



The Munich Project

an online information system on architecture in Munich

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Introduction

The starting point for the following considerations is a proposition that usually evokes immediate contradiction from architects - from students as well as from professionals:

Architecture is information processing

What about the buildings? Ideally an architect's work leads to the erection of a material structure - i.e. a building. But the product the architect sells to his clients is immaterial. Architects don't build houses, their tools are not hammer, trowel and saw but drawing board, telephone and fax machine. They are designing, planning, organizing and communicating - working with information. One could call the built results of this work "materialized information" and architecture as an act of information processing.

Since the computer based "information age" has caught up with the architects, the introduction of computers into the described process has seemed almost compelling. And really: the computer has entered the architect's office and is being used every day - for office organization as well as for drafting - and helps doing the work quicker and more efficiently. And that is the main characteristic: parts of the workflow are "digitized" and the computer is used as a highly specialized tool. Important other parts stay "analogue" and the process itself runs in traditional schemes. The result is a situation that could be described with a common scene from early days of television: Imagine a radio speaker reading the news in front of a camera and microphone. We have changed the media but not the habit.

The next stage of computer use demands for a reorientation:

The computer is not an extension of the drawing board

What has already happened in other areas will happen next in the field of architecture: a complete reassessment of working processes and structures regarding the possibilities of consequent and continuous use of computers. This will not only result in doing more work "on the machine" but also in changes of the work itself: digital networks bring together distant resources, computer supported collaborative work (CSCW) defines new ways of communication and collaboration, on-line services replace libraries and there might be some other interesting prospects we don't yet think of. We should be open for changes in the whole process, from the gathering of information to the evaluation and selection, simulation, presentation and storage.

The Munich Project is an experimental field. It allows our students and ourselves to go new ways in architectural information processing, and it documents and presents itself on the internet.

Objectives and realization

The Munich Project is a growing virtual model of the city of Munich. It is not like its predecessor from the 16th Century an assembly of static three-dimensional volumes but a dynamically developing network of hyperlinked information on architecture in Munich. Input, which is mostly general information about the city from official sources, is provided by the *Lehrgebiet CAAD* on one side. On the other side student projects gradually add detailed information. The restriction of the "testing area" to the city limits of Munich is not just a result of local pride but allows to develop a certain "density" of information over time.



Fig. 1: The wooden city model by A. Sandner (1570).

Structure

For easy navigation *The Munich Project* is divided into four main sections:

City

The *City*-section contains information about the city of Munich: maps, elevation and volume models, satellite and aerial photos, facts and statistics.

Information

The *Information*-section collects general information for the users of *The Munich Project*: the on-line documentation of the project, its concepts, technical realization and underlying principles and access to the literature and hyperlink databases.

Projects

This is where the students' projects are - self contained units consisting of general information in a database, a file archive and a multimedia documentation. It is possible to define a hierarchical order by use of "meta projects" which contain other projects. Usually there is also a 3d-model of the project that can be integrated into the overall model of the city.

Service

The *Service*-section provides administrative access to the projects and databases, so that the students are able to publish data to the archives and maintain their projects.

Technical realization

Technically, *The Munich Project* is an intranet - an internal information system based on internet technology. Early experiments in 1994, where we first tried to provide all relevant information on courses, lectures and exercises for the students on our web-server, have proved that internet technology can be efficiently used in education. Since then we have been working with the WWW as communication platform because of its open standards, commonly available software and easy use.

Client-Server

A fairly powerful web-server is the backbone of the Munich Project, currently hosting about 450 MB of data. The students' workstations form a heterogeneous pool of Windows-NT-PCs, Apple Macintoshes and UNIX-Workstations. They are all equipped with standard web browsers.

Databases

Currently *The Munich Project* is file-based as far as the projects and all the archives are concerned. The literature- and hyperlink databases are built on a simple SQL server. Administration and maintenance is possible via the WWW.

User interface and presentations

HTML as a definition language for hypertext documents is used to realize the user interface of *The Munich Project* and most of the project presentations. Since there are easy-to-use editors available, the students are enabled to do even complex presentations after only a few weeks. The user interface of *The Munich Project* consists mostly of dynamic HTML-documents that are created on the fly via CGI-scripts on the server.

3d models

Three-dimensional models are described in VRML, the Virtual Reality Modeling Language, which has a very useful feature that is of prime importance for *The Munich Project*: its ability to combine several separate and distributed models through external references ("inline"). This mechanism allows to arrange specific models on users' request via CGI-scripts on the web-server. Most of the models are exported directly from CAD systems or converted from other formats like DXF. Browsers for VRML are available for all platforms we use in our computer pool.

Multimedia data

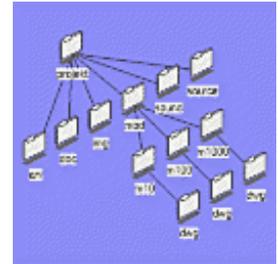
The file-based structure of *The Munich Project* allows to integrate virtually any type of data that could possibly be processed on our machines. So far that includes various graphic formats (GIF, TIFF, TARGA, JPEG), animation and video data (Quicktime), sounds (AU and WAV) and some proprietary formats (Quark Xpress, WinWord..).

CAD data

CAD software used at the *Lehrgebiet CAAD* includes *Nemetschek Allplan*, *AutoCAD* and *ArchiCAD*. To ensure that finished models can be re-used, we record a compressed version of the proprietary CAD data and versions in standard exchange formats like DXF.



Fig.2: Title page of The Munich Project



Aspects of practical use

The Munich Project has been on-line since spring 1996 and has first been used for educational purposes in the summer term 1996. Currently there are about 50 students working on some 20 projects.

