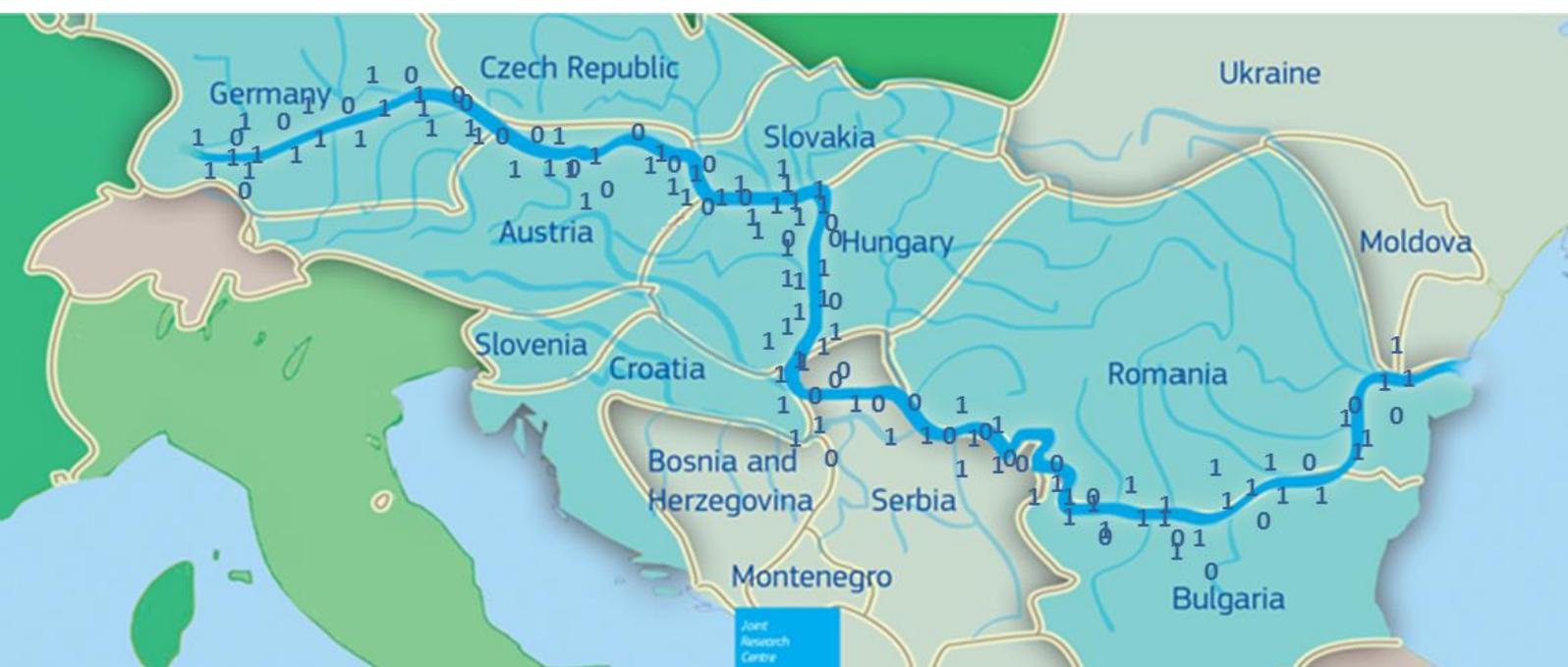Danube Reference Data and Services Infrastructure

Danube_Net (D1)

State-of-play and organisational context of data infrastructure in Germany

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February 2015

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List of acronyms

DRDSI	Danube Reference Data and Services Infrastructure
DEM	Digital Elevation Model
DTM	Digital Terrain Model
EU	European Union
EUSDR	EU Strategy for the Danube Region
GDI-DE	SDI Germany
GIS	Geographic Information System
INSPIRE	Infrastructure for Spatial Information in Europe
Kst.	Coordination office
LG	Steering Committee
OGC	Open Geospatial Consortium
OGD	Open Governmental Data
SDI	Spatial Data Infrastructure

1.   Introduction

Scope

This document highlights the main players for establishing a spatial data infrastructure in Germany. Since the DRDSI only covers the federal states Baden-Wuerttemberg and Bavaria and not Germany in general, the report also addresses the regional SDI of Bavaria. To support directly **Danube Reference Data and Services Infrastructure (DRDSI)** this document furthermore addresses specifically the **spatial data infrastructure** initiatives in both states and **not** in detail the EU Strategy for the Danube Region (EUSDR).

