

SDI's as Basic Components of e-Government and e-Business – The German Approach

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SUMMARY

In 1999 Germany started to implement its Geographical Data Infrastructure (GDI). Especially in the State of North-Rhine Westphalia the involvement of the private sector led to in-depth discussions how to generate sustainable and successful business models in close co-operation of public and private sectors. A main success factor was a bottom-up approach integrating the interests of all involved market partners from the beginning. The result of this strategy is a very active GDI scenery with a lot of participants and projects from all parts of Germany. In between, a national organisational structure has been built by the German States and the Federation, integrating the GDI as a basic component of the national e-Government plan including the interests of the GI economy. On the other hand, regional and local initiatives join partners from private, public and scientific sectors to set up living GDI services for the citizen. In addition, cross-border activities with neighbouring countries have been started.

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1. GDI DEVELOPMENT IN GERMANY

1.1 Federal situation

For understanding the development of a Spatial Data Infrastructure in Germany (GDI-DE) you have to keep in mind the administrative structure in Germany. The Federal Republic of Germany is divided into 16 independent states and even more counties. They are all legitimated to set rules in their territories. In North-Rhine Westphalia for example the cadastre belongs to the 54 counties and bigger cities and not to the State.

This miscellaneous structure causes a mass of information exchange and various expectations to a decentralized Spatial Data Infrastructure which have to fit together without a central competence for geoinformation. It is not surprising that there was no common way in the beginning of GDI developments in Germany.

But the federation and the federal states agreed on three major topics to built up the German Spatial Data Infrastructure:

1. Advance in effectiveness and efficiency of the administrations active in the context of eGovernment
2. Development of a successful geoinformation economy in Germany
3. Supply citizens with spatial data and services

At the end of 2003 the federation and the states could find a common way and they are now working hand in hand to build up a GDI-DE.

1.2 GDI NRW

As a starting point in Germany, the State of North-Rhine Westphalia has begun to set up its Geo-Data Infrastructure – the GDI NRW in 1999. Oriented to international examples, this project is based upon the relevant international norms and industrial standards. It is intended to activate and stimulate the market for geo-data in NRW with the help of this initiative.

To guarantee an organized development of GDI NRW, a permanent decision-body has been appointed by the Minister President's office. This "GI-Committee NRW" (Committee for Geo-Information in North-Rhine Westphalia) designs strategies for the creation of GDI, judges incoming project proposals referring to GDI, and gives advice to the ministries concerning all geo-information aspects. Members of the committee are representatives from all NRW ministries being concerned with geographical information.

The goal of the GDI NRW on the State level and the twin cadastre project GEOBASIS.NRW on the local level is to stimulate the geo-information market which is only at 15 percent of it's potential [Fornefeld, Oefinger 2001]. GDI NRW will provide the users, including private industry, access to available public and private spatial datasets with the help of a homogenous

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infrastructure easily available through the internet. Currently, legal regulations are revised in NRW in order to give the legal reference frame for GDI NRW. The following goals are formulated [Riecken 2002]:

1. Reference data of cadastre and national mapping are the official public reference sources to be used by all State authorities.
2. These reference data should be easily accessible by the general public and all possible user groups.
3. The access to public data sets is only limited if defined privacy information (for example information about the names of the property owners) is concerned.

From the technical point of view this homogeneous infrastructure on the state level is identical with the local GEOBASIS.NRW approach, both focussing on interoperability.

To insure interoperability, both GDI NRW and GEOBASIS.NRW will be based on a common reference model [Kuhn 2000]. All participating institutions (State agencies, private GIS-companies, universities, GIS-users) have agreed on a common manifesto to apply uniform standards fixed in the reference model and based on international standards.

The organisational structure of the GDI NRW initiative is shown in Fig. 1.

About 10 software development projects have been co-funded by public money providing the basic components of an interoperable solution for the GDI NRW, strictly following the available OGC standards. First results could be demonstrated at the INTERGEO 2001 exhibition and congress in Cologne ("Testbed I"), further results at the INTERGEO 2002 in Frankfurt ("Testbed II") and the INTERGEO 2003 in Hamburg ("Testbed III"). The GDI NRW development is supported by market studies giving recommendations for further initiatives to activate the geographic information market in NRW and Germany. Special attention is given to the development of fruitful public-private partnership solutions in this field. An important result of the GDI NRW initiative is the foundation of the PPP company CeGi (Center for Geoinformation GmbH), which acts as a neutral institution coordinating all GDI NRW related activities of the private, public and research sectors, and offers GDI-related consultancy to German and international bodies interested in realising a GDI.

