

INSPIRE Empowers Re-Use of Public Sector Information*

Bastiaan van Loenen¹, Michel Grothe²

¹Delft University of Technology, Knowledge Centre Open Data,
b.vanloenen@tudelft.nl

²Geonovum; m.grothe@geonovum.nl

Abstract

Ready access to public sector information offers unprecedented opportunities for the development of new products and applications and to make existing processes more efficient and effective. These developments have perhaps the greatest opportunities in the field of geographic information. Although the Directive on the re-use of public sector information (PSI Directive) was specifically drafted to address the needs of re-users, the Directive establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) is equally important for re-use of public sector information regarding the physical environment. INSPIRE requirements promote that geographic information, concerning 34 spatial reference and various environmental themes, can be found and is physically attainable on the Internet. With the requirement to provide datasets and service metadata, the obligation to conform to INSPIRE data specifications, and the requirement to do this through discovery, view, and download services, INSPIRE makes a significant contribution to the re-usability of public sector information.

Keywords: Public sector information (PSI), re-use, INSPIRE

*This work is licensed under the Creative Commons Attribution-Non commercial Works 3.0 License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-nd/3.0/> or send a letter to Creative Commons, 543 Howard Street, 5th Floor, San Francisco, California, 94105, USA.

1. INTRODUCTION

Ready access to public sector information (PSI) offers unprecedented opportunities for the development of new products and applications and to make existing public and private sector processes more efficient and effective. PSI has perhaps the greatest opportunities in the field of geographic information. Geographic information is indispensable in the development and maintenance of the physical environment. It is an important ingredient in several public tasks and domains, such as traffic and transport, water management, economic development and spatial planning, climate and environment, education and health care, security and emergency planning. Often geographic information is collected and processed by the government itself or otherwise by third parties on behalf of government. This type of public sector information appears to be very useful for performing these public duties and tasks, but also for other purposes: the so-called re-use of public sector geographic information.

The economic potential of PSI re-use is estimated at least €40 billion for the EU27 (Vickery 2011, Broomby et al. 2000) and \$900 billion per year worldwide (Manyika et al. 2013). Geographic information covers a significant part of these values (see Broomby et al. 2000, Dekkers et al. 2006). However, PSI re-use has not yet reached its assumed potential (see, for example, Du Preez 2012, Rothenberg 2012, EULF 2013, Algemene Rekenkamer 2014).

The European Union introduced several legal instruments to stimulate re-use. The most prominent instrument is Directive 2003/98/EC on the re-use of public sector information (PSI Directive). The INSPIRE Directive 2007/2/EC establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) is not often mentioned in this context (cf. Janssen 2009, Janssen 2011). In this paper, we explore to what extent the INSPIRE Directive and the PSI Directive stimulate re-use of public sector information.

The article starts with re-use: what is re-use and what requirements and qualities exist for re-use of public sector information? Then we discuss two legal instruments that facilitate the re-use of PSI: the PSI Directive (2003/98/EC) and its amendment (2013/37/EU) and the INSPIRE Directive (2007/2/EC). The paper ends with some concluding remarks.

2. REQUIREMENTS FOR RE-USE OF PUBLIC SECTOR INFORMATION

The PSI Directive applies to “any content whatever its medium (written on article or stored in electronic form or as a sound, visual or audiovisual recording); and (b) any part of such content” (art. 2(3) PSI Directive). In 2013, the scope of the Directive widened from government documents (art. 2(3) PSI Directive) to

university libraries, libraries, museums and archives (art. 1(2) under f PSI Directive amended).

In this article, re-use is defined as the use by persons or legal entities of documents held by public sector bodies, for commercial or noncommercial purposes other than the initial purpose within the public task for which the documents were produced (art. 2 PSI Directive). A re-user is then an individual or legal entity that uses public sector information for other purposes than the initial purpose within the public task for which the documents were produced.

2.1. Researching Re-Use

Public sector information re-users cope with many challenges before they successfully fulfil their re-use objectives. One important aspect is the ability to find, obtain and use PSI. These qualities of the PSI itself are a primary concern of re-users: without the data itself re-use will be impossible. Other concerns relate to the environment of the PSI re-user. Access to financial markets, to sustainable information technologies, to a level playing field, to effective redress mechanisms, but also to skilled people, and to appropriate knowledge (networks), are very relevant aspects for many re-users aiming at exploiting their products.

Public sector information re-use has been studied by many scholars and through several different approaches. Some scholars focus on one PSI quality through a best practice approach (e.g., De Vries et al. 2011). Others researched PSI re-use by identifying the barriers experienced by re-users (see, for example, Fornefeld et al. 2008, European Commission 2011, Van Loenen and Welle Donker 2014). Allen (2012) explored the experiences of academic re-users by seeking agreement with principle statements (see also McMillan 2013).