The report gives an overview about the main players, data providers and the identified datasets, data services and application which could potentially become relevant for DRDSI. It ends with some recommendations which were recognized during the inquiry.

Context of the country and the main players

Due to the ongoing implementation process of INSPIRE the spatial data infrastructure (SDI) is already quite advanced in Germany, even if the data is still fragmented and often still not available for the public. The Spatial Data Infrastructure Germany (GDI-DE) is a national network with coordination structures within the meaning of the second sentence of Article 19(2) of the INSPIRE Directive. The main organisational components of this coordination structure are a Steering Committee at the specialised political decision-making level (LG GDI-DE) and a Coordination Office (Kst. GDI-DE) with contact points in the Federal government, Laender and municipalities at operational level. Representatives of the local authority associations, the business community and the academic world are also included in the structure of the GDI-DE.

The spatial data providers are responsible for the provision of spatial data and services at the individual administrative levels. These are compliant to the recommendations, specifications and national technical components of the GDI-DE within the meaning of a common national infrastructure, with due regard for the requirements laid down by the INSPIRE Directive.

The LG GDI-DE is the specialised administrative decision-making body for the development and operation of the GDI-DE. It is composed of representatives of the federal government, the 16 Länder and the three local authority associations at federal level. The LG GDI-DE controls and coordinates the development of the GDI-DE including the implementation of the INSPIRE Directive. The Kst. GDI-DE coordinates the implementation of the decisions and orders of the LG GDI-DE and monitors their implementation.

Politically and technically, the implementation of the GDI-DE is managed within the context of e-government. The e-government initiative is the more general approach for all public adminsitraions, the SDI initiative is a part of e-government, tackling geographic information. So, GDI-DE as a modern IT and e-government infrastructure across all disciplines and levels is in specific focus at political level of the **IT Planning Council**, which was established by State Treaty between the federal government and the Laender on the basis of Article 91c of the Basic Law (Grundgesetz) (as amended on 29 July 2009).

A detailed overview of all key players and partners of the GDI-DE, with corresponding references to the coordination structures of the federal government, Laender and local authority associations, can be found on the website of the GDI-DE: http://www.geoportal.de/DE/GDI-DE

In terms of data provision the Danube strategy mainly affects only Bavaria and Baden-Wuerttemberg. Therefore the regional SDI activities will be highlighted in this report rather than explaining the German approach in general. In Bavaria there is a similar structure for the implementation of INSPIRE and a spatial data infrastructure as in Germany. The INSPIRE Directive was transposed to a state **SDI law** (Bayerisches

Geodateninfrastrukurgesetz – BayGDIG), regulating the necessary organsiational structures, tasks and implementation dates.
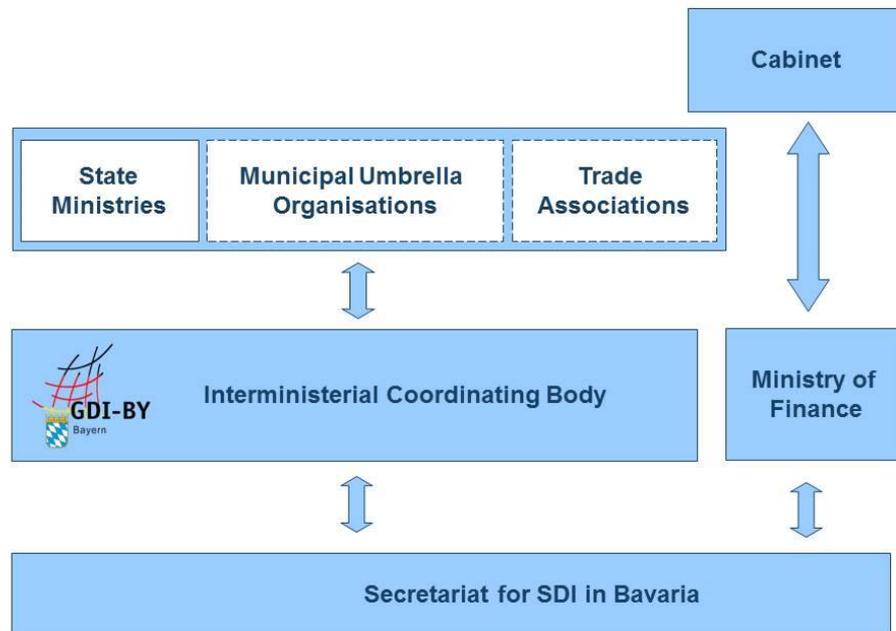

