The information technology of the German Environmental Information Portal PortalU® as tool for the European Level?

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Abstract

Within the European Member States rich environmental data assets exist. Although a lot of these data have already been prepared digitally, the accessibility of the data is still extremely limited. So, a huge amount of environmental data are difficult to discover and exchange. Hence, within the Member States for both, environmental experts and citizens, environmental data are difficult to obtain, to understand, to merge and to use. Environmental information is thereby essential in particular for land use planning, environmental protection and impact analysis as well as for risk analysis. The changes of environmental parameters like soil, water or plant growth are important response agents to climate and land use.

1. Introduction

Public authorities across Europe collect a vast range of environmental data. In spite of the existence of these rich environmental data assets, a huge amount of digital environmental data is not generally accessible. Moreover each European Member state has its one strategy to classify their environmental data and to report about the environmental topics. As a result, the access of environmental data for cross-border analyses are quite difficult. In reference to the development of hazard and risk management strategies and the discussion on forecasting climate change effects, the need for environmental information has tremendously increased at all spatial resolutions, particularly on regional, national and European level.

The Commission of the European Community aims to close this gap. The European Environmental Information Directive on public access to environmental information (EEID, 2003/4/EC) specifies what kind of environmental information have to made available and have to be disseminated by the Member States. The directive targets thereby on improved information about the environment for all citizens. The EU INSPIRE Directive (2007/2/EC) emphasizes the European-wide need to improve the access to spatial information. The target of INSPIRE is the establishment of a corresponding infrastructure in the European Community. The infrastructure shall be used to gain environmental information for the background information of political decisions within Europe. The majority of the INSPIRE themes address environmental data which indicates significant synergies with the European Environmental Information Directive (EEID, 2003/4/EC). The most recent activities of the Commission are the discussion about a Single Information Space for the Environment (SISE) and a Shared Environmental Information System (SEIS). Altogether, the demands on the environmental data and their access have been increased

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significantly. The existing environmental databases have to be interconnected, the use of standards has to be promoted and the access to data has to be improved. Germany has already started connecting state and federal databases and publishing their data online in the German environmental information portal PortalU® (www.portalu.de). Initiatives like PortalU® give policy makers as well as citizens an easy access to latest environmental information. As the European Environment Agency (EEA 2008) pointed out recently, PortalU® can be seen as a building block of SEIS[2] .

2. PortalU and InGrid

The initiative PortalU® started in June 2006 by merging the German environmental information network GEIN® with the environmental catalogue UDK. Since then, a great deal of public environmental information is available at one click. The joint federal state project PortalU® was designed due to increasing demands on the access of environmental information by EU directives. The goal of the portal is to provide a central access to environmental information of public authorities for citizens and experts. PortalU® gives answers on environmental related questions about measures of the government against climate change or the water quality in specific areas for instance. 2 Million web pages and over 500 000 data base entries from public authorities are available from about 200 public institutions and organisations on state and federal level.

The modular software of PortalU®InGrid® bundles the decentralized distributed environmental information. In InGrid® all environmental information web pages, databases as well as data catalogues can be searched by a powerful search engine. If required, spatially, temporally or semantically restrictions can be taken into account. The query results are presented in a main and a secondary result list. The results in the main list are ranked according to the relevance of the query terms for the indexed documents. The secondary list contains results from data bases, which are connected by an open interface. These results are sorted by provider. Besides the full-text search, separately prepared environmental topics from A like “air and climate” over N like “nature and landscape” to W like “water” can be browsed. These thematic web pages are particularly relevant environmental information, selected by experts to improve the understanding of environmental information for non-experts. The 21 environmental topics are subdivided in six functional classes: legislation, concepts, reports, state-of-the-environment, data and maps as well as risk-assessment. Thus in the class “water – legislation” information about waste water legislations or the Water Framework Directive (2000/60/E) should be found. The environmental and functional classes comprehend the topics, which were mentioned in annex B of the EEID (2003/4/EG). Furthermore additional components are available to improve the understanding of environmental information: the rubric “service” provides press releases as well as information about publications and events of the connected public authorities and the rubric “data” provides environmental monitoring data.

[2] http://www.eea.europa.eu/highlights/sharing-environmental-information-to-improve-policy