In this article, we use the concentric shell model developed by Backx (2003) to assess whether the PSI and INSPIRE Directives meet the PSI quality needs of re-users. Backx' model allows for systematically addressing the different qualities of public sector information. The model of Backx incorporates the views of Bovens (2002), Bemelmans (1998), Ministry of the Internal Affairs and Kingdom Relations (1995), Zuurmond (1994), Graafland (1993), and Alblas and Van der Vliet (1990) and accordingly provides a comprehensive and structured overview on the PSI qualities for re-user.

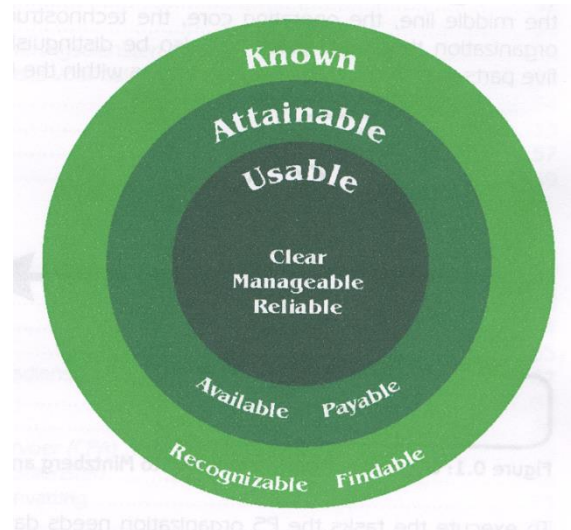
2.2. The Concentric Shell Model For Re-Use of PSI

The concentric shell model developed by Backx (2003) gives a good insight into the perspective of the re-user (see Figure 1). Public sector information can be re-used if the information:

1. Is known to the re-user (where can information be obtained?)
2. Is attainable for the re-user (can the re-user obtain the information, and if so under what conditions?) and
3. Can be used for the intended purpose of the user (for example, in the light of the level of aggregation, used standard, accuracy and completeness of the information).

Only if these three conditions are satisfied, a user will be able to re-use the information, for example, as part of a value added service.

Figure 1: Concentric Shell Model for Re-Use



Source: Backx, 2003

2.2.1. *Known*

It goes without saying that the existence of information must be known before it can be used. This can be achieved through text descriptions of information for the identification of information resources, like resource titles and abstracts, and sometimes graphics. This is also known as 'resource metadata'. If the existence of the information is known to a user (is recognizable), he/she must be able to find it (is discoverable). Publication of information in a well-known and accessible portal may increase awareness of the information. There are several decades of experience with portals for government information. However, these are often poorly stocked, obsolete, and particularly user-unfriendly (see Van Loenen et al. 2010). Shining exceptions would be the recently developed open data portals. Such a portal are launched in many countries, for example in the United States (data.gov), the United Kingdom (data.gov.uk) and the Netherlands

(data.overheid.nl). But also these may suffer from the same critiques (see Open State Foundation 2014). In addition, in terms of data discovery, the datasets should also show on (the first page of) search results of general search facilities, such as google.com or ixquick.com.

2.2.2. *Attainable*

Public sector information should also be attainable. Attainable information implies that the information can be obtained from a legal, physical and financial perspective.

Legal attainability refers to the availability of information on the basis of laws and regulations. One may think here of government information which is attainable through freedom of information legislation, but also of the legal restrictions that apply to the use of information (data protection, intellectual property rights, restrictions imposed through a licence).

Physical attainability refers to the physical availability of the information. Optimal physical availability means that the information is available 24/7 and can be obtained as quickly as possible; direct downloads without having to go through bureaucratic procedures (e.g., finding a contact person, negotiating contracts).

The financial attainability refers to the affordability of the information. Affordable access typically depends on the user. Generally, lower fees can be assumed to better meet the user needs than higher fees. The marginal cost of reproduction of PSI, i.e. the marginal costs incurred for their reproduction, provision and dissemination, would better meet re-users needs than a fee recovering the collection, production, reproduction and dissemination of the PSI.

2.2.3. *Usable*

The final circle of Backx model concerns the usability of the information. Can the information be used for the intended purpose of use? Three criteria for assessing usability exist:

1. Are the information characteristics clear to the user?
2. Is the information manageable?
3. Is the information reliable?

Users should be able to assess whether the information resource is fit for their purpose. Therefore, the resource metadata should be adequately documented, for example what subject the dataset concerns, the semantics of the data (data model), and the level of (spatial and temporal) detail. But also resource metadata about a contact point, terms of use and other restrictions (e.g. price) must be included. Preferably, an international standard for resource descriptions is used and context information is provided (Zuiderwijk et al. 2013). However, there is nothing so

important for users (see Van Loenen and Onsrud 2003), but undervalued and low prioritized by information providers, as resource metadata. The creation and maintenance of metadata can be very time-consuming and therefore expensive (Van Bakel 2007). For some organisations it may be too expensive (Barker 2011). A resource with comprehensive metadata documentation is therefore the exception rather than the rule.