Figure: Organisation of the SDI in Bavaria

The Bavarian **Interministerial Coordinating Body**, which is led by the Ministry of Finance, contains all Ministries which provide geospatial data related to the INSPIRE themes and the BayGDIG respectively. This coordinating body is the main policy making organisation in the field of geospatial data and infrastructure. Additionally, the main SDI stakeholders, such as the trade organizations and municipal umbrella organisations are actively involved in the implementation of a SDI in Bavaria.

The Interministerial Coordinating Body has following designated tasks:

- Find agreements and decisions about the common development if the SDI in Bavaria
- Decisions about measures to implement INSPIRE and the regional SDI law (BayGDIG)
- Participation in INSPIRE working groups and support of the national contact point
- Give orders to the SDI office to support the development of the SDI operationally (guidance documents, training, website, coordination of SDI projects)
- Decide upon the data sets to be provided within the SDI
- Initiate SDI projects
- Communication with stakeholders, municipalities, GIS companies

The members of the Interminiserial Coordinating are listed below. This network is operationally supported by a SDI office.

2.   Data providers

Overview of key data providers

Additionally to the traditional data providers there are more and more service providers who integrate data from different sources to a customized GIS solution (e.g. *infas 360* uses several data sources depending on the use case). These are not data providers in the classical sense but also relevant for regional and local customers.

In the following table relevant data providers are listed which offer data in Germany and are widely used in German and Bavarian applications. The table is divided in global/transnational and regional data providers.

Table 1: List of data providers

Name of Organisation	Type Go=Governmental Pr= Private NGO= Non Governmental Organisations	Provide new data on re-quest	Data provided
Global/National Data Providers			
geo community www.geocomm.com	Pr	No	Global map data (1M): • Administrative/political boundaries • DTM, DEM • Geology • Hydrography • Land use/Land Cover • Transportation • Utilities
Open Street Map	NGO	No	Global topographical map containing lot of additional information (e.g. points of interest)
ArcGIS Online	Pr	No	Several layer files for ArcMap online available; 'only' background information thematic small-scale maps, such as • Europe population density • Europe population by age range • Topographic world map in different scales (also large scales)
GeoContent	Pr	Yes	• Digital aerial map (cross-border) • Orthophotos • Satellite images • Building models • Geocoded addresses • DEM • City maps
Navteq/here	Pr	No	Maps for navigation purposes but with lot of thematic information (topography, buildings)

Name of Organisation	Type Go=Governmental Pr= Private NGO= Non Governmental Organisations	Provide new data on request	Data provided
tomtom/teleatlas	Pr	No	Maps for navigation purposes but with lot of thematic information (topography, buildings)
DLR Earth Observation Centre	Pr	No	Satellite images www.dlr.de
Regional Data providers			
Bavarian chamber of commerce	Pr	No	Commercial areas and industrial parks all over Bavaria; runs an application called SISBY www.sysby.de
Bavarian Government; all ministries	Go	No	Locations of all public agencies with the area of responsibility and the corresponding boundaries
Bavarian Agency for Cultural Heritage Preservation	Go	No	All cultural and historical sites in Bavaria
Bavarian Agency for Environment	Go	No	Official Data related to environmental protection, covering following themes: • Sewage plants • Biotopes • Land Cover • Soil data • Geology • Geological risk areas • Flooding risk zones • Monitoring of historical floodings • Flood protection facilities • Hydrography • Rainfall measurement • Facilities for ground water measurements • Monitoring of historical avalanches • Noise monitoring data around airports • Noise monitoring data along main roads • Noise monitoring in larger cities • Superficial geothermic energy • Gauge network • Weir facilities, cross structures • Natural resources • Protected sites • Environmental monitoring facilities

