Public–Private SDI Challenges in Germany*

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Summary

After the establishment of the basic technical and organisational structures, SDI development is now part of the application domain in Germany. This leads to new discussions on the interface between the public and private sectors and the roles of the different actors. First public-private value adding chains have successfully been built. The public and private user communities are organizing themselves to express their interests and to optimize solutions. Strong initiatives are coming up on the regional and local level, building their own SDI solutions with private and public participants. On the other hand, the INSPIRE challenges are affecting the local, State and the federal level in Germany as a federal nation. In addition, the legal realization of the PSI Directive by two German laws, one law on information liberty and one law on the reuse of public sector data, is the source for a principle debate on public data access by private users. Currently SDI-based standards are being developed and tested by the interested communities. A basic problem is sustainable maintenance of these standards. On the national level, Germany-Online Geo-Data (»Deutschland Online – Geodaten«) is part of the national German e-government initiative and gives interested groups the opportunity to organize themselves under it's umbrella and to develop applications following the principle »few for all«. The author is the co-ordinator of Germany Online Geo-Data, and is in this role involved in the field of public-private co-operation and will report about his experiences and views on the above mentioned topic.

Zusammenfassung

Nach der Einrichtung der grundlegenden technischen und organisatorischen Strukturen wird die Entwicklung der Geodateninfrastruktur Deutschlands nunmehr zum Anwendungsschwerpunkt. Dies führt zu neuen Diskussionen über die Schnittstelle zwischen dem öffentlichen und dem privaten Sektor und über die Rollen der verschiedenen Beteiligten. Erste öffentlich-private Wertschöpfungsketten wurden realisiert. Die öffentlichen und privaten Nutzergruppen organisieren sich, um ihre Interessen zu vertreten und Lösungen zu optimieren. Auf lokaler und regionaler Ebene bilden sich Initiativen, die ihre eigenen GDI-Lösungen mit öffentlichen und privaten Beteiligten entwickeln. Andererseits berühren die INSPIRE-Herausforderungen Deutschland als föderalen Staat auf allen Verwaltungsebenen, von Kommunen und Ländern bis zum Bund. Daneben ist die nationale Umsetzung der PSI-Richtlinie durch zwei Gesetze, das Informationsfreiheitsgesetz und das Informationsweiterverwendungsgesetz, ein Anlass für eine Grundsatzdiskussion über den Zugang privater Nutzer zu öffentlichen Daten. Zurzeit werden GDI-Standards durch die interessierten Kreise entwickelt und getestet. Ein grundlegendes Problem ist die nachhaltige Pflege der einmal eingeführten Standards. Auf nationaler Ebene ermöglicht das Vorhaben Deutschland Online – Geodaten als Teil der nationalen eGovernment-Initiative interessierten Stellen, sich unter seinem Dach zu organisieren und Anwendungen nach dem Prinzip »Einige für Alle« zu entwickeln. Der Autor koordiniert Deutschland Online – Geodaten und ist in dieser Funktion in die Fragestellungen öffentlich-privater Zusammenarbeit involviert. Er berichtet im vorliegenden Beitrag über seine Erfahrungen mit und Sichtweisen auf die angesprochenen Fragestellungen.

1 Introduction

In May 2008, the company MICUS presented a new GI market study, financed half by of the German Federal Ministry on Economics and Technology, with the title »Prospects for business models of German companies in the European and global geo-information market« (Fornefeld et al 2008). A comparison of the estimated market volumes of the years 2000 and 2007 (fig. 1)
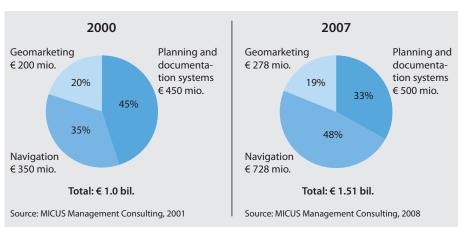

Fig. 1: GI market 2000 and 2007 (Fornefeld et al. 2008)

showed a significant growth of private-sector market: »Content-based growth only took place in the private sector of the geo-information market. Conversely, the geo-information market on the basis of public sector information remained at or developed below the status-quo scenario.« (Fornefeld et al 2008, p. 7). The deregulation scenario developed in 2003 (shown in fig. 2) was created under the following assumptions:

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- Unhindered access to public sector information,
- Integrated access,
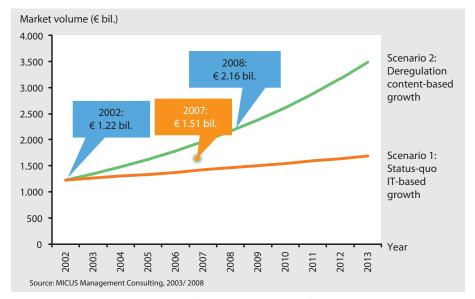- Simplification of user rights,
- Appropriate pricing.