Information retrieval

To obtain the necessary information is the starting point for each project work - and one of the most difficult ones too. Maps are being digitized, pictures are scanned, elevation models are built for each project - often a dozen times for a dozen projects on the same spot. The interesting aspect is: there is already a lot of information existing in digital form. There is a complete and highly accurate digital version of the city maps of Munich, there are digital elevation models, satellite and aerial photos, literature databases, models of already finished projects and so on. But all this is scattered over different locations and mostly stored in proprietary formats - in short: it is not commonly available.

Now *The Munich Project* tries to be the starting point for the investigations: maps, models and pictures are collected, digitized and published on the web-server in standard formats. A database gives hints on literature and hyperlinks in the World Wide Web. Background information on *The Munich Project* and basic tasks and techniques exist as hypertext documents. So the first place to look at the beginning of a new project is the *city-* and *info-*section of *The Munich Project*.

Project work

The single projects are being worked on in groups of one to three students. The subjects range from the reconstruction of historic buildings and the documentation of classic architecture in Munich to the simulation of unrealized designs and the analysis of urban structures. The objective is to bring out a certain aspect of the chosen subject and document it in adequate form. For this work the students are provided with a broad variety of software on a heterogeneous computer pool: CAD systems, modelers, renderers and simulation software, photo- and video editing software, layout- and presentation tools and so on. Students are required to carefully set the scope of their work, so they manage to finish the project in time. They have to evaluate and select the obtained material, plan the presentation and - this seems to be one crucial point - define the right level of abstraction that fits their objectives. Co-operation between different project groups is encouraged and makes sense because all the projects are located within the city limits of Munich. With the early publishing of results to the archives each group can enable others to immediately re-use their work.

Communication

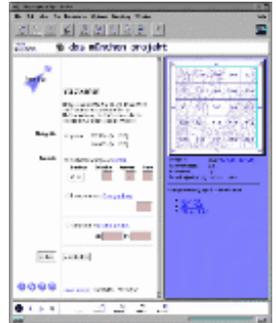


Fig.7: The map chooser.



Fig.8: A page of the on-line documentation.



Fig.9: Project overview.

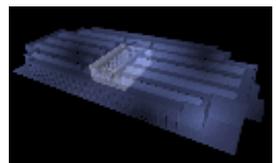


Fig.10: Project model

The Munich Project is accessible on the internet anytime and from anywhere. Communication between the students and the *Lehrgebiet CAAD* outside the frequent reviews mostly happens via e-mail. There are FAQ-lists available and we have planned to set up discussion groupson a news-server. Archives and databases are administered via WWW, so that it is possible to work on the project from any internet host with a WWW browser. Other institutes of the faculty of architecture have been joining *The Munich Project* since the beginning of this year over the university network.



Fig.11: Administration of the literature database.

Presentation

The project work is documented digitally and eventually presented on-line. "New media in architecture" in this case means intentionally to exclude the "old" medium paper from the beginning. The integration of all the results into a multimedia presentation of the chosen project is the final stage of the process. Finding a design language that expresses the aim of the project and allows to easily navigate within the presentation, to chose the right media for each part and to finally present their work on-line is a challenge for the students and they master it with excellence. Until now there have been about a dozen finished projects, all realized in HTML with embedded animations, VRML-models, sometimes even sound and video components.



Fig.12: One page of a project documentation.

Archive

Each project forms a self contained unit consisting of a record in the project database, a file archive and a multimedia presentation. Files can be published to the web-server via an automated FTP-access from the service-section of *The Munich Project* and can then be accessed from the internet in the project-section. Queries in the database, a set of filters and clickable VRML-models of the city with the project locations provide a variety of access points to find certain information. Future developments will go into the direction of multimedia databases ("universal server") that host all kind of data and allow content-based searching.



Fig.13: Publishing data to the server.

Conclusions

When we see architecture as an information process, we need new ways to deal with information and we have to develop methods to navigate through information territory.

Information warehouse

Vast quantities of information lie fallow, because they are not accessible, not connected to each other and not usable because of incompatibilities and proprietary formats. The same work is done over and over again, because of lacking communication. With *The Munich Project* we try to collect data and make it accessible for immediate use - and reuse. The concept is an "information warehouse", a database that holds all data in various formats and points to external sources where data can be accessed directly. On the one hand this means more comfort in enquiry, on the other hand it helps to increase quality of data. The best solution is always to get the information from the original source, up to date and without loss of quality. But to find the sources, carefully maintained and easy to use starting points are necessary. If we can provide those, the process can not only be more efficient, maybe we will find information and see new aspects we did not think of before.

Diversity and integration

The multitude of software packages and incompatible formats is frightening at first sight and maybe there is no general solution, despite all standardization efforts. But with the technology of the World Wide Web and its open standards there is a common basis to work with. *The Munich Project* proves that consequent and continuous work with the digital media is possible with today's methods and resources. Current developments in database technology, like object-oriented and object-relational databases, are going towards diversity in data types and will provide content search in multi-media data. So efficient information retrieval will be possible in non-textbased domains like architecture in the new future.

Education

Finally, *The Munich Project* emerged from needs in education and it is used primarily to teach students the basic concepts and skills of computer use "on the job": Acquiring information from various (digital) sources. Evaluating and selecting of information and the handling of different data types. Editing and presenting digital representations of architecture. Structuring and organizing complex data. And more important than anything else: to concentrate on essential aspects, and find the right level of abstraction.

