

Electronic Publishing at Humboldt University Berlin: Concepts, Tools and Services

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Abstract

Originally established to merely publish electronic theses and dissertations (ETDs) as well as postdoctoral theses, the edoc server at Humboldt University Berlin (<http://edoc.hu-berlin.de/>) has become the service platform for scholarly publications of all types. It is an integral part of the university's information infrastructure which also contains a teaching management system, a virtual library portal, and a media portal. During the past years the edoc server has become the central place for electronic publishing within the university. On the basis of a hosting concept, the Electronic Publishing Group which is in charge of the edoc server also provides its publishing services for external authors, editors and institutions likewise. And being a DINI certified document and publication server, the technological components and the organizational workflows developed for the edoc server exemplify other scholarly publishing servers. As a joint group formed by the Computer and Media Service and the University Library of Humboldt University the Electronic Publishing Group deals with all issues associated with scholarly electronic publishing, including technical, library, and legal aspects. Combining the development of publishing tools and services with its routine operation the group consists of permanent and project funded staff. This paper describes the edoc server at Humboldt University and details on both the technical and non-technical parts of the entire publishing service.

Keywords: Institutional repository; open access; publication chain; ETD; XML; print on demand; metadata; OAI; retrieval; author support; peer review; hosting; workflow software

1 Introduction and Motivation

There are many reasons to support Open Access as a publishing concept for and at universities. From the view of a service department like the library it is vital to acquire, to make accessible and to provide scientific information to the university's research and teaching community. This leads, however, to the common agreement to support both ways, the *green* [1, 2] and the *golden* [3] road to open access. The concept started in 1997 by Humboldt University has developed into an essential part of the university's information infrastructure and to a well accepted service throughout all departments. The edoc server at Humboldt University Berlin (<http://edoc.hu-berlin.de/>) has become the service platform for scholarly publications of all types. It is an integral part of the university's information infrastructure which also contains a teaching management system (Moodle, <http://lms.cms.hu-berlin.de/moodle/>), a virtual library portal (Metalib, <http://digibib.kobv.de/hu.html>), and a media portal (Mneme, <http://medienportal.hu-berlin.de/>).

The University Library and the Computer and Media Service have installed a joint Electronic Publishing Group, which concentrates on offering the service to potential authors and editors. Besides enhancing the visibility of the university's research results, to increase the availability of Humboldt University's scientific output, esp. those that were hardly available and accessible like dissertations or research papers, it is the primary goal to establish a *New Culture for Electronic Publishing* [4] within and outside the university by encouraging scientists to use new publishing models and change publication habits.

