SmartOpenData

Final Liaisons Report

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Linked Open Data for environment protection in Smart Regions

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Executive Summary

The SmartOpenData project is creating a Linked Open Spatial Data infrastructure (including software tools and data) fed by public and freely available data resources, existing sources for biodiversity and environmental protection, and research in rural and European protected areas and its National Parks. This report is one of the two text outputs of the 7.1 task which aims at creating a stable best practice network in order to connect public bodies, researchers and companies to access and use the solutions identified in simple manner, accelerating the publication of open data and its sustainable and profitable use. Both reports the Annual Liaisons Report (D7.2) and the Final Liaisons Report (D7.3) will jointly lead to design a suitable Governance model which will cover the governance rules for the partners in the SmartOpenData infrastructure. The deliverables will also lead the collaboration with other projects and institutions and connections with relevant national and European standardisation bodies. It includes the following activities: (a) Exploitation of synergies / technical concertation. (b) Joint activities for exchange, dissemination and training. (c) Coordination of standardisation efforts. (d) Contribution to repositories of reference implementations. (e) The specific plan for collaboration, including the specific working group for this project will be detailed in these deliverables.

1 Introduction

Within building the information society, many EU Member States aims to have a strategy prepared or approved on a certain level for the efficient and effective use of spatial information and specific public administration services. For the implementation of the outputs from the individual pilot applications within the SmartOpenData project, it is necessary to provide and guarantee by the government certain public services providing spatial information. For the end users it is important that open data are used in the public administration agenda and to allow its reuse by third parties as well. To secure this, it is necessary to standardize the technical and legislative processes of creation, administration, and publishing of the public data.

Implementation and reuse of open data is not only a matter of strategy, but it is also a political issue. The EU plays an important role providing a series of "best practice" rules such as those within the SmartOpenData project. To facilitate the implementation of the outputs in the state structures there is already a number of EU directives and a number of projects supported by the EU and related to open data available.

This document shows and describes the possibilities of implementing the outcomes of the project to the individual policies of the Member States within the SmartOpenData strategy. Therefore a definition must be given and the status and objectives associated with the Open Data and Open Government Partnership (OGP) in the individual states should be described. The project addresses specific tasks associated with the creation of case studies and sample implementations of Open Data which should be in compliance with the legislation and strategy for the use of Geospatial data in the given state. The level of implementation of OD in each country is different, and therefore it is not our aim to cover all the Member States.

We will only try to find common objectives and obstacles among selected SmartOpenData project partners and other ICT projects. These documents (D7.2 and D7.3) should serve as recommendation and examples of best practices in term of liaisons among EU projects and national legislations. Open data, Linked Open data, Geo data etc. are supported or limited on different levels by particular national legislations, due to different reasons. The reasons are described by concrete participants represented by pilots, whose inputs are bound to some country of origin.

2 The Governance model

The idea of open data is not a new topic in the European Union. For example, it could be highlighted the Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information ("PSI") among other counts with the creation of national catalogs of public information in the public sector.[1]

After several SmartOpenData meetings with users and inside the consortium, it is very clear that the level of the "Open Data implementation" differs a lot in the member states. The Governance model will not be the same for all member states because of legislation differences among them. On the other hand, during SmartOpenData project we will come up with some general steps for implementing open data in the field of spatial information. A useful source of information could be the individual "geoinfo strategies" in the member states e.g. Sweden[2], Netherlands (GIDEON)[3] or the Czech Republic.[4] The governance model for every pilot has to join public and private bodies and need to be built on the principles of Public Private Partnership. For every such partnership, it is necessary to define a governance model, which will allow effective management of the initiatives.

Therefore pilots should take into the consideration basic implementation rules for their countries, suggest legislation changes in the field of public administration, if needed, and also evaluate economic impacts of providing data in the form of linked open data.

Government should guarantee implementation of open data into public administration, support it with legislation and technical steps. It is necessary to have clear definition of open data, clear steps of implementation and last but not least clear goal for implementation.

2.1 The governance model definition

The Governance model can be defined as a groundbreaking model of governance for PPP initiatives designed to empower boards of directors to fulfill their obligation of accountability for the organizations they govern. As a generic system, it is applicable to the governing body of any enterprise. The model enables the board to focus on the larger issues, to delegate with clarity, to control management's job without meddling, to rigorously evaluate the accomplishment of the organization; to truly lead its organization.[5]

There is not one coherent, flawless "model".[6] SmartOpenData partners should recommend what type of model will be most suitable for their needs. For example, some Governance models are listed below:

Operational Model: The board manages, governs and performs the work of the organization.

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[1] www.mvcr.cz/soubor/strategicky-ramec-rozvoje-vs-v-cr-pdf.aspx
[2] http://www.geodata.se/upload/dokument/borschyr/geodata_brochure_eng.pdf
[3] http://inspire-forum.jrc.ec.europa.eu/mod/file/download.php?file_guid=1388
[4] http://www.mvcr.cz/clanek/geoinfostrategie.aspx
[5] http://www.policygovernance.com
[6] http://www.snapnonprofit.org/

Collective Model: The board and staff operate as a single team when making decisions about governance and the work of the organization. Board members may work with either or both service operations or management functions.

Management Model: The board manages operations through functional committees that may or may not have a staff coordinator.

Constituent Representational Model: An approach used by publicly elected officials. Federations or other constituency-elected boards have the primary responsibility of balancing the interests of their constituents with the best interests of the organization.

Traditional Model: The board governs and oversees operations through committees established along functional lines (finance, human resources, and programs) but delegates the management functions to the executive director.

Results-based Model: The executive director is a non-voting member of the board, carries substantial influence over policy making, and is viewed as a full partner with the board. Committees, organized around board responsibilities and lead planning, would guide governance, and monitor and audit performance of the board, executive director and organization.

Policy Governance (Carver) Model: The board governs through policies that establish organizational aims (ends), governance approaches, and management limitations. These policies also should define the relationship of the board with the executive director. The executive director has broad freedom to determine the means that will be used to achieve organizational aims.

Advisory Board Model: A board selected and dominated by the executive director. This board provides prima facie legitimacy to the organization but governs only in a nominal sense. Board members provide advice and may rubber-stamp the executive director's recommendations.

3 National legislation

This chapter contains description of situation in each pilot country and is used to explain the current situation with open data and legislation, which is associated with them. Every pilot should focus on general description of eGovernment status in a country and how it affects pilot's goals. Every pilot is dealing with open data and should know how they are present and percept in the pilot's country. Moreover if a pilot is dealing with geo data, it would be desirable to highlight them due to their extensive usage among all partners. Recommended structure is division to following sections:

- ICT / eGovernment
- Open Data
- Geo Data / SDIs

In the 2015 Global Open Data Index from Open Knowledge International[7], that assesses the state of open government data in 122 countries, the 6 SmartOpenData pilot countries were ranked as follows[8]:

- Italy – ranked 17 with an openness score of 55%
- Spain – ranked 17 with an openness score of 55%
- Czech Republic – ranked 21 with an openness score of 52%
- Ireland – ranked 31 with an openness score of 46%
- Slovakia – ranked 50 with an openness score of 35%
- Portugal – ranked 54 with an openness score of 34%

The Global Open Data Index evaluates how well a country provides various categories of important data, such as national statistics and government spending, to the public based on factors such as whether or not the data is freely available, machine readable, timely, or if it exists at all.

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[7] http://2015.index.okfn.org/
[8] http://2015.index.okfn.org/place/

3.1 Spain

3.1.1 Open Data

In Spain, the law 37/2007 of 16 November on the Reuse of Information in the Public Sector passed by Parliament transposed the PSI directive into Spanish national law, more than two years after the established deadline. The law goes beyond the pure transposition of the directive, e.g. requiring public administrations to provide electronically accessible catalogues of the available data. It is seen as a general framework for open data, which is, however, not specific and action-oriented enough, since it leaves the burden to request largely on the potential re-user. Therefore, the Ministry for Industry, Energy and Tourism (MINETUR) in coordination with the Ministry of Finance and Public Administration (MINHAP) – the ministries pushing open data – initiated and launched the Aporta project in 2008. The project focused initially on promoting the topic of open data, especially in the central government, organized community engagement and fostered studies estimating the economic impact of PSI and open data reuse (see Proyecto Aporta-http://datos.gob.es/content/proyecto-aporta-, 2011, 2012). It also published an initial PSI catalogue early in 2010. In order to overcome some of the barriers open data in Spain faced, a royal decree (Royal Decree 1495/2011, of 24 October) was issued. It contains as a main principle that all public sector information is reusable but exceptions that have to be justified, a standard open data license for the national government, conditions for re-use, requires every government organisation to establish some sort of open data officer, prescribes measures for the operative open data process (interoperability guidelines for DCAT and URLs) and contains a soft open by default-clause. Furthermore, it mandates all national government organisations to list their data in a central PSI catalogue. The royal decree only applies to the national level, however.

