

**BROWSING
ARCHITECTURE**
METADATA AND BEYOND

EAAE *Transactions on Architectural Education* no. 40

edited by *Matteo Zambelli, Anna Helena Janowiak and Herman Neuckermans*

produced by *MACE Consortium*

powered by *Collaboratorio*
EAAE European Association for Architectural Education

published by *Fraunhofer IRB Verlag*

supported by *European Commission, eContentplus Program*

Bibliographic information published
by the Deutsche Nationalbibliothek
The Deutsche Nationalbibliothek lists
this publication in the Deutsche Nationalbibliografie;
detailed bibliographic data are available
on the Internet at <http://dnb.d-nb.de>.
ISBN 978-3-8167-7770-0
printed by *Fraunhofer IRB Media Services*

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Fraunhofer-Informationszentrum Raum und Bau IRB
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graphic design
studiovisuale.it

cover illustration
Moritz Stefaner

printing
Fraunhofer IRB Mediendienstleistungen, Stuttgart

typography
*Csuni (Carattere Senza Un Nome Importante/
Typeface With No Important Name)*
by Molotro (Luciano Perondi, Federico Zerbinati)

paper
cover *Schneidersöhne Luxo Satin* 250 g/m²
pages 1-320 printed with 1 colour
on *Schneidersöhne Luxo Satin* 135 g/m²
pages 321-368 printed in 4-colours
on *Schneidersöhne Luxo Satin* 135 g/m²

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6

INDEXED AND BROWSED: A New Didactic Approach Towards the Orders of Columns

- › e-learning
 - › indices
 - › matrix of terms
 - › media-database
 - › orders of columns
 - › visual browsing
-

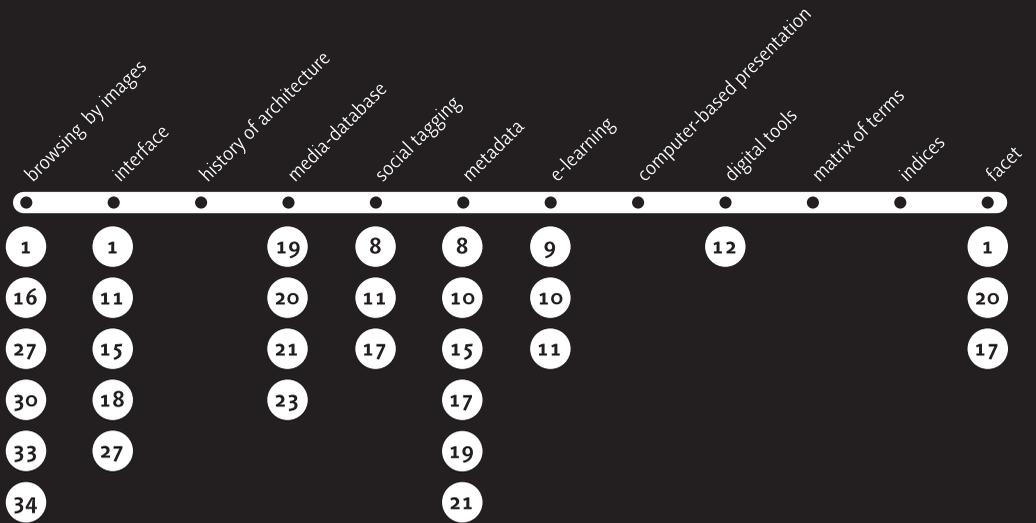
The “Index-Browser” is a digital tool that supports a visual access to a thematic collection of images in a database. Its strong didactic potential can be demonstrated for instance by its practical application in the E-Learning Project “Orders of Columns”. In this context the Index-Browser helps to gather, share, order and understand images related to the topic of the orders of the columns. Supported by a five parted index that covers five perspectives on a thematic field, the Index-Browser enables a novel approach to the collection of image material: Firstly, it makes digitally stored images visible for quick and direct access. Secondly, it generates unexpected connections between images with respect to the content through visual browsing. Thirdly, it offers the procedure of concept formation in detail, because it creates a comparison between the abstract meaning of a term and its visual expression.

The Index-Browser is part of the media-database developed at the Zurich University of the Arts (ZHdK). The e-learning project “Orders of Columns” is located at the University of Zurich (UZh) in the Institute of Art History.



