

Bits, Bytes, and User Comfort – The Digital Library (DigiBib)

ERWIN HARDECK, TATJANA MROWKA AND ANETTE SEILER

Hochschulbibliothekszenrum des Landes Nordrhein-Westfalen (HBZ), Cologne, Germany

HEIKO JANSEN

Stadt- und Landesbibliothek Dortmund, Germany

The Digital Library (DigiBib) was founded in 1998 as a joint project of the University Library of Bielefeld and the Service Centre for University Libraries of North Rhine-Westphalia (HBZ), Cologne. The initial aim was to create an Internet portal furthering science, teaching and research for the libraries of universities and universities of applied sciences in North Rhine-Westphalia and northern Rhineland-Palatinate. A uniform work interface to access the relevant digital sources (catalogues and scientific abstract, index and full-text databases) is offered while allowing the participating libraries to develop their own specific profile on the basis of the common platform. With the initial set-up established successfully, it is now planned to expand further and to integrate other user groups and libraries, such as public or school libraries. This article discusses different aspects pertaining to, and sections of, the DigiBib and shows the interaction of the mod-

ules with each other in order to achieve an integrated whole. In “Technical Administration and Development of the DigiBib”, Anette Seiler gives an overview over the development and maintenance of the different modules of the DigiBib software. The section on content and acquisition (“Acquisitions for the Digital Library”, by Erwin Hardeck) deals with the legal, financial, managerial and technical background of acquiring electronic media such as databases and e-journals in, and for, consortia. In “Public libraries and the DigiBib”, Heiko Jansen describes a groundbreaking project to include public libraries as users of the DigiBib. The section on Interlibrary Loan and Document Delivery by Tatjana Mrowka (“The online-ILL module as an integral part of the Digital Library”) presents one of the latest building blocks of the DigiBib offering users immediate and comfortable ordering facilities subsequent to successful searching.

History

The Hochschulbibliothekszenrum NRW (HBZ), a service organisation for the university libraries in North Rhine-Westphalia, Germany, develops and administers library tasks and projects. One of these tasks is the Digital Library, in short, the DigiBib. Toeteberg (2000a) and Seiffert (2002) have given a detailed chronology of the DigiBib.

In January 1998 the Ministry of Science and Research of North Rhine-Westphalia (NRW) mandated the Hochschulbibliothekszenrum and the University Library of Bielefeld to develop a draft concept for a digital library for NRW. One of the decisive factors leading to the development of the DigiBib was the library budget crisis felt by the libraries in the region: information got more and more expensive each year. It was no longer possi-

ble to supply library users with all the information they needed for study and research.

The goal of the Digital Library is to give students and lecturers access to electronic information. One of the main focal points is to provide students with study materials in digital format. In April 1998 the “Arbeitsgemeinschaften Universitätsbibliotheken und Fachhochschulbibliotheken” accepted the draft concept and decreed that work on an information portal for lecturers, researchers and students in NRW should begin.

According to Pieper et al. (1998) the term *digital library* is defined as the integrated access to available distributed information. The digital library is not a uniform whole. It needs software to connect the different resources. This connection to the distributed resources should be transparent to the users. It was decided that for each university li-

brary a unique "local view" (lokale Sicht) would be created. This local view would have the same design as the Web page of the library and offer a localised view of the digital library, i.e. it would not show databases to which the specific library has no access. Furthermore, the digital library is not restricted to linear, print-like documents, but may also contain other media formats. Users should be able to access the different electronic media on different servers from one single entry point. Where possible a direct link to the full text of the documents should be made. Furthermore, access to the digital library should be platform independent and possible from anywhere in the world (Groos et al. 1998, Arbeitsgemeinschaft der Universitätsbibliotheken and Arbeitsgemeinschaft der Fachhochschulbibliotheken 1998).

In May 1998 a technical concept was presented and in October 1998 programming started. In April 1999 the first field tests were done with the help of seven university libraries. In June that year the DigiBib was officially „opened“. Since then the system has been refined and enlarged. At the moment 35 libraries participate. The HBZ took over the complete administration of the system in 2000. In the same year three public libraries became members. Members are no longer restricted to North Rhine-Westphalia, as libraries in Rhineland-Palatinate joined in. This development is reflected in the name change from DigiBib-NRW to DigiBib.

