The *Umweltdatenkatalog* as a repository for environmental impact studies

Mathias Voell

Abstract

In this article we examine the capabilities of the *Umweltdatenkatalog* to meet the requirements of the second European Union directive on public access to environmental information; we will show how the UDK can be used as a repository for information on environmental impact assessments.

1. Introduction

In 2003, the European Union adopted its second directive on public access to environmental information (Directive 2003/4/EC). Among other things, the new directive specifies that environmental information has to be made available in particular by using information and communication technologies. The list of information, which at the least has to be made available, includes environmental impact studies (EIS). In Germany, they are available from different authorities on different administrative levels. To meet the requirements of the first directive on public access to environmental information (Council Directive 90/313/EEC), Germany and Austria developed an environmental data catalogue called *Umweltdatenkatalog* (UDK), being today their standard meta information system for locating available environmental information of public authorities (Behrens et al. 1999). The aim of this paper is to show how the UDK can be used as a repository for information on environmental impact assessments (Voell 2003).

2. Public access to environmental information

The new directive improves the existing public access to environmental information. Public authorities will be required to make available and disseminate environmental information as widely as possible to the general public, in particular by using infor-
3. Environmental impact assessments

An environmental impact assessment is mandatory for the approval of specific public and private projects which are likely to have significant effects on the environment (UVPG). Germany has no dedicated EIA authority, its procedure is integrated with existing procedures of different authorities. Therefore, EIA information is available from different authorities.

A collection of documents is prepared by or on behalf of the developer, by public authorities and any concerned third parties for the assessment of a project's impact on the environment and for the consent for a project. Most of this information is made available to the public who then have the opportunity to express an opinion on the project before consent is granted. The most important documents and information for the public are the EIS, procedure related dates and the building permit. The EIS consists of a description of the project, measures proposed to avoid, reduce and, where possible, remediate any significant adverse effects. The EIS also has to address the data required to identify and assess the project's main likely effects on the environment and outline the alternative options studied by the developer. Because the EIS is generally a very complex and extensive document, a non-technical summary is required. The EIS provides the key information from which the competent authority arrives at a considered decision. Furthermore it helps the public to judge how they may be affected by the project's impact. The knowledge of procedural dates and venues enables the public to participate in the process and follow the events as they unfold.

4. Umweltdatenkatalog

The Umweltdatenkatalog is a meta information system for identifying and locating available environmental information of public bodies. Its development and current use is based on an agreement between the German states and the federal government. Instead of being organized at a federal level with one central UDK system, most of the states are running their own UDK, searchable via public web servers. The Virtual UDK (http://www.umweltdatenkatalog.de/) makes it possible to start a simultaneous query in all connected UDK servers instead of doing a search by
means of every UDK server’s web search facility. After four major releases, the inte-
gration of the UDK is planned within the German Environmental Information
Network, the web portal site (http://www.gein.de/) to environmental information
databases of many German public bodies (Karschnick et al. 2003).

Meta information on environmental data is stored in UDK objects, each object
belonging to one of six predefined classes with different properties. Data on indi-
viduals and governmental organizations is stored as UDK addresses. Every UDK
object must be linked to at least one address maintaining or providing the described
information. Objects and addresses can be edited, searched and presented in many
ways (Eichler & Kruse 2001; Kruse et al. 1998; Behrens et al. 1999). Objects can be
grouped in a tree-like hierarchical structure and also linked in a hypertext way to
represent semantic associations, including URL links to external web sites and other
data. The UDK also features a thesaurus of environmental keywords for further clas-
sification of objects.

All German states have signed the UDK agreement. However, Bavaria is using a
different system for storing and locating environmental information. But most of the
states are already using the UDK to some degree. Generally the system may be set
up for every public authority, enabling them to record the widespread EIA informa-
tion using a common framework. Authorities lacking a network connection to the
central catalogue may work with distributed instances of a catalogue, but the extra
effort for their administration is a reason for not using this UDK feature. The new
UDK server reduces the extra administrative effort in networked environments, but
the slow performance of its text based protocol may also be a reason for not using it.

