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„Dissertationen Online" - The ETD Project of the German Learned Societies

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1 THE INITIATIVE[1]

In 1996 four German learned societies - comprising the fields of chemistry, informatics, mathematics, and physics - signed a formal agreement to collaborate in developing and using digital information and communication technologies (ICT) for their members, scientific authors and readers. The objectives of this collaboration were

- on a local level to bring together the activities of individual - and often isolated - university researchers and teachers in the various academic fields;
- nation wide to join forces in voicing the interests and needs of scientific authors and readers toward the educational administration, granting agencies, research libraries, documenting agencies, publishing houses and media enterprises;
- globally to use the widespread international contacts of the learned societies to exchange concepts, development and solutions and adopt them to the specific needs within one's own field.

The initiative soon caught public attention, leading to the enlargement of the group. Since then, the learned societies in the fields of education, sociology, psychology, biology, and electronic engineering have also committed themselves to the advancement of the goals of the „IuK-Initiative".[2] Funds were granted for three years by the Federal Ministry of Education and Research (BMBF),[3] to cover travel allowances for international experts, made possible four international meetings[4] and a number of highly specialized workshops that reflect central activities of the growing group.

At present, the following work groups are active within the ICT Initiative:

- Meta Data and Classification: developing common standards, according to Dublin Core, for structuring, documenting and retrieving scientific documents from Web servers, be they texts or multimedia;[5]
- Electronic Journals: publishing peer-reviewed articles in digital journals on the Web;[6]
- Dissertations Online[7]: establishing standards for meta data, retrieval, work flow
- Security and Quality of Scientific Digital Publications;[8]
- and in close cooperation with the Federal Ministry: „Global Info", a large scale project to establish a German virtual digital library.[9]

Plans for further activities include developing international contacts to digital library projects, to W3C[10], to similar national ICT initiatives abroad, and to scientific organizations, establishing a nation wide network of ICT experts to act as reviewers and representatives of the learned societies on national and international boards, defining requirements of multimedia in the natural sciences, organizing and coordinating the interests of the scientific community towards the Länder[11] ministries and international academic publishing houses, introducing standards for the meta data of personal home pages of scientists, departments and institutions, formulating guidelines for authors with special emphasis on copyright questions, including recommendations for proposal contracts with publishers, developing an interdisciplinary network of Web servers, and setting up a networked pool of ICT experts within the German universities.

2 DISSERTATIONEN ONLINE

2.1 Funding by the German National Research Foundation

The activities of one of the workgroups led to a proposal to the German Research Foundation (DFG)[12] to fund an interdisciplinary project to present dissertations online on the Internet, involving five universities (Berlin, Duisburg, Erlangen, Karlsruhe, and Oldenburg), and five academic fields, i.e. chemistry, education, informatics, mathematics, and physics. Funding was initially restricted to one year. It started in the spring of 1998 and was terminated in March 1999 with a conference held in Jena, Germany, provoking much attention among librarians and academics. Though an

infrastructure had been set up and a number of problems were solved, much remained to be done. Therefore a subsequent proposal to DFG was drafted. DFG funds were awarded for a second year, this time with a heavy emphasis on the collaboration with libraries and university computing centers. The project's research and development will extend from May 1999 to May 2000. The overall volume of both grants was some US $ 700,000.

New participants in the second proposal are computing centers and German National Library (DDB)[13]. The project is directed by the author, professor of computer uses in education at Humboldt University, Berlin.

2.2 Rationale

By law, every graduate student in Germany is obliged to publish his or her dissertation, putting a heavy financial burden on young professionals. Unless the dissertation is published by a well known publishing house, dissertations often are not easily accessible. Furthermore, retrieval by means of bibliographic sources will be cumbersome, if not impossible. With the advent of digital production, a convincing alternative model is being developed, using the Internet as means of dissipation as well as retrieval, thus making scientific research more productive.

The learned societies can bring in their demands regarding the graduation procedures and the search aspects necessary for their respective field of science and offer a fast and economic publication form to graduate students, enabling a quick world-wide dissemination of research findings. For libraries, a precise arrangement is necessary, defining the format of documents and meta data for different objectives: retrieval, reading, printing and archiving. The inclusion of the German National Library (DDB) in the project is also necessary, since this library is obligated legally to collect dissertations of the Federal Republic (also in electronic form) and have them accessible in the future. Also, cooperation with publishing houses seems necessary.

The project evoked extensive communications between learned societies and libraries. The discussions of the last year, which have gone far beyond valuable, but isolated single projects in the past, made meaning and consequences of electronic documents lastingly clear: Archiving and supply of research results laid down in dissertations do not any longer represent a mere act of administration of the libraries. Rather, under the conditions of modern electronic publication possibilities, archiving and protection of scientific work in electronic form as well as retrieving scientific information via „meta data" from digital sources necessitates the active participation and collaboration between learned societies, libraries and graduate students is indispensable.

At a time of rapid development in the electronic publication, coordination between the parties involved - faculty, computing centers, libraries, publishers - is indispensable. Learned societies need to work out mutually acceptable solutions in order to produce synergies and to guarantee widespread acceptance.

