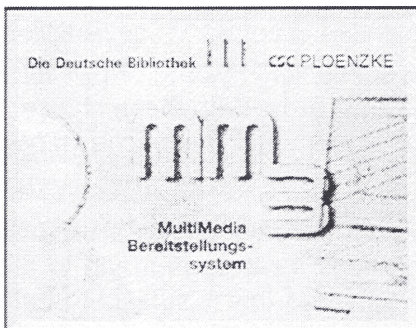


Jürgen Kessler  
CSC Ploenzke AG Dienstleistungen München  
Elisenstraße 3a, 80335 München  
Tel. +49 (0) 89 54491352, Fax: +49 (0) 89 54491337  
E-mail jkessler@cscploenzke.de

*"Science and commerce are using up to date information material. Today this comprises especially electronic publications and multimedia. The acceptance of these in large scale digital archives depends strongly on the fast and reliable access, the direct and combined possibility of presentation and document usage and the inter system compatibility in the global network. The MMB system comprises excellent preconditions for all these."*

Professor Klaus-Dieter Lehmann  
General Director  
Die Deutsche Bibliothek



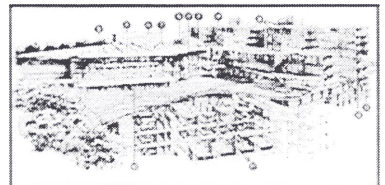
### The Library

'Die Deutsche Bibliothek', with sites in Leipzig, Frankfurt/Main and Berlin is committed by federal law to collect all German publications or publications translated in the German language, to provide public access and to perform the long-term deposit of these publications. This commitment also covers video and audio material, music sources and colour slides, and very recently the rapidly increasing number of more and more important electronic publications. Due to the risk of

demagnetisation of these files, and especially the publications and accompanying media on diskettes, it is necessary to transform the information/data onto longer lasting media for archiving.

### The Project

The Frankfurt site is responsible for the access to the electronic publications of the library. Together with the opening of the new building in may 1997, a newly Multimedia Management System, developed by CSC PLOENZKE, was put into service. This MMB System, which is fully integrated into the IT infrastructure of the library, utilises the internet protocol for the transport of the large data volumes on the basis of an ATM net work. The System contains roughly 50 multimedia workstations, 40 of these are publicly available in a multimedia reading room.

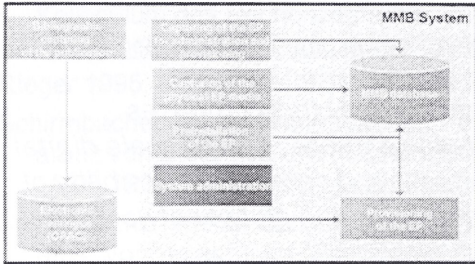


The System supports entry, administration and access to the electronic publications and also for conventional publications, which are provided in digitised form. It doesn't matter anymore what kind of data carrier (CD ROM, Diskette, online or in future DVD) or which format (proprietary, standard or de facto standard) is used for the publications. The long term archiving of endangered publications is performed on CD-R. In this way it is possible to administrate electronic publications, films, colour slide series, archived journals and other documentations as digital objects in a unified way and provide access to these publications with a standardised user interface.

The user interface is a typical Internet based web browser lay-out. Via an extended version of Microsoft's Internet Explorer, users can access the information via an online catalogue, which

introduces an overview of all archived material in the library, and - as far as these publications are installed/available in the MMB system - access the selected publications immediately. Original published documents on diskettes, actual publications on CD-ROM, colour slide series and digitised material are accessible with a mouse click. All necessary installation procedures for the presentation of the publication are running in the background and so invisible for the user.

### From the users perspective



'Die Deutsche Bibliothek' provides two different kinds of system usage to their visitors:

1. Anonymous users: In the normal framework of the overall library usage, these users also have the right to access the system of preinstalled publications and are allowed to use the print and export facilities for pictures and texts at the self service print and export workstations.
2. Registered users: These users have additionally access to a private long term workspace. They are allowed to use the Internet and to use the functions to request access to electronic publications which are not preinstalled (ad hoc installation). This user class is also entitled to store excerpts of publications in their personal workspace and - in a later version of the system - to create and maintain their own documents.

The workstations of the MMB system are fully integrated into the accounting system of the library. Library users can book amounts of money onto their library usage chipcards. With these chipcards, users are able to pay the different service offerings, from carbon copies and microfiche prints to printouts and data export of the MMB system.

