LIBER QUARTERLY, ISSN 1435-5205

K.G. Saur, Munich. Printed in Germany

Access and the Changing Mission of Research Libraries

by HANS-JOACHIM WÄTJEN

FROM BABEL TO VIRTUAL LIBRARIES

The session of this morning deals with the coming century. But I am not a prophet foreseeing the future. I agree with the economist Edgar Fiedler who said in his Law of Prediction, „Forecasting is very difficult, especially if it's about the future." And Mirjam Foot is on the right side too. In the afternoon she will talk about change as the only certainty. Or in other words: today we live in an age of uncertainty and it will increase in the future! Before speaking about the future of libraries I would like to go back to the past.

Ever since the fire of the Alexandrian Library scholars have been dreaming of the all-comprising collection of books. Feudal lords, scientists, librarians, poets and ordinary people have wanted access to the complete knowledge of mankind. But the complete and universal library was never again meant to have its place in the real world. It was only meant to be there as a dream, such as in the phantastic fiction of Jorge Luis Borges and his Library of Babel. I quote:

> „When it was proclaimed that the Library contained all books, the first impression was one of extravagant happiness. All men felt themselves to be the masters of an intact and secret treasure. There was no personal or world problem whose eloquent solution did not exist in some hexagon."[1]

Nowadays, we would say: on any kind of Web server. The hope for this particular feeling of happiness, curiosity for the unknown, but also the intentional search for important information are the underlying forces for millions of people all over the world to travel virtually in the World Wide Web. Yet, the all-comprising virtual library will not be available in the near or far future, not even in our modern society of knowledge and information. There are far too many printed books in our stacks, and new ones are being

added daily. Every year the book-fair in Frankfurt offers more new titles and the publishing industry is still growing by selling printed books, journals and newspapers.

The traditional book offers an almost perfect interface for users - almost perfect, because I can very well imagine a foldable waterproof plasma screen for reading in the bathtub. But would I like to take into my bed the screen and stand-by batteries as well? No - Marshall McLuhan's prognosis for the death of the book was wrong and will remain so! And, as a consequence, the following cartoon by Til Mette[2] will not turn into reality, either:

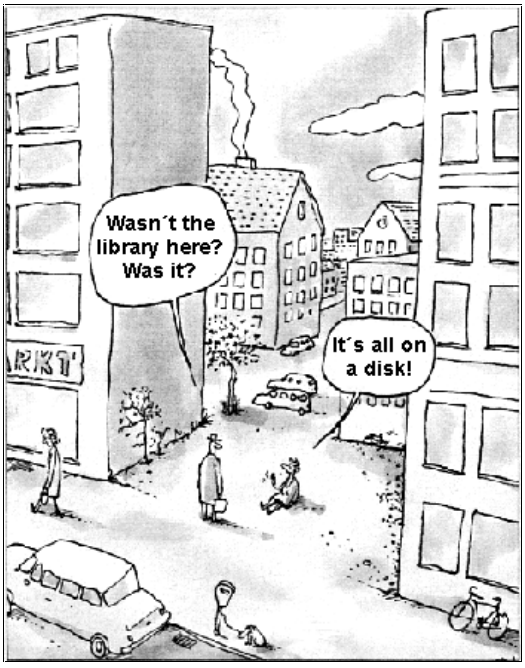


Fig. 1

The future of libraries and librarianship has been discussed controversially for some years and the debate is still going on. On the one side theorists of our profession together with some scientists, science administrators and many library users believe in the progress of information technology to solve all the problems of information provision. Access is the code word for their virtual library as expressed by the motto of the 6th WWW conference 1997:

„Accessibility ... Everyone Everything Connected". It seems to be so simple: just clicking links to get information.

Within this group the optimistic colleagues believe that the library can be transformed to an information warehouse and Web portal as a one stop shopping site for information. Their library will be run by library managers, IT professionals and modern librarians teaching information literacy during the transition period until users have turned to end-users. The pessimistic colleagues within this first group foresee the death of the book, of the library and of the profession. Their world of information is totally virtual and dominated by Microsoft, AltaVista, Elsevier, EBSCO, Bertelsmann and other major players.

The second group of colleagues lament declining budgets for acquisitions and insufficient staff. They still believe in holdings and in the responsibility of the state to solve the crisis of information. Some of them hope that one day the printed collections of their libraries will meet a renaissance of books in the post-modern society.

The arguments of both groups are helpful to analyse what is really going on. They are wrong and right. Between these groups the more practical librarians know that the library of the future has to find a cost-effective balance of access and holdings. Their library will be a hybrid one integrating real and virtual collections. They fight for higher budgets to invest in both: in real collections of locally stored paper and digital resources as well as in IT and services for better access to virtual collections. But more and more they feel bad about fighting for shareholders of Elsevier and of other publishing houses.

For both groups it is clear that the methods and techniques of communicating, producing, distributing and imparting knowledge now change rapidly and radically. All of us know that we have to redefine the traditional role of the library: what and how to select, to acquire, to classify, to catalogue, to provide, to archive or to give access to and how to assist people in the use of information and more important: how to provide free and equal access to information according to the mission of libraries.

Showing the present reality of virtual libraries I will further on talk about the future trends of information media within higher education and research to discuss possible tasks and consequences for libraries at the beginning of the next century.

VIRTUAL, DIGITAL, ELECTRONIC - WHAT LIBRARY IS IT TO BE?

The reality of virtual libraries can best be experienced within the World Wide Web itself. Searching for the virtual library there you will find a touristic advertisement for the Truse Valley under the most promising address: <http://www.virtuelle-bibliothek.com>.