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INDEX-BROWSER – CONCEPT AND IDEA

indices

history of architecture

browsing by images

1 17 19 21
22 26

The "Index-Browser" is a tool that creates an intuitive system for working with images in the media-database of the Zurich University of the Arts. It offers a visual access to the content of the image collections by means of browsing led by images. This novel interface is enabled by the use of specific indices; one such index is parted into five categories of terms, which offer a matrix of words for tagging images. In the context of the E-Learning Project "Orders of Columns", located at the University of Zurich, Institute of Art History, the Index-Browser has adapted this fundamental system for the topic the history of architecture. A "Column-Index" presents the categories "Order", "Epochs of Art History", "Elements", "Context" and "Media" with the relevant terms.

This Index, like others in the media-database, is a mix between a scientific thesaurus and the idea of social tagging. On the one hand, it includes the top-down conceptualization by an expert in the field, but on the other, it adopts the bottom-up principle of participation by all proficient users. In this way attentive users can help to create a thoroughly considered index during the process of application.

THE INDEX ORDERS OF COLUMNS

interface

1 3 11 22 24

media-database

19 20 21 23

metadata

1 8 10 15
17 19 21

social tagging

8 11 17

The five categories of the Index cover five important perspectives on the topic of the orders of columns. The first category ("Order") obviously picks up the canonical distinction between the five orders (Tuscan, Doric, Ionic, Corinthian, and Composita), but additionally, the principle arrangement of an order is mentioned (superimposition of columns, colossal order, etc.). The next category ("Epochs of Art History") relates the examples roughly to a specific epoch like ancient Egypt, the Gothicism or neoclassicism. In contrast to this, the third category ("Elements") goes into detail, because the definition of the orders is strongly connected to a regulated arrangement of clearly defined elements. Even in ancient times a convention regulating the form and name of elements existed, such as capital, pedestal and plinth, which are listed in this row. The fourth category ("Context") tries to identify in which context the shown image appears. This could be an archaeological find, a treatise on architecture, or a triumphal arch. The terms in the last category ("Media") are also very varied. In this category the user can select between building materials like stone or stucco, or between techniques like etching, cutting or rendering (Tab. 1). Obviously these index-data differ from normal metadata. Metadata cover information like author, title, place and year. This data common to all historical databases is also collected in the database. In addition to this, we try to accumulate more categorical information with the index-data. When focusing on one object this data may seem quite vague, yet to a certain degree the data allow the user to cluster the images according to their content.

This structure allows two novel ways of representing images in the interface of the database. One is an image-based browser and the other is a matrix of terms. Both the Index-Browser and the Index-Matrix enable an alternative access to the content of the media-database.

Before describing how these Index-Tools work and what the didactic effect is let me introduce the specific context of its application.

| Ordnung | Stil-Epoche | Elemente | Kontext | Medien |
|-----------------|--------------------|---------------|-------------------------|--------------|
| Alle Ordnungen | 20. Jhdt | Andere | Andere | Andere |
| Andere | Altes Ägypten | Atlant | Archäolog. Fundstück | Animation |
| Dorika | Andere | Basis | Architekturtheorie | Film |
| Gemischt | Barock | Dienst | Architekturtraktat | Fotografie |
| Ionika | Byzantinisch | Gebälk | Dekoration | Glas |
| Kolossalordnung | Etruskisch | Halbsäule | Geografische Karte | Grafik |
| Komposita | Gotik | Intervall | Konstruktionsanweisung | Holz |
| Korinthia | Griechische Antike | Kapitell | Kunsth Handwerk | Keramik |
| Supraposition | Klassizismus | Karyatide | Möbelbau | Klang / Ton |
| Toskana | Mesopotamien | Krepis | Modell | Malerei |
| | Mittelalter | Modul | Monument | Metall |
| | Moderne | Palladiomotiv | Musterbuch | Rendering |
| | Postmoderne | Pfeiler | Nachschlagewerk | Stein |
| | Renaissance | Pilaster | Öffentliche Architektur | Stich |
| | Rokoko | Plinthe | Palast | Stuck / Gips |
| | Romanik | Postament | Plan | Text |
| | Römische Antike | Säule | Privatbau | Vasenbild |
| | Seit 1990 | Schaft | Profanbau | Zeichnung |
| | Spätantike | Stele | Rekonstruktion | |
| | Unbekannt | Stütze | Repräsentationsbau | |
| | | Travée | Ruine | |
| | | Tympanon | Sakrale Architektur | |
| | | Volute | Säulenlehre | |
| | | Wandvorlage | Skulptur | |
| | | Ziersäule | Tempel | |
| | | | Urhütte | |
| | | | Wiss. Fachliteratur | |