Also the intellectual attainability should be mentioned here. It refers to the comprehensibility of information. This implies that re-users should be able to understand the qualities of information. The availability of a helpdesk may be supportive in clarifying the information, among others. A recent study in the Netherlands indicates that re-users highly appreciate timely, knowledgeable support of a helpdesk (see Van Loenen et al. 2014).

The information must be manageable for a re-user. Open formats and machine-readable data are promoting the extent to which a dataset is manageable. Oversized, unstructured and too detailed datasets which take several days to process may not always meet re-user needs.

The information reliability refers to the intrinsic qualities as completeness, correctness, consistency and validity of the information.

2.2.4. *Summary*

Re-user needs concern more than the right of re-use of public sector information. Information resources should be findable, available from a legal, physical and financial point of view. Despite that information resources are legally available, it may very well be that these resources can not be obtained because information is very expensive, only 'available' through a broken link or not well understood (see also Bovens 2002). Also the information resource characteristics should be clear (or clearly described) and the information resource should be manageable and reliable.

In the next sections, the following requirements are used to assess the PSI and INSPIRE Directive for their ability of re-use (based on Backx 2003, Bharosa et al. 2011, Kulk and Van Loenen 2012):

- Known:
 - Recognizable: Identification and description of information;
 - Discoverable: Pro-active publication of information in one central access point;
 - Discoverable: Information sought should show on the result page of a general search engine.

- **Attainable:**
 - Available: Information should be legally attainable preferably through open licences;
 - Available: Information should be available, preferably 24/7 with direct access;
 - Payable: Information should be financially attainable, preferably at a maximum cost of the marginal cost of reproduction of PSI.

- **Usable:**
 - Clear: Information qualities should be clear; adequate metadata is required and a helpdesk preferred to meet user needs;
 - Manageable: Information should be machine-readable and in open format;
 - Reliable: Information should be current, consistent and complete.

3. THE PSI DIRECTIVE

The PSI Directive establishes a minimum set of rules governing the re-use and the practical means of facilitating re-use of existing documents held by public sector bodies of the EU Member States (art. 1 PSI Directive). In this way the PSI Directive promotes re-use and as a result brings out the economic potential of public sector information.

In this section we discuss to what extent the PSI Directive meets the requirements set in section 2.2.4.

Requirement: Information should be known (recognizable and discoverable)

This may be promoted by requiring the publication of the (metadata of the) resource dataset in a publicly available website, or through a data portal.

The PSI Directive requires the publication of metadata in a practical arrangement. The Directive states literally that “Member States shall make practical arrangements facilitating the search for documents available for re-use, such as asset lists of main documents with relevant metadata, attainable where possible and appropriate online and in machine-readable format, and portal sites that are linked to the asset lists.[.]” (art. 9 PSI Directive amended). The Directive is not specific about which metadata needs to be documented or what exactly a practical arrangement is. This margin of appreciation is left to the Member States, which do have a choice to only fulfil this requirement to the very minimum.

Requirement: Information should be legally attainable

The PSI Directive rules that all documents are re-usable unless access is restricted or excluded under national rules on access to documents and subject to the other exceptions laid down in this Directive (recital 8 Directive 2013/37/EU). The PSI Directive does not contain an obligation concerning access to documents. If information is not accessible also the re-use obligations of the PSI Directive do not apply.

Legal attainability may be obtained through open licences. The PSI Directive addresses this in art. 8(1) "Public sector bodies may allow re-use without conditions or may impose conditions, where appropriate through a licence. These conditions shall not unnecessarily restrict possibilities for re-use and shall not be used to restrict competition." (art. 8 (1) PSI Directive amended). However, the PSI Directive only allows open licences; it does not oblige their use (cf. European Commission 2014a).

Requirement: Information should be physically attainable

The PSI Directive does not address physical attainability. It comes no closer than "Member States shall make practical arrangements facilitating the search for documents available for re-use, such as asset lists of main documents with relevant metadata, attainable where possible and appropriate online and in machine-readable format, and portal sites that are linked to the asset lists. Where possible Member States shall facilitate the cross-linguistic search for documents" (art. 9 PSI Directive amended).

Requirement: Information should be financially attainable

This requirement is addressed in article 6 of the PSI Directive: "Where charges are made for the re-use of documents, those charges shall be limited to the marginal costs incurred for their reproduction, provision and dissemination." (art. 6(1) PSI amended), followed with exemptions to art. 6(1) PSI Directive (art. 6 (2)). Although exemptions are still possible, the PSI Directive supports re-use by setting marginal cost of reproduction as the rule. In the UK, departments and agencies that wish to charge for the re-use of PSI are required to justify exceptions from the marginal cost model against the criteria for exceptions for marginal cost pricing (The National Archives 2010). This justification puts an extra threshold on charging more than the marginal cost and should ensure that government does not limit or restrict re-use.

In addition, the PSI Directive requires transparency of the amount of, and the calculation basis for, the standard charges and other charges. These shall be pre-established and published, through electronic means where possible and

appropriate (art. 7). Upon request, the public sector body in question shall also indicate the way in which other charges have been calculated in relation to the specific re-use request (art. 7 (2)).