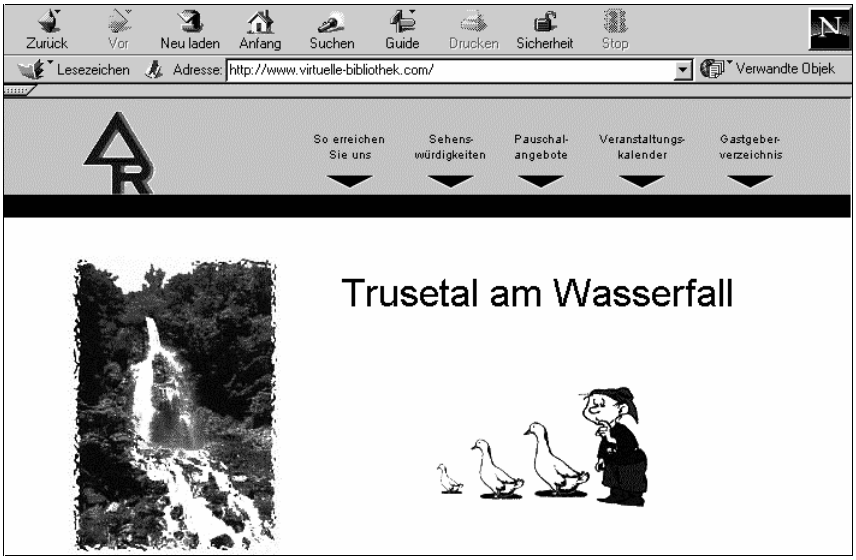


Fig. 2

Today's clever marketing people, hoping for as many clicks as possible, have simply bought the right for this domain name.

Further and more thorough searching will inevitably lead to another dilemma. With the help of the German search engine FIREBALL you will find 3,300 hits for „virtuelle Bibliothek", 1,300 hits for „digitale Bibliothek" and 600 hits for „elektronische Bibliothek" - all this even without truncation and only in Germany. With the use of AltaVista and extended by the English phrases the result will be more than 270,000 entries.

With this number of hits in mind, we may well conclude that the use of language by librarians within the World Wide Web corresponds to that by any other netizen: all three terms are being used arbitrarily for the whole variety of information offered on the Internet. The net reality shows that librarians, normally used to working with controlled vocabulary are not being helpful in

defining the differences between an electronic library from a digital or a virtual one.

On the other hand, our colleague Mr Hilberer from Düsseldorf is making an attempt at a suitable definition. I quote:

> „Digital libraries are collections of electronic information in the possession and thus under control of real libraries. Virtual libraries are collections of references (collections of links) to information which as such are not in the possession of the corresponding real library. By their nature, all the virtual libraries are digital, too, but by no means are digital libraries virtual in all the cases. For instance, collections of CD-ROMS are non-virtual digital libraries."[3]

According to Hilberer an electronic thesis from Düsseldorf would be part of the digital library in Düsseldorf, but part of the virtual library in Oldenburg. The CD-ROM „PsycLit" would be part of the digital library, but access to the very same data via FirstSearch of OCLC would be part of the virtual library. Technical facilities do away with borderlines as well: an analog video e.g. only to be played electronically, turns into digital and virtual information „on the fly" when attached to a Web-TV-server. And even the real book borrowed from the University Library of Düsseldorf, can turn virtual if it is not returned, in spite of reminders. We should not confuse users by giving confusing names to information. Distinctions by technology, cost or source are not helpful. The user does not want to know whether an information resource is part of the electronic, digital, virtual or real library. He wants to access it for searching, reading, copying or whatever.

The meaning of „virtual" as defined by Microsoft's Encarta comes exactly to the point:

,virtual'
1 available as a possibility
2 as a thought, appearing to be[4]

The virtual library is in existence as a possibility, with one or two links functioning or not functioning, with one information not costing anything, with another causing costs, with the document delivery supply unreadable, but with the possibility that it might have been readable. The second meaning is true as well: the virtual library is in existence as a thought, only appearing to be in existence. Because, in spite of hundreds of millions of Web pages, today it is only a tiny library, compared to our real libraries. It seems that, in view of the 270,000 hits, and even after separating the number of duplicate available, we have more virtual libraries than virtual books in the net. Or, put

differently: we have too many virtual libraries and too few virtual books. And, at least partly, librarians are to blame for this situation. There is hardly a library that does not offer its local CD-ROM collection, its more or less well commented, incomplete, manually composed bookmark lists, or its Web interface for their catalogue under one of the three types of language on a world-wide level. We cannot accuse the local pizza baker of not having the meta-tag „noindex" in his Web pages, or of his server directory not including a „robots.txt", a command for the robots of the search engines.[5] But the information experts of the libraries ought to know that their Web list of only locally accessible data increases the recall of AltaVista and many other search engines to such an extent that it obstructs the search for the original supplier of PsycLit, Inspec and other data bases.

The situation looks definitely more sad if we have a look at what libraries are not offering. The great number of grey literature by scientists working at their own institution is in deep slumber on the hard disk of their personal computer, on diskettes in the drawers of their offices, or, at best, on the Web servers of institutes and faculties, and unnoticed by librarians. You cannot gain access to them by the online catalogue of the library or by any of the regional online catalogues. The needles in the haystack are either lying on the doorstep, as yet ungathered, or they have already been gathered by information amateurs like former Stanford students Jerry Yang and David Filo, the makers of Yahoo! and today's billionaires or by scientists like Ginsparg, the founder of the physics pre-print servers.