Name of Organisation	Type Go=Governmental Pr= Private NGO= Non Governmental Organisations	Provide new data on request	Data provided
			• Water protection areas • Water sensitive areas • Water depth estimations (floodings) • Flooding areas and flooding risk areas • Natura2000 areas • Radioactivity measurement • Health indicators
Bavarian Ministry of Finance	Go	Yes	• Monitoring of digging areas for supporting digital broadband infrastructure • Regional planning data
Bavarian Ministry for Food, Agriculture and Forests	Go	No	• Erosion risk areas • Agricultural units map
Bavarian Ministry of Economy, Media, Energy and Technology	Go	No	• Global radiation map • Sunshine duration and intensity map • Deep geothermal data
Bavarian Ministry of Interior (road administration department)	Go	No	• Bicycle tracks network of Bavaria • Road network • Traffic density monitoring data
Bavarian Ministry of Interior (Statistic department)	Go	No	Statistical data mainly in table formats, no spatial data: • Economy (import, export) • Inhabitants • Tourism • Birth rates • Death rates • Inhabitants movements
Bavarian Ministry of Labour, Social Affairs, Family and Integration	Go	No	• Disabled people statistic
EON, TenneT (Energy Suppliers)	Pr	No	• Power supply network
Bavarian Agency for Digitization, High Speed Internet and Surveying	Go	Yes	All base data which have to be used as basis information in all other public administrations, such as: • Topographical maps • Administrative/political boundaries • Cadastral data

Name of Organisation	Type Go=Governmental Pr= Private NGO= Non Governmental Organisations	Provide new data on request	Data provided
			• Orthoimageries • Orthoimageries (infrared) • Arial photos • Historical arial photos • Geo-referenced house numbers • Land use • Digital Elevation Model • Touristic information: Lodges and youth hostels; swimming baths, hiking and bike tracks Data which is collected in charge of other administrations: • Town planning maps • Property prices maps • Soil value estimation maps
GAF AG	Pr	Yes	• Remote sensing and observation data www.gaf.de
Several municipalities	Go	No	• Town planning maps • Hiking and bike tracks in tourist areas

Analysis of Table 1 content

Providing the data for DRDSI

Potentially all listed data may be useful for application in the Danube area, even the regional data on municipality level. For cross-border applications the global data providers offer harmonized data also for the Danube region.

The analysis of the key data providers and the corresponding table 1 shows that mainly governmental organisation offer geospatial data in a wide range of thematic areas. Even in times before INSPIRE there was a significant amount of geospatial information available for mainly governmental use cases. With INSPIRE the new infrastructure (mainly the service oriented architecture) for providing the data has been established to improve the data delivering possibilities.

Due to the popular **Open Data** initiative of the German Government as well as the regional data providers, a huge amount of data sets are available also for the use in the DRDSI Platform under open data principles. Despite of the data of the Mapping Agencies all the data is available for free, which of course does not mean that there are no legal restrictions on it. Also the data form private organisations are in principle available but usually not for free.

Due to privacy and security measures, not all data is available for everybody. The corresponding data and services are therefore protected and not available per se for DRDSI, but can be make available for specific use cases.

The listed data providers already provide the data in geoportals, websites etc. So, no issues can be seen which will prevent the data providers from providing the data also to DRDSI.

The table does not content any information about the different scales, data formats, licencing conditions which are certainly relevant for providing the data also in DRDSI. Therefore, a deeper analysis of the relevant data will be done in deliverable D2.

<u>Estimation of what data in support of the EUSDR might possibly be missing</u>

Considering the requirements of the Nexi projects it can be concluded that there is a significant amount of data available directly addressing the necessary use cases and projects. For Bioenergy Nexus there are land use and land cover data, forest maps, biodiversity information as well as soil protection data. Elevation and infrastructure information could also be provided.

Air Nexus can be supported by basis information such as town maps, traffic information, and pollution data. What is currently missing:
- Statistical data (as spatial data)
- Real time pollution data (observation data)
- Monitoring of air pollution sources
- Atmospheric data
- NOx emission
- Data about mortalities
- Investment plans.

For some of the data there are currently activities and projects to provide such data in the German SDI (e.g. statistical data, atmospheric data). Some of the data themes are available in tables or other documents, but not as geospatial information (investment plans, mortalities).

Water nexus can be well supported by data about water quality, flooding risk areas, land use and land cover, future land use and various hydrographical data. However, the following data are not yet available:
- Meteorological information
- Economic statistics
- Investments
- Water temperature measurement
- Chemical concentrations.

An open issue is the creation of **new data** on request, which might be important for Danube Strategy projects. Usually the public administrations only collect data if there is a legal framework for it. Legal framework means funding, and without funding no data. Data can be collected of course by private companies, but then there is no guarantee for maintenance, updating, service levels etc.

