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Study of the terms of use applied in the INSPIRE resources and their usability barriers

Location interoperability tools and guidance

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Contents

Abstract

In a short period of time, we have witnessed the increasing proliferation of (geospatial) data, thanks to initiatives such as the re-use of public sector information (PSI) and Open Data initiatives. In addition, the emergence of the *Internet of Things* orchestrating and communicating with any sensor and increasing citizen participation are intensifying the volume of data being made available online.

Paradoxically, not all this data is necessarily ready and easy to be re-used, especially when combining it with other data sources. Technological interoperability barriers such as formats or access control mechanisms are often cited, but the variety of data policies applicable have an impact on data reuse, too.

The INSPIRE Directive 2007/2/EC, in this regard, has helped to enhance access to harmonised geospatial data that has with a direct or indirect impact on the environment, requiring the Member States to adopt measures for the sharing of spatial datasets and services between public administrations. However, although INSPIRE supports open government principles and 'open data' initiatives, the Directive has not specified a common data policy; as INSPIRE applies to existing data and, therefore, involves the competence and policies of the thousands of data providers within the scope of the Directive. This flexibility is reflected in the current complex ecosystem of data policies that data users are now confronted with, especially when INSPIRE's data could be re-used beyond its core European environmental policy purpose.

Understanding the extent to which there are barriers to interoperability related to data policy from a user's perspective is, thus, the main driver for the production of this report.

More specifically, this work has a twofold scope. Firstly, it provides an overall picture of the data-sharing approaches that can be found within metadata provided by the Member States, and accessible through the INSPIRE Geoportal. Secondly, it highlights the user barriers to data-sharing by analysing this metadata, with as a first step leading to possible solutions to reduce them.

The key findings of the work are that there is a high variety of applicable licenses with different degrees of openness used in INSPIRE, along with the presence of important user barriers. The barriers range from the low quality of the metadata to help users judge what they can do related to data-sharing to a lack of uniformity to the constraining conditions for access and use, potentially impacting on interoperability.

The work has been performed as part of Action 1.17, *A Reusable INSPIRE Reference Platform*[1] under the *Interoperability Solutions for European Public Administrations* (ISA) Programme.

[1] https://joinup.ec.europa.eu/collection/are3na

1 Introduction

The INSPIRE Directive [1], is aimed at establishing a European Spatial Data Infrastructure (SDI) for data with a direct or indirect impact on the environment. It offers access to data between the public administrations of the European Union, where a large amount of data is already available through the INSPIRE Geoportal[2], which harvests records from the Member States and some EFTA countries. This data, however, is not always ready for immediate use, for issues of technical and/or legal interoperability.

Regarding the latter, despite supporting open government and, therefore, initiatives that support increased openness of organisations and their data, INSPIRE has not specified a common data policy under which Member States' data should be shared. Only a few requirements and recommendations are made for data providers to supply details in the INSPIRE metadata description files. In the metadata the *'Conditions for Access and Use´* of a dataset are indicated for a user, alongside possible derogations on public access (Art. 17 (7) of the Directive). Data-sharing could be limited when *'this would compromise the course of justice, public security, national defence or international relations'* and, according to Art. 13 of the Directive, *where such access would adversely affect* international relations, public security or national defence. The emphasis on a limited implementation burden on organisations by reusing existing content has led to a complex ecosystem of data-sharing approaches. This situation makes data usage often a challenge for those wishing to build applications or perform analysis about environmental issues across borders, to highlight only a couple of examples.

To have more insights on the *'Conditions for Access and Use'* applied in the INSPIRE resources, the Joint Research Centre (JRC) has carried out a desk study sampling metadata records from the INSPIRE Geoportal. The study has been conceived as a research experiment, where we have placed ourselves in the role of a normal user trying to find and then understand if the terms of use provided through the INSPIRE metadata records are sufficient to help determine if a particular resource could be readily used. The study covers both the collection and analysis of the formal characteristics of the terms of use, as well as the provisions included in them, as a way to understand not only which is the 'legal panorama' they apply to but also what difficulties data users may face in practice. Although the data records in the geoportal are dated January 2016, and knowing that more data has become available, most of the issues found with this analysis are still valid and should be corrected with adequate measures to increase the opportunities for data reuse. Our user approach involves experiencing barriers through several stages. The first of these being the availability of terms of use, followed by the language they are presented in, their format and structure, as well as the quality of the content and, finally, the provisions they contain.

The document, therefore, outlines our approach and findings from this work. We provide some background information regarding what is the legal and technical frame of INSPIRE to contextualise the study and for those less familiar with SDIs (Section 2). We then outline the methodology for this research, based on source data and the particular aspects we have targeted, including the different variables under analysis and our statistical analysis approach (Section 3). We then present our results (Section 4) and a summary of the users' barriers encountered (Section 5). To conclude, some good examples, as well as possible lines of future work, are highlighted (Sections 6 and 7). Readers are also invited to read the Annexes of the report, including a list of abbreviations and definitions of some of the key technical terms we use.

It is also worth noting what this report is not about. It will not be assessing the technical or legal compliance of the resources being shared through INSPIRE, even if the *Legal acts* (Directive and Implementing Rules*)* and *Technical Guidelines* for implementers are often used to interpret the contents we examine. It is, instead, intended to be a means to reflect on the barriers to using data across borders and sectors in Europe today as a basis for wider discussion with INSPIRE stakeholders as both data providers and users.

[2] http://inspire-geoportal.ec.europa.eu/

2 Background

2.1 The legal framework

Chapter V of the INSPIRE Directive provides the framework for data-sharing conditions. Several of the terms used in this section relate to the technical approach of INSPIRE, where further details are available on the INSPIRE Knowledge Base website[3].

One of the main aims of INSPIRE is to mandate the exchange the spatial data sets between the Member States' public authorities or third parties acting on their behalf (Art.4); and between those and the institutions and bodies of the Community '*for the purposes of public tasks that may have an impact on the environment'*. The only limitation INSPIRE sets in regards to data-sharing is that '*any such charges and licenses must be fully compatible with the general aim of facilitating the sharing of spatial data sets and services between public authorities.* (Article 17)'.

Nevertheless, the Directive also covers the reuse of INSPIRE resources by the public. In this regard, more specifically in Article 14, the Directive states that at least Discovery Services (those that help share dataset metadata with the INSPIRE Geoportal, for example) and View Services (those that provide samples of map content) '*shall be available to the public free of charge*', unless specific conditions indicated in the Article prevent this. However, it also indicates that View Services *'may be in a form preventing their re-use for commercial purposes*'. Besides, if '*public authorities levy charges for the services'* for view services, download services and invoke services, '*Member States shall ensure that e-commerce services are available. Such services may be covered by disclaimers, click-licenses or, where necessary, licenses'*.

Therefore, it is up to the Member States and, more specifically, to their data providers to choose the licensing and pricing conditions applying to their resources, including the possibility of making a commercial use of them, provided they comply with the Directive and its related Implementing Rules on data-sharing [2]. However, even if not legally binding, some INSPIRE licenses and Service Level Agreement (SLA) templates are provided within the '*Regulation on access to spatial data sets and services of the Member States by Community institutions and bodies under harmonised conditions*' [3] ready to be reused by data providers in the scope of INSPIRE.

It is worth noting that even if INSPIRE does not mandate resources to be provided according to a specific license, as an activity of the European Commission, it fully supports the free flow of data principle and, as such, the 'open data' trends as one of the Digital Single Market (DSM) enablers. In this sense, the European Commission applies the Public Sector Information and Open Data throughout the *COMMISSION DECISION on the reuse of Commission documents* [4] and the INSPIRE Directive is explicitly mentioned in the *EC Communication on Open Data* [5] as a complementary policy contributing to the reuse of data.

Besides, being the INSPIRE datasets provided by Public Administrations or on behalf of them, it would be logic that most of the resources could fall under the *Directive 2013/37/EC on the re-use of public sector information*[6].

Finally, knowing that INSPIRE deals with any information that could have an impact on the environment, a part of the datasets contained in the INSPIRE Geoportal fall under *Directive 2003/4/EC on public access to environmental information* [7] which indicate that the sharing of data should be somehow guaranteed.

[3] http://inspire.ec.europa.eu/

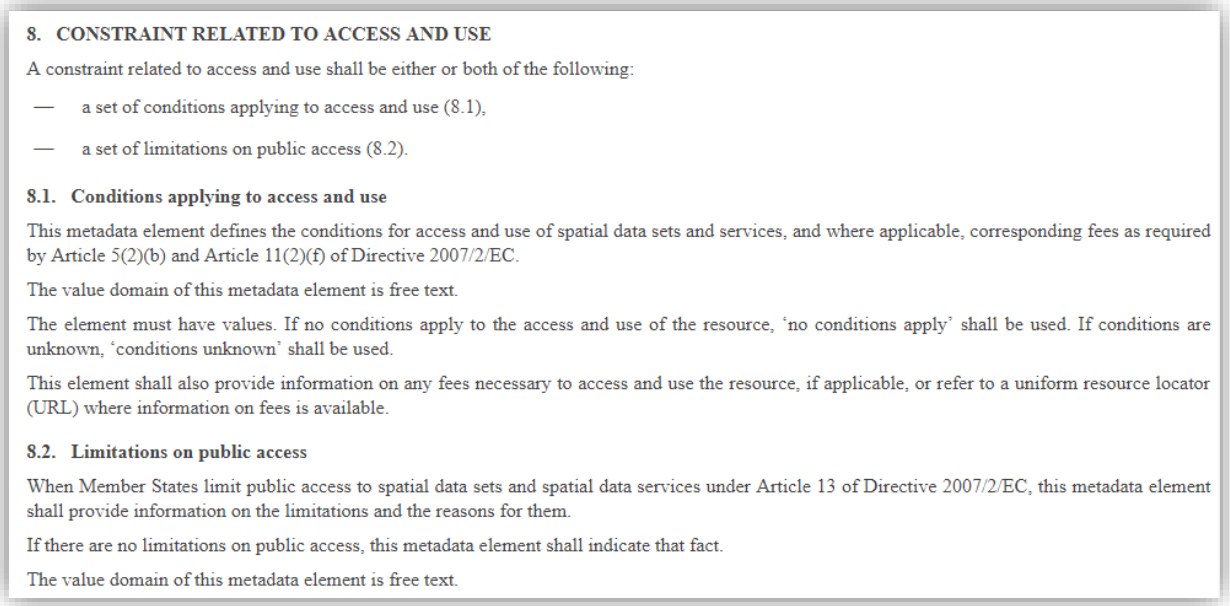
2.2 Data-sharing information within the INSPIRE resources

The Implementing Rules 1205/2008 on Metadata [8] require information on data-sharing conditions of both datasets and network services to be included within the resources' metadata files.

The metadata elements involving the terms of use information are '*Conditions for Access and Use*' and '*Limitations on Public Access´.* In the latter, data holders can indicate the possible derogations for the restriction on public access (Article 17 of the INSPIRE Directive).

These metadata elements are designed as free text fields. However, some "pre-defined" text is required under certain conditions (**Figure 1**).

Figure 1: Articles on the constraints related to access and use



8. CONSTRAINT RELATED TO ACCESS AND USE

A constraint related to access and use shall be either or both of the following:

— a set of conditions applying to access and use (8.1),

— a set of limitations on public access (8.2).

8.1. Conditions applying to access and use

This metadata element defines the conditions for access and use of spatial data sets and services, and where applicable, corresponding fees as required by Article 5(2)(b) and Article 11(2)(f) of Directive 2007/2/EC.

The value domain of this metadata element is free text.

The element must have values. If no conditions apply to the access and use of the resource, 'no conditions apply' shall be used. If conditions are unknown, 'conditions unknown' shall be used.

This element shall also provide information on any fees necessary to access and use the resource, if applicable, or refer to a uniform resource locator (URL) where information on fees is available.

8.2. Limitations on public access

When Member States limit public access to spatial data sets and spatial data services under Article 13 of Directive 2007/2/EC, this metadata element shall provide information on the limitations and the reasons for them.

If there are no limitations on public access, this metadata element shall indicate that fact.

The value domain of this metadata element is free text.

In addition, several INSPIRE technical guidelines have been issued proposing how to encode the metadata files and how to implement the different types of Network Service that INSPIRE uses to exchange data and metadata (View Service, Download Service, Discovery Service etc.).

To improve the interoperability and consistency with existing standards, the technical guidelines for INSPIRE Network Services contain recommendations[4] that map existing standard elements from the OGC services *GetCapabilities* operations or the Atom specifications consistent with INSPIRE metadata elements. More specifically, the recent revision of the metadata technical guidelines (version 2.0)[9] includes additional recommendations to restrict the free text fields related to the terms of use information by making use of certain code values[5].

To be able to capture and classify accurately the information provided by the INSPIRE resources, it is necessary to understand the rules and recommendations for encoding laid down by INSPIRE. To this end, in **Annex 1**, we provide detailed information on how the information regarding the terms of use should be encoded and represented both at the metadata record level and at the Network Service level.

[4] Note that in some cases, these additional recommendations have been wrongly expressed as requirements.
[5] http://inspire.ec.europa.eu/metadata-codelist/ConditionsApplyingToAccessAndUse

2.3 Guidance on access to INSPIRE resources under harmonised conditions

In addition, as already mentioned, with a recommendation value, some additional guidelines on the *'Regulation on access to spatial data sets and services of the Member States by Community institutions and bodies under harmonised conditions'*[3] have been provided.

In this document are included templates for potential INSPIRE agreements '*which can be used by the Member States or public authorities within the context of INSPIRE, although using them is not compulsory*. *The use of these INSPIRE Agreements allows a higher level of harmonisation to be reached'*.

Namely, the provided templates are:

- the ***Basic INSPIRE Agreement*** available in Annex B of the guideline document consisting of two sub-agreements,
    - a licence for spatial data sets and
    - a service level agreement for spatial data services.

In Annex C of the guideline document, there are available templates for a

- ***Specific INSPIRE Agreement for datasets and services*** consisting of two sub-agreements:
    - a ***specific INSPIRE licence template for spatial data sets***
    - moreover, a template for a ***specific INSPIRE service level agreement for spatial data services***.

In the next figure, an overview of the different clauses contained in every model is provided.

Figure 2: Overview of the different clauses contained in the INSPIRE licences agreements templates

	Basic INSPIRE Agreement			Specific INSPIRE agreement		
	Common part	Licence for spatial data sets	Service level agreement	Common part	Licence for spatial data sets	Service level agreement
Preamble	X			X		
Parties				X		
Definitions	X			X		
Subject		X	X		X	X
Grant	X			X		
Allowed use	X			X		
Public access				X		X
Unauthorised use	X			X		
Acknowledge-ment of intel-lectual proper-ty rights		X	X		X	X
Warranties	X			X		
Security	X			X		
Liability	X			X		X
Quality and conformance					X	X
Pricing and payment	X			X		
Access and delivery	X			X		
Processing of personal data	X			X		
Assignment and sub-licensing				X		
Sub-contracting				X		
Force majeure	X			X		
Contact per-sons				X		
Conflict resolu-tion	X			X		
Applicable law and jurisdiction				X		
Termination		X	X	X	X	X

3 Methodology

In this part of the report, we outline the methodology carried out for capturing and processing the terms of use information provided in INSPIRE metadata records.

In broad terms, the research performed is a form of desk experiment, where the data analyst takes the role of a typical user who would be interested in potentially reusing certain resources (i.e. datasets and services) retrieved through the INSPIRE Geoportal, even for commercial purposes.

To determine if he or she can make use of the data or services described by the metadata records, some information on the applicable terms of use need to be available and/or accessible to determine if they are suitable for their reuse purpose.

To do this, we will proceed to a 'deconstruction' of the terms of use texts with the aim to assess several formal and content-related aspects.

Inevitably, the experiment has a high degree of subjectivity given that the same data analyst has interpreted and treated the information manually (no automatic classification is feasible currently).

This methodology allows us to take the role of any user and experiment through their journey by identifying potential user barriers. At the same time, we are aware that, despite having tried to be as accurate as possible, some errors could have arisen. The source of these errors could be due to misinterpretation of the wording in the terms of use texts, or simply because the terms of use details have not been properly translated by the automatic translation tools used. In any case, these potential errors already hint the existence of some usability barriers.

3.1 Conventions

We are aware of the complexity and proliferation of terms existing in INSPIRE when speaking about 'terms of use'. The concepts and the labels of the technical implementation often diverge both in the naming and (apparent) scope.

We could have used the word 'licence', but that would not have reflected properly the complex reality, as most of the resources do not make use of a 'licence document' (Refer to ***section 0.*** to know more).

To clear up any doubt that the reader may have, in this brief section we present a list of terms that will be used from now on. Although they can be used as synonyms in several situations, we will try to be rigorous in their use throughout the report.

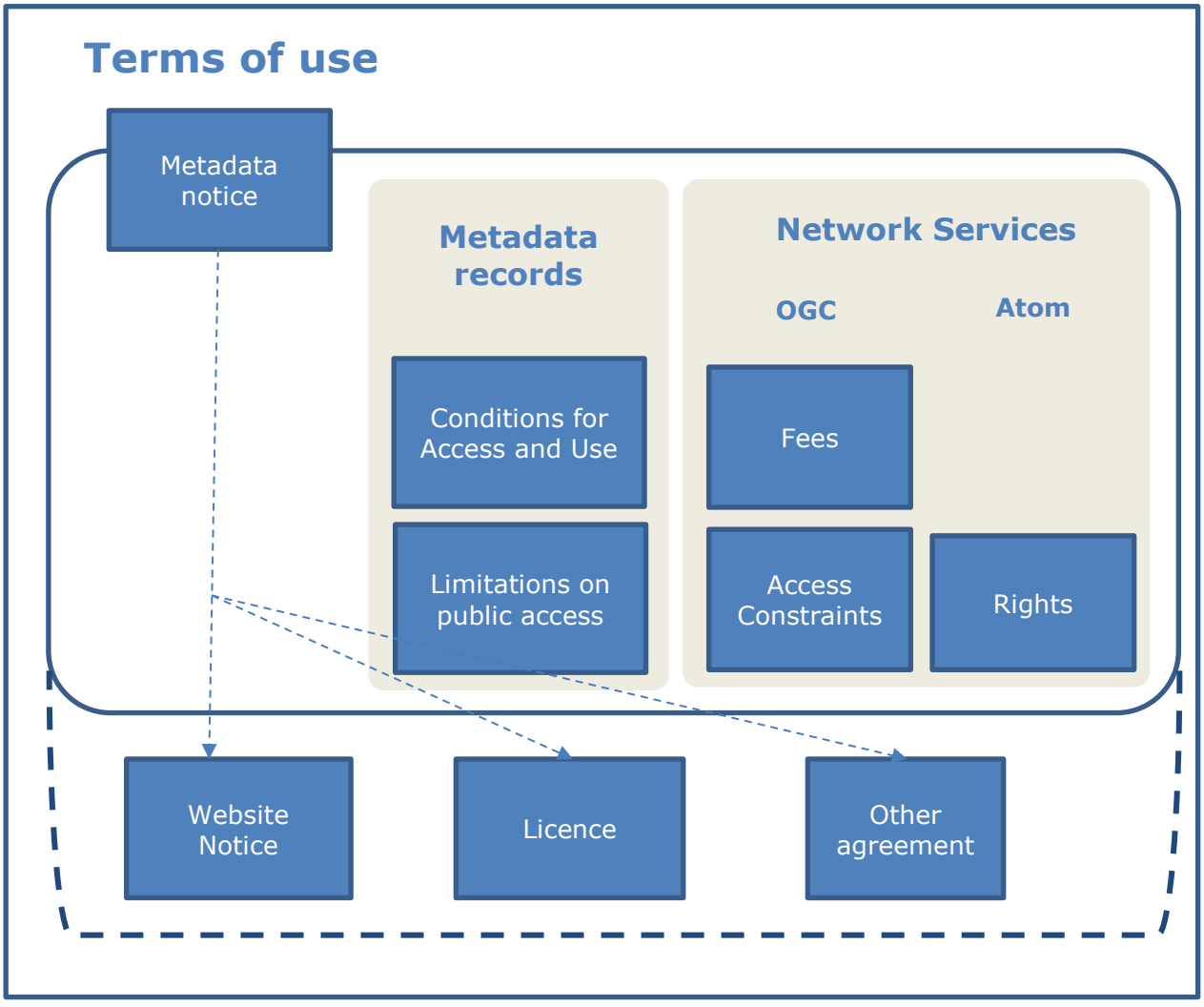
- **Terms of use**: Combination of information provided by any of the resources available. This can be based solely on the information provided by the metadata notices available in the description files or together with information referred to and developed externally, be it in the form of website notice, licence agreement or any other type of arrangement.
- **Metadata notice**: Terms of use provided within the description information of the Metadata records and/or the Network Services. They comprise information related to the conditions on use as well as (limitations) on access. External references to more detailed terms of use might be available through website notices, licence agreements or another type of arrangement.
- **Website notice**: Online legal page containing the terms of use applicable to the website content.
- **Licence**: Terms of use in the form of a dedicated agreement document including different provisions. According to the European ´ *Guidelines on recommended standard licences, datasets and charging for the reuse of documents´* [10], the following sections should appear within the licence document: scope, attribution, exemptions, definition,

disclaimer of liability, consequences of non-compliance, information on licence compatibility and versioning.

- ***Conditions for Access and Use*:** information contained in the metadata element named the same way for the ISO 19115 metadata records.
- ***Limitations on public access*:** information contained in the metadata element named the same way for the ISO 19115 metadata records.
- ***Fees***: refers to the information contained in the 'Fees' metadata element of the OGC Network Services metadata (*GetCapabilities* document). Despite the name, this information should be mapped and aligned with the **metadata records** ´Conditions for Access and Use´ and not include only the information on potential charges.
- ***Access Constraints/Rights***: we refer to the information contained respectively, in the 'Constraints' metadata element of the OGC Network Services metadata (*GetCapabilities* document) and the 'Rights' metadata elements for the Atom download services.

In **Figure 3**, a schema representing the extent of the meanings of the terms previously defined is provided.

Figure 3: Relation of terms used in this report



3.2 Source data

3.2.1 Provenance of the data

To produce the study we have reused a part of the data collected during a complementary activity that was looking into the *Access Control mechanisms for Authentication, Authorization & Accounting* (AAA) put in place by EU Public Administrations, also carried out as part of ARE3NA.

The document *´INSPIRE Geoportal Protected Services Review'* [11] offers a detailed description of the process followed to harvest the data, together with the structure of the output file.

The source data enclosed **29,876** metadata records collected on the 22/01/2016 from the INSPIRE Geoportal.

The data contained a range of details coming from specific elements of the metadata records obtained from the INSPIRE Geoportal. Some additional processing also took place to check, on the first hand, if the resources were publicly accessible and, on the other hand, to verify if other usage and policy issues emerged. For the latter, we performed direct requests to the Network Services (that offer access to the actual data) and stored the responses provided.

We are aware of the dynamic data collected by the INSPIRE Geoportal. For this reason, the source data we have worked with must be considered as a snapshot and, therefore, some Member States or their organisations could be misrepresented in the results presented below.

Although we do not analyse the most recent data, the experiment remains of value because it offers a baseline for future monitoring activities and we believe most of the barriers are still present.

3.2.2 Structure of the source data

The most relevant fields contained in the source data to support the terms of use analysis are the following:

- **MD: Conditions for Access and Use_en** (taken from the Metadata records). The metadata element *´Conditions for Access and Use´ defines the conditions for access and use of spatial data sets and services, and where applicable, corresponding fees as required by Article 5(2) (b) and Article 11(2) (f) of Directive 2007/2/EC*.
- **MD: Limitations on Public Access_en** (taken from the Metadata records). This INSPIRE metadata element defines when Member States limit public access to spatial data sets and spatial data services under Article 13 of Directive 2007/2/EC, this metadata element should provide information on limitations and the reasons for them.
- **NS: Fees_en** (taken from the Network Services requests), this element should map and contain the contents of the *'Conditions for Access and Use´* metadata element.
- **NS: Constraints/Rights_en** (taken from the Network Services requests) this element should map and contain the contents of the *Limitations on Public Access*, metadata element.

To aid the analysis, some changes were made to the original data:

— Because of the multilingualism allowed by INSPIRE, the content coming from relevant free text fields were automatically translated into English. The Google Translate service[6] was used for this purpose. Those fields can be recognised by the suffix '**_en'**.

— For practical reasons, all the empty fields where there was no information in origin or where it has been unable to access or retrieve the values, have been replaced by the string [BLANK].

A detailed view and explanation of all the fields contained in the source data refer to **Annex 1**.

3.2.3 Contents of the original data

Before treating the data policy aspects targeted by this study, it is necessary to provide an overview of the source data content.

As shown in **Table 1**, more than three-quarters of the data harvested belonged to Germany (with 23,772 resources), followed by France (9.75%), Spain (3.24%) and the UK (1.79%). The rest of the countries counted less than 1% of the total of the resources reviewed.

Table 1: Number of resources harvested by country of origin

Country code	Absolute number	Relative number
DE	23,772	79.57%
FR	2,909	9.74%
ES	967	3.24%
UK	534	1.79%
NL	259	0.87%
SE	200	0.67%
AT	193	0.65%
PL	163	0.55%
BE	102	0.34%
PT	97	0.32%
DK	96	0.32%
FI	92	0.31%
SK	78	0.26%
NO	78	0.26%
IT	67	0.22%
CZ	57	0.19%
LV	45	0.15%
EE	41	0.14%
LT	36	0.12%
HR	26	0.09%
LU	21	0.07%
IE	17	0.06%
IS	9	0.03%
RO	7	0.02%
MT	4	0.01%
EL	2	0.01%

[6] https://cloud.google.com/translate/?hl=en

Country code	Absolute number	Relative number
LI	2	0.01%
SI	2	0.01%
Total	**29,876**	**100%**

Those numbers do not simply show the number of resources made available by the countries but also how the country organises their publication.

There are Member States applying a centralised approach to supplying metadata, while others apply a federated approach. The approach impacts on the number of resources available in the INSPIRE Geoportal but it does not affect the representativeness of the present terms of use study. For this reason, charts representing the different analysed variables by country will be provided too.

It is also important to note that the resources collected can be very varied in the type Network Service involved, territorial coverage and, in some cases, economic value. Regarding the type of resource described by the metadata harvested (see **Table 2**), the INSPIRE View Services based on OGC WMS were the most numerous, followed next by the Atom download services.

Table 2: Resources harvested by its type

Type of resource	Absolute number	Relative number
WMS	18,834	63.04%
ATOM	8,307	27.80%
WFS	2,479	8.30%
CSW	220	0.74%
WMTS	24	0.08%
WPS	12	0.04%
Total	**29876**	**100%**

3.3 Data capture

While the source data provided most of the ´raw material´, we still needed to model the information contained in it to be able to draw meaningful conclusions.

This modelling activity involved both the analysis of the source information for its storage in a structured way and the capture of additional parameters. The data capture is particularly relevant for those terms of use that are partly or fully developed by external resources such as licence documents.

The data modelling/acquisition targeted different dimensions of the terms of use:

1. **Examination of the metadata elements on terms of use:** the purpose was to check how the terms of use are expressed within the INSPIRE metadata including the language used, the availability of the information and the coherence of the information across the INSPIRE infrastructure. This phase involves often examining the information available at both the metadata record level and the Network Service level.

This deep analysis has helped us understanding if the information is propagated properly through the whole infrastructure.

2. **Examination of the terms of use:** this dimension focuses on the pure terms of use aspects by observing both the formal characteristics and the provisions defined and those non-defined, too. During this phase, we often have to go beyond the information provided by the metadata information (metadata notice) since the provisions are developed in external documents.

    2.1. **Terms of use identification:** Classification of the terms of use by looking at different aspects, such as the type of document where the terms of use are laid down and the way of accepting the terms, among others aspects.

    2.2. **Formal examination:** Inspection of the layout and functionalities accompanying the text, language used, translations available, versioning systems, summary versions, etc. Those verifications are applied only on the externally defined terms of use, such as licence documents.

    2.3. **Content examination:** Analysis of the texts provided, be it in the form of metadata notice or in the form of externally managed terms of use. We have gone through them with an aim to capture any explicit provision granting permissions, applying conditions and/or setting prohibitions. To be as systematic as possible the provisions included in the analysed texts have been matched with articles available respectively in the '*Required Permissions*' and '*Acceptable Conditions*' sections of the *Open Definition* [12] defined by the Open Knowledge Foundation (OKNF) to be conformant with their concept of *Open Licence*. An output of this last examination is the assessment of the degree of openness (as perceived by our 'data analyst'), according to the information available.

The full list of variables checked, together with the range of values designed are available in **Annex 4**.

4 Results

In this section, the results obtained from the information captured are presented. To this end, statistical tables and illustrations of the analysed variables are provided.

In the first place, the results from the examination of the metadata details on terms of use are provided, followed by the results from the in-depth examination of the terms of use texts.

Every time a difficulty has been faced or could have become an obstacle for the data analyst, it is highlighted as a user barrier and indicated in brackets **[User barrier: XXX].** For the convenience of the reader, every user barrier is linked to its description.

4.1 Metadata on the terms of use

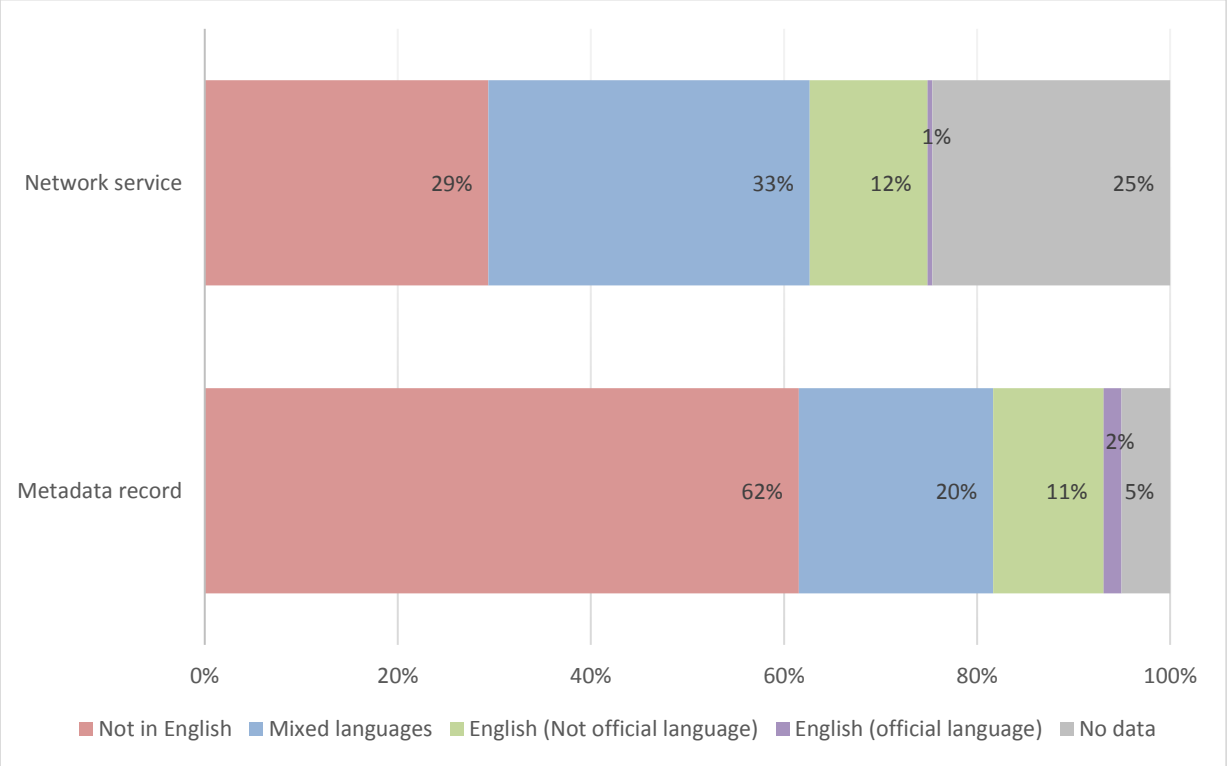
4.1.1 Language used

One of the most obvious obstacles that first appears to a user when trying to read the information on terms of use included in the INSPIRE metadata is the language used for expressing them, since they can appear in any of the European Union official languages.

