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Perspectives of Active Documents: Linking People, Events, Documents and Data

Hans Pfeiffenberger and Ana Macario

Alfred Wegener Institute
for Polar and Marine Research

Abstract

Working on the analysis, visualization and archival of a wealth of scientific data from different disciplines of earth and life sciences, we made some observations:

It is no longer a matter of debate that "one picture says more than 1000 words" or that really big sets of experimental or modelling data can only be analyzed through their visual representations, which - if the data are non-stationary - may take the form of movies, as in example 1, or virtual reality. Consider also, that the classical scientific publication is just one form of communication between scientists. Often, scientists are asked about detailed data behind their publications. In order for this to happen, the scientist herself must be contacted. Both of the later communication issues could be improved by online repositories, as shown by examples 2 and 3:

1) Interdisciplinary cooperation between biologists tracking seals and physicists who did remote sensing of the ice cover around Antarctica, provided a movie showing the [movement of seals](#) in relation to the seasonally varying ice-front. Reportedly, a leader in the field considered this visualization most useful for the understanding of the seals' behaviour.

2) It is useful for the scientific progress to publish documents connected to databases. An example to prove this assertion is the server www.pangaea.de, maintained at AWI since 1997, which contains mainly, but not exclusively, palaeo-geological and biological data and metadata about these. This service provides f.e. online visualization for queries about the existence of data for

user-specified criteria in the form of cartographic maps - thus our classification of this content as a document. It is the intent of the authors to include more textual material and online-references, as soon as possible. Even today it is possible to refer to specific queries and map outputs via a specific URL pointing to the PANGAEA server, thus giving the possibility to refer to the *current* database content from text-documents or even to include queries into publications as active components. However, in most disciplines it is unusual to use URLs in the list of references and in most cases data or other online publications are not considered equivalent to classical publications.

3) The [Hydrographic Atlas of the Southern Ocean](#) was published on paper 1992 and on the web in 1994 . This static document is tied to the content of the corresponding database at the time of publication. Any additions to the observed data or improvements of the analysis are not reflected until a completely new "edition" is made. Even though this is intended by the authors it remains a practical problem to contact three of the contributors to this volume - their e-mail addresses were given as URLs but they are no longer valid, since these three have left AWI long ago. Therefore it is not possible to contact them without cumbersome searching. Even if they had given more details about their persons through "personal homepages" those would not have been maintained since they left or even deleted, depending on the policy of the institute.

The same arguments would of course apply to the online description of events like seminars or expeditions: In many cases it would be useful - even long after the event itself - to track down text, data or people associated with the event or follow-up events.

Therefore, online publishing in the context of scientific communication asks for more than a different format applied to the classical, static, text-oriented document. Many active applications do already show the potential of this new paradigm. One of the nontechnical problems to be solved however is the recognition of data-publication and online visualization as generic scientific work. If there is no increment of the publication counter, this useful work will not be done since it involves spending even more time than writing up text or drawing static illustrations.

On the integration of personal homepages and electronic publications using the Lightweight Directory

Access Protocol (LDAP)

Ana Macario and Hans Pfeiffenberger

Abstract

In order to simplify management of information on the increasing number of employees at the Foundation Alfred Wegener Institute for Polar and Marine Research (AWI), we have recently implemented the Netscape Directory Server which uses the Lightweight Directory Access Protocol (LDAP). The data model for the LDAP server is based on the X.500 standard which is an international standard for global directory structures. Non ASCII-characters such as "umlauts" are preserved by using UTF-8 coding. Information on AWI scientists and support staff stored in the Directory Server is used to dynamically create standardized homepages. This approach allows us to create multiple-levels of administration with platform independent authentication. While certain user attributes such as those related to specific computer platforms are managed by the corresponding system administrators, attributes related to the users' personal data are managed by the users themselves. Changes in the attributes of existing users and entry of new users in the database is accomplished using customized templates which drastically reduce administration overhead. The system we designed is ultimately meant to be easy for end-users to do queries and fastly retrieve important information. Dynamic information on AWI scientists which are subject to often changes, such as the top five publications, research interests and responsibilities are also stored on the LDAP server as customized attributes. In order to electronically store and manage information on scientific publications, we used the Web-based Upload Form Interface (WUFI) developed in cooperation with University of Oldenburg. WUFI is meant to provide a user-friendly interface for scientists to upload metadata on their publications along with the respective digital publication. The metadata is then used for queries via a decentralized search machine such as Harvest. The metadata on each publication along with the respective digital documents and data will be ultimately archived in a relational database.