Users at the offices Leipzig and Berlin can access the MMB system in Frankfurt via an Extranet based on a high speed network between these locations. Preparations have been made to allow internet access to the preinstalled publications of the system; nevertheless this is subject to further clarification of copyrights and payment regulations.

The MMB system also provides improved facilities for the employees of 'Die Deutsche Bibliothek', Electronic publications, which are necessary for the daily work of the librarians, will be accessible from the workstations. Furthermore, the facility of a temporary installation of the material will improve the precision of the bibliographic information to be entered into the catalogue system.

### From the Developers perspective

A special feature of the MMB system is to provide access to a broad variety of publications as there is still lack of standardisation and/or conventions for the structure and construction of electronic publications. The archived material, which is digitised by the library itself can be prepared in a uniform way. Publications on CD ROM are mostly accompanied by their own presentation software. Depending on the date of issue, these publications have quite different requirements regarding the operating system, software drivers and supporting hardware of the workstations.

With the past special experience of CSC PLOENZKE Logistic Information Systems Munich in the development of technical documentation systems, it was possible to develop a universal approach for the automatic installation and deinstallation of the electronic publication over the network. *"Our intention is to comfortably protect users from the nasty technical requirements by using the right technology"* explains Rainer Kuhn, manager of the unit Logistic Information Systems, the focal point of the project team.

## **The key Concept for everything: Preinstallation**

Together with the initial entry of the bibliographic information of the publication a preinstallation of the publication is performed. All details of this installation are recorded in an installation script. When later on a publication is requested by a user the installation script is replayed on this workstation to equip the users workstation with all modules, files and registry amendments that were necessary during the preinstallation of the document or the application. After this step is finished, the data and the corresponding presentation program are loaded. This procedure runs fully automatically for standard PCs with Intel hardware and operating system of the windows family.

A well defined mechanism is implemented, to put the workstation back into it's basic configuration under specific circumstances if this deemed to be necessary. For this purpose the initial configuration of the workstation is copied as an image into an additional partition of the workstations hard disk. If necessary this image is automatically copied back to the boot partition and the workstation is rebooted under it's initial configuration. The saved image can also be used to update other workstations with a modified version of the initial configuration. The initial configuration of the workstation can always be amended.

## **Demand driven access categories**

The expectations of the users, regarding the availability of publications and the technical possibilities, is perfectly balanced with the limitations of the systems storage capacities in a four step concept of media storage.

1. The most often requested publications (currently several hundred) are imported as images on a RAID system with at the moment 250 GB capacity and are accessible from this RAID system. The MMB media server controls all activities to convert all necessary data from the original carriers (primarily CD ROM) onto the RAID system.

2. Other frequently requested publications are held in jukeboxes with approximately 150 slots and are permanently available on demand of the users. Due to the positive development of the price/performance ratio of today's RAID systems, it is subject to further analysis, whether the initially planned capacity of 1000 jukebox slots will be installed. Meanwhile, the much more favoured RAID systems do not only work with a much higher transfer rate - but also allow a performance access to the publications of parallel access of different users - provided that this is not restricted due to licence regulations.

Scalability and flexibility play a major role in the architectural design of the system. Therefore it wouldn't be a major operation to meet future capacity needs of the system. Both categories of electronic publications are automatically installed on the users workstation using the pre-recorded installation scripts.

3. Individual electronic publications, more rarely requested by the users, are taken out of the archive manually and - depending on the type of data carrier - imported into the corresponding media server subsystem. The user is given access to the electronic publication across the ATM network. Currently the system deals with three major media server components: CD ROM server (currently 28 drives) CD ROM Jukeboxes and the RAID system mentioned previous. In this case the temporary installation of the individually and exclusively provided electronic publication is done by the user himself on his workstation.

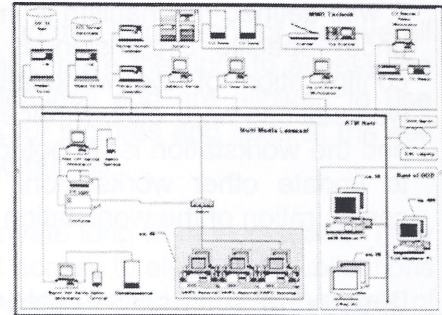
EPs of all three categories are available on all multimedia workstations of the network. Each usage case and the respective user behaviour is anonymously recorded, depending on the type of access category, for the purpose of statistical analysis. The result of this statistical analysis safeguards that each electronic publication is held in the right access category and the system can be optimised and extended to satisfy the requests of the users.