As shown in **Figure 4**, a 62% of the metadata records had their terms of use expressed in a language other than English [**User barrier: Unknown Language**]. This situation seems to improve when looking at the Network Service metadata level where the usage of mixed languages (i.e. the combination of the local language and English) is more common, although our dataset has a higher proportion of empty fields (25% of the Network Services did not provide this information, or the information was not retrievable).

On a positive note, we found that more than 10% of resources were expressed in English, even if it was not the official language of the data provider, potentially pointing to some interest of them to make content available to a wider user-base.

Figure 4: Languages used in the metadata to express the terms of use



4.1.2 Availability of information

The simple counting of the different values for each one of the analytical metadata fields shows the heterogeneity of the information that we dealt with. As shown in **Table 3**, the number of unique values found to express the terms of use at the metadata record level is very high. [**User barrier: Excessive number of terms of use**]

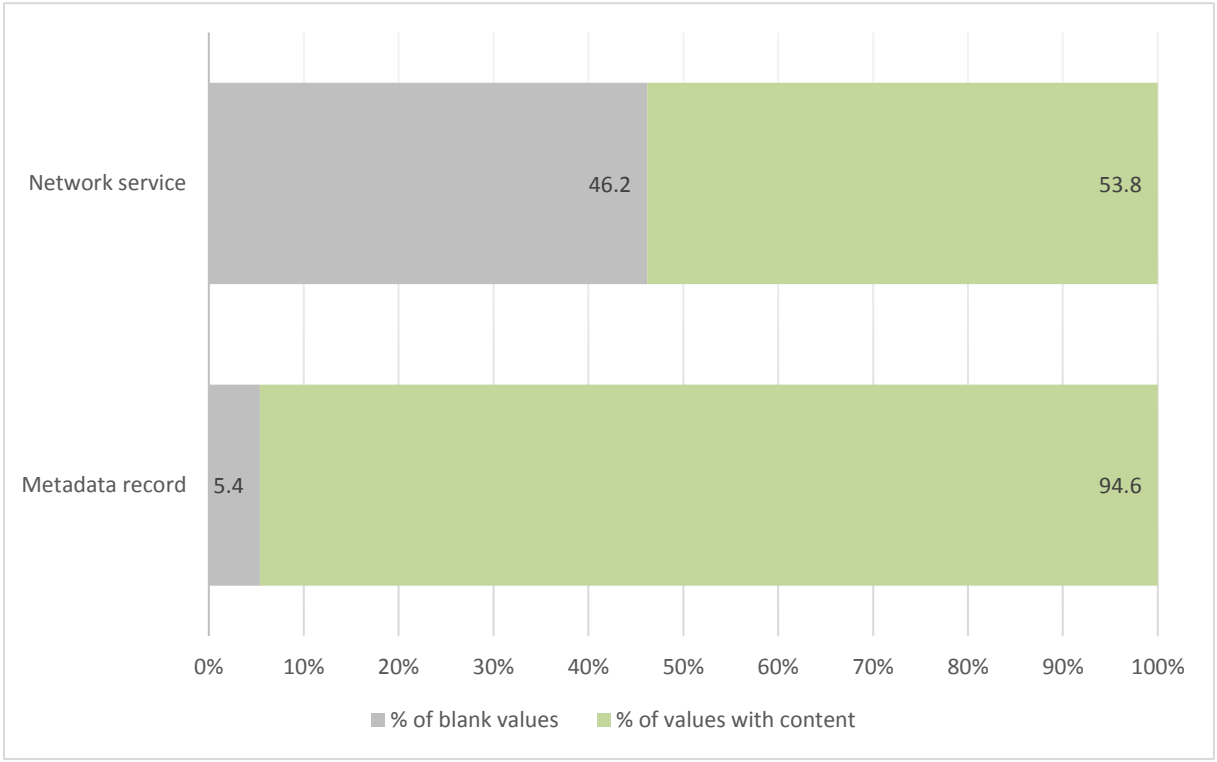
Table 3: Number of distinct values found for `*Conditions for Access and Use* `and `*Limitations on Public Access´*

Number of distinct `*Conditions for Access and Use*`	**Number of distinct `*Limitations on Public Access*`**
809	1,387

Paradoxically, despite the high number of different terms of use, not all the resources have them included in their descriptions. This is an important barrier because it lets the user in the absolute ignorance regarding the potential use that he could make on top of the resources. By default, unless the user decides to directly contact the data provider to have an explicit approval, he or she should treat the resources as fully protected without any right granted.

As shown in **Figure 5**, more than 5% of the resources of the INSPIRE Geoportal did not contain any information within the field on *'Conditions for Access and Use'.* This number increases dramatically at the Network Service level, where more than 46% of them did not provide this information, or the information could not be retrieved[7]. [**User barrier: Lack of information on terms of use**]

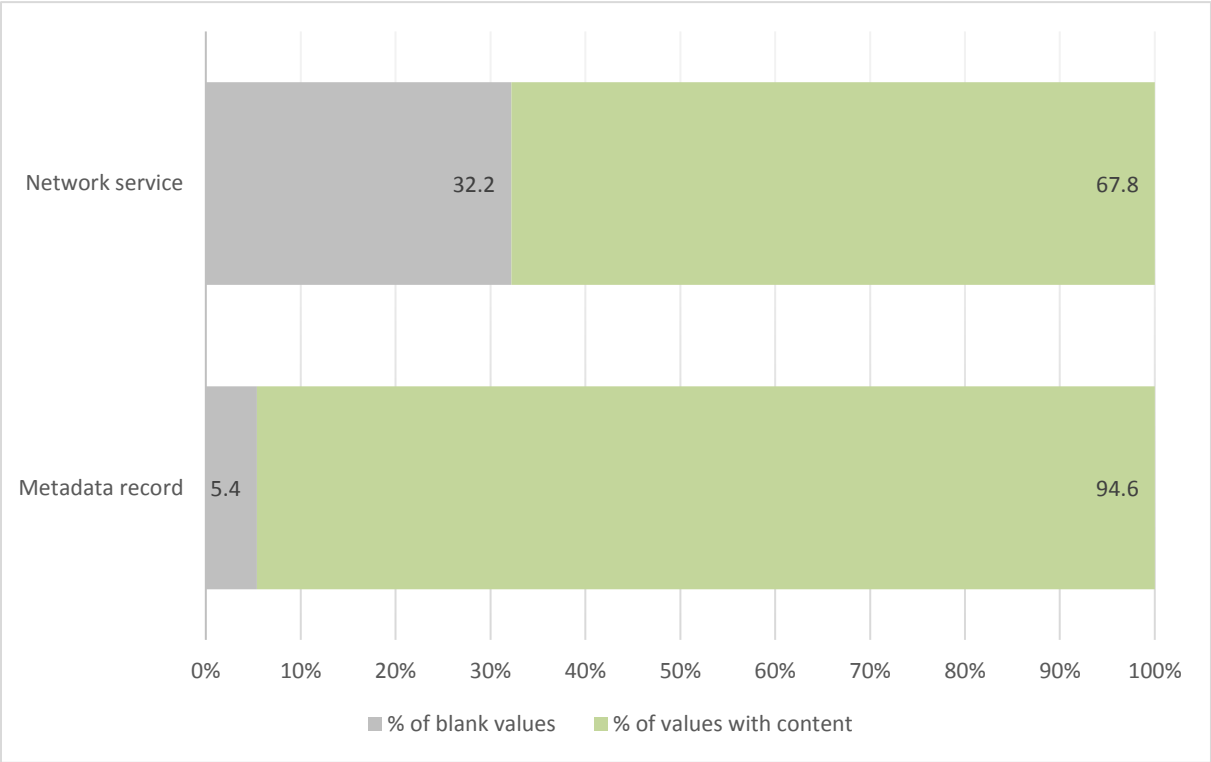
Figure 5: Availability of information for `*Conditions for Access and Use´* metadata element at both the metadata record and resource level



[7] Reasons for not being able to extract the information were mostly that the web service was not working and that the URL provided for reaching the web service was incorrect or outdated.

If we look at the information available within the fields related to the *Limitations on Public Access*, in **Figure 6**, the situation is similar.

Figure 6: Availability of information for `*Limitations on Public Access*´ metadata element at both the metadata record and resource level



The complete lack of information regarding the terms of use is an issue. This is especially the case when accessing the information directly from the network services, since their description is more often missing than at the level of the metadata records.

Even if the natural way of discovering SDI resources is through metadata records, Network Service can often be accessed directly, without passing via the metadata record. **If this happens, the user has fewer opportunities to know the conditions of access and use that apply to the data contained within the service**.

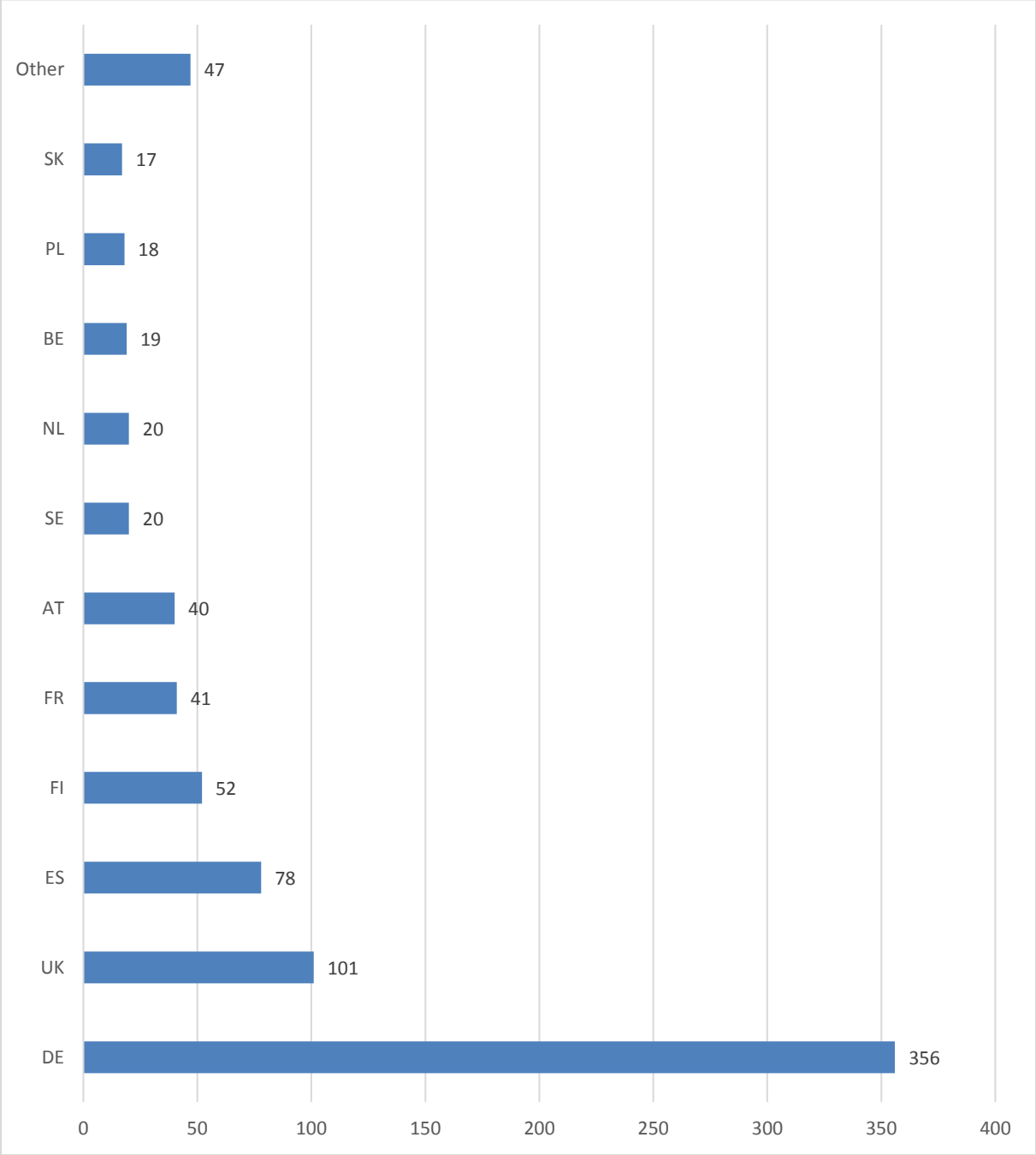
4.1.3 Variability of content

A reason for the proliferation of different terms of use is the lack of normalised content. As metadata elements are defined as free text fields, it is easy to find the same concept written with different variants due, for example, to the likely presence of typos. [**User barrier: Unstructured content**]

In addition, the terms of use described in the INSPIRE metadata can be given in official languages, which makes heterogeneity of content more likely.

Figure 7, shows how the 809 different `*Conditions for Access and Use*' texts are distributed across Europe.

Figure 7: Number of unique texts found for the ´*Conditions for Access and Use*´ by country



We can see how three countries (Germany, United Kingdom and Spain) provided more than half of the available texts on terms of use. This indicates that the user not only has to deal with many different terms of use texts, but also that the distribution by country is very unbalanced, implying more effort may need to be targeted in certain case.

Another aspect of this heterogeneity can be drawn by observing the relationship between the number of texts on `*Conditions for Access and Use* `and the number of responsible organisations providing data, as shown in **Table 4**.

Table 4: Relation of number of unique texts for 'Conditions *for Access and Use´* by responsible organisation

Country	*Number of different 'Conditions for Access and Use´* texts	Number of Responsible Organisation	Relation of conditions by responsible organisation
DK	6	2	3.0
LI	2	1	2.0
NL	20	12	1.7
LV	8	5	1.6
IS	6	4	1.5
LU	6	4	1.5
MT	3	2	1.5
CZ	10	7	1.4
HR	7	5	1.4
SK	17	13	1.3
IE	7	6	1.2
FI	52	51	1.0
EL	1	1	1.0
SI	2	2	1.0
BE	19	20	1.0
IT	11	13	0.8
SE	20	24	0.8
UK	101	133	0.8
LT	2	3	0.7
RO	2	3	0.7
EE	5	8	0.6
NO	9	15	0.6
AT	40	70	0.6
PL	18	37	0.5
ES	78	168	0.5
DE	356	795	0.4
PT	5	13	0.4
FR	41	249	0.2
Total	**809**	**1658**	**Average = 0.5**

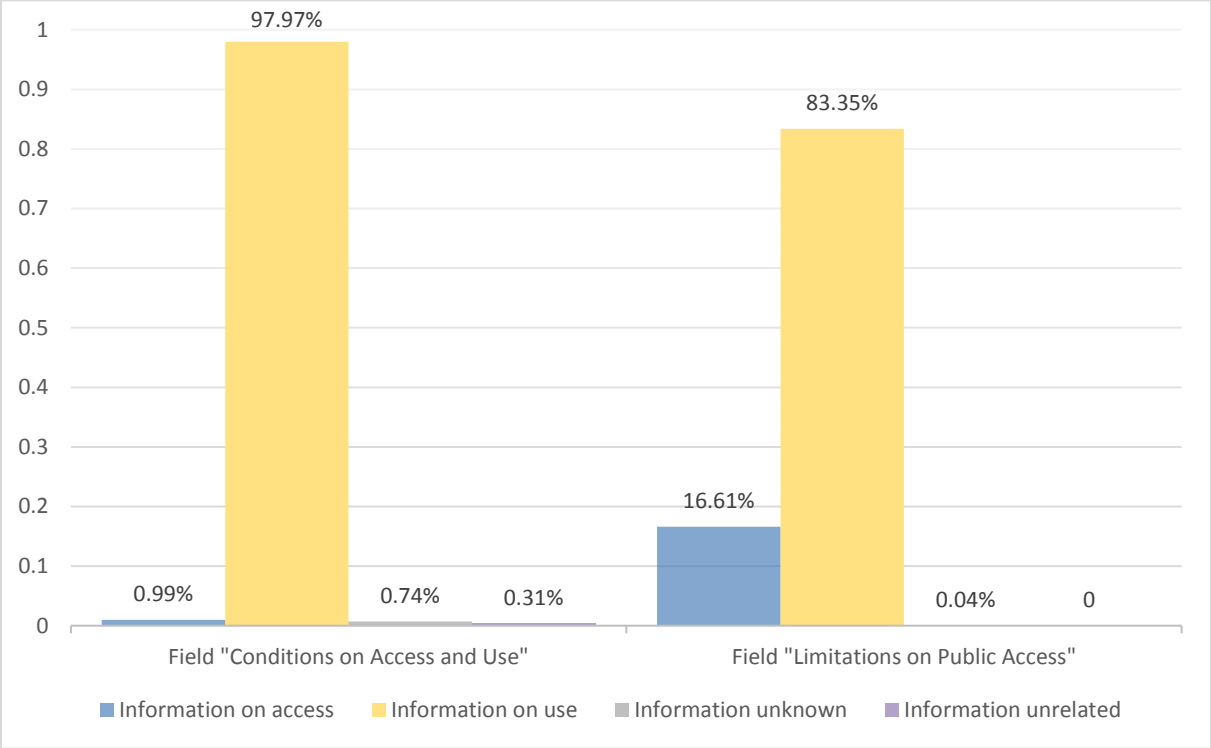
If we assume that the responsible organisation's labels and the texts on `*Conditions for Access and Use´* are exempt from errors, the closer to zero the relation indicator is, **the more homogeneous and harmonised the terms of use at the organisation level.** In this case, France, Portugal or Germany would be rather homogenous, whereas Denmark, the Netherlands or Latvia are among the more heterogeneous.

This relationship could be an indicator helping to identify possible **dual-licensing** mechanisms, that is, different terms of use provided by a single data provider. However, a more in-depth analysis is needed to confirm these ideas. The only conclusions that can be drawn so far are that the strings provided to describe the *'Conditions for Access and Use´* are more or less syntactically harmonised within organisations.

4.1.4 Quality of the metadata

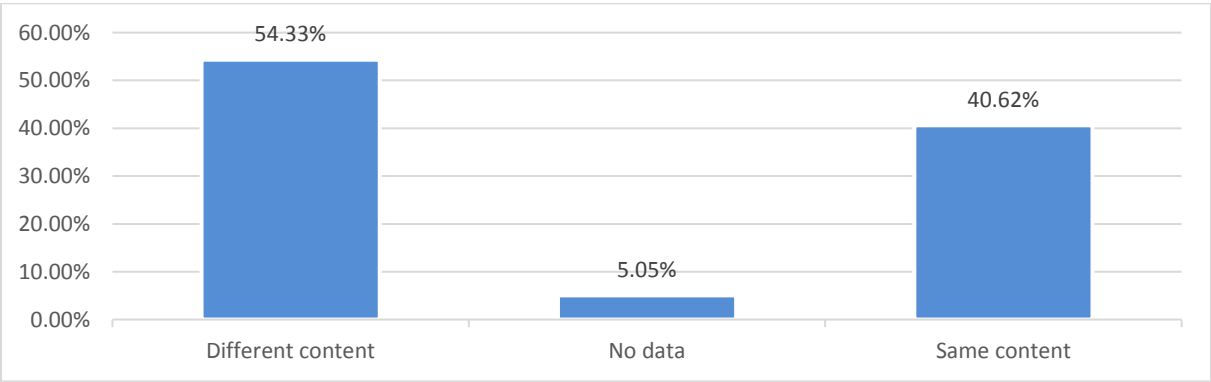
Where there is data available, the analysis of the type of information written within both the `*Conditions for Access and Use*´ and `*Limitations on Public Access*´ (**Figure 8**) indicates that they would often appear to be used incorrectly. Around 83% of the contents within the `*Limitations on Public Access*´ were containing information on the use that we believe should appear within the `*Conditions for Access and Use*´ metadata field. Often the information is swapped between both metadata fields, or simply there is no information that we can access at all. [**User barrier: Inaccurate/ wrong information**]

Figure 8: Type of information provided within the `*Conditions for Access and Use*' and `*Limitations on Public Access*´ fields



An automatic comparison of the contents provided in both fields has proven, as shown in **Figure 9**, that too often the content across the fields is repeated. This practice does not add value to the quality of the information and, it does not follow the new Metadata technical guidelines 2.0, where it states that those fields are meant to include different information (See **Table 12**).

Figure 9: Literal comparison of information provided by the metadata records' fields



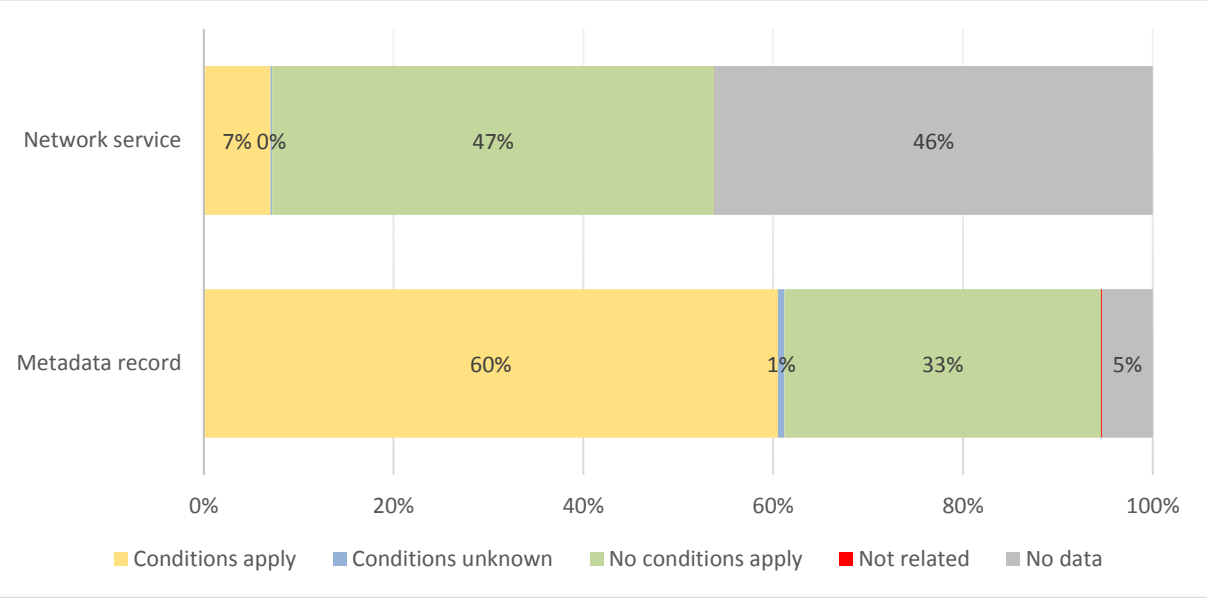
4.1.5 Coherence across the infrastructure

The assessment of the terms of use of the resources at both the metadata record and network service levels has unveiled an important degree of misalignment between them. [**User barrier: Mismatching information across the infrastructure**]

In **Figure 10**, we can see that 60% of the metadata records declared that `Conditions apply´, while the number decreases to 7.1% at the Network Service level.

Although the metadata records describe the Network Services' resources, we can see that the content is referring to conditions of use and access often and they do not propagate properly, being often even incoherent. This situation can send misleading information to the user and offers little legal certainty, especially in those cases where the user reaches the network service directly, something that tends to be more poorly described.

Figure 10: Conditions applying to the resources according to the metadata information at both the metadata record and resource level



4.1.6 Coherence with reality

According to the aggregated information extracted from the *Limitations on Public Access field´*, we can see in **Table 5** that very few resources were applying restrictions on the access to the resources.

However, it should be noted that most of the proper access information was not provided, as already shown in **Figure 6**.

Table 5: Access mode to the INSPIRE resources based on the *´Limitations on Public Access´* information

Access mode to the resource	Metadata record	Network Service
Public	15.2%	5.8%
Restricted	1.4%	0.1%
Unknown/Not mentioned	83.3%	94.1%
Total	**100%**	**100 %**

To understand if the mode of access indicated in the metadata description represents the real behaviour of the Network Services, a comparison between the information provided at the metadata record level and the results returned from the former activity on Access Control (by sending live queries to capture the HTTP response code) was done. (See Section 3.2.1).

The results provided in **Table 6** indicate that, in general, most of the resources were openly accessible when no information on access was provided. However, a small amount of the resources was found to be restricted (1.2%) despite indicating this fact in the metadata, or even cases where the resources were meant to be restricted were, in fact, openly accessible [**User barrier: Diverging information with reality**].

Table 6: Comparison of information on public/restricted access from metadata

Comparison Metadata / Request Network Service	Percentage
Unknown/Not mentioned - Public	81.7%
Public - Public	14.5%
Unknown/Not mentioned - Restricted with AAA	1.2%
Restricted - Public	1.0%
Public - Restricted with AAA	0.7%
Restricted - Restricted with AAA	0.5%
Unknown/Not mentioned - Not working	0.4%
Public - Not working	0.0%
Total	**100%**

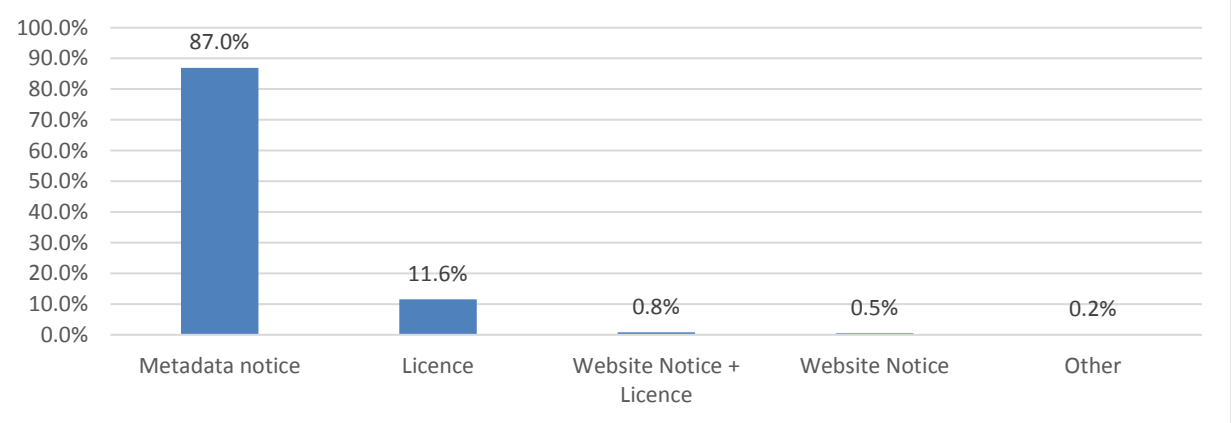
4.2 Examination of the terms of use

4.2.1 Terms of use identification

4.2.1.1 Document type

The review of the information provided by the metadata records has allowed us to collect, classify and interpret the different terms of use applied by the data providers under INSPIRE. As shown in **Figure 11**, the vast majority of the terms of use (87%) analysed were directly expressed using metadata notices, that is, embedded within the metadata description files. Less than 12% referred to an external resource such as a licence or a website notice to develop the provisions.

Figure 11: Terms of use according to the place where the provisions are developed

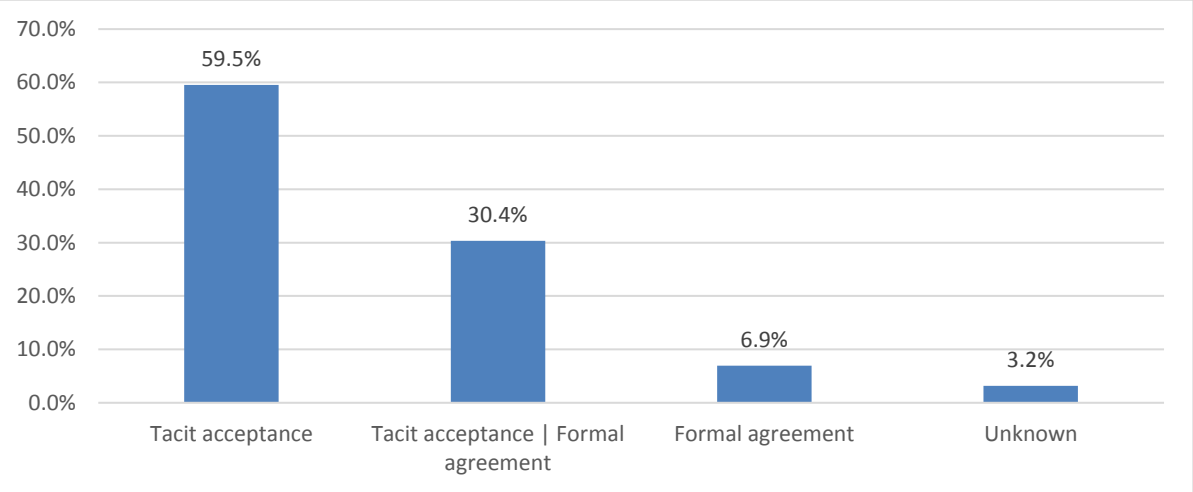


We saw in **Figure 10** that a 33% of the resources analysed at the metadata record level, indicated *´No conditions apply´*. That means that more than 50% of them had their applicable conditions written using the metadata notices, following **Figure 11**.

4.2.1.2 Acceptance mode

Considering the acceptance of terms of use, we can see in **Figure 12** that most of them allow the tacit approval of data usage. Only a small portion of the resources required a previous written or formal consent (6.9%). However, around a 30% of the terms of use presented a hybrid behaviour, whereby the consent was tacit until the moment when more rights than the 'by default granted' were needed. In such cases, a formal agreement should take place (as Dual licensing).

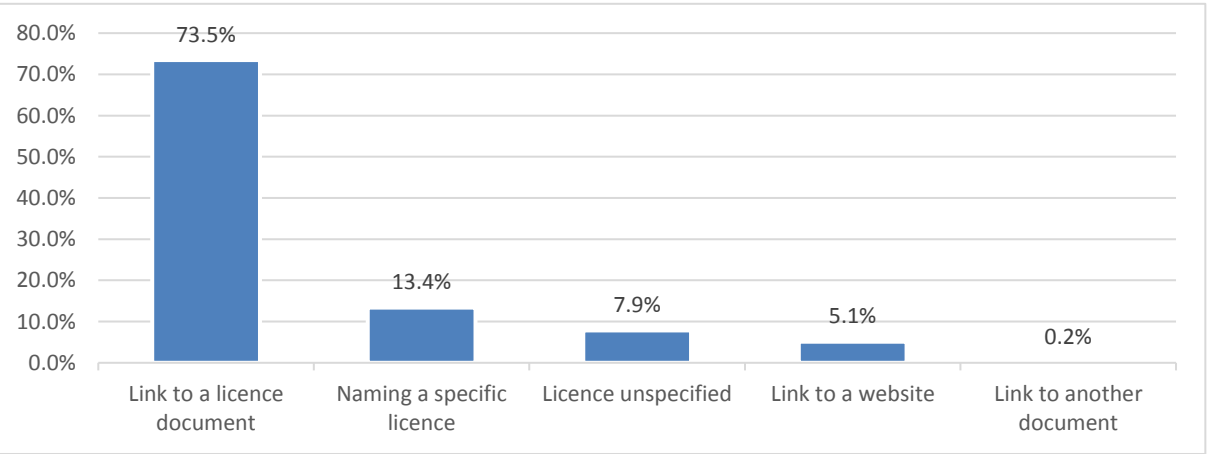
Figure 12: Terms of use by their acceptance mode



4.2.1.3 Reference to external terms of use

We saw in **Figure 11**, that around 15% of the resources analysed had their terms of use developed externally, mainly through a licence or a website legal notice. However, as shown in **Figure 13**, almost 8% did not specify any concrete licence document, even if they had mentioned being governed by a licence. This situation obliges the user to contact the data holders and request individually further details [**User barrier: Terms of use provided under request**].