Tab. 1: The Index "Orders of Columns" arranges a matrix of terms.

THE E-LEARNING PROJECT ORDERS OF COLUMNS

Topic

computer-based presentation

e-learning

9

10

11

This e-learning project "Orders of Columns" originated from a students initiative at the Institute of Art History at the University of Zurich. They were searching for alternative ways to deal with questions around the morphology of columns and the context of their usage in the history of architecture. Indeed, this point of view offers a number of perspectives into the transcultural history of architecture. How were the renaissance architects able to interpret the books of Vitruvius by inspecting the ruins and spolia in Rome? What idea of the ancient world did they shape out of these relicts? And can the development of the antique temples even be seen as a reinterpretation of Mesopotamian or Egyptian rituals and forms? These enigmas questions have occurred throughout history up until present times. Why does the concept of the orders of columns have such a normative power, not only with renaissance architecture, but also up until neoclassicism? And what kind of transformation can we rediscover in modernity and within postmodern comments? In conclusion, the investigation of the orders of columns means to question the impetus of architecture.

The task of the project is to develop a visual form of a computer-based presentation

following a vivid didactic concept that is close to the diverse material. It intends to broach the issue of columns by using a set of down-to-earth questions and practical thought. The content of the planned e-learning module is currently being developed by students. In a seminar they learn about the topic of the orders of columns, as well as how to use three different computer tools to present the work. In December 2008 a prototype will be completed.

Structure and tools

digital tools

12

Since e-learning projects mostly rely on a range of competencies the Column-Project is a cooperation between the Institute of Art History with the media-database of the Zurich University of the Arts and the e-science-network "HyperImage" (Humboldt University of Berlin and University of Lüneburg). This allows the use of three different digital tools that have all developed in the academic context to deal explicitly with the medium of text, the medium of images, and to combine both in an interactive presentation.

1. tEXtMACHINA: a text-orientated web-based platform developed by University of Zurich / Germanic Faculty.
In the context of the column-project, tEXtMACHINA is used to collect textual material and required reading lists. It also supports additional collaborative writing. Furthermore tEXtMACHINA assists the scientific and technical communication between the members of a group of students as well as the administrative needs of the course.
<http://www.textmachina.uzh.ch/khist/index.jsp> (access only with login)

 *Fig. 1: tEXtMACHINA, web-based platform to work collaboratively with texts (p. 329).*

2. Media-Database of Zurich University of the Arts: a database with an intuitive interface that helps to organize visual materials.
We use the media-database to collect images of columns of the different historical epochs and to group this data thematically for shared usage. In addition, the aforementioned index for the topic of orders of columns was developed. This index enables the use of a visual browsing tool to assist the concept formation.
<http://dilps.zhdk.ch> (access only with login)

 *Fig. 2: Media-Database of ZHdK provides a platform for saving, grouping and sharing of images (p. 329).*

3. HyperImage: a digital tool that transfers the concept of hypertext to images in order to realize interactive e-science networks. HyperImage is currently being developed at the Humboldt University of Berlin and the University of Lüneburg. The HyperImage Editor helps to realize the multimedia e-learning module. Within this program, visual arguments and elements of images can be linked in a collaborative workflow. The comparison of images, a strong art based historical method, is supported by the program up to the level of details of images. HyperImage allows the user to create linked and indexed networks of images and to publish them online or offline.
<http://www.hyperimage.org>

 *Fig. 3: HyperImage, an editor to compile interactive presentations (p. 330).*

To precisely explain the title of the paper I'm now going to describe the method of the application of the Index-Browser in the thematic field of the e-learning project "Orders of Columns".