Source: MICUS Management Consulting, 2003/ 2008

Fig. 2: Estimated market growth (Fornefeld et al. 2008)

The conclusion of the study is: Deregulation of the German GI market has not taken place in an appropriate manner; the public sector information market has stagnated. In many cases of private and public applications public data has been replaced by private data.

In the following, the author tries to give an overview on the current situation from a public sector point of view, and describes the initiatives to come to a better cooperation of the public and private sectors in the field of geo-information.

2 Deutschland-Online, the German eGovernment Initiative

In the year 2003, the German Federal Government, the German *Länder*, and the Local Government Central Associations started the national eGovernment initiative Deutschland-Online. The goal was to offer all public services over the internet to the citizens, based on an integrated IT infrastructure and on integrated processes for all administration levels.

In 2006 an action plan was developed by the new German Government which concentrated the central support on high priority activities: standardisation, motor vehicle register, register on civil status, citizen registration, realisation of the EU services directive, and creation of basic infrastructures. For high priority actions special money is available. Existing successful activities like Deutschland-Online Geo-Data could be continued, but without extra money. The central coordinator of these activities has to organize the needed financial and organisational resources.

The cooperation principle is »few for all«: One or few active participating public institutions develop solutions to be used by all concerned.

All activities are coordinated by a special branch at the Federal Ministry of the Interior and controlled by the involved State Secretaries. Principle questions are decided by the Conference of the Heads of the Governments of the German Federation and the *Länder*.

3 Deutschland-Online Geo-Data

Deutschland-Online Geo-Data has been started as a Deutschland-Online initiative in 2003. The central coordination has been given to North-Rhine Westphalia (NRW), represented by the Head of the State's mapping service GEObasis. nrw, which is assigned to the Cologne District Government. He is supported by a coordination office. Members of Deutschland-Online Geo-Data are representatives from ministries, mapping agencies, communities, and SDI initiatives. Private companies are invited to take part on a project basis. All Deutschland-Online Geo-Data projects have to use the German SDI rules and standards, which are defined by the German SDI initiative GDI-DE.

Several projects have successfully been realized, others are just under active development, and further projects are in preparation.

Realized projects

- **Deutschland-Viewer**
The Deutschland-Viewer was the first Deutschland-Online Geo-Data project. The goal was to demonstrate the possibility of using the OGC WMS standard for visualising the German distributed standard maps through the Internet. Two solutions have been tested. One of them has been realized by the Bavarian Mapping Agency and can be seen at www.deutschlandviewer.de.

- **Gazetteer Service based on house coordinates and addresses**
The mapping service of NRW is responsible for the collection of all 20 million house coordinates and house geometries of Germany with related addresses and their distribution to public and private users. The Germany-wide standardized dataset is used for navigation and geocoding applications. Part of this task is the development of a Gazetteer Service for these house coordinates and related addresses. The service is realized as a cascade including those mapping agencies which are already able to run the service themselves. For the others a central

solution is offered by the mapping service of NRW. The experiences of this project are used to support a demonstrator within the European project EURADIN, which is just developing a Europe-wide solution of a gazetteer service using a similar cascade approach.

Running projects

■ **XPlanung**

This project is developing a standards family for zoning maps and regional planning under the leadership of some German local communities. The standards are the basis for software solutions realized by several private companies. XPlanung allows the exchange of planning data between the different actors in a horizontal and a vertical manner. During the first phase a standard has already been realized for zoning maps, currently a standard for regional planning is being developed. The standards are based on the standardisation rules specified by the AAA standard (AFIS, ALKIS, ATKIS) of the Working Committee of the Survey Administrations of the *Länder* of the Federal Republic of Germany (AdV).

■ **VBORIS**

VBORIS is the abbreviation of *»Vernetztes Bodenricht-wertinformationssystem«*, which means an integrated network solution for accessing all standard land values in Germany by the Internet. These standard land values are defined by official advisory committees assigned to the local communities, based on the knowledge of all sales contracts which are collected on community level by law, and based on the special market knowledge of the committee members. VBORIS offers a common homepage www.gutachterausschuesse-online.de with links to the different portals of the *Länder*. The application combines different datasets with different services. VBORIS consists of a Web Mapping Service accessing the background maps, a Gazetteer Service supporting access by addresses, a Web Pricing and Ordering Service supporting ePayment and a Web Feature Service providing the standard land values.

There are some private companies reusing the standard land values for own commercial products based on a licence. Their clients are i. e. banks or real estate companies, who need a detailed expertise on the value of an object. In the future standardized services will be offered instead of the datasets themselves.