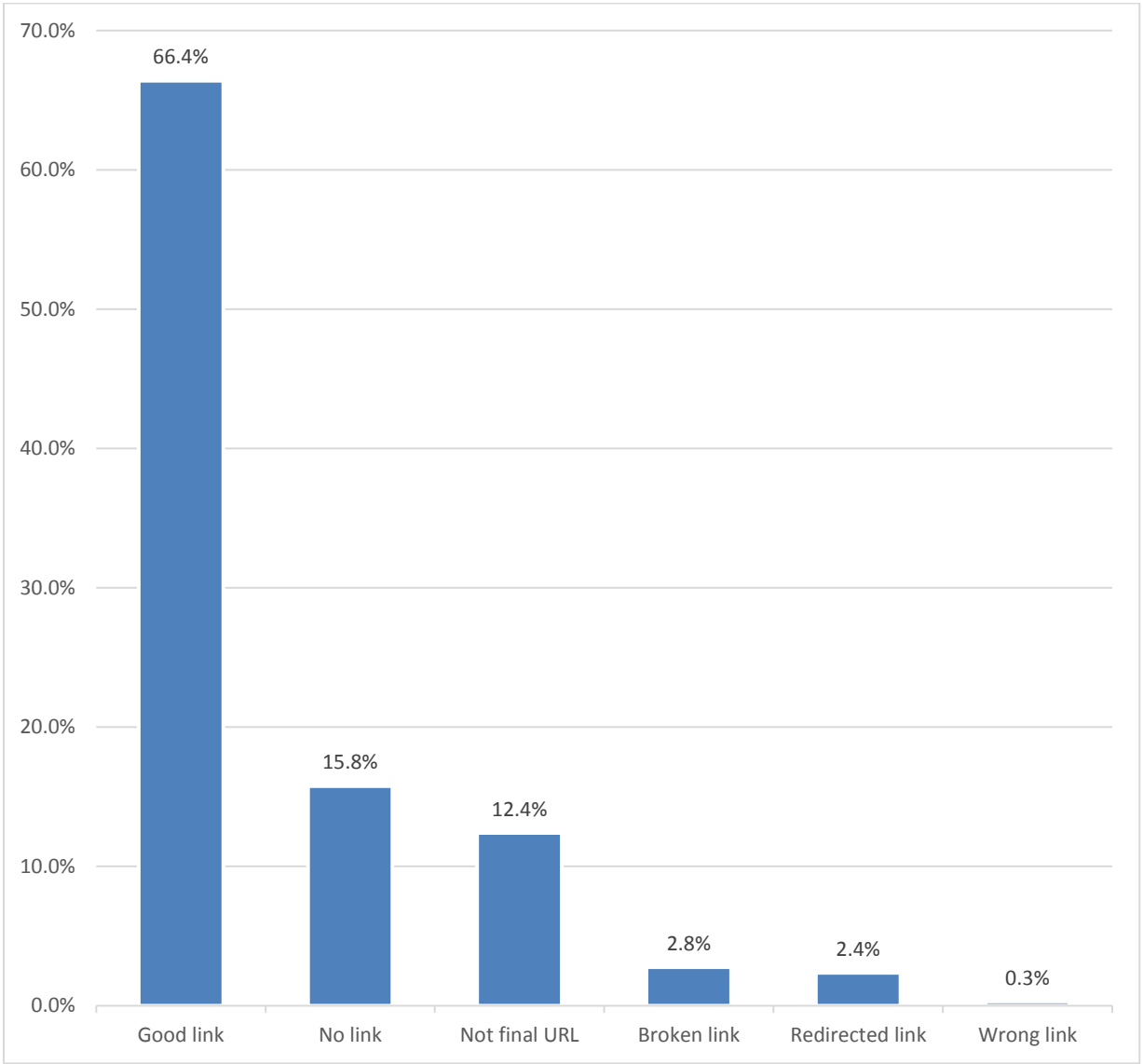
Figure 13: Ways of referring to external terms of use (from metadata records information)



Another obstacle in this sense is the fact that more than 13% of the resources were merely naming the title of the licence (in their language). This practice makes it difficult to know how data can be used when it is not (readily) possible to reach and retrieve the terms of use documented. A related issue encountered in this sense is the lack of specification of a concrete version of such documents. This is particularly problematic for the user and, for our analysis, we have used the most up-to-date version, although we believe that some legal uncertainty can remain. [**User barrier: Reference to a licence by its name only**].

In addition, other issues were encountered while trying to reach the licences referenced through a link. As shown in **Figure 14**, most of the licences provided a working link (more than 66%). However, 15% had no link at all [**User barrier: No link to licence]** or provided a link that required the user further clicks to reach the final licence document (12,4%) [**User barrier: No final link**]. A small portion of the cases (more than 5%) had outdated links that were automatically redirected, that were broken or that simply were wrong [**User barrier: Broken/wrong link**].

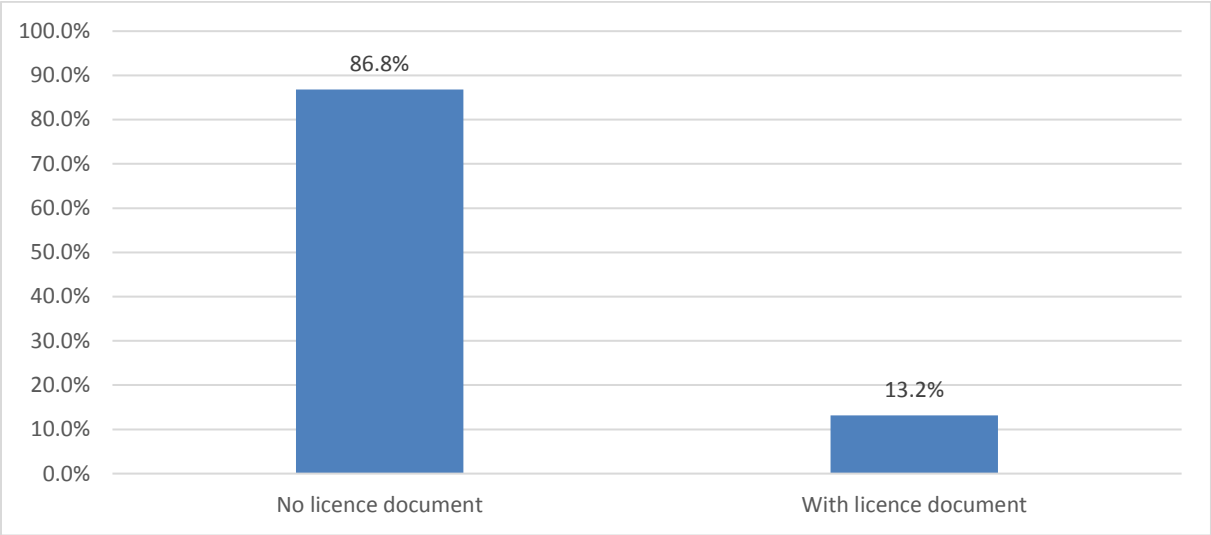
Figure 14: Issues encountered with external links



4.2.1.4 Resources ruled under a licence document

Only 13% of all resources analysed referred to a specific licence document, as shown in **Figure 15**.

Figure 15: Proportion of resources whose terms refer to specific data licence documents

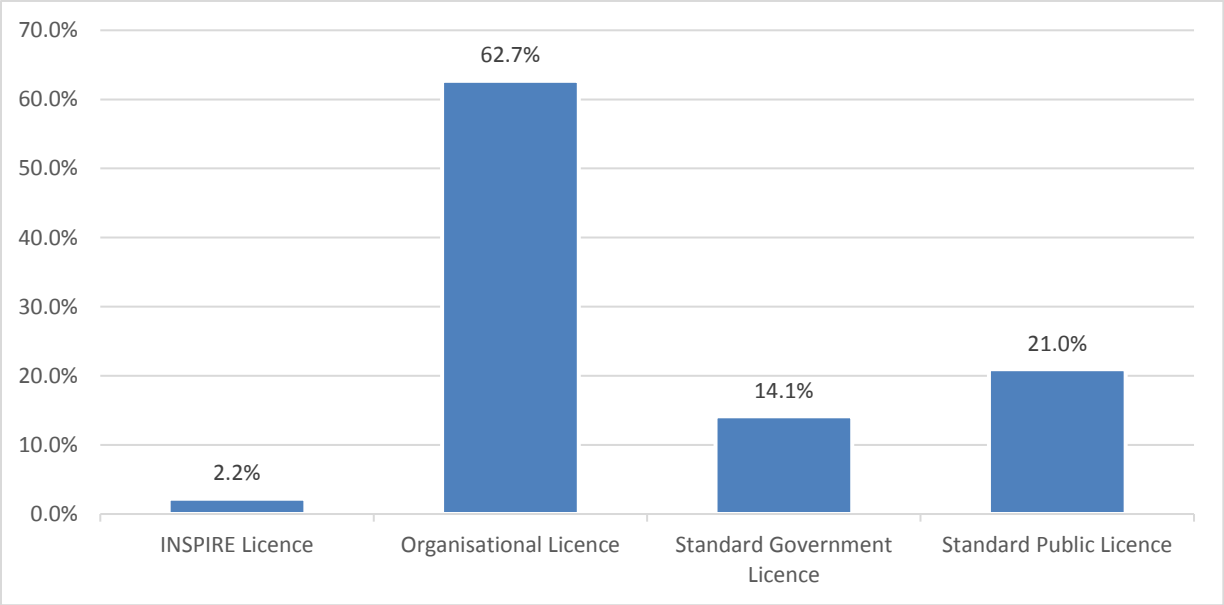


In absolute numbers, this amount corresponds **to 86 different licence documents**. The number decreases if we do not consider the different versions and jurisdictions [**User barrier: Heterogeneity of licensing documents**]

4.2.1.5 Licensing schemes

By digging into this small portion where licensing agreements are applied (**Figure 16**), 60% of them were seen as ´Customised Organisational Licences´. In absolute numbers, this was followed by the application of standard public licences (21%) and standard government licences (14%).

Figure 16: Data licences found by type



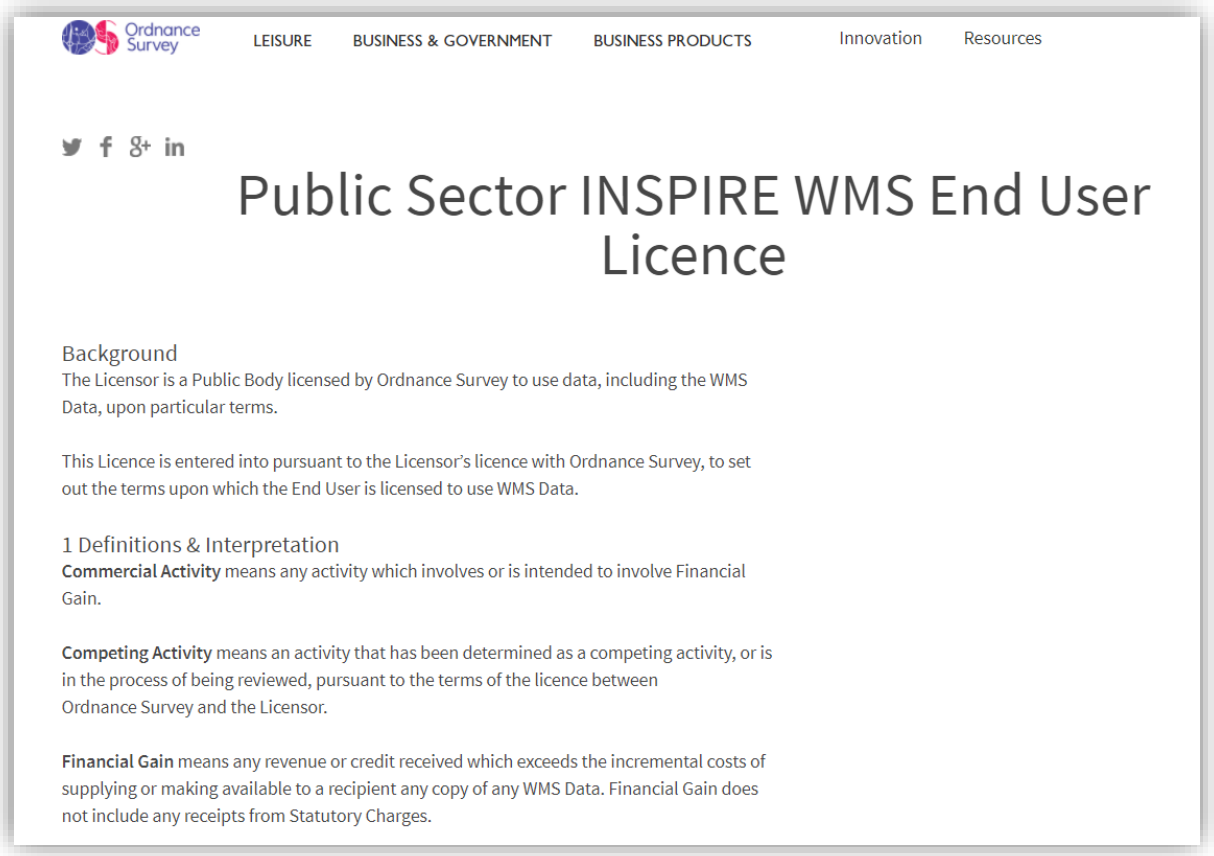
It is worth noting the existence of specific organisational licences that we have called `INSPIRE licences´ representing the 2% of the total of resources under a licence in our

sample. We have deemed relevant their isolation because of their explicit use in the context of INSPIRE.

It must be clarified that the 'INSPIRE licence' subtype is not a legal text mandated by the INSPIRE Directive. Those are specific agreements laid down by some organisations to share their INSPIRE-relevant geospatial resources.

The organisations adopting those licenses are mainly the UK's Ordnance Survey issuing a generic INSPIRE licence '*INSPIRE End User Licence*'[8] and specific licence for WMS resources: '*Public Sector INSPIRE WMS End User Licence*'[9], alongside Ireland's Ordnance Survey with its '*NON-COMMERCIAL INSPIRE LICENCE*'[10] and the Czech Mapping Agency: '*Základní INSPIRE licence pro e-shop geoportálu*'[11].

Figure 17: Screenshot of the UK's Ordnance survey Public Sector INSPIRE WMS End User Licence



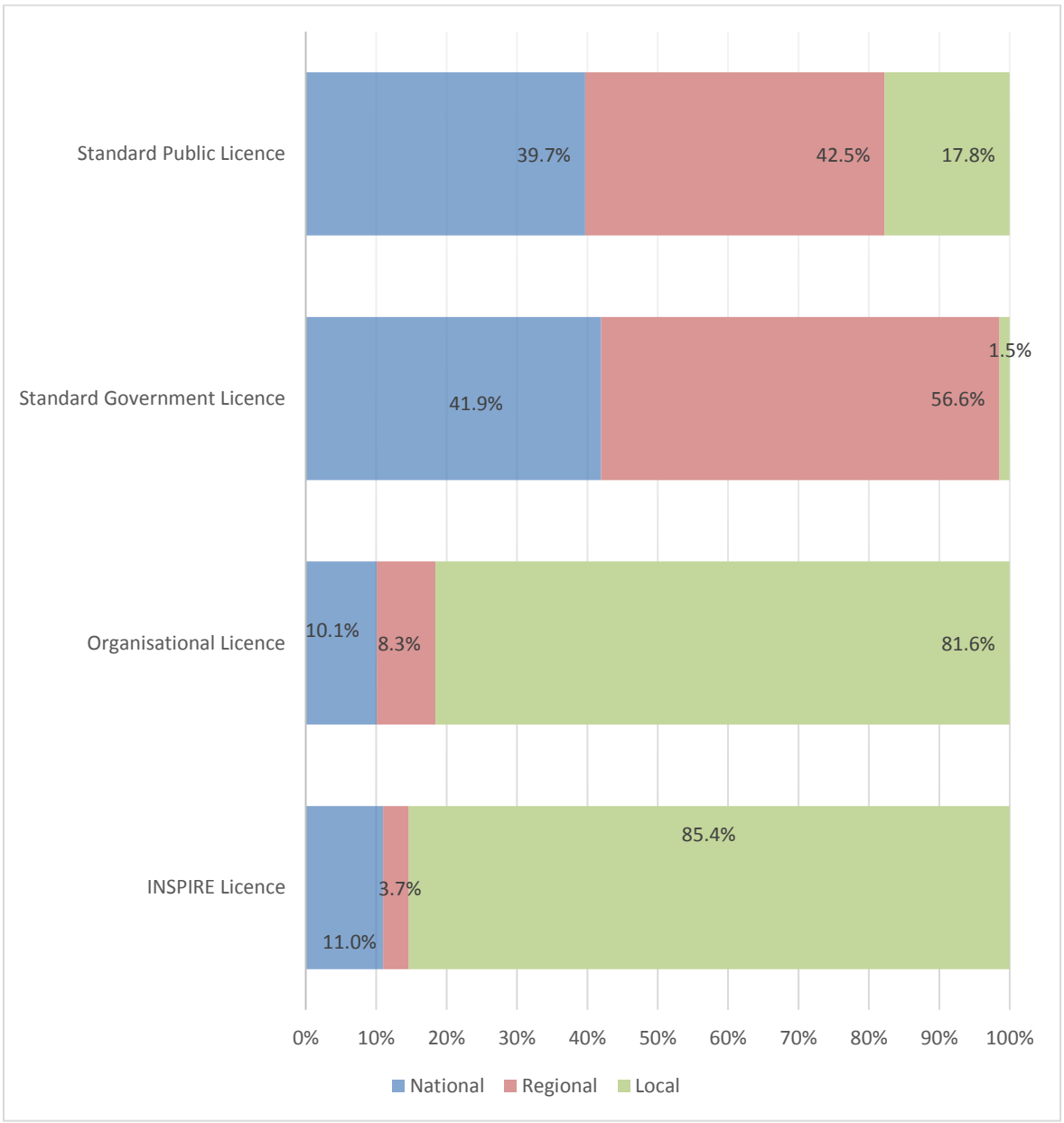
Source: https://www.ordnancesurvey.co.uk/business-and-government/licensing/licences/web-mapping-service-end-user-licence.html

The Czech example, however, based its legal text on one of the optional templates provided within the *Annex B: Basic INSPIRE Agreement* included in the technical guidelines *'Regulation on access to spatial data sets and services of the Member States by Community institutions and bodies under harmonised conditions*'[3].

[8] https://www.ordnancesurvey.co.uk/business-and-government/public-sector/mapping-agreements/inspire-licence.html
[9] https://www.ordnancesurvey.co.uk/business-and-government/licensing/licences/web-mapping-service-end-user-licence.html
[10] https://www.osi.ie/wp-content/uploads/2016/08/Non_commercial_Inspire_licence.pdf
[11] http://geoportal.gov.cz/c/document_library/get_file?uuid=f6c85e3e-fc70-4cbb-80fc-7532d4a57572&groupId=10138

The above-aggregated numbers, however, hide the way those licences are applied. If we look at how the different schemes are applied, considering the organisational administrative level, we can see that national and regional levels of the public administrations tend to use standard public licences and National government licences more often than local administrations.

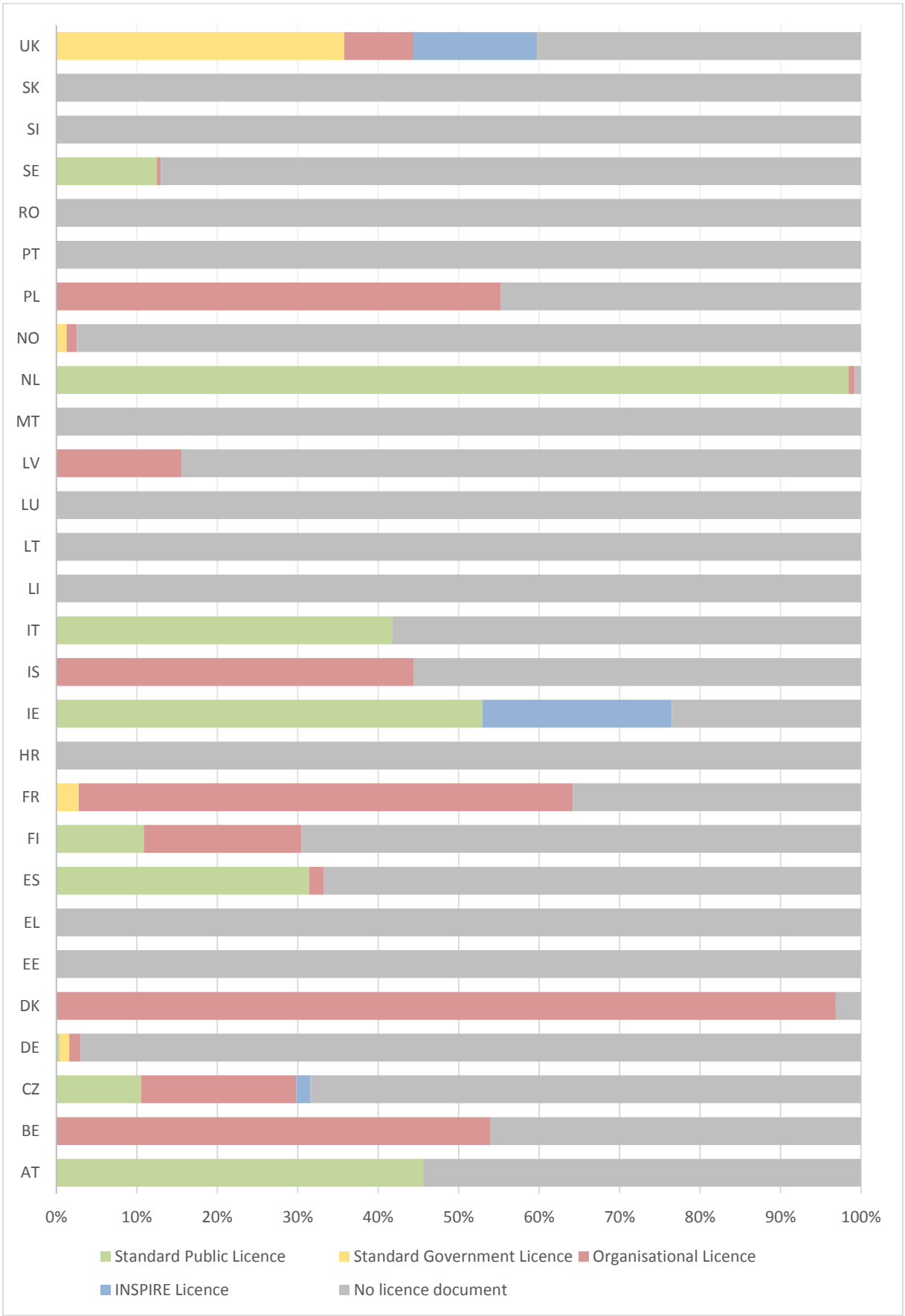
Figure 18: Type of data licence documents used by the different administrative levels



However, the application of the different licensing schemes is also variable from one country to another, as shown in

Figure 19. There are countries where the licence agreements are not used at all, (e.g. Estonia, Greece, Luxembourg), while others make an extensive use of it (e.g. Denmark, Netherlands, United Kingdom). This chart also allows us to understand which specific licensing schemes are the most used by country. The standard public licences, for example, are very much used in Austria, Ireland and Spain, but especially in the Netherlands. Instead, other countries such as Denmark, Germany or France, for example, tend to opt for organisational licences.

Figure 19: Application of licensing schemes by country

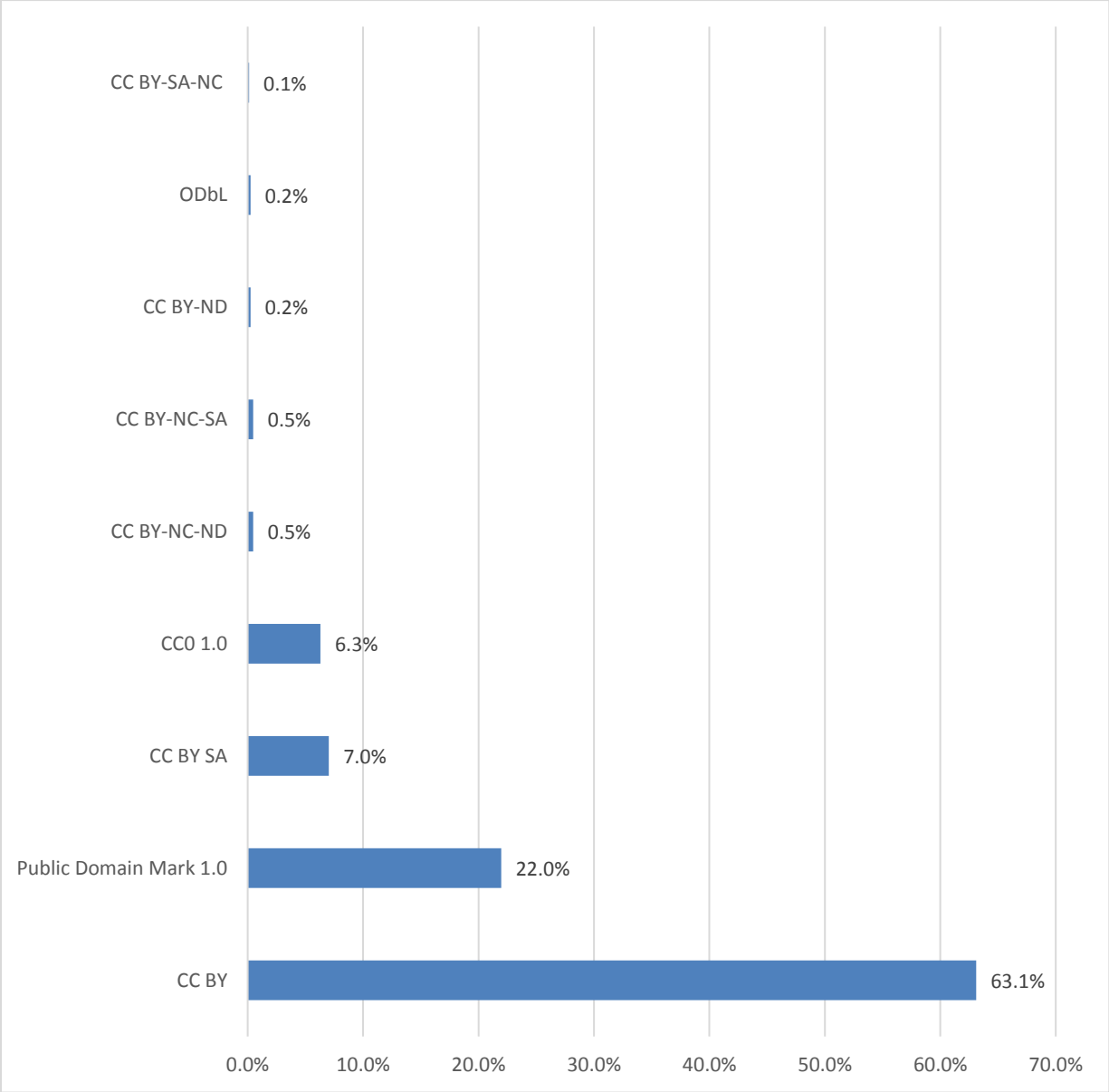


4.2.1.6 Standard public licences

Among the standard public licences, the *Creative Commons*[12] ones are practically the only ones being used. Only a couple of resources were found to be making use of *Open Database License (ODbL)*[13].

More specifically, the *Creative Commons Attribution* subtype (*CC-BY*) is by far the most often used (more than 60%), followed by the *Public Domain Mark 1.0*[14] (**Figure 20**).

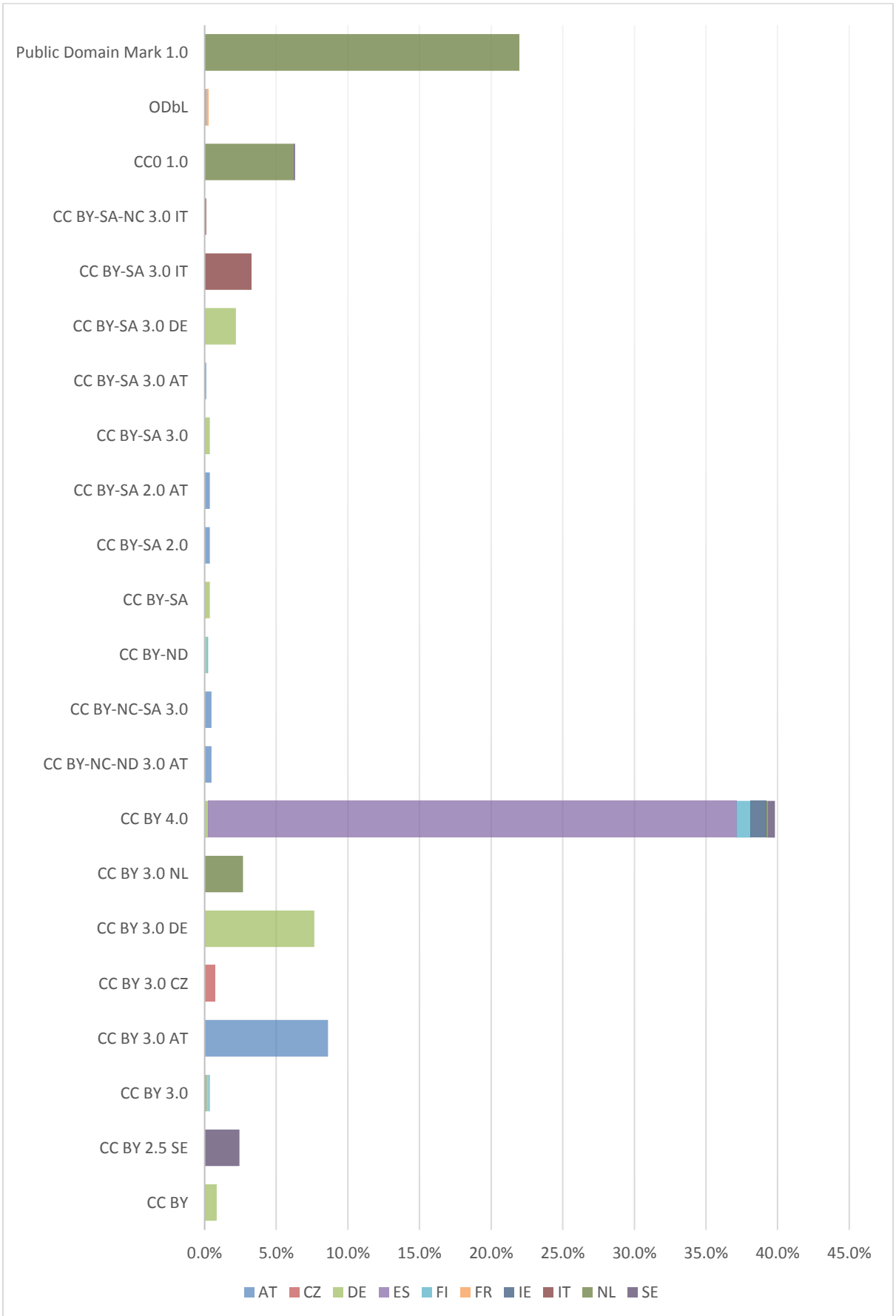
Figure 20: Use of standard public licences by type



In **Figure 21**, the list of the different versions of standard public licences used is made available. In this regard, we can see that *CC-BY 4.0*[15] version is the most used of all, and it is extensively used by Spain. The *Public domain Mark 1.0* licence is quite often applied, although exclusively by The Netherlands.