Another outcome is the foundation of the Terramapservers company in Dortmund supported by the State of NRW and the companies of Microsoft and Intergraph, providing combined public and private geographic data to the geographic information market.

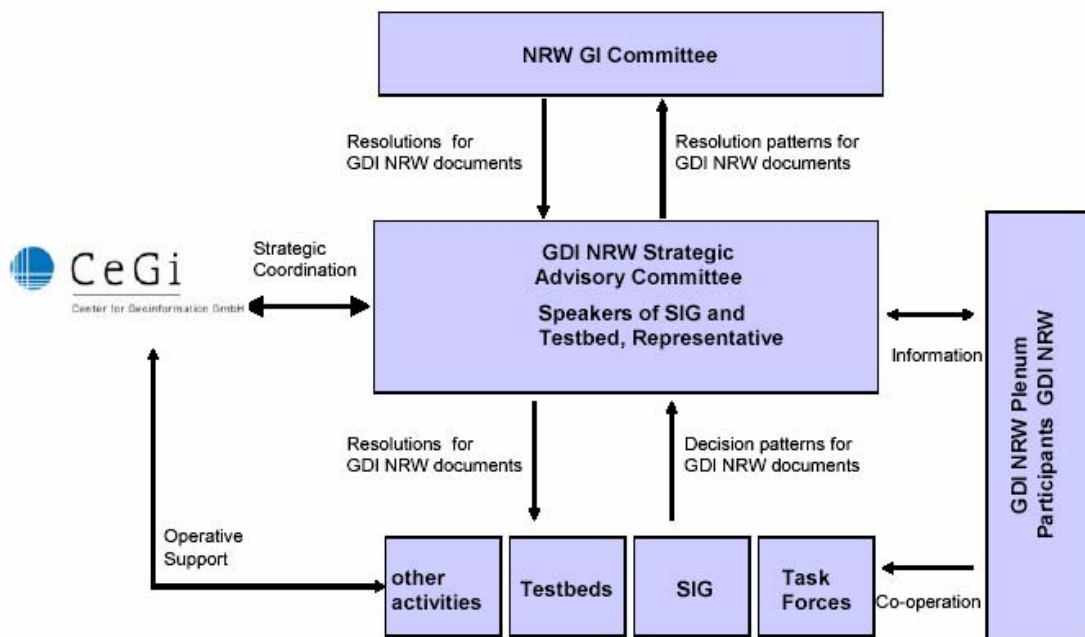


Fig. 1: Organisational structure of the GDI NRW initiative

1.3 GDI DE

The NRW GDI activities are integrated in nation-wide initiatives with the aim to generate a German Geographic Information Infrastructure together with the other German States and the federal government.

One initiative has been started by the AdV, the Working Committee of the German States in the fields of Surveying and Mapping. The communication concept of this network-oriented solution is shown in Fig. 2. All geodata servers of all participating public and private institutions are connected by a virtual bus structure. A neutral clearing house offers information about available products and services. Based on this concept, several inter-states projects have been started, e.g. setting up a decentralized meta-information system solution and cross-border solutions on real-estate valuation and inter-state traffic management.

A second initiative called GDI-DE has been set up by IMAGI, the inter-ministerial committee on geoinformation of the federal government, starting with the integration of all federal geodata by a meta-information system and the establishment of a central geodata portal of the federal government.