As a "playground" without too much restrictions *The Munich Projects* offers the opportunity to test new methods and new media on concrete projects more than on single exercises. In addition, the students are not working for the paper basket or some dusty archive but know that their work is published and kept accessible for further use - which obviously increases the motivation and leads to impressive results.

We would be pleased to welcome visitors at <http://www.arch.tu-muenchen.de/m/>

Appendix

We would like to thank the *Lehrgebiet CAAD* and Prof. Richard Junge for supporting our ideas and our work. Special thanks to Dr. Gernot Pittioni, who introduced the idea of CAAD into the faculty of architecture at *TU München* many years ago.

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CW-focus Nr. 2, Juni 1997

Links to related sites

The Munich Project: Homepage

<http://www.arch.tu-muenchen.de/m/>

Lehrgebiet CAAD @ TU München: Homepage

<http://www.arch.tu-muenchen.de/caad/>

Scheurer, F.: VRML 1.0 Skript

<http://www.arch.tu-muenchen.de/caad/edu/skript/vrml.html>

ETH Zürich: Digitaler Architekturführer Zürich

http://caad.arch.ethz.ch/~elte/ZH_Architekturfuehrer/ZH_HTML/zuerich_frame.html

Universität Dortmund: Digitaler Architekturführer Dortmund

<http://www.bauwesen.uni-dortmund.de/AFD/main/html/Main.html>

Universität Karlsruhe: ArchINFORM - International Architecture Database

<http://www.archINFORM.de/>

Telepolis - Ausstellung und Symposium über die vernetzte und digitale Stadt

<http://www.lrz-muenchen.de/~MLM/telepolis/>

Stadtkarte von Karlsruhe

<http://rz70.rz.uni-karlsruhe.de/cgi-bin/user/ry10/stadtplan/>

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Keywords: information system, architecture, education, online, internet, WWW, virtual reality, VRML.

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Abstract

Architecture, when seen as a description for the process rather than for the result is an act of information processing. The architect's product is an immaterial collection of information that eventually leads to the material constitution of a building. This separation between two aspects of the term architecture may seem a bit artificial in the first place. But from this more abstract point of view it is almost inevitable that the computer as a tool for information processing has finally found its way into the architects' offices. Though, it mostly just replaces other tools instead of redefining parts of the process that have become obsolete with the new technology. This paper discusses an experiment in which we try to get beyond this point: *The Munich Project*.

First, *The Munich Project* is an online information system on architecture in Munich. It is accessible in the internet and provides useful startup information for architectural projects, such as city maps, models, literature databases and many more. The aim is to collect and link valuable information from different sources and build a starting point for information enquiry. *The Munich Project* stands as a prototype for a new type of city-model, an information-model of the city.

Second, *The Munich Project* shows, that continuous use of computers throughout the whole process is possible with today's methods and tools: from the gathering of information, the evaluation and selection to the modeling and simulation, presentation and storage. The multitude of incompatible formats that usually results from working with diverse software-solutions can be integrated in multimedia presentations, based on Internet-technology and its commonly accepted standards. And the results can be held accessible for further reuse, so coming generations can build upon the work of their predecessors.

Finally, *The Munich Project* is an educational experiment. The continuous use of computers, the introduction of new media and new ways of communication pose new challenges to the students. We have to teach basic principles and methods more than to train certain software packages, and we have to react on current developments, such as on-line services and the Internet. *The Munich Project* is a "testbed" for the students as well as their stage. They work on a concrete project with a variety of software tools, collaborate and communicate via digital media and finally publish a multi-media documentation of their work to be visible for everybody else.

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The multitude of software packages and incompatible formats is frightening at first sight and maybe there is no general solution, despite all standardization efforts. But with the technology of the World Wide Web and its open standards there is a common basis to work with. *The Munich Project* proves that consequent and continuous work with the digital media is possible with today's methods and resources. Current developments in database technology, like object-oriented and object-relational databases, are going towards diversity in data types and will provide content search in multi-media data. So efficient information retrieval will be possible in non-textbased domains like architecture in the new future.

Education

Finally, *The Munich Project* emerged from needs in education and it is used primarily to teach students the basic concepts and skills of computer use "on the job": Acquiring information from various (digital) sources. Evaluating and selecting of information and the handling of different data types. Editing and presenting digital representations of architecture. Structuring and organizing complex data. And more important than anything else: to concentrate on essential aspects, and find the right level of abstraction. As a "playground" without too much restrictions *The Munich Projects* offers the opportunity to test new methods and new media on concrete projects more than on single exercises. In addition, the students are not working for the paper basket or some dusty

archive but know that their work is published and kept accessible for further use - which obviously increases the motivation and leads to impressive results.

We would be pleased to welcome visitors at <http://www.arch.tu-muenchen.de/m/>

Appendix

We would like to thank the *Lehrgebiet CAAD* and Prof. Richard Junge for supporting our ideas and our work. Special thanks to Dr. Gernot Pittioni, who introduced the idea of CAAD into the faculty of architecture at *TU München* many years ago.

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Flusser, V. (1989) Vom Unterworfenen zum Entwerfer von Gewohntem

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Süddeutsche Zeitung Nr. 81, 9. April 1997.