The Digital Library is administered by the DigiBib Section of the HBZ in Cologne. The Section is subdivided into four departments:

- Technical Administration and Development of the Digital Library System
- Acquisitions of Content for the Digital Library
- Public Libraries and the DigiBib, and
- Interlibrary Loans and Document Delivery

Technical administration and development of the DigiBib

This department is responsible for the technical development of the three core modules of the DigiBib:

- Control and Monitoring System
- Access System
- Account and Billing System

Control and monitoring system

Many of the databases in the DigiBib are not free to use for all users of the DigiBib. For example only thirteen of the 35 member libraries have a licence to use Inspec®. Only the registered users of the licensing libraries should have access to the database and they should be able to access the database from anywhere, not just from their campuses. (At the moment, due to constraints by the database publishers and providers it is not possible to access databases from anywhere. However a mechanism to do so exists and will be implemented as soon as the vendors allow this). Other users from libraries that are not licensed to use the database should not even be aware of the database. For this reason, a control and monitoring system had to be developed. This system decides what rights a user has. According to Toeteberg, Haage and Pieper (1998) rights could be firstly, use of the free-of-charge databases; secondly, use, free of charge, of licensed databases; thirdly, use of databases, that charge for use; or fourthly, no use at all. Users who do not belong to any library but are interested in using the DigiBib may login as guests. Guests have access only to the free-of-charge databases.

It is for this reason that users have to login before using the DigiBib. The system automatically checks the IP-address of the users. If the IP-address is recognised, the campus the user belongs to is determined. If the IP-address is not recognised, the user can give a user name and password. (As mentioned above it is at the moment not possible to offer campus-like access to databases from off-campus due to constraints from the database vendors). The system uses this information to determine the campus. If the IP-address is unknown and the users have no user name and password, they are logged in as guests.

The monitoring system also keeps (anonymous) statistics on the use of documents and databases.

Depending on affiliation to a campus, the user then gets displayed the specific search form for the campus to which the user belongs.

Access system

Groos et al. (1998) and Pieper et al. (1998) describe the technical requirements of the Access System software. The Digital Library provides access to

quite a diverse range of databases. There might be bibliographic databases (library OPACs, bibliographic subject databases) or full text databases. The databases are supplied by many different vendors and have different ways of accessing the information contained in them. Some databases are hosted by the vendor; others are available on CD-ROM at a specific library or at the HBZ. The Access System of the DigiBib provides an integrated access to all databases of all flavours of the Digital Library. This access is provided from one point of entry.

The databases are accessed through a Z39.50 or HTTP gateway. It is possible to search for author, title, corporate bodies, keywords, publisher, ISBN, ISSN and year of publication. Right truncation and Boolean operations between search fields is possible. In addition to search terms users also have to select the databases they want to search. It is possible to select individual databases or groups of databases (e.g. a search in the Library of Congress Catalog vs. a search in all international library catalogues available).

Search results are first displayed in a list of short entries, displaying only title, author and year of publication. Duplicates are eliminated wherever possible. When users select a specific entry, a longer bibliographic description is displayed. Several fields are only displayed when there is actual information contained in them, e.g. the field „abstract“ is only displayed when the bibliographic record contains an abstract.

If other documents by the same author are available, they can be accessed by clicking on the hyperlink connected to the name of the author.

Should a search for a specific field (e.g. a publisher) not be possible with a specific database, a message is displayed to the users. This feedback enables the users to determine why the search results are not as expected.

Should the search results be fewer than 100, the users can save the results into a list and access the list at a later stage through the Internet. With the new release, available shortly, users will be able to select items from the result list into a separate list and access this list later (Toeteberg 2000b).

It is also possible for users to save a search strategy as a profile. The search is done automatically at predetermined times and results are sent to the user via e-mail (Toeteberg 2000b).

If the document is in full text and accessible through a URL, the URL is given as the location.

If the document is not online available as full text, the location might give the codes of the libraries owning the document.

Users can also do an availability search („Verfügbarkeitsrecherche“), if, for example, they have searched a library catalogue in Australia and want to know if the document they have found is available in a library nearby. The availability search will do a search through several databases: full text to determine if the document is available online, the local OPAC and union catalogue of North Rhine-Westphalia and Rhineland-Palatinate to determine if the document is available in the local library, through interlibrary loan, the JASON-database (JASON = Journal Articles Sent On demand) to determine if it is available via document delivery, or the databases of several online booksellers to determine if the document can be bought. Depending on the results the user can then either read the document online, borrow it from the library, order it through ILL or document delivery or buy it (Toeteberg 2000b).

It is also possible to do a meta-search with several German and international Internet search engines. In this case the user cannot differentiate between author, title, keyword, etc, but only gives the search terms. These terms can be combined by Boolean operators. Users can specify the number of hits per search engine they want to see and a grouping of the hits by site or content. Results are displayed in the usual search engine display fashion in the order the user determines.

Account and billing system

Whenever users want to use a database that is not free for all or free for only a few libraries, but not their library, they should nevertheless be able to access the database on a pay-per-document or pay-per-view basis. For this reason an Account and Billing System was developed.

As content providers are not (yet) prepared to offer this functionality (e.g. pay-per-view) to users of the DigiBib not licensed to use the databases, the Account and Billing System is available but not in use nor further developed.

The computer system of the DigiBib

The DigiBib runs on two Sun Solaris servers that mirror each other. One server is housed at the

HBZ in Cologne, the other at the University in Bielefeld. A Cisco router controls the load sharing between the two servers. In this way a backup is available should one server fail and the load is distributed evenly between the servers (Toeteberg 2000b; Groos et al. 1998).

