II. Digitisation and Data Management

5. Databases

Prof. Dr. Martin Langner

Kohle (2013) 15–61; Schreibman / Siemens / Unsworth (2004) Kap. 14. 15. 32; Schreibman / Siemens / Unsworth (2016) Kap. 16. 26; Jannidis / Kohle / Rehbein (2017) Kap. 8. 16. 17; https://www.ianus-fdz.de/it-empfehlungen/datenbanken

Udo Kroschwald as Hermann Göring in “Monuments Men” (Germany, USA 2014)

Johann Georg Hinz, Kleinodien-Schrank, 1666 (Hamburger Kunsthalle)

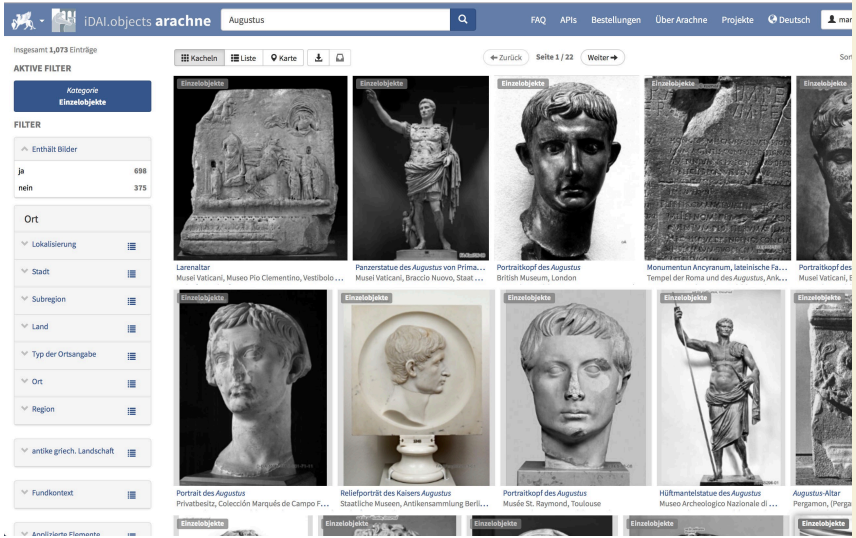
Modern staging of baroque collectibles in the Colnaghi Gallery, London (2013)

„Today's cabinets of curiosities are no longer those of Dresden; they are Google and Facebook.“

Hubert Burda, In medias res. Zehn Kapitel zum Iconic Turn. Mit Beiträgen von Friedrich Kittler, Peter Sloterdijk, Bazon Brock, Horst Bredekamp und Hans Belting (München 2010)

http://www.bl.uk/manuscripts/Viewer.aspx?ref=cotton_ms_vitellius_c_iii_f011r

https://en.wikipedia.org/wiki/List_of_ancient_Olympic_victors

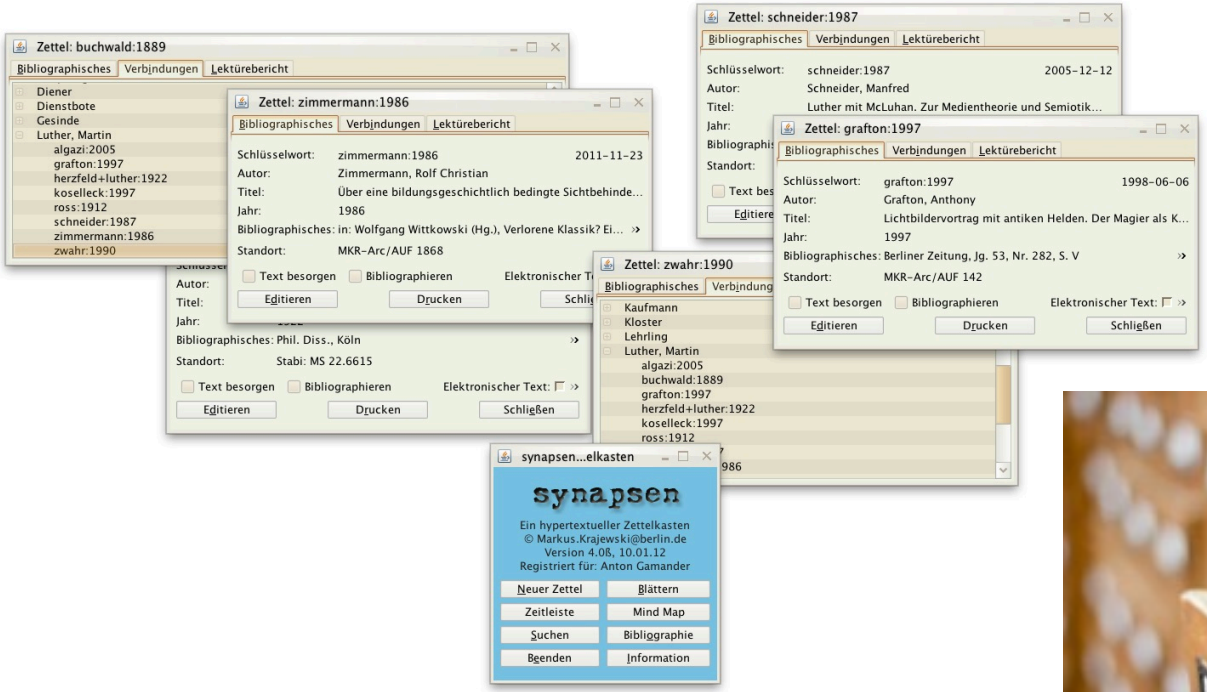


Arachne (https://arachne.dainst.org):
4.439.847 DS (Mai 2020)

Beazley Archive Pottery Database
(www.beazley.ox.ac.uk/xdb/ASP/default.asp):
118.202 DS (Mai 2020)

Short-lived technology: quality selection or collect and store all data?

www.tomlefrench.com



- Recognising patterns and structures
- Grouping entities and setting appropriate links

1. CONCEPTS AND TECHNICAL TERMS

a) Data model, data structure and data type

b) Database system

c) Database models

d) Media-theoretical considerations

2. RECOMMENDA-TIONS FOR THE CREATION OF A DATABASE

a) Conception and implementation

b) Data entry and data quality

c) Collaboration, data backup and export

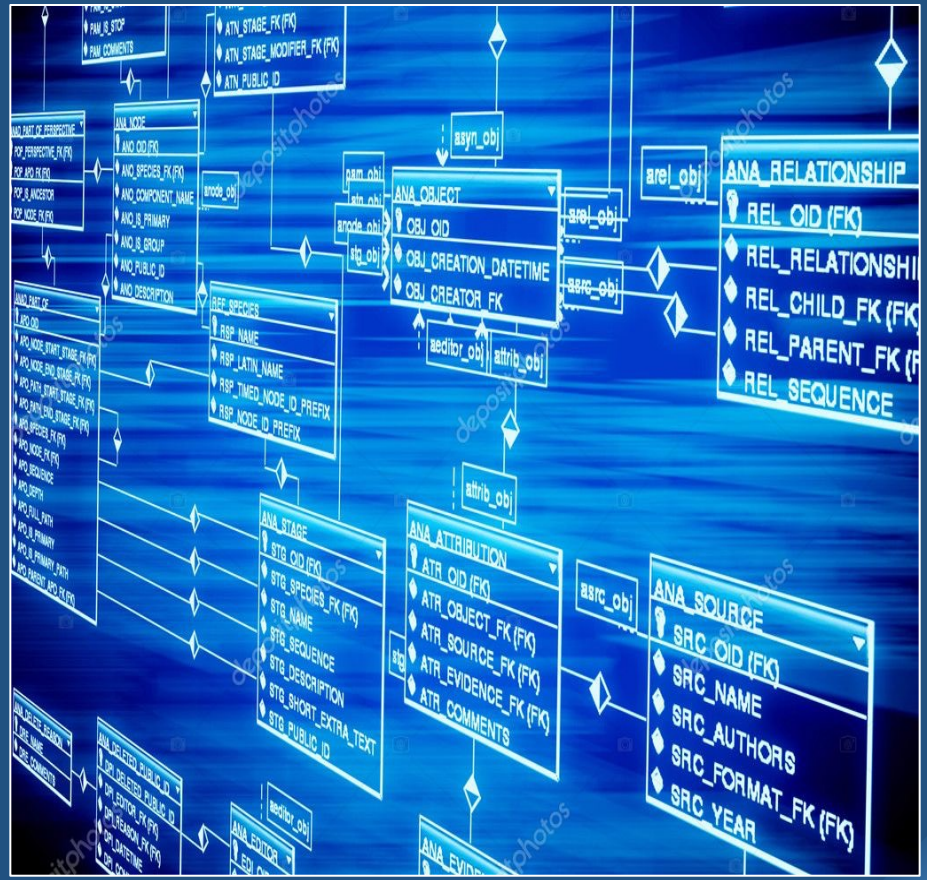
3. IMAGE DATA BASES OF THE FUTURE

a) Centring on the user

b) Image Collection Exploration

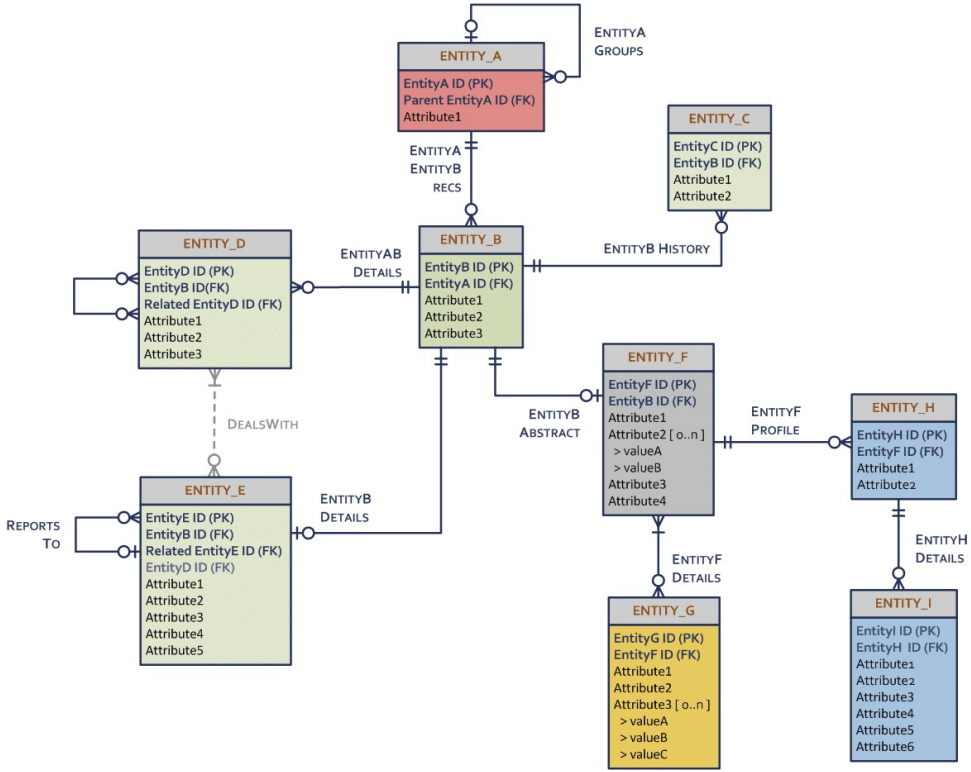
c) Visualisation Layouts

1. CONCEPTS AND TECHNICAL TERMS



DATA MODEL

A **data model**, e.g. in the form of a diagram, describes the relevant real-world objects that are to be mapped in a database, and the relationships between these objects.