The "Column-Index" and the "Column-Browser" are the core tools in the phase of gathering, sharing, ordering and understanding the visual collection on the topic of the orders of columns.

First, we will look at the Browsing-Tool based on the Column-Index; let us call it "Column-Browser". Then we will investigate the matrix of terms in this field, in analogy the "Column-Matrix".

The Column-Browser

browsing

1

The Column-Browser is the visual expression of the concept introduced at the beginning of this paper. This browsing tool offers, in relation to the five categories, five bands of images, which are linked to the topic of columns. The first selection of images is randomly generated. With the mouse pointer one can scroll these image-bands to the left and to the right in order to discover more image options. To start the browsing process the user selects one of the thumbnail images with a mouse-click. This action activates a new set of images that fills the bands. The selected image is displayed in each of the five bands at the same position as a reference for all other images.



Fig. 4: Column-Browser, starting situation with randomly filled image-bands (p. 330).

In other words, after the browsing process has started with the first "query by image" the pictures in each band are sorted according to their contents. For example, with a mouse-click we can activate the thumbnail of Sebastiano Serlio's plate from "Regola generali di architettura" (1537, book IV) leading to four possibilities of positioning a column in relation to a wall (freestanding or connected with a wall by different usages of a pilaster). As Serlio used the Dorica to show its systematic considerations, in the first line ("Order") other illustrations of the Dorica are displayed. The examples are exclusively related to the topic Dorica; ranging from a colored reconstruction of the entablature of the Parthenon on the acropolis in Athens, to a photo of the palazzo Chiericati by Palladio in Vicenza, also encompassing other renaissance treatises discussing the construction of the Doric order, so within this band of images one can also see different formulations of the very old concept of the doric style. The second band presents examples related to "Epochs of Art History". As Serlio's treatise is a Renaissance book, all the other presented examples of built architecture, theoretical concepts, paintings or etchings in this line are also considered to belong to this epoch, so the user can broaden his or her view to find out how the orders of columns were formulated. In the next category ("Elements") connections related to details are displayed. Here, elements like column, half column, pilaster and engaged pier are shown in a substantial range of pictures. This image band offers a wide selection of examples when looking for material to compare different possible solutions in these architectural details. As previously mentioned, the fourth row is labelled "context". Because Serlio's plate belongs to the context of the theory of the architectural orders the other listed examples are mainly taken out of renaissance treatises. Finally, in the fifth image band ("Medium") many other woodcut illustrations are presented, this

fifth category allows an uncomplicated investigation into the illustration facilities of this technique. This detailed explanation makes the functionality of the Column-Browser clear.

 *Fig. 5: Column-Browser: browsing situation: a reference image and related examples to the left and to the right (p. 331).*

Based on the aforementioned principles the browsing-tool only reveals its full potential in the continued process of selecting a reference image with a mouse-click and the subsequent investigation of the new set of images. With this function the Column-Browser is conceived for endless browsing through the compilation of material for the e-learning project. This process of browsing is certainly not aimless nor finds its conclusion within itself. For the members of the e-learning project, this creates great stimulus in two main areas: the content and the workflow.

The content: browsing architecture!

The inspiring combination of thumbnail-images in a line under the headline of one or more predefined terms has already been emphasized. This generates more than simply unexpected neighbourhoods of images; it also forces an active examination of the visual expression of a term. I will call this process “visual concept formation” and underline it as one of the additional benefits of the Index-Browser.

Visual concept formation is an active confrontation of one term and several dedicated images. In order to precisely represent the term one may need to add or delete images, or one may prefer to find another term that better represents a particular compilation of images. This is a highly conceptual procedure that requires deep knowledge of the topic terminology as well as the visual material.

To aid visual concept formation a tool called “basket” is provided to rearrange and to re-index images by drag and drop.

The workflow

facet

1 17 20

A second facet of the Index-Browser is its a novel way of handling the content of the database. First of all there is the visual access to images. While in common databases the user has to start the query by typing specific words in a mask, the activated query in this database is a directed search where the user already knows what he or she is looking for. The result of this query is as appropriate and as accurate as the metadata in the database. In addition to this, the index-browser offers a visual, and thus more associative and more inspiring access to images. Consequently, the process of browsing is an undirected search that makes the content of image collections visible and supports the user with correlating images. The previously mentioned basket helps to collect, group and share images.