Administration

Although the system is running smoothly, there is still much work to be done. The Administration team at the HBZ has several tasks like connecting new databases to the DigiBib, connecting new libraries to the DigiBib, project management of further development of the DigiBib software or research into new technology and trends in digital librarianship.

Future developments

Release 4 is tested at the moment and will be available soon. According to Seiffert (2001) improvements over the current version will be:

- Results from a database will be displayed as soon as they are available. In the current release they are displayed only after all results from all databases are available.
- Users can specify the timeout when doing a meta-search.
- At the moment it is possible that users might select the same database more than once, slowing down the search. In future this duplication will not be possible.
- Search histories can be saved.
- A CORBA client will be integrated for user administration. This enables the DigiBib system to communicate with the user administration modules of the local library systems.

Furthermore, Release 5 is already in development. The following is planned:

- Categorised browsing lists: Web pages and databases not integrated in the meta search are displayed in the search form.
- Dynamic database selection: Databases are automatically selected according to keywords or area of interest.
- Use of services by non-DigiBib applications will be possible, e.g. local library systems might integrate the availability search.
- Transfer mechanisms to other applications will be improved.

- Z39.50 will be optimised
- It will be possible to do a keyword search across all available fields in the databases.

Acquisitions for the Digital Library

„To search, find and use digitally“ – this is how the functionality of the DigiBib, managed by the HBZ, can be summarised. With the help of networked online tools it is possible for the end user to search and find full text information from one point of entry and without switching between systems. However, these integrated functions only make sense, if the content needed for science, teaching and research is made available.

Content of the DigiBib

The following electronic product groups are available through the DigiBib:

- Classical electronic union catalogues, local OPACs and international library catalogues
- bibliographic subject databases
- full text databases
- Collections of texts (e.g., Shakespeare)
- Electronic journals (e.g. Springer, Kluwer)
- Textbooks (e.g., Desktop Bronstein, Desktop Stoecker)
- Reference works (e.g., Brockhaus, Oxford English Dictionary, Dubbel, Grove Dictionary of Art)
- Theses and Dissertations

This overview shows that the DigiBib is a hybrid library, which offers access to traditional print media (catalogued by libraries and found through OPACs as well as through bibliographic databases) as well as digital media. In this way, all media forms are accessible by the end users in the same way.

During the development of the DigiBib, the University Library of Bielefeld was one of the development partners that collected and integrated freely accessible information sources on the Internet of the above mentioned media types into the DigiBib. In this way about 40 000 online publications in all scientific areas were catalogued through the tools of the DigiBib and made available freely and internationally. Today the number amounts to about 50 000.

In addition to the maintenance of the overall supply of media of the DigiBib, there are different

conceptual rules and proceedings to access and integrate the different product groups into the DigiBib. Electronic union catalogues, OPACs of individual libraries and international library catalogues are not acquired through purchase. In this area there is „only“ the duty to find relevant products in time and ask the owners for permission to integrate the databases into the DigiBib.

With regard to electronic theses and dissertations, the original concept of the DigiBib was that the documents would be catalogued by participating libraries into the so-called „Collect-Datenbank“ (now called „Verbundkatalog Digitale Dokumente“) by entering and maintaining metadata. Today this catalogue as a proprietary solution is no longer seen as having a future. At the moment a procedure is tested where individual universities and their libraries maintain their own servers for theses and dissertations and offer access to the databases. This means that the DigiBib does not need to acquire them through purchase. It is envisaged that existing and new theses and dissertation servers, while maintaining their document server software, will follow the OAI (Open Archives Initiative) protocol. The HBZ will function as service and data provider for uniform access to these documents. In this way a co-operative consortium called the Hochschul-Publikationsverbund NRW will be created with common administration and by using uniform interfaces and cataloguing standards.

However, with specialised subject databases, collections of texts, electronic journals, textbooks and reference works different proceedings have to be followed. Normally they are bought collaboratively by a consortium for substantial costs. In the following this branch of acquisitions for the DigiBib with all its special cases and problems will be discussed.

Co-operative acquisitions

The DigiBib, as a co-operative venture of libraries and the HBZ, was designed to be a service centre. Especially for this reason the acquisitions of content is done co-operatively. Acquisitions is a co-operative process between the HBZ and its department „Acquisitions and Content of the DigiBib“ on the one hand and the libraries of universities and universities of applied sciences on the other hand. The department „Acquisitions

and Content“ is responsible for the administration of acquisitions and the libraries are responsible for defining and communicating their information needs.