DATA MODEL

Grunddaten

Historische Daten

Numismatische Daten

Beschreibende Daten

Vorderseite (Bild):
Kopf des Nero mit Lorbeerkranz nach rechts; Perlkreis

Vorderseite (Legende):
Umlaufend im Uhrzeigersinn, IMP NERO CAESAR AVG GERM

Rückseite (Bild):
Bekleidete Viktoria nach links fliegend, mit beiden Händen Schild haltend; Perlkreis

Rückseite (Legende):
Auf dem Schild, [S P Q R]; im Feld, S C

Technische Daten

Bibliographie

Verweise

Administrative Daten

www.kenom.de/objekt/record_DE-MUS-062622_kenom_161844/1/

DATA STRUCTURE AND DATA TYPE

A data model is realised in a data structure, e.g. a list or table. A **data structure** is therefore used to store and organise data, arranged and linked in a certain way, to enable it to be accessed and managed efficiently.

Coins						
ID	**InvNo**	**Weight**	**Dat.**	**Material**	**Site**	**Nominal**
32	UK-00365	8,615	65	Bronze	Lyon	As
33	UK-00460	3,410	79	Silver	Rome	Denarius
34	UK-00462	2,932	80	Silver	Rome	Denarius
35	UK-00465	25,945	80	Bronze	Rome	Sestertius
36	UK-00465a	25,400	81	Bronze	Rome	Sestertius
37	UK-00467	10,075	81	Bronze	Rome	As

DATA STRUCTURE AND DATA TYPE

Basic requirements for all data structures:

- Access
- Insert
- Remove
- Find
- Sort

Coins						
ID	InvNo	Weight	Dat.	Material	Site	Nominal
32	UK-00365	8,615	65	Bronze	Lyon	As
33	UK-00460	3,410	79	Silver	Rome	Denarius
34	UK-00462	2,932	80	Silver	Rome	Denarius
35	UK-00465	25,945	80	Bronze	Rome	Sestertius
36	UK-00465a	25,400	81	Bronze	Rome	Sestertius
37	UK-00467	10,075	81	Bronze	Rome	As

The data structure takes into account the data type (e.g. whole numbers, floating point numbers or strings) and the data format (e.g. number, formula, date, text, image).

WHAT IS A DATABASE?

Database ≈ Drawer or filing cabinet
Data set ≈ File cover
Data ≈ Contents of the file cover

A **database** stores information in the form of **records** containing the actual factual data, which is either entered manually by users or generated automatically.

The database contents can be in different formats and can flow into the database as texts, numbers, links or media (photos, drawings, films, etc.).

WHAT IS A DATABASE?

Coins						
ID	**InvNo**	**Weight**	**Dat.**	**Material**	**Site**	**Nominal**
32	UK-00365	8,615	65	Bronze	Lyon	As
33	UK-00460	3,410	79	Silver	Rome	Denarius
34	UK-00462	2,932	80	Silver	Rome	Denarius
35	UK-00465	25,945	80	Bronze	Rome	Sestertius
36	UK-00465a	25,400	81	Bronze	Rome	Sestertius
37	UK-00467	10,075	81	Bronze	Rome	As

WHAT IS A DATABASE SYSTEM?

A **database system** consists of one or more **databases** and a management software called a **database management system** (DBMS).

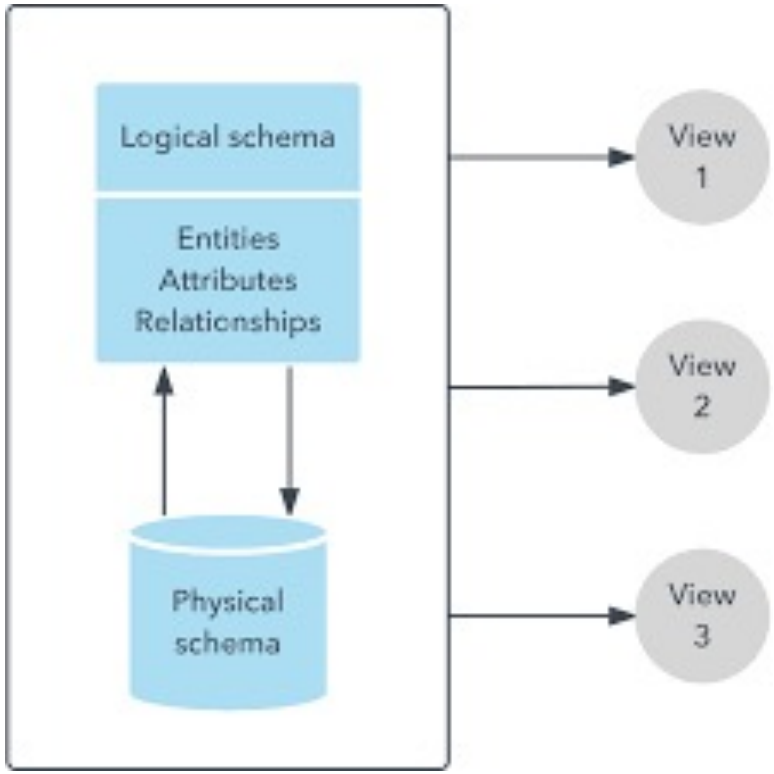
The DBMS structures and stores the information in the **database**, while the **records** consist of a sum of self-defined fields.

WHAT IS A DATABASE SYSTEM?

The tasks of a database system include the following areas:

- Entering, changing and deleting data
- Creating databases including implementation of the data model
- Searching in database contents by means of queries
- General administration of users, accesses and access rights

A DATABASE SYSTEM HAS THREE LEVELS OF ABSTRACTION



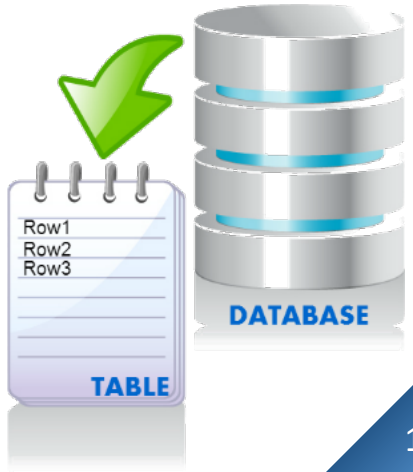
- The **physical level** describes the form in which the data is stored on the secondary storage.
- The **logical/conceptual level** records which data is stored by means of a database schema.
- The views or sections (**view level**) visualise subsets of the data. They are tailored to the respective needs of the user.

WHAT ARE DATABASES USED FOR?

Features of databases

- Editing and changing data
- Searching and filtering
- Sorting
- Evaluating
- Creating reports
- Further processing (in other programmes)

The main aim is to store large amounts of data efficiently, unambiguously and permanently and to provide the required subsets in different, demand-oriented forms of presentation.



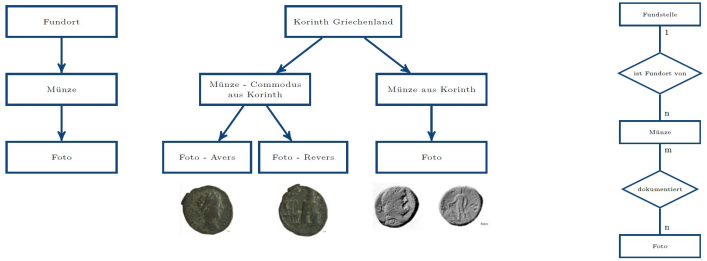
ADVANTAGES OF DATABASE SYSTEMS

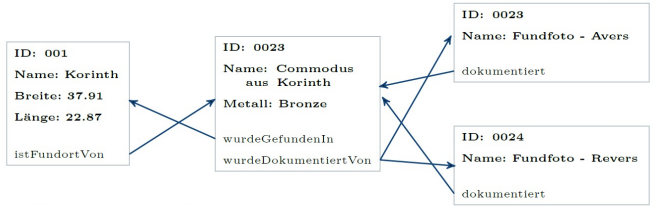
compared to structured individual files, such as tables:

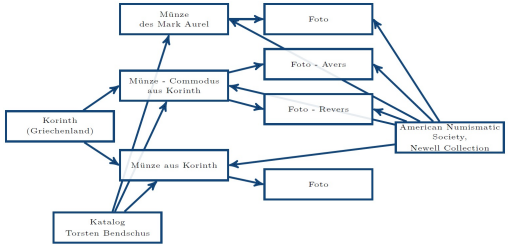
- Redundancies are avoided
- Inconsistencies can be reconciled
- Integrity conditions / control functions are possible
- Data protection problems / user management (differentiated access regulations possible).
- Representation variants through different sections, so-called views, from the total amount of all stored information.