The same is true for printed treasures in our stacks, whose copyrights have expired. We might as well recover them and put them on the net instead of paying collectors' prices for facsimile editions. But hardly any library is willing to do this without project sponsoring. Again, it had to take amateurs like Michael Hart, Gunter Hille and many voluntary non-librarians to found the Gutenberg-Project[6] and clever publishers like those from Directmedia Publishing, who are marketing the „Digital Library with German Literature from Lessing to Kafka" on CD-ROM and on the Internet[7], and who have snatched away the domain name „digitale-bibliothek.de" from German libraries.

It seems that librarians are always on the spot a little too late, but always with professional thoroughness and solidity, hyperactive in many projects and driven by their apprehension that the status of their profession and the library as an institution could be shoved aside by others in the World Wide Web.

If we look at the results of librarians and publishers building the virtual library, both have not worked very effectively if we compare it with those of

the major players in the Internet. There are only few exceptions like some national academic Web indexes, subject based information gateways and digitised collections which were created and well maintained by librarians. I hope that we get - or better take - a second chance for the next steps on the way to virtual libraries. Before we look at the concrete chances and the possible new mission of research libraries I will give you some of my prospects for the technological change and the future of the information media.

FUTURE TRENDS IN IT

It is not the time to discuss the future trends intensively. I will give you only a short list of my forecast in the field of IT:

We will live more rapid technological change:

- Today the capacity of storage media is no longer a real problem if we think of DVD, personal computers with huge hard disks and servers with terabyte archives. The problems of limits in the past will be unknown in the future.
- The bandwidth of our local and wide area networks will be great enough e.g. to transport streaming videos in high resolution full screen quality and three-dimensional virtual realities.
- The mobile hand-held communication will be integrated with mobile computing. We will take it as a matter of course when students will visit the virtual library from everywhere e.g. from their tables in front of the coffee bars.
- Software will be more user-friendly and more suitable driven by voice commands and voice outputs. Helping agents and robots will assist users personally. But the speed of change will bring new bugs with new software applications as well as it does in the present.

FROM BOOKS TO MULTIMEDIA PRODUCTS?

Let us stay with the future of information media for a few more minutes. The complete text of Heine's Wintertale on my PSION hand-held computer is nothing but a gadget, like the „Rocket Book" or the „Soft Book" as new devices for electronic books. Today they are toys for big children. The English dictionary which I have stored on my PSION, on the other hand, is rather useful for consultation. Electronic publications have already replaced their

printed counterpart in the field of reference works and boring bibliographic indexes, and they will soon replace scientific articles in journals and similar sources of information.

Neither librarians nor users mourn the loss of the numerous volumes of bibliographic reference works - only, if at all, our administrators of CD-ROM-nets do. Almost daily, they are angry about badly programmed and incompatible software, not to mention their trouble with Microsoft's operating systems.

With the increasing number of software and multimedia products in the field of teaching and learning, the number of technical problems will increase. Looking at our kid's computer games with their particular hardware demands and destroyed operating systems after installing the new game, we get a glimpse of what the ideal world of multimedia - so much yearned for by educational politicians as well - might be like.

Librarians who have considerably neglected or only reluctantly touched the predecessors of this type of information, the video films, will no longer be able to keep away from these sources of information as they will replace existing textbook collections in many fields. The consequences for the libraries will be the more serious the greater the span of time before we start dealing with them and being able to handle them competently. Otherwise, this job will be done by others, by the data processing centres and by the media centres. Or else, the collections will again be under the administration of the individual institute's secretary or of the faculty's science assistant - nicely decentralised on a CD-ROM or on the Internet, but by no means retrievable in any library catalogue.

Or the change will be much more radical. A scenario of academic education in the future just published for the Bertelsmann and the Nixdorf Foundations gives an impression of the market for higher education in the year 2005[8]: The student's decision will not be to study in Munich because of his girlfriend or in Oldenburg because of the lower costs of living. He will search the Internet for online suppliers of higher education globally and he will find offers of certified distance-learning modules, course-packs and „training in the box" by international consortias, corporate universities, virtual universities and networks of universities. The study says that 50 percent of the students will not be educated at traditional universities anymore. Their study will be Web-based, flexible, configurable, interactive with simulations and computer supported co-operative work (CSCW). The students decision will be cost-benefit oriented because he will have to pay for his education 15,000 Euro annually. In this scenario of competition between universities and other

suppliers in the education market the authors do not mention the library whether playing a role as a distributor and technical provider or not. Today we see millions of federal money invested in multimedia developments at our universities. I am not sure, however, if the prognosis of Bertelsmann and Nixdorf will succeed either in its business idea or in the complex reality of learning. I hope that the more behavioristic approaches of learning and teaching by multimedia will fail and that the idea of constructivistic learning with its social dimensions will succeed in the sense of Benjamin Franklin: „Tell me and I forget, teach me and I remember, involve me and I learn." Multimedia and Web based learning will come but it should be used as a tool for better communication and information to reach more creativity and involvement of the students and a better quality in teaching. The potential of multimedia will also reach the research publications which are still electronic copies of the linear paper versions.

Considering that today the number of electronic editions of monographs has so far reached a level of under one per cent, and that the number of journals is far under 10 per cent the current status of the virtual library is indeed a relative one.

My prognosis for the immediate future is different. Textbooks for teaching will be supplemented and partly replaced by multimedia products. Typical research monographs for a small but world-wide circle of readers, scientific journals and serials, bibliographic and other reference works will primarily be offered electronically. Only one question remains: by whom and at what financial and legal conditions or in other words:

FROM PAPER TO PAY PER ... ?