 *Fig. 6: The metadata field opened out of the Index-Browser. Showing on the bottom of the screen a “basket” to collect and group images by drag and drop (p. 331).*

The Column-Matrix

matrix of terms

term-based

1

The Column-Matrix is a tool for a term-based exploration of collected material. In this modus, instead of five image-bands, the interface offers five columns of terms. Their names and contents have already described at the beginning of the paper. This matrix of terms supports the user in the process of a query.

Similar to the Column-Browser, the reference term is visually selected by a highlight and correlated terms are coloured. The coloured terms signify the existence of images that are related to both the highlighted and the coloured term. The number after each term displays how many images are connected to this term. These discreet labels enable the user to estimate the result of their query.

But while the Column-Browser always offers an open field of images for browsing, the query with the Column-Matrix is a successive process for narrowing down the scope of searching.

 *Fig. 7: Column-Matrix: five columns of terms. Refinement of the search by marked terms (p. 332).*

The didactic effects

To sum up these new possibilities and to extract their didactic effects we return to the Column-Project. The participating students contribute their images to a joint collection. They develop a pool of images where everybody has to add images, but can also take advantage of everyone's entries. As one can imagine, concepts where everybody has to share do not work in practice in the same way as in theory, but the overall outcome is definitely worthwhile. The field of terms, namely the Column-Matrix, helps the students to place their images in a field of meaning as well as in the overall context of the history of the orders of columns. Furthermore, only indexed images go into the Column-Browser producing a simple selection process that means only indexed images are viewable. It is very satisfying to see how the collection grows and consequently how the output of the Column-Browser gets more and more detailed and versatile. While compiling the definitive e-learning module in HyperImage, the browsing tool will constantly help to detect demanded images.

Sustainability

The collection of images of the orders of columns will be accessible for students even after their project is finished. Students will be able to use the Column-Browser to prepare for a typical art history examination, as the system randomly presents images thus a student can classify the objects to check his or her knowledge. Beyond this, the Column-Index is extendable for archaeologists for example; they can use and complete the term to describe for example temples. Additionally, other more general indices such as an Architecture Index will be installed and could intertwine with the Column-Index.

So the application of the Index-Browser in the e-learning project "Orders of Columns" is not only a proof of concept, but also a starting point for further extensions in the field of the History of Art and Architecture.

PROJECT TEAM



PROJECT TEAM

Index-Browser

Idea and Concept: Susanne Schumacher.

The Index-Browser is part of the media-database of Zurich University of the Arts developed by Departement of Design and Informationstechnologie-Zentrum (itz), <http://dilps.zhdk.ch>.

E-Learning Project

Scientific supervision: Prof. Dr. Hubertus Günther.

Project-Management: Susanne Schumacher, Dr. Hanns Hubach.

Initiative and tutors: Urs Baumberger, Elisabeth Geiger, Sabine Vass.

This Project of the Institute of Art History/University of Zurich is supported by:

› E-Learning Center der Universität Zürich, www.elc.uzh.ch;

› Mediendatenbank Zürcher Hochschule der Künste, <http://dilps.zhdk.ch>;

› HyperImage - Bildorientierte e-Science-Netzwerke, Leuphana Universität Lüneburg und Humboldt-Universität Berlin, www.hyperimage.org.