DATA MODELS

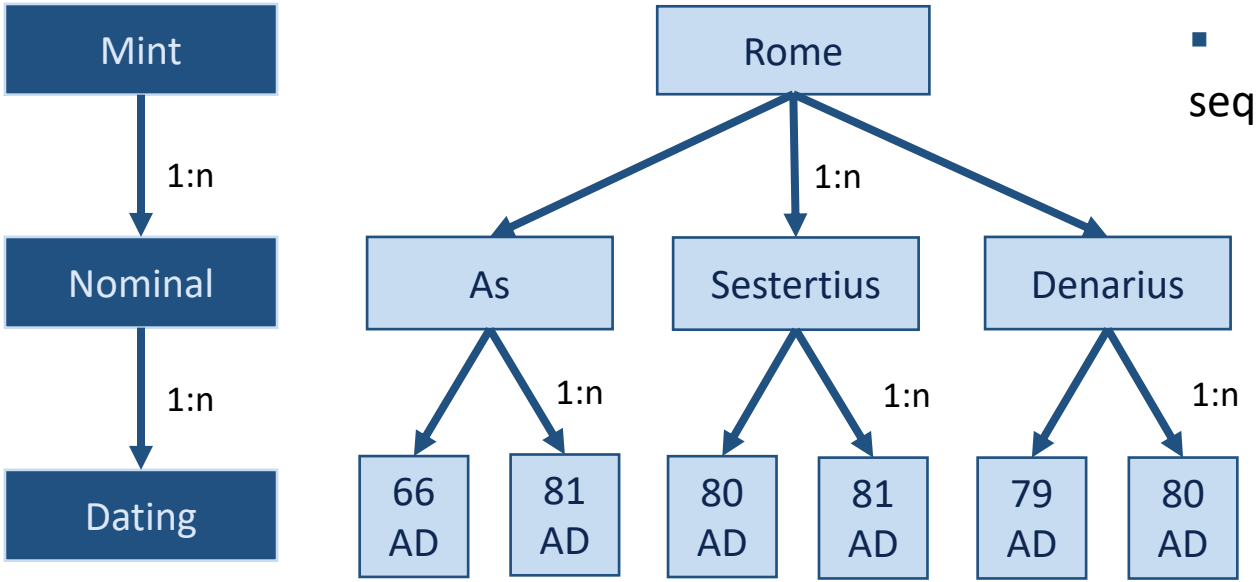
A **data model** is used at the conceptual level to formally describe all the data contained in the database, how it is stored and the relationships between them. It determines how the data to be stored is structured and which operations are possible on this data (search, delete, ...).







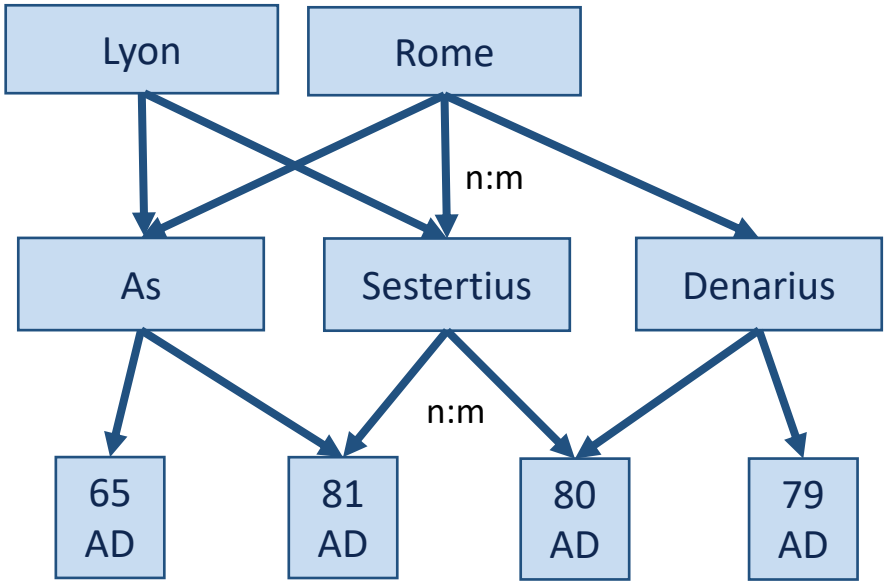
HIERARCHICAL DATABASE MODEL



- The data structure is structured in tree form.
- The data is subject to sequential data organisation.

https://www.ianus-fdz.de/it-empfehlungen/datenbanken

NETWORK DATABASE MODEL



- more complex than the hierarchical database system
- n:m assignments can also be made
- complex data structures can also be mapped through networking

Disadvantage: rigid, complex and confusing overall structure

RELATIONAL DATABASE MODEL

- Data is stored in data records with a similar structure
- Data records are organised in tables
- Relationships can exist between the tables

Coins

ID	InvNo	Weight	Dat.	Material	Site	Nominal
32	UK-00365	8,615	65	Bronze	Lyon	As
33	UK-00460	3,410	79	Silver	Rome	Denarius
34	UK-00462	2,932	80	Silver	Rome	Denarius
35	UK-00465	25,945	80	Bronze	Rome	Sestertius
36	UK-00465a	25,400	81	Bronze	Rome	Sestertius
37	UK-00467	10,075	81	Bronze	Rome	As

Dating

ID	Dat.	Epoch	Emp.
88	79	flavian	Titus
89	80	flavian	Titus

Mint

ID_M	Name	Breite	Länge
1	Rome	41.53	12.29
2	Lyon	45.46	4.50

Nominals

ID_N	Name	Material
11	Sestertius	Bronze
12	Denarius	Silver
13	As	Bronze

RELATIONAL DATABASE MODEL

Attribute (column)

Data set (row)

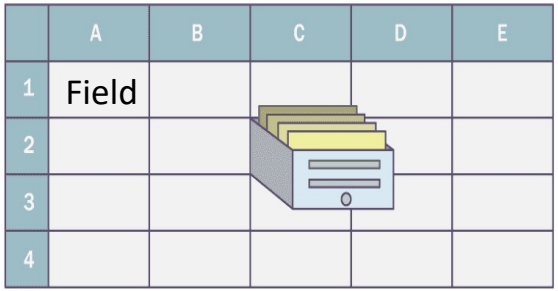


Table (also: relation, file)

Data set (also: tuple, row, record)

Field (also: column, attribute)

Attributes of a coin table:

- ID (Integer)
- Nominal (String)
- Dating (String)
- Material (String)
- Diameter (Integer)
- Weight (Float)
- Date of discovery (Date)

Attributes (columns)

ID	InvNo	Weight	Dat.	Material	Nominal	Site
32	UK-00365	8,615	65	Bronze	As	Lyon
33	UK-00460	3,410	79	Silber	Denarius	Rome
34	UK-00462	2,932	80	Silber	Denarius	Rome
35	UK-00465	25,945	80	Bronze	Sestertius	Rome
36	UK-00465a	25,400	81	Bronze	Sestertius	Rome
37	UK-00467	10,075	81	Bronze	As	Rome

← Relations-Schema

← Tupel (Data set)

Only real objects (entities) of the same kind are ever acquired per table, e.g. only findings, only coins, only photographs, only buildings, etc. The unique referencing of a record is done with the help of one or more key attributes, the so-called primary key. This key is unique and must never change, as it is used to reference the row in the table.

Coins						
ID	InvNo	Weight	Dat.		Site	ID_N
32	UK-00365	8,615	65		Lyon	13
33	UK-00460	3,410	79		Rome	12
34	UK-00462	2,932	80		Rome	12
35	UK-00465	25,945	80		Rome	11
36	UK-00465a	25,400	81		Rome	11
37	UK-00467	10,075	81		Rome	13

Nominals		
ID_N	Name	Material
11	Sesterz	Bronze
12	Denar	Silber
13	As	Bronze

Individual tables can be related to each other using keys in order to explicitly express relationships between individual data records from the different tables.
The primary key of a relation ("ID") may only occur once, i.e. it must be unique in order to guarantee referencing.
A foreign key (ID_N) is used to reference a primary key of another table.

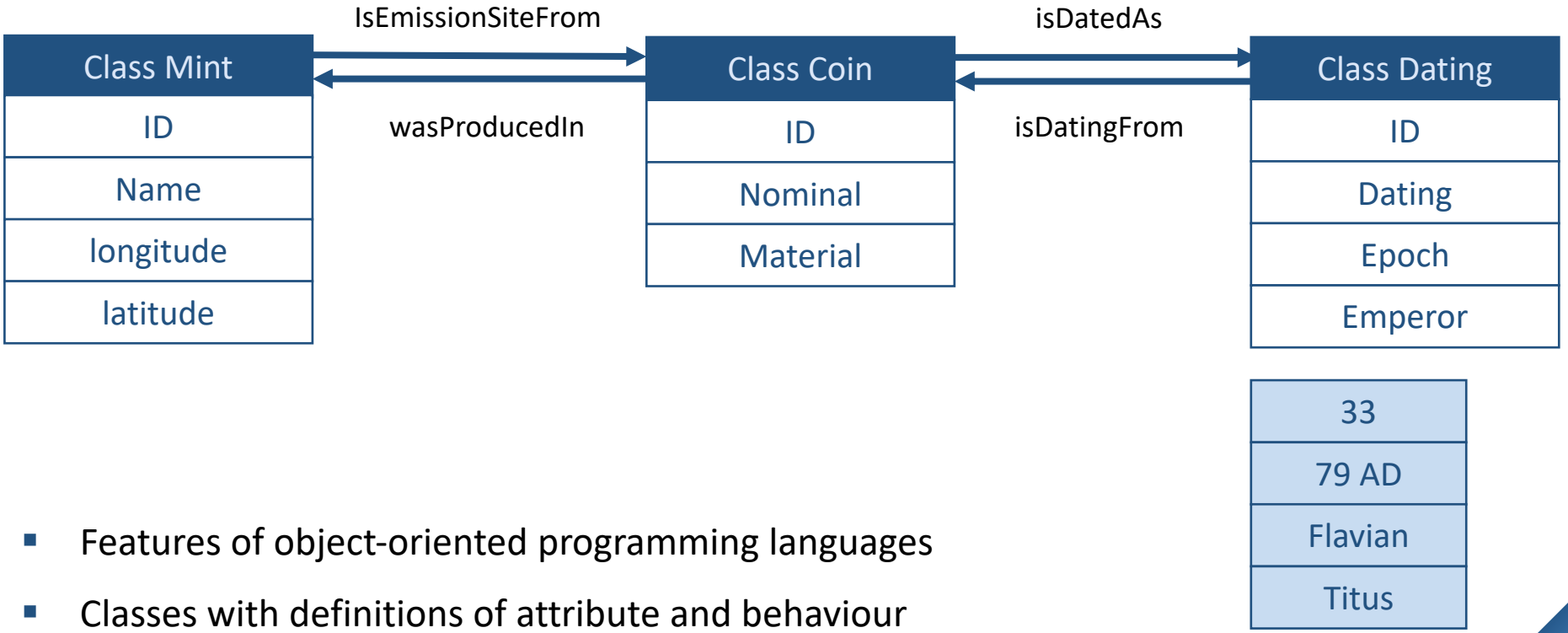
RELATIONAL DATA MODELL: CRITICISM

Coins						
ID	InvNo	Weight	Dat.		Site	ID_N
32	UK-00365	8,615	65		Lyon	13
33	UK-00460	3,410	79		Rom	12
34	UK-00462	2,932	80		Rom	12
35	UK-00465	25,945	80		Rom	11
36	UK-00465a	25,400	81		Rom	11
37	UK-00467	10,075	81		Rom	13

Nominals		
ID_N	Name	Material
11	Sesterz	Bronze
12	Denar	Silber
13	As	Bronze

- Artificial key attributes as internal management information increase the amount of data
- Lack of homogeneity to programming languages often makes external programming interfaces necessary, which in turn can bring some limitations.