The cross-level coordination structure around open data in Spain follows to a great extent the established modes of coordination within its federal-like system (Colomer, 1998; Lijphart, 1999), not only for ICT or open data, but in regard to any topic of cross-level relevance. Thus, MINHAP engages in regular working groups for open data with the regional level and the Spanish federation of local entities which represents the municipalities, provinces etc. These are affected by the 2007 PSI-law, but not by the royal decree. The autonomous regions cannot be directed by the central government to open their data, how to publish it or where to publish it. Spain is a unitary parliamentary constitutional monarchy divided into 17 autonomous communities and two autonomous cities. The autonomous communities and cities have far-reaching and exclusive competences which render the state government with less formal powers than in a centralised state. As a third and fourth governmental tier below the autonomous communities, there are 51 so called provinces and about 8.000 municipalities. Hence, there are multiple governmental layers, each of which exercises its own rights. The various (independent) governmental layers also cause a strong vertical fragmentation regarding the public administration and policy issues in Spain. This fragmentation can also be seen in the approaches to e-administration (electronic administration), which is dominated by divided structures as well.

However, the Spanish public administration has increased efforts in recent years to raise coherence and interoperability in regard to e-government. Various coordination bodies for e-government and ICT have been established, such as the High Council for E-Government

and the E-Government Sector Committee, coordinating ICT-use across departments and governmental levels respectively. Besides the institutional structure, a joint legal basis has been developed. Subsequently to the law on electronic access of citizens to public services (Law 11/2007), the Spanish national interoperability framework was drafted, which applies to all public administrations in Spain. An interoperability agreement about the re-use of information resources was added to the national interoperability framework in 2011 (Ministry of the Presidency, 2011), making detailed specifications for open data in Spain.[9]

3.1.2 Geo Data

The INSPIRE directive adoption into the Spanish law 14/2010, known as LISIGE (Law about infrastructures and Services of Geographic Information), has created a new scenario for open access to scientific data in Spain. LISIGE mandates central, regional, and local governments to share geographical data and to implement interoperable services. These services include visualization, localization, download, transformation, and enchainment; the first two must be free. If a fee is required, the availability of electronic commerce services must be guaranteed. Administrative procedures, international relationships, intellectual property, etc. are limited in their access rights. A Web Map Service (WMS) is the main standard for the visualization of geo-referenced information. Metadata are also under the schedule of this law and limit dates for its elaboration were established. On December 31, 2010, the reference and basic geographic metadata and services were started, and by December 31, 2013, general cartographic metadata should be established. In Spain, with this legal basis, it could be said that, at least in the case of geographical data, if data collection services are supported by a government body, results must be published.

In accordance with the INSPIRE initiative, the Permanent Commission of the National Geographic High Council (the Spanish consultative and planning body in cartography) decided on April 10, 2002, that a working group to study and coordinate the spatial data infrastructure (IDEE) in Spain should be established. This initiative to integrate data, metadata, and geographical information provided its potential users with the ability to locate, identify, and access such information. The current national website for the IDEE provides access to the main node of distribution and screening of data and geographical services in Spain. It has been launched with the nodes and websites of official geographical information under the theme of nature and other equivalent websites that have been established in the Autonomous Communities. Currently 15 out of the 17 regions are involved in the development of IDEE and are building their own regional SDI nodes. In this context in Spain, the development of infrastructures of spatial data (IDE) is carried out in each one of the three administrative levels: national, regional, and local. Furthermore, during the period 2007-2009, this policy, under the umbrella of the European programme INSPIRE, has completed the issuing of reference geoportals to the national and regional levels and begun local level issuance. Similar to that of the Åarhus Convention, the philosophy is to open digital cartography and GI to the citizen. The INSPIRE Spatial Data Interest Communities (SDIC) are coordinated through periodic meetings of the Geomatics Commission of the National Geographic High Board, the IDEE working group. The SDIC (Rodriguez et al., 2009) is made up of:

- The Spanish Nature Databank (BDN - Banco de Datos de la Naturaleza);

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[9] http://knowhow.opendatamonitor.eu/stakeholder/policy-making-around-open-data/

- EUROPARC Spain;
- The National Assembly of the Land Cover and Use Information System of Spain (SIOSE), which avoids duplication of geographic data and integrates existing data systems to fit EU requirements;
- The Geographical Standards Specialized Commission, SDI of Catalonia, a network of local authorities working under 3.0 specifications (in this context a comparative exercise has been performed between the Catalonia and the Castilla La Mancha IDEs)
- The Navarre Territorial Information System;
- the Spanish Railways SDI at Executive Direction of Circulation (ADIF);
- The Engineering Design Group (GID) of Universitat Jaume ;
- Indra Espacio S.A., the leading Spanish company in the Ground Segment for Space Systems and Applications;
- Euskal Herriko Datu Espazialen Azpiegitura (EHDEA); and
- Registra, SL (Capdevila Subirana, 2010).[10]

3.2 Portugal

The most relevant initiative related with Open Data launched in Portugal during the last years, in the area of georreferenced data, is the IGEO initiative (http://www.igeo.pt/). The rationale behind the IGEO initiative is that the way in which information, data and knowledge are made available to the citizens and it is of utmost importance to the modernization of the public sector and to the way its results are disseminated to the citizens. The IGEO initiative intends to freely provide spatial data from the public sector to the citizens without costs or constraints to use (This initiative was more deeply characterized in the deliverable D7.2). The IGEO initiative intends to comply with the Directive 2013/37/UE of 26th of June, whose scope is the reuse of public sector information and the integration of data in other information systems. The objective is to promote new business models, better supported decisions and more precise analysis of risks and tendencies.

The Portuguese national Spatial Data Infrastructure (SDI) SNIG (Sistema Nacional de Informação Geográfica) is one of the oldest SDIs existing in Europe and is available on the internet since 1995. Thus, the matters related to the data availability, being them related to data production or to data use and dissemination, are discussed in Portugal for a number of years. With the entry into force of the European Directive INSPIRE (Infrastructure for Spatial Information in the European Community) – Directive 2007/2/EC of the European Parliament and of the Council, of 14th of March 2007 – whose purpose is the creation of an European SDI integrating spatial data structured according to rules and principles established in Implementing Rules there was the need to align SNIG with Inspire. The Inspire Implementing Rules were published for 34 spatial data themes, listed in three annexes of the Inspire Directive, and these themes were considered the most relevant ones for environmental applications and thus, those for which interoperability needs to be established by harmonizing existing datasets in the various EU countries. The objective is that the SDIs from the EU Member States are interoperable, compatible and allow its simultaneous use in transboundary contexts.

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[10] https://hal.archives-ouvertes.fr/hal-01240259/document

In Portugal, the National Contact Point for the Inspire Directive issues and matters is the SmartOpenData partner DGT (General Directorate for Territorial Development). The transposition to the national legislation of the Inspire Directive was made by the Decree-Law nº 180/2009 of 7th of August. This decree-law also revised the national SDI (SNIG) legislation and established the rules for SDIs creation in Portugal and their relations with SNIG. SNIG incorporates an advisory board called CO-SNIG (Orientation Council for the SNIG) that has the responsibility for the strategic coordination while DGT is the organization responsible for the operational implementation, maintenance, development and operational coordination of SNIG. SNIG incorporates all the public institutions that produce and provide spatial data or spatial data services in the country and that should comply with the Inspire Directive Implementing Rules. The development of SNIG in Portugal allows an easy identification of existing spatial data (possible by documenting data through the use of metadata), and access to that spatial data and its characteristics, data quality and provides the capability for integration with other spatial information.