■ **Standard map for Germany**

ATKIS (Authoritative Topographic-Kartographic Information System) is part of the German AAA standard, which combines geodetic reference data, cadastre data and topographic-cartographic data, based on the international standards of ISO and OGC. ATKIS will be the basis for all analogue and digital topographic maps in the future. By model generalisation, an ATKIS WMS presentation at scale 1:50000 has been derived from the basic data

model for all German *Länder* in a fully automated way. The WMS service can be integrated in existing Geo-Portals, in NRW it is part of the portal »TIM-Online« (www.tim-online.nrw.de). All results of the project are shown on www.do-geodaten.nrw.de.

In preparation

■ **City maps for Germany**

It is planned to derive a unique city map for Germany at scale 1:10000 from the ATKIS landscape model. This product will be of interest for local communities, who only need to add special contents like hospitals, police stations, bus network etc. For these addings a cascade approach could be applied.

■ **OKSTRA – communal**

Following the AAA standard philosophy of AdV, the road administration has developed its standard OKSTRA describing a data model and a feature catalogue for roads. But, the respective database does not contain local roads and town streets. Therefore, an initiative has been started to develop OKSTRA-communal as a Deutschland-Online Geo-Data project to close the gap.

■ **Solar-potential and geo-information**

Recently a proposal has been presented to establish a Deutschland-Online Geo-Data project on presenting the solar-potential of house roofs on official maps and aerial photos. First solutions are available for some cities, but not based on the German GDI-DE rules. As a standard City GML might be applied in this project.

4 GDI-DE, GIW Commission

GDI-DE stands for *»Geodateninfrastruktur Deutschland«* (Geo-Data Infrastructure Germany). It is the common initiative of the German federal government, the *Länder*, and the local communities to set up an SDI for Germany including all three administrative levels. Currently the main task of GDI-DE is to implement INSPIRE for Germany. For this purpose, the central office of GDI-DE in Frankfurt at BKG *(Bundesamt für Kartographie und Geodäsie)* is supported by respective central offices of the *Länder*. Within the INSPIRE process, the steering committee of GDI-DE, consisting of representatives from ministries of the Federation and the *Länder* responsible for Geo-Information, and the Local Government Central Associations, are nominated as Legally Mandated Organisation (LMO) for Germany. In addition, the GDI-DE office is the central contact point in Germany for all questions around the INSPIRE realisation. Under the umbrella of GDI-DE some projects have been realized demonstrating the value of SDI standards for Germany.

Besides GDI-DE, the GIW Commission is involved in the realisation of an SDI in Germany (GIW is the abbreviation for *Geoinformationswirtschaft*). Whereas GDI-DE concentrates on administrative questions, the GIW Commission represents the private economy. Under the umbrella of the Federal Ministry on Economics and Technology, the trade associations concerned with Geo-Information represent their interests in re-using public
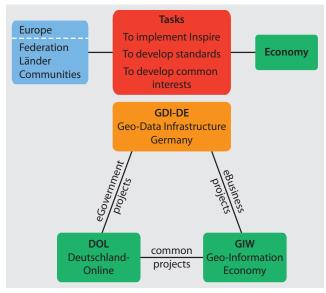

Fig. 3: Deutschland–Online Geo–Data, GDI–DE, and GIW Commission

Geo-Data and develop solutions following the rules and standards defined by GDI-DE. Several successful projects have been realized. A good example is the portal named GisInfoService which was developed by the industry association for geo raw material combining different data sources from public institutions like Geological Surveys and NMA's with private data, which the *Länder* offices of the association provide to their users. Besides, the GIW Commission has developed a specimen of a licence agreement for the use of public data by private companies, in cooperation with AdV. Recently, the Commission has ordered an expertise on the re-use of public Geo-Data by private companies, especially with regard to privacy protection.

Fig. 3 shows the relationship between Deutschland-Online Geo-Data, GDI-DE and GIW Commission. The common task of the three initiatives is to implement and realize INSPIRE in Germany, to develop the needed standards and to identify common interests of the involved parties from the private and public sectors. In common projects demonstrators are realized to develop and test interoperable SDI solutions in the fields of eGovernment and eBusiness with Geo-Data.

5 Private Use of Public Data – Principles

5.1 Legal Situation

Regarding private use of public data, a lot of legal acts have to be observed in Germany. The situation is quite complicated because of the federal structure of Germany. In many cases, besides federal laws also *Länder* laws have to be derived from EU directives. Currently the INSPIRE directive is being implemented on *Länder* level, after implementation on the federal level last year. In principle, the regulations of the directive are fully implemented in the different acts. Special solutions are fixed for the organisational structures. A lot of discussions came up because of the relevance of Geo-Information with respect to privacy.