Requirement: Information qualities are clear

In the PSI Directive metadata is addressed, but not strictly required: “Public sector bodies shall make their documents available in any pre-existing format or language, and, where possible and appropriate, in open and machine-readable format together with their metadata. Both the format and the metadata should, in so far as possible, comply with formal open standards” (art. 5(1) PSI Directive amended).

The requirement of a helpdesk is not addressed in the PSI Directive.

Requirement: Information is manageable (machine-readable and in open format)

The PSI Directive addresses this point in article 5: “Public sector bodies shall make their documents available in any pre-existing format or language, and, where possible and appropriate, in open and machine-readable format together with their metadata. Both the format and the metadata should, in so far as possible, comply with formal open standards” (art. 5 PSI Directive amended). Although machine-readable format and open standards are in principle required, the wording “where possible and appropriate” leaves room for interpretation and provides public sector bodies a possibility to not fulfil this requirement.

Requirement: Information is reliable

The requirement that information should be current, consistent and complete is not addressed in the PSI Directive. It refers to the INSPIRE Directive as an example of ensuring interoperability (PSI Directive amended, recital 20).

Monitoring and reporting

The PSI Directive (art. 13) requires Member States to report every 3 years to the Commission on the availability of public sector information for re-use and the conditions under which it is made available and on the redress practices. The outcome of this process may result in a change in the current legal requirements. For example, the recent notice of the Commission promoting standardized open licences (European Commission 2014a) may obtain a more formal status if the reporting on the conditions of PSI re-use justifies this.

4. THE INSPIRE DIRECTIVE

The INSPIRE Directive (2007/2/EC) lays down general rules aimed at the establishment of the Infrastructure for Spatial Information in the European Community, for the purposes of Community environmental policies and policies or activities which may have an impact on the environment (art. 1 INSPIRE Directive). This requires measures that address exchange, sharing, access and use of interoperable spatial datasets and spatial data services across the various levels of public authority and across different sectors (recital 3 INSPIRE Directive). INSPIRE applies to a wide range of 34 content themes, from specific geographic reference data themes (e.g., transport networks, cadastral parcels, buildings, orthoimagery, elevation, statistical and administrative units) to environmental themes (e.g., geology, habitats and biotopes, human health and safety, meteorology, hydrology, oceanographic features). The INSPIRE Directive should be without prejudice to the PSI Directive, the objectives of which are complementary to those of the INSPIRE Directive (recital 8 INSPIRE Directive).

The INSPIRE Directive is a framework Directive that consists of multiple pieces of legislation. It concerns the Directive itself, the transposition of the Directive in EU Member States' legislation, and the detailing of several measures through implementing rules of the European Commission. These implementing rules can be Commission Regulations or Commission Decisions. Finally, there are technical guidelines for all components of the INSPIRE infrastructure: metadata, data specifications for 34 themes, network services for discovery, view and download, and technical guidelines for data sharing, and for monitoring and reporting.

In this section we discuss the extent to which the INSPIRE Directive meets the requirements set in section 2.2.4.

Requirement: datasets should be known (recognizable and discoverable)

INSPIRE requires Member States to describe INSPIRE resources (datasets, datasets series and services) through metadata and provide resources metadata actively to the INSPIRE geoportal (art. 15(2) and art. 11 INSPIRE Directive). The INSPIRE geoportal is the European portal for the discovery of the INSPIRE resources of all EU Member States. Member States may also choose to provide access to the INSPIRE geoportal through their own national access points (art. 15(2)). The Netherlands (Dutch INSPIRE implementation Act, art. 8(b)), the Belgium region Flanders (Flemish GDI Act art. 29 and art. 30), and the German state Hamburg (Hamburg 2009, art. 6) for example, require this.

Requirement: Information should be legally attainable

All INSPIRE datasets must be made accessible through INSPIRE network services. Network services are discovery, view, download and transformation services and services allowing spatial data services to be invoked (art. 11 INSPIRE Directive). Article 13 of the INSPIRE Directive details in which specific instances public access may be limited. For example, access may be limited if the public access to the dataset or services would adversely affect the international relations, public security or national defence.

INSPIRE does not require information providers to distribute their information through open licences. For data sharing with other public authorities there are some rules provided in article 17 of the INSPIRE Directive. Each Member State shall adopt measures for the sharing of spatial data sets and services between its public authorities. Those measures shall enable those public authorities to gain access to spatial data sets and services, and to exchange and use those sets and services, for the purposes of public tasks that may have an impact on the environment. These measures shall preclude any restrictions likely to create practical obstacles, occurring at the point of use, to the sharing of spatial data sets and services (art. 17(2) INSPIRE).

