

Austrian Literature Moving to Cyberspace - A Framework for Building an Open Distance Learning Website using Platform Independent Standards Like XML

Alexander Schatten
Austria, Vienna University of Technology
Favoritenstr. 9-11 / 188, 1040 Vienna
aschatt@ifs.tuwien.ac.at

Klaus Zelewitz
Austria, University of Salzburg
Akademiestr. 20, 5020 Salzburg
Klaus.Zelewitz@sbg.ac.at

A Min Tjoa
Austria, Vienna University of Technology
Favoritenstr. 9-11 / 188, 1040 Vienna
tjoa@ifs.tuwien.ac.at

Johann Stockinger
Austria, Ministry of Science
Rosengasse 2-6, 1010 Vienna
Johann.Stockinger@bmwf.gv.at

Abstract: Due to the steadily growing interest in Austrian Literature, we had initiated an Open Distance Learning (ODL) course. For this purpose, we build a framework that allows to record the data required for publication in a highly generic form. The aim was to separate data from presentation, to prevent information loss and to gain flexibility for future use of the data in other (scientific) projects. We decided to store data in a database using a GUI for easy access. The database is then transformed into XML using Java and DOM/SAX libraries for flexible generation of different presentation formats like HTML and PDF. This guarantees usability in other contexts. With this approach, we anticipate the possible direct use of XML using XSL in the future.

Basic Ideas

Experiencing a steadily growing interest in Austrian Literature, Prof. Zelewitz, German language and literature scientist at the University Salzburg, initiated an Open Distance Learning (ODL) course in cooperation with a team of technicians in Vienna. A set of basic ideas were taken into consideration when starting the joint project: Storage of generic information instead of direct publishing was required for having the option to reuse the data for future projects. So a highly generic representation of the data with a minimal loss of information was pursued. Furthermore, for the processing of the data, platform-independent tools were preferred (Java, XML, DOM, JDBC). Metadata initiatives like Dublin-Core and RDF should be considered for easy interoperability with other information systems (Lassila 1997, DublinCore 1997).

Besides this set of conditions further requirements for our co-operative work are: The two teams are located in two cities (Salzburg and Vienna) and therefore a good concept for information exchange and documentation is needed. Additionally colleagues from the Austrian Ministry of Science and from institutes of other european countries were interested in information exchange. Hence both results, discussions and also technical information and instruction into new software tools or database interfaces had to overcome a long distance.

Generic Concept

In our project it was our goal to avoid common problems of poor planning, i.e.: *Loss of information*, *Low flexibility* (reuse of data is not possible without a huge effort), *Layout and content get mixed up* (keeping a consistent layout in the whole website is a serious issue). We decided to use a *generic data concept*, where Information is structured and entered into a relational database management system (RDBMS); We try to collect and structure not only on the surface “hard” structured data, but even “soft” data like lecture texts. Following this approach we avoid the mentioned problems and it is again easier to add meta-information (metadata) like: keywords, subjects, abstracts, links, etc. and maintain the data (like URLs, image-links, and so on). The next step is the generation of XML files, which contain the information for publication and the meta-information. The XML data is then used to generate the files for publication (HTML and PDF).

Data Structures

Besides some “free” elements the data in our project could be divided into a set of main components, namely *Biographical Articles*, the “main” information for distant learning: *Lectures*, *multimedia elements*, *original literature* (Citations, Full Text) and an *index*.

Technical Details

We decided to use Microsoft Access 97 as *database system*. At the moment there is no need for a multi-user solution so Access is used as frontend as well as for data storage.

We recognized (beside others) the following advantages of *XML* for our project: XML is a text-format, hence platform and system independent (Bray 1996). This is an important factor to consider because we want to emphasize durability in the storage of information. XML offers the possibility to store all our data without a loss of information as well as handling flexibility which allows an easy publication of the XML data.

The optimal way of *publication* would be using XML directly! This seems possible as a part of the XML standardisation efforts is dealing with style-languages, particularly DSSSL and XSL. The conceived method is to keep the data without information loss in XML and publishing this data “through” a style “filter”. The problem is, that at the moment neither Netscape Navigator nor Internet Explorer are capable to perform this task in a stable way, but it should be possible with the next browser generation.

The *conversion problem* can be divided (at least) into two sub-problems: The building of the XML files out of the database and publishing the information as HTML and PDF. As Java has adopted XML as a kind of *standard data format*, lots of free XML parsers of high quality are available and also the database linking using JDBC (Java Database Connectivity) works reliable, we decided using Java as platform independent scripting language (Sun 1999, Leventhal 1998). So the XML file creation as well as the HTML/PDF publication were done using Java programs and conventional libraries like JDBC, LotusXSL, ProjectX and others.

For technical details please take a look at: http://www.ifs.tuwien.ac.at/~aschatt/pubs/ed_media2000/paper.html.

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