The co-operation between service centre and libraries happens on two levels. At the first level member libraries are requested to communicate their needs and wishes to the service centre. Meanwhile the department „Acquisitions and Content of the DigiBib“ informs the libraries of new products on the market, promotes discussion on them and organises tests with the help of the publishers and providers of the content. Decisions on what to buy are made on special mailing lists where all participating librarians can cast their votes. In addition, a password-protected list of (expensive) periodical subject databases is available for authorised persons, mainly directors of libraries and heads of the acquisitions departments, who can then communicate their needs and wishes to the HBZ. In this list, they find specific terms and conditions for access to the databases, current prices, notes on future price increases as well as hints on possible ways to reduce costs, terms of cancellation, options for use, specific contract conditions such as required user training by the library and so on.

At the second level, co-operation in acquisitions is ensured through the collaboration between DigiBib with the Working Group Electronic Journals and Databases (Arbeitsgruppe Elektronische Zeitschriften und Datenbanken) of the AGUB (Arbeitsgemeinschaft der Universitätsbibliotheken NRW) of the VBNW (Verband der Bibliotheken des Landes Nordrhein-Westfalen). The Working Group Electronic Journals and Databases, which is also administered by the HBZ department Content, is concerned with questions of principle regarding the collaborative acquisitions in a consortia, e.g. regulations, determining the share of financing each library has to carry, the quorum needed to acquire a product or limits on costs. The Work Group Electronic Journals and Databases negotiates and decides together with the HBZ in regard to acquisitions of electronic journals and functions as a consultant for the HBZ which is responsible for business negotiations and the making of contracts for all other electronic media.

The politics of consortium building in North Rhine-Westphalia is not restricted to its own Land.

It is embedded in the consultations and voting of the German, Austrian and Swiss Consortia Organisation (Arbeitsgemeinschaft der Deutschen, Österreichischen und Schweizer Konsortien). Because of this institutionalised co-operation with other „foreign“ consortia, the HBZ has not only become a regional, but with some titles, a national and even supranational leader regarding acquisitions by consortia.

The Working Group Electronic Journals and Databases of North Rhine-Westphalia has co-ordinated and administered the collaborative acquisitions of electronic content by universities of North Rhine-Westphalia even before the creation of the DigiBib. This branch of acquisitions of electronic media done in the normal way – which is differentiated from other acquisitions for the DigiBib as each library has to pay a share out of its own budget – is still managed by the department Content of the HBZ. In this role the Working Group is the solicitor for the libraries with the publishers in regard to an appropriate definition of subscriptions and possibilities of acquisition of the media. The acquisitions program of the DigiBib is constantly harmonised with the Working Group. This is especially the case with periodical databases, where, because of their importance, costs and continuity of supply and use special diligence is needed.

Consequently, in the same department of the HBZ acquisitions for the DigiBib as well as the administration of the Working Group Electronic Journals and Databases is combined. In the framework of the acquisitions process the following duties have been taken on:

- Management of the voting between the libraries (building of consortia, collaborative acquisitions)
- Business Management with publishers and providers (negotiations, conclusion of contracts, accounting, finances)
- Business management with libraries (management of licenses, financing, accounting)
- Administration of funds made available by the federal state.

Thus, in the department “Acquisitions and Content of the DigiBib” the complete acquisitions process of a library is mirrored, but because of the co-operative framework enriched with further duties.

The co-ordination of large periodical acquisitions with the university libraries is normally done once a year and is only relevant for the following year. Only titles in which a majority of libraries are interested are acquired. It happens that differences between libraries occur with regard to the possibility of acquiring the same database from different providers with different attached services. This means that some libraries have to accept compromises.

Monographic electronic publications do not necessarily need agreement only once a year; often proceedings depend on their individual case and requirements. Special diligence is needed in the selection of these publications, especially regarding contents and technical requirements before a decision can be taken to deliberate on the acquisition of the publication. The assistance of subject librarians is required in this respect. Another difference between periodical electronic publications and monographic electronic publications is the following: periodical publications are not bought for all libraries, but only for those interested in them. Monographs on the other hand are bought mainly for all libraries. The only differentiation could be between university libraries and university of applied sciences libraries.

Financing

The common content of the DigiBib is financed out of two sources: from centralised funds of the federal state and from library funds of the member libraries. The subsidisation of the common content by the federal state is to support the change in and growth of the media supply, as both these tasks could not be fulfilled by traditional financing.

It is for this reason that the Ministry for Schools, Science and Research (MSWF) of North Rhine-Westphalia decreed in January 1999 (in: Grundsätze der Landesförderung für die laufende Versorgung der Hochschulen mit wissenschaftlichen elektronischen Informationsdiensten durch die Bibliotheken) that “in the following years continuously up to 3 million DM will be made available for the subsidisation of periodical electronic publications in the framework of the basic supply. Additionally the Digital Library will be supported with the acquisition of monographic electronic publications with further centralised

funds.” At the same time the MSWF decided that University Libraries would have to carry a share of between 10 and 50% of the purchasing of electronic media and that savings made in this way would go back to the universities. The federal state would only subsidise solutions that are operated technically as well as organisationally in the form of a consortium and not as a local solution for a single library.

