Libraries as a Worldwide Infrastructure for Open Access
(Invited Paper)

Dünya Çapında Açık Erişim Alt Yapısı Olarak Kütüphaneler
(Çağrılı Bildiri)

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Abstract: "Science back to scientists" is one of the demands of the open access development. Libraries

- **have been providing guaranteed free access to knowledge for centuries;**
- **are the natural partners of open access activities;**
- **are accustomed to use global standards on local level;**
- **are able to build local repositories for original publications as well as for postprints; and**
- **have the organisational power to offer open access material locally, in regional as well as in global networks.**

The paper gives an overview of the development of open access activities of libraries in Germany, Europe and worldwide and the future role of libraries in respect to the electronic user environment.

Keywords: Open access movement, big deal, consortial licensing, institutional repositories, e-research, e-learning

Öz: Açık erişim hareketinin taleplerinden biri bilimin bilim insanlarına geri verilmesidir. Kütüphaneler

- *yüzyıllardır bilgiye garantili ücretsiz erişim sağlamaktadır;*
- *bilimsel etkinliklerin doğal ortaklarıdır;*
- *küresel standartları yerel düzeyde kullanmaya alışıktırlar;*
- *hem özgün yayınlar hem de son baskılar için yerel arşivler kurabilirler; ve*
- *açık erişim materyallerini bölgesel ve küresel ağlarda sunacak örgütsel güce sahiptirler.*

Bu davetli bildiride Almanya, Avrupa ve dünyadaki kütüphanelerin açık erişim etkinliklerinin gelişmesi ve kütüphanelerin elektronik kullanıcı ortamlarındaki gelecekte yükleneceği rol gözden geçirilmektedir.

Anahtar sözcükler: Açık erişim hareketi, büyük ticaret, konsorsiyal lisanslar, kurumsal arşivler, e-araştırma, e-öğrenme

Introduction

Libraries have been providing guaranteed open access to knowledge for centuries. This has been a changing role:

- *In the Middle Ages* monasteries and universities in Europe were the main institutions for information. But they were mainly self-sufficient: scriptoria in the monasteries produced the manuscripts they required themselves; in the universities the teachers had their own books and produced commentaries, disputations and excerpts. The students acquired their book collection through the lectures, where tutors dictated the texts.

- *In the printing age from 1452* more and more editions and learned publications were published. The progress of knowledge was documented in these publications. Libraries developed as institutions; they needed regular budgets, professional care and regulated opening hours. There are early examples of libraries of this kind in Heidelberg and Oxford.

- *The ideas of Naudé and Leibniz:* It was a young French scientist, Gabriel Naudé, who first formulated the idea of the research library, where books were chosen for their research value, not for precious bindings or illustrations; they were well classified and easily accessible not just for the owner but for the whole community of learned people. In the French Minister Mazarin, Naudé found a *Maecaenas*, who gave him the opportunity to build the kind of library he proposed -now the "Mazarine" in Paris.

  The famous German philosopher Leibniz tried to build similar user-oriented libraries at Hanover and Wolfenbüttel, but no longer as private libraries but as libraries provided for research purposes by the state -an idea that was realized in the big national libraries commencing with the Royal/National Library in Paris and, later in the 19th century, with the Library of the British Museum, under the directorship of Panizzi.

- *From private to public research libraries – the Goettingen example:* But, in the meanwhile, a modern

library as the ideal tool for research purposes was developed: As Prince Elector of Hanover, King George II of Britain founded the University of Goettingen in 1734 as a research university bringing the ideas of the Enlightenment into the academic education (lectures officially started in 1737). The Library was the most valuable research instrument with universal acquisition of every publication showing the progress of knowledge. Researchers acquired the newest publications from all over the world via the most modern catalog system in classified order. Access to all these well chosen and documented materials was quite liberal: it was at least "easy access" in his time even if it was not yet "open access". New acquisitions were documented and announced to the research community in the *Goettingische Gelehrte Anzeigen*.