Requirement: Information should be physically attainable

The INSPIRE Directive requires information resources to be attainable through a specific type of network service, the download service, enabling copies of spatial data sets, or parts of such sets, to be downloaded and, where practicable, accessed directly (art. 11c INSPIRE Directive) and requires also minimum performance criteria for those services (art. 16 INSPIRE Directive). The Commission Regulation No 976/2009 and Commission Regulation No 1088/2010 set the requirements for the quality of service criteria relating to performance, capacity and availability of network services. For example, they set the response time for a download service at a sustained response greater than 0.5 Megabytes per second, the minimum number of simultaneous requests to a download service to be served in accordance with the quality of service performance criteria shall be 10 requests per second, and the availability of a network service to be available shall be 99 % of the time (art. 3 Commission regulation 2009 and its amendment by Commission Regulation 2010b).

Requirement: Information should be financially attainable

INSPIRE requires that public access to discovery and view services are without costs. Charges may only be applied if such charges secure the maintenance of spatial data sets and corresponding data services, especially in cases involving very large volumes of frequently updated data (art. 14(1) and (2) INSPIRE

Directive). INSPIRE does not limit the price for other services such as the download services.

Member States may allow public authorities that supply spatial data sets and services to license them to, and/or require payment from, the public authorities or institutions and bodies of the Community that use these spatial data sets and services. 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. Where charges are made, these shall be kept to the minimum required to ensure the necessary quality and supply of spatial data sets and services together with a reasonable return on investment [..]. (art. 17 INSPIRE Directive).

Spatial data sets and services provided by Member States to Community institutions and bodies in order to fulfil their reporting obligations under Community legislation relating to the environment shall not be subject to any charging (art. 17(3) INSPIRE Directive).

The Commission Regulation (2010c) on INSPIRE data and service sharing requires that “Where requested, offers for the provision of access to spatial data sets and services to the Community institutions and bodies made by Member States shall include the basis for charges and the factors taken into account” (art. 6(2)).

Requirement: Information qualities are clear

Clear information quality is addressed in Commission Regulation (2008) for metadata. It requires comprehensive, standardized metadata documentation on several aspects of data quality descriptions.

INSPIRE does not require that data providers or national contact points establish helpdesks to support the (potential) users or providers of INSPIRE data and services.

Requirement: Information is manageable (machine-readable and in open format)

INSPIRE provides requirements for data and services harmonisation which should enable and stimulate the cross-border interoperability of INSPIRE datasets and services (see Commission Regulation 2010a, 2011 and 2013). Having interoperable datasets and services (network services and spatial data services) implies that they need to be machine-readable. Although open data formats are not legally required by INSPIRE, INSPIRE offers guidelines for the encoding of spatial data recommending the use of open exchange formats based on international standards. Member States can fulfil the Commission Regulations by following the requirements and recommendations of the technical guidelines for

the encoding of spatial datasets (European Commission, 2014b). While the Commission Regulations are legally binding, and the technical guidelines not, one may still argue that the status of the guiding documents is rather formal: adhering to the Regulations is very difficult if the requirements of the guiding technical documents are not met.

Requirement: Information is reliable

The requirement that information should be current, consistent and complete is partly addressed in the INSPIRE Directive.

INSPIRE does not require that source datasets are updated. In the instance that source datasets are updated, INSPIRE requires data providers to make available updates of datasets and services on a regular basis. All updates shall be made available at the latest 6 months after the change was applied in the source dataset, unless a different period is specified for a specific spatial data theme (art. 8 Commission Regulation 2010a).

INSPIRE requires that information is consistent. INSPIRE provides requirements for data and services harmonisation which should enable and stimulate the cross-border interoperability of INSPIRE datasets and services (see Commission Regulation 2010a, 2011 and 2013).

INSPIRE does not require data to be complete or to collect new data to make the data complete.

Monitoring and reporting

The Commission Decision as regards monitoring and reporting requires the extensive monitoring and reporting on the progress of the INSPIRE implementation and its performance (including usage and costs of implementation and benefits) (Commission Decision 2009). The usage/ benefits are an important part of the reporting.

Every six years the European Commission shall present to the European Parliament and to the European Council a report on the implementation of the Directive. Where necessary, the report shall be accompanied by proposals for Community action (art. 23 INSPIRE Directive).

5. ANALYSIS

The PSI Directive promotes the re-use by introducing the right to re-use if public sector information is available. It further stimulates re-use by only allowing in exceptional circumstances to charge more than the marginal cost of reproduction

of the information. Other relevant issues are often addressed, but still allow an escape to not adhere to the spirit of the Directive. The PSI Directive also supports the re-use through governance issues such as the establishment of a level playing field and means of redress through the review by an impartial review body with the appropriate expertise. However, these governance issues were not in scope of this article.

The INSPIRE Directive satisfies a good part of the needs of a re-user of public sector information. All INSPIRE datasets and services are required to be published through the INSPIRE geoportal at the European community level. Ultimately, the European INSPIRE geoportal will provide access to all INSPIRE datasets and services of all Member States. With the requirement to provide dataset and services metadata, the obligation to conform to INSPIRE data specifications, and the requirement to provide access through discovery, view, and download services, INSPIRE makes a very important contribution, in particular to the legal and physical attainability of public sector geographic information as well as to its usability.