OBJECT ORIENTED DATAMODEL



- Features of object-oriented programming languages
- Classes with definitions of attribute and behaviour

GRAPH DATABASES

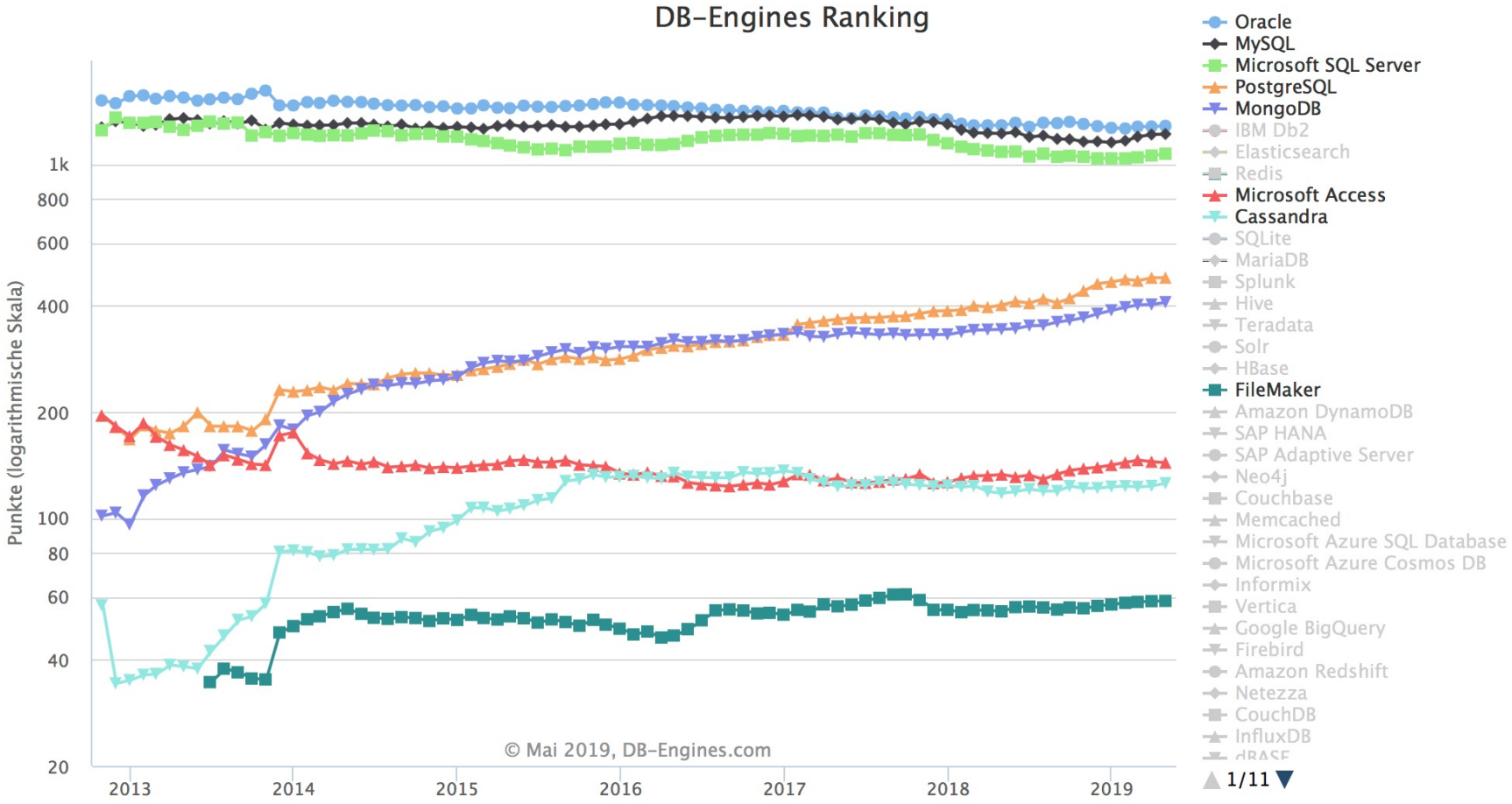
- are mainly used for very strongly interconnected data.
- Representing the data as nodes and the relationships between them as edges
- Both the nodes and the edges can have properties.

```
{
    "id":1,
    "Fundstellen_Name":"Korinth",
    "Breite"':37.91,
    "Länge"':22.87,
    "Münzen"'[
        {
            "id":23,
            "Münzen_Name":"Commodus aus Korinth",
            "Metall":"Bronze",
            "Fotos":[
                {
                    "id":49,
                    "Foto_Name":"Fundfoto -- Avers"
                },
                {
                    "id":50,
                    "Foto_Name":"Fundfoto -- Revers"
                }
            ]
        },
        {
            "id":24,
            "Münzen_Name":"Münze aus Korinth",
            "Metall":"Bronze",
            "Fotos":[
                {
                    "id":51,
                    "Foto_Name":"Fundfoto"
                }
            ]
        }
    ]
}
```

357 Systeme im Ranking, Mai 2020

Rang Mai 2020	Rang Apr 2020	Rang Mai 2019	DBMS	Datenbankmodell	Punkte Mai 2020	Punkte Apr 2020	Punkte Mai 2019
1.	1.	1.	Oracle	Relational, Multi-Model	1345,44	+0,02	+59,89
2.	2.	2.	MySQL	Relational, Multi-Model	1282,64	+14,29	+63,67
3.	3.	3.	Microsoft SQL Server	Relational, Multi-Model	1078,30	-5,12	+6,12
4.	4.	4.	PostgreSQL	Relational, Multi-Model	514,80	+4,95	+35,91
5.	5.	5.	MongoDB	Document, Multi-Model	438,99	+0,57	+30,92
6.	6.	6.	IBM Db2	Relational, Multi-Model	162,64	-2,99	-11,80
7.	7.	7.	Elasticsearch	Suchmaschine, Multi-Model	149,13	+0,22	+0,51
8.	8.	8.	Redis	Key-value, Multi-Model	143,48	-1,33	-4,93
9.	9.	↑ 11.	SQLite	Relational	123,03	+0,84	+0,14
10.	10.	↓ 9.	Microsoft Access	Relational	119,90	-2,02	-23,88
11.	11.	↓ 10.	Cassandra	Wide column	119,16	-0,91	-6,57
12.	12.	12.	MariaDB	Relational, Multi-Model	90,09	+0,19	+3,57
13.	13.	13.	Splunk	Suchmaschine	87,75	-0,33	+2,51
14.	14.	14.	Hive	Relational	81,54	-2,51	+3,64
15.	15.	15.	Teradata	Relational, Multi-Model	73,89	-2,70	-2,15
16.	16.	↑ 19.	Amazon DynamoDB	Multi-Model	64,72	+0,45	+8,78
17.	↑ 19.	↑ 21.	SAP Adaptive Server	Relational	53,99	+1,37	-1,45
18.	↓ 17.	↓ 16.	Solr	Suchmaschine	52,58	-1,01	-8,22
19.	↑ 20.	↓ 18.	FileMaker	Relational	50,96	-1,12	-7,55
20.	↓ 18.	20.	SAP HANA	Relational, Multi-Model	50,54	-2,76	-5,20

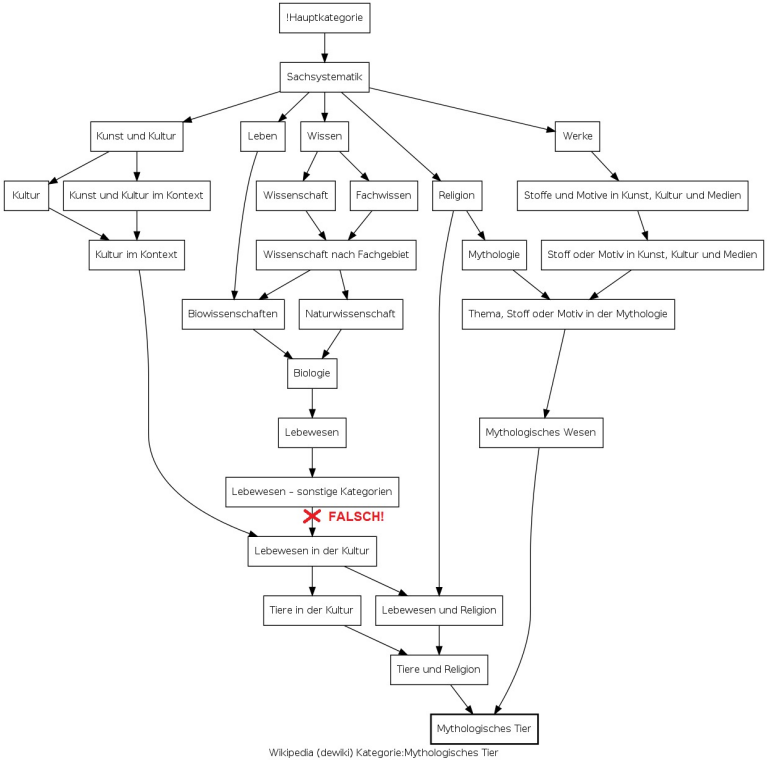
https://db-engines.com/de/ranking


DB-Engines Ranking
Punkte (logarithmische Skala)
1k
800
600
400
200
100
80
60
40
20
2013
2014
2015
2016
2017
2018
2019
© Mai 2019, DB-Engines.com
Oracle
MySQL
Microsoft SQL Server
PostgreSQL
MongoDB
IBM Db2
Elasticsearch
Redis
Microsoft Access
Cassandra
SQLite
MariaDB
Splunk
Hive
Teradata
Solr
HBase
FileMaker
Amazon DynamoDB
SAP HANA
SAP Adaptive Server
Neo4j
Couchbase
Memcached
Microsoft Azure SQL Database
Microsoft Azure Cosmos DB
Informix
Vertica
Google BigQuery
Firebird
Amazon Redshift
Netezza
CouchDB
InfluxDB
dBASE
1/11

FORMALISATION AND CATEGORISATION OF INFORMATION

The complexity and heterogeneity of artefacts and cultural circumstances cannot easily be subsumed under a few generic terms.

The relation of entities to each other is subject to interpretation.



DATABASE CREATION AS A SCIENTIFIC ACHIEVEMENT

The result of the evaluation is already predetermined by the parameters of the conception.

This is because each database not only contains the individual static values, but also the associated ontological relationships between these data.

Artist	Title	Dating	Work	Material
Michelangelo	David	1501–1504	Statue	Marble

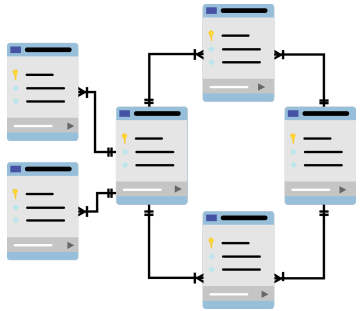
EXPLORATIVE RESEARCH

Databases may be understood as formations of knowledge that accompany interpretation.