Even there are lots of data sets available an issue will be the cross-border harmonisation of the data throughout the Danube region.

3. Policy-making organisations

Overview of key organisations related to the Danube Strategy

Since the German part of the Danube River is located only in Bavaria and Baden-Wuerttemberg the policy-making organisations are basically the regional governments and ministries of the states (Laender), with a strong support from the federal German Government. The general political leader of the Danube strategy

in Bavaria is the **Ministry of European Affairs**, which is coordinating all transnational European activities on regional level. Bavarian Government mainly supports the target areas "Security" and "Environmental Protection". Therefore mainly the **Ministry of Interior** and the **Ministry for Environmental protection** are the main policy-making organisations for the Danube strategy. Additionally, the Ministry of Environmental protection has the lead of the main area "*To preserve biodiversity, landscapes and the quality of air and soils*".

In terms of the development of the spatial data infrastructure and providing data for INSPIRE and the regional SDI project the **Ministry of Finance** has the lead of this task.

Table 2: List of policy-making organisations

Name of Organisation	Type Central, regional or local	Policy Areas	Past or current projects, creating data or tools for Danube_net
Bavarian Ministry of European Affairs	Central	Trans-European collaboration	No specific project known
Bavarian Ministry Interior	Central	Security, Statistic	Coordination of the target area "Cooperation for enhancing security and for tackling organised and serious crime" together with the German Federal Ministry of Interior and Bulgaria. However, there are no projects running creating data or tools for the geospatial support of the strategy.
Bavarian Ministry of Environment	Central	Environmental protection	Coordination of the target area "To preserve biodiversity, landscapes and the quality of air and soils" in cooperation with Croatia.
Bavarian Ministry of Finance	Central	Spatial Data Infrastructure (SDI)	Coordination of the development of a spatial data infrastructure Coordination of the implementation if INSPIRE in Bavaria Coordination and funding of several SDI project also related to potential DRDSI reference data infrastructure, such as: • Energy Atlas (http://www.energieatlas.bayern.de/) • Atlas for historical sites (http://www.geoportal.bayern.de/bayernatlas/denkmal) • Spatial Planning (http://www.bauleitplanung.bayern.de/) Additionally, SDI tools have been developed to create metadata, a service infrastructure, a central integrated data base and central components for viewing and downloading the data (http://geoportal.bayern.de/geoportalbayern/).

Analysis of Table 2 content

The Bavarian Government strongly supports the Danube strategy by coordinating two target areas. The policy-making organisations are fully aware of this important task. The coordination within Bavaria/Germany as well as the transnational coordination is in place.

Additionally, a spatial data infrastructure has been developed since the last 10 years, even before the INSPIRE directive was established. This SDI is up and running and provide lots of different data sets available for governmental and private stakeholders. However, it seems that the Danube strategy and the SDI in Germany currently are two independent worlds. Some of the local projects using spatial data even don't know that official spatial reference data is available. Therefore it will be an important task to bring these two worlds together within the DRDSI activities.

The current projects creating data sets and SDI tools for supporting the Danube strategy needs further enquiries which will be done in deliverable D2. The two supported target areas only use existing data and tools rather than crating own data.

The following table lists all organisations which are involved in the SDI Bavaria and the policy making processes.

Table 3: Support for the national/regional data infrastructure

Name of Organisation	Legal Acts related to data	Key initiatives	Funding possibilities
Bavarian Chamber of Commerce	No	SDI projects (e.g. commercial areas information system - SYSBY	Yes, non-governmental funding
Bavarian Ministry of Finance	Yes, BayGDIG (SDI law), VermkatG (cadastral law)	Head of the SDI initiative in Bavaria

Coordinator of several SDI projects in Bavaria

Bavarian representative to the national SDI steering committee

Leader of development activities for legal acts (laws, implementing rules) | Yes: Own financial resources, eGovernment funding possibilities |
| Representatives from municipalities from different levels (districts, cities, villages) | No | Involved in some pilot projects (spatial planning) on regional level | No |
| The IT Planning Council, IT-CIO in charge for eGovernment development | In preparation (eGovernment law) | The head of the eGovernment strategy in Bavaria which the SDI is part of

Development of the Open Data Portal (http://www.opendata.baye | Yes, eGovernment funding |