INDEXED AND BROWSED: A NEW DIDACTIC APPROACH TOWARDS THE ORDERS OF COLUMNS

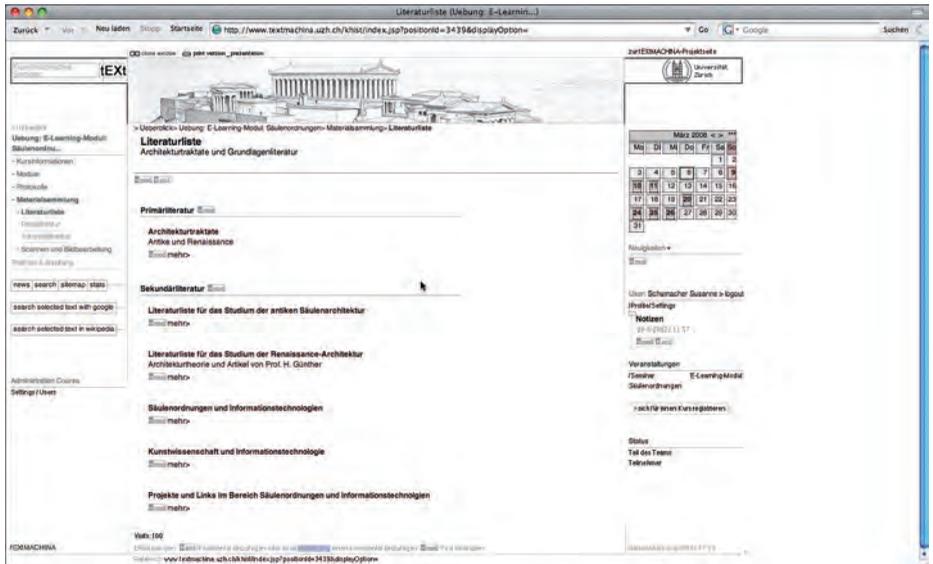


Fig. 1: tEXtMACHINA, web-based platform to work collaboratively with texts.

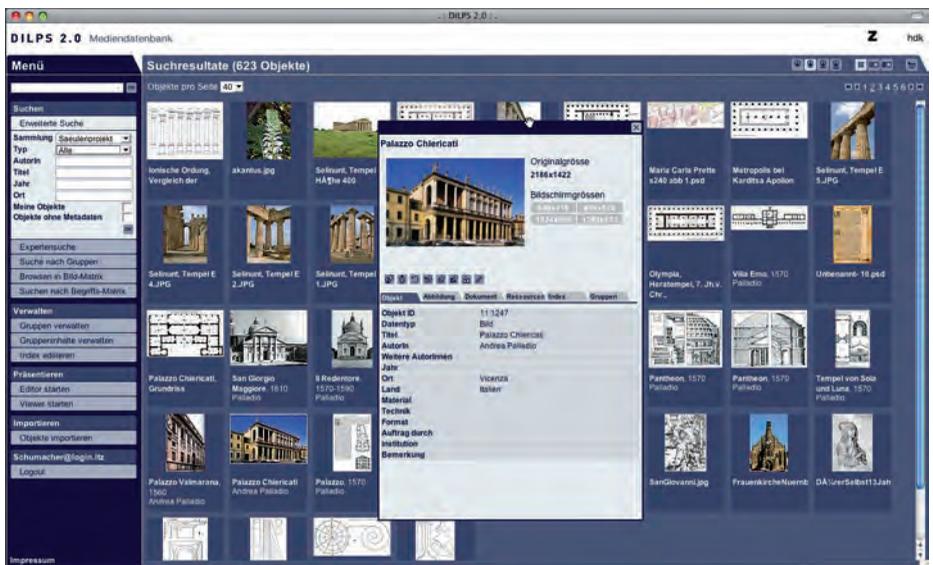


Fig. 2: Media-Database of ZHdK provides a platform for saving, grouping and sharing of images.