In Portugal the general framework for land policy, spatial planning and urbanism is established by the Law of Spatial Planning Basis (Law nº 31/2014 dated from 30th of May). The integration of fundamental spatial planning concepts with a set of matters related to land policy, spatial planning and urbanism was the first step towards building a robust, coherent and articulated system based on the evaluation of the existing planning system, on the dynamic of land use and transformation and in a set of framework studies. Among the general basis established by this law we emphasize the importance of the land legal system establishing the legal basis for land use and evaluation which will allow the integration of the planning system and the tools for land policy. These tools are fundamental for implementing territorial plans. In this context the importance of the project SmartOpenData must be stressed once it allows the creation of linked data services but also for the evaluation of the territorial dynamics in an area classified as strategic for the supply of a natural resource (drinking water, in this case) and covered by the pilot developed in Portugal.

The Decree-Law nº 80/2015, published in May the 14th, revises the Legal Regime of Spatial Planning Tools (Regime Jurídico dos Instrumentos de Gestão Territorial) which was initially established by the Decree-Law nº 380/1999 from 22 of September. This decree-law establishes the development of the land public policy and of spatial planning and urbanism established by the Law nº 31/2014 in effect. In this way, the coordination between the different territorial scopes (national, regional, inter-municipal and municipal) of the territorial management system as well as the general regime of land use and also the regime for the creation, approval, execution and evaluation of the spatial planning tools.

The Water Framework Directive (Directive 2000/60/CE of the European Parliament and Council from 23 of October, 2000) is the main instrument of the European Union policy towards water and establishes a framework for action from the EC for the protection of interior surface waters, transition waters, coastal waters and underground waters.

This directive was transposed into the national legislation by the Law nº 58/2005 published in 29 of December. As reported in the deliverable D7.2, this law was taken into consideration during the evaluations performed in the implementation of the SmartOpenData project Spanish-Portuguese pilot (Portuguese part). The more relevant aspects considered were related to the concern in the preservation of water quantity and

quality in one on the main Portuguese dams for the supply of drinking water (Castelo de Bode dam) and integrates a series of physical and anthropic variables for establishment of goals or for the creation of guidelines for land use and land cover. The Strategic Environmental Evaluation (SEE) is also considered in this context as an instrument that supports the decision-making process towards the promotion of a sustainable development and integrating the preparation and evaluation of plans and programs involving the public and the environmental authorities.

Once the SmartOpenData project integrates a set of environmental information with a spatial representation, it allows the creation and integration of environmental concerns in the decision-making process contributing to greener plans and programs which are requirements of the SEE.

When establishing goals for adaptation measures to climate change it is important to understand the influence of these measures on the hydric availabilities (quality and quantity). The Spanish/Portuguese pilot helps the creation of preventive measures to mitigate climate change. For establishing these mitigation measures we need to evaluate the main transitions in forest areas taking into account changes in precipitation and temperature in the context of forest fires (e.g., precipitation as an important role in the development of biomass but with the increase in temperature there is a greater risk of forest fires and this is a fact that could be verified in Portugal in the last years).

3.3 Ireland

Ireland was ranked 31 with an openness score of 46% in the 2015 Global Open Data Index[11]. However this reveals some interesting information regarding the Irish situation with regard to the 3 areas mentioned above. Grouping the 13 measures that make up the overall Irish score and ranking, gives the following:

1. Open Data – Ireland had an openness score of 66% which ranked it 11 for this aspect
2. ICT/eGovernment - 32% and ranked 46 for this aspect.
3. Geo Data / SDIs - 23% and ranked 53 for this aspect.

These indicate that Ireland is quite good on Open Data but has a lot to do yet with regard to the other two aspects.

Within the Irish Pilot, the key and central governance model is very much hands-on social validation with regular meetings and interactions with the various Burren and other stakeholders throughout the WP5 pilots, as they use and evolve the two SmartOpenData-enabled applications and services described in D5.3:

1. SmartOpenData enabled European Tourism Indicator System (ETIS) Webservice for the Burren and European GeoParks Network.
2. SmartOpenData enabled App to Ground-Truth potential Protected Monument sites

However the Irish pilot also involved interaction with and SmartOpenData LOD input to the Irish Open Government Partnership (OGP)[12] process through various interactions and attendance at various workshops (as described in D5.2). This helped greatly in the evolving

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[11] http://2015.index.okfn.org/place/ireland/

[12] www.ogpireland.ie

creation of a stable best practice network in Ireland to connect public bodies, researchers and companies to access and use the solutions identified in a simple manner, accelerating the publication of open data and its sustainable and profitable use.

As reported in D7.2, Open Data forms a core element of Ireland's first Open Government Partnership (OGP) National Action Plan, which was published in July 2014[13]. The plan was drafted in consultation with citizens and civil society activists (including those from SmartOpenData). Since February 2014, civil society members and government officials have been holding regular meetings to finalise the Action Plan, which contains 26 commitments towards more open government across three core areas:

1. Promoting Open Data and Transparency,
2. Building Citizen Participation and
3. Strengthening Governance and Accountability to rebuild public trust in Government

The measures in the Irish National Action Plan build on the foundations already laid in the area of the Irish Government's political and democratic reform, in particular, on key commitments included in the Irish Public Service Reform Plan, and provide a framework for the implementation of further reforms identified in the National Action Plan.

In June 2015, the Irish Government launched a public consultation on two key documents under the Open Data Initiative[14]:

- a Foundation Document for the development of Ireland's Open Data Strategy based on the G8 Open Data Charter principles[15] and EU/international best practice.
- a Technical Framework for the publication of datasets in open data format on the Irish open data portal at http://data.gov.ie, which now has over 1,000 datasets.

The Foundation Document for the development of the Irish Public Service Open Data Strategy specifies that every Public Organisation in Ireland

1. Audit their Datasets (using the COMSODE methodology[16], which SmartOpenData supports).
2. Develop an Open Data Publication Plan using an Open Data Technical Framework of:
   1. Open Data Licence
   2. Recommended Formats
   3. Metadata Schema
   4. Recommended Standards
   5. Recommended Unique Resource identifiers

The Irish Open Data Technical Framework recommends use of the GeoDCAT-AP Metadata Schema (Geo Data Catalogue vocabulary Application Profile for data portals in Europe)[17], which is also in line with SmartOpenData's conclusions and recommendations.

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[13] http://www.per.gov.ie/minister-brendan-howlin-td-publishes-irelands-first-open-government-partnership-national-action-plan/

[14] At www.per.gov.ie/open-data/, as reported in D5.3.

[15] G8 Open Data Charter Principles: 1.Open Data by Default, 2. Quality and Quantity, 3. Usable by All, 4. Releasing Data for Improved Governance, 5. Releasing Data for Innovation, see
https://www.gov.uk/government/publications/open-data-charter/g8-open-data-charter-and-technical-annex

[16] Described at www.comsode.eu

[17] https://joinup.ec.europa.eu/node/139283/

The Irish Government's Department of Public Expenditure and Reform is committed to collaborating and engaging with all interested stakeholders – citizens, businesses, researchers and public bodies. The next phase of the Irish Open Data Initiative will involve significant engagement with citizens, business, researchers, and public bodies and is a core element of Ireland's approach to Open Data. The public consultation will guide and inform the development of the Open Data Strategy and the finalisation of the Technical Framework.

The Irish Open Data strategy is guided by the following principles[18] (which are totally in line with SmartOpenData):

- The needs of citizens and businesses are at the centre of Ireland's approach to Open Data
- Data will be open by default and of high quality (accurate, authoritative, maintained and updated at regular intervals), published as 3* increasing to 4* and 5* (LOD) over time
- The quantity of datasets will be grown over time and usable by all to achieve inter alia improved governance and innovation in usage
- Open Data linked to the portal data.gov.ie will meet the requirements of the Technical Framework (standards, formats, metadata, License) over time to ensure interoperability
- Where requested datasets are not released as Open Data, the responsible public body will provide reasons why not
- A lifecycle approach to management of data will be promoted from creation to archival to ensure continuity and availability of datasets.