We already have heavy turbulences and conflicts among authors, publishers, booksellers, retailers, libraries and readers. During this transition period all actors in the information chain try to use a double strategy: they conserve their traditional roles and they call each other into question.

Here I cannot discuss the serial crisis very deeply which is illustrated by the following cartoons[9]:

Fig. 3

Fig. 4

The library's mission to offer access at non-prohibitive prices for everyone and for a long time differs from the shareholders' and managers' interests of large publishing firms. They have started to create an e-commerce library. During

the transition period they bundle print subscriptions together with online access at additional prices. They try to increase their share of the market by selling access to all titles if the library accepts the „no cancellation" clause. All these previous price policies of the publishers will escalate the crisis. Maybe the escalation is necessary to bring libraries and the scientific community to another policy rethinking their purchasing power and their property rights.

But today the reactions of libraries and scientists are inconsistent. On the one hand the libraries have formulated statements and guidelines for the selection and purchase of electronic information like those of the „International Coalition of Library Consortia"[10] with 5,000 member libraries world-wide or those of Dutch and German university libraries[11] or the new licensing principles of LIBER[12]. On the other hand they ask the state for extra money and if they get it they sign the contracts with Elsevier and Academic Press under terms and conditions which do not accord with any of their principles. It is the same with the scientists. They still give their articles to the commercial publishers, establish new journals for them, and do not think of the consequences or about alternatives.

Instead of doing this we should act together with the scientists and the scholarly societies. We should develop and practice new models of scholarly publishing using the possibilities of the World Wide Web and of new technology. The attempts of Stanford's „High Wire Press" or the alternative concept of the „New Journal of Physics" or „SPARC - The Scholarly Publishing & Academic Resources Coalition"[13] lead to the right direction. They try to create a more competitive market place for research information by publishing new journals within scholarly institutions, by founding a non-profit publishing house or by establishing self organised structures for electronic publishing.

A scenario a little bit more radical would be the following one: What would happen if all the members of LIBER together with all the 5,000 members of the International Coalition of Library Consortia decided not to renew the subscriptions of the five main publishers with the highest price increases for the next year and the learned societies agree with that boycott. For the meantime the planned articles could be refereed as usual and then send electronically together with their meta data to a central database maintained by SPARC or to decentralised databases at the national libraries or to the library of the authors' home institution or to all three.

I fear that this scenario will remain a dream. Libraries still hold subscriptions even of the nearly criminal publisher MCB Publications and librarians accept

the same publisher still as a main sponsor of IFLA which can finance round tables about the future of electronic journals as it happened.

But let us now look forward a little bit more optimistic at the reality and at the concepts for the future of libraries which will be hybrid ones. In these times of transition, the question for libraries arises as to how the new information media will have to be presented to our clients together with the old and still new printed information.

THE HYBRID LIBRARY: INTEGRATION OF INFORMATION AND WORK

I agree with the British colleagues who have formulated their idea of a hybrid library as follows: „Communications and Information Technology enables the integration of information and work."[14] Another description comes from the Santa Fe Workshop on Distributed Knowledge Work Environments: „[T]he concept of a „digital library" is not merely equivalent to a digitized collection with information management tools. It is rather an environment to bring together collections, services, and people in support of the full life cycle of creation, dissemination, use, and preservation of data, information, and knowledge."

Students and scientists want to do all the things in the virtual library that they have always done in the real library - but with digital means, without any frictions and more comfortably, without having to leave their seats and even working from their homes. They want to find, read, hear, see, store, print, analyse and adapt information. They want to criticise and comment on it, to quote it and to take it into their individual database. They want to send it on to colleagues and if necessary they want to pay for precious information and services.

Each of these activities is connected to a number of individual processes. Just think of the searching and finding of information in the Internet. The problem is not a new one. I quote Borges again:

> „As was natural, this inordinate hope was followed by an excessive depression. The certitude that some shelf in some hexagon held precious books and that these precious books were inaccessible, seemed almost intolerable."[15]

Borges' idea of the Universe as an infinite library with maze-like chaos is comparable with today's reality of the Internet. In spite of the great number of

search engines, we have great problems sifting the chaff from the wheat, or to find the needles in the many haystacks. Many steps are necessary for finding the information as such. Just think of your own library, of what searching, what change of systems and, at best, what fussy copy and paste activities are necessary. As a rule, the user has to write down new references over and over again in order to insert them in their next search. If they choose an interdisciplinary subject, they are even worse off.

And up to now, we have only dealt with the finding of information. If the user wants to produce new information for the virtual library, the situation will be even more complex, such as in this example:

> „Supposing a scientist open to modern techniques would like to put into practice the appeal of the Heads of Universities for the integration of new media into university teaching. He would like to produce a new teaching and learning unit in his particular subject which is to be based on multimedia, in the process of which he has to prepare his own texts, printed texts, graphic representations from books, taped documents and video material as well as bibliographic references from a didactic point of view, and he has to present them to his own students and to those of other universities on an interactive hypermedially connected level in the World Wide Web.
>
> Full of hope, he asks for technical support at the data processing centre, the library and the media centre. He would then be handed on to various people and - if he was lucky, get to know half a dozen helpful colleagues in different institutions. At best, he would be given hints at how to procure financial means from national and European sponsoring programs for his institute. But it is not very likely that any of the universities would be able to fulfill the services he would be in need of."[16]

It is part of the hybrid library to offer services for these requests. If the library is not able to do this on its own it should outline an integrated service together with the data processing centre and the media centre and introduce this service in a clear and understandable way to the user.