4. Such electronic publications which cannot be installed within the MMB system- e.g. due to copy protection mechanisms - are provided to the users under especially configured single user workstations.

## The Infrastructure

The basic communication infrastructure at 'Die Deutsche Bibliothek' is an ATM Network to which all components of the MMB system are connected. Devices with a broader demand of bandwidth like for instance the RAID server, all Jukebox servers, CD writer, CD servers and the database server, are connected to the backbone via

155MBit adapters. All servers operate under Windows NT 4.0 and Microsoft BackOffice. The database system SQL Server is the central element for all administrative data management. Corner stone of the access to the database is an object oriented class library developed by CSC PLOENZKE in the scope of other projects. This class library reflects the experience of CSC PLOENZKE out of several industrial projects. The object oriented approach supports the distribution of the various server functions onto several powerful pieces of server hardware and therefore leads to a high degree of scalability of the system.



In the first version of the system the various server functions are mapped onto two powerful servers. One server runs the database service, the WWW-service and the full text index service. The other server is purely used as data and communication server.

During the architectural design of the software requirements fault tolerance and robustness were playing a major role. Important for the daily work for instance is, that all user and employee workstations can continue to work even under short term breakdown conditions of single system components.

The workstations in the reading room of 'Die Deutsche Bibliothek' are operating under Windows 95 to ensure compatibility as high as possible with all currently available multimedia applications. Especially video and audio applications which are reaching the upper class limits of multimedia hardware, are currently best supported by Windows 95.

The workstations of the employees at 'Die Deutsche Bibliothek' are operated under Windows NT. With the introduction of version 2 of the MMB system in autumn 1998, employees - in the course of their daily work - are able to access all electronic publications managed by the MMB system, provided these are tested to run free of problems under Windows NT.

## The way ahead

The overall IT project at 'Die Deutsche Bibliothek' was split into three connected projects: the network infrastructure, the workstations and the multi media management system. Management of the overall project and the handling of the interfaces between the different partners was performed by the ADP department of 'Die Deutsche Bibliothek'. In a strong competition, the contract for the production of the multimedia management system was awarded to CSC PLOENZKE. Winning points during the evaluation of the different vendor proposals that lead to the selection of CSC PLOENZKE were the following underlying concepts

- Windows NT as server operating system and Windows 95 as operating system for the multimedia workstations in the reading room,
- a relational database system as the reliable basis for the client server data management and
- the planning and implementation of the system using object oriented models and methodologies

and the large scale of experiences and references of CSC PLOENZKE as a professional IT service provider. These properties fulfilled the requirements of 'Die Deutsche Bibliothek' to a very high degree.

The system is in production since the 15th May 1997 - the day of the ceremonial opening of the new library building - and fulfills the expectations of the library in terms of scalability, integration into the existing installation and future developments as far as this is possible in an area of such an innovative movement.

Peter Schmich - the project manager of the system at CSC PLOENZKE- summarises his project experiences as follows:

*"In a joint endeavour 'Die Deutsche Bibliothek' and CSC PLOENZKE succeeded to deliver a remarkable and innovative solution for the challenges of the multimedia era in the library area"*

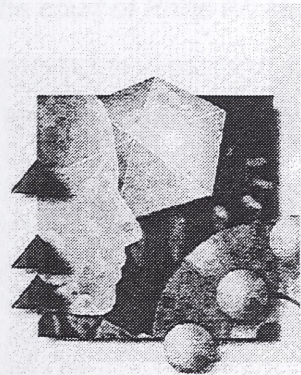
With the additional experiences gained in the design and implementation of distributed systems, incorporating modern internet technology, CSC PLOENZKE will launch new projects in the areas of libraries, museums and - last but not least also in the industrial business domain.

'Die Deutsche Bibliothek' and CSC PLOENZKE have signed an agreement for the joint marketing of the MMB system to use the MMB system as a sound basis for future challenges in the business area of libraries.

In the European project "Networked European Deposit Libraries (NEDLIB)" 'Die Deutsche Bibliothek' and CSC PLOENZKE together with other important European national libraries and state archives, have started to develop joint solutions for long term archiving and access of electronic publications. The MMB system is considered as a remarkable corner stone for the intended development by all partners involved.

Point of contact:

#### CSC PLOENZKE



Bayerstraße 36  
80335 München  
Tel.: +49 (89) 5 44 91.310  
Fax: +49 (89) 5 44 91.388  
or mail to [mmb@cscploenzke.de](mailto:mmb@cscploenzke.de)

copyright 1996, 1997, 1998 CSC PLOENZKE AD. All rights reserved