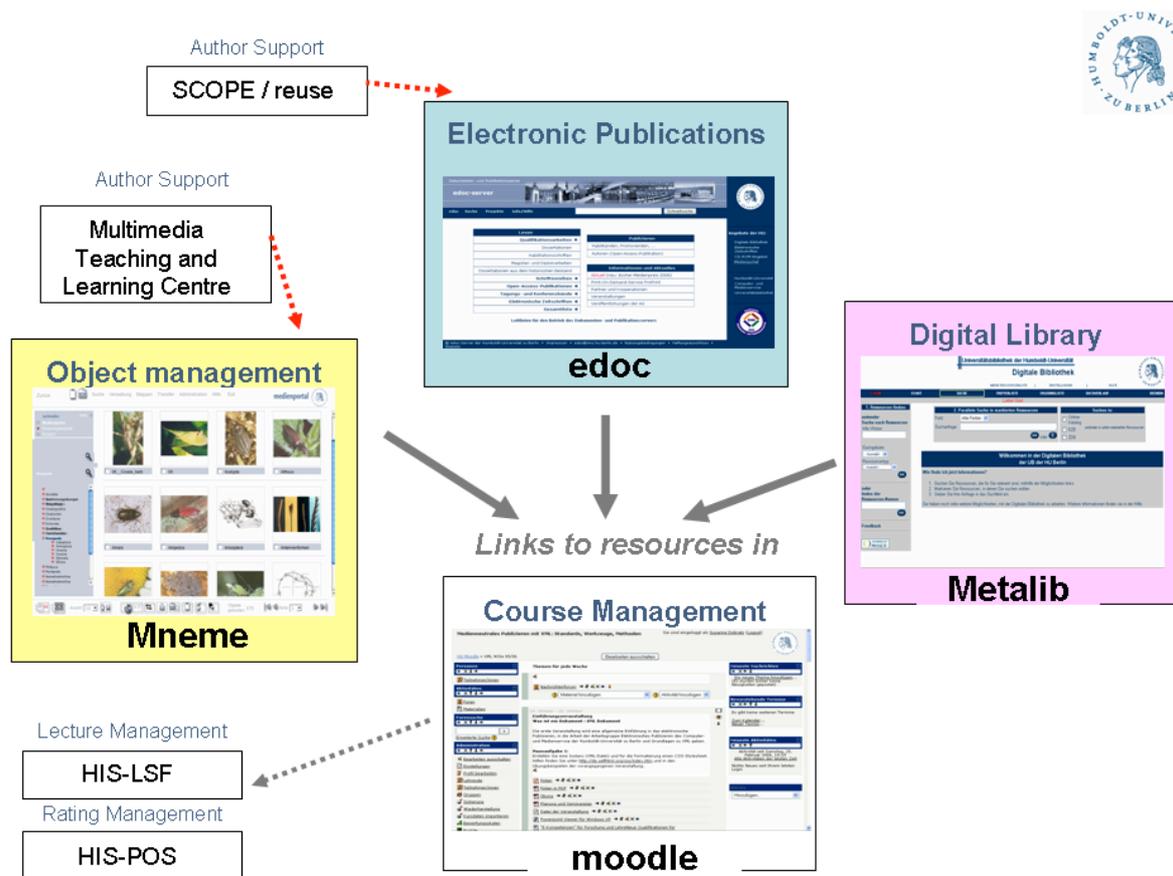


Figure 1: edoc as part of the Humboldt University's information infrastructure

The support of authors and editors on the one hand and “reading” users on the other hand implicates different technological aspects. These are:

- Support for the production and writing process for authors by providing style sheets for a variety of text processing systems, such as Microsoft Word, LaTeX, QuarkXPress, Indesign, FrameMaker+XML, etc. Those allow a structured way of writing and form the basis for an XML based publishing approach.
- Customization and provision of filters and tools for an XML based export of documents from proprietary systems and document formats to a standardized cross-media applicable approach
- Provision of a workflow support system to enable computer supported peer review processes for e-journals.
- Provision of the technology to enter, store and export metadata. A customization of metadata sets used, of the librarian’s user interface and the generic adaptation of the user interfaces displaying a particular e-journal is an important factor to enhance the visibility of the published documents and the possibility to make those accessible through well established and commercial services, like Google, Google Scholar, SCIRUS, etc.
- The usage of a persistent identifier system, the uniform resource name (URN) in form of the national bibliographic number (NBN, for implementation details see <http://www.persistent-identifier.de>) allows a worldwide unique assignment of the electronic documents via the internet.
- Offering additional services like print-on-demand or hosting.

The growing acceptance of the service can well be documented in figures: While it only contained dissertations and postdoctoral theses in 1997 – 1999, the edoc server offered mainly scientific series, e.g. the reports issued by the Institute for Computer Science, the reports issued by *nestor* (the *German Network of Expertise in Long-Term Storage of Digital Resources*, <http://www.longtermpreservation.de/>), *DINI* (*German Initiative for Networked Information*, <http://www.dini.de/>) publications, electronic journals edited at the university, like *SPEPS* (*Stochastic Programming E-Print Series*) published by the Institute of Mathematics or *Historisches Forum* as

well as pre- and post prints of peer reviewed journal articles from Humboldt University's scientists in 2005. In 2004, the publication of digitized material was started with the EC funded project *reuse* (<http://www2.uibk.ac.at/reuse/>), that allowed an exploration of appropriate technologies like Meta-E (<http://meta-e.aib.uni-linz.ac.at/>) using METS (<http://www.loc.gov/standards/mets/>) or e-bind (<http://sunsite.berkeley.edu/Ebind/>) to offer digitized copies of rare books in a user centred approach.