3 Development in Subgroups

Within an interdisciplinary approach, the project comprises several fields of science, computing centers and libraries.

3.1 Meta Data for Dissertations

This subgroup, headed by mathematician Prof. Törner of Duisburg University[14], has developed a tool to register bibliographic dissertation meta data in accordance with the German National Library, the MyMetaMakerforTheses (MMMfT).[15] It has also developed a broker for a meta data based search for dissertations.[16] It is developing methods of registering or extracting structural meta data, i.e. table of contents, headings of tables and graphs, reference to important content wide terms (special index, name index etc.), references (links) to external sources (printed as well as Web sources) the bibliography, references within the work definitions, or mathematical/chemical formulas.

The group is adapting the MMMFT to multimedia material (e.g. video sequences) in cooperation with the multimedia subgroup and the German national library, cooperating with the formats subgroup with respect to digital dissertations in the natural sciences.

3.2 Retrieval and Legal Aspects

This subgroup is headed by physicist Prof. Hilf, physics of Oldenburg University)[17]. It has a twofold objective:

Retrieval
Using Reseach Description Frameworks (RDF) and the Dublin Core (DC), this subgroup has been working on transferring meta data in retrieval procedures and a work flow, installing an upload tool[18] for the electronic full text and running a Harvest Broker[19] to search for dissertations worldwide, including a map of online dissertations in Europe.[20]

Legal Aspects.
The group has interpreted German Copyright Law provisions with regard to dissertations and formulated recommendations for graduate students concerning legal aspects. It has colleted university provisions concerning digital dissertations and formuled drafts for faculties and universities to enable publishing of dissertations on the Internet.

3.3 Formats for Retrieval, Reading and Storing

Information technologist Dr. Schirmbacher, director of the Humboldt University computing center in Berlin,[21] has joined the project and brought into its context the local Humboldt project DiDi (Digitale Dissertationen)[22] for a digital library of Humboldt dissertation, ultimately aiming at a secure and robust document server for all kinds of digital publications (storing, searching, archiving).

His subgroup has developed a document type definition (DTD) for digital dissertations (DiML) in the natural sciences and in educational science, transferring meta data from text processing systems used by the graduate student into general formats such as HTML, XML and SGML, implementing and testing conversion tools to create SGML/XML-based documents from texts produced by commonly used word processing systems (MS Word, LaTeX, Word Perfect) and conducting a usability study of new XML-tools.

3.4 Multimedia in Dissertations

Prof. Gasteiger of the chemistry department of Erlangen University[23] has been assigned the task of integrating multimedia elements (i.e. chemical structures, specters, raw data, references, pictures, animations, audio and video sequences) into multimedia dissertations in chemistry, medicine, mathematics, physics, and education, providing search tools specific to the different scientific disciplines, and creating an easy-to-use tool set for libraries.

3.5 Support of Authors, Faculties and Libraries

The group at the department of educational science, headed by Prof. Diepold at Humboldt University, Berlin[24], has been developing guidelines for digital dissertations, testing a tutorial system for graduate students, evaluating the acceptance of guidelines with graduate students, and providing basic support information for faculties, libraries, universities, and learned societies on the diss_online Web server and on CD-ROM.

3.6 Libraries: Work Flow and Archiving

The State and University Library of Göttingen,[25] headed by Prof. Mittler, has been testing the products developed in the subgroups, defining procedures for a library work flow to be adopted by other university libraries.

The German national library (DDD)[26] in Frankfurt, headed by Dr. Niggemann, has developed an entry tool for digital dissertation meta data based on HTML 4, in close cooperation with subgroup Meta Data[27]. There is a complete documentation with the DDB and a well structured table of dissertation specific and technical meta data.[28]

The DDB has defined a preliminary list of formats acceptable to the German National Library and is developing procedures for long term deposit.

3.7 Coordination of the Subgroups

Responsible for the overall coordination is Prof. Diepold of Humboldt University, Berlin[29]. This includes presenting the project in the Internet, acting as clearing house for national and international contacts, organizing meetings and workshops, informing the scientific community, including libraries, presenting the project on exhibitions, editing reports, and advising faculties, libraries and learned societies.

4 RESULTS

4.1 Results to be Expected in 2000

At the end of 1999 we will have completed formal requirements and procedures for a common procedure to officially join Dissertationen Online on a national level. This is supported by the conference of university computing centers, academic libraries and the CIT initiative of the learned

societies. In 2000 we expect the learned societies to back up the project by recommending their members, on a national scale, to use the procedures, guidelines and materials developed in the project.

Since the Conference of the German ministers of education (KMK)[30] has recently decreed an online publication to be an acceptable way of meeting the publication requirement for dissertations in Germany, universities now are free to offer this option to their graduate students. Some 20 German universities have followed the KMK move so far, and we expect that many will follow, as soon as the recommendations of Dissertation Online as to formats, library procedures, guidelines and support system are completed.