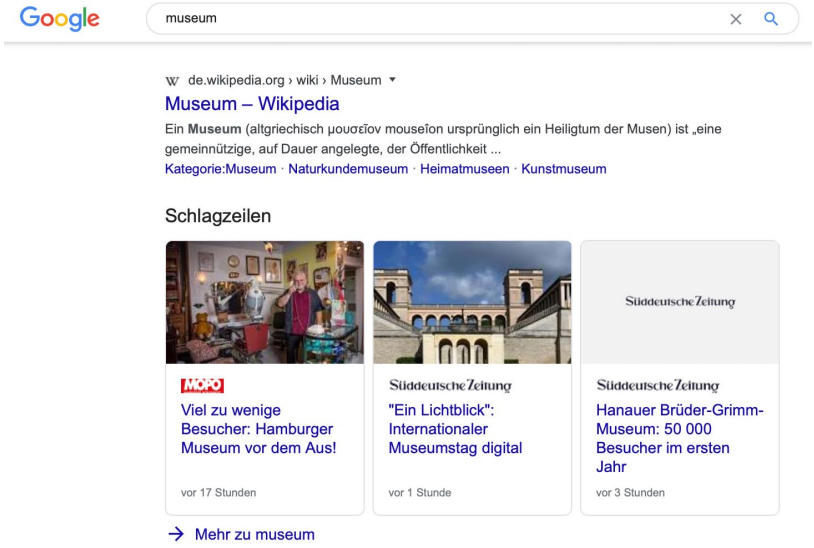
ACCESSING THE OBJECTS

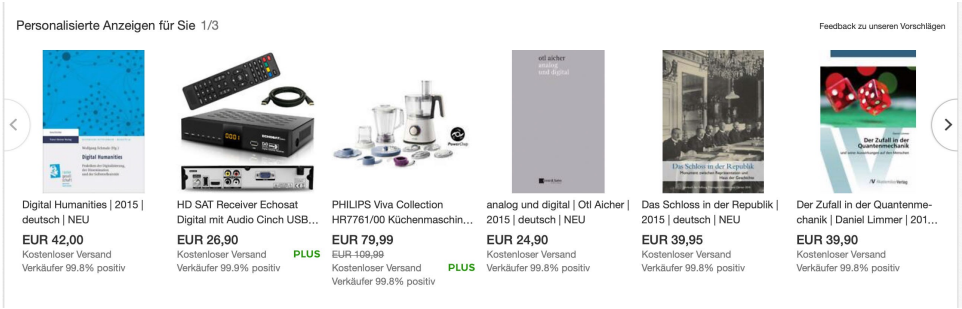
Databases have three different accesses to the objects they store and manage:

- internal storage logic of the computer
- external usage logic of the user
- conceptual description of information of the database model



CONTEXTUAL SEARCH RESULTS





APPEARANCE OF DIGITAL DATABASES

- the database as a latent infrastructure (content management systems)
- the database as an information collection and research tool that makes it possible to find the one in the many
- the database that enables the evaluation of the many and, above all, their visualisation (Big Data).

Marcus Burkhardt, *Digitale Datenbanken. Eine Medientheorie im Zeitalter von Big Data* (Bielefeld: transcript, 2015)

"Above all, however, the computer changes the relationship between (accessible) surface and depth, compared to what was traditionally defined by religion and art. [...] The surface is now the screen with extremely limited use of human senses, while the depth is the invisible machine that is now able to reconstruct itself from moment to moment, for example in response to use. The connection between surface and depth can be established via commands that instruct the machine to make something visible on the screen or by printing it out. It itself remains invisible."

Niklas Luhmann, Die Gesellschaft der Gesellschaft (Frankfurt a. M.: Suhrkamp 1998), 304.

DATABASE STRUCTURES AND THEIR MEDIA PROPERTIES

- Surface of use (interface, commands)
- Sub-surface of signal processing (signal, data)
- interlaced by forms of mediation downwards (views) and configuration of possibilities (commands, algorithms) for above.

„Searching becomes a creative act in which unknown connections can be explored and investigated.“

Burkhardt 257

DATABASES AS ‘INFORMATION POTENTIALS’

Marcus Burkhardt, *Digitale Datenbanken. Eine Medientheorie im Zeitalter von Big Data* (Bielefeld: transcript, 2015)

DATABASES AS ‘INFORMATION POTENTIALS’

Databases, in their need for formalisation and abstraction, actively co-produce information by visualising and thus consolidating assignments and links.

Databases thus construct an image of reality: information about reality thus becomes information as reality.

THE DATABASE AS A SYMBOLIC FORM OF DIGITAL MEDIA CULTURE

https://i.vimeocdn.com/video/512467099

Lev Manovich, „Database as Symbolic Form,“ *Convergence: The International Journal of Research into New Media Technologies* 5 no. 2 (1999), 80-99

2. RECOMMENDATIONS FOR THE CREATION OF A DATABASE

RECOMMENDATIONS

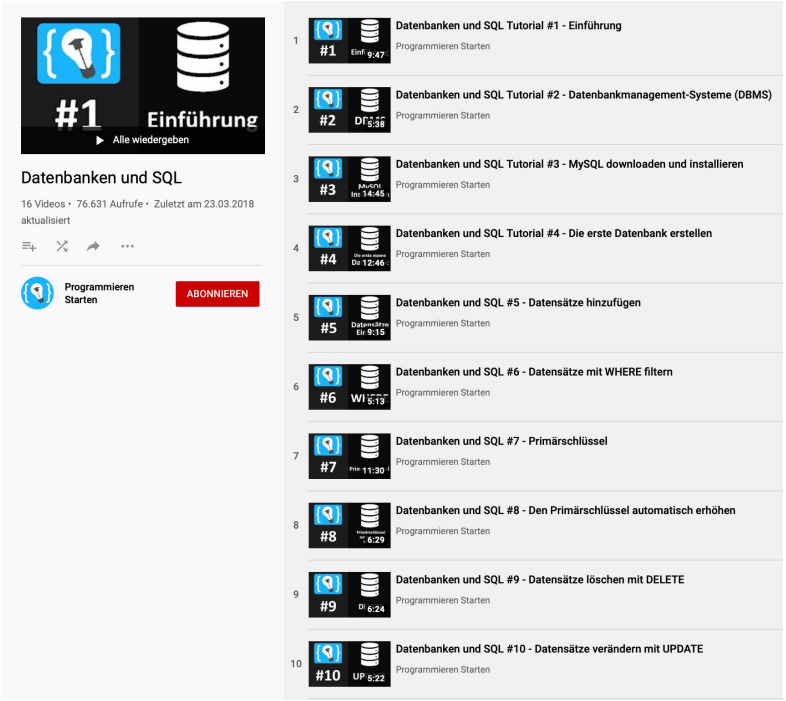
IANUS: https://www.ianus-fdz.de/it-empfehlungen/sites/default/files/medialibrary/DatenbankenChecklisteFormular.pdf

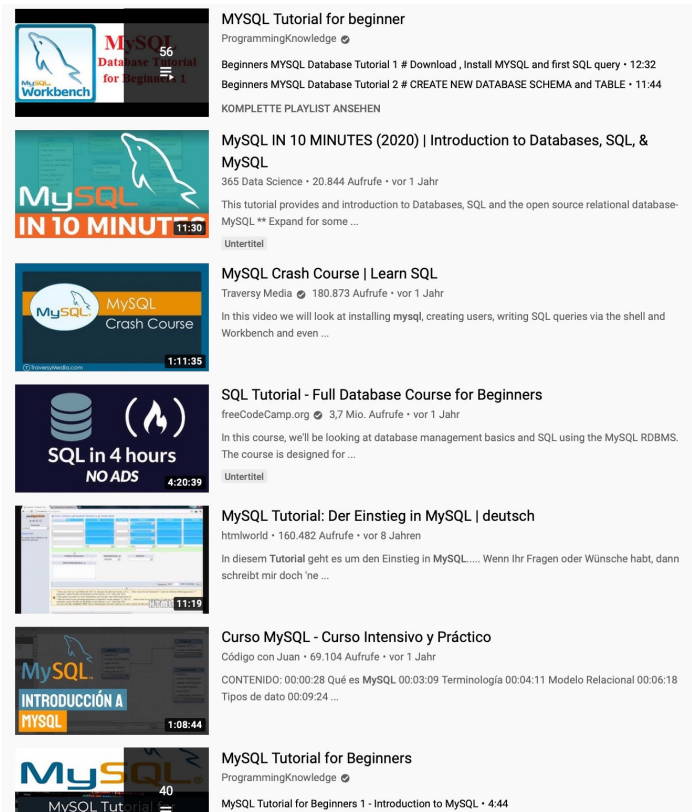
Ergebnisse der CIDOC Working Group „Documentation Standards“: International Guidelines for Museum Object Information (Juni 1995): http://network.icom.museum/fileadmin/user_upload/minisites/cidoc/DocStandards/guidelines1995.pdf

Ergebnisse der CIDOC Working Group „Lightweight Information Describing Objects (LIDO)“: LIDO Booklet (introductory, April 2011): www.lido-schema.org/documents/LIDO-Booklet.pdf

Deutscher Museumsbund (Hrsg.), Leitfaden für die Dokumentation von Museumsobjekten (Berlin 2011)