In terms of these guiding principles periodical databases were acquired with funds of the federal state and of libraries, monographic databases (which are bought for all libraries) are funded fully by the federal state. During 1999 the share of the participating libraries was 40% of “normal subscriptions” (for subscriptions less than DM20 000 p.a.) and 20% for “expensive subscriptions” (for subscriptions more expensive than DM20 000 p.a.). This resulted in a non-uniform burden for the libraries. For this reason it was decided that the share for the libraries would be 30% p.a. in 2000 for all databases. In 2001 this percentage had to be increased to 50% to be able to keep the databases already subscribed to and to modestly acquire new subscriptions.

Financing of the DigiBib is discussed continually to integrate past experiences as well as future developments of the market. As the DigiBib would like to guarantee the acquisition of periodical databases the finance minister of North Rhine-Westphalia was asked to codify this as an item of the budget.

Future expansions

Further expansion in content of the DigiBib is not just to be understood as acquiring more and more titles. It is much more a work in progress as the DigiBib as a co-operative venture is subjected to the same quantitative and qualitative needs for growth as every library.

Especially in the area of subject databases the DigiBib has developed not an exuberant but a reasonable supply taking into account the short period of time since the first set-up. In the first years publishers and providers offered and the DigiBib mainly selected databases in the area of S[cience], T[echnology] and M[edicine] and in Economics. In the meantime, oriented more on the needs of end users and libraries, a number of other subject areas e.g. education, psychology,

philosophy, philology, history and others were also included in the selection process.

It has already been mentioned that it is not always possible to fully plan the acquisitions of monographic electronic media. Nevertheless the Department “Acquisitions and Content of the DigiBib” tries to set priorities in this area. In the coming acquisitions cycles it is planned – if such media are offered by publishers and providers – increasingly to include general as well as subject-specific electronic reference works. It is observed that especially in this area there is a high potential for the multi-dimensional supply of information and also for cost-saving. It will become, analogous to the traditional library, the electronic reading room of the DigiBib. It seems that the conditions to realise this are better than a year ago. A number of publishers, especially Anglo-American ones are offering major reference works as databases. It is hoped that German-speaking publishers will follow suit soon.

The duty of the DigiBib is not only to acquire more content, but also to look at what the publishers offer and at the licensing requirements linked to these offers. At the moment publishers will offer all their electronic journals under one licence and even if the DigiBib is only interested in a small part thereof, it has to take everything. The aim is to get rid of these all-or-nothing agreements. At least two alternatives are envisaged to close agreements more suited to the real needs and use of the member libraries. One way might be to acquire only core electronic journals as a consortium and offer other, less used titles on a pay-per-view base. Another way could be to make a subject breakdown of the total offer of the publishers and subscribe as a consortium to only the relevant parts thereof.

The result of these alternatives would be a better cost-performance ratio and savings for the consortium members. The most obvious advantage, however, would be to the benefit to end users. At the moment only members of the campus of a fully licensed consortium member are able to access licensed electronic products. All other end users do not have access. It is envisaged that a new agreement could permit academic users who do not need to have permanent access to all databases to access digital documents on a pay-per-view basis. Such agreements seem to become more and more acceptable to publishers

and providers and are also suitable for monographic electronic publications and their diverse user groups. With agreements such as these, not only is there a better usage of acquired digital products, but also the possibility to offer a wider variety of content.

Public libraries and the DigiBib

The DigiBib was originally developed for libraries at university-level institutions. However, the innovative concept and the possibilities it offers soon awakened interest in public libraries.

Three of them – the Stadt- und Landesbibliothek (City and State Library) Dortmund and the Cologne and the Düsseldorf Public Libraries – applied to the North Rhine-Westphalia Ministry for City Planning and Housing, Culture and Sports (Ministerium für Städtebau und Wohnen, Kultur und Sport) to finance a project that would enable them to access the DigiBib.

The ministry approved a project with a specified timeframe from October 2000 to December 2002.

Four major goals were formulated in the project application:

1. Defining the demands of public libraries towards the DigiBib.
2. Determining the benefit and effort for both the participating libraries and the HBZ
3. Integrating the project libraries into the DigiBib
4. Creating a finance model for the integration of additional public libraries.

Compared to the average standard of the scientific libraries, goal three has been achieved by November 2001. Since then, the public libraries are participating in the newly developed services of the DigiBib, like online ILL, in the same way the other libraries do.

Substantial work on goal four has also been undertaken. Licensing costs to use the DigiBib software were negotiated with the software company (ihs – Information Handling Services) and are based on the size of the libraries. Additionally, the HBZ determined the costs for incorporating and maintaining the “view” (“Sicht” in German) of a public library in the DigiBib. Because especially the licensing costs are still very high for small libraries, there are plans to

create shared views: e.g. for the libraries in one district.