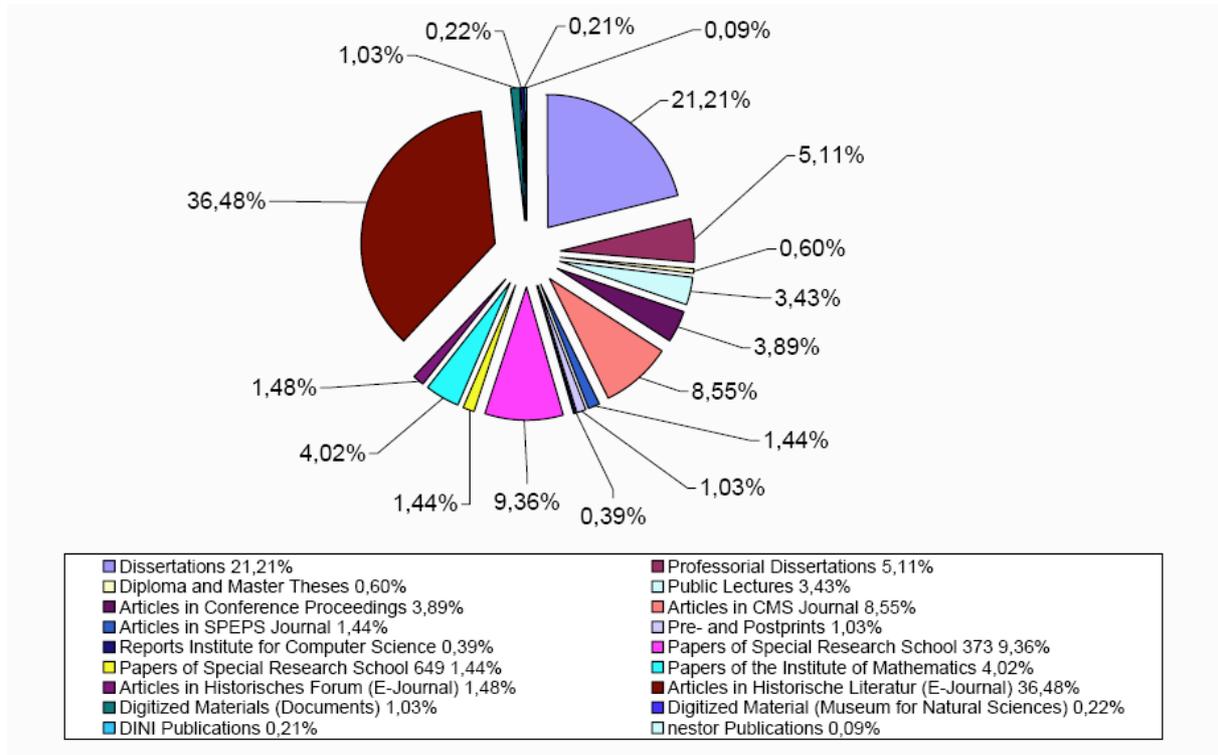


Figure 2: Documents on the edoc Server (27.02.2006)

2 XML - The Core Document Format for edoc

Since the first steps to establish an electronic publishing service were taken in 1997 the Electronic Publishing Group has embarked on a cross-media publishing strategy using a standardized, non-proprietary, and human readable file format as the basis to produce, process, and store electronic documents [5]. Hence, SGML and subsequently XML have been applied as the central archiving formats on the edoc server. The consequential usage of XML involves several benefits within the publishing process. XML files can be transformed into multiple presentation views, e.g. HTML and PDF, and can be converted into other XML structures to enable value added services, e.g. export of structured bibliography entries, RSS feeds, etc. Due to its ISO and W3C standardization and its independence from commercial vendors XML provides a stable basis for long-term preservation. Moreover, XML enables qualified retrieval possibilities.

On the basis of this XML driven document approach a complete workflow has been developed containing authoring aids, validation mechanisms, conversion tools, and transformation styles. Starting from XML document models the different workflow components are described in detail within the next few paragraphs.

As XML represents the central data format for the edoc server XML based document models form the core of the technological document workflow. The structure definitions of which the Dissertation Mark-up Language (DiML) is the most commonly used one are encoded as DTDs. For obvious reasons different publication types require modified document models, and with it modified DTDs. Thus, an array of different DTDs has been developed during the past years while new types of publications have emerged to be handled as electronic documents at the edoc server. In order to allow reutilization of DTDs and their different parts for new document models a modular DTD system has been developed and implemented. Using this system which is equipped with a web interface new document models can easily be derived from different DTD fragments (modules) and assembled to new DTDs.

Whereas XML serves as the starting point for all presentation and retrieval formats and as well as archival format for long-term preservation activities it is not suitable as an authoring format. Instead, mainly current word processors (e.g. MS Word, Open Office) and LaTeX are used to create scholarly publications. To allow subsequent conversions to XML structures several plug-ins have been developed to be used by authors, endorsed by adequate guidelines and checking tools.