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CW-focus Nr. 2, Juni 1997

Links to related sites

The Munich Project: Homepage

<http://www.arch.tu-muenchen.de/m/>

Lehrgebiet CAAD @ TU München: Homepage

<http://www.arch.tu-muenchen.de/caad/>

Scheurer, F.: VRML 1.0 Skript

<http://www.arch.tu-muenchen.de/caad/edu/skript/vrml.html>

ETH Zürich: Digitaler Architekturführer Zürich

http://caad.arch.ethz.ch/~elte/ZH_Architekturfuehrer/ZH_HTML/zuerich_frame.html

Universität Dortmund: Digitaler Architekturführer Dortmund

<http://www.bauwesen.uni-dortmund.de/AFD/main/html/Main.html>

Universität Karlsruhe: ArchINFORM - International Architecture Database

<http://www.archINFORM.de/>

Telepolis - Ausstellung und Symposium über die vernetzte und digitale Stadt

<http://www.lrz-muenchen.de/~MLM/telepolis/>

Stadtkarte von Karlsruhe

<http://rz70.rz.uni-karlsruhe.de/cgi-bin/user/ry10/stadtplan/>



The Munich Project

an online information system on architecture in Munich



[Fig.1:](#) The wooden city model of Munich by A. Sandner (1570)



The Munich Project

an online information system on architecture in Munich



[Fig.2:](#) Title page of *The Munich Project*.

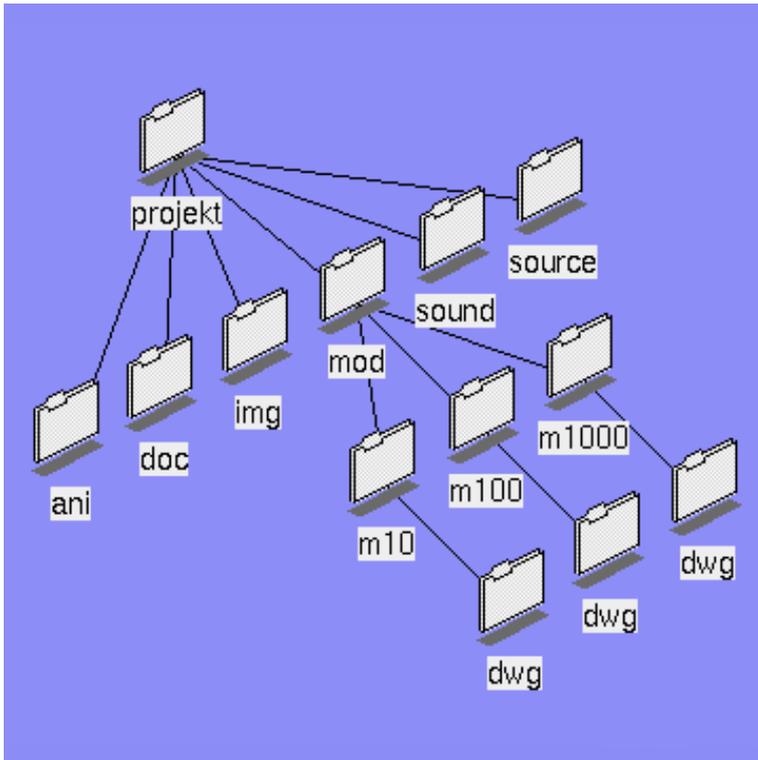
The blue buttons lead to the four main sections *city*, *info*, *projects* and *service*, a ticker tape shows the latest news.





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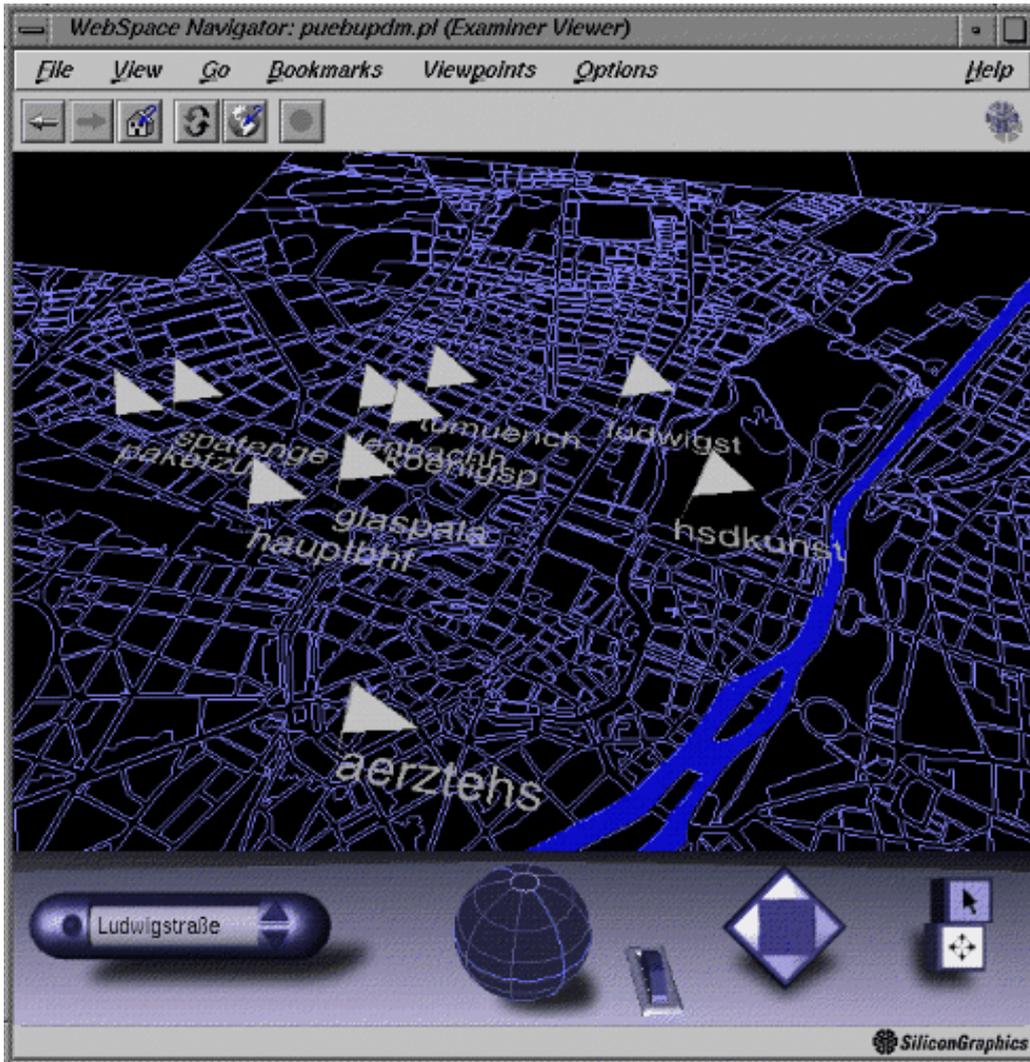