A view is the customised interface including both the design and the functionality (e.g. the searchable databases), which a user from a specific library sees when accessing the DigiBib. A “shared view” requires the participating libraries to agree on design and functionality, but minimises licensing fees as well as configuration and maintenance effort, thus lowering the costs considerably. To distinguish between these two different kinds of views, those belonging to only one library are called “local views”.

Goals one and two address problems not solved yet. This is partly due to the fact that demands and available software solutions are in conflict with each other. Therefore, the achievement of the first two goals is an ongoing process.

Two examples might highlight this.

A service offered by the DigiBib is based on rigidly selected and reviewed Internet links. Of course, the currently available links were gathered with scientific users (students, researchers, and lecturers) in mind. These links do not always fit the interests of typical users of public libraries. Adding new links of interest to them is not a simple task, because the data is kept in such a way that does not allow the selection of individual links to be used solely in one local view. Only the selection of whole link groups is possible. Therefore, a link to a homework help site for pupils added to the mathematics group also appears in the local views of all university libraries. Labour-intensive workarounds had to be found. Finally this demand led to the decision to redesign the link management.

The second example has to do with the access to CD-ROM and online databases. Usually, the access rights for the databases are based on IP-address checks of the user’s computer. The IP addresses of the participating institutions are known, so from within the respective LANs, access is always allowed.

Working at home and using a private Internet service provider to access the Internet would lead to the problem that the IP address dynamically assigned to the user’s computer is not known to the database providers. However, most university-like institutions in Germany act as Internet service providers for their students. In that way the assigned IP belongs to the known IP pool of the

institution. The public libraries do not offer such a service, which means that their users cannot access the licensed resources from home. Now the public libraries would like the HBZ to develop a software solution to solve this problem. This is a solution that would require continuous additional maintenance effort for the HBZ.

Accessing the resources from home via unregistered IP addresses also requires the vendors to approve of this. Currently most of them do not do so.

Summarising the current project status, the public libraries made a good start. There is still quite a lot of work to do, but it seems to be well worth it. Though this pilot project has not ended yet, a number of other public libraries are eager to join the project libraries.

The online-ILL module as an integral part of the Digital Library

An indicator for the quality of a portal is the combination of research results with options to access documents as full texts or via a document delivery service. Already at an early stage, the Digital Library (DigiBib) incorporated a number of services including automatic search in, and linking to, Internet bookstores, and fee-based delivery services for journal articles. Recently, with the integration of an online-interlibrary loan module another key feature has been added.

According to the current code [1], ILL in Germany is organised along the structures of the German library regions. In every region there is a service centre for the libraries. The centres have developed from the regional union catalogues and coordination points for inter-library lending. The position in structuring and guiding inter-library loan in the region of North Rhine-Westphalia and northern Rhineland-Palatinate has traditionally been held by the Centre for University Libraries (HBZ) in Cologne. It was therefore consistent that the development of an online-ILL-system and the necessary organisation and controlling was established at the HBZ.

There are five other library regions in Germany, and all six regions operate independently from each other. All cooperation and all joint projects are based on the principle of good will and a common interest in the progress of the overall German library system. This independ-

ence is one reason why in some parts of Germany online-ILL has been established for years while in other regions books are still ordered on red charge slips that have to be filled in by the user – often with a typewriter – and are then sent to a potential lending library by mail. Another reason is the diversity of local library systems. It is interesting to note that online-ILL was introduced first in those regions where a homogeneous system structure with interfaces between local applications and the regional union catalogue already existed. For other regions, the situation proved to be far more complicated. In the region covered by the HBZ, three main local systems – all differing widely from each other – are in use. Added to this are a number of individual solutions in smaller libraries.

For this reason, the online-ILL system was introduced to the HBZ region at a rather late stage. The requirements on the ILL system were much more complicated than they would have been in a homogeneous structure as it had to answer very different needs. Existing interfaces had to be addressed but the system had to be flexible enough to be accessed with a minimum of technical requirements, enabling a requesting library to place ILL orders via the World Wide Web if no interfaces existed, and sending requests to lending libraries in the form of e-mail. This minimum amount of adaptation for the library system had, for obvious reasons, to be also taken into consideration. Yet, at the same time it had to be possible for technically well-equipped libraries to operate the system practically without human interference in the requesting part of the procedure. Orders then are processed directly in the local library system, treating an ILL request as if it were a local order, with the requesting library as user.

When Aleph 500 was chosen in 1999 as a new library system for the HBZ regional union catalogue, it soon became apparent that because of the diversity of local systems it would not be possible to realise online ILL as an integrated component of the union catalogue. For that reason, the decision was made to incorporate a stand-alone module for ILL into the DigiBib as it already offered a number of necessary features such as an availability search and user authentication routines (Kostaedt 2000).