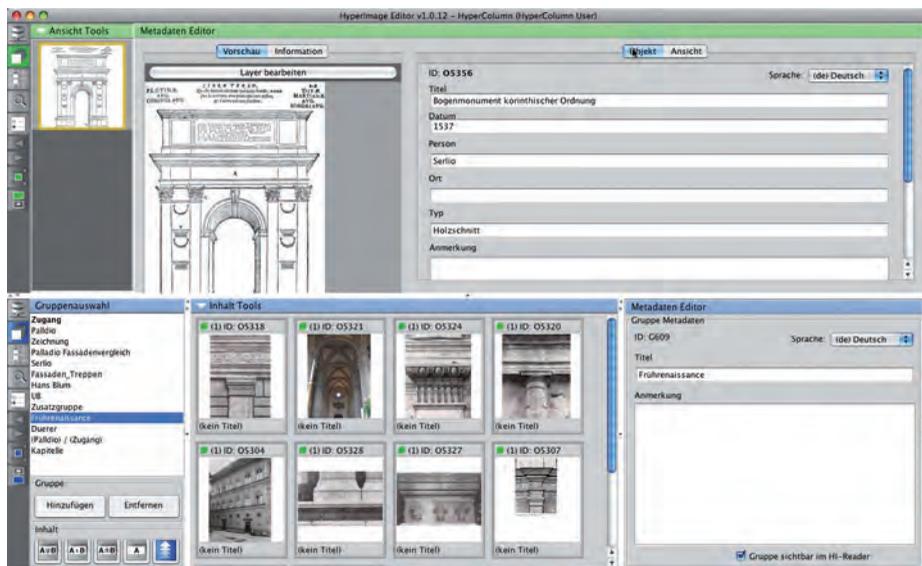


Fig. 3: HyperImage, an editor to compile interactive presentations.

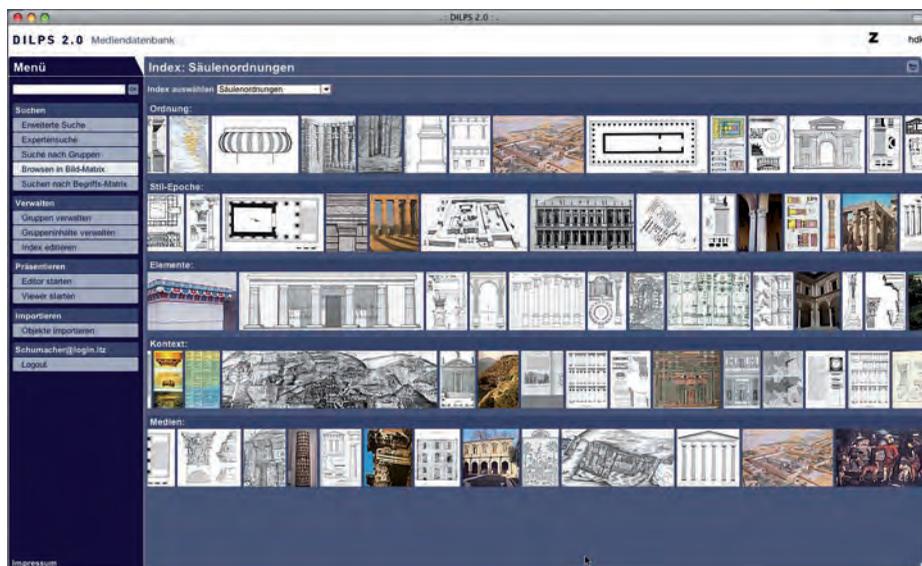


Fig. 4: Column-Browser, starting situation with randomly filled image-bands.

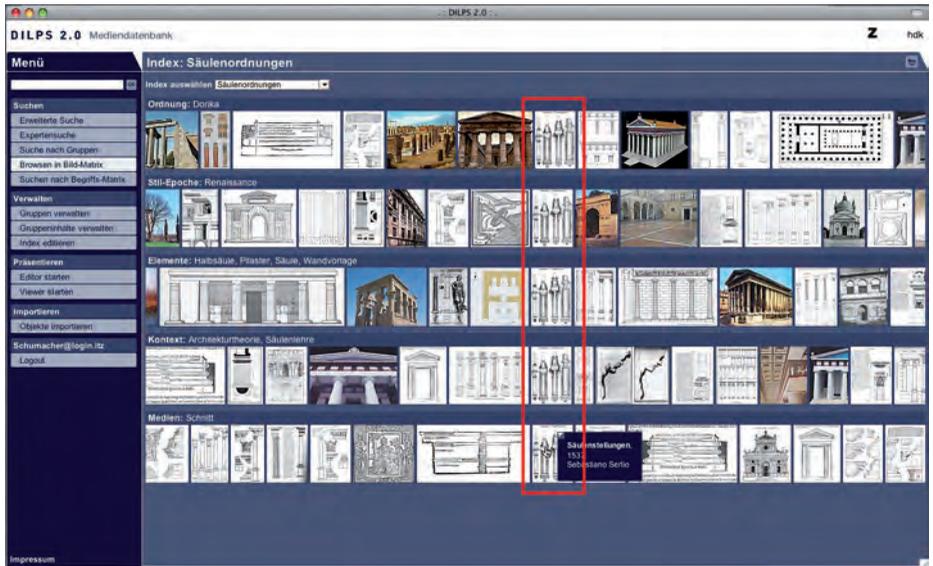


Fig. 5: Column-Browser. Browsing situation: a reference image and related examples to the left and to the right.