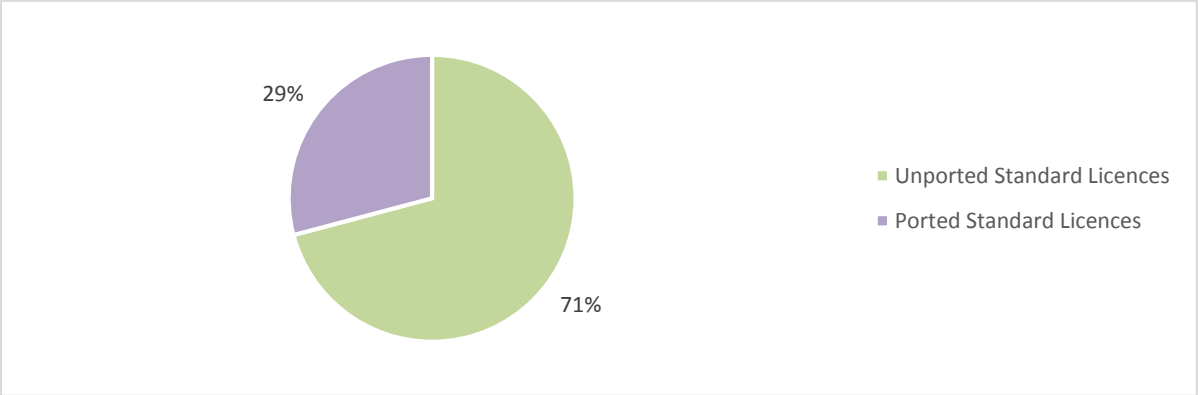
[12] https://creativecommons.org/licenses/
[13] https://opendatacommons.org/licenses/odbl/1-0/
[14] https://creativecommons.org/publicdomain/mark/1.0/
[15] https://creativecommons.org/licenses/by/4.0/

Figure 21: Versions of standard public licences applied by the country



Regarding the jurisdiction applied, more than the two-thirds of the organisations that made use of standard public licences applied the international versions or '*unported*' versions as shown in **Figure 22**.

Figure 22: Proportion of international versus ported licences



It is worth noting that we have come across some examples of ***'mixed licensing***`, a practice whereby data providers add provisions on top of an already defined licence agreement, and particularly on top on Public Standard Licences. We believe that this practice should not be recommended, as it may narrow the rights originally granted to the user, as well as creating uncertainty about data's potential reuse. [**User barrier: Mixed licencing]**

4.2.1.7 National government licences

National licence schemes occurred in 14% of the resources that referred to licence documents (**Figure 16**).

At the time of the analysis, four countries were making use of a national licensing scheme: Germany (*Data licence Germany*[16] and `*GeoNutzV*'[17], a particular ordinance targeting geospatial resources), France (*Licence Ouverte / Open Licence*[18]), Norway (*Norwegian Licence for Open Government Data (NLOD)*[19]) and the United Kingdom (*Open Government Licensing for Public Sector Information*[20]). Germany and UK also had in place different versions of these licences. In **Table 7**, we provide the full list of the national licences, sorted in decreasing order according to the proportion of its usage.

Table 7: List of national licences encountered

Standard Government Licence	Percentage
(DE) Data licence Germany – Attribution – version 2.0	37.23%
(UK) Open Government Licensing for Public Sector Information	34.35%
(FR) Licence Ouverte / Open Licence	14.39%
(DE) Ordinance on the Determination of the Use Regulations for the Provision of Geodata of the Federation (GeoNutzV)	10.07%
(DE) Data license Germany - Attribution - Version 1.0	3.78%
(NO) Norwegian Licence for Open Government Data (NLOD)	0.18%

[16] https://www.govdata.de/dl-de/by-2-0
[17] https://www.geodatenzentrum.de/docpdf/geonutzv.pdf
[18] https://www.etalab.gouv.fr/wp-content/uploads/2017/04/ETALAB-Licence-Ouverte-v2.0.pdf
[19] https://data.norge.no/nlod/en/2.0
[20] http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/

4.2.2 Formal examination

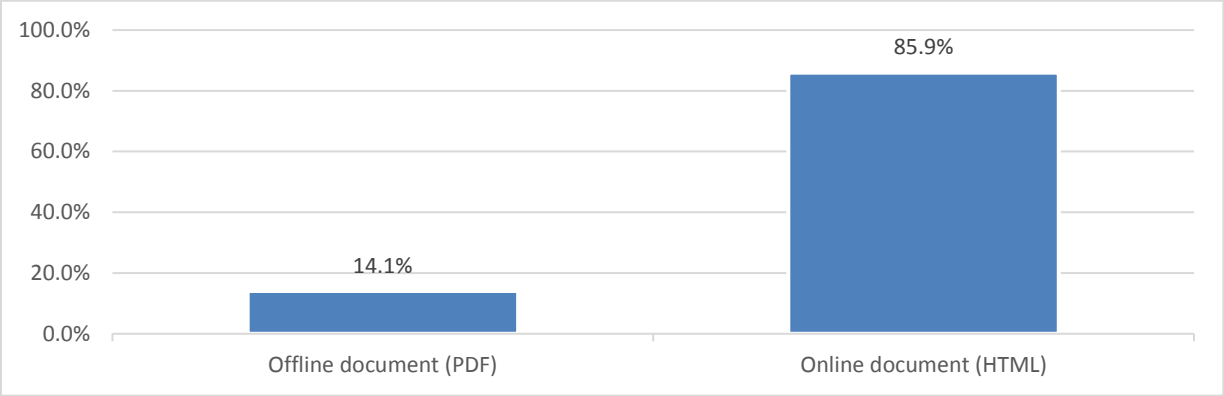
As noted above, the amount and heterogeneity of terms of use found in our sample is already a large amount. The variability further increases when considering several formal aspects in which these terms are rendered.

The aspects analysed in this section do not relate to the quality of the provisions of the terms of use but, instead, their accessibility and readability. It should be noted that checks have been performed exclusively on the externally referred terms of use such as licence documents or website notices.

4.2.2.1 Encoding of the external terms of use

Around 85% of the terms used were distributed in HTML, while the remaining 15% came in PDF documents (See **Figure 23**). PDF documents are useful for inclusion with a dataset but they can also be frequently outdated, as well as not being machine-readable (especially when the text is an image) that could help a user when searching/filtering for preferred terms of use online.[**User barrier: PDF**]

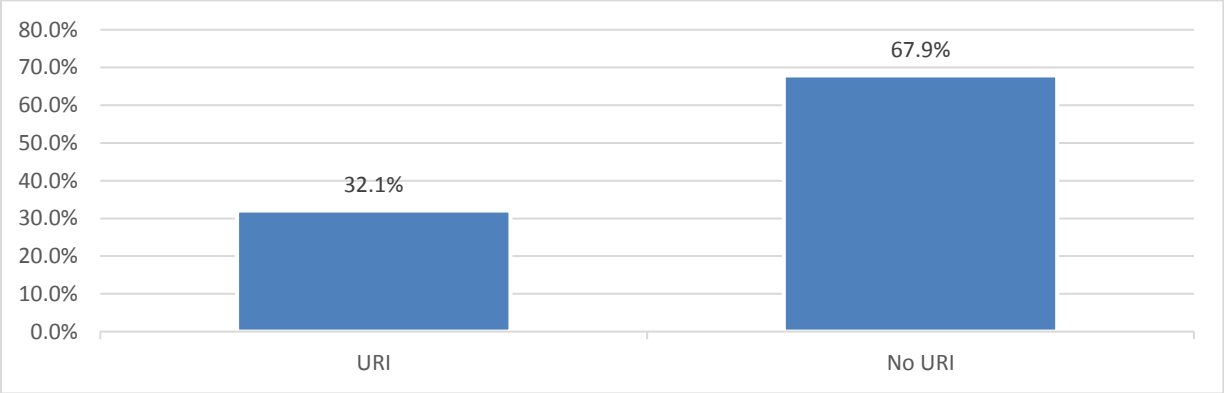
Figure 23: Encodings used by the external terms of use



Among the online licence documents, we have identified that a third of them (**Figure 24**) were following a meaningful URI pattern. This feature is quite useful because the same link provides the minimum information to understand which is the licence targeted. This URI works as a real identifier that provides information on, for example, the version and the type. The Creative Commons family of licences can be seen to manage this feature relatively well.

4.2.2.2 Persistent identifiers

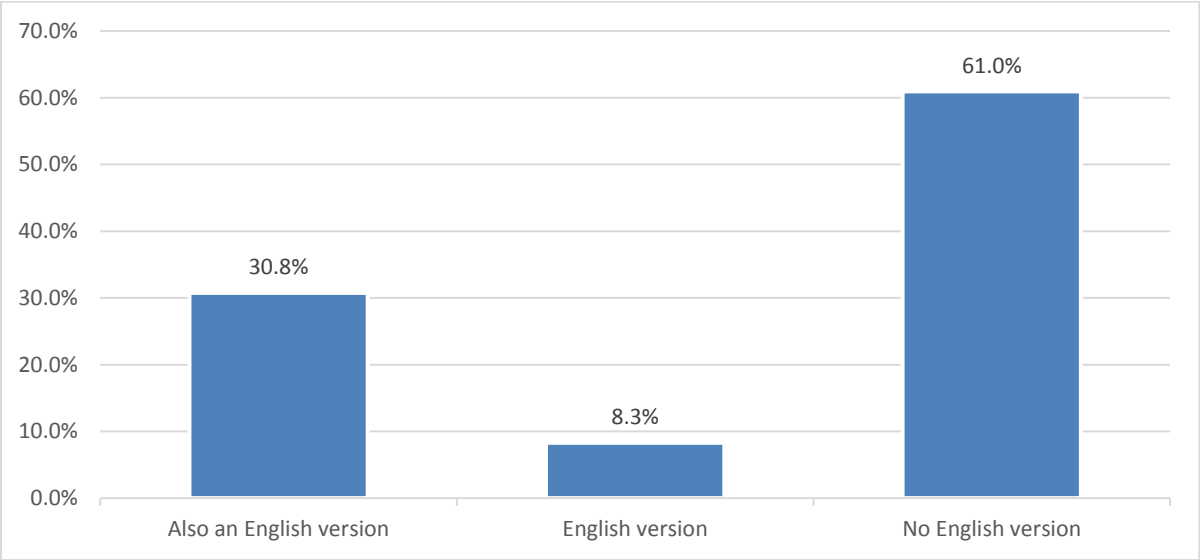
Figure 24: Online terms of use following a URI pattern



4.2.2.3 Language of the external terms of use

As shown in **Figure 25**, more than half of the licenses were expressed in a language other than English [**User barrier: Unknown Language**]. However, a good indicator is that 30% of the remaining terms of use were provided in more than one language, including English. (See **Figure 25**).

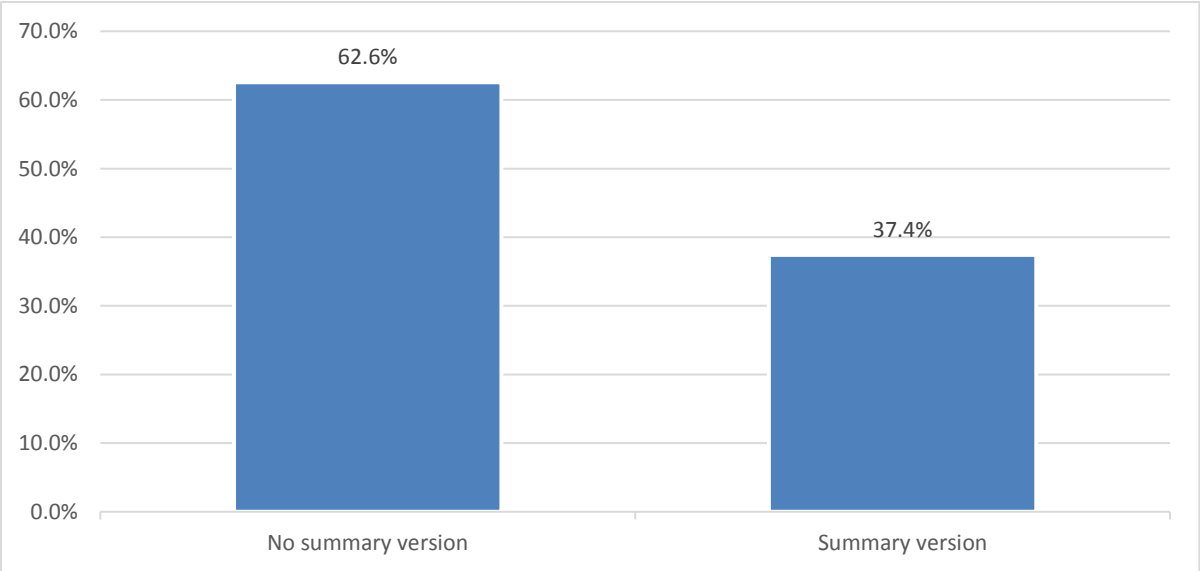
Figure 25: Licence by language



4.2.2.4 Summary version

Another aspect that reduces the difficulty when approaching a legal document is the presence of a simple and clear summary version of the legal code. Around 37% of the external terms of use analysed were offered in a user-friendly manner, be it as the term of use on its own or as a complementary version of the detailed legal code. (**Figure 26**) [**User barrier: No summary/plain version available].**

Figure 26: Proportion of licences providing a user-friendly version of the legal text



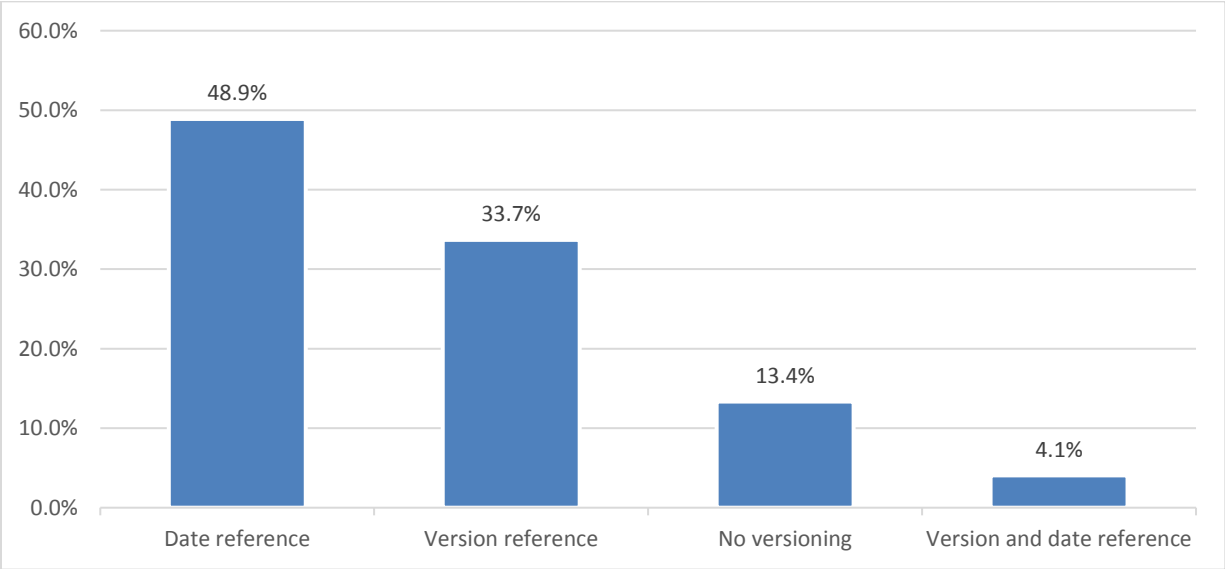
4.2.2.5 Versioning system

A complete text of terms of use was seen to normally come alongside additional attributes, such as a date of reference when the terms of use were published or last updated. In the best of the cases, a numbered version of the terms of use. This information provides an additional level of legal certainty to the user, since he or she could refer to the rights granted specifically in a given moment.

As shown in **Figure 27**, most of the licence documents provided some form of versioning, where only a 13% of them did not provide any. [**User barrier: Content**

No versioning system/ No date of reference]

Figure 27: Versioning system used by the licence



In several cases, we noticed that the versioning information is integrated within the link of the terms of use document. We believe that if the links were treated as persistent identifiers, the traceability and identification of the terms of use would be very much improved. [**User barrier: Lack of Persistent Identifiers**]

4.2.3 Content examination

At another level of analysis we now dive into contents to better understand not only which are the rights granted but also if there are conditions to comply with (or any prohibitions to be aware of).

4.2.3.1 Permissions

To understand which are the permissions granted by the terms of use applied in INSPIRE, we have made use of the Open Knowledge Foundation (OKNF) articles last version of the *Open Definition* (version 2.1)[21] that must be guaranteed to consider a licence as an ´Open licence´.

While mapping the terms of use to these *Open Definition* provisions we found two barriers:

- The abundance of synonymy and small nuances when referring to the different type of rights. **[User barrier: Ambiguity by excess of synonymy]**
- Paradoxically a big proportion of terms of use that were not explicitly indicating the range of rights granted and especially those not granted.**[User barrier: Permissions, conditions and prohibitions not explicitly stated]**

[21] http://opendefinition.org/od/2.1/en/

4.2.3.2 Acceptable conditions

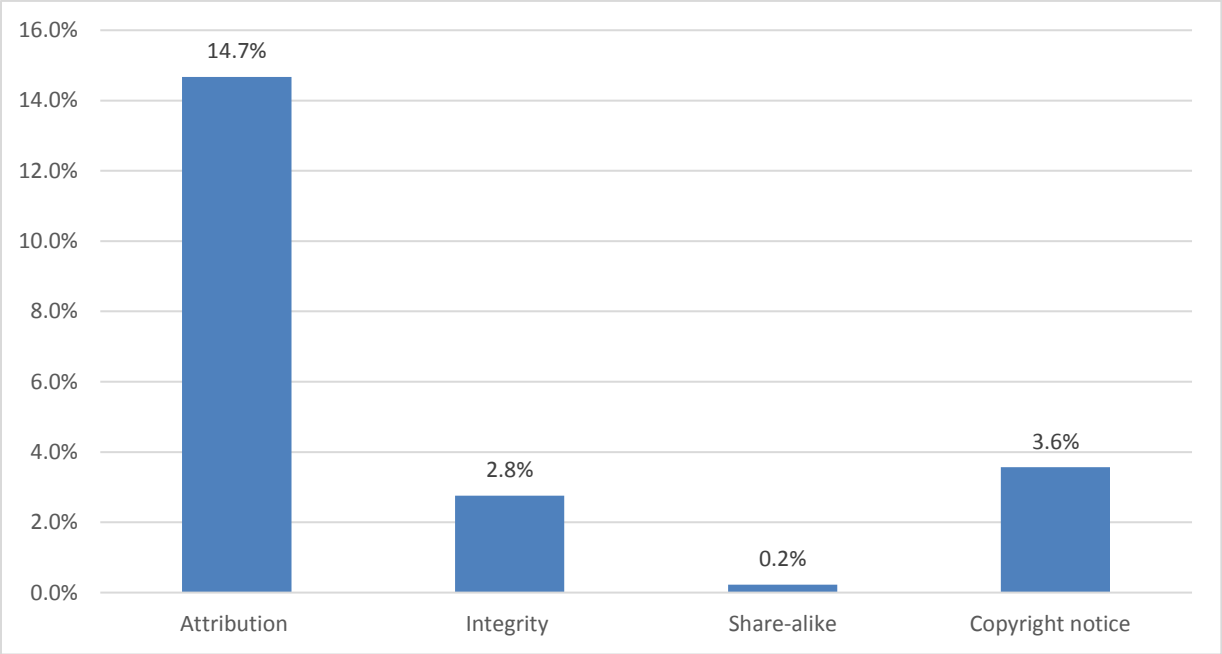
Within the *Open definition*, when it comes to the listing of features that make up an `open licence', a set of `acceptable conditions´ is listed afterwards. We considered those optional provisions as not interfering with the openness of a licence.

As shown in **Figure 28** the obligation of attribution is explicitly required in 14% of the resources. In this regard, we noticed that the pattern or attribution formula to be used by the user was often provided.

The condition of attribution is often accompanied by an obligation of retaining the original copyright notice or licence (3.6%) and in a 2.8% of the cases keeping the integrity of the original source by, for example, indicating which changes have been made to the original dataset. Finally, only a small amount of resources (0.2%) required distributions of the work to remain under the same license or a similar license (*Share-alike*).

Normally, those conditions are not a burden for the user but there could be negative effects if they were used excessively, for example, if the attribution formulas were too onerous or very demanding in their formulation **[User barrier: Onerous attribution required]**.

Figure 28: Acceptable conditions required by the resources' terms of use



4.2.3.3 Prohibitions

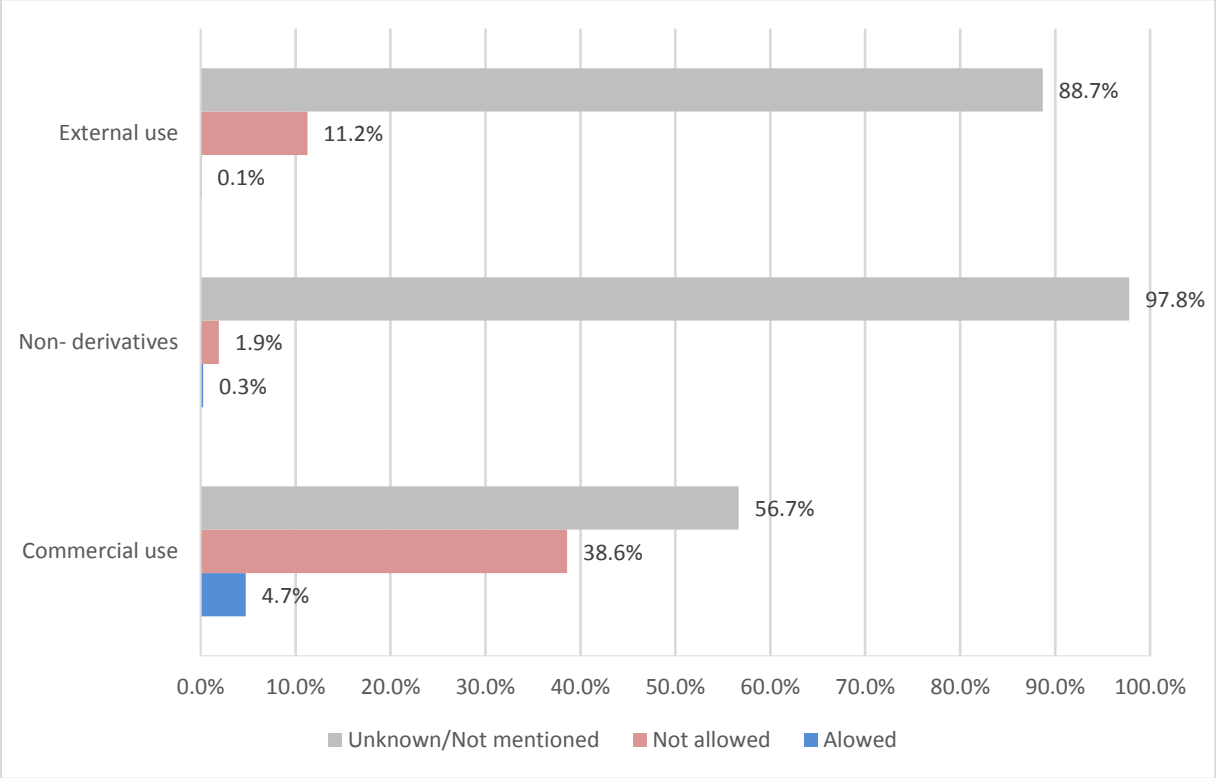
When collecting the prohibitions stated in the terms of use texts, three main types have been identified.

As shown in **Figure 29**, the prohibition of making a commercial use on top of the resource is mentioned by more than the 38% of the resources.[**User barrier: Non-commercial**]. Often this prohibition is combined with requiring users not to make use of the resources in public networks (11%) [**User barrier: Internal use only**]. Finally, the prohibition of creating derivative works was imposed in few cases [**User barrier: Non-derivatives**].

Any of the former prohibitions go against the open definition principle of `*application to any purpose*' and, therefore, when assessing the openness of the licences, if any of these prohibitions are stated the licence would be categorised under other types than 'open', since they impact decisively on what the user can do with the data.

Explicitly indicating both which uses are prohibited and allowed would confer a greater legal certainty to the user.

Figure 29: Prohibitions stated in the terms of use



Another related restriction comes with what *Open Definition* expresses as ´Non-discriminatory terms´. It is not always easy to separate this provision from the ´application to any purpose´, which includes commercial exploitation, because they are often provided together. In any case, we have identified some cases where the resources can be exclusively reused by a certain group of users, such as public sector administrations or researchers.

4.2.3.4 Charging conditions

Figure 30: Terms of use regarding charging conditions

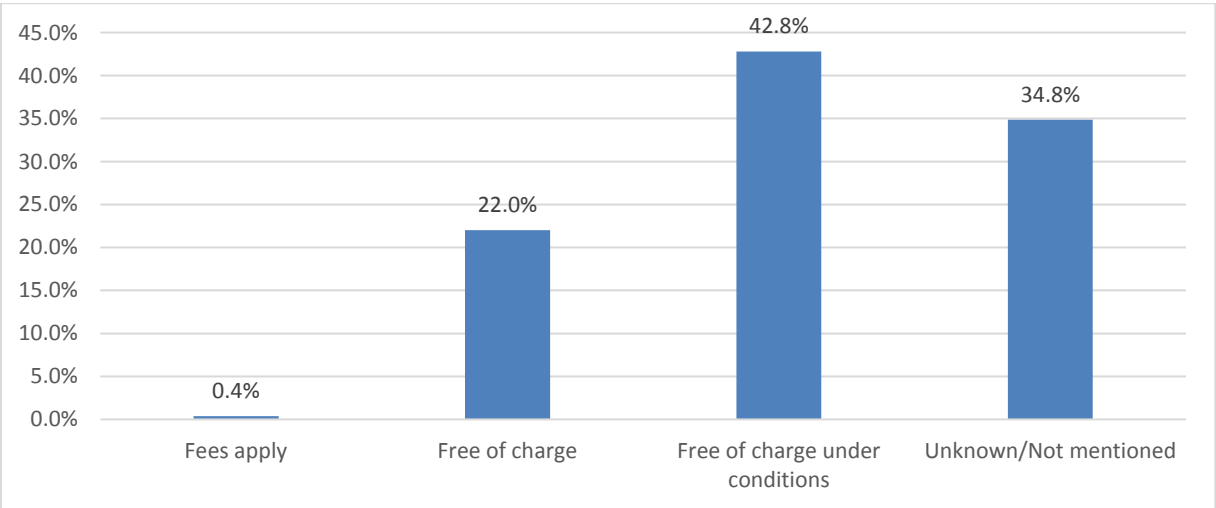


Figure 30 indicates that, in general, **the INSPIRE resources are shared without charges**. However, it is a common practice to release the resources for free but subject to certain conditions.

These conditions are frequently related to the prohibition of making use of the resource for commercial purposes unless a separate commercial agreement is made to obtain further rights [**User barrier: Requires agreement**].

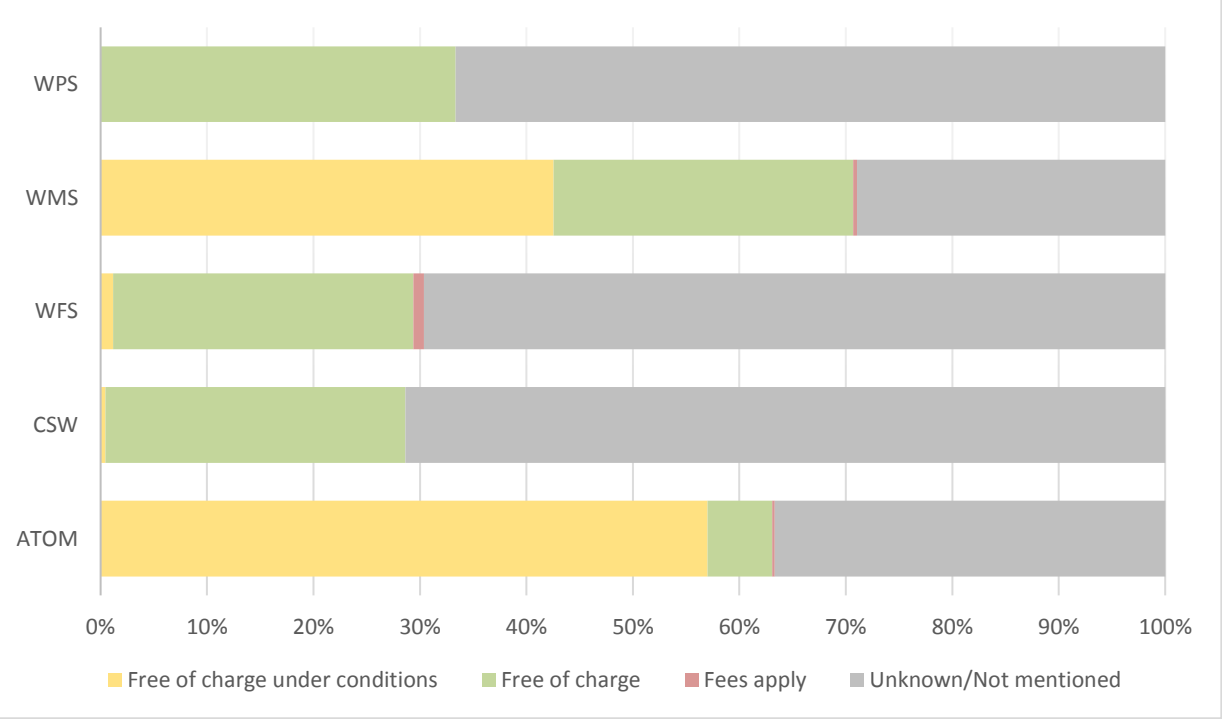
This practice often falls within the dual licensing mechanism that could present difficulties for the user if he or she needed to change the purpose of his or her project [**User barrier: Dual-licensing**].

It must be noted that there is a high number of resources where there is no statement regarding the monetary conditions. In those cases, we can imagine that by adding a default statement "free of charge", could help users to decide if they would make use of it.