In October 2015, the Irish Government established the Irish Open Data Governance Board (OGBD) with very experienced members, to provide strategic leadership and help drive implementation of the Open Data Initiative[19]. The OGBD aims to[20]:

a. develop Ireland as a country where the economic, social and democratic opportunities and benefits for all stakeholders can be realised by publishing high value open datasets.
b. to put the ecosystem in place to enable the potential of Open Data to be exploited and to develop niche areas where Ireland has the potential to develop core competencies and be a leader in Open Data

The OGBD will be supported by the Irish Government's Public Bodies Working Group and the Open Data Unit within the Department of Public Expenditure and Reform in implementing its mandate. In terms of open data governance and strong leadership in Ireland, the OGBD brings a very good mix of skills, knowledge and expertise and its mandate in overseeing implementation will include:

- **Strategy** – develop the Open Data Strategy in line with best practice, govern implementation and maximise opportunities for Ireland by identifying and driving publication of high value datasets to achieve long term economic, social and democratic benefits

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[18] http://per.gov.ie/wp-content/uploads/FINAL-Mandate-for-Open-Data-Governance-Board-1210151.docx
[19] http://www.per.gov.ie/?p=15520
[20] http://per.gov.ie/wp-content/uploads/FINAL-Mandate-for-Open-Data-Governance-Board-1210151.docx

- **Support Public Bodies -** help improve the capacity and capability of public bodies in implementing Open Data and work towards building core competencies in Open Data in niche areas e.g. tourism/culture. Supports will be provided by way of seminars, briefing, tools, and guidance by the Open Data Unit under the leadership of the Board.
- **Governance -** ensure effective governance including ensuring a sound Open Data ecosystem is in place, efficient delivery of Open Data, reporting to the Minister on evaluation of performance in terms of progress and benefits realisation, managing risks and ensure synergies with relevant strategies or legislation are maximised
- **Leadership** - provide expert leadership and advice on the development of centres of excellence (linking data, mapping, visualisation), development of data analytics capability across the public sector and on the potential for linking to non-tabular data (e.g. research, images) and non-public data over time.
- **Promoting usage** - by participating in fora, increasing accessibility of datasets by encouraging public bodies to audit and publish high value datasets in line with the Technical Framework, identifying potential pilot projects to promote usage and demonstrate benefits, identify future opportunities for usage including through cross-border collaboration
- **Monitoring -** monitor international trends to guide and ensure Ireland is at the forefront in its implementation of Open Data and identify ways to ensure Ireland performs well in international evaluations as well as in terms of meeting the Open Data objectives set nationally

The overarching OGBD objectives are to set the direction for Ireland on Open Data over the next three years (2016-2019) and beyond by:

- Developing a data driven culture across the public service with a lifecycle approach taken to data management and publication of data in open format being a matter of routine
- Building a value driven economy around Open Data by making high value datasets publicly accessible and freely reusable.
- Stimulating innovation and economic growth, promoting transparency and efficiency in public administration through data usage, and improving data quality informed by feedback from users
- Ensuring good governance structures to lead and drive the Initiative and ensure a consistent and coherent approach to Open Data is pursued by public bodies
- Ensuring datasets are in line with the Technical Framework to ensure data on data.gov.ie is of high quality and free to use and Ireland ranks highly in international evaluations
- Promoting awareness of Open Data and creating an environment where stakeholders engage with public bodies to identify datasets with the potential to deliver benefits and demonstrate use made of such datasets
- Considering the potential for adding non-public data which is considered valuable over time

These are totally in line with the SmartOpenData vision and approach, so the future governance and strategic direction of open data and LOD in Ireland is very positive.

3.4 Slovakia

As in many other countries, Slovakia is also facing to the heterogenic legislation framework setting up the rules delineating the conditions for the digital support of the society.

3.4.1 General ICT / eGovernment situation

Initial systematic effort to establish basis for the Information society in Slovakia is dated around the beginning of this millennium, when based on the eEurope+ initiative Slovak Information Society Policy and Strategy that have been approved by the Government Resolution No. 522/2001. Following decade was characterised by various efforts for digitalisation of the public sector processes and introduction of ICT-based services. Around the 2008 national concept of eGovernment was defined, following the adoption of the eGovernment Strategy of the Slovak Republic by Government Resolution No. 131/2008. In connection to the integration of Slovakia within the European Union context The Information Society Strategy for 2009 - 2013 shaped the further maturation of information society. Currently main outcomes of this effort shall become to be visible and accessible. At the same time new operational program 2014-2020 is taking the place aiming to reflect the latest developments in the information and communication technology as well as new societal expectations[21]. Whole framework of Information society is therefore delineated with the wide spectrum of the legislation framework as from EU[22] as well as from national perspective[23]. Some efforts took place towards simplification and more consistent approach, but there is still long way ahead. As reaction to often ineffective expenditure of the public funds on tasks related with the eGovernment, voluntary apolitical initiative Slovensko.digital[24] have been launched with ambition to stimulate open discussion on reasonable, more transparent use of latest technologies and public funds.

3.4.2 Open Data

Initial impact on Open Data movement in Slovakia has been triggered by the signing of participation in Open Government Partnership in September 2011. The OGP action plan in Slovakia is a legally binding document. After initial changes in the governance of the OGP, Office of the Plenipotentiary for the Development of Civil Society, under the Ministry of the Interior of Slovak republic is currently the main leading, implementing and coordinating body for the OGP activities in Slovakia. Although commitments are owned by a variety of agencies, the strongest progress was made in the area of open data[25]. In cooperation with the Government office of the Slovak republic Open Government Initiative dedicated website has been established to provide the central point for related information[26]. Initial interaction with public sector bodies took place during the period 2012-2013 with the collection of first set of inventory of open data, which were collected by the new Open Data

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[21] http://informatizacia.sk/strategic-documents/4614s#NS of the SR for DI

[22] http://www.informatizacia.sk/legislativa-eu/683s

[23] http://www.informatizacia.sk/legislativa-sr/684s

[24] http://slovensko.digital/

[25]

http://www.opengovpartnership.org/sites/default/files/Slovakia%20OGP%20IRM%20Public%20Comment%20%28Eng%29_0.pdf

[26] http://www.otvorenavlada.gov.sk/ogp-home/

Portal (Portál Otvorených Dát)[27]. Important aspect in setting up the scene for the Open Data was an approval of the legally binding Decree on standards, with the definition of requirements on Open Data (§ 57)[28]. For 2015 Open Data action plan[29] have been defined composing from 5 actions aiming to improve the situation:

- Update of the list of public sector datasets[30]
- Publish datasets on Open Data Portal
- Launch the survey focused on the demand for the datasets
- Based on the survey outcomes publish the datasets with the highest priority
- Prepare the the Open Data strategy

In mid-2015, officials of the Slovak government's information technology (IT) service, the National Agency for Network and Electronic Services (NASES), and of the Office of the Plenipotentiary for the Development of Civil Society contended that open data in Slovakia had a bright future[31].

Despite the effort done so far, it's very difficult to conclude, what kind of governance model defined in chapter 2.1 is currently established in Slovakia from the Open Data perspective. The closest one could be "Results-based Model". With sufficient societal and political support this model could remain also as the most suitable for the future activities.

3.4.3 Geo Data

From the geo data perspective, there is also long tradition of the collection of geospatial data in Slovakia. The majority of the content was developed within the public sector bodies, but recently significant amount of the geo data is being created and maintained also in private sector or via voluntary geography and crowdsourcing initiatives. Similarly as in ICT/eGov also legal framework reflected this historical sectoral maturation and just recently initial efforts for coordinated and harmonised legal acts have been driven mainly via INSPIRE initiative and related policy. The main legal act transposing the INSPIRE directive in Slovakia id the law n.3/2010 coll. about national spatial data infrastructure[32]. Aside of this law set of domain specific pieces of legislation is defining the conditions for the collection, maintenance and access to the relevant geospatial content and functionality.