My virtual dream library consists of an integrated access to any kind of information as well as of the workplace for integrated use and processing of information - in the library, at the institute and at home. This vision is far from being a reality. It is not enough to put up 200 personal computers in the library, to equip them with any kind of software and to list the sources of information via the Web browser. Colleagues from Groningen University Library have made the experience, that this only leads to surfing on the World

Wide Web or to using the personal computer as a digital type-writer. Students are not to blame for this. It is also due to a lack of integration of these precious sources of information that they are often not being used. Therefore, let us have a closer look at the information on offer.

INFORMATION IN THE HYBRID LIBRARY

In the hybrid library the WWW is to serve as a mean to make various sources of information accessible, independent of place and time and of their physical form - in particular:

- the own OPAC and those of other libraries,
- the shared regional catalogue,
- the national catalogue, if there is one, and those of other countries,
- data bases,
- printed and electronic journals,
- printed and electronic books,
- multimedia material,
- special collections (maps, audio, video, photo archives ...),
- retrospectively digitised material of the own library and of others,
- other sources of information in the World Wide Web,
- collections of data, facts and software.

And all this irrespective of the resources being available in your own institution, by remote access via the Internet, or by interlibrary loan and document delivery services.

Many of these resources are already being offered by libraries via their Web interfaces. But the following polemic remark by Umberto Eco, originally meant for traditional libraries, is also true for hybrid libraries:

> „Catalogues must be separated as far as possible: we should be particularly careful to separate the catalogue of books from that of journals and that of the journals from the subject catalogue, the catalogue of new acquisitions from that of the older collection."[17]

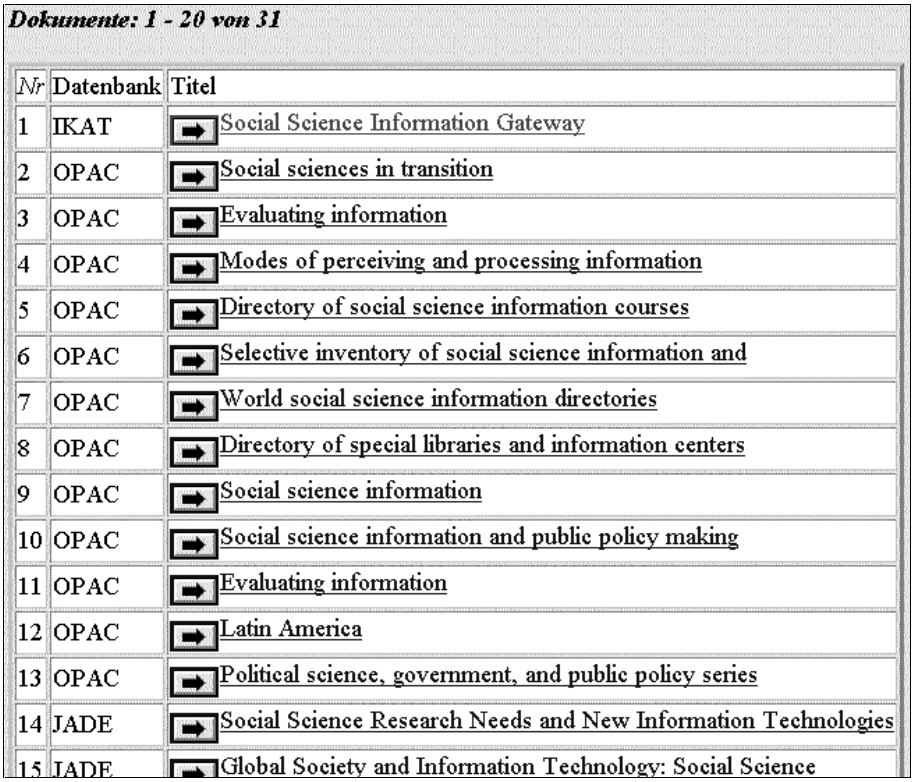
As a rule, there are still different types of access, of systems and of user interfaces, which are offered by libraries, depending on the catalogues, on the data bases, on the publishers, etc. They are often to be found in seperated workplaces, too. There have been a variety of technical and organisational reasons for this phenomenon. For the librarian at the information desk and even more so for the user, the services available are hardly surveyable or conveyable. It will not do to make a list of the possibilities of access to different information resources and to their respective WWW gateways on a single HTML page. Many suppliers of information and many libraries as well have taken this road, but without achieving a true integration of different sources of information. The solution cannot lie with one interface and with one system, as the sources are too heterogeneous. Our aim should be to create few integrated Web-based accesses of selected high-quality resources. Let us have a look at the individual possibilities and let us start with the library catalogue.

FROM THE OPAC TO AN INFORMATION GATEWAY

Today the local catalogue can be accessed via a Web gateway. But navigation possibilities via hyperlinks are simply being given away in many solutions with Web OPACs. The hits they indicate contain HTML only as „preformatted text" without any links to connected titles or index entries in the data base. But it could be made possible to refer from one indicated hit to others of the same author, the title key-word, the subject index, the classification by means of a link. Even corporate entries, hardly ever searched for by anyone, could be made useful by a click. Most of these information are available in the local data base - they would just have to be supplied as a link via the perl scripts in order to release a new search script on click.

