NSDI IN GERMANY

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National Spatial Data Infrastructure, Metadata, Geographic Information System, Data Access, Data Exchange, Standards

ABSTRACT
Computer assisted Geographic Information Systems (GIS) and digital data processing are essential to today's practices. Due to the complex tasks there is a high demand in many areas for accurate spatially related data. Geodata provide the essential building blocks for successful information systems. Up-to-date areas of application are all modern technologies in the fields of public planning and administration, conservation, traffic control and telecommunication all the way to the use of geodata on the Internet.

The problem in Europe as well as in Germany concerning NSDI at the moment is that the future growth is hampered by major differences in the way geographic information is collected, stored and distributed in different sectors of government and commerce. There is still no conclusive policy on digital geographic information, nore are there operational standards for data definition and exchange. Readily available basic data sets and knowledge infrastructure all over Europe is still missing. The main impediments to the successful use of geographic information in Europe are not technical, but political and organisational.

There is a policy framework required to set up and maintain a stable set of agreed rules, standards, procedures, guidelines and incentives for creating, collecting, exchanging and using geographic information. Policy has to create the conditions for competitive, plentiful, rich and differentiated supply of geographic information which is easily identifiable and easily accessible for the benefit of the citizen, society and the economy. Based on the questionnaire of Harlan Onsrud this paper shows the german activities about NSDI.

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1. INTRODUCTION

Information is the principal asset in an information society. Geographic data sets do have considerably greater value to the community if they were definitive and unique. Among a clear set of principles the geographical referencing system is the core of a national spatial data infrastructure.Well developed address referencing systems or national cadastres can be found in the European countries. Anyhow, a SDI is not built from scratch and its evolution implies profound changes in existing roles and responsibilities. Easy access and dissemination of data are the main issues to create a "local" SDI.

Geographic information applications vary greatly, but users have a recurring need for a few common themes of data. These themes include basic information about transportation, hydrography (rivers and lakes), geodetic control, digital imagery, government boundaries and land ownership information etc. A lack of investment, common standards, and coordination have created situations in which these needs are not being met. As a result important information is not available for many areas, and different organizations support duplicate data for other areas. Increased costs and reduced efficiency for individual organizations as well as for the Nation are the results. Therefore a means to maintain and manage the common information being collected by the public and private sector is urgently needed.

The creation of a german policy framework in the area of GI is essential. A strategy to remove the bottlenecks and create new market opportunities has to be established. An action plan should include the following areas:

- Stimulating the creation of base data
- Stimulating the creation of metadata services
- Lowering legal barriers and reducing potential risks
- Coordination at European level
- Technological support
- Research and development
- Quality and standards
- Awareness and training
- Market awareness

The collection and dissemination of base data in Germany is done by a range of mandated national institutes such as National Mapping Agencies (NMA), Military Organisations, Cadastral and Geodetic Surveys, and there are private companies that publish a wide range of cartographic products. Much of this geographic information is currently controlled by the government through licensing and copyrights.

2. NSDI - ACTIVITIES IN GERMANY

Based on the "NSDI on-line questionnaire" - a survey of National Spatial Data Infrastructures around the globe - of Onsrud (1999), the German activities are demonstrated. The goal of this survey is to gather baseline information on the nature and characteristics of the NSDI's currently being developed. The information collected will be used (1) to determine whether there are sufficient similarities among the national characteristics and (2) to assess the need for a global coordination or facilitation mechanism. Although this first survey was done in 1998, it gives a fairly good overview of the today's situation of NSDI in Germany.

In Germany we have several initiatives for developing a national spatial data infrastructure. There are mainly three organizations coordinating NSDI development efforts:

1. Working Committee of the Surveying and Mapping Agencies of the German states; ***A****rbeitsgemeinschaft* ***d****er* ***V****ermessungsverwaltungen der Länder der Bundesrepublik Deutschland* (AdV)

2. German Umbrella Organization for Geoinformation; ***D****eutscher* ***D****achverband für* ***G****eo****I****nformation* (DDGI)

3. German Political Working Group for Geoinformation; ***I****nter****M****inisterieller* ***A****usschuss für* ***G****eo****I****nformationswesen* (IMAGI)