[Fig.3:](#) Directory structure of a project archive.



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see also Fig.09: Project overview

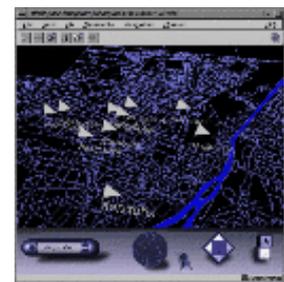
Fig.4: VRML-model of the city with project locations.

The flags that mark the locations are clickable and lead to the project information. The models are arranged on users' request from the *project overview*, a set of filters and options allow modifications.



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see also Fig.04: VRML-model of project overview

Fig.9: Project Overview

A set of filters and options allow searching for specific projects. The results can also be viewed as a VRML-model.



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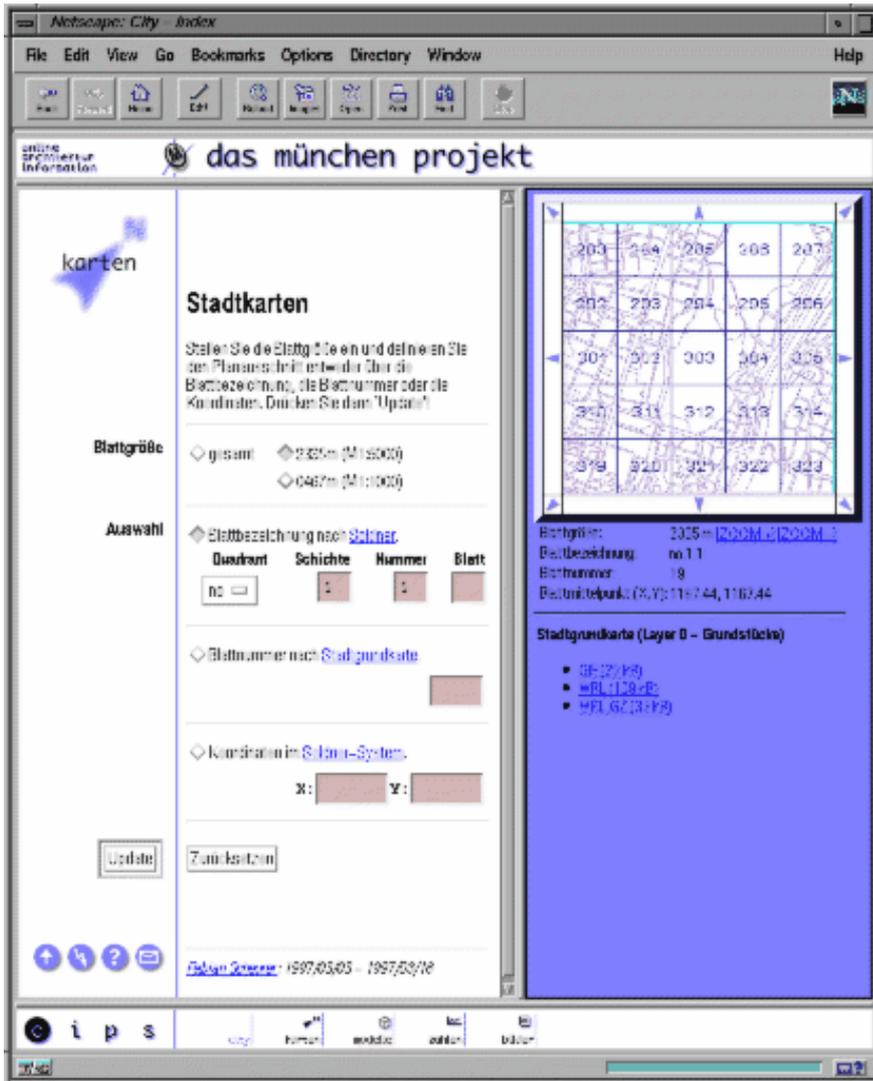


Fig.7: The map-chooser in the *City*-section.

Users can search for a city map and download the selection as scan-, CAD- or VRML-data.