4.2 Operable to Date

As of now (October 1999), the following materials are operable:

- entry form for digital dissertation meta data has been completed and is being used in the participating projects, serving as bibliographic document with the German National Library. a complete documentation[31] with the German National Library and a well structured table of dissertation specific and technical meta data at the DDB;
- Harvest gatherer at several universities with a central broker at Oldenburg University for digital dissertation;[32]
- a Harvest network of online dissertations in physics;[33]
- a document type definition for digital dissertations (DiML);[34]
- style sheets for Microsoft WinWord; [35]
- conversion procedures to transform WinWord and LaTeX documents into SGML;
- approximately 50 documents in SGML format;
- a procedure for digitally signing documents;
- training materials and guidelines for authors.[36]

5 Linking the German Activities to International ETD Projects

In March 1999, Dissertationen Online has formally joined the Network of Digital Libraries of Theses and Dissertations (NDLTD), thus drawing on the broad international experience of colleagues from a dozen countries and bringing into this common enterprise its specific expertise. Some of the Web pages are being translated into English in order to facilitate contacts. At the recent workshop on ETD, organized by UNESCO in September 1999 in Paris, a close cooperation with a number of ETD projects was agreed upon, with Dissertationen Online serving on a steering board, together with the ETD projects of Virginia Tech, Australian universities, Montreal and Lyon Universities, and the Organization of American States. The overall coordination will be by NDLTD.

Dissertationen Online has offered to UNESCO and NDLTD to use the facilities of the German Educational Server[37], viz. the relational database system for institutions, material, persons, and events, operational since 1997, to set up an ETD clearing house, structuring information on universities that offer their students ETD facilities or are interested in developing ETD programs; project descriptions, guidelines, training packets, etc: experts in the field of ETD; international ETD conferences as well as regional workshops of general interest.

References

Web: <http://www.educat.hu-berlin.de/diss_online/>

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1 Information on the ICT Initiative (in English): <http://www.iuk-initiative.org/index.html.e>

2 IuK stands for „Information und Kommunikation"

3 BMBF stands for „Bundesministerium für Bildung und Forschung" (<http://www.bmbf.de>)

4 Berlin 1995: „New Ways of Scientific Information and Communication"
Munich 1996: „New Media in Science"
Würzburg 1997: „Multimedia in the Sciences"
Hamburg 1998: „Integrated Scientific Information Systems"
Jena 1999: „Dynamic Documents"

5 <http://www.mathematik.uni-osnabrueck.de/ak-technik/>

6 <http://www.iuk-initiative.org/ej/index.html>

7 <http://www.educat.hu-berlin.de/diss_online/englisch/index1e.html>

8 <http://www.physnet.uni-hamburg.de/secu/>

9 <http://www.global-info.org/index.html.en>

10 the World Wide Web Consortium (<http://www.w3c.org>)

11 „Länder": the 16 federal states in Germany

12 DFG stands for „Deutsche Forschungsgemeinschaft" (<http://www.dfg.de>) and is Germany's National Science Foundation

13 DDB stands for „Die Deutsche Bibliothek" (<http://www.ddb.de>)

14 <http://www.ub.uni-duisburg.de/dissonline/eindex.htm>

15 <http://elib.Uni-Osnabrueck.DE/MMMfT/>

16 <http://elib.Uni-Osnabrueck.DE/Harvest/brokers/$>

17 <http://elfikom.physik.uni-oldenburg.de/dissonline/olengl.htm>

18 <http://www.physik.uni-oldenburg.de/docserver/wufi/cgi-bin/page1.pl.cgi>

19 <http://elib.Uni-Osnabrueck.DE/Harvest/brokers/$>

20 <http://elfikom.physik.uni-oldenburg.de/dissonline/disEUROPE.htm>

21 <http://dochost.rz.hu-berlin.de/epdiss/tp3-en.html>

22 <http://didi.rz.hu-berlin.de/>

23 <http://www2.ccc.uni-erlangen.de/diss_online/m_daten.htm>

24 <http://www.educat.hu-berlin.de/diss_online/projekt5.htm>

25 <http://www.sub-goettingen.de>

26 <http://www.ddb.de>

27 <http://www.ub.uni-duisburg.de/cgi-mmmft/Edit-1.2.cgi>

28 <http://www.ub.uni-duisburg.de/dissonline/englmetatags.html>

29 <http://www.educat.hu-berlin.de/diss_online/projekt8.html>

30 <KMK stands for „Kultus-Minister-Konferenz", cf. www.kmk.de>

31 <http://deposit.ddb.de/metadiss.htm>

32 <http://elfikom.physik.uni-oldenburg.de/dissonline/PhysDis/dis_europe.html>

33 <http://elfikom.physik.uni-oldenburg.de/dissonline/PhysDis/dis_europe.html>

34 <http://dochost.rz.hu-berlin.de/epdiss/projekt.html>

35 <http://dochost.rz.hu-berlin.de/epdiss/vorlage.html>

36 <http://www.educat.hu-berlin.de/diss_online/autoricht/autor1.htm>

37 DBS „Deutscher Bildungs-Server" (<http://www.eduserver.de>)

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