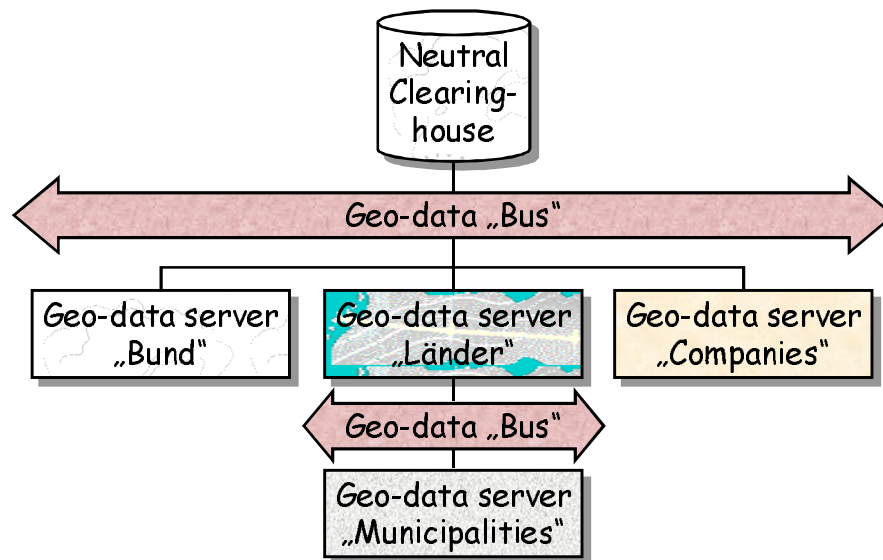


Fig. 2: AdV concept of a German GDI

Recently, the GDI-DE initiative has led to a joint initiative of all German States, the federal level and the German cities and counties. Fig. 3 shows the main aspects of the GDI-DE as currently discussed.

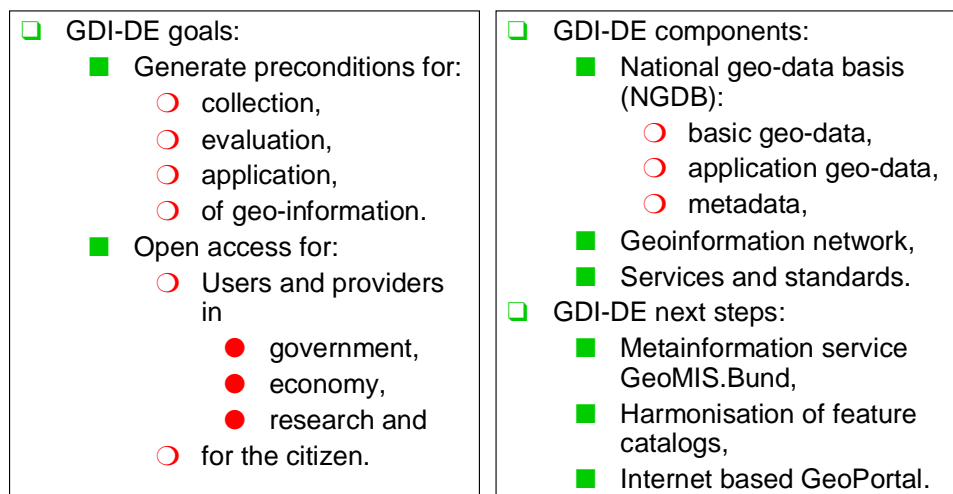


Fig. 3: GDI DE, goals, components and next steps

The organizational structure of the GDI-DE shall be as shown in Fig. 4. On the right side the e-government part is depicted. Common decision and working bodies are foreseen bringing together all actors from the public sector. On the left side a parallel structure for the private sector is developed which underlines the idea of a close public-private cooperation.