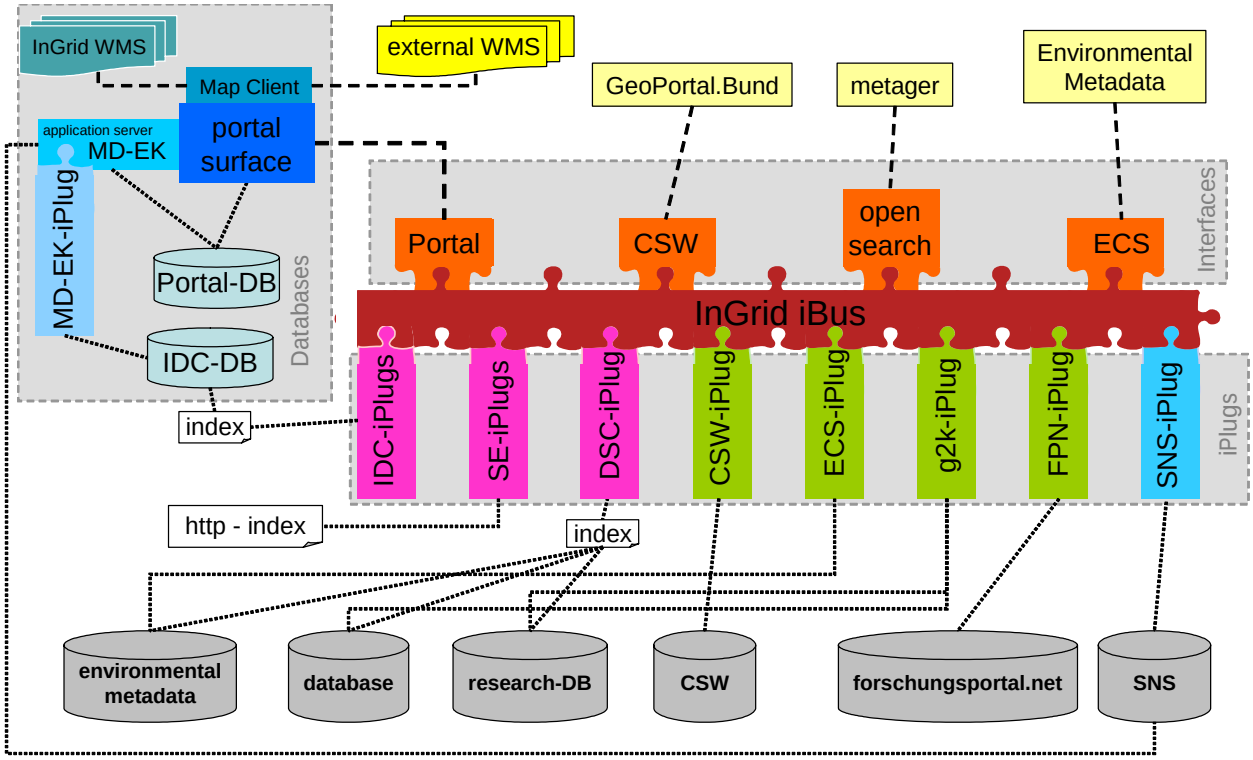

Fig. 1: Architecture of the portal software InGrid®

The PortalU® software InGrid® is structured in several components (Fig. 1). The information bus (iBus) forms the central component of InGrid®. It receives and processes search queries, which come from the portal surface or from other connected interfaces. The search queries are transferred to the data sources and the query results were bundled and delivered again by the iBus. The information plugs (iPlugs) build a further part of InGrid®. They can be described as generic adapters to connect data sources to the iBus. Different iPlugs are implemented to connect different kinds of data sources. Data bases and expert information systems for instance are connected by the data source client (DSC) iPlug. Thus, an access to parts of the so called hidden web is realised. New data sources are easily integrable by connecting them to existing iPlugs or by adding a new specific iPlugs. The InGrid® database module consists of two parts: the database of the InGrid® metadata catalogue (IDC-DB) and the portal database. Metadata of the environmental catalogues are stored in the IDC-DB, while internal information like the user administration are stored and managed in the portal DB. Furthermore metadata can be created and managed with the online metadata management tool (MD-EK) of the software in the near future. Further components are an integrated web map service (WMS), a WMS viewer and certainly the web-surface of portal.

3. Adaption of the portal software InGrid of Europe

Currently PortalU® provides an access to web pages, meta data and to specific environmental data. For the support of reporting obligations and the further demands according to the planned Shared Environmental Information System (SEIS) an extended access to environmental data, especially numerical data, is necessary. For this purpose the portal software InGrid® has to be extended. In the concept for these extensions the model for Observations & Measurements (O&M) from the Open Geospatial Consortium (OGC) should be considered. The DSC has to be extended to a „Sensor Data Source Client“ (S-DSC), which enables the access to numerical data. Furthermore a generic OGC-compliant Sensor Observation Service (SOS) has to be implemented as well as a SOS-iPlug and a SOS-interface at the iBus, to connect InGrid® with external SOS. Moreover, the portal surface shall be extended by a SOS viewer to visualize SOS data.

InGrid® is based on open source technology and proprietary developments and is conform to ISO, OGC and prospective INSPIRE. The portal software can be adjusted to different public administration levels. Thus besides the application as software for the German environmental information portal PortalU® an application of InGrid® in other Member States or on European level is also possible. In the hierarchical user administration the Member States will act as partner. The particular partner will be able to add national data providers. For the use of InGrid® on European level the following adjustments of the software will be necessary. The currently bilingual thesaurus UMTHES (http://www.umweltbundesamt.de/uba-info/dokufabib/thes.htm) has to be replaced by the multilingual GEMET (http://www.eionet.europa.eu/gemet). Furthermore the spatial reference of the search is currently only available for Germany (German semantic network service). Moreover, some text translations, the extension of the current bilingual mechanism and layout adoptions have to be made.