But most of all, the Web OPACs offer a decidedly new quality by making it possible to gain access to external information by means of a link: direct access to full text, to the table of contents of a journal, to the abstracts of a CD-ROM data base, to the publisher's server with its electronic version of the journal, but also to pictures, audio data and videos. Many of these sources of information are digitally available in the library or accessible on a licence basis, but not yet connected to the OPAC. The local catalogue could thus turn into an information gateway to the hybrid library. There have been examples, though incomplete, for this kind of development: The University Library of Bielefeld links the search in the catalogue with a search for data on articles (JADE), on abstracts (Silver Platter), on full texts of publishers, on their own

retrospectively digitised books, on Web sources (IKAT), and with the document-supply service Jason:[18]



Dokumente: 1 - 20 von 31

Nr	Datenbank	Titel
1	IKAT	Social Science Information Gateway
2	OPAC	Social sciences in transition
3	OPAC	Evaluating information
4	OPAC	Modes of perceiving and processing information
5	OPAC	Directory of social science information courses
6	OPAC	Selective inventory of social science information and
7	OPAC	World social science information directories
8	OPAC	Directory of special libraries and information centers
9	OPAC	Social science information
10	OPAC	Social science information and public policy making
11	OPAC	Evaluating information
12	OPAC	Latin America
13	OPAC	Political science, government, and public policy series
14	JADE	Social Science Research Needs and New Information Technologies
15	JADE	Global Society and Information Technology: Social Science

Fig. 5

Everyday the OPAC of a library is being used thousands of times by library users whereas expensive CD-ROM databases are being left relatively unnoticed. Integration into the Web OPAC can bring about a more intense use of the data. Technical solutions exist, such as ERL by Silver Platter and a gateway for Ovid databases. Both of them make the links between reference information and concrete holdings possible.

Libraries which have a licence agreement with publishers for electronic journals usually find that the possibility of direct access to articles is being used too little. Normally, these libraries offer a list of the electronic titles in the World Wide Web, in alphabetical order and according to subjects and

publishers. Even if we establish a link in the OPAC between the titles and the publisher's server - as we have done in Oldenburg[19] - the demand for this service is very limited.

If, on the other hand, the bibliographic data of each article in the OPAC were to be mixed with links to abstracts and full texts, demand for this service would surely increase considerably. But hardly a publisher would be ready to supply one single library with data on a regular basis.

The alternative would either be for a large consortium to feed the data into the bibliographic utility system at the regional or national level or else for us to go and get us the data ourselves from the publisher's server by means of a robot such as Harvest. This second path is being taken by the University Library of Osnabrück in its „Electronic Library" project.[20] It is thus collecting the accessible pages of publishers' journals and the data of freely available electronic journals in the Net, a few thousand titles by now. During this process of integration into the OPAC data base, the problem of consistency of the data has to be solved, not a trivial one, even with programs for checking links. There is also the need for regular checking that the robot is not gathering completely different information, because the structure of the publisher's server may have changed in between. The same applies to inserting any other Web resources into the OPAC, whether manually or gathered by a robot. I would rather warn you of it. There is a different solution, instead. By means of a gateway search enquiries can be sent simultaneously to the WWW OPAC and to a search machine or a Web index. This can be implemented without great expenditure. The great success of meta crawlers, but also of the Karlsruhe Virtual Catalogue[21] lies in the simple principle of simultaneous enquiry by scripts.

Not all sources of information can be integrated into this model of simultaneous enquiry. The number of potential services has become too big for this. „Internet sleuth"[22] alone offers gateways to over 3,000 data bases in its own data base, and has thus turned into the data base of data bases in the Internet. I warmly recommend the use of this service to any librarian at any information desk. The link to this service should not be missing on any home page of any hybrid library.

CATALOGUING RULES AND DUBLIN CORE

When processing electronic documents and, in particular, Web resources we should examine the cost factor carefully. We can simplify the work if we let

the authors at our institutions do the simple cataloguing. The Dublin Core Metadata Element Set has gained considerable ground internationally with such a process although its use is not widespread. There are already too many templates for the recording of the Dublin Core Data in the Internet. You should not develop your own method, but rather use an established one. Whether you simply convert these data into the national MARC or into your own format and transfer them unchanged into the OPAC or whether you want to check and complete them is a question of feasible cost-expenditure.

A problem is presented by the rules for cataloguing. They prescribe that for each new edition of a publication an individual record of title must be made. The result is then quite curious. If you imagine that, because of the deterioration of the paper, you film an old book from your library which already has a title record. Then you digitise the microfilm which you have produced and deposit it on your document server as an electronic publication. The result is then four different records of title: one for the original, one for the master film, one for the user film and one for the electronic document. In your Web OPAC the non-circulating original will probably be shown first and in final position the electronic version, which can be accessed with a click, will appear - provided, of course, that the user will scroll down that far. I think that in this case a pragmatic revision of the existing rules is urgently required.

FROM INFORMATION TO SERVICES

In the hybrid library the capabilities of the WWW are still too little used for providing services. Many libraries offer services via interactive Web sites which can be introduced at one's home library without great expense.

Requests for information can be answered not only by telephone or by walking around the library, but also by sending a Web-form immediately and automatically to the reference librarian or another responsible staff member per e-mail. Do not be frightened that this service will be used very often. The users' goal is not to get answers one hour or one day later but to get on with their work. Today the Internet-using clients are answering more questions on their own. We have to do the next steps „providing a point-of-need „reference service to information seekers at the place where they are when they have a question."[23] The reference service must change in the hybrid library to an interactive remote service even if the user is working in the library but fears to leave his workstation and to loose his chair when going to the help desk. There are possible techniques to provide a just-in-time reference service. A

flashing link on all our Web pages including the dynamic ones of our database gateways can offer a talk to a librarian by different ways: by talking via CuSeeMe or Netmeeting, by chatting via a second browser window. The online interactive help service could be started locally or it could be organised co-operatively by several libraries at a regional or national level to offer a 24 hours service.