In particular, the Electronic Publishing Group provides template files for MS Word and Open Office including styles, macros, and additional menu entries, styles and guidelines for LaTeX, and automated validation tools to check the formal correctness of documents. Moreover, authors and editors of electronic publications are supported in various forms (see section 0).

The submission process encloses the formal validation of the document and is followed by the automatic conversion into an XML based document format, e.g. xDiML. Starting from an XML representation the documents are converted into browser readable HTML and in case of journal articles and conference papers also into PDF. When the document layout cannot be determined as strictly as for periodicals and proceedings a PDF version is directly created from the original word processor format, e.g. in case of dissertations.

To realize all these document conversion and transformation steps various tools have been developed which help automate the entire workflow. This includes XSLT scripts, Java programs, Perl scripts, CSS files, and shell scripts. A web based and role oriented workflow system helps to manage the organizational and technological process the different documents have to pass. In the near future the system is going to be extended by an embedded component which allows the automated activation of conversion, validation and transformation tools without having to leave the workflow system interface. It will adhere to guidelines by [6].

3 The edoc Publishing System

The edoc server itself has become a DINI certified server [7] in 2004. This states a certain technological level and an organizational presentation and acceptance within the university. Coming from a homogeneous document server solely used for electronic theses and dissertations the edoc server has developed to a document repository aiming at publishing the entire scholarly output of the university and beyond it. This leads to an increase in complexity in terms of metadata models, presentation forms and document structures. Moreover, the system is required to provide web based input and browsing interfaces which are adaptable regarding layout and functional specifications – especially in view of electronic journals or even external institutions using the edoc server as their publishing platform (see section 0).

When starting to tackle these problems out-of-the-box solutions for institutional repositories like Eprint (<http://www.eprints.org/>) and DSpace [8] had not yet emerged. Apart from a lacking XML support and relatively confined configuration facilities of these software packages this historic background was the main reason to autonomously develop and maintain an own repository software.

In order to realize this, a configurable metadata system that allows the definition of serial or publication specific metadata sets has been developed providing individually adaptable metadata registration masks as well as search and browsing interfaces. The configuration of browsing sites include different possibilities to access and order the publications – e. g., by subject classification, issue number, author name or institutional structure. Both types of web based front-ends, the registration forms and the browsing and searching sites, can be configured by XML and template files and therewith follow a standardized and transparent software approach. They can therefore easily be adapted to different publication series. With the aid of a user access control component editors and institution staff members can manage their publication series including document upload. With these abilities the metadata system represents the core of the hosting concept established by the Electronic Publishing Group. Providing a convenient upload mechanism for full text documents the metadata system also serves as a document management system. All uploaded format versions of a document are automatically assigned to a globally unique URN allowing a persistent resolving mechanism independent of physical server addresses and structures.

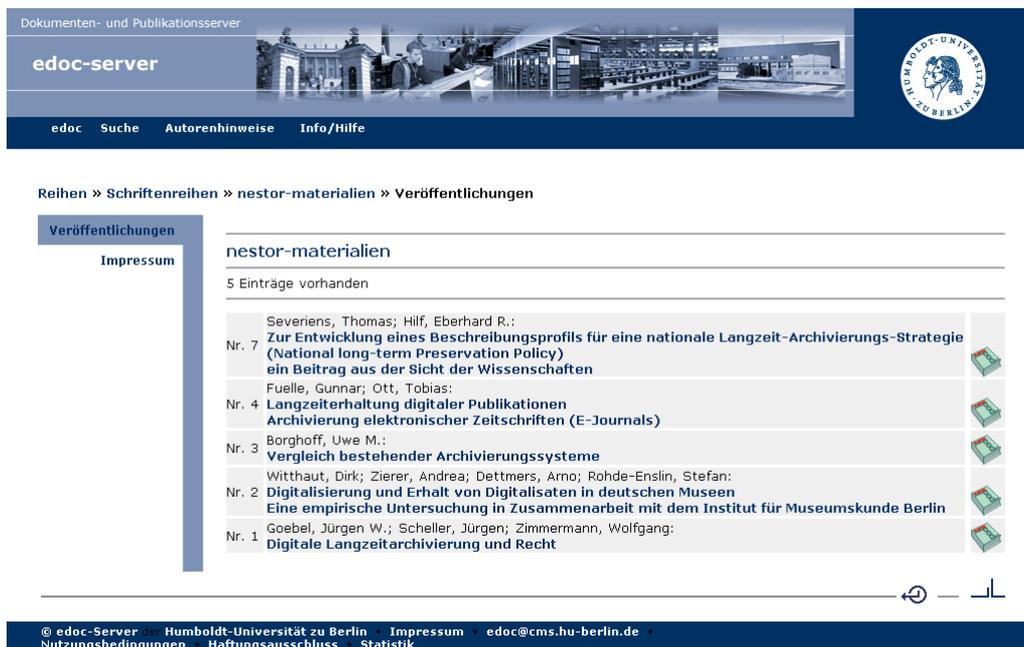
The metadata system is equipped with an OAI interface on top of which a print-on-demand service has been established (see chapter 0) and which forms the basis of the strong integration of the edoc server into national and internal scholar search engines, networks, etc. For the nearer future, it is planned to endorse the system by other import and export interfaces, e. g., to allow the dynamic integration of metadata information into websites of institutions or authors whose electronics publications are hosted on the edoc server.