The Public Sector Information (PSI) Directive has been split into two different acts on the national level. Whereas the Freedom of Information Act (IFG) defines the rules for accessing public information by everybody, the Act on Re-Utilisation of Public Information (IWG) specifies the conditions, how private companies can make use of public data for their business. On European and national level organisations have been built for trying to influence the legislative bodies to simplify the access to public data and make it cheaper. This topic is related to the discussion in chapter 1.

The special field of environmental information is ruled by the German Environment Information Act, which is the national implementation of the respective EU Directive on Public Access to Environmental Information. It guarantees everybody free access to information related to the environment.

The EU Directive on Privacy and Electronic Communication has (stricter) national implementations on federal and *Länder* levels. In Germany data privacy is a basic right (right on informational self-determination) defined in *Länder* constitutions. It affects directly Geo-Information which is connected with personal data as in the cadastre: You have to declare your justified interest before getting such information. At the moment it is discussed, whether aerial photographs of high resolution (less than 40 cm) fulfil the criteria of being protected against free access. Also direct marketing and so-called geo-scoring – generalized social quality assignment to areas – are discussed by official data privacy protection organisations.

Beside these general acts special acts for some branches are existing. Especially the different survey and mapping acts of the *Länder* give concrete rules for processing and providing Geo-Data. In general access is free for everybody by paying for the data or the service. The fee follows common rules specified by an AdV proposal. Re-use by private companies is supported based on licence contracts. A general proposal for licence contracts is agreed on as the already mentioned licence agreement written down by AdV and GIW Commission. In general fees and licensing are criticized by the private sector. They consider the fees being too high and the licences too complicated.

5.2 AAA Standard

AdV has developed a common standard for geodetic reference data (AFIS), for topographic mapping (ATKIS), and for cadastre data (ALKIS), called AAA. It is published as »Documentation on the Modelling of Geo-Information of Official Surveying and Mapping in Germany (GeoInfoDoc)« and available on the AdV homepage www.adv-online.de. Based on a common data model, an application schema is described using UML consisting of a basic schema and a semantic schema. The basic schema specifies the different aspects of geo-objects, whereas the semantic schema describes the different feature classes with their attributes and relationships. The basic schema can be used as basis for application-oriented information systems. For the AAA application schema an external interface called NAS (standard-based exchange format) is defined. The relationships are shown in fig. 4.

Fig. 5 shows the embedding of the AAA standard in norms and standards.

Part of the AAA standard is a proposal how to connect application schemata to the AAA basic schema. This allows public or private users to assign their geo-data to AAA data in a consistent manner.
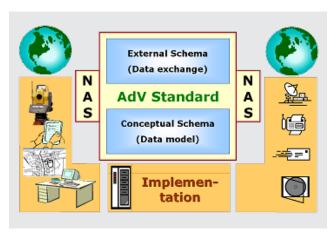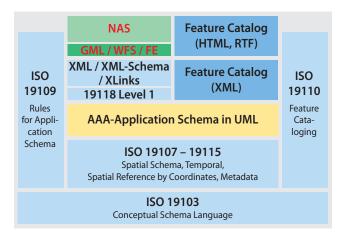

Fig. 4: AAA application schema

Fig. 5: Embedding of AAA standard in international norms and standards

6 Use of Public Data – Solutions

Solutions following the AAA proposal are based on the 3-level structure of the GeoInfoDoc consisting of
- AAA modelling framework,
- AAA basis schema,
- AAA application schema.

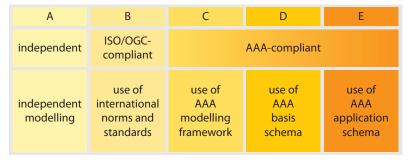| A	B	C	D	E
independent	ISO/OGC-compliant	AAA-compliant		
independent modelling	use of international norms and standards	use of AAA modelling framework	use of AAA basis schema	use of AAA application schema

Fig. 6: Modelling concepts for application information systems

The connection principles are shown in fig. 6, which can be used for the modelling of application information systems on different levels of integration. A very poor connection is given by A, whereas a full integration using the AAA application schema is shown as E.

First solutions based on D are already realized or currently prepared. Good examples are the already mentioned projects of X-Planung and VBORIS. These examples are public applications, which have been developed by public institutions. But, in the future the same principle will be applied for private solutions using public data. Initiatives have been started by the GIW Commission and by Deutschland-Online Geo-Data.

This approach could overcome some technical problems of re-using public geo-data by private companies as shown by the MICUS study (chapter 1). In addition, further simplification of user rights and an agreement on appropriate prices and simple license agreements are needed. AdV is prepared to start new discussions and Deutschland-Online Geo-Data is a good place for developing and testing demonstrating projects as part of the general German eGovernment initiative.

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