The primary types, categories or forms of spatial digital data being made available through the NSDI are all kind of official Geodata e.g. geodetic control, elevation, topography, digital aerial survey, administration boundaries and land ownership. The vision is that these core data sets of the cadastral, surveying and mapping agencies will provide a current base which anyone may use to collect, register or integrate other thematic spatial information. But only core spatial data sets, vector as well as raster data, are being made available through the German NSDI. They will be provided by the cadastral authorities, the surveying and mapping agencies of the German states, and the Office of Cartography and Geodesy; ***B****undesamt für* ***K****artographie und* ***G****eodäsie* (BKG.) Metadata and means for finding spatial data sets may be found on the web sites of AdV and BKG. This is the first step to establish a clearinghouse. Citizens, businesses or others may gain access to data available by special laws, contracts and they are charged according to a price-list determined by the AdV. The basis for determining the price of various forms of spatial data are fixed by balanced relation between benefit and expenses of production. DDGI and IMAGI are working on an effective and transparent data collection and data exchange model. On the other hand there are also some private companies collecting their own geodata and they are selling it on a separate price-list. Those private commercial firms will need NSDI as soon as possible. Therefore they have to be involved in building the NSDI, preferably as a member of the DDGI.

Public domain data sets are not available within Germany. There is no additional service or goods provided by government in support of the NSDI for which individual users are not charged. AdV and BKG offer information for finding and obtaining spatial data free of charge.

The privacy of individual citizens is strongly protected relative to data that may be accessed through the NSDI. All spatial data sets, that contain information of individuals, are subject of the German laws of protection of privacy.

AdV and the DDGI explicitly recognized the need to establish a NSDI. The German government also has recognized the importance of spatial data and has founded a German Political Working Group for Geoinformation (IMAGI) in order to build up and improve the coordination of a spatial data infrastructure. Unfortunately there are no funds specifically budgeted and acquired for NSDI activities. On DDGI-level it is done by the common weal. To build a Geo Data Service Centre (GDSC) several partners will have to invest into a new common company.

NSDI is mainly build up by the surveying and mapping agencies of the German states, the cadastral authorities and the BKG whilst AdV is coordinating it. DDGI is in general active as an interdisciplinary, official and neutral non-profit organization whereas IMAGI is active on the political level.

The vision of a German NSDI incorporates the following components or concepts:

- METADATA maintained by AdV and DDGI
- CLEARINGHOUSE maintained by AdV and DDGI
- DATA STANDARDS maintained by AdV and DDGI
- CORE DATA maintained by AdV
- THEMATIC AND VALUE ADDED DATA maintained by DDGI

Funds specifically budgeted and spent on research projects to advance NSDI concepts are very poor in Germany. Only research projects at several universities and some initiatives on local level for special disciplines, like environmental monitoring, are under development. International and national information and communication technology standards are on discussion, but it is planned to adopt it to EGII and GSDI solutions which will include ISO and OGC.

About the access to spatial data sets with global coverage the official spatial data is integrated into the European metadata information system and European data sets provided by MEGRIN, e.g. Seamless Administration Boundaries of Europe (SABE) and Geographical Data Discription Directory (GDDD). The German NSDI is formally affiliated with or connected to spatial data infrastructure initiatives like CERCO, CEN/ISO, OGC, EUROGI and GSDI.

At the moment the AdV plans to establish a Geo-Data-Centre which will be maintained by the BKG. The DDGI is developing a concept for GDSC. Similar activities can be found for special disciplines in various regions of Germany. More information about NSDI efforts in Germany may be found on the Internet addresses www.adv-online.de, www. ifag.de and www.ddgi.de.

3. CONCLUSION

The major impediments to the successful use of GI in Germany is not technical, but political and organisational. To receive the benefits of an unified German/European GI infrastructure, such like

- Efficiencies of scale in a unified market
- Reduced problems for any German-wide projects
- New business opportunities for the German GI industry
- Ability to design technical solutions for the future growth
- Increasing use of skills and improved market position in GI
- Improved capability for German-wide planning and decision making

the formulation and implementation of a German policy framework for GI is inevitable although it will be difficult to establish. The intention is to set up a Task Force (e.g. IMAGI) composed of high level prominent persons from the German GI industry and from the user community as well as high level officials from the government. The basic collection and storage of data, metadata as well as the performance of other basic actions shall remain as a local task. The major investments needed for the creation of data and applications will have to be provided by the private sector and/or the public organisations mandated to produce data.

To remove bottlenecks, reduce unneccessary costs and provide new market opportunities, a coherent policy framework is urgently needed. Considering about the consequences of the German situation mentioned before, there would be a continuation of a fragmented GI-market, no coherent German view of spatial problems, increased dependence on foreign technology, high costs for the conversion of data and last but not least a tendency to adopt ad hoc solutions will take place.

Fortunately, via the work of OGC, ISO, CEN, CERGO and EUROGI there is now a discernible trend towards a harmonisation of GI in Europe, and because of joint projects in industry and business positive efforts are on the way to get coherent base data. As a result there is an ever-growing collecting of national digital GI datasets held by local, regional and national data providers and users, both public and private. In order to have access to those databases, metadata information services have to be established.

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