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[27] http://www.data.gov.sk

[28] http://www.informatizacia.sk/standardy-is-vs/596s

[29] https://github.com/otvorenavlada/akcnyplan2015

[30] http://www.otvorenavlada.gov.sk/datasety-statnej-spravy/

[31] https://joinup.ec.europa.eu/sites/default/files/js_ogp_slovakia_formatted_012oct2015.pdf

[32] http://inspire.enviroportal.sk/transpozcia/zakon-o-nipi

3.5 The Czech Republic

The process of modernization of public administration in the Czech Republic is defined by Smart Administration strategy. From 2007 to 2013 the Czech Republic has reached the main goal of Smart Administration strategy - to ensure a coordinated and effective way of improving public administration and public services with a help of the Structural Funds. The implementation structure of modernizing of Czech public administration, managed by the Ministry of Interior (MoI), has been set. For the new programming period, a document for the implementation of Smart Administration "Strategic framework for the development of public administration and eGovernment 2014+" is being prepared. The document shows vision and goals to 2020. One of the measures whose implementation as an integral part of Czech eGovernment contribute to the achievement of European objectives in the field of data and services interoperability is work on "Strategy of spatial information infrastructure development in the Czech Republic up to 2020" (hereinafter referred to as "GeoInfoStrategy"). The intention to prepare GeoInfoStrategy was submitted in October 2012 by the Minister of Interior for approval. The Czech Government discussed the intention and approved it in its Resolution No. 837. Minister of the Interior has to elaborate and submit the GeoInfoStrategy proposal to the Government, in cooperation with the President of the Czech Office for Surveying, Mapping and Cadastre (SDI on the reference area) and with the Ministers of the Environment (INSPIRE implementation, SEIS and GMES participation), Local Development (building code and land use planning), Defense (military map series and primary spatial data base for national defense) and Transportation (implementation of the Galileo program at the national level and acquiring spatial data on transportation infrastructure), within the deadline of February 28th, 2014. GeoInfoStrategy will serve as a fundament for the development and improvement of eGovernment services regarding spatial data[33].

The Government of the Czech Republic has approved the Strategy of the Spatial Information Infrastructure Development to the 2020 (GeoInfoStrategy) on 8th August 2014. The GeoInfostrategy is the key document indicating the direction of the development of spatial information management and use in the public government in the long-term horizon. The GeoInfostrategy is the key document indicating the direction of the development of spatial information management and use in the public government in the long-term horizon[34].

Linked open Data are till now not directly included as part of Czech GeoInfostrategy, but some organisations like Czech Cadastral Office are now working on publishing their data as Linked Open Data. Also National Geoportal offers INSPIRE metadata as Linked Open Data. This was direct input of SmartOpenData.

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[33] http://inspire.ec.europa.eu/events/conferences/inspire_2013/schedule/submissions/184.html
[34] http://www.geoportalpraha.cz/en/clanek/256/the-czech-government-has-approved-the-geoinfostrategy#.Vls79r_WGa4

3.6 Italy

Italy is ranked 17th in the Global Open Data Index of the OKFN (22nd in the W3 Foundation's Open Data Barometer), but the details of the classification are very revealing. The highest scores are for those areas that are susceptible to top-down policy decisions at the central government level: statistics, government budget, legislation, tenders, election results, and the national map. The areas of concern to SmartOpenData and more specifically the Italian pilot (water quality monitoring), are quite a different story. To the OKFN, it is entirely unclear what the status of information regarding water quality is, as the information available is only waste water data provided by ISPRA through the European portal, although the census leaves open the possibility that data can be available at the municipal level. In truth, this reflects a rather confused and contradictory framework as regards the responsibilities for monitoring water quality where ISPRA and, at the regional level ARPA as is our Sicilian Partner, share responsibilities with municipal governments as well as local health authorities for monitoring water quality. The OKFN census doesn't make explicit mention of air quality, but we can say that a similar situation persists although the governance mechanisms for the collection and aggregation of information from different sources is more effective.

In a LOD perspective, the Italian Pilot identified several types of datasets that would require to be linked to water or air quality in order to be able to respond to sensible queries on the causes and effects of pollution. This leads us to the other areas of the OKFN census with some element of concern; in particular, land ownership, company registers, and location datasets are all not freely available even though they may be published through on-line services. These areas also correspond, in terms of the data providers, to a broad range of agencies and sectors of the public administration, as well as private bodies, less affected by the top-down legislative efforts. Progress at this level would require a different type of engagement, where the prospects of mutual enrichment of datasets through the LOD paradigm would need to be used as a force of attraction more than the rationale for Open Data on its own.

In any event, it is useful to review the evolution of the normative framework at the national level, since this provides a first impetus for innovation at the local level. Over the past 5 years, different (and sometimes conflicting, especially when it comes to privacy) laws and initiatives have taken place, with a particular flurry of activity between 2009 and 2011. The early ones include:

- Art. 21 of the law 69/2009 (transparency of cvs and pay);
- Art. 11 of the legal decree 150/2009 (transparency, evaluation, and merit sections on public web sites);
- Deliberation n.105/2010 of the "Civit" package (dynamic transparency and the list of datasets that administrations should publish on their websites);
- Art. 52 comma 1-bis of the Code of Digital Administration, legal decrees 82/05 and 235/2010 (promotion of the diffusion and use of data, requirement to publish data in open format);
- 2011 Guidelines for Public Administration websites (including guidelines for publishing Open Data);

- The most important step was the adoption of the "open by default" principle, though the conversion into law of Art. 9 of the legal decree 179/2012, which modifies Art. 25 of the Code of Digital Administration.

Several regions have in parallel taken a leading role in transferring this impetus to the local administrations, in particular in Piedmont, Emilia Romagna, and Veneto, as well as ENEL (electricity) and ISTAT (national statistics institute).

More recently, the "Open Cohesion" portal, published by the Ministry for Economic Development, has had a significant impact by publishing all of the programmed investments for the 2007-2013 ERDF expenditures by regions and central administration. The difference here lies in a shift of emphasis from transparency (the main concern of the legal frameworks for the public administration) to usefulness (in addition to transparency of course), even though LOD has not been adopted in full. This is attained primarily by the initiative "Open Cohesion at School", which built on the available datasets in different localities to teach the fundamentals of data journalism in schools.

An important element of the Open Cohesion at School initiative is that the programmes in different regions are carried out in partnership between the central government and local civic groups related to the promotion of transparency, open government, and open data. This recognizes the legitimacy of these groups, who have in turn played an important role in promoting an Open Data culture throughout the public administration, in particular from a bottom up perspective. The most important of these groups are:

- OpenPolis, fonded in 2006, works primarily at the national level, publishing all legislative acts on-line and in general promoting open data, open source, and open government.
- Spaghetti Open Data, a more informal and bottom-up group that got started among the blogger community in 2010.
- Stati Generali dell'Innovazione (State of Innovation), formed as an association in 2012 with a high-level group of innovation thinkers among its founding members.
- More recently, the government has appointed a diffused network of Digital Champions (1,583 in all of Italy), in line with the EU level initiative within the Digital Agenda.

This general situation – strong normative framework at the top, overlapping roles and mixed results in the middle, and fervent activity at the bottom – also holds at the level of the Sicilian Region. The national legislation is currently being applied with different degrees of success at the municipal level, with the City of Palermo leading the pack with an Open Data strategy launched during the International Open Data day in Feb 2013. The Regional government is in contrast lagging far behind, with a proposed law waiting to be discussed for several years now and very few datasets published on the official web site. At the same time, Sicily is home to one of the most active local civic groups, OpenDataSicilia (ODS), born as a mailing list, opening its official blog in 2014, and holding its first official meet-up (over 100 participants) in 2015.

The governance strategy of ARPA for the SmartOpenData pilot was thus based on creating a solid link between ARPA and ODS, at the same time engaging different institutional actors in between including the municipal governments of Palermo and Bagheria. This was the first time that an agency of the Regional government actually reached out to the civic digital innovation community in order to co-design an Open Data strategy, and the first step involved building a platform of trust between ARPA as an institution and ODS as an open

community. This was achieved through the joint writing up of the Palermo Declaration, which defines the shared goals, objectives, and principles for Open Data. From there, the joint collaboration has proceeded through a series of steps:

- Presentation of ODS and the Palermo Declaration at the SmartOpenData workshop held in Palermo, 7 July 2015, on occasion of the project meeting of the previous day.
- Participation of ARPA at the ODS2015 Summer Edition, the first ODS meet-up held in September 2015. On this occasion, ARPA invited the members of ODS to participate in a technical meeting to co-design their Open Data platform.
- A joint ODS-ARPA workshop, held at ARPA premises on the 14th of October 2015 (and streamed live to several remote ODS participants), where the publication of data regarding air quality was discussed and a joint initiative of co-development planned.
- Opening of a joint ARPA Sicilia group (11 members including ARPA staff and ODS members) on the ODS Sicilia Hub space on Github https://github.com/orgs/SiciliaHub/teams/arpa-sicilia for the shared development of resources and services.