In principle, the payment should not be seen as a barrier to data use, especially if the service is accompanied by a proper e-commerce platform. However, there is an argument that requiring payment makes the resource less attractive than those that are free of charge. For some users, a real obstacle could be in place if the price of data is not affordable or if they simply cannot use chargeable services [**User barrier: Application of charges**].

If we now look closer to the few resources that mention the presence of applicable fees, we see, as shown by **Figure 31**, that the download services (WFS, ATOM), providing access to vector data tend to be more frequently charged for.

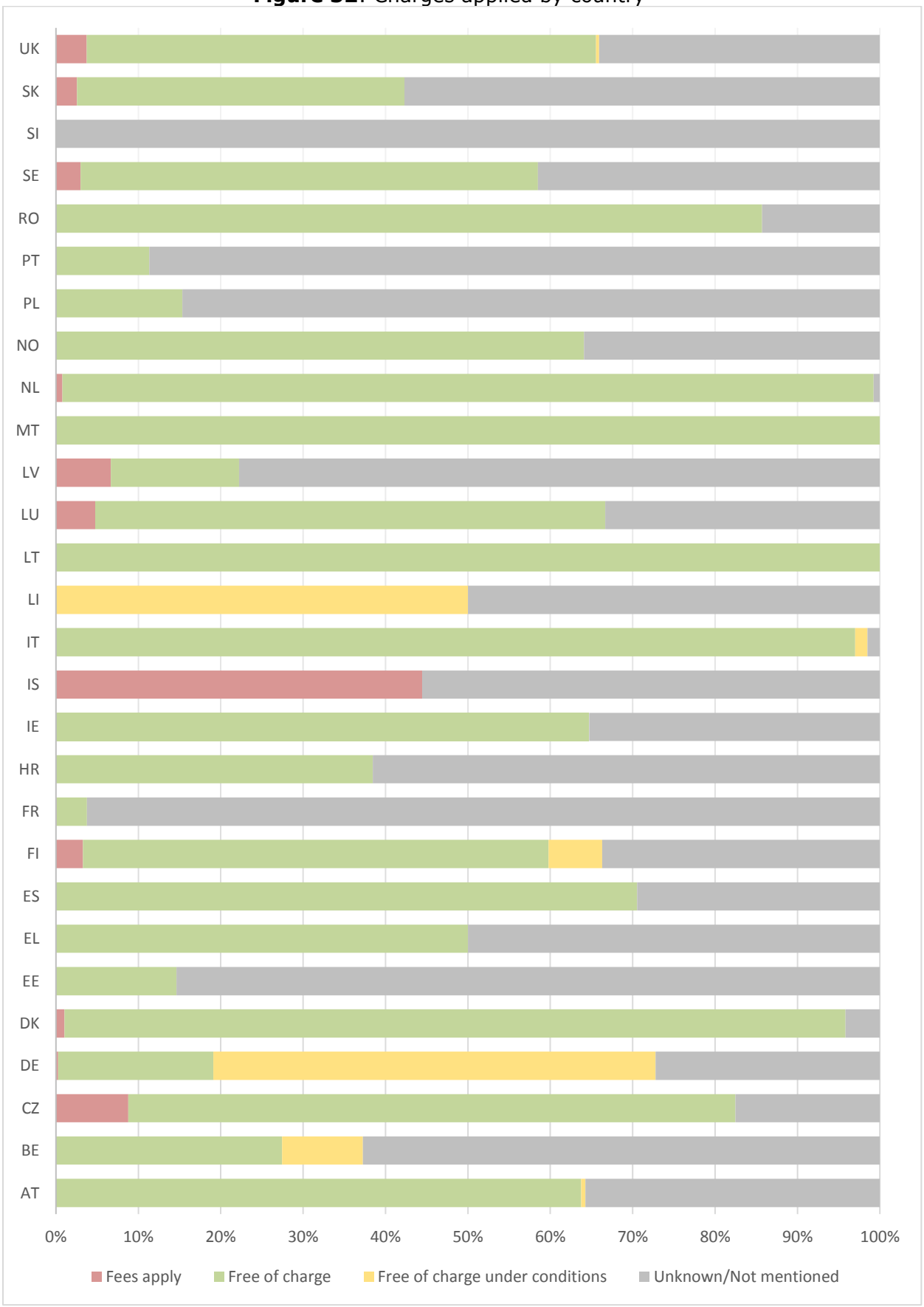
Figure 31: Charges applied by type of resource



Clearly, across all the Network Services a lot of information is missing, again creating potential uncertainties for users.

In terms of charging conditions, if we look at their distribution in Europe, as shown in **Figure 32**, we can see that countries like Denmark, the Netherlands, Malta and Norway offer their data (at least in the sample) almost completely free of charge. At the same time, others release a part of their resources against a fee, with examples found in the Czech Republic Finland, Luxembourg and Slovakia.

Figure 32: Charges applied by country



4.2.3.5 Limitations on Public access

As shown in **Table 5**, less than 1.5% of the resources had limitations on Public Access according to the metadata record information. This behaviour is certainly allowed by INSPIRE but some information on the reason for this decision has to be provided in these cases.

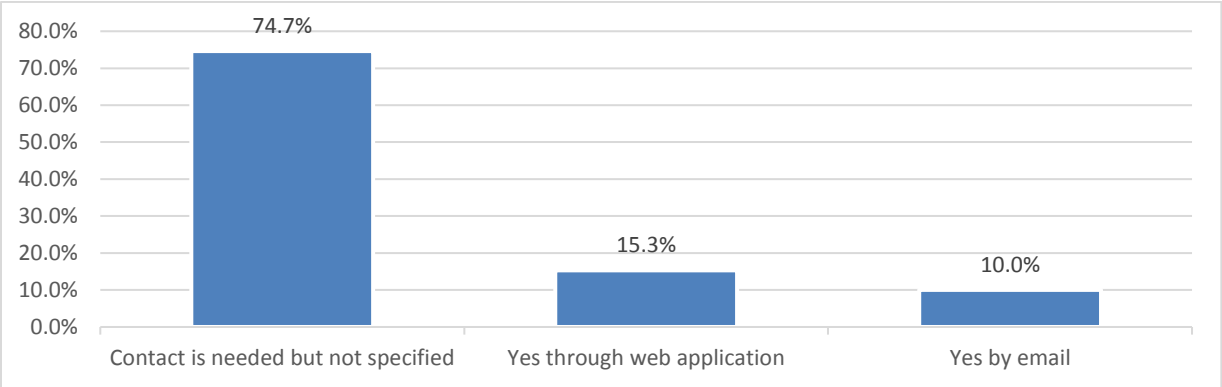
In **Table 8**, we can see that only around a third of the cases provided such a reason. The restrictions because of Intellectual Property Rights, one of the INSPIRE derogation included in Article 13, are the most mentioned, followed very closely by the declared ´unknown reasons´ by the data owner organisations.

Table 8: Reasons provided for restricting the access to the resource

Reasons for restricting the access	Percentage
Limited Access - Reason not provided	63.7%
Article 13 e - intellectual property rights	17.9%
Limitations unknown	16.9%
Article 13 f - the confidentiality of personal data and/or files relating to a natural person where that person has not consented to the disclosure of the information to the public, where such confidentiality is provided for by national or Community law	0.8%
Article 13 d - the confidentiality of commercial or industrial information, where such confidentiality is provided for by national or Community law to protect a legitimate economic interest, including the public interest in maintaining statistical confide	0.4%
Article 13 a - the confidentiality of the proceedings of public authorities, where such confidentiality is provided for by law	0.2%
Article 13 h -the protection of the environment to which such information relates, such as the location of rare species	0.2%
Total	**100%**

However, a publicly restricted resource may not necessarily be restricted from re-use. On the contrary, some resources do not apply any condition but only require user registration. In **Figure 33** have been plotted the main categories on the modes of requesting access to restricted resources based on the information provided by the metadata. We can see that in the counted cases (only a 25%), details are given about how the request must be started [**User barrier: Missing detailed information on access**] and [**User barrier**: **Terms of use provided under request**], among those, only a 15% support self-registration through a web application.

Figure 33: Details on how to access restricted resources



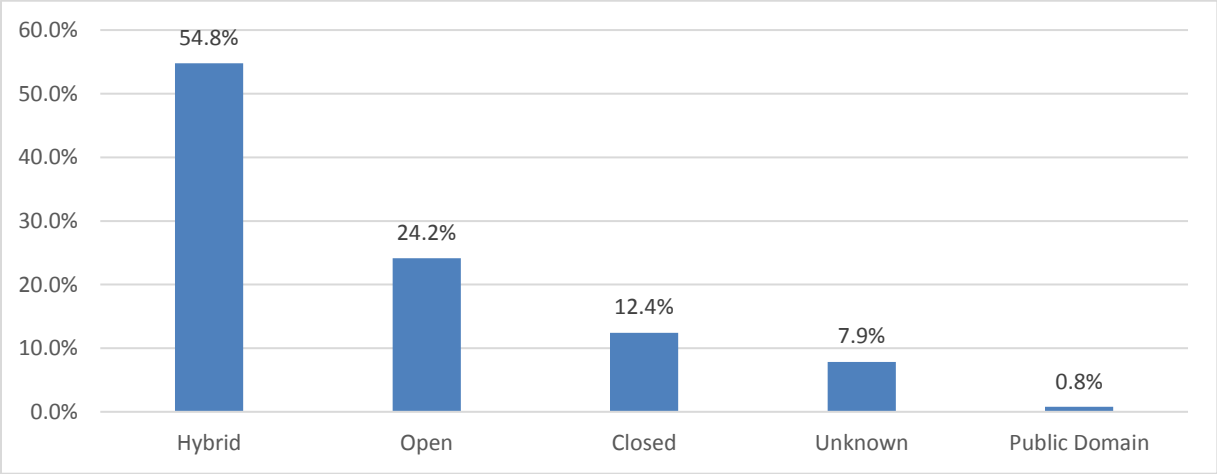
4.2.3.6 Degree of openness

After having retrieved and read the terms of use, we can assess the degree of openness of the resources and have defined a classification that ranges from the most open to the most closed examples.

- **Public domain**: resources under this value are those that go beyond the minimum requirements to be considered open by even waiving the attribution right.
- **Open:** A resource that can be used for any purpose, including commercial purposes. Some conditions for its reuse could be required such as the attribution of the source, the maintenance of the copyright notice, or the indication of changes to keep the integrity of the original data.
- **Hybrid**: This value can be applied to resources that grant some rights but impose discriminatory terms and/or restrictions on the purpose of data reuse. Those terms of use that prevent commercial reuse, create derivatives or require the purchase of additional rights are included in this category. Despite offering some permissions, hybrid terms of use can be considered as a subtype of ´closed data´.
- **Closed**: In this category fall any resource that has a terms of use document that either prevent any kind of reuse, require the application of an individual agreement or are publicly restricted without the option to access the resource.
- **Unknown**: In this category are included resources whose terms of use are unclear, are missing or that explicitly say that the conditions are unknown. If a potential reuser encountered a resource whose terms of use were unknown, it should be treated as if were ´closed', even if the data holder had the intention of sharing it with open conditions.

The results of this assessment, available in **Figure 34**, show that half of the INSPIRE resources belong to the Hybrid category. Only a quarter could be considered as pure Open data.

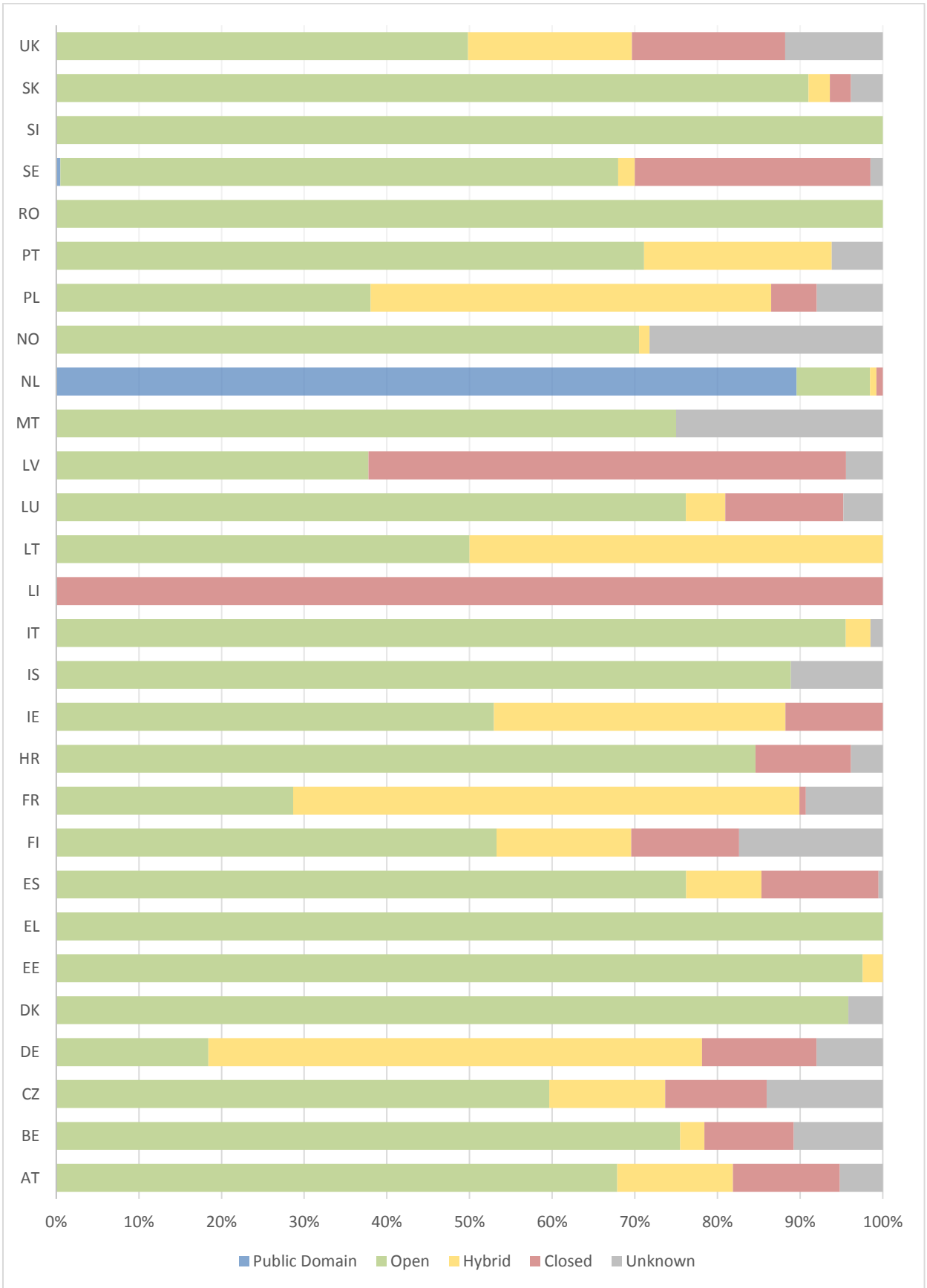
Figure 34: Degree of openness perceived according to the information contained in the terms of use



Together with this assessment, we also looked for the keyword ´open data´ within the metadata texts, and found it in only 44 out of 29,877 resources. [**User barrier: Open data resources**]

These results also hint that there are many instances where legally non-interoperable terms of use could be in place, especially if a user needed to mix information from the INSPIRE geoportal (or with other sources) for commercial purposes. [**User barrier: Lack of legal interoperability**].

Figure 35: Degree of openness perceived according to the information contained in the terms of use by country



5 User barriers encountered

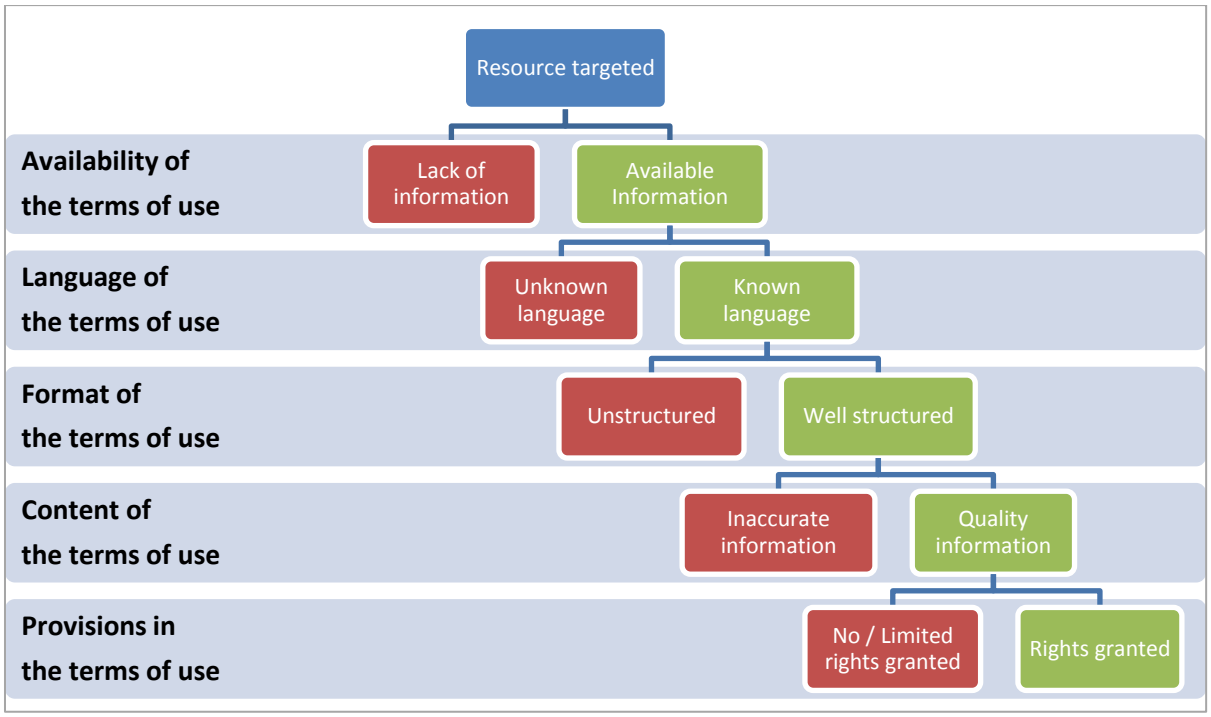
In this section, we list the user barriers encountered while reading and analysing the terms of use.

Some proposals have been given below to initiate discussions about their suitability and possible alternatives with stakeholders.

In **Figure 36**, a simplified schema captures the process we have gone through when facing the terms of use for a given resource. The high-level user barriers encountered during the process appear in red colour. Often the presence of one of them is translated into the impossibility of continuing the journey, or maybe of continuing with many difficulties.

It should be noted that in real life, many users would have abandoned the research for the terms of use unless they were very interested in a particular dataset.

Figure 36: Schema of the barriers encountered in the process of understanding the rights of use of a resource



The user barriers are organised according to the different layers of information examined. They have different granularity and go from the documentation of the terms of use (covering availability, language, format and content) down to the application level, where users have to decide if the rights granted are suitable for them, or not.

The analysis did not cover the reuse of the resources itself and, therefore, we have not addressed any of the barriers listed under the 'provisions' section. However, we can envisage that there can be some potential obstacles for their reuse, depending on the type of user and the activity they intend to perform upon a resource.

Many of the barriers are tightly related, being sometimes caused by and/or consequence of another, or they can appear as specialisations of other more generic issues. They do not have the same weight either, but fixing/improving them can make a difference from the usability point of view. We have decided to list them all because they appeared in different situations and at varying steps of our analysis.

The presence of user barriers related to terms use in INSPIRE has raised wider interest than this study. During the 2017 INSPIRE Conference, Bastiaan van Loenen presented a paper entitled '*Harmonising Open Licences in the European Union: Been there, done that. What's next?*'[13], raised similar points.

The remainder of this section addresses each of the above barriers, in turn.

5.1 Availability

User barrier 1. Lack of information on terms of use

The metadata records examined did not include any information about the terms of use applicable to the described resource. This fact means that users could be ignorant of rights and appropriate/legal uses of an available dataset. Even if the intention of the data holder is to share it openly, by default, in such a situation, a user could not do anything without the approval of the data holder. That means that the user has to identify a contact point, in the first instance, to be able to clarify this situation.

Proposal: The data provider should make sure that the descriptor files of the INSPIRE resources include the necessary information on terms of use.

User barrier 2. Excessive number of terms of use

The excessive number of terms of use is a concern when a user is interested in assessing the suitability of several resources, including combining data from different sources. Even if we were to consider a means to filter and browse these terms of use contained in the metadata fields, an unmanageable list would contain more than 800 values.

Proposal: A harmonisation effort could be considered, by constraining the number of possible values at the governance level and, at the organisational/national level, by coordinating the values that could be included in this field.

One possible approach would be to take the defined values of *'Conditions for Access and Use'* metadata element to use from the official languages versions of the legal text and make this available as a code list, as presented simply in Annex 2.

The *INSPIRE Registry* already provides a code list named '*Conditions applying to Access and use*'[22] whose values, only available in English, are slightly different from the ones given in the Implementing Rules' text and whose governance level is 'technical' instead of legal. The use and usefulness of these resources should be discussed with the Member States to see what implementation approaches would address this issue without creating an unnecessary burden.

User barrier 3. Terms of use provided under request

We have come across cases where the information provided indicates that applicable terms of use exist but that they are not fully or directly available to users. Often a contact is provided, but this is not always the case. This situation in a way is similar to [**User barrier: No information on terms of use**]

Proposal: Provide more transparently the terms of use along with the data/metadata, if possible avoiding burdening the user with additional actions to contact organisations and enter transactional workflows, potentially creating management overheads in organisations.

[22] http://inspire.ec.europa.eu/metadata-codelist/ConditionsApplyingToAccessAndUse

5.2 Language

User barrier 4. Unknown Language/Multilingualism

This can be seen as a key user barrier. The description of the terms of use can appear in a language that is not necessarily known by the user, as seen in the case of cross-border applications. If a translation is not provided by the data provider, the burden is again placed on the user who would be obliged to make use of external tools to have the terms translated. Moreover, the automatic translation could not be 100% reliable, and this could result in both misunderstandings and legal uncertainties.

Proposal: Knowing that the target of the INSPIRE resources is accessible data at European and cross-border levels in the European Union, it would be advisable to include the terms of use in different languages, in at least English or with standardised multilingual terms contained in resources such as code lists. The last example may also provide some approaches towards harmonised terms and a ground for discussion of what terms make sense across the EU and, importantly, for users in other public administrations.

5.3 Format

User barrier 5. Unstructured content

The metadata descriptions used by INSPIRE have defined the fields where the information on the terms of use is captured as free text. This provides `flexibility´ for any data provider to customise the text according to their needs but, at the same time, it creates a lack of uniformity, variation in terminology and, in general, potentially poorer quality of the content due to the lack of standardised quality checks.

The contents, therefore, can range from a complete lack of information, to a single word or to a narrative paragraph of details. Another consequence of free text usage is the higher probability to include errors such as typos.

Proposal: This user barrier is closely related to the excessive number of terms of use, and as such, the proposal goes on the same line.

User barrier 6. Heterogeneity of licensing documents

The licensing documents can be highly variable both in terms of form (syntax, structure, internal/externally developed terms of use) and, of course, in the type and extent of provisions. For the user, an effort is needed to map the content of different terms of use, be it a metadata notice, standard licence or a customised licence. In addition, the contents in different cases may not necessarily match, as some could have more detail than others, again potentially resulting in legal uncertainties. Moreover, for example, if the user is a startup or SME, the burden of addressing such material may prevent activities taking place.

Proposal: A good practice would be to try, in the first instance, at an organisational level to harmonise the terms of use by checking if there is already available national licence scheme that would be suitable to adhere to. That would increase the understanding and compatibility of the terms of use.

User barrier 7. PDF files

The PDF format is a convenient option if the user wishes to have an offline version of the terms of use document but this is not an accessible means to obtain information. In addition, when a PDF document is provided, often a PDF viewer is required to render it. Finally, a PDF version of the terms is often non-machine readable, especially when the content is included as an image, instead of text.

Proposal: When a PDF version of the terms of use if felt to be useful for users as a local copy for download, it should be made available as an additional option offered online after a more accessible and machine-readable HTML version has been provided, to help web content to be accessed more easily.

User barrier 8. Lack of Persistent Identifiers

As important as providing an HTML version of the terms of use is, it is also important to keep the link or URL relating to the stable resource over time.

Proposal: A good practice is to put in place persistent identifier (PID) mechanisms. These have a twofold scope: they allow us to have links or a working URL and they are a permanent identifier that can be assigned to an object or resource, so it is both easily identifiable and retrievable.

Normally, PIDs follow a well-known scheme or pattern that allow additional semantics to be added to a link. By doing that, the same link indicates the target resource without a user even having to access the content. Creative Commons does this for its licences as applied to the versions, languages and type of licences. This can be seen in the case of the following URI: https://creativecommons.org/licenses/by/3.0/deed.en, where we know (as informed readers) that it relates to the version 3.0 of an attribution type licence expressed in English.

5.4 Content

User barrier 9. No versioning system/ No date of reference

Terms of use documents should not just be updated and replaced with another one. They should include a hook to a concrete date or a version, so that the user can unambiguously refer to the terms of use he or she has accepted when making use of the resource. This could become a more pressing issue if developers are relying on services in their applications, where terms of use were maybe suitable at the time of initial development but changes in an organisation may impact on continuing development or service provision.

Proposal: This user barrier is closely related to the [**User barrier: Lack of Persistent Identifiers**], and the proposal for improving it could be shared. In addition, it raises issues of users being able to be notified in changes of terms of use to datasets they are making use of. That is particularly relevant when the re-user is actually a consumer, since he could make use of his/her obligation and rights by referencing a particular version or timestamp. The European Guidelines on recommended standard licences [10] mentions that '*it is important to maintain and refer to a clear licence versioning and date scheme so as to indicate updates*'.

User barrier 10. No summary/plain version available

Providing a summary and synthetic version of the legal code is very helpful for everyone. Certainly, such material does not substitute the legal code but it makes it easier to digest as it gives a clearer message and enough understanding of the rights and constraints that a user must be aware of.

Proposal: Provide a clear summary in easily understood language.

In addition, as recommended by the Commission Notice ´*Guidelines on recommended standard licences, datasets and charging for the reuse of documents*´, '*it is advisable that the main terms of the licence (licensor, use, information, licensee, etc.) are defined concisely and as far as possible in layman's language and in line with those of the Directive and national transposing legislation*.´

Related to the latter, it could be helpful to explore the possibility of key legal terms being harmonised across different languages.

User barrier 11. Permissions, conditions and prohibitions not explicitly stated

The terms of use should explicitly indicate not only the prohibitions and conditions for the usage of a resource but also the granted rights. Terms of use texts providing the unambiguous range of allowed uses give confidence to the user to make use of the data, whereas stating only the prohibitions and/or conditions could offer a rather negative/constraining message to users.

Proposal: Data providers should highlight the permissions, conditions and prohibitions of the terms of use.

User barrier 12. Ambiguity by excess of synonymy/terminology

While going through different terms of use text, we quickly notice the richness of vocabulary to refer to different rights. Those can be narrower, wider, or even including a set of rights. For example, the right to 'adapt', 'modify', 'edit', 'change' may be understood similarly, but they can also cover different extents, especially when the terms of use have to be compared to check for compatibility between data sources. More precision by using standard terms would help to provide additional legal certainty, although some legal discussion should take place on this topic, which is beyond the scope of this current work.

Proposal: Investigate where existing (international) standards, including relating to Digital Rights Management, are defining differences between such terms.

User barrier 13. Inaccurate/ wrong information

In this category are included any information that could confuse the user or leave them with particular doubts. Clearly, good quality control procedures should be in place to let people know what they should be able to do with data. Another issue that this raises is that organisations may wish to put in place mechanisms for users to provide feedback about certain content in their metadata, a topic being explored under ELISE.

Proposal: Investigate good practices for quality control and data management procedures, including for managing users' feedback.

User barrier 14. Swapped information across metadata fields

This obstacle appears when information that is expected in a particular field appears in another (or simply does not appear at all). This inaccuracy can lead to a situation where a user does not read the full information contained in the description files because it does not appear where it should. One could also imagine scenarios where resources would aim to process a field for classification purposes and have this miscoding. Such issues of (meta)data quality are also worth discussing in the context of user feedback.

Proposal: Follow advice of Technical Guidelines and good practice to ensure metadata is completed as requested. If you are reusing metadata, check the semantic differences between your content and the elements that INSPIRE is requesting.

User barrier 15. Mismatching information across the infrastructure

Since the metadata information is stored in different places (as metadata files and Network Services description layers), it may happen that the information on terms of use differs.
More specifically, we have noticed that often the details relating to terms of use do not appear at all, or are not propagated with the same meaning, at the Network Service level. In such a situation, a user could be confronted with different information or, when information is missing, not know which terms of use apply to the resource. This barrier is likely to be a consequence of poor quality control.

Proposal: A proposal to reduce to some extent this user barrier could come through the revision of the available INSPIRE Technical Guidelines with the aim of harmonising (in a consistent way) the recommendations proposed for filling the terms of use details.

An example illustrating that would be the fact that among the Technical Guidelines, only the one for *View Services* explicitly mentions the values to include for '*Conditions for Access and Use'*, while the *Technical Guidelines for Discovery Services* requests information to be added on fees, when applicable.

Explore best practices and technical solutions that can help align terms of use found in Metadata and Network Services. In the 2017 INSPIRE Conference, an oral presentation entitled '*GDI-Südhessen: The INSPIRE laundry'*[23] highlighted the advanced technical features of the Wetransform INSPIRE GIS software that can face the metadata challenges such as the mismatching of content between metadata and resources.

User barrier 16. Diverging information with reality

This barrier takes place when the information offered by the description files is not aligned with reality. An example observed several times was the indication of no '*Limitations on Public Access'* but when trying to access the resource, a registration form needed to be completed. Similarly, examples exist where the indication of terms of use in the metadata notice were different from the ones appearing in the website notice.

Proposal: Stakeholders should create a common view of 'public access' and aim to have only one authentic source of terms of use.

User barrier 17. Missing detailed information on access

The analysis of the resources has demonstrated that the information on access to the resources is often omitted or missing. Even if the resource is public, this fact should appear in its dedicated field. A more serious barrier would involve stating that the resource is restricted and requiring a request for access but without mentioning the steps a user should follow to obtain such authorisation.

Proposal: Stakeholders should create a common view of 'public access' so that additional barriers are reduced. Best practices should be explored, including when technical access control details are provided in metadata. For example, if there is password, the user should be made aware in the metadata. In addition, it would be advisable to consider providing access to data and services through an interoperable AAA infrastructure. Under the ARE3NA ISA Action, a study on AAA for data and services focussed on a potential solution for INSPIRE with cross-border test cases and testbed software[24]. The potential of such solutions should be discussed further and include such issues on data policy/terms of use.

User barrier 18. Reference to a licence by its name only

Another practice that was found was the referencing of licence documents through their name without providing an accompanying URL. For well-known licences such as the *Standard Public Licences (i.e. Creative Commons)*, the barrier is usually minimised since its tile and/or the acronym unambiguously refers to licence type and version. In several cases though, the version was not indicated. That fact is particularly confusing when several versions are available; the users could feel he has to choose himself the version. However, for customised licences not that popular, users would have to look for the licence over the Internet (using a search engine) and then interpret which is the proper link to select. Again, the ambiguity increases when no specific version is provided.