Fig. 6: The metadata field opened out of the index-browser. Showing on the bottom of the screen a "basket" to collect and group images by drag and drop.

The screenshot displays the DILPS 2.0 Mediendatenbank interface. On the left is a 'Menü' (Menu) with various search and management options. The main area is divided into two sections: a 'Suchergebnisse (69 Objekte)' (Search Results) grid on the right and a 'Column-Matrix' on the left. The matrix has five columns: 'Ordnung', 'Stil-Epoche', 'Elemente', 'Konstrukt', and 'Medien'. The 'Suchergebnisse' grid shows a grid of 69 objects, each with a thumbnail and a title, such as 'Gebäude des Parthenon', 'Mosaik Ansicht von Athen', and 'Aegina, Aphaia-Tempel, Farbmodell'.

| Ordnung | Stil-Epoche | Elemente | Konstrukt | Medien |
|----------------|----------------|----------------|-------------------|----------------|
| andere 266 | Altus | | Archäolog. | andere 2 |
| Dorik 117 | Aggela 19 | Basis 124 | Fensterblick 2 | |
| Ionik 126 | | Bogen 13 | Architekturmodell | |
| Kolonnenorden | | Erkältungen 2 | Ordnung | Fotografie 118 |
| Komposition 42 | | Früh 26 | Architektur 14 | |
| Korn 27 | | Gebälk 266 | Dekoration 9 | |
| mehrere | | | Gräber 4 | |
| Ordnungen 26 | Gräber 4 | Hälsäule 28 | | Holz 47 |
| Toskana 27 | Andere 113 | Interkolumnium | Gräber 4 | |
| | | Kannelur 26 | | |
| | | Kapitel 262 | | |
| | | Karyatid 2 | | |
| | | Kreuz 12 | | Malerie 14 |
| | | mehrere | Modelle 2 | |
| | | Elemente 27 | Monument 4 | |
| | | Modelle 1 | | |
| | Römische | Maler 46 | | Schiff 26 |
| | Antike 26 | Platze 23 | | Stich 13 |
| | Renaissance 27 | Platze 23 | Platz 26 | |
| | | Portikus 27 | Praktik 14 | |
| | | Postament 16 | Rekonstruktion | |
| | | Säule 267 | Repräsentation | |
| | | Schiff 26 | Rolle 2 | Zeichnung 275 |
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| | | | Villa 42 | |
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Fig. 7: Column-Matrix: five columns of terms. Refinement of the search by marked terms.

This book has been published on occasion
of the International Conference
On-line repositories in architecture
Venice, Italy, 20-21 September, 2008

Curator of the International Conference
On-line repositories in architecture
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(Collaboratorio, Italy)
Herman Neuckermans
(EAAE, Belgium)

produced by

MACE Consortium

COLB Collaboratorio snc, Italy
DFKI Deutsches Forschungszentrum für Künstliche Intelligenz, Germany
EAAE European Association of Architectural Education, Belgium
FHP Fachhochschule Potsdam University of Applied Sciences, Germany
FIT Fraunhofer Institut für Angewandte Informationstechnik, Germany
IRB Fraunhofer Informationszentrum Raum und Bau, Germany
KUL Katholieke Universiteit Leuven, Belgium
HUM Humance AG, Germany
NAU Nautes srl, Italy
OUNL Open University Netherlands, Netherlands
POLIMI Politecnico di Milano, Italy
UNIVPM Università Politecnica delle Marche, Italy
IUAV University IUAV of Venice, Italy
UPC Technical University of Catalonia, Spain

powered by

Collaboratorio, Italy
EAAE European Association of Architectural Education, Belgium

published and distributed by

Fraunhofer IRB Verlag, Germany

supported by

European Commission, eContentplus Program

thanks to

Alessandro Miniussi, Italy (typesetting)
Nick Simcock, England (English check)
Hans-Martin Barth and *Klaus Kaiser*, Germany (publishing)

This book is part of the series

EAAE Transactions on Architectural Education no. 40



www.mace-project.eu