As a prerequisite to measure impact factors of documents and series in the future detailed usage statistics are provided to editors and publishers.

4 Additional Services

PROPRINT

One of our most frequently used services is the print-on-demand service ProPrint (<http://www.proprint-service.de/>) [9] jointly developed by the Humboldt University and the State and University Library Göttingen (<http://www.sub.uni-goettingen.de/>). Using a PDF merge function tailor-made publications can be delivered as paperback copies by this service. ProPrint is based on the Open Archive Initiative Protocol for Metadata Harvesting (OAI-PMH). It uses XML and HTTP. Therefore, the integration of this service into an existing document and publication server is very simple. ProPrint requires standardized formats and a certain level of technical quality in order to enable the document exchange between servers. ProPrint uses Adobe's PDF format, but the technical quality of documents can vary due to scanning mistakes or upgrades to higher PDF versions. This became clear during the pilot scheme when representative documents were tested by trying to print them at a professional print shop. Currently, ProPrint offers a print-on-demand service in Germany and Austria for nearly 6000 documents from the libraries at Humboldt University Berlin, SUB Göttingen, University Library Tübingen (<http://www.ub.uni-tuebingen.de/>) and University Library Graz (<http://www.kfunigraz.ac.at/ub/>). Between the document servers of these institutions a virtual connection was established. Within this virtual network the metadata information of all servers is searchable via one single search interface. The user has the chance to build his own collection. It is possible to combine different documents or even different chapters. The orders are printed and bound by decentralized professional print shops and distributed to the user. Users without access to a local ProPrint outlet copy shop can order their book directly from Göttingen and will receive it via conventional mailing. This service provides users with unlimited access to distributed electronic documents via the central ProPrint search engine and sets up an efficient print-on-demand workflow for those libraries that publish electronic information.



The screenshot shows the 'edoc-server' website interface. At the top, there is a navigation bar with 'edoc', 'Suche', 'Autorenhinweise', and 'Info/Hilfe'. Below this, a breadcrumb trail reads 'Reihen » Schriftenreihen » nestor-materialien » Veröffentlichungen'. The main content area is titled 'Veröffentlichungen' and 'nestor-materialien', indicating '5 Einträge vorhanden'. A list of publications is displayed, each with a number, author(s), title, and a small icon representing a document or book.

Nr.	Author(s)	Title
Nr. 7	Severiens, Thomas; Hilf, Eberhard R.:	Zur Entwicklung eines Beschreibungsprofils für eine nationale Langzeit-Archivierungs-Strategie (National long-term Preservation Policy) ein Beitrag aus der Sicht der Wissenschaften
Nr. 4	Fuelle, Gunnar; Ott, Tobias:	Langzeiterhaltung digitaler Publikationen Archivierung elektronischer Zeitschriften (E-Journals)
Nr. 3	Borghoff, Uwe M.:	Vergleich bestehender Archivierungssysteme
Nr. 2	Witthaut, Dirk; Zierer, Andrea; Dettmers, Arno; Rohde-Enslin, Stefan:	Digitalisierung und Erhalt von Digitalisaten in deutschen Museen Eine empirische Untersuchung in Zusammenarbeit mit dem Institut für Museumskunde Berlin
Nr. 1	Goebel, Jürgen W.; Scheller, Jürgen; Zimmermann, Wolfgang:	Digitale Langzeitarchivierung und Recht

At the bottom of the page, there is a footer with copyright information: '© edoc-Server der Humboldt-Universität zu Berlin Impressum edoc@cms.hu-berlin.de Nutzungsbedingungen Haftungsausschluss Statistik'.