[23] https://inspire.ec.europa.eu/sites/default/files/presentations/20170908_inspire_conference_360_gdisuedhessen_domeyer_vondoemming.pdf

[24] https://joinup.ec.europa.eu/release/are3na-aaa-software-package

Proposal: A good practice would be to include the full title of the licence, including the acronym (if available) and the version number, accompanied by a link to access it, if possible making sure that an English version can be accessed.

User barrier 19. Unspecified licence

This obstacle appears when in the description texts the presence of an applicable licence is mentioned but then not specified. This vagueness results, again, in burdening the user who has to request the terms of use from the data provider. Again, the reasons for making such restrictions cannot be detected by this analysis, including possible benefits in customer relations, but it can still be seen as a barrier to more efficient use of online data.

Proposal: Make sure that the complete name of the licence and a link to it are explicitly indicated so that the user can know if the resource could fit their reuse purposes.

User barrier 20. No link to licence

This barrier includes all the cases where a link to the terms of use or licence is not provided. This barrier includes partially the **User Barrier 19**: **Unspecified licence** and **User Barrier 18**: **Reference to a licence by its name**.

Proposal: Every time the terms of use are developed externally, a reference to the licence document needs to explicitly mentioned. This is the only mechanism the user has to trace the applicable conditions on the resource.

User barrier 21. No final link

Another aspect of the links that could be easily improved is their quality regarding the target information. In several cases, we have encountered links pointing to pages not displaying the terms of use and therefore obliging the user to interact and get familiar with the external page to look for the place where he could access them. This presents some additional barriers to the user when the accessed page is not available in a known language.

Proposal: Unless the link refers to a selector licence page (to let the user pick the relevant one for his or her purposes), it would be advisable to provide the direct link to the terms of use text.

User barrier 22. Broken/wrong link

The validity and/or correctness of the links is another usability aspect encountered in the study. This includes links that were not working anymore resulting in error pages.

Proposal: It would be advisable to check regularly the links provided in the description file to check their validity and correctness. Besides, if changes were applied in the incoming website, setting automatic redirections to the targeted information would be helpful. Another approach that would certainly help in avoiding these issues would be the application of persistent identifiers as already suggested in the **User barrier 8** when pointing out the **Lack of Persistent Identifiers** usage.

User barrier 23. Open data resources not easily identifiable

Open data resources are not easily retrievable when using the metadata information. As shown during the above experiment, when searching for the words 'open data' (see ***Section 4.2.3.6 Degree of openness***), a very low number of hits were returned, despite being aware that a large portion of the resources could be considered as open data.

Proposal: While no further harmonisation is put in place, it would be advisable for those data providers who apply compatible conditions with the Open Data principles to include the word ´***Open data***´ in the fields related to the ´***Conditions for Access and Use***´, so they can be more easily fetched/filtered. The likely costs and benefits of such an approach should be discussed with INSPIRE stakeholders, as perceived impacts of such a simple change to metadata could be informative.

5.5 Provisions

User barrier 24. Onerous attribution required

As shown in the analysis section, ***4.2.3.2 Acceptable conditions***, the attribution is often required as a condition to make use of a resource. When this happens, often an attribution formula or statement is provided by the data holder. That can become an issue when a data re-user needs to attribute different sources in prominent places, as often required. That issue is exacerbated when, together with the attribution, the data provider requires showing both the legal notice and/or original licence as well as the specification of the changes.

Proposal: The motivations for requiring such effort by users merit some further research to better understand the pros and cons for data users and data providers. This could include, for example, if the data provider is aiming to increase awareness of their product to a wider market or to be able to search for published content based on such key statements.

Initiatives in other fields such as the '***Open Music Initiative***'[25] powered by ***blockchain technology*** could inspire new ways of identifying the rights of creators. In their words: '*new technologies can be applied to radically simplify the way music rights' owners are identified and compensated, resulting in sustainable business models for artists, entrepreneurs, and music businesses alike*'. How applicable this is to (geospatial) data sharing and reuse could be explored further.

User barrier 25. Not enough rights granted

This potential obstacle depends on the type of user and purpose of his or her reuse. In the worst-case scenario, he or she could be confronted with the situation where the terms of use are not granting the necessary rights for their intended purpose. *This category does not include rights that could interact with other legal frames, such as personal data privacy*.

Proposal: Certainly, the organisation is free to choose the licensing/business model. However, some investigation could be done to make it clearer if the purchase of additional rights is applicable or not and, if positive, to provide a usable way of extending the rights. An example of how the rights and permissions are treated in the copyright world can be found at the *Copyright Clearance Center* company[26] when searching for any Publication Title and checking the '*Pay per Use Options*'[27].

User barrier 26. Non-commercial

Limiting the rights of reuse by prohibiting the commercial exploitation of data could reduce opportunities for growth, innovation and, potentially, job creation.

[25] http://open-music.org/about/
[26] http://www.copyright.com/basicSearch.do?operation=go
[27] http://www.copyright.com/search.do?operation=detail&item=410140557&detailType=basic

Proposal: Unless there is a special business model behind that requires this restriction (or any other reason for limiting commercial activity), it would be advisable to allow reuse for such purposes. The PSI Directive itself indicates that licences should not unnecessarily restrict possibilities for re-use.

User barrier 27. Internal use only

Different terms of use include this restriction. Often this is related to the '*Non-commercial*' prohibition, acting as an additional way to protect data from wider usage. In addition, this limitation could be due to other reasons such as data service performance, for example, to avoid stressing the network resources in very demanding applications, even when they are not intended for commercial gain.

Proposal: The re-use of aggregated data or any other suitable solution to disclose data should be considered. Again, the motivations of organisations requiring data to only be used for internal purposes could be explored further, especially if this related to certain types of data or certain legal or ethics-related processes that may be driving the creation of this barrier.

User barrier 28. Non-derivatives

This condition is maybe one of the most constraining, since any work based on a non-derivative resource is simply not allowed.

Proposal: It may also create some legal issues, as there is not necessarily a common view of what may be considered a 'new' or 'derived' work, in part as some legal views come from the creative industries, such as the appropriate use of samples in music. It may also be difficult in some cases for a data provider to be able to detect where a data product had its origins in their data, such as where some geospatial operations are applied, as well as the possible burden of how to police the usage of data with this restriction. Again, further understanding of this topic is needed to come to clear recommendations.

User barrier 29. Mixed licencing

Several cases have been identified applying a mixed licensing approach that adds additional provisions upon an existing licence document. Creative Commons has covered those use cases through the *CCPlus (CC+)* mechanism. '*CC+ denotes the combination of a CC official license (unmodified and verbatim) + another separate and independent agreement granting more permissions*.'https://wiki.creativecommons.org/wiki/CCPlus However, the CC+ notation was not mentioned when modified Creative Commons licences where found.

Proposal: In general, it would be desirable to avoid this approach, as it may create confusion and legal uncertainties. This may be the, for example, where there are overlapping provisions or jurisdictions. The question, therefore, emerges as to why a standard licence was not adequate for data-sharing and if there were additional organisational goals, including beneficial ones, that a mixed approach can serve. From the user perspective, however, the departure from an expected licence type could create barriers, in particular where more than one data provider's datasets are involved in a user's work.

User barrier 30. Dual-licensing

The dual-licensing practices applied to many INSPIRE resources could represent barriers to the reuse. The same resource could be subject to more than one term of use depending on the scope of the reuse or, for example, on the type of re-user (private, researcher or public administration). This can vary, therefore, the range of rights and prohibitions allowed which, in turn, can generate legal problems. For example, if the user does not know these issues in advance the final product/scope of his or her work could be altered.

Proposal: On the one side, the data user should check carefully the terms of use before making use of the data while the data provider should be very clear up-front that the data made 'openly' available could change its nature if used for other purposes. For example, research developing a new product could become a commercial activity. Any restriction could impact on the innovative reach of data and, possibly, some technologies. What kind of licencing could best be applied for such experimentation?

User barrier 31. Requires agreement

The requirement of obtaining a formal agreement prior to making any use of a resource is not necessarily a barrier in itself if this is well designed. However, that is not often the situation a user encounters: written consents from data providers are often required following contact by a potential user via telephone or email. The latter could be replaced and facilitated with a web form.

Proposal: More investigation on the reasons for requiring written consents prior to reuse should be done, considering the balance between administrative burden, proper customer support and the needs of users.

User barrier 32. Application of charges – Non-e-commerce platform

Again, this is not necessarily a barrier provided the user accepts the condition. The barrier comes when the prices are not publicly available and/or they are abusive. Besides, not having a proper e-commerce platform available to allow the user efficiently processing the purchase transaction could be discouraging for the reusing of the resources.

Proposal: It would be advisable to check that the user is provided with the tools to efficiently purchase data online, as well as to check that the pricing conditions are fair and transparently published.

As a reminder, for the resources falling under the PSI Directive, the charges and other conditions for re-use have to be pre-established and published. The Directive also indicates that the charges for re-use should, in principle, be limited to the marginal costs of the individual request (reproduction, provision and dissemination costs).

Finally, it must be noted that, as the user is actually a consumer, a notice mentioning the consumers' rights and obligations must be included. Relating to that, it is worth highlighting the good practice found several times in the analysed terms of use of linking to the European ***Online Dispute Resolution*** system (ODR[28]), allowing consumers making complaints about goods and services purchased online.

User barrier 33. Lack of legal interoperability and data silos

This user barrier appears when a user needs to put together two or more resources whose terms of use include different provisions, including cases where some of the data has more constraints than others do. For example, if the user wished to produce an application potentially for commercial purposes, where one of the datasets is free and the other one explicitly restricts the use in an external network, he or she would face a legal incompatibility that would be difficult to overcome.

The lack of legal interoperability could derive from '***data use silos***', which are well explained by the OKNF report *'Avoiding Data Use Silos'* [14]: *'Even if all licences are open, they may prevent users from mixing data under multiple licenses because of incompatibility among each other. Licences are compatible if people can combine works and distribute them under one of these licences, or a third compatible licence. Licences must be at least be 'one-way compatible'. This means that it must be possible to provide a combined work at least under the terms of the more restrictive licence.'*

[28] https://ec.europa.eu/consumers/odr/main/?event=main.home.show

Proposal: It would be advisable for those data providers considering the review of the applicable terms of use to avoid the creation and stimulation of data silos. In addition, the inclusion of a compatibility section pointing out the known compatible licences could help greatly the user thinking of producing new products including '*mashups*'.

In the OKNF words[29]: *'Governments need to be very careful not to create data use silos. We speak of silos whenever a data system is not compatible or integrated with another data system. Use silos arise legally if it is not possible to combine data from different sources, due to incompatible licensing. This problem becomes even more important as governments turn towards supporting the free flow of public sector information such as with Europe's Digital Single Market strategy.* ***Licence compatibility and maximum simplicity of licences are paramount for creating effective data markets, economic growth through data, cross-border data-sharing, and reuse of government data by civil society****.*

Open Knowledge International strongly discourages governments from creating new licences to avoid complicating the licence ecosystem further. Fundamental differences and incompatibilities exist both between permissive and copyleft licences, and between different copyleft licences.'

To avoid generating more confusion, and as indicated in the PSI Directive, Member States are encouraged to use standard licences in digital format.

[29] https://research.okfn.org/avoiding-data-use-silos/

6 Featuring good examples encountered

While capturing and checking the different variables under analysis, we have also encountered good examples of terms of use relevant from a user-centric perspective.

Apart from the Creative Commons licence family, that has a long experience in making legal codes more usable both from the data provider and re-user side, we found other examples that we believe are worth highlighting.

6.1 Norwegian Licence for Open Government Data

Norway´s Licence[30] for Public Sector Information and specifically for Open Government Data, implements different features that make the document particularly accessible for both users and machines.

In **Figure 37**, a screenshot of the beginning of the licence allows users to see the versioning system that has been put in place using explicit and meaningful PIDs (in the form of URIs). Those, together with the layout of the document, allow the user to browse the different versions that have been issued, knowing at any moment which one he or she is accessing and its status. In the image below, we also note that the document also indicates that the displayed version has been deprecated.

Figure 37: Norwegian Licence for Open Government Data, deprecated version 1.0

[30] https://data.norge.no/nlod/en/1.0

The legal text is clear, complete and well-structured, comprising most of the recommended licensing provisions included within the European Commission guidelines on '*recommended standard licences, datasets and charging for the reuse of documents*' [10].

It counts eleven different sections accompanied by explanatory boxes covering:

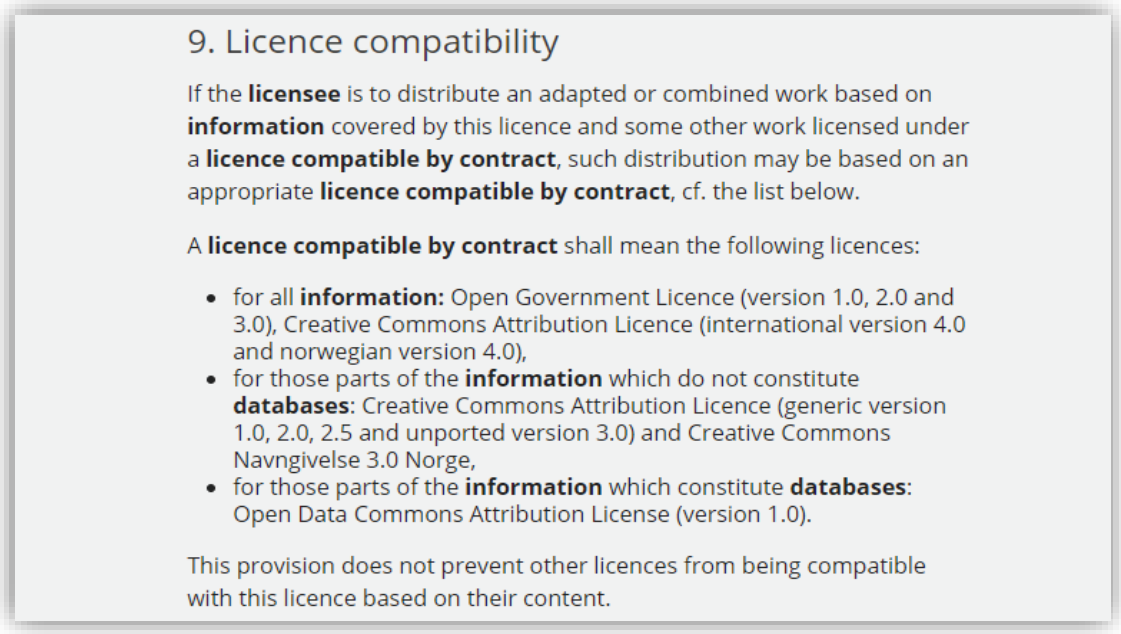
- Definitions
- Licence
- Exemptions
- Effects of breach of the licence
- Attribution
- Proper use
- Disclaimer of liability
- Licence compatibility
- New versions of the licence
- Governing law and legal venue

It must be noted that unlike other analysed terms of use, this licence is comprised of not only the usual copyright set of rights but also the database rights, which are often missing in customised licences.

The lack of database right protection goes to the detriment of the data holder since it leaves the content of the datasets unprotected, as copyright only covers the 'creativity' of the data structure.

In this regard, the licence compatibility section must be highlighted, too (**Figure 38**). This information facilitates the mapping exercise the user must face every time he or she has to work with different licenced resources to check the license compatibility. This is put in place by indicating how to proceed in the most frequent situations.

Figure 38: Excerpt from the English version of the 2.0 licence document



9. Licence compatibility

If the **licensee** is to distribute an adapted or combined work based on **information** covered by this licence and some other work licensed under a **licence compatible by contract**, such distribution may be based on an appropriate **licence compatible by contract**, cf. the list below.

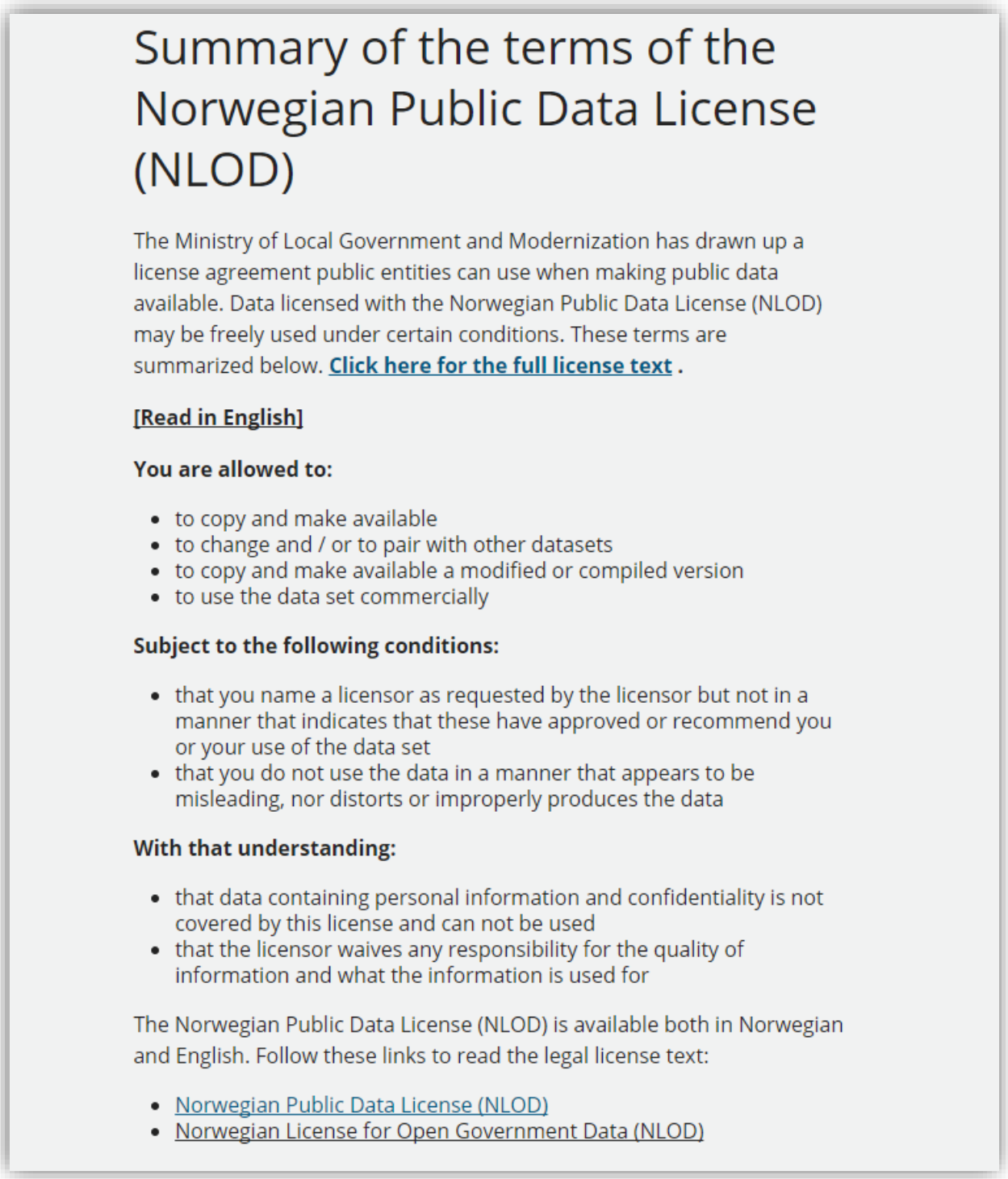
A **licence compatible by contract** shall mean the following licences:

- for all **information:** Open Government Licence (version 1.0, 2.0 and 3.0), Creative Commons Attribution Licence (international version 4.0 and norwegian version 4.0),
- for those parts of the **information** which do not constitute **databases**: Creative Commons Attribution Licence (generic version 1.0, 2.0, 2.5 and unported version 3.0) and Creative Commons Navngivelse 3.0 Norge,
- for those parts of the **information** which constitute **databases**: Open Data Commons Attribution License (version 1.0).

This provision does not prevent other licences from being compatible with this licence based on their content.

Moreover, it offers an English version of the licence along with a summary version, as shown in **Figure 39**.

Figure 39: Summary version of the licence (translated with Google translate)



Summary of the terms of the Norwegian Public Data License (NLOD)

The Ministry of Local Government and Modernization has drawn up a license agreement public entities can use when making public data available. Data licensed with the Norwegian Public Data License (NLOD) may be freely used under certain conditions. These terms are summarized below. **Click here for the full license text** .

[Read in English]

You are allowed to:

- to copy and make available
- to change and / or to pair with other datasets
- to copy and make available a modified or compiled version
- to use the data set commercially

Subject to the following conditions:

- that you name a licensor as requested by the licensor but not in a manner that indicates that these have approved or recommend you or your use of the data set
- that you do not use the data in a manner that appears to be misleading, nor distorts or improperly produces the data

With that understanding:

- that data containing personal information and confidentiality is not covered by this license and can not be used
- that the licensor waives any responsibility for the quality of information and what the information is used for

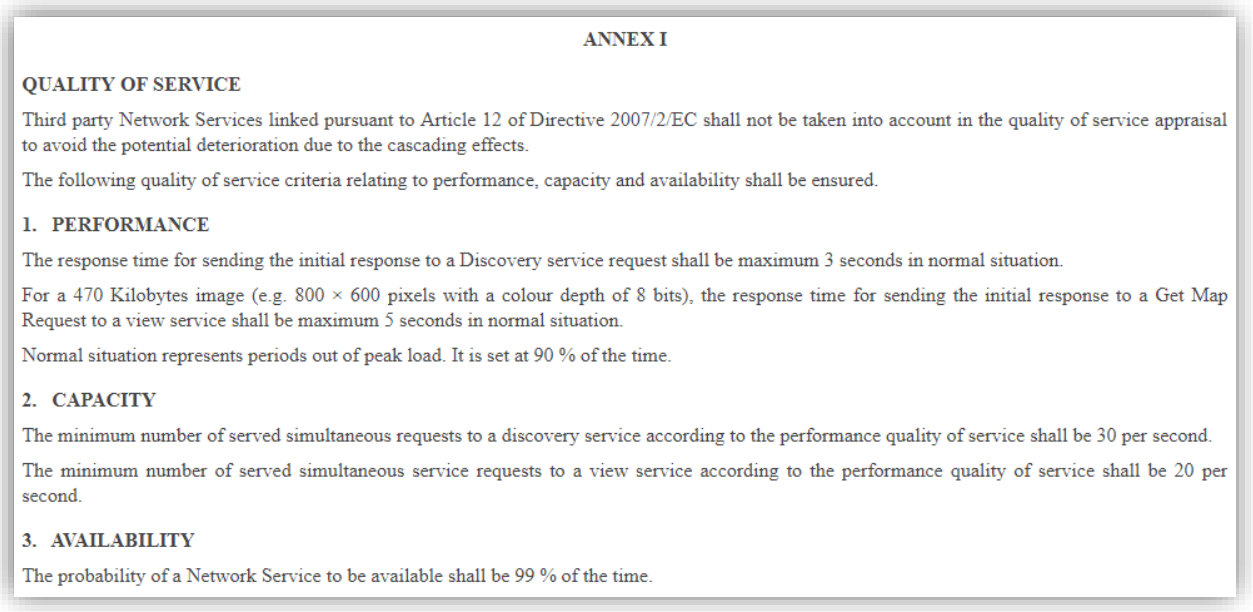
The Norwegian Public Data License (NLOD) is available both in Norwegian and English. Follow these links to read the legal license text:

- Norwegian Public Data License (NLOD)
- Norwegian License for Open Government Data (NLOD)

6.2 Service Level Agreement from *Danmarks Miljoportal*

Although the INSPIRE infrastructure is powered by Network Services that need to comply with strict quality service indicators (such as availability, capacity, performance; see **Figure 40**) according to the Implementing Rule 976/2009 on Network Services [15], almost none of the terms of use analysed made any mention of those aspects.

Figure 40: Requirements set By INSPIRE in regards to the quality of the network services



ANNEX I

QUALITY OF SERVICE

Third party Network Services linked pursuant to Article 12 of Directive 2007/2/EC shall not be taken into account in the quality of service appraisal to avoid the potential deterioration due to the cascading effects.

The following quality of service criteria relating to performance, capacity and availability shall be ensured.

1. PERFORMANCE

The response time for sending the initial response to a Discovery service request shall be maximum 3 seconds in normal situation.

For a 470 Kilobytes image (e.g. 800 × 600 pixels with a colour depth of 8 bits), the response time for sending the initial response to a Get Map Request to a view service shall be maximum 5 seconds in normal situation.

Normal situation represents periods out of peak load. It is set at 90 % of the time.

2. CAPACITY

The minimum number of served simultaneous requests to a discovery service according to the performance quality of service shall be 30 per second.

The minimum number of served simultaneous service requests to a view service according to the performance quality of service shall be 20 per second.

3. AVAILABILITY

The probability of a Network Service to be available shall be 99 % of the time.

These aspects are usually not included by the terms of use provisions or, if covered, they do so only partially under 'non-liability' sections, mentioning the right of the data publisher to interrupt the service temporarily or permanently whenever needed.

However, we have identified a Service Level Agreement issued by *Danmarks Miljoportal*[31] (Danish Environmental Portal) (**Figure 41**), covering in a very transparent way these aspects, especially in relation with communication with potential re-users.

In particular, the document includes the following sections:

- **Definitions**
- **Production Environment**
  - Uptime of running web services
  - Monitoring
- **Changes**
  - Managing changes
  - Notification of changes in web services
  - Rear compatibility
- **Operation of web services**
  - Amendment requests
  - Rules for using the *Danmarks Miljoportal* exhibited web services
  - Special circumstances

[31] Service Level Agreement issued by *Danmarks Miljoportal*

- Test and demo environment
- Other events

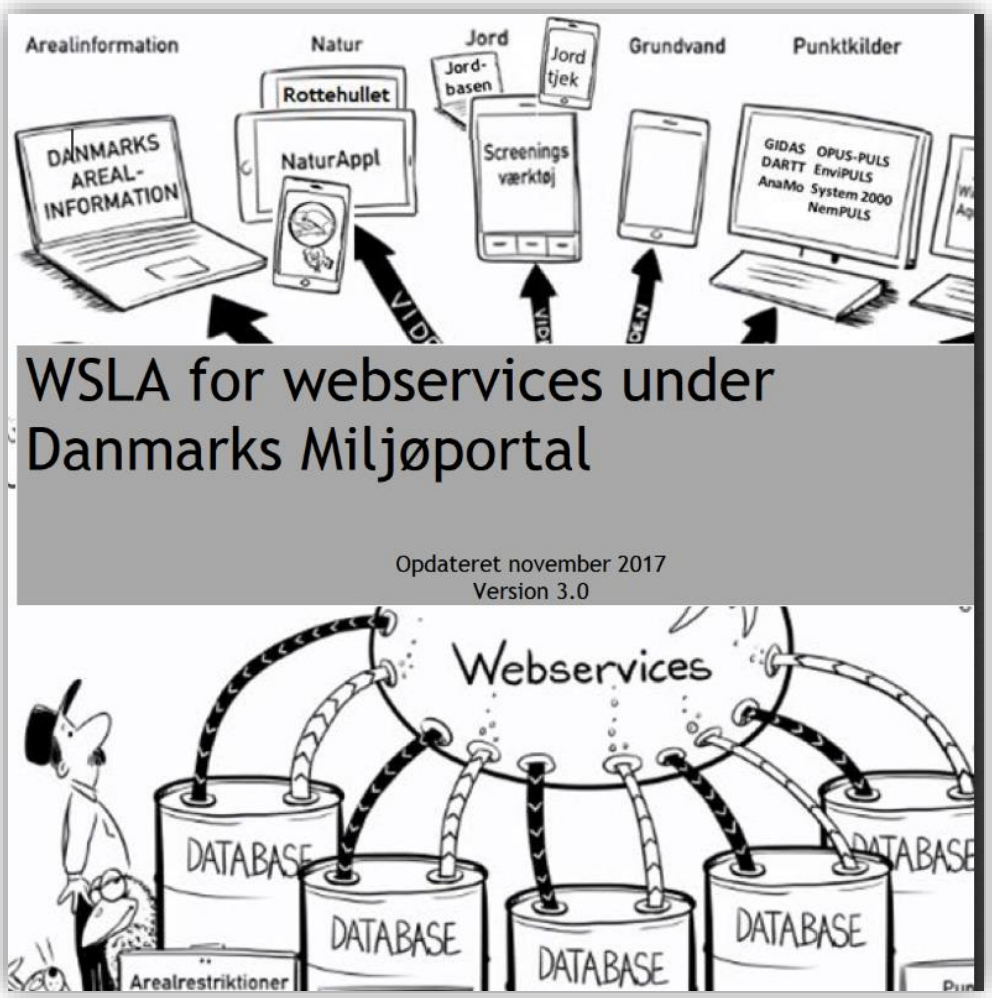
- Opening hours Helpdesk support

From a re-user perspective, these service agreements are more suitable to the nature of the INSPIRE Network Services than the common licence documents/terms of use usually issued to protect information, be it images or datasets.

In more general terms, SLAs are recognised as a component of the **European Interoperability Reference Architecture's** (EIRA) [16] organisational view and their role in INSPIRE and the tools used to handle such details could be of wider interest to other data-sharing communities involved in e-government.

This sort of document adds further legal and technical certainties to the potential re-user and could act as a stimulator for users to feel they can rely on the quality of public services, knowing in advance how they will behave when they should respond, including the period of maintenance (etc.). This tool can help build a reliable infrastructure.

Figure 41: WSLA for services under *Danmarks Miljoportal*



7 Next steps and future lines of research

To contribute to the free flow of data, it is fundamental not only to make more data resources available but also to have them properly described, and this includes their applicable terms of use.

The open data initiatives contribute greatly to this free-flow data idea, but the interpretation of what it means to be open diverges across organisations. Some organisations use the term in a more rigid way than others do by including in it not only the dimension of the applicable legal texts but also the format of the resources to ensure, for example, technological neutrality. Therefore, an agreed definition of what the term 'Open Data' should mean is a priority, at least within the context of INSPIRE.

The experiment carried out by capturing and interpreting the terms of use has demonstrated that, although INSPIRE provides mechanisms to define them, they appear not to be efficient enough from an average user's perspective. The use of two free text fields, namely, *`Conditions for Access and Use´* and *´Limitations on Public Access´*, has led to a large range of options for any user, who may also encounter vague, inaccurate, inconsistent and/or unrelated information, when not missing.

While we wait for smarter technologies (making use of artificial intelligence that are able to discern the conditions behind unstructured free text terms of use), we need to consider improvements in interoperability by agreeing and implementing common rules.

Harmonisation could come through different and complementary actions:

- **Legally**: By using a unique and common licence agreement used by all the INSPIRE data providers or compatible harmonised licences. That would be helpful to put order within the complex legal ecosystem, but would not fix the `noise' from a syntactical/technical point of view. Moreover, it would require modifying the Regulation, since the data policy models are not meant to be governed by INSPIRE but left to the data holders.
- **Technically**: By defining, sharing and using further controlled vocabularies and code lists to express the terms of use: more accurately, unambiguously and clearly.

Since it is not the scope of ARE3NA to address the first issue directly, we will focus on possible technical solutions, where **the definition of a set of combinable code lists values could help to shape the different possibilities of terms of use**.

7.1 New registers and code lists

To limit the noise produced by the free text fields dedicated to describing the terms of use, we propose to use the value of a well-known and shared classification.