There are also library services which intend to replace or to support the work of reference librarians. The university library of Groningen developed a system called COBRA which makes suggestions for search strategies according to the needs of the user.[24] It is an expert system which generates an individual advice of all kinds of reference works, books, databases, abstracting and indexing services, by using a local database with more than 3,000 reference titles.

In addition to the concept of integration by simultaneous gateways as described we need a knowledge database or an expert system for our users and our reference staff as a gateway to gateways to fill the lack of information literacy and to mediate the different resources according to the needs.

Another example: The scholar no longer has to send his suggestions for book orders to the library via the slow in-house mailing system. She or he can send the bibliographical details of the order directly to the respective subject librarian via a Web-form.

The almost complete availability not only of the faculty members, but also of many other users via e-mail opens new possibilities for providing information. The New Books List can be sent to subscribers according to individual subjects without burdening the library with additional work. Current contents information aimed at the needs of individual users can also be distributed in this way. Other automated SDI services can be pushed to the users. Ultimately costs can be saved if the overdue warnings of the circulation department are delivered automatically and without delay via e-mail.

One principal service area does not lie exclusively in our hands, but can be realised only by co-operative effort. I address here the functioning of interlibrary loan, or, as we say in the hybrid library - the document delivery system.

DOCUMENT DELIVERY AND SUBITO

In Germany we have a document delivery system that consists of five different access systems. Although I was personally involved in the initial phases of the planning of SUBITO, I must confess that I only recently placed my first order via the SUBITO access system of the DBI.[25] The experience was astonishing. Since my information about the journal article was incomplete, I first of all searched for the article data in a Current Contents Database and found it. I copied the data in the clipboard and switched to the access system of the DBI. After the troublesome registration and receipt of a password I was also able to find the journal in the National Serials Database. From a long list of scarcely interpretable data on holdings I selected a large library and laboriously inserted my article data from the clipboard into a form and ultimately sent the order off. The e-mails, which reached me after that, were cryptic and incomprehensible. I interpreted the first as a confirmation of the receipt of the order, while the second announced that the delivery was to be expected forthwith. The third was supposed to be the delivery itself. All e-mails seemed to be „letters" automatically generated by the document delivery station, which contained numerous numerical codes and began without a salutation and ended without regards. The delivery itself contained an attachment, which could not be opened by any of my viewers. A glance into the file with a programming editor showed that it was only a few bytes in size and did not contain the Megabytes of the expected multi-page TIF file. As indicated, I sent my complaint that the TIF- file was probably damaged per e-mail to the address indicated with the request for renewed delivery and since that time I have heard nothing more from SUBITO. I have also never received a bill. The example is, I hope, an individual case, but nevertheless instructive.

A further problem with SUBITO is identification. If we require simple accessing procedures via the domain from publishers and database providers, the librarians themselves cannot introduce a system full of complex log-in procedures and multiple passwords and then give the whole complex tangle a single name.

In my mind a user-friendly service of the hybrid library is something quite different. An easy entry into the regional and national system for ordering and delivering documents should be offered via the local Web OPAC, which should also encompass the holdings of the other local libraries. The user-code of the home library should suffice for identification and the article and journal data should be immediately transferred into the ordering system. The SUBITO services JASON and GBV approach this system in their configuration and structure.

ON DECIPHERING AND CONVERTING: DIGITAL ARCHIVES

Let us think 20 or 100 years ahead. We will have a problem which Jose Luis Borges foresaw nearly 60 years ago:

> „Five hundred years ago, the chief of an upper hexagon came upon a book as confusing as the others, but which had nearly two pages of homogeneous lines. He showed his find to a wandering decoder who told him the lines were written in Portuguese; others said they were Yiddish. Within a century, the language was established: a Samoyedic Lithuanian dialect of Guarani, with classical Arabian inflections."[26]

We would say today, that in the year 2099 the restorer in the workshop of the German Library in Leipzig luckily succeeded in decoding the file format of a Microsoft Winword 8.0 file on the library´s document server with the help of a virtual Windows98-engine and made it readable. Whether that will actually succeed in a hundred years, nobody knows. The long-term filing of digital documents is a pressing problem which the virtual library has not yet solved. The chances of success will be all the greater if various copies in different file formats are preserved and still available on our servers. No one knows whether it will be easier to convert and decipher Postscript Level 2 or PDF Acrobat 4.0 or Winword 8.0 in a hundred years. It follows that if you establish a collection of important electronic publications in your library - for example the publications of your institution - you should never delete the source format after having converted it into another. Today's html-, sgml- and future xml-files will surely be able to be read by a programmer with a manual from the year 1999 who can write an appropriate parser. But what about the other file formats and those which Bill Gates will present us with in the future? No one can safely assume that the National Library will solve all the problems of deciphering files. The problem can only be solved by co-operation among all research libraries.

FROM PROJECT SUPPORT TO THE PLANNING OF THE HYBRID LIBRARY

With the problem of digital archives we have arrived at the end of the daily routine in the hybrid library. In closing, I would like to come to the national library policy. Arnoud de Kemp, a manager of Springer, said at a conference: „There are too many research and development projects for professional societies, publishing houses, libraries and the disseminating book-trade."[27] As regards Germany I would say that there are too many expensive projects whose benefit for our customers is questionable and that these projects do not

co-operate, but rather compete with each other. In Germany we lack co-ordinated and professional planning for the development of the hybrid library.