Figure 3: edoc Proprint Button

CONFERENCE PAPER MANAGEMENT SYSTEM

To support peer review processes we offer two different systems: a conference system and GAPWorks. For scholarly conferences and conventions a widely used conference system has been designed in-house to not only facilitate the paper review process but also the conference registration process, and the scheduling of the conference. It has been completely designed for a web use, i.e. the system is as independent as possible from a specific platform or software and worldwide accessible. It supports different user groups, like authors, reviewers, attendees and members of the organizational committee. Each group has its own role within the system and due to a sophisticated role model, each of these groups has only access to information intended for it. E.g. authors do

not need to see the administration section, etc. During the login process a specific view on the conference system for each user is generated based on the user's roles. The setup, administration and configuration can also be done using a web interface.

The paper handling capability of the system allows each authenticated user to submit papers up to a specific date, usually the submission deadline. After submission this paper is assigned to a group of reviewers – automatically or manually – depending on the configuration. The reviewers evaluate the submitted work, may comment on it and rate it verbally or on a specified scale. After acceptance the reviewed works can be assigned to different discussion or session categories, based on relevance, topic and, of course, rating.

Another feature of this system is the ability to schedule sessions and the usage of lecture halls. For each session lectures and chairs can be assigned. The system checks that neither lecture halls nor session chairs are assigned to more than one concurrent session. For information reasons it also generates a schedule and publishes it as a web page. The last main functionality of the conference system is the organization of the registration process and management of all the conference participants. It allows the configuration of different registration fees for different groups like students, authors, etc. and can take into account the date of registration – i.e. a lower price for early birds. Additionally the system also allows different conference packages, i.e. including certain extra activities or workshops. The layout of the system is very flexible and easily configurable. The system can either be included as a component into specific conference web sites or be used as the central conference site.

The screenshot shows the 'Papers' section of the ETD 2003 conference system. On the left, there is a sidebar with user information for Susanne Dobratz, including her status (Normal User, Paper Manager, Chair, SPC, Exempt from fees) and various navigation links like 'review', 'ETD 2003', 'Logout', 'Change your personal data', 'Programme', 'Contact', 'Registration', 'List Persons', 'List Papers', 'Review Abstracts', and 'Manual'. Below these are 'Topics' and 'Conference Venue' sections.

The main area displays a table of papers with columns for Paper title, Authors, State, SPC, and Comments. The papers are organized by session (A, C, E, P, S). The 'State' column contains a sequence of letters: A, S, K, S, P, R, U, N, D. The 'SPC' column contains a sequence of letters: A, S, K, S, P, R, U, N, D. The 'Comments' column is empty.

Session	Paper title	Authors	State	SPC	Comments
A	A Union Catalog for ETD's An Update	Chachra, Vinod (chachrav@vtls.com)	A S K S P R U N D		
C	Collaboration and ETDs: Institutional and International Strategies	Lippincott, Joan K. (joan@cni.org)	A S K S P R U N D		
E	Electronic Theses and Dissertations and the Necessity of a New Culture of Electronic Publishing	Schirmbacher, Peter (schirmbacher@rz.hu-berlin.de)	A S K S P R U N D		
P	Panel discussion - The UNESCO Guide brings ETD's to your university	Allard, Suzie (slalad@uky.edu); Hagen, John (John.Hagen@mail.wvu.edu)	A S K S P R U N D		
S	Scientific information for	Mathe, Axel			

Below the table, there are options for 'Applied for contribution (not yet accepted)', 'Special', 'Key note', 'Short Communication', 'Presentation (firm)', 'Rejected', 'Uploaded first version', 'New version required', and 'Definitely accepted'. There is also a search box and a 'Search' button. The 'Entries per page' are set to 10, with options for 1, 3, 5, 10, 20, 50, and all. The 'SPC' status is 'not reviewed'.

Figure 4: The conference system in use for ETD2003

PEER REVIEW SYSTEM

For other publications that need a structured way of handling a review process but have no need for registration or hall management we offer the GAPWorks system. GAPWorks was developed within the GAP project specifically to realize the peer review process for electronic publications and is published as open source [10]. It provides an online management of persons, roles and for the different steps of a publication process, from submission over technical review to the imprimatur. The metadata can be extracted from GAPWorks in an OAI-PMH compatible format and be made available to service providers, as our metadata system. We therefore offer GAPWorks to editors that would like to handle the internal document management via GAPWorks and use our publishing system for presenting the documents.