7.1.1 Licence Register

The first solution would be to create a kind of federated licence register offering harmonised spellings and URLs of the applied licences in INSPIRE. However, this would be relevant only for those resources that are governed by licences and, as shown in the analysis, the majority of them use the inline metadata notice. Therefore, a licence register would be partially helpful.

7.1.2 Digital Rights Register

In combination, when applicable with the 'Licence Register', we could foresee a hierarchical code list, listing the different digital rights possibilities that would cover all the type of rights or permissions granted, conditions required and prohibitions imposed.

This approach would be suitable for any resource regardless the application, the type of terms of use put in place, including if it were a proper licence agreement, a website notice or simply the inline metadata notice.

The definition of vocabularies modelling the digital rights is not new. There are already public vocabularies expressed in RDF used in the Web and Linked Data worlds, such as:

- **Open Data Rights Statement Vocabulary (ODRS)** [17], *´A vocabulary that supports the publication of Open Data by providing the means to capture machine-readable "rights statements", e.g. the licensing information, copyright notices and attribution requirements that are associated with the publication and re-use of a dataset.´*
- **Creative Commons Right Expression Language (CC REL)** [18].*´The Creative Commons Rights Expression Language (CC REL) lets you describe copyright licenses in RDF.´*
- The W3C *Permissions & Obligations Expression Working Group Charter*[32] that recently released the **ODRL Vocabulary & Expression 2.2** recommendation [19]. *´The Open Digital Rights Language (ODRL) is a policy expression language that provides a flexible and interoperable information model, vocabulary, and encoding mechanisms for representing statements about the usage of content and services. The ODRL Vocabulary and Expression describes the terms used in ODRL policies and how to encode them´*.

In the Geospatial domain, we are aware of the **Standard ISO 19153:2014** [20] and **OGC Geospatial Digital Rights Management Reference Model (GeoDRM)** [21] but they can be seen as more sophisticated than maybe needed, since they address licence management from a transactional point of view (**Figure 42**) including their integration in access control mechanisms.

Figure 42: Semantics of licence structure as shown in the OGC Geospatial Digital Rights Management Reference Model

Licence	Digital representation of the agreement between the Principal and the Issuer
Grant	Description of the right being conveyed (one to many instances)
Principal	Entity to whom the right has been granted
Right	Act associated to the right that has been granted
Resource	Resource associated to the act above
Condition	Conditions that modify the right
Issuer	The other party to the licence, the source of the rights.
Signature	Digital signature of the issuer of this licence
Details	Other information needed to assure validity of this licence

Source: http://www.opengeospatial.org/standards/requests/30

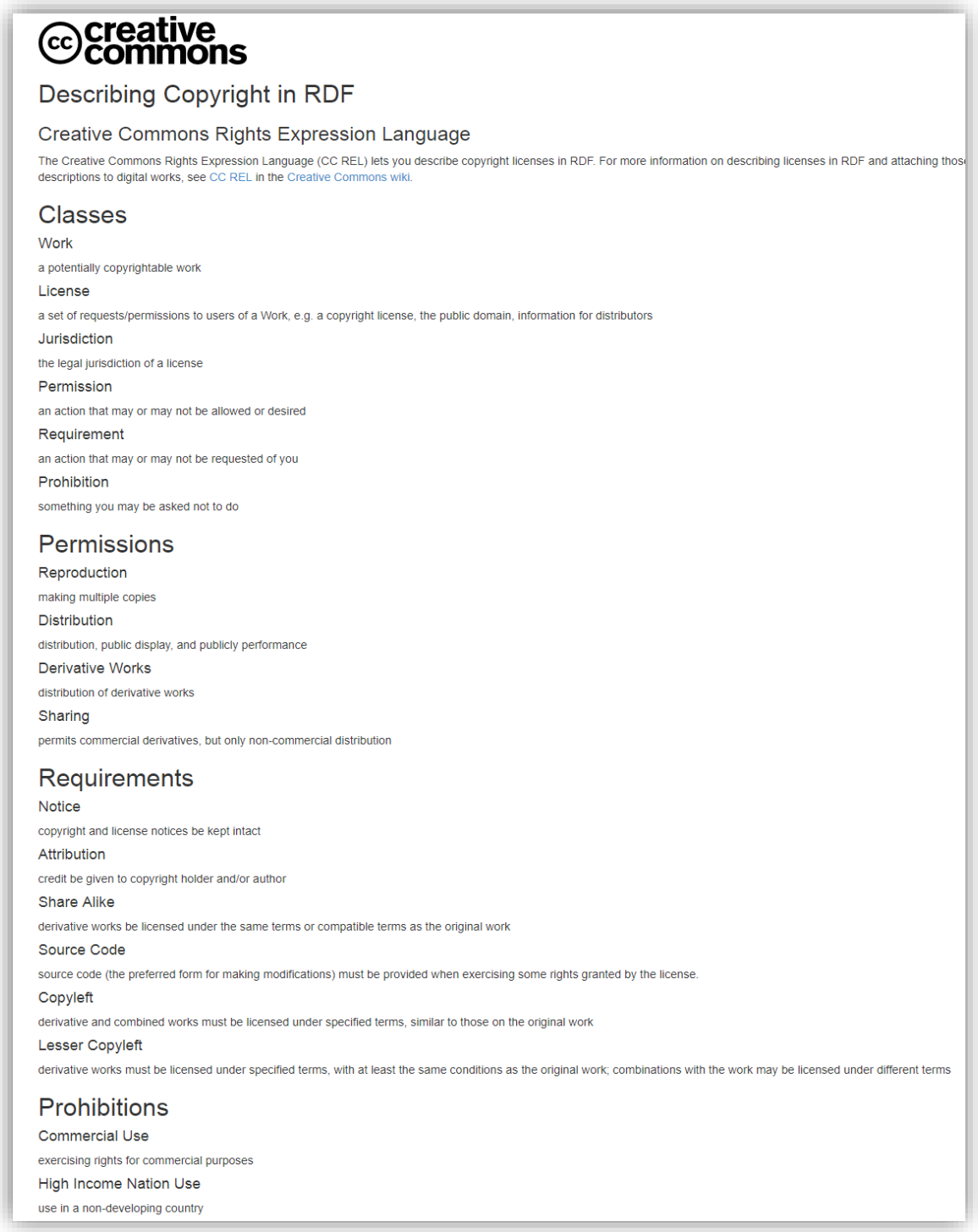
It is worth noting, in any case, the potential of the *GeoDRM* reference model when it comes to specific spatiotemporal restrictions, for a given geographical space or over a specific period, as explored in the Access Management Federation testbed experiments in ARE3NA[33].

[32] https://www.w3.org/2016/poe/charter
[33] See https://joinup.ec.europa.eu/solution/are3na-study-aaa-data-and-services

Our proposal would, therefore, involve looking into and re-using some or parts of the ontologies proposed by the World Wide Web domain.

Attention should be drawn to **Figure 43**, which contains a screenshot of the Creative Commons Rights Expression language, where we can see the relatively simple classification of terms used.

Figure 43: Screenshot of the CC REL vocabulary



creative commons

Describing Copyright in RDF

Creative Commons Rights Expression Language

The Creative Commons Rights Expression Language (CC REL) lets you describe copyright licenses in RDF. For more information on describing licenses in RDF and attaching those descriptions to digital works, see CC REL in the Creative Commons wiki.

Classes

Work

a potentially copyrightable work

License

a set of requests/permissions to users of a Work, e.g. a copyright license, the public domain, information for distributors

Jurisdiction

the legal jurisdiction of a license

Permission

an action that may or may not be allowed or desired

Requirement

an action that may or may not be requested of you

Prohibition

something you may be asked not to do

Permissions

Reproduction

making multiple copies

Distribution

distribution, public display, and publicly performance

Derivative Works

distribution of derivative works

Sharing

permits commercial derivatives, but only non-commercial distribution

Requirements

Notice

copyright and license notices be kept intact

Attribution

credit be given to copyright holder and/or author

Share Alike

derivative works be licensed under the same terms or compatible terms as the original work

Source Code

source code (the preferred form for making modifications) must be provided when exercising some rights granted by the license.

Copyleft

derivative and combined works must be licensed under specified terms, similar to those on the original work

Lesser Copyleft

derivative works must be licensed under specified terms, with at least the same conditions as the original work; combinations with the work may be licensed under different terms

Prohibitions

Commercial Use

exercising rights for commercial purposes

High Income Nation Use

use in a non-developing country

***Source*:** https://creativecommons.org/ns

The main concepts such as *Work*, *Licence*, *Jurisdiction* etc. are modelled as classes that are later specialised in narrower terms, as found in the case of '*permissions'*, through *reproduction*, *distribution*, *Derivative-works* etc. This vocabulary, despite its apparent simplicity, is very rich and has embedded semantics. An excerpt of the RDF schema encoding is shown in **Figure 44**.

Figure 44: Excerpt of the CC REL's RDF schema

```
<?xml version="1.0" encoding="utf-8"?>
<rdf:RDF
  xmlns:cc='http://creativecommons.org/ns#'
  xmlns:owl='http://www.w3.org/2002/07/owl#'
  xmlns:rdf='http://www.w3.org/1999/02/22-rdf-syntax-ns#'
  xmlns:rdfs='http://www.w3.org/2000/01/rdf-schema#'
>
  <rdf:Description rdf:about="http://web.resource.org/cc/License">
    <owl:equivalentClass rdf:resource="http://creativecommons.org/ns#License"/>
  </rdf:Description>
  <rdf:Property rdf:about="http://creativecommons.org/ns#legalcode">
    <rdfs:domain rdf:resource="http://creativecommons.org/ns#License"/>
    <rdfs:range rdf:resource="http://www.w3.org/2000/01/rdf-schema#Resource"/>
  </rdf:Property>
  <rdf:Property rdf:about="http://creativecommons.org/ns#jurisdiction">
    <rdfs:domain rdf:resource="http://creativecommons.org/ns#License"/>
    <rdfs:label xml:lang="en-US">jurisdiction</rdfs:label>
    <rdfs:range rdf:resource="http://creativecommons.org/ns#Jurisdiction"/>
  </rdf:Property>
  <rdf:Description rdf:about="http://web.resource.org/cc/prohibits">
    <owl:equivalentProperty rdf:resource="http://creativecommons.org/ns#prohibits"/>
  </rdf:Description>
  <rdf:Description rdf:about="http://web.resource.org/cc/CommercialUse">
    <owl:equivalentClass rdf:resource="http://creativecommons.org/ns#CommercialUse"/>
  </rdf:Description>
  <rdf:Property rdf:about="http://creativecommons.org/ns#useGuidelines">
    <rdfs:range rdf:resource="http://www.w3.org/2000/01/rdf-schema#Resource"/>
    <rdfs:subPropertyOf rdf:resource="http://purl.org/dc/terms/relation"/>
    <rdfs:domain rdf:resource="http://creativecommons.org/ns#Work"/>
  </rdf:Property>
  <rdf:Description rdf:about="http://web.resource.org/cc/permits">
    <owl:equivalentProperty rdf:resource="http://creativecommons.org/ns#permits"/>
  </rdf:Description>
  <cc:Requirement rdf:about="http://creativecommons.org/ns#LesserCopyleft">
    <rdfs:label xml:lang="en-US">Lesser Copyleft</rdfs:label>
    <rdfs:comment xml:lang="en-US">derivative works must
          be licensed under specified terms, with at least
          the same conditions as the original work;
          combinations with the work may be licensed under
          different terms</rdfs:comment>
  </cc:Requirement>
  <rdf:Description rdf:about="http://web.resource.org/cc/Permission">
    <owl:equivalentClass rdf:resource="http://creativecommons.org/ns#Permission"/>
```

Source: https://creativecommons.org/schema.rdf

The agreement on a similar code list would bring at least two advantages:

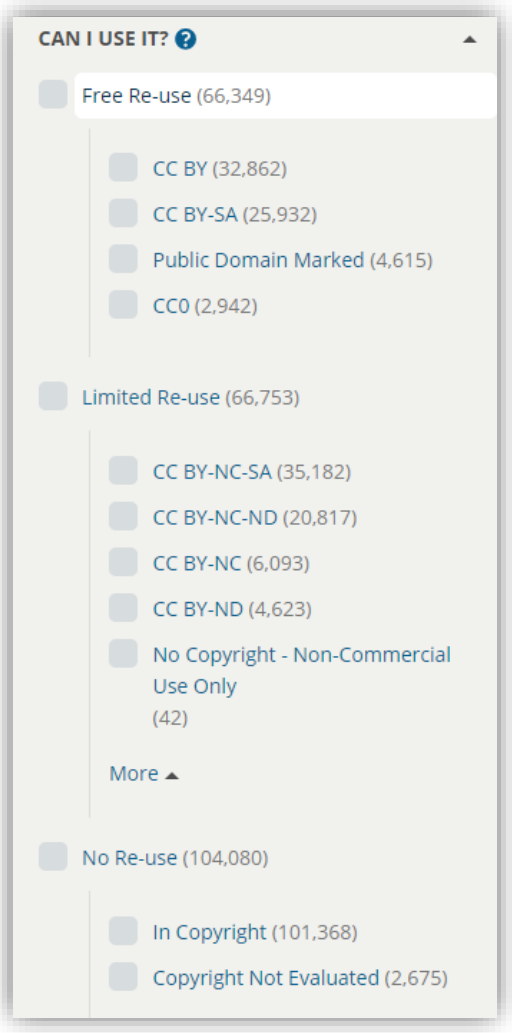
- By combining the values, we could model quite precisely the terms of use **at such point that the user would not even need to know the name of a licence or even to access it to understand the granted permissions or the conditions and obligations to be aware of**.

- Those code list values can be easily mapped and retaken by the informational systems to allow the implementation of smarter and more user-friendly front-ends.

7.2 Improvement of data catalogues filtering functionalities

We envisage that the use of the proposed controlled vocabularies would allow the development of web applications that are able to manage more easily and efficiently search functionalities. An example of how these improvements could be developed is shown in **Figure 45** where faceted filters are available in the ***Europeana Collections*** catalogue[34] to help browsing the rich collections of digitalised artworks, artefacts, books, videos and sounds from across Europe.

Figure 45: Filter functionality for terms of use in the Europeana portal



Source: www.europeana.eu

[34] https://www.europeana.eu/portal/en/search

7.3 Licensing assistants powered by Linked Data

INSPIRE is taking some initial steps in the Linked Data world as a way to understand the benefits that this could bring to geospatial data-sharing, while offering greater visibility and reusability of spatial resources to other domains.

For example, INSPIRE has provided a representation of its metadata for the exchange across data catalogues through the **GeoDCAT specification** [22]. It has also produced a set of **RDF ontologies and vocabularies** [23] representing the conceptual models of the INSPIRE geospatial features and drafted the **INSPIRE RDF Technical Guidelines** [24]to encode traditional geospatial resources in RDF according to common rules to help maximise interoperability.

We believe that the integration and testing of those RDF rights-related vocabularies within the INSPIRE RDF resources could be readily undertaken.

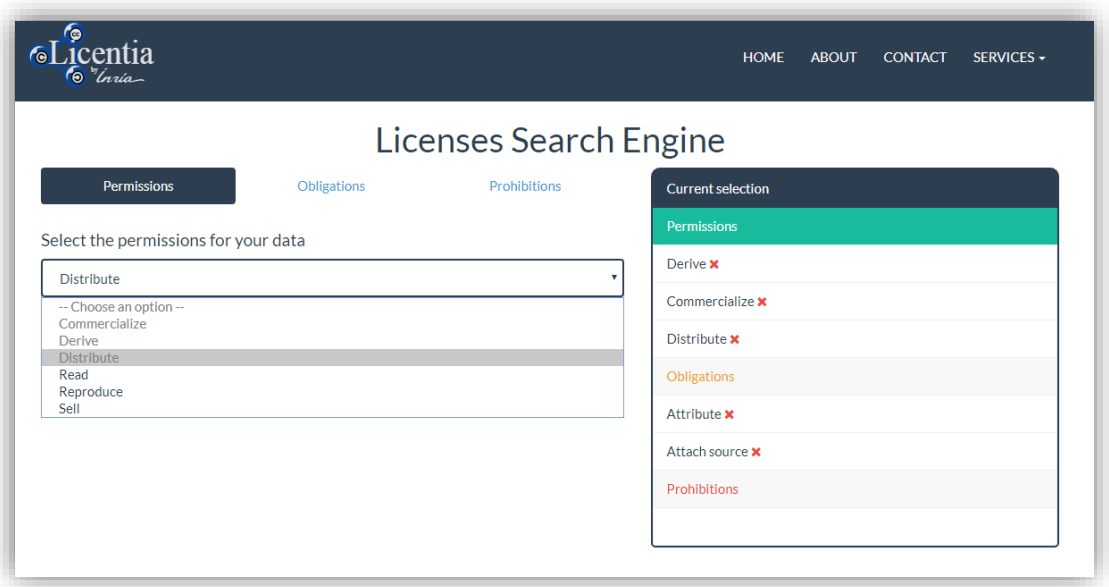
The use of expression rights vocabularies could, for example, allow useful tools to be developed that could support:

- users, to get a quick summary of the legal codes or to automatically check the compatibility of several licences; and
- data providers, to produce and export 'customised' interoperable licences semantically understandable and consumable by informatics tools such as search engines.

Some research actions have taken already place in this regard. The tool ***Licentia***[35], developed by INRIA in France is a good example of it. It describes itself as a *'suite of services to support [the data provider] in looking for a suitable license for [his] data'*.

In **Figure 46**, we provide a screenshot of the Licentia search engine, able to check compatibility among different licenses. These functionalities are possible thanks to the use of harmonised licence documents translated in RDF according to clear ontology rules. In **Figure 47** we can see how the semantic relationships are represented behind the scenes.

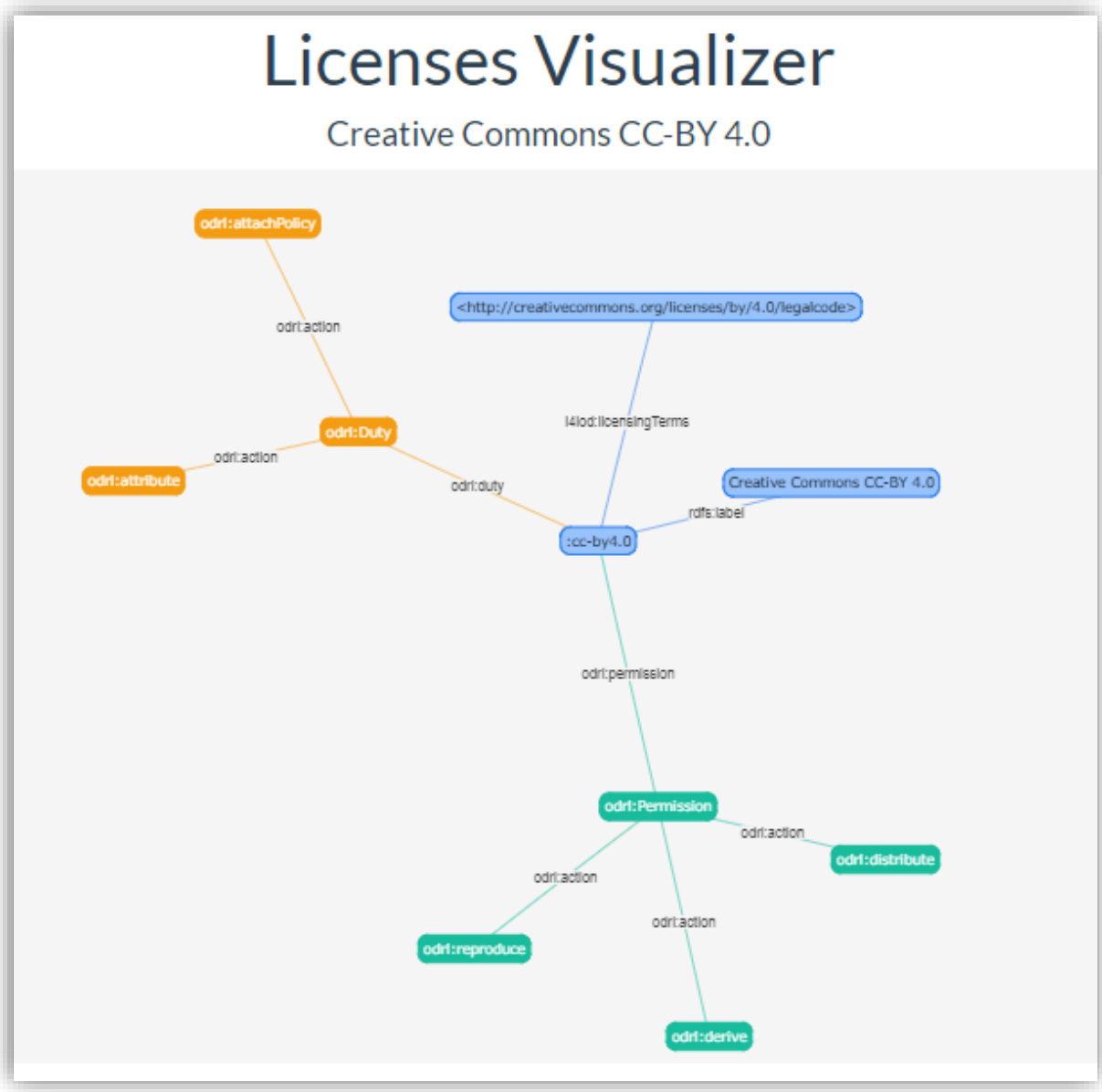
Figure 46: Licentia's license search engine



Source: http://licentia.inria.fr/licenseservice

[35] http://licentia.inria.fr/licenseservice

Figure 47: Licentia's licence visualiser



Source: http://licentia.inria.fr/visualize/cc-by4.0

With these potential avenues for further work, we can draw some conclusions from this study.

Another example of ´Licence selector´ aiming at helping the data/software provider is https://ufal.github.io/public-license-selector/

8 Conclusions

The analysis of the terms of use based on a sample of INSPIRE metadata from the Member States has confirmed a high heterogeneity with implications for dataset usability.

Today unfortunately, it is not a straightforward task to figure out if an INSPIRE resource is open and ready for reuse. More than 800 different terms of use were identified in our sample, where most were in the form of multilingual, unstructured texts. Only a 15% of them were supported by an external document, usually a licence agreement. This shows that, unlike the software environment where licences are widespread, the use and application of data licences is less mature.

Although INSPIRE has provided guidance and even proposed the reuse of licences and Service Level Agreement templates to support legal interoperability (at least for data-sharing between public bodies), those have been almost completely unused. In the sample, we found only one resource using the '*INSPIRE basic licence*' model. Around 60% of the applied licences were customised organisational licences, often issued by local administrations. The national and regional levels, instead, made more intensive use of standard public licences and national licensing schemes (21% and 14% of the whole resources, respectively). In particular, the *Creative Commons* attribution licences in different versions and jurisdictions were found to be the standard public licences most frequently chosen and harmonised national licensing schemes were partially applied by Germany, United Kingdom, France and Norway.

As far as the '*Limitations on Public Access'* are concerned, the analysis has demonstrated that a very small portion of the resources (1.4%) were putting in place some Access Control restriction, the most common reason, when provided, was related to the presence of Intellectual Property Rights.

In regards to the format, the licence documents appeared to have richer and better-structured information than the inline metadata and website notices. In general, the licence documents were machine-readable and accessible online, although some examples were still using PDF documents. Further improvements could take place by providing better systems for the management and versioning of PIDs, by either providing English versions of licence text or by incorporating a user-friendly summary of the legal texts.

While only 0.9% of the resources stated that there was an application of fees, nearly 43% applied dual-licensing mechanisms, whereby the resources were provided for free provided no more rights than those granted were used.

A more detailed analysis of the degree of openness perceived from the available information and according to the OKNF's Open Definition, has shown that less than a quarter of the resources could be considered as Open Data even though they did not use the `Open Data´ word in the relevant metadata fields. Most resources were seen as `hybrid´ (55%) that is granting limited rights but, in general, prohibiting the commercial exploitation of the data. The remaining examples found in the sample were explicitly closed, requiring the separated agreement or authorisation request (12.5%) or simply 'unknown' because of the lack of details in the metadata's information.

The user barriers encountered, as shown through the analysis, have different origins and, consequently, our proposals to address them are also varied.

- As already indicated in the background section, and confirmed with our findings, the way INSPIRE defines the encoding of the terms of use in the description files appears not to be optimal. This neither helps a user who is wanting to check the conditions for the potential reuse of a resource nor the policy officer for monitoring data usage.

- Some barriers are somewhat technical, including typographic or compilation results or when metadata fields are left empty. There are also cases involving the lack of verification or checking the consistency of rules between the access and use

conditions declared for the data and the download service(s) and the validity of the links to access the licences.

- Another group of barriers are derived from a lack of harmonisation of the data-sharing policies within a country. Open Data initiatives have been embraced by many public bodies and found in national strategic policies, but these are not yet clearly identifiable through the metadata. Although we know that an improvement is already in place in many countries, this is not yet fully visible in our sample.
- Some barriers can be solved with technical solutions to check either consistency, duplication of fields or by making use of standardised code lists or agreed text options, instead of continuing to make use of free text fields. A significant type of barrier is the great diversity of licences that users are confronted with, including their varied terminology. From the usage perspective, there is a demand for standardisation and improved legal interoperability. Further work is necessary to arrive at such standardisation, with a related review of INSPIRE's rules, given the issues uncovered in the proposed adoption of common approaches. One item of further research, therefore, would be to understand the motivations for using the terms of use approaches in select organisations through more qualitative approaches.

The next actions should aim towards an improvement in interoperability. That could be achieved through the challenging harmonisation of the licensing or through the improvement of the terms of use semantics. As proposed, a way to proceed could be by modelling the different terms of use by reusing some of the existing Digital Right Expression languages to put order into the current highly varied legal landscape. This expressivity could potentially lead to the development of tools that support both users and data providers when interacting with the rights related to the reuse of public sector information. One area of further work could involve not only considering geospatial data policy in INSPIRE but also where INSPIRE is combined with other data, such as environmental and statistical data holdings.

9 Bibliography

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List of abbreviations

ARE3NA	A Reusable INSPIRE Reference Platform
ATOM	Atom Syndication Format (Atom RFC 4287)
CC	Creative Commons
CC BY	Creative Commons Attribution
CC REL	Creative Commons Right Expression Language
CSW	Catalogue Service
DRM	Digital Rights management
DSM	Digital Single Market
ELISE	European Location Interoperability Solutions for e-Government
INSPIRE	Infrastructure for Spatial Information in the European Community
IOT	Internet of Things
ISA	Interoperability solutions for public administrations
IR	Implementing Rule
JRC	Joint Reseacrh Centre
OGC	Open Geospatial Consortium
OKNF	Open Knowledge Foundation
ODBL	Open Data Commons Open Database License
ODRS	Open Data Rights Statement Vocabulary
PID	Persistent Identifier
PSI	Public Sector Information
RDF	Resource Description Framework
SA	Share-alike
SLA	Service Level Agreement
REL	Rights Expression language
SDI	Spatial Data Infrastructure
TG	Technical Guideline
WMS	Web Map Service (OGC-WMS)
WMTS	Web Map Tile Service (OGC WMTS)
WFS	Web Feature Service (OGC WFS)
WSLA	Web service level agreement

List of definitions

Access Control	Short term for referring to *Authentication, Authorization, and Accounting* (AAA). *'Term for a framework for intelligently controlling access to computer resources, enforcing policies, auditing usage, and providing the information necessary to bill for services.'*[36] [Techtarget.com]
Availability	Probability that the Network Service is available [IR 976/2009]
Capacity	Limit of the number of simultaneous service requests provided with guaranteed performance [IR 976/2009]
[Acceptable]Conditions	In the licensing context, those are requirements the user has to comply with (prior) to make use of the granted rights. For the OKNF´s *Open Definition,* the *´license must not limit, make uncertain, or otherwise diminish the permissions required in Section 2.1 except by the following allowable conditions´*: attribution, integrity, share-alike, notice, source, technical restriction prohibition, non-agression. [http://opendefinition.org]
Data provider	The entity responsible for producing and/or making the dataset available. In the report data provider/data holder are treated as synonyms even if we are aware that some distinctions could be done.
Data silos	Use silos arise legally if it is not possible to combine data from different sources, due to incompatible licensing. [OKNF]
Download service	Enabling copies of spatial data sets, or parts of such sets, to be downloaded and, where practicable, accessed directly
Discovery service	Making it possible to search for spatial data sets and services on the basis of the content of the corresponding metadata and to display the content of the metadata
Dual-licensing	Also known as ´Multi-licensing´. Is the practice of distributing data under two or more different sets of terms and conditions.
GetCapabilities	OGC request allowing to retrieve metadata about the service, including supported operations and parameters, and a list of the available layers
Infrastructure for spatial information	Metadata, spatial data sets and spatial data services; network services and technologies; agreements on sharing, access and use; and coordination and monitoring mechanisms, processes and procedures, established, operated or made available in accordance with this Directive [Directive 2007/2/EC]

[36] http://searchsecurity.techtarget.com/definition/authentication-authorization-and-accounting

Implementing Rules	Legally binding texts adopted as Commission Decisions or Regulations.
Interoperability	Possibility for spatial data sets to be combined, and for services to interact, without repetitive manual intervention, in such a way that the result is coherent and the added value of the data sets and services is enhanced [Directive 2007/2/EC]
INSPIRE licence	This is a subtype of customised organisational licence laid down by some organisations to share their INSPIRE-relevant geospatial resources, not a legal text mandated by the INSPIRE Directive.
Licence	Any agreement, including licence agreements, contracts and exchanges of e-mails or any other arrangement on access by (Data-sharing IR) A set of requests/permissions to users of a Work, e.g. a copyright license, the public domain, information for distributors [CC REL]
Licensor	A licensor is the party that grants the license.
Licence compatibility	In the software environment, *´is a legal framework that allows for pieces of software with different software licenses to be distributed together. The need for such a framework arises because the different licenses can contain contradictory requirements, rendering it impossible to legally combine source code from separately-licensed software in order to create and publish a new program.´*[Wikipedia] Often called ´conformant licenses´ when approved after a passing given criteria in an assessment of compatibility process.
Licensee	The licensee is the party that receives a license
Linked data	*The Semantic Web is a Web of Data — of dates and titles and part numbers and chemical properties and any other data one might conceive of. The collection of Semantic Web technologies (RDF, OWL, SKOS, SPARQL, etc.) provides an environment where application can query that data, draw inferences using vocabularies, etc. [W3C]*
Machine-readable	*File format structured so that software applications can easily identify, recognize and extract specific data, including individual statements of fact, and their internal structure. [PSI Directive]*
Mashup	(computer industry jargon), in web development, is a web page, or web application, that uses content from more than one source to create a single new service displayed in a single graphical interface.[Wikipedia]

Metadata	Information describing spatial data sets and spatial data services and making it possible to discover, inventory and use them
Mixed-licensing	Practice that adds additional provisions upon an existing licence document, generally to grant further rights.
Network service	Web services provided in internet
Open Data	Datasets that can be freely used, shared and built-on by anyone, anywhere, for any purpose. This is the summary of the Open Definition which the *Open Knowledge Foundation* created in 2005 to provide both a succinct explanation and a detailed definition of open data
Open Government	Governing doctrine, which holds that citizens have the right to access the documents and proceedings of the government to allow for effective public oversight. In its broadest construction it opposes reason of state and other considerations, which have tended to legitimize extensive state secrecy
Organisational licence	A bespoke or custom-made licence is created by the data publisher and introduces specific conditions with which the user must comply. Bespoke or custom-made licences can be written by the publisher or adapted from a standard licence through the addition of new conditions and/or the modification of existing ones. Bespoke and custom-made licences can increase complexity for users of open data. They may introduce specific conditions that limit usage, restrict data integration and, in some cases, are difficult for users to comply with. [www.europeandataportal.eu]
Performance	Minimal level by which an objective is considered to be attained representing the fact how fast a request can be completed within an INSPIRE Network Service [IR 976/2009]
Persistent Identifiers	(PI or PID) is a long-lasting reference to a document, file, web page, or other object.[Wikipedia]
Permissions	Granted rights. For the OKNF, *Open Definition*, the required permissions that a licence must irrevocably permit (or allow) are the following: use, redistribution, modification, separation, compilation, non-discrimination, propagation, application to any purpose, No charge.
Prohibitions	Forbidding clauses of a licence. Often the Commercial use (exercising rights for commercial purposes) is forbbiden.
Public Sector Information	any content whatever its medium (written on paper or stored in electronic form or as a sound, visual or audiovisual

	recording)» when produced by a public sector body within its mandate
Public authority	For INSPIRE, this role could be *(a) any government or other public administration, including public advisory bodies, at national, regional or local level;* *(b) any natural or legal person performing public administrative functions under national law, including specific duties, activities or services in relation to the environment; and* *(c) any natural or legal person having public responsibilities or functions, or providing public services relating to the environment under the control of a body or person falling within (a) or (b).* [Directive 2007/2/EC]
Register	Official list or reference codes
Reuser	Generally, we refer to an end-user who exploits the data resources to create added-value works. There is a conceptual discussion between ´reuse´ and ´repurposing´. ´While: • '**Data reuse'** means taking a data asset and using more than once for the same purpose.´ • '**Data repurposing**' means taking a data asset previously used for one (or more) specific purpose(s) and using that data set four a completely different purpose.´ [http://dataqualitybook.com/?p=349]
Unported	Licences that are not associated with any specific jurisdiction (e.g. country).
Usability	is the ease of use and learnability of a human-made object such as a tool or device. In software engineering, usability is the degree to which a software can be used by specified consumers to achieve quantified objectives with effectiveness, efficiency, and satisfaction in a quantified context of use. [Wikipedia]
User barrier	Also known as usability or experience obstacles. *´Barriers [and enablers] are properties, situations, or conditions in the product development process, team, or context that negatively [or positively] influence the usability of a product.'* [37]

[37] https://www.tandfonline.com/doi/full/10.1080/07370024.2015.1117373

Service Level Agreement	Official commitment that prevails between a service provider and a client. Particular aspects of the service – quality, availability, responsibilities – are agreed between the service provider and the service user.[Wikipedia]
Spatial data	Any data with a direct or indirect reference to a specific location or geographical area
Spatial data set	Any identifiable collection of spatial data
Technical Guideline/Guidance	Non-binding documents describing detailed implementation aspects and relations with existing standards, technologies and practices in order to support the technical implementation process. They may need to be revised during the course of implementing the infrastructure to take into account the evolution of technology, new requirements, and cost benefit considerations.
Terms of use agreement	Rules by which one must agree to abide in order to **use** a service
View service	Making it possible, as a minimum, to display, navigate, zoom in/out, pan, or overlay viewable spatial data sets and to display legend information and any relevant content of metadata

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Annexes

Annex 1. Requirements and encoding rules to include terms of use details within the INSPIRE resources

Annex 1.a. Metadata records

The Implementing Rules 1205/2008 on Metadata [3] indicate which are the metadata elements applicable to spatial data sets and services, along with their multiplicity and their value domains. An excerpt of it is shown in **Figure 1**.