Table 1 and Figure 2 show the comparison between the PSI Directive and INSPIRE Directive and their adherence to requirements of meeting re-user's needs.

Figure 2: Position of the PSI and INSPIRE Directive in the Re-Use Requirements Model

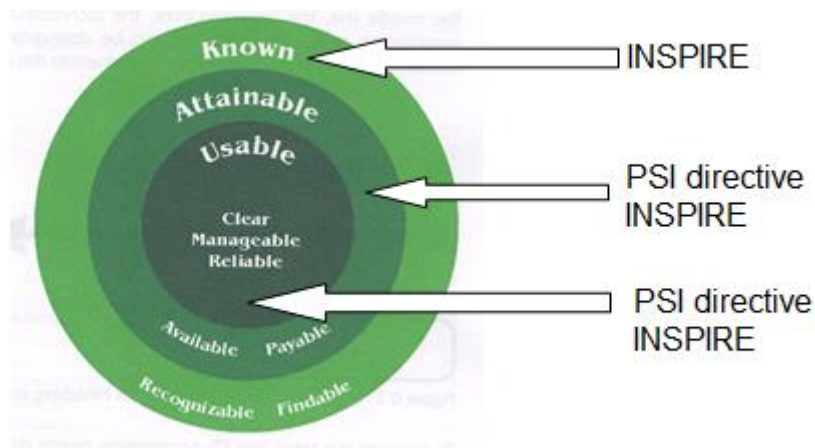


Table 1: Summary of the Adherence of the PSI and INSPIRE Directive to Re-Use Requirements (M= Mandatory, V=Voluntary, - = Unaddressed)

Re-use requirements	PSI Directive requirement	INSPIRE Directive requirement
<i>Known</i>		
Recognizable. Identification and description of information	V	M
Discoverable. Pro-active publication of information in one central access point	V/-	M
Discoverable. Showing on the first page of a general search engine	-	-
<i>Attainable</i>		
Available. Legal: Information should be available for re-use	M (if access is allowed)	V
Available. Legal: Information should be provided through open licences	V	V
Available. Physical: Information should be available, 24/7 with direct access preferred	-	M
Payable. Information should be financially attainable for re-use, preferably at a maximum cost of the marginal cost of reproduction of PSI	M/V	V
<i>Usable</i>		
Clear. Information qualities should be clear: Adequate metadata	M/V	M
Clear. Helpdesk	-	-
Manageable. Information should be machine-readable	V	M
Manageable. Information should be in open format	V	V(M)*
Reliable. Information should be current, consistent and complete information	-	M (current, consistent) - (complete)

6. CONCLUSION

Re-use of public sector information is a subject, which over the past decade has become increasingly important to political debate. This is also known as the 'open

* The score V(M) stems from the requirement of the INSPIRE guidelines. These guidelines are not legally binding, but it is very difficult to adhere to the Commission Regulations (see European Commission, 2014b) if one does not follow the INSPIRE guidelines.

data' debate. Nowadays, there is a range of laws and regulations at the disposal of re-users of public sector geographic information, some more directed towards the legal and financial attainability (PSI Directive) and another more towards the ease of discovery, legal attainability, physical attainability and usability levels (INSPIRE Directive).

Although often mentioned as a major re-use barrier, legal attainability is perhaps not the most important re-use barrier anymore. It is equally important that information can be found and is physically attainable and usable. Mandatory publication of PSI available for re-use in a publicly accessible register, such as an open data portal or INSPIRE portal, are just as important as an open legal regime.

With the requirement to provide dataset and service metadata, the obligation to conform to INSPIRE data specifications, and the requirement to do this through discovery, view, and download services, INSPIRE makes a very important contribution, in particular, to the legal and physical attainability of public sector geographic information as well as to its usability.

Only together the PSI Directive and INSPIRE Directive support re-use to its full extent. Widening the scope of the INSPIRE Directive to information resources other than public sector geographic information is highly desirable for re-users in other public sector information domains. Therefore, we recommend that for the next evaluation of the PSI Directive, account is taken of the added value of the INSPIRE principles and infrastructure components and their implementation to the needs of re-users of public sector information in general.

REFERENCES

- Algemene Rekenkamer (2014). *Trendrapport open data*, Den Haag: Algemene Rekenkamer.
- Alblas, G. and E. van der Vliet (1990). *Doelmatig organiseren*, Groningen: Wolters-Noordhoff.
- Allen, B. (2012). *Access to and use of public sector information: The academic re-user perspective*, at http://www.oaic.gov.au/images/documents/information-policy/information-policy-resources/information-policy-reports/PSI__academic_re-user_Bronwyn_Allen.pdf [accessed 14 October 2014].