Name of Organisation	Legal Acts related to data	Key initiatives	Funding possibilities
		rn.de/daten.html)	
Bavarian Ministry for Education, Culture and Science	No	Involved in some SDI projects on regional level in the field of cultural heritage Involved also in INSPIRE (protected sites)	No
Bavarian Agency for Environment	No	Main data provider for INSPIRE data themes	Yes, own resources
Bavarian Ministry for Food, Agriculture and Forests	No	Involved in some SDI and eGovernment projects on regional level in the field of agriculture (e.g. agricultural units map)	Yes, own resources
Bavarian Ministry of Economy, Media, Energy and Technology	No	Involved in some SDI and eGovernment projects on energy sources	Yes, own resources
Bavarian Ministry of Interior (road administration department)	No	Involved in some SDI and eGovernment projects on road networks (https://www.baysis.bayern.de)	Yes, own resources
Bavarian Ministry of Justice	No	Not known	No

Note: Only legal acts related to the creation, collection and delivery geospatial data are listed in this table. Other legal acts related to other activities of the Danube Strategy are not listed.

Analysis of Table 3 content

As mentioned above the spatial data infrastructure in Germany is right in place and is working operationally. It was (and it is) implemented according to the timeframe of INSPIRE.

Due to the federal structure of Germany the policy making framework is implemented on the state level. All policy making organisations responsible for geospatatial data and spatial data infrastructure on a regional level are public administrations of the states (Laender). This offers a good opportunity to support the Danube Strategy, since both activities are closely related to the same region.

Data is collected on the basis of lots of different laws on European, regional and local level. The scope of this document is to highlight the spatial data infrastructure activities. There are mainly two relevant laws dealing with creation and providing geospatial data:

- The SDI laws of the states, which adopted the INSPIRE Directive on Germany (BayGDIG)

- The Surveying and Cadastre law, which gives the mandate to the Mapping Agencies to provide basic geospatial information, which have to be used by all other public administrations (VermKatG).

The organisational framework of the spatial data infrastructure is based on legal acts as well. The decisions related to SDI are based on agreements of all participating public administrations. Funding is possible mainly by own budgets and specific e-government budget. The Interministerial Coordinating Body would be a good platform to promote the DRDSI and to support this initiative by concrete data, services and applications.

Since the Danube Strategy as well as the spatial data infrastructure is highly important on a political level in Germany, the policy framework seems to be mature enough to support the DRDSI significantly. For providing existing data there is apparently no need for further laws and agreements.

4. Research organisations

Academic institutions are at least part of the German Steering Committee but not (yet) part of the regional coordination committees in Bavaria or Baden-Wuerttemberg. They are not data providers but valuable partners in different SDI pilot projects, education of personnel, awareness raising and networking activities with stakeholders.
For the Danube Strategy in general there might be a huge range of different research institutions in different thematic domains. As is was mention several times, this report focuses on the DRDSI issues only to narrow this task of collecting relevant research organisations. Listed are those, which already play an important role in the implementation of a spatial data infrastructure in Germany.

Table 4: List of research organisations

Name of Organisation	Type	Relevant projects/activities	Network participation
Technical University Munich	University	SDI projects , model and data transformation for supporting INSPIRE themes Training courses for SDI, data modelling (capacity building)	Excellent network with municipalities, software producers , public authorities (http://www.rtg.bv.tum.de/index.php/en/)
Fraunhofer Institute for Computer Graphics Research	Public research centre	Capacity building Development of SDI tools (e.G: the SDI-DE Testsuite) Development of the German Gov Data Portal (https://www.govdata.de/)	
Technical University of Dresden	University	Data modelling projects Data harmonisation projects SDI activities INSPIRE capacity building	Member of the GDI-DE Steering Committee

Name of Organisation	Type	Relevant projects/activities	Network participation
University of Regensburg	University	Bavarian Academic Center for Central, Eastern and Southeastern Europe (BAY-HOST) (http://www.uni-regensburg.de/bayhost/)	Coordination of academic relations with Eastern Europe and support academic exchanges between students and scientists

Analysis of Table 4 content

In Germany research organisations are usually not data providers. Depending on specific projects there is sometimes a need to collect specific data but considering the public administration as the main data provider, these data are not relevant for the spatial data infrastructure. The main activities of research institutions address capacity building (e.g. workshops, seminars), research issues (e.g. sematic generalisation of topographical information, semantic web technologies) and the development of SDI tools and applications (e.g. portals, data transformation tools). All the activities are closely connected to data providers, simply for the reason that data providers are usually funding their activities.