Further rules and best practices to include terms of use information is included within the technical guidelines on metadata. There are two different versions of them: the 1.3 [25]and 2.0 [9], the latter already considers feedback and identified issues from implementation experience, notably on '*Conditions for Access and Use'* and '*Limitations on Public Access'*. However, the analysed metadata were still following the 1.3.0 version according to the date when those were harvested.

An overview of the rules to represent the terms of use information within the metadata records files is specified in the following tables.

Table 9: Description of the metadata elements for describing the terms of use

Conditions for Access and Use	**Limitations on public access**
Description: *This metadata element defines the `Conditions for Access and Use´ of spatial data sets and services,* ***and where applicable, corresponding fees*** *as required by Article 5(2) (b) and Article 11(2) (f) of Directive 2007/2/EC*.	**Description:** *When Member States limit public access to spatial data sets and spatial data services under Article 13 of Directive 2007/2/EC, this metadata element shall provide information on the limitations and the reasons for them.*
Multiplicity: 1* both for spatial data and services	**Multiplicity**: 1* both for spatial data and services

Table 10: Rules to encode the terms of use' metadata elements according to the Metadata Implementing Rule

Conditions for Access and Use	**Limitations on public access**
Value domain: Free text	**Value domain:** Free text
Allowed values: • '**no conditions apply'**, shall be used if no conditions apply to the access and use of the resource • '**conditions unknown'**, if conditions are unknown • If fees are applicable, refer to a uniform resource locator (URL) where information on fees is available.	**Allowed values:** • No values are provided • However, if there are no limitations on public access, this metadata element shall indicate that fact.

Table 11: Encoding of the metadata elements according to Metadata technical guidelines 1.3.0

Conditions for Access and Use	**Limitations on public access**		
	MD_LegalConstraints.accessConstraints	*MD_LegalConstraints.otherConstraints*	*MD_SecurityConstraints.classification*
Value domain: Free text	Code list	Free text	Code list
Allowed values: • If no conditions apply to the access and use of the resource, `**no conditions apply**´ shall be used (Requirement 33) • Recommended the provision of a URL to detailed information	Strictly limited to the value defined in B.5.24 of ISO19115. See the values in **Figure 49**	If there are no limitations on public access, use the free text available in MD_LegalConstraints.otherConstraints to enter `**No Limitations**´ in the language used for the metadata.	See **Figure 48** containing code list B.5.11 of ISO 19115)

Table 12: Encoding of the metadata elements according to Metadata technical guidelines 2.0

<table>
<tr><th colspan="2">Conditions for Access and Use</th><th colspan="2">Limitations on Public Access</th></tr>
<tr><td colspan="2">Value domain: Free text

It shall not be the same than Limitations field</td><td colspan="2">Value domain: Free text and code list

It shall not be the same than `Conditions for Access and Use´ field</td></tr>
<tr><td colspan="2">Allowed values - Combination of:</td><td colspan="2">Allowed values:

The limitations on public access (or lack of such limitations) are based on reasons referred to in point (a) or in points (c) to (h) of Article 13(1)
Combination of:</td></tr>
<tr><td rowspan="3">One instance of either gmd:accessConstraints or gmd:useConstraints element shall be given. In both cases, this element shall contain a gmd:MD_RestrictionCode element with code list value `<i>otherRestrictions´</i></td><td>If no conditions apply the <i>gmd:otherConstraints</i> shall include a gmx:Anchor element pointing to the value `noConditionsApply´ in the code list ConditionsApplyingToAccessAndUse.</td><td rowspan="3">one instance of gmd:accessConstraints/gmd:MD_RestrictionCode element with code list value `otherRestrictions´</td><td rowspan="2">at least one instance of gmd:otherConstraints/gmx:Anchor pointing to one of the values from the code list for LimitationsOnPublicAccess</td></tr>
<tr><td>If the conditions are unknown gmd:otherConstraints shall include a gmx:Anchor element pointing to the value `conditionsUnknown´ in the code list ConditionsApplyingToAccessAndUse.</td></tr>
<tr><td>In other cases gmd:otherConstraints shall include a Non-empty Free Text Element with a textual description of the conditions in the language of the metadata. This text shall include descriptions of terms and conditions, including where applicable, the corresponding fees or an URL pointing to an online resource where these terms and conditions are described.</td><td>If there are no limitations on public access, the element shall point to the code list value `noLimitations'.</td></tr>
</table>

Figure 48: Code list B.5.11 of ISO 19115, to be used to fill the *Limitations on Public Use* when using the *MD_SecurityConstraints.classification* element

B.5.11 MD_ClassificationCode <<CodeList>>

	Name	Domain code	Definition
1.	MD_ClassificationCode	ClasscationCd	name of the handling restrictions on the dataset
2.	unclassified	001	available for general disclosure
3.	restricted	002	not for general disclosure
4.	confidential	003	available for someone who can be entrusted with information
5.	secret	004	kept or meant to be kept private, unknown, or hidden from all but a select group of people
6.	topSecret	005	of the highest secrecy

Source: ftp://podaac.jpl.nasa.gov/misc/outgoing/ed/pre_2013/GHRSST_metadata/ISO%2019115%20.pdf

Figure 49: Code list B.5.24 of ISO 19115, to be used to fill the Limitations on Public Use when using the *MD_LegalConstraints.accessConstraints* classification element

B.5.24 MD_RestrictionCode <<CodeList>>

	Name	Domain code	Definition
1.	MD_RestrictionCode	RestrictCd	limitation(s) placed upon the access or use of the data
2.	copyright	001	exclusive right to the publication, production, or sale of the rights to a literary, dramatic, musical, or artistic work, or to the use of a commercial print or label, granted by law for a specified period of time to an author, composer, artist, distributor
3.	patent	002	government has granted exclusive right to make, sell, use or license an invention or discovery
4.	patentPending	003	produced or sold information awaiting a patent
5.	trademark	004	a name, symbol, or other device identifying a product, officially registered and legally restricted to the use of the owner or manufacturer
6.	license	005	formal permission to do something
7.	intellectualPropertyRights	006	rights to financial benefit from and control of distribution of non-tangible property that is a result of creativity
8.	restricted	007	withheld from general circulation or disclosure
9.	otherRestrictions	008	limitation not listed

Source: ftp://podaac.jpl.nasa.gov/misc/outgoing/ed/pre_2013/GHRSST_metadata/ISO%2019115%20.pdf

Annex 1.b. Network services

Even if the metadata records already describe the INSPIRE services, the implementation of the network services include an additional description layer. For example, in the OGC type ones, the description layer comes through an operation called *GetCapabilities,* which also provides information regarding the terms of use.

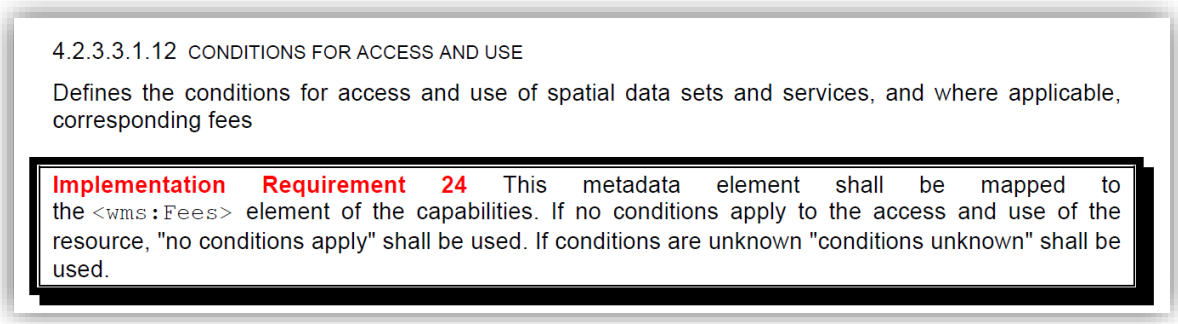
The only obligation a network service has to comply with is to provide a link to the INSPIRE metadata.

The next encoding rules come from technical guidelines, and thus they are not legally binding since there is no reference to them within the Network services implementing rule. In the next tables are provided the rules applying for every type of INSPIRE Network Service.

Table 13: Encoding of the INSPIRE View Service metadata elements including information on terms of use

INSPIRE VIEW SERVICES	**Source:** View services technical guidelines [26]	
	Conditions for Access and Use	**Limitations on Public Access**
	Path to mapped element: • *wms:Fees* (OGC-WMS) See **Figure 50**	**Path to mapped element**: • wms:AccessConstraints (OGC-WMS) See **Figure 51**
	Value domain: Free text	**Value domain**: Free text
	Allowed values: • '**no conditions apply'**, shall be used if no conditions apply to the access and use of the resource • '**conditions unknown'**, if conditions are unknown	**Allowed values:** • The use of '**None**' is recommended when no limitations on public access apply • When constraints are imposed, the **MD_RestrictionCode code list** names may be used as defined in [**ISO 19115**, Annex B – Data Dictionary, Section 5.24 available at **Figure 49**

Figure 50: Requirements on *Conditions for Access and Use* for an INSPIRE view service as indicated in the *Technical Guidance for the implementation of INSPIRE View Services*



4.2.3.3.1.12 CONDITIONS FOR ACCESS AND USE

Defines the conditions for access and use of spatial data sets and services, and where applicable, corresponding fees

Implementation Requirement 24 This metadata element shall be mapped to the `<wms:Fees>` element of the capabilities. If no conditions apply to the access and use of the resource, "no conditions apply" shall be used. If conditions are unknown "conditions unknown" shall be used.

Figure 51: Adding *limitations on public access* information in View services as indicated in the *Technical Guidance for the implementation of INSPIRE View Services.*

> **Implementation Recommendation 5** The use of "None" is recommended when no limitations on public access apply. When constraints are imposed, the MD_RestrictionCode codelist names may be used as defined in [**ISO 19115**, Annex B – Data Dictionary, Section 5.24].

Table 14: Encoding of the Download Service metadata elements including information on terms of use

INSPIRE DOWNLOAD SERVICES	**Source:** Download services technical guidelines [27]	
	Conditions for Access and Use	**Limitations on Public Access**
	Path to mapped element: • ows:Fees (OGC WFS) • Not mapped (ATOM)	**Path to mapped element**: • ows:AccessConstraints (OGC WFS) • rights (ATOM)
	Value domain: Free text	**Value domain**: Free text
	Allowed values: No values are provided	**Allowed values:** No values are provided

Table 15: Encoding of the Discovery services metadata elements including information on terms of use

INSPIRE DISCOVERY SERVICES	**Source:** Discovery services technical guidelines [28]	
	Conditions for Access and Use	**Limitations on Public Access**
	Path to mapped element: • ows:Fees (OGC CSW)	**Path to mapped element**: • ows:AccessConstraints (OGC CSW)
	Value domain: Free text	**Value domain**: Free text/Code lists
	Allowed values: No values are provided, but if fees are applicable, it must be mentioned.	**Allowed values:** Different values can be added depending on the way of describing it. See **Figure 53**.

Figure 52: Adding Limitations on Public Access information in an Atom type download services as indicated in *Technical Guidance for the implementation of INSPIRE Download Services*

5.1.9 Download Service Feed: feed 'rights' element

The 'rights' element shall be used to capture any information about rights or restrictions to the Download Service. Typically this will correspond with the value of 'accessConstraints' in the corresponding service metadata record. Note that rights and restrictions may also be applied to individual pre-defined datasets in the linked "Dataset feed".

Example 9: Example feed rights element

```
<!-- rights, access restrictions -->
<rights>Copyright (c) 2012, XYZ; all rights reserved</rights>
```

TG Requirement 10	The 'rights' element of a feed shall contain information about rights or restrictions for that feed.

Figure 53: Adding limitations on public access information in an INSPIRE Discovery service as indicated in the *Technical Guidance for the implementation of INSPIRE Discovery Services*

Table 7: Composition of union LimitationsOnPublicAccess

Name	Definition	Data type	Property Mapping to Information Model
AccessConstraints	Access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the resource.	Codelist (MD_RestrictionCode), one of: copyright, patent, patentPending, trademark, license, intellectualPropertyRights, restricted, otherRestrictions	identificationInfo[1]/*/resourceConstraints/*/accessConstraints
OtherConstraints	other restrictions and legal prerequisites for accessing and using the resource.	CharacterString	identificationInfo[1]/*/resourceConstraints/*/otherConstraints
Classification	name of the handling restrictions on the resource.	CodeList (MD_ClassificationCode), one of: unclassified, restricted, confidential, secret, topSecret	identificationInfo[1]/*/resourceConstraints/*/classification

Annex 2. Collection of the predefined values for the *Conditions for access and use* metadata element as indicated in the different language versions of the Implementing Rules on metadata

English (EN)	no conditions apply	conditions unknown
Bulgarian (BG)	не се прилагат условия	неизвестни условия
Spanish (ES)	no se aplican condiciones	condiciones desconocidas
Czech (CS)	žádné podmínky neplatí	podmínky nejsou známy
Danish (DA)	ingen betingelser	betingelser ukendte
German (DE)	Es gelten keine Bedingungen	Bedingungen unbekannt
Estonian (ET)	Tingimusi ei rakendata	Tingimused ei ole teada
Greek (EL)	δεν ισχύουν όροι	άγνωστοι όροι
French (FR)	aucune condition ne s'applique	conditions inconnues
Croatian (HR)	ne primjenjuju se uvjeti	uvjeti nisu poznati
Italian (IT)	nessuna condizione applicabile	condizioni non note
Latvian (LV)	bez nosacījumiem	nosacījumi nav zināmi
Lithuanian (LT)	Netaikomos jokios sąlygos	Sąlygos nežinomos
Hungarian (HU)	nincs vonatkozó feltétel	ismeretlen feltételek
Maltese (MT)	l-ebda kundizzjoni ma tapplika	kundizzjonijiet mhumiex magħrufin
Dutch (NL)	geen voorwaarden	voorwaarden niet bekend
Polish (PL)	brak warunków	warunki nieznane
Portuguese (PT)	sem restrições	condições desconhecidas
Romanian (RO)	fără condiții	condiții necunoscute
Slovakian (SK)	neuplatňujú sa žiadne podmienky	podmienky neznáme
Slovenian (SL)	ne velja noben pogoj	pogoji niso znani
Finnish (FI)	ei käyttöehtoja	käyttöehdot tuntemattomat
Swedish (SV)	inga tillämpliga villkor	villkor okända

Annex 3. Fields from data source

Code	Description	Example
MD: Resource Type	Refers to the type of resource. The possible values are: - For download services `WFS´ or `ATOM` - For view services `WMS´ or `WMTS`. - For discovery services `CSW´ - For transformation services `WPS´.	WFS
cURL Effective URL	It is the real URL that the script uses to perform different requests to get among other data its HTTP status code.	http://www.gfds.sachsen-anhalt.de/ows/ws/wfs/7217a44b-3bb8-21f7/GDI-LSA_LAGB_BODEN_BASISDATEN/?REQUEST=GetFeature&SERVICE=WFS&COUNT=1&TYPENAMES=lyr:Bodenbasisdaten_bk_feature&VERSION=2.0.0
cURL: HTTP Response	HTTP status code returned after the testing of the `cURL Effective URL`.	200
cURL: Content Type	The format of the resource targeted expressed by means of the MIME type. Often this information comes with the character encoding used. This information is provided directly by the server (if available).	text/xml; charset=UTF-8
MD: MS Country Code	Two-letter code for the country of origin of the resource. The information comes from the metadata in the proxy browser.	DE
MD: Responsible Organisation	Name of the responsible organisation. The information comes from the metadata in the proxy browser.	Landesamt für Geologie und Bergwesen Sachsen-Anhalt (LAGB), Dienstsitz: Halle (Saale), Abteilung Geologie, Dezernat Geodatenservice, Träger öffentlicher Belange, Controlling
MD: Responsible Organisation_en	Name of the responsible organisation automatically translated to English from the field `MD: Responsible Organisation´	State Agency for Geology and Mining of Saxony-Anhalt (LAGB), Office: Halle (Saale), Department of Geology, Department geodata service, public agencies, Controlling

Code	Description	Example
MD: Conditions for Access and Use	Conditions for accessing and using the resource. The information comes from the metadata in the proxy browser.	Keine
MD: Conditions for Access and Use_en	Conditions for accessing and using the resource automatically translated into English from the field `MD: Conditions for Access and Use` For a detailed information on the INSPIRE rules applying to this field refer to **Annex 1**.	There are no conditions
MD: Limitations on Public Access	Details on possible limitations on Public Access as for instance the presence of access control mechanisms. The information comes from the metadata in the proxy browser.	aufgrund der Rechte des geistigen Eigentums
MD: Limitations on Public Access_en	Details on possible limitations on Public Access automatically translated to English from the field `MD: Limitations on Public Access´ For a detailed information on the INSPIRE rules applying to this field refer to **Annex 1**.	because of intellectual property rights
NS: Fees	Information on fees from the Network services descriptions. This element maps the `Conditions for Access and Use´ metadata element	[Not available/Not applicable]
NS: Fees_en	Information on fees from the Network services descriptions. Automatically translated into English from the field `NS: Fees`	[Not available/Not applicable]
NS: Constraints /Rights	Information on the potential existence of constraints coming from either the OGC type network services metadata documents (‘*Access Constraints’* element) either from the ATOM feed ‘*rights’*.	[Not available/Not applicable]
NS: Constraints /Rights_en	Details regarding constraints, automatically translated to English from the field `NS: Constraints/Rights_en`	[Not available/Not applicable]

Annex 4. Terms of use elements examined

Annex 4.a. Metadata records and network service description level

To be able to capture and classify the information provided are properly, it is compulsory to understand the rules and recommendations laid down by INSPIRE to make available information on licensing. A review of the implementation rules and technical guidelines applying to those is available in **Annex 1**.

Field name	Field definition	Field type	Possible values
Language of the metadata record	Checks if the contents of the original Metadata are expressed in English or not. The fields reviewed are *´MD:Conditions for Access and Use´* and *´MD: Limitations on Public Access*'.	Code list	English (official language) English (Not official language) Not in English Mixed languages No data
Type of *'Conditions for Access and Use_en*'	Checks and classifies the contents provided within the 'Conditions for Access and Use_en´ metadata element. The table provided in **Annex 2**, has been reused over the not translated terms first to assign the values.	Code list	No conditions apply Conditions unknown Conditions apply No data Not related
Info in *'Conditions for Access and Use_en'*	Checks, there where conditions apply, the type of information that is provided and assigns it to the nearest option. The information comes from '*Conditions for Access and Use_en´*.	Code list	No data Information on use Information on access Information unrelated Information unknown
Information available from '*Limitations on Public Access_en'*	Checks the type of information that is provided and assigns it to the nearest option. The information comes from *´MD: Limitations on Public Access'.*	Code list	No data Information on use Information on access Information unrelated Information unknown
Access mode	Extracts the information on the mode of access applied.	Code list	Public Restricted Unknown/Not mentioned

Field name	Field definition	Field type	Possible values
Reason for Restricting the Public Access	Checks, there where limitations on access have been pointed out, if any reason has been provided for restricting the public access to the resource.	Code list	Article 13 a - the confidentiality of the proceedings of public authorities, where such confidentiality is provided for by law
			Article 13 b - international relations, public security or national defence
			Article 13 c -the course of justice, the ability of any person to receive a fair trial or the ability of a public authority to conduct an enquiry of a criminal or disciplinary nature
			Article 13 d - the confidentiality of commercial or industrial information, where such confidentiality is provided for by national or Community law to protect a legitimate economic interest, including the public interest in maintaining statistical confidentiality and tax secrecy
			Article 13 e - intellectual property rights
			Article 13 f - the confidentiality of personal data and/or files relating to a natural person where that person has not consented to the disclosure of the information to the public, where such confidentiality is provided for by national or Community law
			Article 13 g - the interests or protection of any person who supplied the information requested on a voluntary basis without being under, or capable of being put under, a legal obligation to do so, unless that person has consented to the release of the information concerned;
			Article 13 h -the protection of the environment to which such information relates, such as the location of rare species

Field name	Field definition	Field type	Possible values
			Limited Access - Reason not provided
			Limitations unknown
			No limitations - Public Access
			No data
			No info on access
Other reasons for restricting Public Access	If none of the restrictions considered under the Article 13 is suitable, indicate other reason for the resource being restricted.	Free Text	
Access request details	Checks if any possibility of accessing the request is given and how.	Code list	Not applicable
			Yes by email
			Yes by telephone
			Yes through web application
			Contact is needed but not specified
			Not mentioned
			Public resource
´Terms of use´ contents	Checks by combining the fields '*Conditions for Access and Use_en* ' and *'Limitations on Public Access_en* ' the way the terms of use are made available.	Code list	Referring to an external resource
			Referring to a contact
			Incomplete terms
			Inline terms and conditions
			No data
			Not related
			Unknown terms
Formal Comparison of meatadata fields	Checks if the information provided in the '*Conditions for Access and Use_en* ' and *'Limitations on Public Access_en* ' fields is the same.	Code list	Same content
			Different content
			No data
Degree of Openness perceived	Degree of openness perceived by the user, according to the information provided by the metadata records.	Code list	Public Domain
			Open
			Hybrid
			Closed
			Unknown

Annex 4.b. Terms of use formal examination

Field name	Field definition	Field type	Possible values
External link	Collects the link of the licence as indicated in the metadata, if any.	hyperlink/ code value	[Link]
			Not available
URI pattern	Checks if the URL provided for the licence follows a URI pattern, if any.	Code list	URI
			No URI
			Not applicable
Link to the real URL	If the URL indicated in the metadata is not valid or has changed, indicate the correct one.	hyperlink/ code value	[Link]
			Not applicable
URL issue	If applicable, details on any issue encountered with the URL provided.	Code list	Broken link
			Redirected link
			Wrong link
			Not final URL
			Good link
			No link
			Not applicable
Summary version	Checks if there is a user-friendly or human-readable version of the licence (deed).	Code list	Summary version
			No summary version
			Not applicable
English version	Checks if the licence document is available at least in English.	Code list	English version
			Also an English version
			No English version
			Not applicable
Link to the English version if available	URL to an English version of the licence, if available.	hyperlink/ code value	[Link]
			Not available
Encoding of the terms of use	Encoding or distribution format in which the licence document is provided.	Code list	HTML
			PDF
			DOC
			Other
			Inline metadata
Type of licence scheme	Checks if the license document is under any specific scheme.	Code list	No licence document
			Standard Public Licence
			Standard Government Licence

Field name	Field definition	Field type	Possible values
			Organisational Licence
			INSPIRE Licence
Type of licence document	Checks if the licensing conditions cover a single use case or more than one or if alternatively mixes different licenses by relying on a third licence document.	Code list	Normal Licence
			Mixed licence
			Dual licence
			Other
Is there information on the version or date of the licence?	Checks if the licence information refers to a particular version of a licence or if it has date of reference.	Free text	Yes - There is a version reference
			Yes - There is a date reference
			Yes - There is both a version and a date reference
			No
Provide values	If a particular version is mentioned, indicate the value.	Free text	
Jurisdiction	Checks if the license mentions its jurisdiction of application.	Code list	International
			Ported / National

Annex 4.c. Terms of use / licence identification

Field name	Field definition	Field type	Possible values
Name of the licence	Collects the name of the licence as mentioned in the metadata information.	Free text / Code list	[Found value]
			Not provided
			Not applicable
Full name of the licence (Original language)	Looks for the official name of the licence in its original language.	Free text	
Full name of the licence (English)	Looks for a translation or it translates to English the official name of the licence.	Free text	
Code / licence ID	Gives an internal Acronym for cleaning up duplicates.	Free text	[value]
			Not applicable

Annex 4.d. Content examination – rights granted

Collection of attributes following the permissions to conform an Open Licence as defined by OKNF

Field name	Field definition	Field type	Possible values / examples
Use	The license must allow free use of the licensed work.(OD_2.1.1_Use)	Code list	Yes - Permitted No Unknown/Not mentioned
Redistribution	The license must allow redistribution of the licensed work, including sale, whether on its own or as part of a collection made from works from different sources. (OD_2.1.2. Redistribution)	Code list	Yes - Permitted No Unknown/Not mentioned
Modification	The license must allow the creation of derivatives of the licensed work and allow the distribution of such derivatives under the same terms of the original licensed work. (OD_2.1.3_Modification)	Code list	Yes - Permitted Unknown/Not mentioned No
Separation	The license must allow any part of the work to be freely used, distributed, or modified separately from any other part of the work or from any collection of works in which it was originally distributed. All parties who receive any distribution of any part of a work within the terms of the original license should have the same rights as those that are granted in conjunction with the original work. (OD_2.14 Separation)	Code list	Yes - Permitted Unknown/Not mentioned No
Compilation	The license must allow the licensed work to be distributed along with other distinct works without placing restrictions on these other works. (OD_2.1.5 Compilation)	Code list	Yes - Permitted Unknown/Not mentioned No

Field name	Field definition	Field type	Possible values / examples
Non-discrimination	The license must not discriminate against any person or group. (OD_2.1.6_ Non-discrimination)	Code list	Yes - Permitted
			Unknown/Not mentioned
			No
Propagation	The rights attached to the work must apply to all to whom it is redistributed without the need to agree to any additional legal terms. (OD_2.1.7_Propagation)	Code list	Yes - Permitted
			Unknown/Not mentioned
			No
Application to Any Purpose	The license must allow use, redistribution, modification, and compilation for any purpose. The license must not restrict anyone from making use of the work in a specific field of endeavor. (OD_2.1.8_Application to Any Purpose)	Code list	Yes - Permitted
			Unknown/Not mentioned
			No
No charge	The license must not impose any fee arrangement, royalty, or other compensation or monetary remuneration as part of its conditions. (OD_2.1.9_No charge)	Code list	Free of charge
			Free of charge under conditions
			Fees apply
			Unknown/Not mentioned

Annex 4.e. Content examination – acceptable conditions

Field name	Field definition	Field type	Possible values / examples
Attribution	The license may require distributions of the work to include attribution of contributors, rights holders, sponsors, and creators as long as any such prescriptions are not onerous.	Code list	Required
			Unknown/Not mentioned
Attribution pattern	If applicable, indicate if a pattern or example to give credit is provided	Free text/ Code list	[Value]
			Not provided
			Not applicable

Field name	Field definition	Field type	Possible values / examples
Integrity	The license may require that modified versions of a licensed work carry a different name or version number from the original work or otherwise indicate what changes have been made.	Code list	Required Unknown/Not mentioned
Share-alike	The license may require distributions of the work to remain under the same license or a similar license.	Code list	Required Unknown/Not mentioned
Notice	The license may require retention of copyright notices and identification of the license.	Code list	Required Unknown/Not mentioned
Source	The license may require that anyone distributing the work provide recipients with access to the preferred form for making modifications.	Code list	Required Unknown/Not mentioned
Technical Restriction Prohibition	The license may require that distributions of the work remain free of any technical measures that would restrict the exercise of otherwise allowed rights.	Code list	Required Unknown/Not mentioned
Non-aggression	The license may require modifiers to grant the public additional permissions (for example, patent licenses) as required for the exercise of the rights allowed by the license. The license may also condition permissions on not aggressing against licensees with respect to exercising any allowed right (again, for example, patent litigation).	Code list	Required Unknown/Not mentioned

Annex 4.f. Content examination – prohibitions

Field name	Field definition	Field type	Possible values / examples
Commercial use	Restriction refraining from making exploitation targeting economical profit	Code list	Allowed
			Not allowed
			Unknown/Not mentioned
Derivatives	Restriction refraining to produce works based on given resource	Code list	Allowed
			Not allowed
			Unknown/Not mentioned
External/Public use	Restriction refraining to use the resource in external networks	Code list	Allowed
			Not allowed
			Unknown/Not mentioned
If other, which one	Any other prohibition	Free text	

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