- Backx, M. (2003). *Gebouwgegevens redden levens. Toegankelijkheidseisen van gebouwgegevens in het kader van de openbare orde en veiligheid*, MSc. Thesis, Delft University of Technology.
- Bharosa N, Janssen, M., and Y-H. Tan (2011). A research agenda for information quality assurance in public safety networks: information orchestration as the middle ground between hierarchical and netcentric approaches, *Cognition, Technologies & Work*, 13(3): 203–216.
- Barker, D. (2011). *Why doesn't Esri support metadata publishing through ArcGIS Server and ArcGIS Online?* at <http://gis-elektrika.blogspot.nl/2011/11/why-doesnt-esri-support-metadata.html> [accessed 14 October 2014].
- Bemelmans, T.M.A. (1998). *Bestuurlijke informatiesystemen en automatisering*, Amersfoort: Kluwer bedrijfsinformatie.
- Bovens, M. (2002). Information Rights: Citizenship in the Information Society, *The Journal of Political Philosophy*, 10(3): 317-341.
- Broomby, E., Minio, R., Munro, A., Malone, M., Amos, J., Baxter, D., and J. Woods (2000). *Commercial exploitation of Europe's public sector information*, Report for the European Commission, at ftp://ftp.cordis.lu/pub/econtent/docs/commercial_final_report.pdf [accessed 14 October 2014].
- Commission Decision (2009). *Commission Decision of 5 June 2009 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards monitoring and reporting*, OJ L 148/18.
- Commission Regulation (2013). *Commission Regulation No 1253/2013 of 21 October 2013 amending Regulation (EU) No 1089/2010 implementing Directive 2007/2/EC as regards interoperability of spatial data sets and services*, OJ L 331/1.
- Commission Regulation (2011). *Commission Regulation No 102/2011 of 4 February 2011 amending Regulation (EU) No 1089/2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services*, OJ L 031/13.
- Commission Regulation (2010a). *Commission Regulation No 1089/2010 of 23 November 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services*, OJ L 323/11.

- Commission Regulation (2010b). *Commission Regulation No 1088/2010 of 23 November 2010 amending Regulation (EC) No 976/2009 as regards download services and transformation services*, OJ L 323/1.
- Commission Regulation (2010c). *Commission Regulation No 268/2010 of 29 March 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards the access to spatial data sets and services of the Member States by Community institutions and bodies under harmonised conditions*, OJ L 83/8.
- Commission Regulation (2009). *Commission Regulation No 976/2009 of 19 October 2009 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards the Network Services*, OJ L 274/9.
- Commission Regulation (2008). *Commission Regulation No 1205/2008 of 3 December 2008 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata*, OJ L 326/12.
- De Vries, M., Kapff, L., Negreiro Achiaga, M., Wauters, P., Osimo, D., Foley, P., Szkuta, K., O'Connor, J., and D. Whitehouse (2011). *POPSIS; Pricing Of Public Sector Information Study*, Summary Report, Brussels: Deloitte.
- Du Preez, D. (2012). Prime minister's special envoy 'disappointed' with open data use, *Computerworld UK*, (October 12), at <http://www.computerworlduk.com/news/public-sector/3405589/prime-ministers-special-envoy-disappointed-with-open-data-use/> [accessed 14 October 2014].
- Dekkers, M., Polman, F., te Velde, R., and M. de Vries (2006). *Measuring European Public Sector Information Resources, Final report of study on exploitation of public sector information– benchmarking of EU framework conditions*, at <http://www.epsiplatform.eu/content/mepsir-measuring-european-public-sector-resources-report> [accessed 14 October 2014].
- Dutch Parlement (2009). *Wet van 2 juli 2009 tot implementatie van richtlijn nr. 2007/2/EG van het Europees Parlement en de Raad van de Europese Unie van 14 maart 2007 tot oprichting van een infrastructuur voor ruimtelijke informatie in de Gemeenschap (Inspire) (Implementatiewet EG-richtlijn infrastructuur ruimtelijke informatie)*, Stb. 2009 310.
- EULF (2013). *European Union location framework strategic vision version 0*, at http://ec.europa.eu/isa/actions/documents/isa-2.13_eulf-strategic-vision-lite-v0-3_final_en.pdf [accessed 14 October 2014].
- European Commission (2014a). *Commission notice — Guidelines on recommended standard licences, datasets and charging for the reuse of documents*, OJ 2014 C240/01.