- *The modern research library*. So Goettingen was the model for the modern research library. This type of library had its golden age in the second half of the 20th century: research and education were principal fields of investment in the USA and Western Europe. Libraries had increasing budgets and were able to compete with the rise of publications till the mid-1980s. Libraries were leaders in the development of state, nation and worldwide networks for shared cataloging, increasing their efficiency.

   The journal crisis. Library networks were a great help against the new problems of the booming publishing industry: price increases mainly in the S(cience), T(echnical)and M(edicine) fields overstretched library budgets, but interlibrary loan and document delivery allowed libraries to guarantee access to every document the user needed -not always free, but at the cost of a small and reasonable fee.

- *The electronic age* was for many people a dream that would overcome all information problems. But in the first stages, the situation would worsen. Researchers used electronic means to work from home: they prepared new papers electronically; publishers used electronic versions for printing; and libraries delivered text as copies to their users, who were annoyed about the media break (which, in their view, was caused by librarians). In reality, leading librarians were working on innovative publishing schemes like Highwire, which developed electronic journal publishing with new information potentials such as the linking of references. Leading publishers like Elsevier and Springer also invested a lot in the development of electronic publications, mainly databases and journals, and offered licensed access.

   Licensing versus selling. There is a major legal difference between printed and electronic publications: electronic publications are more and more online services that are licensed instead of sold. The legal regulations for licensing are much weaker than for those for selling -at least in regard to copyright. Exemptions like fair use or the German right of a personal copy, or a copy for research and educational purposes, can be disregarded in licences -and many publishers do so.

   Consortia and Big Deal. Librarians built consortia to strengthen their position: they tried to overcome the legal problems by developing licensing principles -but

their power was limited. That shows the development of the licensing policy of publishers quite well. Elsevier, for example, made as one of the favoured offers the so-called "Big Deal" schema: under its terms, a group of libraries got access to the full set of Elsevier journals; and the contract was combined with a non-cancellation clause for printed subscriptions, and an additional fee for electronic access for the full membership of the consortium. The advantage for libraries was obviously that they could provide free online access to the full list of Elsevier journals -in this respect, the libraries fulfilled their mission of "access provider" quite well. But as a negative outcome, the increasing cost of the Elsevier contract brought reductions in subscriptions and purchases of monographs from other publishers -and it has had the more negative side effect of increasing the market power of Elsevier as a quasi monopolist, able to dictate prices and contract conditions. Additional efforts were needed. The 1998 SPARC Scholarly Publication and Academic Resources Coalition (SPARC Europe, www.sparceurope.org, followed in 2002) was the first attempt to facilitate the starting of new journals as alternatives to the overpriced titles of commercial publishers, and to make the publication market more competitive. But soon, SPARC looked for new models of community projects like the Public Library of Science (PLoS).

The Open Access Movement

The fast international development of the open access movement was a good partner in this development. Here again, the starting point was not so very promising. Paul Ginsparg's idea of collecting all the papers of physicists in one database -the ArXivserver (arxiv.org)- became more and more accepted by other research communities such as mathematicians. But this did not change publication behavior: publication had still to be in one of the high impact journals, mainly edited by commercial publishers, in order to have recognition in the research community. Delivering to the ArXiv was not much more than a modern way of exchanging preprints. But some further activities made the open access idea more and more popular:

- The Budapest Open Access Initiative (www.soros.org/openaccess/read.shtml), a statement of commitment, arose from a meeting convened in Budapest by the Open Society Institute (OSI) on 1-2 December 2001. The outcome centred on two main proposals:

  o First, scholars needed tools and assistance to deposit their refereed journal articles in open electronic archives, a practice commonly called, self-archiving.

  o Open-Access Journals (www.doaj.org): Second, scholars needed the means to launch a new generation of journals committed to open access, and to help existing journals that elected to make the transition to open access.