So, research organisations play an important role in the development of a spatial data infrastructure and potentially also in DRDSI. Usually research organisation need designated funding for their activities and given that they could get engaged also for the Danube Strategy.

5. Stakeholder engagement organisations and networks

There are many stakeholder organisations dealing with geographic information in general, but also regional networks supporting awareness raising activities and capacity building measures. Some are already closely connected to the Danube Strategy, others offer a good platform to promote the Danube Strategy and the DRDSI.

Table 5: List of stakeholder engagement organisations

Name of Organisation	Type **National, cross-border regional**	Areas of interest	Members, meetings
German SDI Network	National	Knowledge sharing Data provider support to fulfil the INSPIRE legal requirements Guidance documents for implementing the SDI and INSPIRE (https://wiki.gdi-de.org/)	Data providers, users, software developers

Name of Organisation	Type National, cross-border regional	Areas of interest	Members, meetings
FOSSGIS	International, (German speaking countries only)	Organisation supporting free and open source GIS software	Yearly conferences, next FOSSGIS 2015 from 11. - 13. of March 2015 in Munster castle http://www.fossgis.de
OGD D-A-CH-LI	International (German speaking countries), cross-border	The initiative Open Government Data D-A-CH-LI is a knowledge sharing platform for politicians, administration, citizens, economy and science .	It is the biggest Open Government network with representatives from Germany, Switzerland, Austria and Liechtenstein. Yearly conferences
GeoBusiness	Sector-specific and cross-regional	This community provides a stimulus for the business community to activate the geodata market in Germany. Provide also SDI tools such as a geo licencing tool.	Members are representatives of the German economy http://www.geobusiness.org/GEOBUSINESS/Navigation/DE/Home/home.html
DVW, The German Association of Surveying (DVW)	National	Objectives: To promote the disciplines of geodesy, geoinformation and land management in science, research and practical experience. To contribute to legislative proceedings at federal level as far as the concerns of geodesy, geoinformation and land management are affected. To present the achievements and the importance of geodesy, geoinformation and land management to the public.	Every year DWV organises the INTERGEO consisting of a professional congress and a comprehensive trade fair. The INTERGEO is the most important and largest event of this kind in the world, covering all disciplines of geodesy, geoinformation and land management. DVW is publishing bi-monthly the Journal for the Surveying Profession [Zeitschrift für Vermessungswesen (zfv)] since 1872. It covers topical issues of science and practical experience. http://www.dvw.de
FIG (International Federation of Surveyors)	International, cross-border	Objective: To promote worldwide the disciplines of geodesy, geoin-	Congress every 4 years; yearly working weeks, workshops, publications

Name of Organisation	Type National, cross-border regional	Areas of interest	Members, meetings
		formation and land management in science, research and practical experience. To contribute to the education, further training and professional development of its members, and in this context, to promote international co-operation.	
Eurogeographics	Cross-border	Knowledge Exchange Network (KEN) in the field of implementation of INSPIRE an cross-border harmonisation if NMCA data	All national mapping agencies (NMCA) of Europe
EuroSDR	Cross-border	EuroSDR is a non-profit organisation linking National Mapping and Cadastral Agencies with Research Institutes and Universities in Europe for the purpose of applied research in spatial data provision, management and delivery.	Yearly meetings, working groups, workshops
DANUBEPARKS	Cross-border	DANUBEPARKS is the Network of Protected Areas along the Danube River, working together since 2009. It currently consists of 17 Protected Areas from 9 Danube countries, all hotspots for biodiversity.	See http://www.danubeparks.org/
Donaubüro_Netzwerk (Danube offices network)	Regional	The Donaubüro network is a non-profit organisation which is managing inter-regional cooperation and projects in the Danube region.	See https://www.donaubuero.de/
Donaukompetenzzentrum (Danube Competence Centre - DCC)	Cross-border	The Danube Competence Centre (DCC) works to build and support networks of tourism stakeholders from	Members see http://www.danubecc.org/index.php?pg=list-of-members

Name of Organisation	Type National, cross-border regional	Areas of interest	Members, meetings
		the whole Danube region by investing in people and skills, enhancing transnational cooperation and promoting the mutual interests of our members.	
Fraunhofer Institut for Computer Graphics Re-search	Public research centre	Capacity building Development of SDI tools (e.G: the SDI-DE Testsuite)	See https://www.igd.fraunhofer.de/en/Institut

Analysis of Table 5 content

You can distinguish between stakeholders which are interested in concrete and local projects and those which are capable to disseminate the Danube Strategy results to a broader community. Additionally, there are also stakeholders which provide useful SDI tools (some also from the open source community).