The system that was subsequently developed in cooperation of the HBZ, the commercial firm

Sisis and the University Library of Bielefeld, is based on a central database where all the necessary information is filed, thus enabling a seamless tracking of orders. Users log on to the DigiBib authenticated as members of different institutions i.e. libraries. When they have performed a search in the union catalogue, they are offered the possibility to place an ILL order if the system cannot find a hit in the respective library. To order media held by the user's own library – on loan, for example – is prohibited according to the German ILL code. Still, the library's staff, at the user's request, can order such media via another interface in the World Wide Web, if it turns out, for example, that the book is lost or temporarily unavailable because it is at the book-binder.

When an ILL request has been made, the data is filed in the central database of the ILL server. The server then charges the order to the user's local account at the requesting library and generates a message to the first potential lending library. It is important to observe that, in contrast to many existing ILL systems, the availability of an item is checked in the local library system, thus covering not only the case of general but also of *actual* non-availability. If a book cannot be delivered, the request is automatically sent to the system of the next library, following a sequence of libraries according to the requirements of the German ILL code. To the basic ordering options in the DigiBib, a number of features are added such as automatic filling in of an entry mask with data found in other databases and catalogues, links to a document delivery service if a journal article is demanded, and take-over of user data from the log in – authentication to the DigiBib (Mrowka 2002).

If a request cannot be fulfilled in a region, the ILL system until recently initiated the printing of a red ILL paper slip in the requesting library. This was necessary as the order had to be sent to other regions of Germany, and there were no interfaces between online-ILL systems, if those existed at all. Consequently, even though with the use of online ILL a considerable increase of speed was obtained within the HBZ region, the crucial point was the transition to another region when requests were sent by mail. Another drawback was the fact that with the printout, a tracking of the order was no longer possible.

For these reasons, the HBZ together with service centres in other regions of Germany developed a system of sending orders online from one ILL union system to the others. It was fortunate that the HBZ system, tested for flexibility in the region's internal ILL, offered means of adaptation to a model of transporting orders to other regions. For example, an almost seamless exchange of orders is possible with the region of Bavaria as a similar system to that of the HBZ is in use there. With other regions, a solution comparable to the mode of transmitting orders within the region to libraries without required interfaces was tested, and it proved to be practical for the inter-regional transfer as well (Diedrichs 2001). Orders are conveyed in the form of e-mails and translated from one internal format to the other.

From the users' point of view, apart from the inclusion of other union catalogues in the search nothing much changes for easy research and ordering in the DigiBib. As it is not possible for users to choose which library delivers the book, the system decides for them where to place the order and when to leave the library's ILL zone to demand the book in other regions. This also means that users don't have to adapt to new adjustments of layout, graphical interfaces or other aspects of usability but can continue to work with the ILL module of the DigiBib as they are used to. However, they will notice that all kinds of inter-library loans will be delivered to them much more quickly, even when from far away.

Conclusion

When the Digital Library was developed, the initial goal was to provide a multi-functional tool for the libraries of North Rhine-Westphalia that they, in turn, could offer to their users as a means to search, find and use all kinds of information and media, both digital and conventional. The DigiBib was one of the first portals to offer services that are now generally recognised as being standard, such as authentication and personalization options, availability search and so on. As it is not a specialist portal for a restricted field of research and knowledge like the German "Virtuelle Fachbibliotheken" (virtual libraries) but can be classified as belonging to the group of regionally defined portals, the possibilities of further expansion are manifold. Obviously, new

members such as public libraries can be included. Innovative projects such as the introduction of the ILL module add to the original range of products, and a number of new solutions are in discussion. For example, to overcome some of the restrictions of distributed searching (e.g. different document servers in North Rhine-Westphalia have different interfaces) an OAI service provider is being developed and will be integrated into the DigiBib. Promoting open archives and electronic publishing is also seen as a means to overcome the so-called "Journal Crisis" which is not only experienced in North Rhine-Westphalia but also worldwide.

Another new development is the re-launch of the successful North Rhine-Westphalian document delivery system Medea. This system – at the moment still based on local workstations in the participating libraries – will in future have a central database maintained by the HBZ. Of course, in the field of document delivery, a multitude of further developments is possible, such as expanding the service nation-wide, presenting a delivery service for users not belonging to any library at all, offering pay-per-view options for full-text archives and so on.

New developments are one major field of work, the other is keeping up the standard and constantly improving the performance of already existing modules. With more than one million requests per month (Vetten 2002), the DigiBib team faces constant challenges to maintain the standard and to satisfy the users' expectations.