- The Bethesda Declaration (www.earlham.edu/~peters/fos/bethesda.htm) was the result of a meeting on 11 April 2003 at the headquarters

of the Howard Hughes Medical Institute in Chevy Chase, Maryland. The purpose was to stimulate the goal of providing open access to primary scientific literature. Members of all the relevant parties -organizations that foster support for scientific research, scientists that generate the research results, publishers who facilitate the peer-review and distribution of results of the research, and the scientists, librarians and others who depend on access to this knowledge- made proposals to promote a rapid and efficient transition to open access publishing.

- The Berlin Declaration (oa.mpg.de/openaccess-berlin/berlindeclaration.html) mainly used the definitions of the Bethesda statement. It has had great international impact; and researchers either in the sciences or the humanities have never promoted open access so successfully with such widespread international publicity.

The Role of Granting Societies and Public Funds

Perhaps the most important result of the Berlin Declaration was the acceptance of open access by the major funding institutions such as the DFG (Deutsche Forschungsgemeinschaft) in Germany. They declared that publication was a necessary part of the research process and, therefore, could be financed as part of the grant. Similar announcements came from the Maxwell Trust in the UK.

One of the most valuable reasons for open access is that research financed with public money has to be in open access for the common good. That was proposed many times in Europe as well as in the United States. In the US, the Congress decided in July 2007 that the National Institutes of Health would have a legal obligation to deliver the publications of all funded research on open access at the latest after one year. That is a breakthrough for open access development, at least for biological and medical research. The former regulation that funded authors had to deliver a copy directly to the PubMed Central of the National Library of Medicine within six months was a real disaster: only 5% of authors complied with the rule.

Business Models for Open Access

There are different ways and different business models for realizing open access. They are often distinguished as the "Golden Way" and the "Green Way".

The Golden Way means original publication in an open access journal or monograph.

- *Author Pays.* It is mainly combined with the business model "author pays". Here, the usual stream of income is reversed: instead of the user (or, perhaps more appropriately, the library) paying, the publishing costs are met by the author. One of the first publications of this kind (from1998) is the *New Journal of Physics*, edited by the Deutsche Physikalische Gesellschaft (DPG) and the British Institute of Physics (IOP). The costs for peer reviewed and published papers are 870 €; other

published journals are more expensive, e.g. Public Library of Science between 1.250$ (PLoS ONE) and 2500$ (PLoS Biology), BioMed Central 1700$, Atmospheric Chemistry and Physics (ACP) between 23$ and 68$ per manuscript page. There is a lot of discussion about the sustainability of this business model[1], but the decision of major foundations to grant publishing costs may indicate a positive outlook.

- *Open choice* is another business model combining subscription with the open access scheme. Papers in a subscription journal are made open access if the author pays an additional fee. Springer was the first publisher to start offering this model with 3000$ per article as the fee.

The Green Way means instead mainly the postprint publication of papers originally published in journals. In the US this will be -as mentioned before -the normal way for research publications funded by the National Institutes of Health. In Europe there is a big discussion about the realisation of the EU's proposal in its "Study on the economic and technical evolution of the scientific publication markets in Europe" (ec.europa.eu/research/science-society/pdf/scientific-publication-study_en.pdf) to make all publicly funded research results open access at the latest after half a year. There is, in addition, a petition promoted by the Research Foundations open for signature (www.ec-petition.eu).

The reaction of publishers. Many publishers accept postprints delivered on the personal or institutional server of the author. There is a list prepared by the SHERPA project with additional German information (www.sherpa.ac.uk/romeo.php; miles.cms.hu-berlin.de/oap/).

The open access advantage: This response from publishers makes sense because research results mainly from the group around Stevan Harnad show that publications with an additional open access opportunity have a higher citation rate -and this in the end means a better impact factor for the journal in which they were originally published.[2] But unlike the practice of many publishers, the publishers' associations are resistant, for example, to the EU proposal for open access after six months (www.stm-assoc.org/brussels-declaration/).