LONG-TERM PRESERVATION

The edoc server is integrated into the common backup system of the university. Additionally there is a tight cooperation with the German National Library (DDB: Die Deutsche Bibliothek, <http://www.ddb.de/>) in terms of long-term storage of digital documents. Ensuring reachability of digital documents and a stable citation independent from URLs, which often change over time, the edoc server uses *Uniform Resource Names (URN)* in form of the *National Bibliographic Number (NBN)*. This is a structured expression containing the kind of URN, the country, the library consortium and the publishing body responsible for the digital publication. In addition a

unique identifier for that particular document including a check number is included. The URN gateway (<http://www.persistent-identifier.de/>) maintained by the German National Library (DDB) and the browser plug-ins developed within the *EPICUR project* allow to access digital documents via a common web browser. The browser then interprets a URN put into the address line and redirects to the resolving server of the DDB.

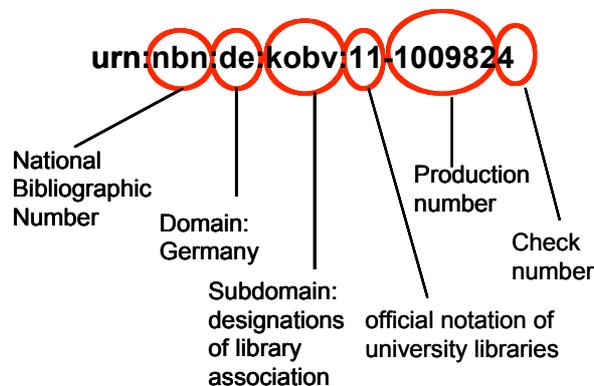


Figure 5: Composition model of the urns used for the edoc server

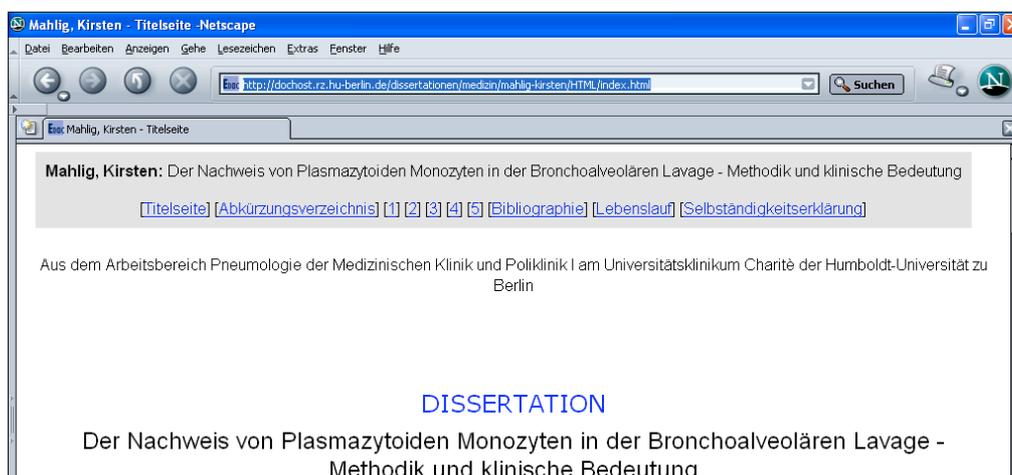


Figure 6: URN:NBN:DE:KOBV:11-1009824

Providing such a service for German publishers pushes the usage of persistent identifiers in form of URNs also for institutional repositories in Germany. Humboldt University is, as of July 1st, 2005, one of 87 institutions in Germany that are already using URNs.

As part of the edoc server technology, a specialized OAI interface delivers the persistent identifier in form of a URN to the DDB that automatically updates their database of documents and identifiers daily and stores the digital documents of the edoc server at the DDB deposit server (<http://www.deposit.ddb.de/>).

5 Support for Authors and Editors

In the last sections we described the different services we offer. As can easily be seen, these services depend in parts on each other and are very complex. For example the quality of the generated XML files depends largely on the correct use of our document templates. Another example is the conference system: the desired configuration and knowledge about all the little tweaks and features is not easily achievable. For that reason we also offer a wide range of support to authors and editors.