5. UDK object model and EIA information

5.1 Acquisition guidelines

The various UDK providers in Germany do not always input similar data using
similar object structures and descriptions, due to the many input possibilities of the
UDK and because of people’s different appreciation of the same information.
Guidelines and rules for data acquisition are necessary in order to guarantee a more
homogeneous quality of data throughout the different UDK databases (Barnikel et
al. 2003). The states are responsible only for their own data and catalogue. They
have agreed upon a non binding acquisition guideline (KUG 2002). A few of them
also have additional guidelines for their own use. In addition to those rather general
guidelines already in use, a more specific one for the acquisition of EIA information
is necessary.
5.2 Object structure

The UDK object model is generally suitable for a structured documentation of EIA. The project/programme class is used for describing current or concluded projects and programmes (KUG 2002, 10), so it may be used for describing EIA projects. EIS and other related documents can be described as objects of the document/report/literature class. Objects of the project/programme class are apt to serve as parent nodes for other objects (KUG 2002, 10), so the relation between EIA project objects and their documents is expressed by the tree-like hierarchical structure, one EIA project object being the parent of one or more related document objects. Depending on the catalogue's structure, all its EIA project objects can be linked to another object of the class dataset/database to provide a main entry point, a directory of the catalogue's environmental impact assessments. The three mentioned object classes have almost all the necessary properties for the description of EIA related information.

5.3 Object names

Rules for the creation of object names and their spelling improve the quality and comparability (cf. BARNIKEL et al. 2003).

**EIA:** The name of the object starts with Umweltverträglichkeitsprüfung (UVP), followed by the title of the project which should specify whether it is a new installation, modification or an extension (Errichtung, Änderung or Erweiterung). A reference to the geographical or administrative area is appended at the end. Example: Umweltverträglichkeitsprüfung (UVP) für die Errichtung eines Offshore-Windparks bei Helgoland.

**EIS:** The object name starts with Umweltverträglichkeitsstudie (UVS), followed by a reference to the project and its area, for instance: Umweltverträglichkeitsstudie (UVS) für die Errichtung eines Offshore-Windparks bei Helgoland.

**EIA directory:** Starting with Umweltverträglichkeitsprüfungen (UVP), followed by the name of the state the catalogue is belonging to, for example: Umweltverträglichkeitsprüfungen (UVP) Niedersachsen.

5.4 Object descriptions

The object should be described with a few sentences, but not only repeating the objects name. Only nouns are indexed for the UDK's text search capabilities, so they should be used as often as possible (KUG 2002, 13).

**EIA:** Who is the developer? What shall be built, modified or extended? Which are the major characteristics and threshold values of the project? The main likely effects on the environment should be described, too.
**EIS:** After repeating the project's description, a summary of the EIS should be provided including its main methods, essential likely effects on the environment, envisaged measures and affected factors as water, air etc.

### 5.5 Addresses

The UDK object model request that every object must be linked to an address, an institution or person maintaining or providing the related information. EIA information must be linked in the first place to the competent authority. Developers can also be stored as UDK addresses and linked to their projects. This has two advantages: the address need to be stored only once, and the developer's projects can easily be browsed by selection his address. Involved authorities can probably be selected from the existing addresses within the catalogue. Other involved organizations or individuals can be stored as addresses or just included with the description.

### 5.6 Area and time references

For every UDK object, an geographical or administrative area and a time reference can be specified. For EIA objects, the location of the project and of neighbour communities should be provided, or the area likely to be affected by the project's impact. The time reference can be a single date or period, it should always be specified in terms of days, as the UDK's search function is working with days.

The catalogues should be up-to-date for an efficient use. In case the catalogue uses a hierarchical structure of parent and child instances it may not be suitable for researching up-to-date information, because the lapse of time between the manual update cycles may be of several months. Those catalogues cannot be used for process information.

**EIA:** For current procedures the day of its beginning has to be entered, and the status is set to *in Arbeit* (work in progress). Once the procedure has been concluded the status is set to *abgeschlossen* (closed) and its last day has to be entered. Additional procedure or workflow related information cannot be stored in a structured way yet, only as text along with the description.

**EIS:** The time reference for an EIS is the day it started and eventually the day it was finished, the status being either *in Arbeit* or *abgeschlossen*.

### 5.7 Links

Objects may be linked to other data. An address link is created by linking UDK objects to UDK addresses, selected from the catalogue. An object link is a reference to
another object from the same catalogue. URL links are pointing to internet resources like web pages and other files.