The Future of Open Access

Nevertheless, open access seems necessary or, let's say, unavoidable as the preferred scheme for research publications. If we reflect on the overhead costs of publications for research material via publishers, and compare them with the increasing number of researchers

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[1]For the facts on open access: http://www.alpsp.org/ForceDownload.asp?id=70

[2] For an account of the advantages of open access, consult the recent publication by Stevan Harnad and Chawky Hajjem (2007), which contains information about former publications.

and the research results that have to be published worldwide, no-one anywhere can afford the traditional outsourcing scheme to publishers. As a result, fast developing countries are trying to be at the forefront of open access development.

Library Activities

Standards as the foundation for open access: One of the necessary conditions of open access is a worldwide use of standards.

- *Dublin Core* is widely accepted as a metadata schema for electronic documents (http://dublincore.org/workshops). It was developed with the support of the OCLC, the biggest library network in the world.

- *The Open Archives Initiative Protocol for Metadata Harvesting* (OAI-PMH) (www.openarchives.org/OAI/openarchivesprotocol.html) gives the opportunity to provide metadata for harvesting databases like OAIster (www.oaister.org) (12 million items) or scientific commons (www.scientificcommons.org) (15 million items) collecting open access material around the world.

- *The DINI-CertificateDocument and Publication Services 2007* (edoc.hu-berlin.de/series/dini-schriften/2006-3-en/PDF/3-en.pdf) is the German standard for open access local repositories. Servers fulfilling the requirements of this standard are internationally compatible; there are national versions of the standard in preparation, for example, in India.

Local repositories: Libraries are accustomed to using standards for cataloging; they are leaders in the acquisition and delivery of printed as well as electronic documents; and so, therefore, they are responsible for the local repositories of most universities -normally in close cooperation with the computer centre.

Most German university libraries run a local repository. They normally started as a server for dissertations that are published in the course of the doctorate process. A student can deliver an electronic copy to the local server instead of delivering a hundred print copies for interlibrary exchange. The German National Library is responsible for the long-term preservation (www.dissonline.de). There are additional services in development such as on demand ordering of printed versions via Pro print (www.edoc.hu-berlin.de/proprint/). The German development is networked with the European scene, mainly via the DRIVER project (www.driver-repository.eu/index.php).

Local repositories normally act as server for the Green Way as well as for the Golden Way. But it is not easy to collect the full range of an institution's publications for open access purposes. CERN has perhaps one of the best results with 72% of the publications of the research center on open access.

There is no similar result at European universities. Promotional activities like the Dutch project "Cream of

science" are of great help. In the Netherlands, the papers of selected top researchers are mounted on open access servers (www.creamofscience.org/en/page/language.view/keur.page). An increasing number of universities and research institutions have an official open access policy.[3]

The publication pyramid. In a modern university, a lot of documents are produced in electronic format. Most are hidden on personal computers and distributed in small groups. But with learning management systems and local servers, this material can be brought more and more into standardized formats. The publication pyramid developed in a planning paper from Goettingen University shows the different layers of "publication" from internal papers to the peer reviewed publications of the University press (GWDG, 2004, p. 36).

The publisher as aggregator. Goettingen University Press (www.univerlag.uni-goettingen.de/) publishes the peer reviewed research results of the University in parallel print and electronic forms. It is not the aim of the University press to monopolize the publications of the University. But if university researchers would deliver the full preprint versions of their publications to the university repository (as physicists do with ArXiv), the position and power of the universities in the publication chain would change a lot. As Rosendaal, Geurts and van der Vet (2002) have shown, the future role of the publisher would change as well, acting more as aggregator of material stored on the university servers. But we are far from the realization of this utopian perspective.

The new research environments:

- *Open access for data as well as for publications.* The Berlin Declaration combined for the first time the goal of open access for research data with open access for publications. The idea behind it was the realization of new research environments for the sciences as well as for the humanities, giving access to the full range of research material researchers need. With grid-technology, the technical means are in preparation to allow worldwide distributed and collaborative research.

- *Libraries as service infrastructure for e-research.* It is obvious that open access is a necessity for using these technologies successfully. The challenge for libraries is to become partners in the development of Web2-research environments as service providers for publications (and in some cases for data). The development of textgrid as a tool for the editing of texts is a grid project in the humanities led by the SUB Goettingen (www.textgrid.de).