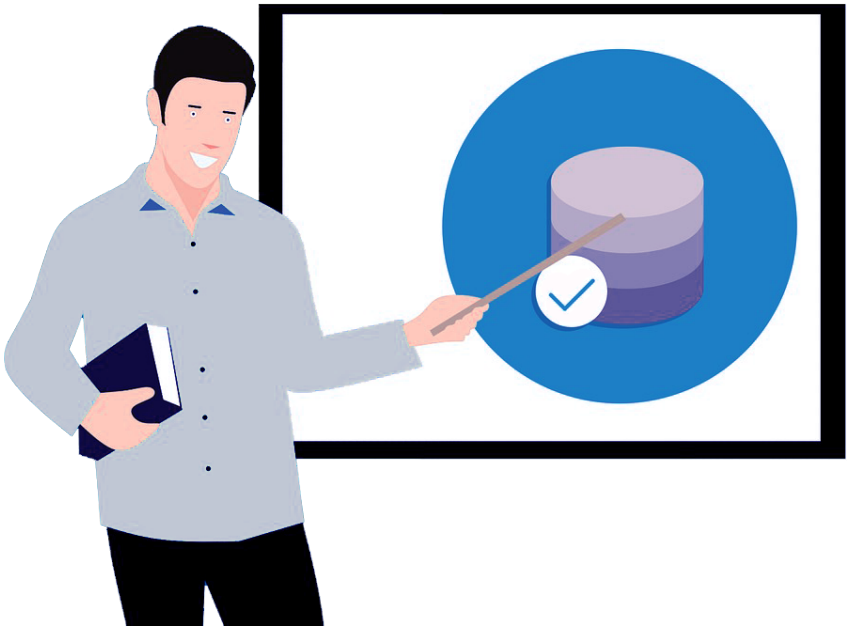
TECHNICAL IMPLEMENTATION





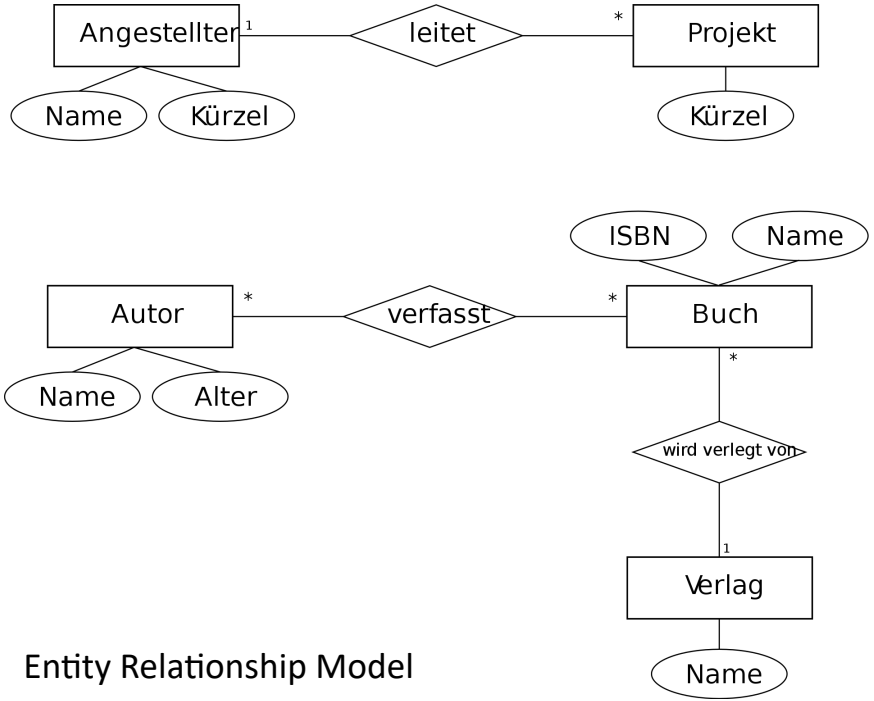
https://www.youtube.com/playlist?list=PL_pqkvxZ6ho1dn7jRkTfoYBXhw5c9jll0

DETERMINE REQUIREMENTS



- Clarify the requirements of a database in advance as comprehensively as possible and with all those involved.
- Record the results of the requirements analysis in writing!
- Check possibilities of adopting or adapting already existing databases!

DEVELOPING A CONCEPT



Entity Relationship Model

Define entity types and their relations using an entity relationship model:

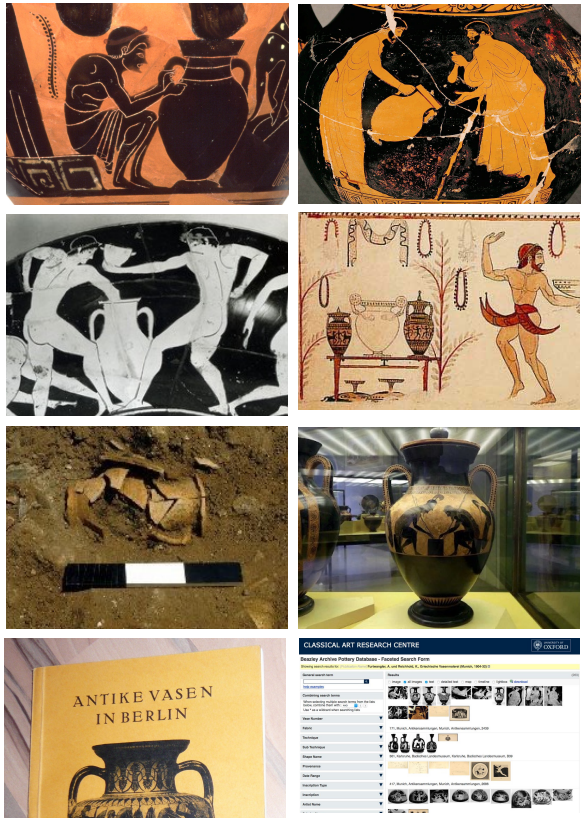
- Determine which fields are assigned to which entity type.
- Distribute the contents over several fields with smaller information rather than a few large free-text fields.
- Document the database design!
- Develop workflow for short-term data backup and long-term archiving.

LIDO MANDATORY ELEMENTS

There are only three mandatory sections in LIDO, plus a LIDO record identifier and the language information for the metadata, which are mandatory.

http://network.icom.museum/cidoc/working-groups/lido/lido-overview/lido-mandatory-elements/

EVENT-BASED MODELLING



1. manufacturing (material, production, design, decoration)
2. trade
3. use (primary / secondary function)
4. depositing (removal)
5. excavation
6. collecting events (current museum data, inventory, previous collections)
7. restorations (current conservation, previous restorations)
8. exhibitions
9. publications (reproduction)
10. collecting data in a database

FOR EXAMPLE: DATABASE FOR CERAMIC VESSELS

1. Manufacturing (material, production, design, decoration)

1a. Material:
Material
Material composition (clay composition / grain, clay colour, clay colour_MunsellNr, strength, colour and density of coating, coating_MunsellNr)
Quality of sherd
Quality of coating
∑Material description
Remarks_Material
Literature_Material

1b. Production:
Artist (=producer: potter and painter).
Manufacturer (=workshop)
Execution
Attribution
Quality Drawing
Signed
Hallmarks
∑Production
Remarks_Production
Literature_Production

THE TEN COMMANDMENTS OF DATA ENTRY (FROM A TEXT SOURCE TO A TABLE)

1. reserve the first row only for the names of the attributes (titles of the columns)!
2. use the first column to assign an ID to each entity!
3. keep the wording of the source as far as possible!
4. always note the source reference (insert as many "comment" columns as necessary for this)!
5. enter missing data with "missing" or "not applicable"!

Claire Lemercier and Claire Zalc, *Quantitative Methods in the Humanities. An Introduction* (Charlottesville: University of Virginia Press 2019), 57–60

THE TEN COMMANDMENTS OF DATA ENTRY (FROM A TEXT SOURCE TO A TABLE)

6. divide the information as much as possible into different columns!

7. avoid using the data format "date"! Instead, distribute the day, month and year (in numerical format) over three columns. 8.

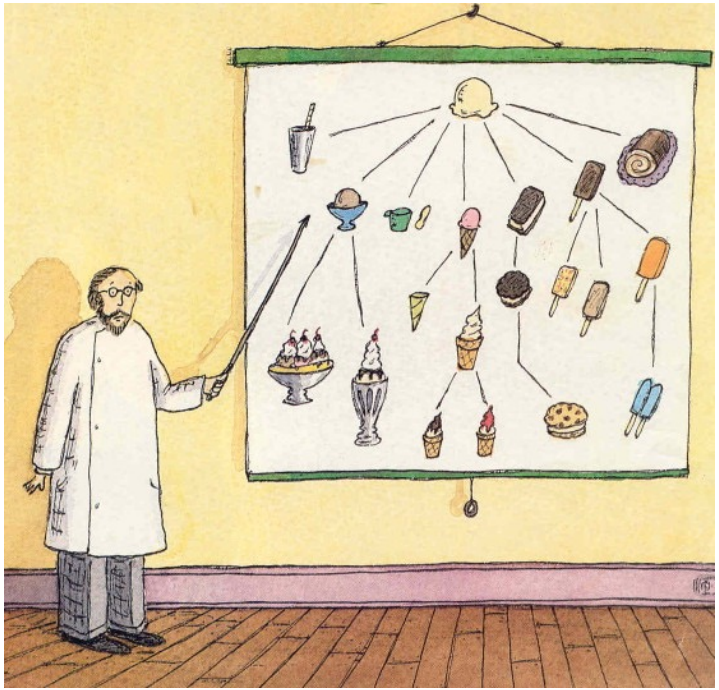
Write down the exact wording of the date. Split intervals into start and end dates!

9. familiarise yourself with the context menu of your software, i.e. everything you can do with a right click on a PC (or Ctrl+click on a Macintosh)!

10. back up your data as often as possible! (Create new files regularly, don't just replace the previous version with the new one).

Claire Lemercier and Claire Zalc, *Quantitative Methods in the Humanities. An Introduction* (Charlottesville: University of Virginia Press 2019), 57–60

DEFINING AUTHORITY RECORDS AND VOCABULARY



Roz Chast's Ice Cream Ontology

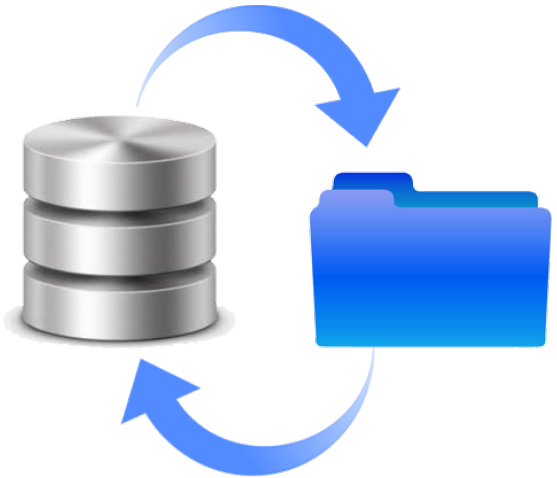
- Define and document binding terms and terminology before starting the input. Repeat regularly after initial experience.
- Which attributes must always contain a value (NULL problem)?
- Use controlled vocabulary in the form of value lists, authority records or thesauri whenever possible!

http://xtree-public.digicult-verbund.de/vocnet/
http://www.museum-digital.de/term/
http://www.aat-deutsch.de/das_projekt/

WORKING ON THE DATABASE

- Allocate sufficient time, money and staff for ongoing operations (checking and standardising input, updating documentation, troubleshooting, etc.)!