There are certainly enough studies and papers available for such planning. The Ministry of Education and Research, the German Research Society, and the Research Council have worked out numerous recommendations and formulated programs. Co-ordination and a concrete planning concept must still be achieved in Germany. Federalism cannot be an excuse for this situation. It happens too often that committees meet to discuss these very same questions on the federal level. „Global Info"[28], which now calls itself „The German Digital Library Project" is being funded by the federal state. Simultaneously, the Research Society supports three seperate programs in the field of „Deployed Digital Research Library".

All these initiatives exist side by side. The supported projects themselves do not seem to be subject to any real co-ordination or supervision. It is, for example, incomprehensible why the digitisation of ancient Egyptian dictionaries or the documentation of the television program ‚Black Channel' during the cold war should be important elements of the „Deployed Digital Research Library". It is obvious that still more co-ordination is necessary - above all the development of pragmatic, practice-oriented concepts according to the user's needs.

The most recent criticism by foreign experts of German scientific development can also be directed at the library development of the ministry and the DFG: It does not suffice to establish programs and then to wait and hope that corresponding grant proposals will be forthcoming. The planning and realisation of the infrastructure necessary for the hybrid library can not be left to chance. Those who are involved in developing the hybrid library must be asked specifically to undertake the necessary projects and they must also be required to act co-operatively and to organise the necessary procedures for professional planning.

Our British colleagues have shown us that this is possible. In phase 3 of the program „e-lib"[29] the concept of the hybrid library is pursued, which has as its principal goal the integration of information resources and the work of the research scholar. While in the USA the „Digital Library Initiative"[30], financed by the National Science Foundation, is strongly oriented toward research and new technology, the program in Great Britain is oriented toward practical application and is therefore at the same time both visionary and practical.

A FINAL REMARK

Let us give the word again to Jorge Luis Borges:

> „The impious maintain that nonsense is normal in the Library and that the reasonable (...) is an almost miraculous exception."[31]

My lecture was not intended to be irreverent. On the contrary: The criticism of existing incomplete solutions should bring us closer to Borges' paradise, which he imagined as a kind of library, for us perhaps the ideal virtual library which is a hybrid one. I have the impression that librarians shy away from open criticism today. In earlier times they often earned their money with brilliant and biting literary criticism. We should also become critics again - in and through the Internet.

REFERENCES

1 Borges, Jorge Luis: The Library of Babel - Translated by J. E. I. <http://jubal.westnet.com/hyperdiscordia/library_of_babel.html>

2 Stern - 19.6.1997.

3 Hilberer, Thomas: Was ist eine Virtuelle Bibliothek? (own translation) - <http://www.uni-duesseldorf.de/ulb/virtdef.html>

4 Microsoft Encarta Enzyklopädie 1998. Entry „virtuell"

5 See: Koster, Martijn: Robot Exclusion Standard - <http://info.webcrawler.com/mak/projects/robots/norobots.html> and: <http://www.kollar.com/robots.html>

6 See: <http://promo.net/pg and : <http://gutenberg.aol.de/gutenb.htm>

7 See: <http://www.digitale-bibliothek.de>

8 Hochschulentwicklung durch neue Medien - Vision 2005. BIG - Bildungswege in der Informationsgesellschaft - Gütersloh: 1999

9 ill. 3: To Publish and Perish. In: Policy Perspectives. March 1998, Volume 7, Number 4 <http://www.arl.org./scomm/pew/pewrept.html> ill.4: Frankfurter Allgemeine Zeitung - Summer 1999 (own translation)

10 See: <http://www.library.yale.edu/consortia/statement.html>

11 See: <http://cwis.kub.nl/~dbi/english/license/licprinc.htm>

12 See: <http://www.kb.dk/guests/intl/liber/news/981116.htm>

13 See: <http://www.arl.org/sparc/>

14 Richard Heseltine: The Future of the Subject Resource Gateways. Proceedings of the library Strategy workshop. Bristol: JISC, 1998

15 Borges

16 Informationsinfrastruktur im Wandel - Herausforderungen für die Hochschulen und ihre Informations- und Kommunikationseinrichtungen. Thesen der gemeinsamen Arbeitsgruppe. – Oldenburg: 1998 (own translation)

17 Eco, Umberto: Die Bibliothek. München: Hanser 1987, S. 15 (own translation)

18 <http://www.ub.uni-bielefeld.de>

19 <http://www.bis.uni-oldenburg.de/cgi-bin/nph-gj.pl?fachdef=bio#bio>

20 <http://elib.uni-osnabrueck.de>

21 <http://www.ubka.uni-karlsruhe.de/kvk.html>

22 <http://www.isleuth.com>

23 Anne G. Lipow: Serving the remote user: reference service in the digital environment.
<http://www.csu.edu.au/special/online99/proceedings99/200.htm>

24 See: <http://www.ub.rug.nl/html/cobra.html>

25 <http://www.subito-doc.de/infos/zugaenge/zugaenge_index.html>

26 Borges, S. 50f

27 Arnoud de Kemp: Real oder Virtuell? Erfahrungsbericht über die Entwicklung und Nutzung von elektronischen Bibliotheken aus dem Springer-Verlag. In: Service im Wandel. 27. Arbeits- und Fortbildungstagung der AspB/Sektion5 im DBV.- Karlsruhe: ASpB, 1999. p. 127 (own translation)

28 See: <http://www.global-info.org>

29 <http://www.ukoln.ac.uk/services/elib>

30 <http://www.dli2.nsf.gov>

31 Borges, S. 55

Hans-Joachim Wätjen
Oldenburg University Library
P.O. Box 2541
26015 Oldenburg, Germany
Tel: +49 441 7984010
Fax: +49 441 7984040
waetjen@bis.uni-oldenburg.de