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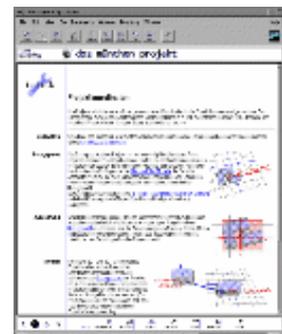
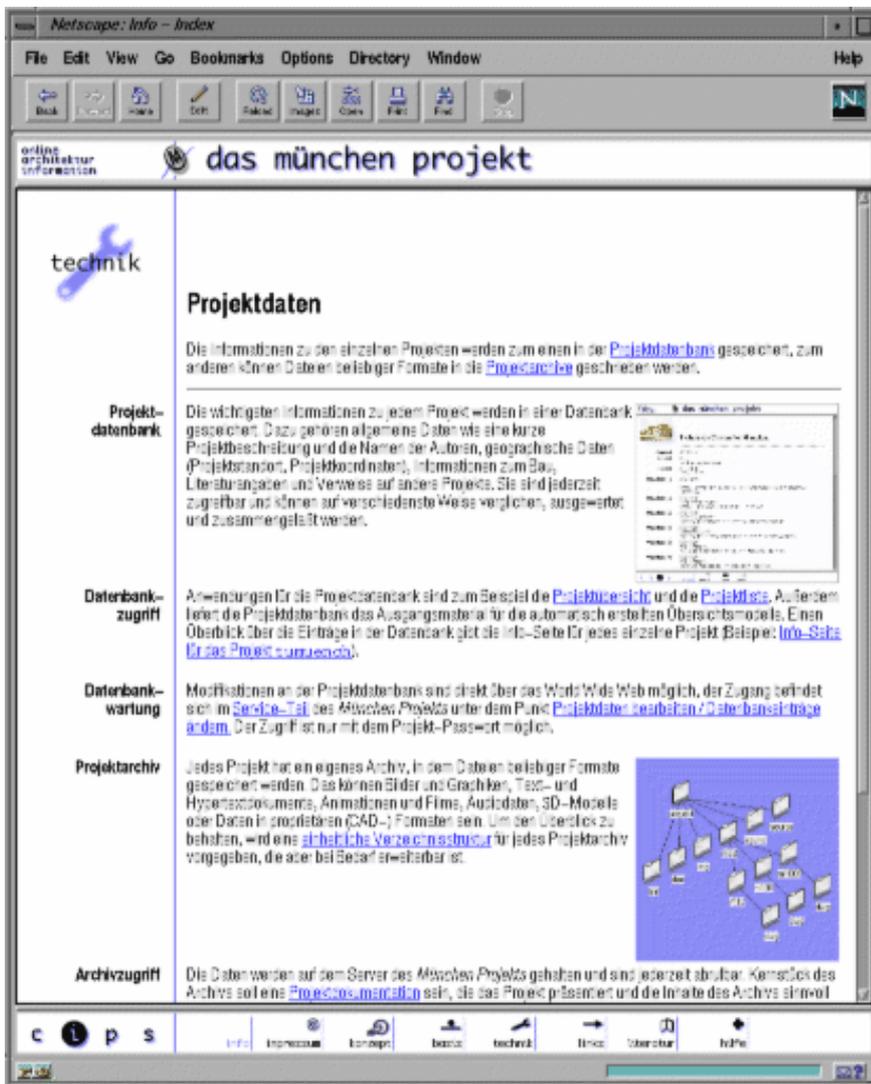


Fig.08a: Documentation project coordinates



Fig.08b: Literature database

Fig.8: A page of the on-line documentation from the *Info*-section.

Also provided are a literature- and hyperlink database and general information on *The Munich Project*.





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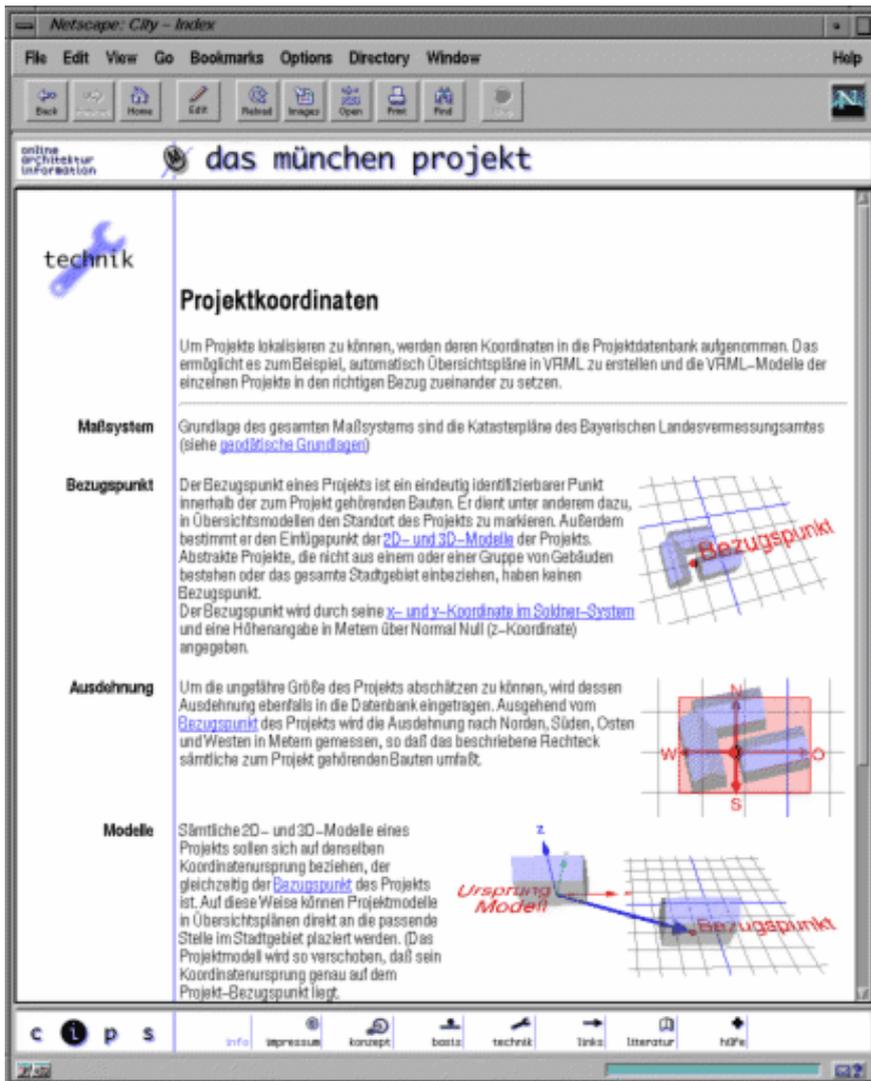