A sustainable collaboration has thus been created, which will be using the SmartOpenData tools and services after the project's lifetime to carry forward what was just begun in the Italian Pilot.

4 European legislation and initiatives

4.1 European legislation on reuse of public sector information

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

The Directive on the re-use of public sector information (Directive 2003/98/EC, known as the 'PSI Directive') entered into force on 31 December 2003. It was revised by Directive 2013/37/EU which entered into force on 17 July 2013. It focuses on the economic aspects of re-use of information rather than on the access of citizens to information. It encourages the Member States to make as much information available for re-use as possible. It addresses material held by public sector bodies in the Member States, at national, regional and local levels, such as ministries, state agencies, municipalities, as well as organisations funded for the most part by or under the control of public authorities (e.g. meteorological institutes). Since 2013 content held by museums, libraries and archives fall within the scope of application as well.

This is a summary of the Directive:

- All content that can be accessed under national access to documents laws is in principle re-usable beyond its initial purpose of collection for commercial and non-commercial purposes;
- by way of exception, content held by museums, libraries and archives is only re-useable if it is made available by the institutions for re-use;
- Conditions for re-use shall be non-discriminatory for comparable categories of re-use.
- Charges for re-use should in principle be limited to the marginal costs of the individual request (reproduction, provision and dissemination costs);
- Exceptions apply to museums, libraries and archives and to situations in which either the public sector body as such is required to generate revenue to cover a substantial part of the costs relating to the performance of its public tasks or situations in which such requirement applies to a specific piece of content ('document');
- In such cases, the charges for re-use have to be limited at a ceiling calculated on the basis of actual costs. Public sector bodies need to calculate charges per re-user in a way so that the total income from charging does not exceed the costs incurred to produce and disseminate the information, together with a reasonable return on investment.
- Public sector bodies are encouraged to apply lower charges or to apply no charges at all. On request, public sector bodies must indicate the method used to calculate charges.
- Charges and other conditions for re-use have to be pre-established and published. If a request for re-use is refused, the grounds for refusal and the means of redress need to be explained.
- Prohibition of cross-subsidies: If public sector bodies re-use their own documents to offer added-value information services in competition with other re-users, equal charges and other conditions must apply to all of them.

- Prohibition of exclusive arrangements: Public sector bodies may not enter into exclusive arrangements with individual re-users, excluding others.
- Two exceptions apply: Exclusive rights may be authorised in exceptional circumstances
- if they are necessary to provide services in the public interest; or
- In the context of digitisation of cultural resources.
- In both cases, review clauses ensure that exclusive arrangements are regularly reviewed against the evolution of technology and the market for digitisation and provision of electronic services;
- Requests for re-use shall be processed within a specific timeframe (20 days for standard cases).
- Licences should not unnecessarily restrict possibilities for re-use or be used to restrict competition.
- Member States are encouraged to use standard licences in digital format.

In July 2014, the Commission published guidelines to help the Member States transpose the revised rules and to indicate best practice in several fields of importance for the re-use of public sector information. Member States were obliged to transpose Directive 2013/37/EU by 18 July 2015.[35]

4.2 Open Data

In December 2011, the European Commission adopted its Open Data Strategy, aiming to make open data the standard in the Member States of the European Union. The strategy included a proposal to revise the 2003 Directive on the re-use of public sector information (PSI directive). This proposal has been discussed in a dialogue procedure and the Council's Committee of Permanent Representatives has adopted a final text on the 10th of April. The main elements of the proposal for amending the PSI Directive include the introduction of a general right of re-use of PSI, the extension of the field of application to cultural institutions, and the adoption of marginal cost charging as the default charging policy. The proposal was discussed in the Council and the European Parliament in the course of 2012, and it was decided to create a dialogue between the institutions to avoid the long process of a first and second reading in the Parliament. On 10 April 2013, the European Commission announced the EU Committee of Member States' Permanent Representatives (COREPER) agreement with the revisions of the Directive (European Commission, 2013). On the 25th of April, the European Parliament's Committee on Industry, Research and Energy votes on the text, and the plenary vote is expected on the 11th of June. As the text was negotiated in a trialogue, it is expected that these votes will only be a formality. Therefore, this Article is based on the text adopted by the COREPER (Council, 2013).[36]

This paper critically analyses the proposed amendments of the European Commission, the Parliament and the Council, against the background of the policy and practice experiences relating to PSI in the Member States and the recent developments relating to open data. It assesses to which extent the possible changes to the directive will impact open data policy and practice and whether the legal barriers that are currently in place will actually be removed.

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[35] http://ec.europa.eu/digital-agenda/en/european-legislation-reuse-public-sector-information
[36] http://ejlt.org/article/view/238/411

The Commission's work in the area of open data is focusing on generating value through reuse of a specific type of data – public sector information, sometimes also referred to as government data. That is all the information that public bodies produce, collect or pay for. Examples are: geographical information, statistics, weather data, data from publicly funded research projects, and digitised books from libraries. Commission supports open data for 4 reasons:

- Public data has significant potential for re-use in new products and services;
- Addressing societal challenges – having more data openly available will help us discover new and innovative solutions;
- Achieving efficiency gains through sharing data inside and between public administrations;
- Fostering participation of citizens in political and social life and increasing transparency of government.[37]

4.3 INSPIRE

The Member States of the European Union are currently implementing the Infrastructure for Spatial Information for Europe (INSPIRE) Directive (2007/2/EC) and related regulations, a major European data-sharing policy helping to create a Spatial Data Infrastructure for the environment and related policy areas. Technical guidelines for INSPIRE implementation, based on existing international standards, are either in place or are currently under development. However, standards can be implemented in different ways, they can evolve and coordinating changes between standards can be a challenge. All these issues can limit the interoperability between systems and the way in which this European environmental Spatial Data Infrastructure (SDI) can operate.

In order to address these issues, as part of the Interoperability Solutions for European Public Administrations (ISA) Programme, the European Commission's Joint Research Centre (JRC) is establishing the Reusable INSPIRE Reference Platform (ARE3NA) which will identify and develop common components for the successful implementation of the INSPIRE Directive in relation to European e-government. ARE3NA supports collaboration, identification of best practices, guidance and sharing of components relate to various aspects of INSPIRE (e.g. metadata-related tools, spatial data themes (as described in Annexes I, II, III of the Directive), spatial data services and technologies, including for testing conformity) through the following activities:

- Inventory of existing platforms and tools spanning multiple policy areas;
- Support existing or initiate new open source projects to address identified gaps;
- Produce extended multilingual documentation to help create an INSPIRE node based on existing Member States' relevant initiatives;

This site provides a major contribution to the last item by using JoinUp as part of ARE3NA's collaborative platform and a place to host, review and discuss these project outputs. The relevant department of the European Commission, the JRC, has lead the definition of a complex data model that is broken down into various themes. Naturally enough, the data is modeled in UML and the implementations are based largely on OGC standards that make

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[37] https://ec.europa.eu/digital-agenda/en/open-data-0

use of XML/GML etc. However, a number of projects are experimenting and using the model in Linked Data environments. These include GeoKnow, MELODIES and SmartOpenData, through its partner ERCIM, which is W3C's European host.[38]

4.4 Copernicus

Copernicus is a European system for monitoring the Earth. Copernicus consists of a complex set of systems which collect data from multiple sources: earth observation satellites and in situ sensors such as ground stations, airborne and sea-borne sensors. It processes these data and provides users with reliable and up-to-date information through a set of services related to environmental and security issues. The services address six thematic areas: land, marine, atmosphere, climate change, emergency management and security. They support a wide range of applications, including environment protection, management of urban areas, regional and local planning, agriculture, forestry, fisheries, health, transport, climate change, sustainable development, civil protection and tourism. The main users of Copernicus services are policymakers and public authorities who need the information to develop environmental legislation and policies or to take critical decisions in the event of an emergency, such as a natural disaster or a humanitarian crisis.[39]

The European Delegated Act on Copernicus data and information policy will enter into force in the coming days. This Act provides free, full and open access to users of environmental data from the Copernicus programme, including data from the Sentinel satellites. This decision confirms the one recently adopted by ESA Member States – as current owners of the Sentinel satellites – for granting free and open access to Sentinel data. It will allow long-term continued access to data through the operational phase of Copernicus, led by the European Commission. These data will dramatically improve the management of the environment, help to understand and mitigate the effects of climate change and ensure civil security. ESA is coordinating the acquisition and delivery of data through the Sentinel series of satellites. This common approach on data policy confirms the coherence between the EU and ESA in the Copernicus programme. It paves the way for a successful uptake of the operational phase of the Copernicus Space Component, as well as the full economic benefits to come from the Copernicus programme[40].