WORKING ON THE DATABASE



- Allocate sufficient time, money and staff for ongoing operations (checking and standardising input, updating documentation, troubleshooting, etc.)!
- Develop concepts for

- Data entry and data quality

- Export options

- Storage and backup

- multilingual data entry

DATA ENTRY AND DATA QUALITY

- Support the input with

- external documentation

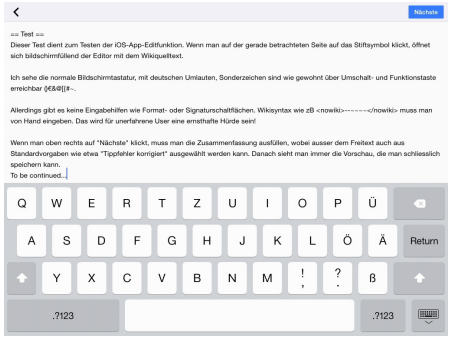
- descriptive input forms (e.g. using help functions),

- sample data sets

- predefined terms (e.g. value/code lists, thesauri, vocabularies)

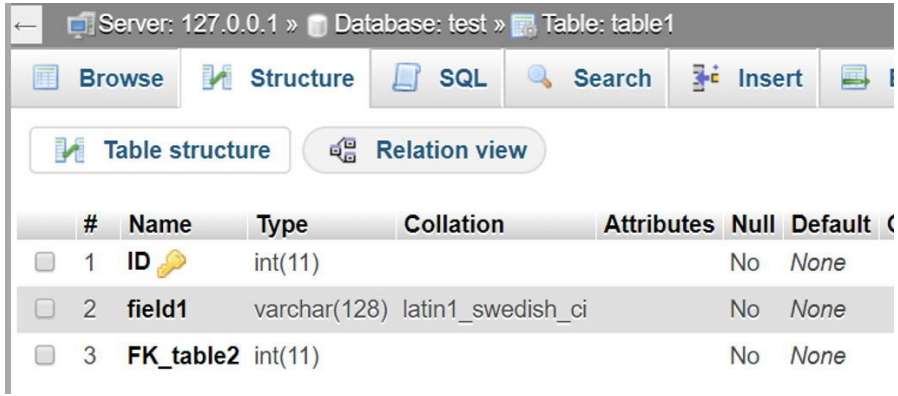
- technical functions (e.g. indices, auto-completion)

DATA ENTRY AND DATA QUALITY



- For properties of entities modelled as free text attributes, additionally provide a content equivalent attribute with controlled vocabulary (e.g. with keywords summarising the free description).
- Subdivide longer free text content and divide this information into several separate attributes.
- Provide short descriptions for each record in the manner of catalogue headings.

DATA ENTRY AND DATA QUALITY



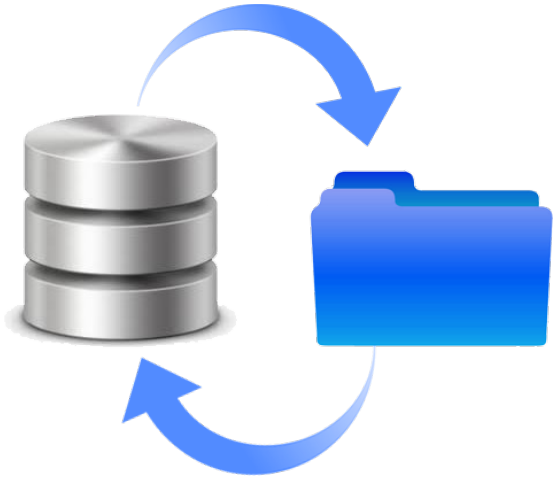
- Instead of fields that are not filled in (so-called null problem), a unique entry can be made for which certain characters are reserved, e.g.:

- Information currently unknown or not relevant: **NULL**

- Information will be entered later: **#**

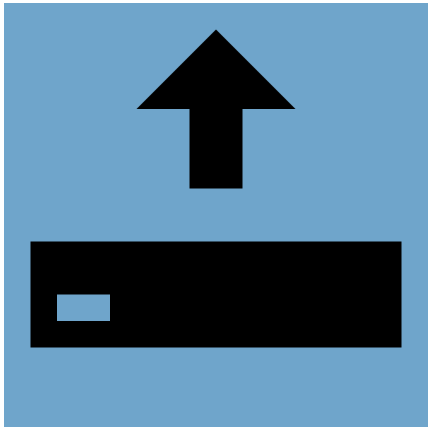
- Statement currently not clearly possible or to be answered: **?**

INTERFACES AND EXPORT OPTIONS



- simple text-based file formats such as CSV or TSV for word processing, spreadsheet or quantifying analysis
- more complex structured file formats such as XML and JSON for semantic queries
- universal interfaces such as ODBC (Open Database Connectivity) and JDBC (Java Database Connectivity), which enable access to and data exchange with a database

STORAGE AND BACKUP



- Secure the deletion of data records through security queries and restrictive access rights.
- The creation of backup copies or data exports, especially before major changes to the database, is strongly recommended.
- In addition, older versions should also be accessed with the help of versioning, which saves all states of the database contents.

MULTILINGUAL INPUT INTO DATABASES

- has a strong impact on the conceptual and logical design of the database schema.
- Labelling of user interfaces and forms in different languages.
- Attributes with controlled vocabularies can be automatically transferred to another language, provided that concordance lists (international reference systems) are available.
- define several language-specific attributes for one property of an object (for example, depiction_de, depiction_en), which are annotated subsequently (e.g. <de>Die Rückseite zeigt Victoria mit einem Schild nach links.</de> <en>The back shows Victory holding a shield facing to the left.</en>).

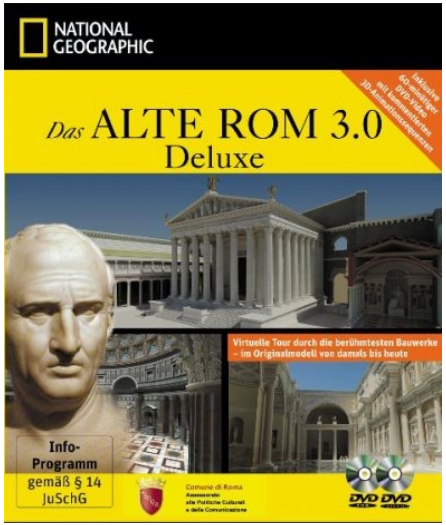
ENABLING WORK IN TEAMS

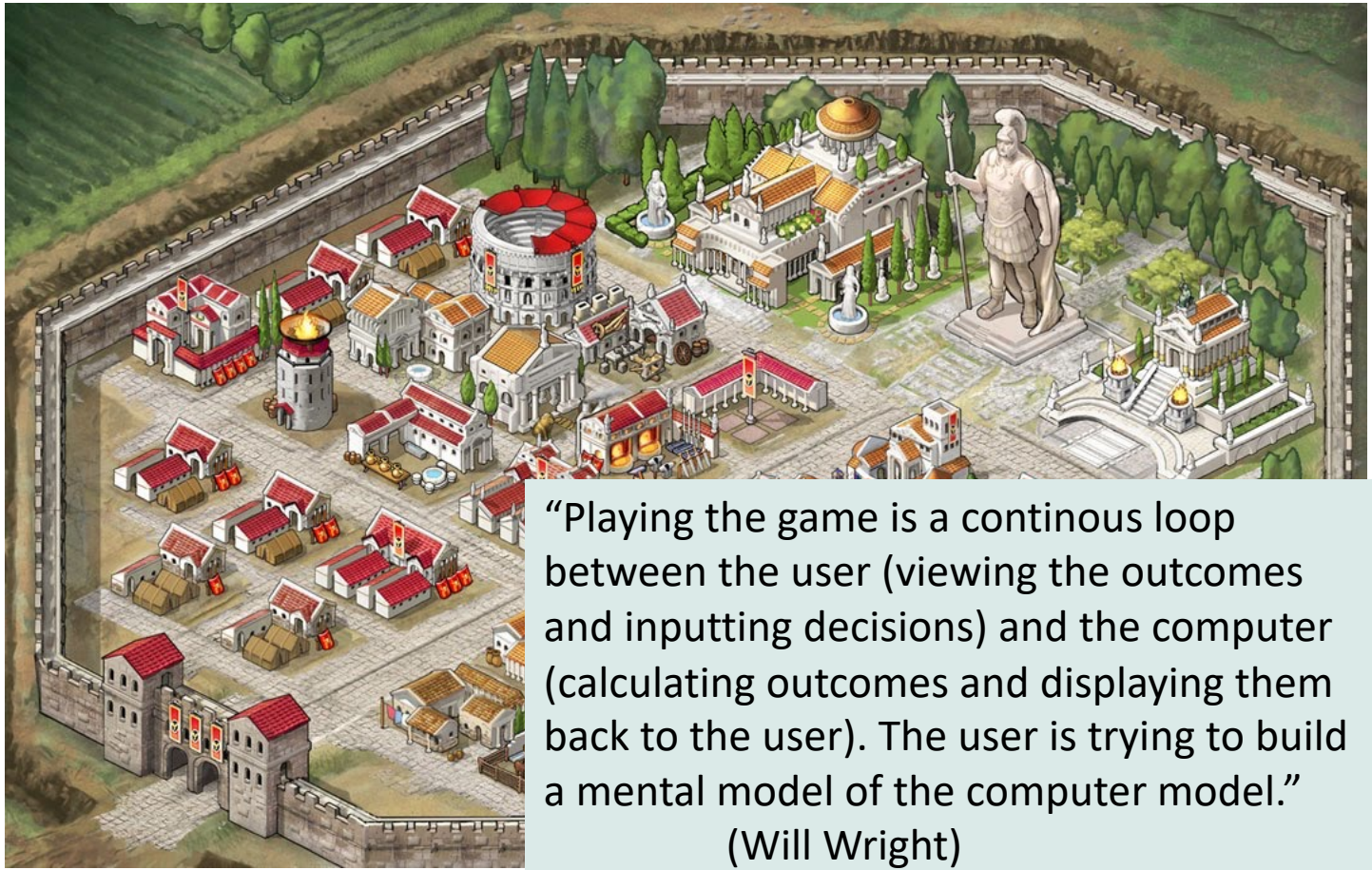
- Clarify potential requirements for hardware, software and infrastructure (e.g. network access).
- Determine which user group may see and change which fields in which way. Pay attention to the uniformity and clarity of the respective layout masks!
- Agree on terminology and understanding of field contents between the users.