Geographical Data Infrastructure Germany

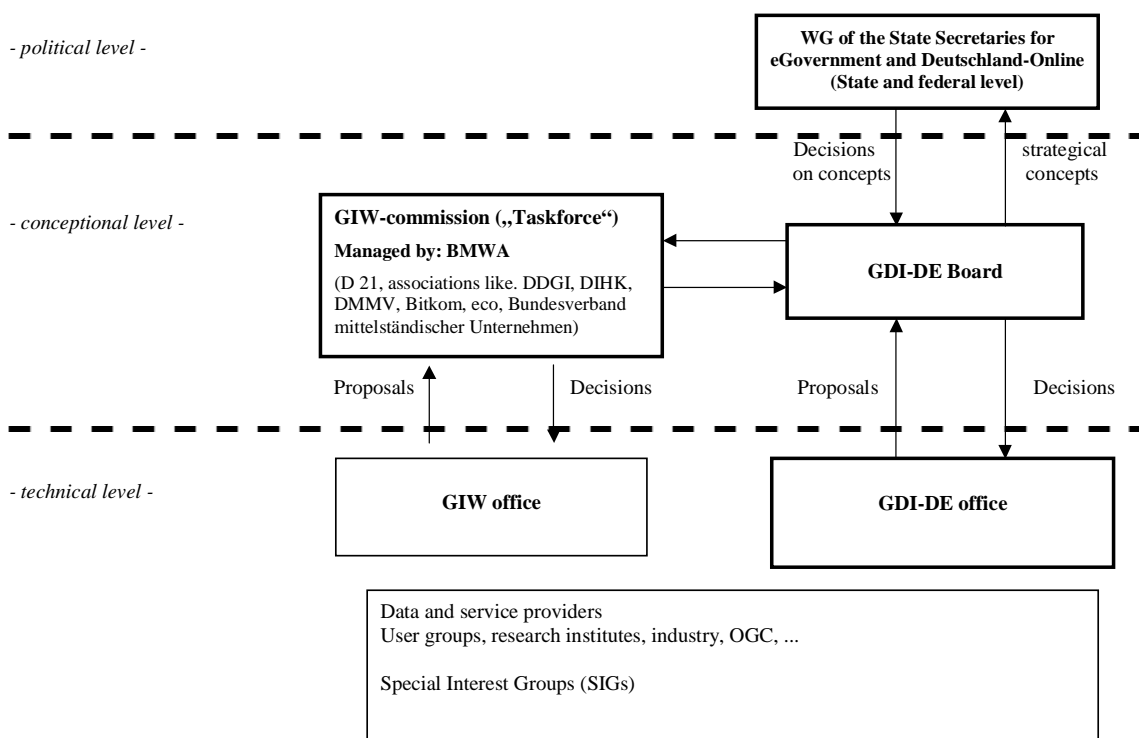


Fig 4: GDI-DE organizational concept

2 GDI AS PART OF E-GOVERNMENT AND E-BUSINESS INITIATIVES

The GDI development in Germany has been recognized as a main part of the German e-Government strategy. Therefore, on the national level it has been integrated in the so-called “Germany-Online” initiative started end of 2003 by the German Chancellor and the Minister Presidents of the States, a joint initiative of the federal level, the States and the municipalities. It’s aim is to provide all suitable public services on an online-basis until 2008. The structure of the initiative is shown in figure 5. The control is given to the State Secretaries responsible for e-Government of the federal Ministry of Interior and the respective State Ministries. Geoinformation has been assigned to the first pillar (Service Portfolio) but, because of it’s nature being integrated in all aspects, there are connections to the other pillars, too. The first GI projects have been presented during the INTERGEO 2004 fair in Stuttgart. Leadership is given to the Surveying and Mapping Agency of NRW.

There is a further national e-Government initiative in Germany called D21, an initiative driven by the German Industry supporting the government in the transformation process from the industrial society to the information society. Since a few years GI is part of this initiative.

The main outcome were two remarkable high-level conferences in Bonn and Hannover, especially with the aim of activating the awareness of GI on the potential GI users side.