- European Commission (2014b). *D2.7: Guidelines for the encoding of spatial data, Version 3.3*, at http://inspire.ec.europa.eu/documents/Data_Specifications/D2.7_v3.3.pdf [accessed 14 October 2014].
- European Commission (2011). *Communication to the European Parliament, the Council, the European Economic and Social Committee, and the Committee for the Regions. Open data: an engine for innovation, growth and transparent governance*, COM(2011) 882 final.
- Flemish GDI Act (2009). *Decreet betreffende de Geografische Data-Infrastructuur Vlaanderen*, bl. 33349.
- Fornfeld, M., Boele-Keimer, G., Recher, S. and M. Fanning (2008). *Assessment of the Re-use of Public Sector Information (PSI) in the Geographical information, Meteorological Information and Legal Information Sectors*, Final report, Düsseldorf: MICUS Management Consulting GmbH.
- Graafland, A. (1993). *Geo-informatievoorziening in Nederlandse gemeenten*, Delft: Delft Universitaire Press.
- Hamburg (2009). *Gesetz zur Umsetzung der Richtlinie 2007/2/EG vom 14. März 2007 zur Schaffung einer Geodateninfrastruktur in der Europäischen Gemeinschaft (INSPIRE)*, HmbGVBl. Nr. 57, 528.
- INSPIRE (2007). *Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)*, OJ L 108/1.
- Janssen, K. (2011). The influence of the PSI Directive on open government data: An overview of recent developments, *Government Information Quarterly*, 28(4): 446-456.
- Janssen, K. (2009). *The EC Legal Framework for the availability of public sector spatial data; An examination of the criteria for applying the Access Directive, the PSI Directive and the INSPIRE Directive*, Dissertation, KU Leuven.
- Kulk, S., and B. van Loenen, (2012). Brave New Open Data World? *International Journal of Spatial Data Infrastructures Research*, 7, 196-206.
- Manyika, J., Chui, M., Farrell, D., Van Kuiken, S., Groves, P., and E. Almasi Doshi (2013). *Open data: Unlocking innovation and performance with liquid information*, San Francisco: McKinsey, at http://www.mckinsey.com/insights/business_technology/open_data_unlocking_innovation_and_performance_with_liquid_information [accessed 14 October 2014].
- McMillan, J. (2013). *Open public sector information: from principles to practice, report on agency implementation of the principles on open public sector*

information, The Office of the Australian Information Commissioner, at <http://www.oaic.gov.au/information-policy/information-policy-resources/information-policy-reports/open-public-sector-information-from-principles-to-practice> [accessed 14 October 2014].

Ministry of Internal Affairs and Kingdom Relations (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties) (1995). *Terug naar de Toekomst*, Beleidsnota Informatiebeleid Openbare Sector nummer 3.

Open State Foundation (2014). *Many broken links and barely any new data on open data portal*, (June 25), at <http://openstate.eu/nl/2014/06/nauwelijks-nieuwe-datasets-op-data-overheid-nl/> [accessed 14 October 2014].

PSI Directive (2003). *Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information*, OJ L 345/90.

PSI Directive amended (2013). *Directive 2013/37/EU of the European Parliament and of the Council of 26 June 2013 amending Directive 2003/98/EC on the re-use of public sector information*, OJ L 175/1.

Rothenberg, J. (2012). *Case study International Benchmark; Open data and use of standards*, at http://www.forumstandaardisatie.nl/fileadmin/os/documenten/Internationale_benchmark_v1_03_final.pdf [accessed 14 October 2014].

The National Archives (2010). *Exceptions to Marginal Cost Pricing*, at <http://www.nationalarchives.gov.uk/information-management/re-using-public-sector-information/ifts-and-regulation/exceptions-marginal-cost-pricing/> [accessed 14 October 2014].

van Bakel, B. (2007). "The value of metadata", *Proceedings of the PhUSE 2007 conference, October 8 -10 2007, Heidelberg, Germany*, at <http://www.phusewiki.org/docs/2007/PAPERS/TS08.pdf> [accessed 14 October 2014].

van Loenen, B., and F. Welle Donker (2014). *De stand in opendataland*, TU Delft, at <http://repository.tudelft.nl/view/ir/uuid%3A7b425db6-2f9a-4be6-b5f0-3492055268d8/> [accessed 14 October 2014].

van Loenen, B., Cromptvoets, J., and A. Poplin (2010). "Assessing geoportals from a user perspective", *Proceedings of the GeoValue Workshop, September 30- October 2 2010, Hamburg, Germany*, at

http://www.spatialist.be/download/pub/IO0906039_CrompvoetsVanLoenen_2010_Geovalue_Hamburg.pdf [accessed 14 October 2014].

van Loenen, B. and H.J. Onsrud (2004). Geographic Data for Academic Research: Assessing Access Policies, *Cartography and Geographic Information Science*, 31(1): 3-17.

Vickery, G. (2011). *Review of recent studies on PSI re-use and related market developments*, at <http://ec.europa.eu/digital-agenda/en/news/review-recent-studies-psi-reuse-and-related-market-developments> [accessed 5 December 2014].

Zuiderwijk, A., Helbig, N., Gil-García, J. R., and M. Janssen (2014). Guest Editors' Introduction. Innovation Through Open Data: A Review of the State-of-the-Art and an Emerging Research Agenda, *Journal of Theoretical and Applied Electronic Commerce Research*, 9(2): I-XIII.

Zuurmond, A. (1994). *De infocratie, een theoretische en empirische heroriëntatie op Weber's ideaaltype in het informatietijdperk*, Den Haag: Phaedrus.