Links are the only possibility provided by the UDK for a direct access to the described information, for instance available PDF files. When a project has been decided to be subjected to an assessment and this decision has been made public on internet, an URL link shall be provided. The same applies for web sites dedicated to a specific EIA. The EIS object may have a link to online available files related to the EIS, for example the non-technical summary. Object links are used to link EIA objects to the EIA database object of the competent authority.

5.8 Legal basis

The title of some laws and regulations can be selected from the predefined drop-down list which eventually may have to be extended. Articles or other more detailed references can only be stored separately with the description, along with the the acronym of the law, otherwise the context is not clear.

5.9 Keywords

The UDK has its own thesaurus for environmental keywords. The thesaurus is being maintained by an international working group (Wortgutredaktion des UDK-Thesaurus) at the Austrian federal agency for the environment. Keywords are used to describe the content of information in a structured way. They work best when different people use the same keywords for describing the same content. For instance, instead of describing a certain type of project with its number taken from the appendix 1 of the German federal law on EIA (UVPG), the project type can be specified using one or a combination of keywords. This has the advantage the it is not necessary to update that number in the description in case of a change of the law, the number my change but the project's characteristics remain the same. However, the UDK thesaurus may not have appropriate keywords for every project type. For instance in the appendix 1 of the UVPG the project type 1.1 is specified with a few nouns as Errichtung, Betrieb einer Anlage and Dampfkessel, just to name a few. For the first two the thesaurus offers Errichtungsgenehmigung and Genehmigungsbedürftige Anlage. The Dampfkessel can only be described with a combination of the two keywords Kessel and Dampferzeugung. Considering these difficulties it is unlikely that different persons will use the same keywords for the same projects. Nevertheless the UDK thesaurus has suitable keywords for a more general description of EIA information. EIA procedure objects may be index with: Umweltverträglichkeitsprüfung, Umweltverträglichkeitsstudie, Bürgerbeteiligung, Information der Öffentlichkeit. And for EIS objects the following keywords may be used: Umweltverträglichkeitsprüfung, Umweltverträglichkeitsstudie,
6. Conclusions

The UDK can generally be used as a repository for EIA information, because of its object model and online search capabilities. But a few restrictions apply.

The object model has to be modified to allow the structured storage of procedure related information, introducing new properties for the record of single dates and periods with descriptive text.

As a meta information system, the UDK offers description of and links to environmental information. The restriction on meta information is not a hindrance for the dissemination of that information. Anyway, EIS are often too voluminous to be distributed.

A special guideline for EIA data acquisition should focus on how to enter data for recommended properties, especially when there is no list of predefined values. A consistent selection of thesaurus keywords for similar projects is especially important to improve the search possibilities and results. Some projects may only be described with keywords which are not yet available in the thesaurus.

Data quality can be further improved by including the guidelines into the acquisition software. The existing Windows UDK client cannot be easily configured to streamline its interface for specific environmental data. But it is not the only means to input data. The new UDK releases 4.2 and 4.3 provide a XML-interface to import and export data. Some UDK providers already use other input interfaces to improve data quality, for instance the Landesanstalt für Umweltschutz (State Institute for Environmental Protection) of Baden-Württemberg, helping and guiding the user, offering only a subset of properties or values from predefined list. HTML forms are used for the development of such new UDK interfaces adapted for the input of more specific information. The forms import and export object data as XML, ready to be imported with the Windows UDK client into the UDK database.

The quality and usability of the UDK as a repository for EIS does not depend on object model and interfaces for data acquisition only. The information has to be up-to-date to be useful to interested parties. Whether it is up-to-date greatly depends on the UDK infrastructure and data acquisition workflow which are different in almost every German state. In order to offer more up-to-date catalogues, update cycles have to be improved. No update cycles at all are necessary with the use of one central catalogue and the UDK’s client-server technology.

The UDK is a suitable framework for the storage and retrieval of information on environmental impact assessments in Germany. However, a few changes of the database model are necessary to cover procedure related information. The XML import and export capabilities combined with HTML should be used to provide a more
streamlined acquisition interface, in addition to the existing Windows UDK client. Special attention must be paid to the acquisition workflow to ensure the availability of up-to-date information, enabling the wider and better informed participation of the public in the EIA procedure.

Bibliography


Behrens, S., Kazakos, W., Kruse, F., Nikolai, R., Swoboda, W., 1999: WWW-UDK 4.0: Die neue Generation eines Web-Portals zu deutschen und österreichischen Umweltdaten.