Another time-consuming but necessary area of activity is the planning and upkeep of the libraries' local views. The importance of individual views for the participating members became clear very early during development and made it necessary to rethink part of the concept. The fact that a library can identify with the product and that the corporate image is maintained throughout is a vital condition for the acceptance of the DigiBib and for the integration into the own Web pages. Thus, great effort is made not only in the field of content but also of design and layout when, for example, logos and colours identical to those of the local Web pages are included according to the wishes of the libraries. Some libraries have incorporated the Digital Library into their own pages to such an extent that it is no longer visible to the user as a separate application. This is ben-

eficial for the general approval of the DigiBib by the libraries but, as a consequence, the HBZ is no longer recognisable as the providing institution to the end-user. As a result of not always dealing with the end-users themselves, those who work on the product in the HBZ are required to constantly keep in mind who the most important customers are, i.e. who the target group is. This is obtained on the one hand by monitoring user research conduct and evaluating the resulting usage statistics. On the other hand, close cooperation with both the libraries and the universities is required. Only then, can impulses, trends and ideas be taken up and developed in accordance with the wishes of the participating members, thus maintaining and guaranteeing the standard the DigiBib has acquired in the three years since it was started.

Note

1. Die Ordnung des Leihverkehrs in der Bundesrepublik Deutschland, usually abbreviated Leihverkehrsordnung (LVO). The current version dates from 1993.

References:

- Arbeitsgemeinschaft der Universitätsbibliotheken, Arbeitsgemeinschaft der Fachhochschulbibliotheken. 1998. *Die Digitale Bibliothek NRW – Konzept*. [The Digital Library North Rhine-Westphalia – Concept.] URL: <http://www.ub.uni-bielefeld.de/digibib-nrw/dokumente/konzept.htm> [viewed February 24, 2003].
- Diedrichs, R. 2001. Online-Fernleihe in Deutschland – eine Utopie? [Online-ILL in Germany – a Utopia?] *Bibliotheken – Portale zum Globalen Wissen*. Frankfurt/Main: Klostermann, 26–29.
- Groos, M., J. Hardt, A. Nold, D. Pieper, F. Seiffert, F. Summann. 1998. *Die Digitale Bibliothek NRW – technisches Konzept*. [The Digital Library North Rhine-Westphalia – Technical Concept.] URL: <http://www.Florian-Seiffert.de/1998/tk-digibib/> [viewed February 28, 2002].
- Kostaedt, P. 2000. Entwicklung eines Fernleihmoduls im Rahmen der Digitalen Bibliothek NRW. [Development of an ILL-module within the framework of the Digital Library of North Rhine-Westphalia.] *ProLibris* 5 (3): 151–152.
- Kostaedt, P., T. Mrowka. 2002. *Online-Fernleihe und Dokumentlieferdienste*. [Online ILL and document de-

- livery services.] URL: <http://www.hbz-nrw.de/literatur/fernleihe/> [viewed March 18, 2002].
- Mrowka, T. 2002. Schneller, besser, weiter. Die Online-Fernleihe ersetzt den Roten Leihschein. [Faster, better, longer. Online ILL replaces the red charge slip.] *ProLibris* 7 (3): 108–111.
- Pieper, D., A. Sprick, F. Summann, B. Troeger. 1998. *Die Digitale Bibliothek NRW – Pflichtenheft Zugangssystem*. [The Digital Library North Rhine-Westphalia – Requirements Specifications Access System.] URL: http://www.hbz-nrw.de/produkte_dienstl/DigiBib/dokumente/allg/pflicht.html [viewed February 24, 2003].
- Seiffert, F. 2001. *Neue Funktionalitaeten in der DigiBib: Releases 3, 4, 5*. [New Functionalities with DigiBib Releases 3,4,5.] URL: http://www.hbz-nrw.de/produkte_dienstl/DigiBib/Vortraege/12122001-sei/index.html [viewed February 24, 2003].
- Seiffert, F. 2002. *Die DigiBib Chronologie*. [The DigiBib Chronology.] URL: http://www.hbz-nrw.de/DigiBib/DigiBib_Chronologie.html [viewed February 27, 2002].
- Toeteberg, I. 2000a. *Die Digitale Bibliothek NRW*. [The Digital Library North Rhine-Westphalia.] In: *ProLibris* 5 (3):146–147.
- Toeteberg, I. 2000b. *Sun Summit Bibliotheken 2000 : Neue Entwicklungen der DigiBib : Teil 1*. [New Developments in the DigiBib : part 1.] URL: <http://www.sun.de/Downloads/Praesentationen/BiblioSummit2000/Pdf/1-toeteberg.pdf> [viewed March 4, 2002]
- Toeteberg, I., U. Haage, D. Pieper. 1998. *Die Digitale Bibliothek NRW – Zentrale Systeme*. [The Digital Library North Rhine-Westphalia – Centralized Systems.] URL: http://www.hbz-nrw.de/produkte_dienstl/DigiBib/dokumente/allg/zsys.html [viewed February 24, 2003].
- Vetten, M. 2002. Digitale Bibliothek ist Millionär. [The Digital Library is a millionaire.] In: *ProLibris* 7 (3): 72.

Editorial history:

paper received 30 April 2002;

final version received 2 October 2002;

accepted 29 October 2002.