Document-oriented Management and Visualisation of Environmental Information

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At the moment most organisations work on management and availability of their (raw-)data. However, to take decisions, information and knowledge is more important than (raw-)data. But the three components, i.e. (raw-)data, information and knowedge often get confused, but within information– and communication science they are defined cleary: Information is deduced from data and users can gain knowledge from the available information as a basis for their reasonable actions. In conclusion not only data must be managed but also information and knowledge must be maintained. Nevertheless there is no possibility to store knowledge. This always leads to loss of information content and brings the knowledge back to the level of information. For this reason above all the management of information is relevant. So the brokering of information and the gain of relevant knowledge can be guaranteed.

Users should be able to access easy and rapid all available information to gain relevant knowledge as base for there actions. They do not need to know what data are available nor how to deducate needed information from (raw-)data. The information should be presented on screen in an usual layout. Search and visualisation of available information depends on a suitable way to manage and to provide the desired information. A proper datamodell to offer the required information must be developed. The visualisation must be made by an own softwaretool adapted to the developed datamodell.

The majority of information are presented as graphical components e.g. maps, diagrams and tables. Thus, compact and clear presentation gives a good way to understand and to interpret connections and to gain knowledge. Supplementary background and context information is brokered by textual components. Therefore graphical components are the fundamental information carrier of organisations. Information can be managed and made available using graphical components. Their analog or digital output is considered as a document. Management and storage of graphical components forms the base of their output as a document. This includes links to the (raw-) data, instructions for the presentation design, catalogue- and meta-data of the graphical components as well.

The catalogue-data are needed to search graphical components, while the meta-data evaluates the content of the graphical components. Meta-data and catalogue-data are developed following international standards concerning management and documentation of digital objects e.g. documents, maps, tables or diagrams.

The management of (raw-)data links, instructions for the presentation design and catalogue- and metadata is made by XML stored in a native XML-database. XML-documents and native XML-databases have several advantages compared to traditional relational or hierarchical databases. They are designed to broker information with unregular structure and mixed content. XML has a hierarchical structured build up as a tree. It can also be adapted and extended to special needs. The storage in form of a XML-document can also be used by other tools for example by the internet. Hence the information content stored in XML-documents is available independently of the proper software solution developed to search and to visualize graphical components.

Graphical components can consist of a different type e.g. diagrams, tables and maps. Hence the data which is necessary to allow search and visualisation of the graphical components e.g. (raw-)datalinks, presentation rules variates in dependence of the component. For example there are other (raw-) data and an other presentation forms needed to visualize the graphical component map than the graphical component table. Therefore the structure and content of the XML-documents differ from one graphical component type to another. Other desciptive languages based on XML e.g. EnvironmentalML, MapML, LegendML and DiagramML are considered.

A project for search and visualisation of relevant information is carried out in the administration of the National Park in Berchtesgaden. Mostly environmental data are available there. These types of data requires special demands not only for management but also for the visualization. Spatial references are given for almost all environmental data. The graphical component map is used to visualize environmental information with spatial references. Therefore access to three different types of data: spatial data, attribute data and graphic describitive data is necessary. Development of special strategies is important to solve problems with place availability on screen and resolution of digital map presentation.