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[38] https://www.w3.org/blog/data/2015/06/08/inspire-in-rdf/

[39] http://www.copernicus.eu/main/copernicus-brief

[40] http://www.esa.int/Our_Activities/Observing_the_Earth/Copernicus/Free_access_to_Copernicus_Sentinel_satellite_data

5 Liaisons with other projects

SmartOpenData has developed strong links with several projects, institutions and working groups during its lifetime. The following list points out the principal among them.

5.1 W3C/OGC Working Group

The OGC Spatial Data on the Web Working Group (SDWWG) is constituted as a subgroup of the OGC Geosemantics DWG. It will operate in collaboration with a parallel group in W3C of the same name. The Mission of the SDWWG working group is to clarify and formalize the relevant standards landscape for spatial on the web. In particular:

- to determine how spatial information can best be integrated with other data on the Web;
- to determine how machines and people can discover that different facts in different datasets relate to the same place, especially when 'place' is expressed in different ways and at different levels of granularity;
- to identify and assess existing methods and tools and then create a set of best practices for their use;
- Where desirable, to complete the standardization of informal technologies already in widespread use.
- All working group proceedings will be available via W3C at http://www.w3.org/2015/spatial/ [41]

Both the World Wide Web Consortium (W3C) and the Open Geospatial Consortium (OGC) have launched working groups devoted to the task. They are pledging to closely coordinate their activities and publish joint recommendations. SmartOpenData played critical role in establishing of this group and contribute to the work of this group. SmartOpenData project, the World Wide Web Consortium (W3C) in partnership with the Open Geospatial Consortium (OGC) and the OGC GeoSPARQL Standards Working Group, the UK Government Linked Data Working Group, Google and Ordnance Survey, organised initial workshop with the target share experiences, successes and observations in using geo and location information.[42] The Linking Geospatial Data Workshop was billed primarily as a joint exercise between the Open Geospatial Consortium (OGC) and W3C as part of its role within the SmartOpenData project. It came about through a desire to make better use of the Web as a platform for sharing and linking Geospatial Information (GI) alongside but not instead of existing GI systems.

5.2 GEOSS Architecture Implementation Pilot (AIP)

The Global Earth Observation System of Systems (GEO SS) is a coordinating and integrating network of Earth observing and information systems, contributed on a voluntary basis by Members and Participating Organizations of the intergovernmental Group on Earth Observations (GEO). The vision for GEOSS is to realize a future wherein decisions and actions

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[41] http://www.opengeospatial.org/projects/groups/sdwwg
[42] http://www.opengeospatial.org/taxonomy/term/424/all

for the benefit of humankind are informed by coordinated, comprehensive and sustained Earth observations and information.[43]

GEOSS will achieve comprehensive, coordinated and sustained observations of the Earth system, in order to improve monitoring of the state of the Earth, increase understanding of Earth processes, and enhance prediction of the behavior of the Earth system. The GEOSS Architecture Implementation Pilot (AIP) develops and deploys new process and infrastructure components for the GEOSS Common Infrastructure (GCI) and the broader GEOSS architecture. OGC leads the AIP using the OGC Interoperability Program policy and procedures.[44]

AIP's aim to increase use of GEOSS resources by the end-users, in applying in situ and remotely sensed data, by further developing results from previous GEO developments through integration with the GEOSS Common Infrastructure (GCI).

The AIP's goals are to:

1. Increase Societal Benefit Area (SBA) use of GEOSS Resources for end-user
2. Increase availability of GEOSS Resources
3. Focus on benefits and usability for Developing Countries
4. Solidify previous GEO results and technical achievements[45]

SmartOpenData actively contribute to GEOSS AIP-7 and GEOS AIP-8 mainly with introducing principles of Linked Open Data and sharing and offering its results to AIP partners.

5.3 COMSODE

COMSODE project[46] addressed the topic of OpenData from the perspective of supporting software and methodology development together with the publication of related datasets. There has been established close cooperation with SmartOpenData, particularly in the use of the OpenDataNode[47] software framework as well as via utilisation of the methodology framework[48] supporting the public authorities with their effort to open their datasets. In addition, COMSODE project contributed to the development of the SmartOpenData modeling framework represented by INSPIRE vocabularies[49]. On the contrary, SmartOpenData contributed to the activities of the COMSODE via involvement of the User Board[50] via SAZP representation as well as in the awareness raising and dissemination activities (e.g. Open Data In Action Workshop at ICT 2015 Lisbon)[51].

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[43] http://www.earthobservations.org/documents/cfp/201302_geoss_cfp_aip6_architecture.pdf

[44] http://www.opengeospatial.org/projects/initiatives/geoss/ogc

[45] http://www.webservice-energy.org/resources-list/geoss-aips

[46] https://www.comsode.eu/

[47] http://opendatanode.org/

[48] https://www.comsode.eu/index.php/deliverables/

[49] http://www.w3.org/2015/03/inspire/

[50] https://www.comsode.eu/index.php/consortium-2/

[51] https://ec.europa.eu/digital-agenda/events/cf/ict2015/item-display.cfm?id=15786

5.4 CIP projects

SmartOpenData influenced three projects from the last call of CIP ICT PSP work programme "2013 COMPETITIVENESS AND INNOVATION FRAMEWORK PROGRAMME (CIP)": OpenTransportNet, SDI4Apps and FOODIE, which are now extending some basic ideas of SmartOpenData.

5.4.1 OpenTransportNet (OTN)

OpenTransportNet is a project designed to revolutionize the way that transport related services are created across Europe. By bringing together open geo-spatial data within City Data Hubs and enabling it to be viewed in new easy-to-understand ways, OpenTransportNet enables:

- Anyone to have fun with data, by viewing data mash-up's in maps and graphs and be able to use and embed these maps in their own websites
- Public Sector users to gain insights from linking and visualising different data sets and be able to make better public service decisions based on the findings
- Businesses and entrepreneurs to use the data to enhance existing services and build new transport-related services
- The wider open community to benefit from the project outputs and findings to advance geospatial data standards such as INSPIRE[52]

OTN further development work started in SmartOpenData about implementation of INSPIRE profile as extension of DCAT. DCAT represents metadata format proposed for European portals based on principles of semantic web. In the framework of ISA Action (ARe^{3}NA), an alignment exercise has been carried out between INSPIRE metadata and DCAT-AP. OTN implemented this as part of OTN solution.

5.4.2 SDI4Apps

SDI4Apps is an EU-funded project managed by the University of West Bohemia from the Czech Republic. The project is being implemented with the concerted effort of 18 organizations across Europe. SDI4Apps seeks to build a cloud-based framework with open API for data integration focusing on the development of six pilot applications. The project draws along the lines of INSPIRE, Copernicus and GEOSS and aspires to build a WIN-WIN strategy for building a successful business for hundreds of SMEs on the basis of European spatial data infrastructures.

SDI4Apps used experience of SmartOpenData and introduce principles of Linked Open Data into tourism as part of their smart Point of Interest concept.

The SDI4Apps team developed a seamless open database of POIs, which will be distributed as 5 star Linked Open Data to be accessible for all users. The essential core of the model was extended by several attributes which are integral components of some original data and could be helpful for tourist purposes. The SDI4Apps Points of Interest data set is the seamless and open resource of POIs that is available for other users to download, search or reuse in applications and services. Its principal target is to provide information for cycling as Linked data together with other data set containing road network. The added value of the

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[52] http://www.opentransportnet.eu/

SDI4Apps approach in comparison to other similar solutions consists in implementation of linked data, using of standardized and respected datatype properties and development of the completely harmonized data set with uniform data model and common classification.