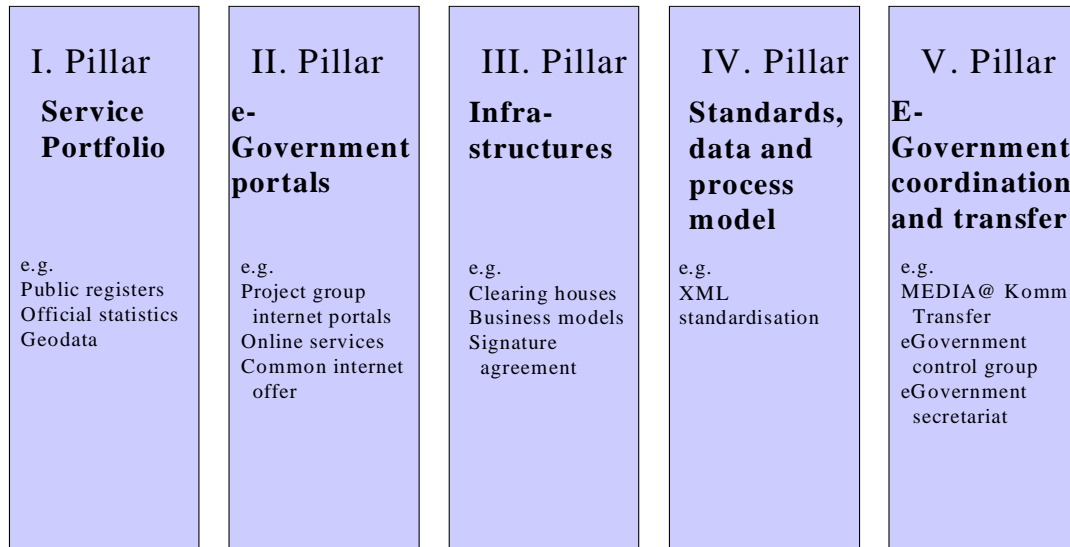


Fig. 5: Germany-Online structure

But, e-Government is not only a national or State oriented matter. More and more initiatives are being started on regional and local levels, which bring the GDI in Germany to live. Most of these activities are joint activities of public and private actors, setting up value adding chains between both. The public institutions have recognized that it is impossible for them to serve all the needs of end users, reduce therefore themselves to their public tasks as defined by law, and provide their data as rough data to private value adding companies. This way seems to become a successful one.

3 INTERNATIONAL ASPECTS

3.1 GSDI

NRW was one of the founding members of the GSDI initiative. The first GSDI meeting took place in Bonn. For the GDI NRW development the GSDI Cookbook was one of the basic references. Now NRW contributes to the GSDI activities by it's membership to EUROGI.

3.2 INSPIRE

INSPIRE (Infrastructure for Spatial Information in Europe) is the basic activity of the European Commission with the aim to establish a European GDI. Currently a European

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Directive is being prepared giving harmonisation rules for a common European GDI solution. It's main basis will be a standardized geodata framework provided by the European mapping agencies. German representatives from NRW and from the federal level are involved. Basic ideas of the GDI NRW specifications have been used as input to the INSPIRE concepts.

3.3 X-border GDI NL-NRW

A significant number of SDI's are currently under development worldwide – on all levels from local to global. While this is very encouraging, there are a number of risks associated with these fast-paced, but parallel developments. To name just a few:

- Different SDI's (or even different players within an SDI) have a conflicting understanding of what an SDI is;
- incompatible and conflicting technical solutions or content;
- incompatible organisational structures and rules.

As this was realised very early during the development of GDI NRW, more and more activities deal with linking GDI NRW components to offerings from its neighbouring regions (both inside and outside of Germany).

Since several years, co-operation between The Netherlands (NL) and NRW relating to geo-information has been intensified. Four workshops have been organised (Düsseldorf 2001, Arnhem 2002, Münster 2003, Cologne 2003) which improved cross-border networking on an expert level. A regional SDI (RSDI) workshop, held at the Joint Research Centre (Ispra) at the beginning of 2003 made clear that concrete demand for cross-border SDI co-operation exists. The region of NRW, The Netherlands and Belgium has proved to be an ideal test area for a cross-border pilot following INSPIRE rules, with its more than 20 million inhabitants sharing cross-border problems. From the user's point of view, the main application areas of disaster management, spatial planning, nature & recreation and traffic & transport need to be considered. A future regional cross-border SDI should focus on these application areas and should be set up in an incremental process: starting with mapping and cataloguing services which provide access to topographic base data, continuing with specific processing services and the provision of geo-information services which accommodate specific user groups. The parties involved on both sides of the border realise that it is necessary to demonstrate the value of cross-border co-operation and to show that open and standardised techniques for interoperable GI services are already available. In addition, agreements on common policies and institutional arrangements will facilitate the availability and accessibility of geo-information across administrative borders and jurisdictions.

In spring 2003, a preliminary cross-border study was started, to explore the feasibility and the potentials of NL-NRW SDI. This study focuses on three subtopics. The investigation of the benefits of cross-border co-operation will be documented in a market study for the NL-NRW border region. The main aim of this is to gather prospective users of a common cross-border RSDI and to disclose their individual requirements with respect to geo-information.

The second investigation will deal with organisational issues of a future cross-border SDI. The main aim is to deliver an organisational structure that is capable of achieving a sustainable development of the cross-border SDI. Here it is of great importance to incorporate the prospective users in order to develop an RSDI that really matches the needs of the users.

The third investigation deals with technological issues of the cross-border SDI. The main goal is to deliver a test prototype that provides a seamless and frictionless search and visualisation of geo-information for the border region. Hence, this prototype can be used to realise the scenario as described in the introduction. The following section will detail the design and the components of this prototype.

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BIOGRAPHICAL NOTES

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- 1975 Surveying and Mapping Agency of Northrhine-Westphalia (NRW) sections "Digital cartography" and ATKIS; DIN/CEN/ISO member (Geographic Information)
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