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[3] Registry (www.eprints.org/openaccess/policysignup/sign.php) for promoting activities for open access, consult the DINI-publication: Massnahmen zum Aufbau einer elektronischen Publikationsinfrastruktur (edoc.hu-berlin.de/series/dini-schriften/2005-7-de/PDF/7-de.pdf).

New learning and teaching environments. In a similar way, libraries have to integrate publications, data and other digital objects into modern learning and teaching management systems. The learning of information literacy is as valuable for the students of today as the skills for active publishing in the open access internet world. Libraries have an increasing teaching role in this respect.

Learning resources center. The institutional service for the learning and teaching of the future are the learning resources centers providing library services, IT facilities, e-learning and e-teaching environments, combined with human advice- and all this as a 24/7 service throughout the year.

Bringing the library into the workflow of the user. The real challenge is to bring these services into the working and live environment of the user- researcher, teacher and student. Library services have to be ubiquitous- accessible from the campus, from home or from anywhere else in the world- another meaning of open access.

Open past. Last but not least, libraries have the responsibility of giving digital access to the world of printing as well- if digitized versions are not available, then by digitizing on demand, and offering better quality than Google sometimes provides. Library-driven projects like JSTOR (www.jstor.org) or Digizeitschriften (www.digizeitschriften.de) provide huge collections of accessible research journals- but they are not on open access, like the digitized backlist of journals of many publisher.

Conclusion

Libraries as the worldwide learning and research service infrastructure of the future. That brings us back to the mission of libraries. Libraries have been providing free access for centuries to expensive as well as free publications. In this respect, libraries are open access providers for their institutions and patrons. As a worldwide cooperative community, they guarantee access to published information- and it is a corporate obligation to keep this in the so called information society of the future.

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Biography

Elmar Mittler, Professor of Book and Library Sciences, University of Goettingen, has been a leading figure in the scholarly communication and open access (OA) developments in Germany as well as in Europe. He was a member of the Board of SPARC Europe (The Scholarly Publishing and Academic Resources Coalition). He served as the director of the University of Goettingen Library from 1990 to 2006 and ran several German, European and international projects in the field of the digital library development (metadata, digitization of journals, subject gateways for Internet resources etc.). He has also been active in DINI (German Initative for Networked Information) and served as president of LIBER (Association of European Research Libraries). Professor Mittler received his Ph.D. degree from the University of Freiburg. He has been bestowed honorary professorship/ doctorate degrees by Mainz, Goettingen and The Sorbonne (Paris) Universities. He has published extensively on various topics including digital libraries, scholarly communications and open access.

Özgeçmiş

Göttingen Üniversitesi Kitap ve Kütüphane Bilimleri Profesörü Elmar Mittler Almanya'da ve Avrupa'da bilimsel iletişim ve açık erişim (AE) konusundaki önemli kişilerden biridir. Prof. Mittler SPARC (Bilimsel Yayıncılık ve Akademik Kaynaklar Birliği) Avrupa Yönetim Kurulu üyesi olarak görev yapmıştır. 1990-2006 yılları arasında Göttingen Üniversitesi Kütüphane Müdürü olarak görev yapan Prof. Mittler bu süre içinde gerek Almanya'da gerekse Avrupa'da dijital kütüphanelerle ilgili birçok uluslararası proje yürütmüştür. Alman Ağa Dayalı Bilgi Girişiminde (DINI) aktif olarak görev alan Prof. Mittler Avrupa Araştırma Kütüphaneleri Derneğinin başkanlığını yapmıştır. Prof. Mittler doktorasını Freiburg Üniversitesinden almıştır. Mainz, Göttingen ve Sorbonne (Paris) üniversiteleri tarafından kendisine onursal profesörlük ve doktora dereceleri verilmiştir. Prof. Mittler dijital kütüphaneler, bilimsel iletişim ve açık erişim konusunda çok sayıda makale yayımlamıştır.