What is missing from my perspective are potential users of the DRDSI platform on a regional level. This needs further investigation by analysing the concrete local Danube Strategy projects and getting in contact with the local organisers of the projects (e.g. Danube offices network). This could be done in a later stage of the DRDSI activities.

Those organisations which are providing a valuable dissemination platform (such as FIG, DVW, Euroge-ographics) would certainly cooperate with DRDSI. Some technical issues can be promoted there (e.g. on how to establish a SDI outside the INSPIRE community), to share the knowledge/best practice experiences to others.

6.   Conclusions

Completeness of the investigation

In terms of the SDI and Open Data with all potential public data providers and their activities, this enquiry can be considered as complete. In terms of the data sets, it covers mainly those data which is available in the internet or in restricted IT networks (intranet). Potentially, there are more data out there which cannot easily be found and distributed to the DRDSI network. However, considering the high amount of data sets and themes a lot of Danube strategy projects can be supported significantly.

Findings

The EUSDR activities in general are not easy to evaluate since they are not gathered in a central portal. However, lots of local project already use spatial information, unfortunately usually not data from the public administration. Reasons for that might be:

- The project coordinators and the local EUSDR offices simply did not know about the official (mostly) open data.
- The data provided by the German SDI and via the Open Data Portal (GovData Portal) do not fulfil the requirements in terms of cross-border harmonisation, harmonised data formats, licences etc.

Both issues can be tackled during the DRDSI initiative. During the enquiries it became more and more clear that EUSDR and the SDI initiatives are parallel threads, currently without any connection to each other.

Recommendation: Raise awareness about DRDSI and **available open data** also on local level in the Danube region.

The total amount of data available for the SDI, open data and also for DRDSI is quite impressive. Also the different themes cover a lot of the EUSDR target areas and can support upcoming projects significantly. For example offers the German Open Data Portal some 10.000 data sets. However, it is not an easy task to find the right data and evaluate them if they are fit for the specific purpose.

Recommendation: A customization or categorisation of the available data considering the EUSDR target areas might be useful.

Key players (mainly the ministries) from both initiatives, SDI and EUSDR, are well identified. However, the investigations showed that they do not know from each other very well.

Recommendation: Promote the Danube Strategy and the DRDSI within the SDI community (e.g. within the Bavarian Interministerial Coordinating body).

Although there are few cross border projects (e.g. the Daunbe Park Network), official data from the public authorities were not used but Open Street Map data for example. One reason for this is the missing harmonisation of data models, data formats, licences.

Recommendation: Initiate cross-border projects (maybe restricted to a specific region) to address the requirements for harmonisation and try to stimulate the data harmonisation on the data provider level.

Considering the potential data sets for DRDSI it became obvious that by going beyond viewing services (raster data) there is a lack of data models. Sometimes data models are missing at all (e.g. statistical data which is mainly available in tables only). There is no common approach in describing vector data, no common data encoding solution and so on. DRDSI is supposed to provide semantically enriched data which means to promote also the use of the model driven approach. This would be very helpful in areas which are not yet covered by INSPIRE. Tackling this issue you have two choices: Promotion of commercial software or

the promotion of open and independent standards. Although I have an opinion on that I cannot say (yet) what would be the right strategy for the DRDSI data portfolio.

Recommendation: Address this issue in the further DRDSI process to come up with recommendations on how to proceed with data modelling.

It was not an easy task to find all relevant data sets which might be potentially interesting for the DRDSI platform. The main reason was the missing metadata. Even the data providers are willing to create corresponding metadata it was not possible to do that practically. The SDI in Bavaria provides tools and guidelines for collecting metadata. The same issue arises when it comes to providing the data, for which a web map server is needed.

Recommendation: Promote the development or availability of central SDI tools in order to support the data (metadata) collection in the Danube region.

Considering again the huge amount of already existing data it seems there is no need for creation of new data, depending on the planned projects and use cases of course. Providing the data that is **already available** in a central DRDSI platform would be of great value for the regions.

Finally I want to stress that is important (at least for me) for Danube_net members to learn from each other, specifically how other partners address those issues listed above.