5.4.3 FOODIE

The key point of FOODIE project is creating a platform hub on the cloud where spatial and non-spatial data related to agricultural sector are available for agri-food stakeholders groups and interoperable. It will offer an infrastructure for the building of an interacting and collaborative network; the integration of existing open datasets related to agriculture; data publication and data linking of external agriculture data sources, providing specific and high-value applications and services for the support of planning and decision-making processes. FOODIE use mainly experience from SmartOpenData for integration of Linked Open Data coming from Eurostat and FAO.

5.5 DaPaas

During the course of the project, SmartOpenData has had continuous contact and collaboration, through SINTEF, with the FP7 DaPaaS project (DaPaaS - A data-and-platform-as-a-service approach to efficient open data publication and consumption; http://dapaas.eu) which SINTEF coordinated. DaPaaS created and operated the DataGraft platform (https://datagraft.net) – a cloud-based service for data transformation and data access. The collaboration materialized in the fact that SmartOpenData results were reused in DaPaaS, and in turn SmartOpenData reused DaPaaS results. More specifically, Jarfter – the software developed by SINTEF in SmartOpenData for packaging data transformations was reused and integrated with the DataGraft platform, and in turn, SmartOpenData used DataGraft for creating and hosting data transformations and publishing the resulting data of transformation on DataGraft for the Spanish-Portuguese and Italian pilots. The cooperation between SmartOpenData and DaPaaS was beneficial for both projects.

5.6 proDataMarket

The proDataMarket project (http://prodatamarket.eu/) (Enabling the property data marketplace for novel data-driven business products) is a relatively recent H2020 innovation action project lead by SINTEF, and includes as partners also TRAGSA and SpazioDati. It is fair to say that the cooperation of those three partners in SmartOpenData created the opportunity to them to continue the cooperation based on the work in SmartOpenData. SINTEF and SpazioDati are reusing their technical results and expertise gained in SmartOpenData in proDataMarket, and TRAGSA are reusing the their data published through SmartOpenData in proDataMarket, therefore SmartOpenData are taken further in proDataMarket – a good success story of reusing and building upon cooperation and results from SmartOpenData.

6 Conclusion

Both documents (D7.2 and D7.3) serve as recommendation and examples of situation in term of liaisons among EU projects and national legislations in different countries. These different countries are represented by pilots and the documents confirm that the level of using the Open data and the Linked Open Data is varying. It is difficult to find some measurable statistics for country comparison, a rank of openness for example from the Global Open Data Index[53] could be good starting point for some country comparison and therefore has been included in this document.

Partners focused also on national legislation in terms of ICT/eGovernment, Open Data and if present Geo Data/SDI, where the level is also different. In some countries Open Data are very well present, but Geo Data are at the beginning of expanding, for example the statement is based on the description of the Czech pilot and the rank of openness of Ireland.

6.1 The Governance model

Due to complexity of particular national legislations and also differences among partners, the definition of one common government model cannot be recommended. Experiences with Linked Open Data during SmartOpenData project showed, that it will take some time, in order to stabilize its usage together with legislation preparedness in case of widespread use among government organisations, private sector and others.

It is not easy to even fit some government model within one country or the definition is more or less specific for a pilot goal, examples:

Slovakia: *It's very difficult to conclude, what kind of governance model defined in chapter 2.1 is currently established in Slovakia from the Open Data perspective. The closest one could be "Results-based Model". With sufficient societal and political support this model could remain also as the most suitable for the future activities.*

Ireland: *Within the Irish Pilot, the key and central governance model is very much hands-on social validation with regular meetings and interactions with the various Burren and other stakeholders throughout the WP5 pilots, as they use and evolve the two SmartOpenData-enabled applications and services described in D5.3.*

During SmartOpenData a common approach of some pilots was to follow government strategies of the country and contribute to them:

Czech: *The Government of the Czech Republic has approved the Strategy of the Spatial Information Infrastructure Development to the 2020 (GeoInfoStrategy) on 8th August 2014. The GeoInfostrategy is the key document indicating the direction of the development of spatial information management and use in the public government in the long-term horizon. The GeoInfostrategy is the key document indicating the direction of the development of spatial information management and use in the public government in the long-term horizon.*

Linked open Data are till now not directly included as part of Czech GeoInfostrategy, but some organisations like Czech Cadastral Office are now working on publishing their data

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[53] http://2015.index.okfn.org/place/

as Linked Open Data. Also National Geoportal offer INSPIRE metadata as Linked Open Data. This was direct input of SmartOpenData.

Italy: *The governance strategy of ARPA for the SmartOpenData pilot was thus based on creating a solid link between ARPA and ODS, at the same time engaging different institutional actors in between including the municipal governments of Palermo and Bagheria. This was the first time that an agency of the Regional government actually reached out to the civic digital innovation community in order to co-design an Open Data strategy, and the first step involved building a platform of trust between ARPA as an institution and ODS as an open community. This was achieved through the joint writing up of the Palermo Declaration, which defines the shared goals, objectives, and principles for Open Data.*

6.2 Liaisons with other projects

During the SmartOpenData project liaisons among many other projects have been established. It is important to share knowledge among projects, because open data or linked open data goals are targeted in several European projects, thus SmartOpenData started to cooperate with them in order to not substitute work and to share knowledge and experience. SmartOpenData actively contribute to CIP, GEOS AIP-7 and GEOS AIP-8 mainly with introducing principles of Linked Open Data. Some projects reused technical results and expertise of SmartOpenData and some projects used directly linked open data to build apps on top of them. SmartOpenData also played critical role in establishing of the W3C/OGC Working Group and contributing to the work of this group.

Good example of technical transfer is cooperation with DaPaas project, where a software for packaging data transformations (developed during SmartOpenData) was used as a part of a platform for hosting data transformations and publishing (developed during DaPaas project) and both were used by SmartOpenData pilots for data publishing.

On the base of ideas about Linked Open Data for Tourism in SmartOpenData, it was developed SDI4Apps large scale pilot and repository of Smart Point of Interest (see http://sdi4apps.eu/spoi/), which currently contain more than 23 million of RDF records. The ideas and concepts coming from SmartOpenData are now exported also to other pilots like INSPIREYouth or Open Land Use.

OpenTransportNet project continue in effort focused on Metadata Implementation and elaborate for practical usage GeoDCAT model. The work is done in cooperation with JRC, OGC and W3C.

SmartOpenData contributed to FOODIE project with integration of Linked Open Data coming from Eurostat and FAO and also helped with implementation of INSPIRE profile as extension of DCAT for OTN project, both examples show an experience exchange between these projects.

Annex: List of Abbreviations

API – Application Programme Interface

ARPA – Environment Protection Regional Agency

COMSODE – Components Supporting the Open Data Exploitation

DaPaaS – A data-and-platform-as-a-service

DCAT – Data Catalog Vocabulary

DCAT-AP – DCAT Application profile

EC – European Commission

ETIS – European Tourism Indicator System

EU – European Union

FMI – Forest Management Institute

FOODIE – Farm-Oriented Open Data In Europe

GeoSPARQL – Geographical SPARQL Query Language for RDF

GEOSS – Global Earth Observation System of Systems

GI – Geo-information

GIDEON – Key geo-information facility for the Netherlands

GIS – Geo-information systems

GMES – Global Monitoring for Environment and Security

ICT – Information and Communication Technologies

INSPIRE – INfrastructure for SPatial InfoRmation in Europe

ISA – Interoperability Solutions for European Public Administrations

LISIGE – Law about   nfrastructures and Services of Geographic Information

LOD – Linked Open Data

MAC – The National Microelectronics Applications Centre Ltd

MINETUR – Ministry for Industry, Energy and Tourism

MINHAP – Ministry of Finance and Public Administration

NASES – National Agency for Network and Electronic Service

OD – Open Data

ODS – OpenDataSicilia

OGBD – Irish Open Data Governance Board

OGC – Open Geospatial Consortium

OGP – Open Government Partnership

OTN – Open Transport Net

OWL – Web Ontology Language

PA – Public Administration

PSI – Public Sector Information

SAZP – Slovak Environment Agency (SEA)

SEIS – Shared Environmental Information System

SDI – Spatial Data Infrastructure

SME – Small to Medium Enterprise

SPARQL – SPARQL Protocol and RDF Query Language

RDF – Resource Description Framework

UHUL – Ústav pro hospodářskou úpravu lesů

UK – United Kingdom

URL – Uniform Resource Locator

W3C – World Wide Web Consortium

WG – Working Group

WMS – Web Map Service