In general we provide documentations of our tools for internal and external use or refer to web sites offering detailed information, as for example about certain LaTeX specifics. Users of our document templates can rely on a comprehensive guide on how to use it, along with example documents and a check list [4]. For doctoral students and users of the “dissertation-hu” template we offer support via e-mail and telephone and give lessons at least once a month. For serious problems we also offer personal appointments. Authors of other publications than dissertations are supported individually, depending on the need and the level of service agreed on.

As a relatively new option to many authors the open access publication of their works needs special attention. The primary focus lies on individual support regarding to formatting, PDF creation, e.g. the inclusion of fonts and metadata and what open access means. The most important questions regard to the copyright. We have set up a special web site concerning this problem and link to information pages like the SHERPA/ROMEEO list [11]. We try to help authors with their copyright questions by looking up information on that list and give them advice from our experience with certain publishing companies, but we are not allowed and capable to give a judicial judgement of their publishing rights. Another issue with these authors is that most of them do not have a librarian background. Sometimes they do not know, what metadata they have to enter. The librarians in our group gladly help them in these cases.

Not only authors need support. We also host several electronic journals and the document server for the *Berlin-Brandenburgische Akademie der Wissenschaften* (Academy of Sciences, BBAW). The editors of these electronic journals and document servers also need support on how to use the tools we offer them. Most importantly we help them by providing detailed knowledge about the technical necessities for setting up electronic publications, discuss workflows with them and name possible options and alternatives that they can provide to their users. As will be further described in the next section we also customize our documentation for these editors, offer workshops for them and their authors and listen to their problems. Depending on the level of service we agree on, we provide technical support via e-mail or phone only to the editors or even to their authors.

6 Hosting and Deployment

The edoc server is designed as a distributed publishing system based on a centralized hosting approach. This means that the published documents as well as the corresponding metadata are stored on central file and database servers while the different publication series can be managed by the responsible editors or institutions' staff independently of their affiliations and locations. The hosting concept consists of a matrix representing the different services and their usage. Those are:

1. Provision of information material for end users / authors
2. Hosting agreements
3. Author's support
4. Authoring tools and publishing platform technology
5. Publishing platform
6. Security and long-term preservation
7. Workflow and workflow system
8. Conference system
9. Data administration, library support, cataloguing
10. Conversion services
11. Additional services, like ProPrint, OAI interface, URN interface

The tendency to support the editors and publishers of E-Journals or E-Publications is growing, see Figure 2. The standard portfolio offered includes the usage of the Metadata database, an author support package and the adaptation of the GAP reviewing workflow. Additional services like the OAI interface, the search interface, ProPrint are the most attractive parts to potential users and the argument to use edoc as their publishing platform.

7 Discussion

We have described a service to support electronic publishing for a whole university. The focus, however, lies in the provision of technology and training of potential publishers, editors and authors and by purpose not in the organization of the publishing process as distribution process, as this is done by commercial publishing companies. The interest of the university primarily is to enhance the visibility of its scientific output and excellence and not to reach the maximum monetary return of investment in this case. But it is still obvious that edoc and the electronic publishing service do not convince large parts of the university to change from traditional publication habits. There are still necessary technological and organizational enhancements to be done. Those are e.g. the support of alternative copyright and licensing models, like Creative Commons (<http://creativecommons.org/>), the introduction of an impact measuring mechanism [12, 13] that is internationally standardized and accepted for institutional repositories, like the Counter (<http://www.projectcounter.org/>) model is for e-journals. The stabilization of the edoc services in term of becoming a trusted digital repository is another way to maintain the digital output of a university for future generations, see [14, 15, 16, 17].

8 Conclusions

The publishing audience of the edoc server has been changed during the last two years from doctoral candidates wanting to fulfil their publication duty with the electronic publication of their dissertation on the edoc server to editors of e-journals and series from all over the university. But edoc is still far away of being *the* publication platform of the university. So University Library and Computer and Media Service with their joint Electronic Publishing Group will continue to focus on the training of multipliers in order to introduce a new culture for electronic publishing at the university and to change publication habits from conventional publishing to new forms and to increase the acceptance of new publication forms as *electronic only*, e.g. done for *SPEPS* or *Nordeuropaforum*, or as *cross media concept* in addition or first publication form in cooperation with a publishing house, e.g. as done for *Historisches Forum*, where an established publishing company is responsible for the marketing and distribution of the product. Edoc, however will improve its technology and services meanwhile as described in section 0.

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