Fig.08b: Literature database

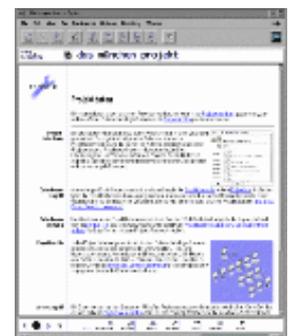


Fig.08: Documentation: project data

Fig.8a: A page of the on-line documentation from the *Info*-section.

Also provided are a literature- and hyperlink database and general information on *The Munich Project*.



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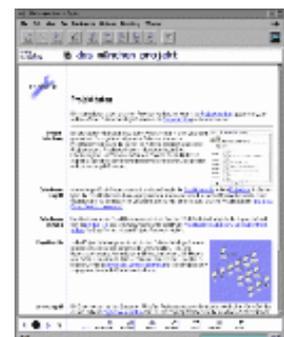


Fig.08: Documentation: project data

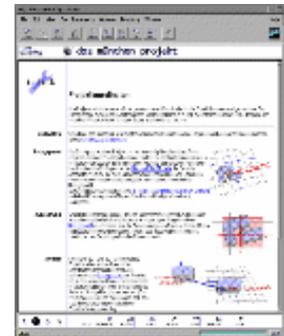


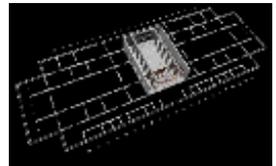
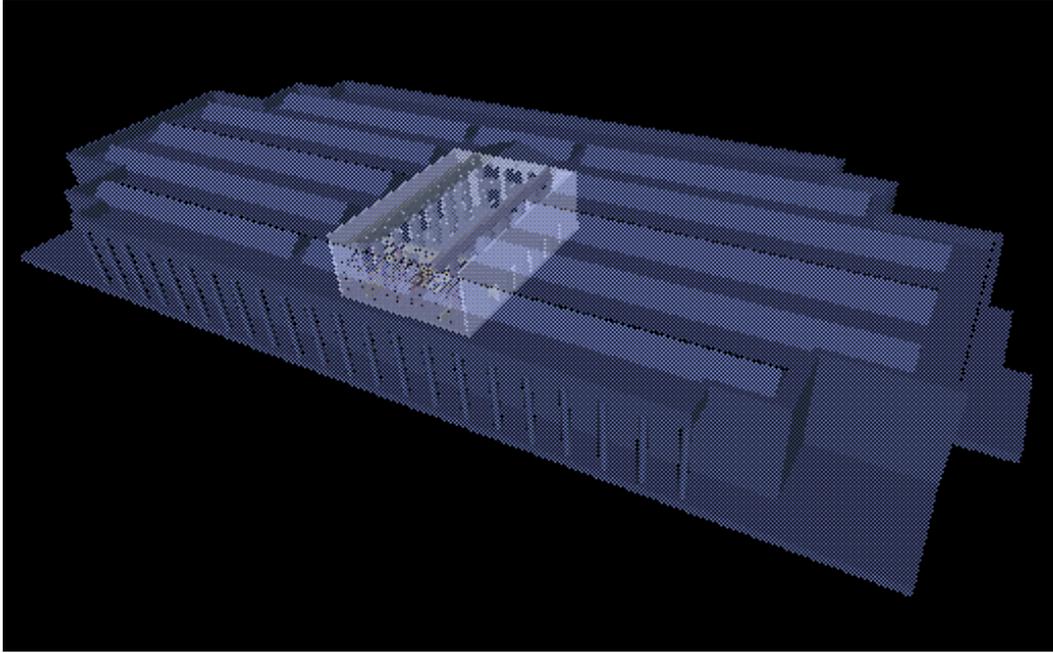
Fig.08a: Documentation: project coordinates

Fig.8b: The interface of the literature database in the *Info*-section. Also provided are a hyperlink database and general information on *The Munich Project*.



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[Fig.10a:](#) VRML-model with floor plan

