that do not have this formal status but basically they are still organized almost like independent silos. Addresses optimize for addresses alone. Large scale topography with large scale topography. But the user is not interested -- there is not single user: oh I want to access the address registry or I want topography. I want to know if they have information about buildings and maybe if you want to know everything about this building, some of it is starting the address registries, large scale topography, the small scale typography, the real estate, tax data set.

So basically to serve this user you have to almost play the role as the intermediary to know where to collect all the tiny bits of information and combine it to really come up with an answer because the current open data infrastructure is basically do it your own infrastructure. You have a problem? OK, you can search for data. We can point you to different data set. You can make a connection or download the data which you have to do the analysis yourself. We give you the building blocks for solving your problem, which you still have to solve your problem with yourself. So basically you should be capable of using QGIS or Esri software to combine this data to do your analysis and to get your answer. And the data specialist is perfectly fine with it, but a climate specialist, he could not be bothered to use that kind of system. They want to know how many charging station for electrical vehicles are in city center. And he doesn't care if the data is coming from different data sources. He just should be able to ask the question and get an answer.

Because then you're really helping the customer. I think that's something that <redacted: unique information> can do much better. And the <redacted: unique information> is still a bit reluctant, is it the task of a public platform or is that something that if you want to do that, you should go to a private company and pay for it? And that's still a debate. But it hinders the actual uptake of data-driven approaches within all this fields that are typically not that tech oriented, or that data oriented. I mean climate specialists, some of them know data, but most of them don't know data and they don't care about data, so it should be as easy as possible. Yeah. Why should why using Google? Because you can ask something and they're really helping you. You get an answer instead of building blocks instead of hey, good luck, mate.



## Interviewer

Yeah, but do you think this debate that <redacted: unique information> has whether they should do this integration or not? Is it because of resource or because of the legal around it?

## Interviewee 8.A

Both. Legal concerns is really a blocking issue. At this moment in time and the Ministry of <redacted: unique information> also thinking about changing law on this point and making it a specific task because <redacted: unique information> has its own law where it says what <redacted: unique information> should do. The role of having a data platform and access is already in the law, but integration of data is not yet in the law. They could change the law and they're thinking about it. So legal is really a valid point, but also they're struggling with funding because open data is a success and if you make calculations about added value for open data, it's always a positive business case. But the place where the benefits go are different places than places where the costs are being made.

So <redacted: unique information> needs more money because I have more data, more users, they want to provide better services. But basically who's going to pay because their current, all their open data services are free to use. And as soon as you say, OK, you have to pay for it, even if I charge you one cent for open question, it's a psychological issue because I'm now confused, I'll try to do my own, even if it's 1000 times more expensive than to do it.

As soon as you start charging money, people tend to back off and say, I'm not going to use it anymore. So then the problem is the government should come and say, in the bigger picture, the value being created, so there is some value added tax, so we have more tax revenue, so we are going to pay <redacted: unique information>. But basically, the closing of the loop, it's not working in government. And I think most parties have problems with that. It's not only <redacted: unique information>, it's true for the entire <redacted: unique information>.

Everybody's positive about what they're doing but they still have problem of getting funding and especially additional funding for these developments and bringing it to the next level. I think that's something where -- because it started like really technical thing and only tech minded people were concerned with it but basically the big decisions about money are made in politics and those kind of people, they are not involved in data, they have no clue about technical issues whatsoever. They think oh, it's boring. We have much to do with policy, we create policies and this just the actual operation, putting the policy to work out. We don't want to be bothered with that.

And that's a big issue. If you really want to have a successful digital government, you need really serious funding. it needs to be on the political agenda as well. For instance, if you have a look at <redacted: irrelevant detail>, everything about data and digital transformation is a political issue. Their Prime Minister has an IT background. <redacted: irrelevant detail>. So as a result, there is a completely different mindset within government.

And as a result, <redacted: government is developing in a ridiculous pace, if you compared to the <country of organization 8> base because they have the political support, the political backup, and they have the funds. So they are working with solids and with data poles and in all kinds of technical solutions to make the old data network more ethical again and make it work with regard to privacy as basically try dealing with these issues. In <country of

organization 8>, we see that we have a problem, but nobody's building a solution yet because of that issues.

*<The interview proceeded with questions specific about Esri as an open data intermediary. This part is omitted from this transcript as it is not relevant and used for this particular research paper>*

**Interviewer**

Yeah. OK. Thank you so much.

**Interviewee 8.A**

You're welcome.