[Fig.10:](#) Project model

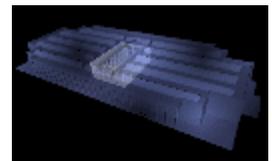
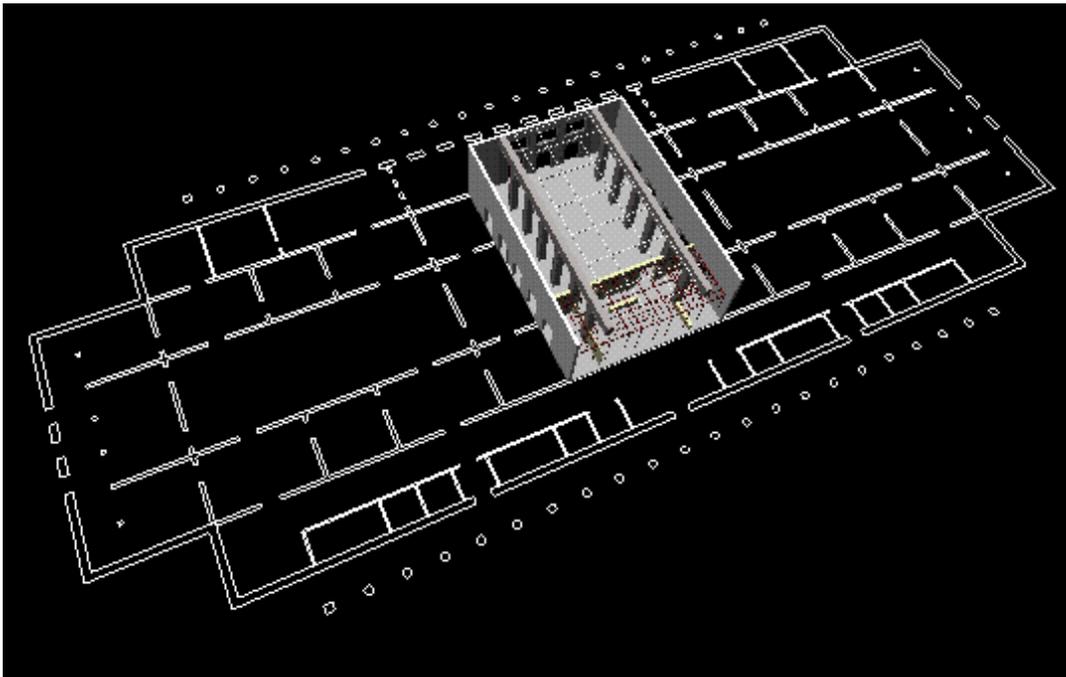
This VRML-model shows the entrance hall of the museum 'Haus der Kunst' within the transparent volume of the whole building. To abstract and find new ways in visualizing is one of the main objectives in our CAAD education.





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[Fig.10a](#): VRML-model with transparent building volume

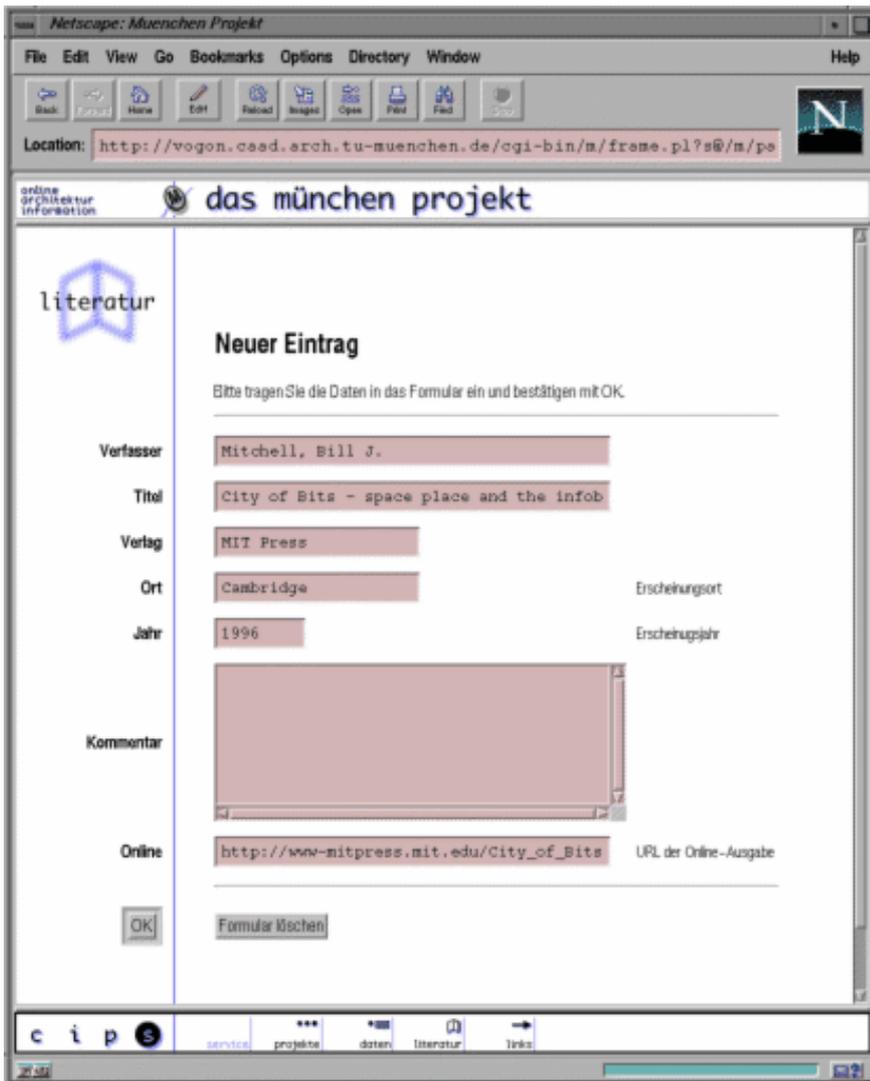
[Fig.10a](#): Project model

This VRML-model shows the entrance hall of the museum 'Haus der Kunst' with the floor plan of the building. To abstract and find new ways in visualizing is one of the main objectives in our CAAD education.



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[Fig.11:](#) Administration of the literature database in the *Info*-section.
Administration and maintenance of the databases can be done via the World Wide Web.



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Fig.12: One page of a project documentation

This is a page from the multi-media documentation of the project 'Haus der Kunst' finished in March 1997.



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Fig.13: Publishing data to the server.

The publishing of data to the project archive on the web-server is done via an automated FTP-transfer from the students' workstations.