3. IMAGE DATABASES OF THE FUTURE

„After the novel, and subsequently cinema, privileged the narrative as the key form of cultural expression of the modern age, the computer age introduces its correlate – the database. Many new media objects do not tell stories; they do not have a beginning or end; in fact, they do not have any development, thematically, formally, or otherwise that would organize their elements into a sentence. Instead, they are collections of individual items, with every item possessing the same significance as any other.“

Lev Manovich,
The Language of New Media (Cambridge: MIT Press 2001), 218

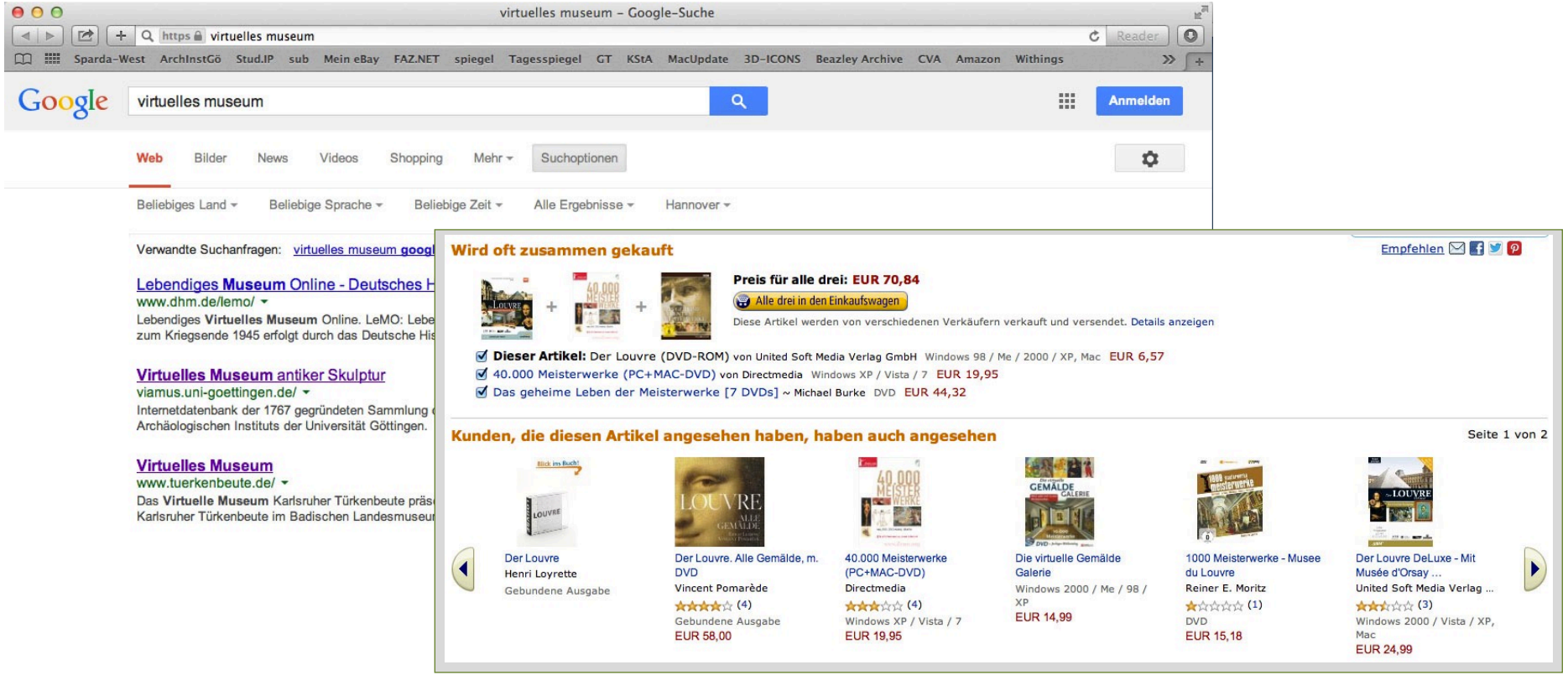




"Playing the game is a continous loop between the user (viewing the outcomes and inputting decisions) and the computer (calculating outcomes and displaying them back to the user). The user is trying to build a mental model of the computer model."
(Will Wright)

GLORY OF ROME
„Rome lies in chaos. Leaders seek to crush their rivals with massive armies and ruthless politics. Destroy marauding barbarians and raise shining new cities out of the dust. Reforge the Empire with blood and steel! Restore the Glory of Rome!"

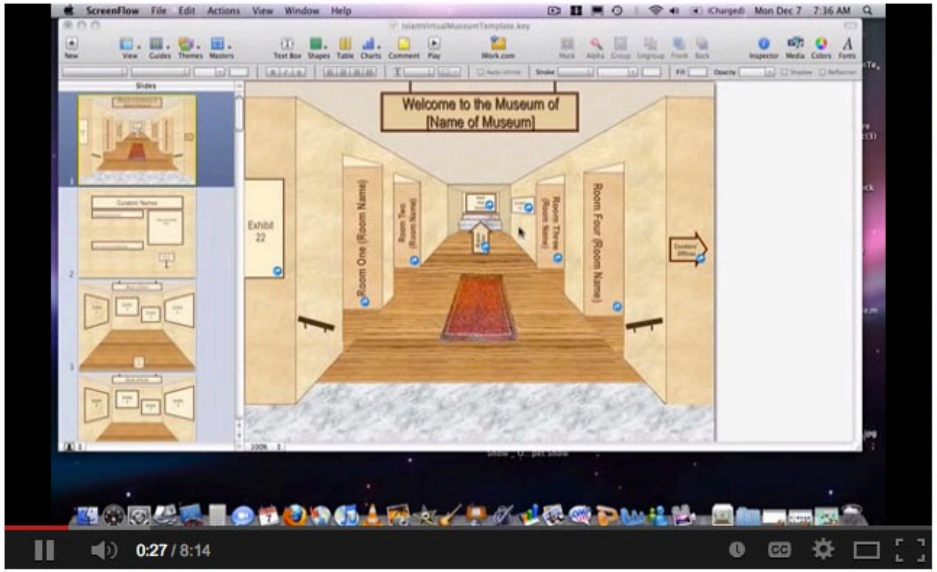
USER-BASED RESULTS



virtual museum

Video hochladen

Anmelden



Tutorial - Virtual Museum.mov

Fady Tabbara · 41 Videos

Abonnieren 8

3.167

Mag ich

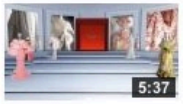
Info Teilen Hinzufügen

Hochgeladen am 06.12.2009

Louvre
von Dave Fleisher
1.637 Aufrufe

Creating a Virtual Museum in Microsoft PowerPoint
von mrs0410
10.451 Aufrufe

A World of Art: The Metropolitan Museum of Art
von Great Museums
157.738 Aufrufe



Valentino Garavani Virtual Museum Tour
von ValentinoMuseum
37.745 Aufrufe

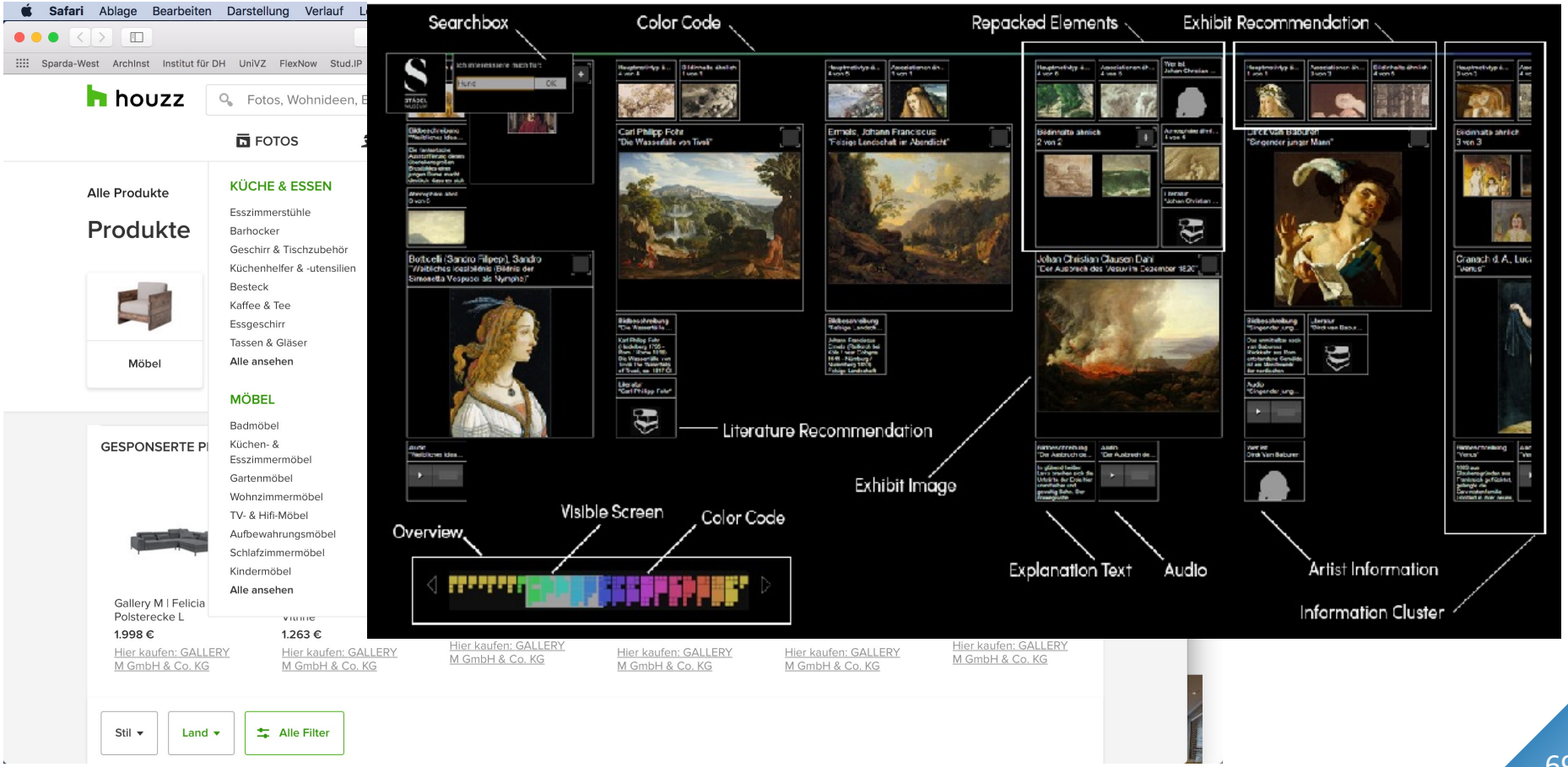
Virtual Frost Art Museum -- Inktel Direct
von Frost ArtMuseum
1.541 Aufrufe

3D Kunstgalerie - www.artfolio.de - WebGl
von Artfolio UG
4.127 Aufrufe

Virtual Tour of The Mint Museum Expansion
von jkarout
1.829 Aufrufe

MAV - Virtual Museum of

USER-BASED RESULTS



USER-BASED RESULTS: FACETTED BROWSING (DRILL DOWN)

virtual museum | Search | Only show ebooks

Encounters in a Virtual Feminist Museum by Grisel Pollock
2 editions – first published in 2008

Encounters in the virtual feminist museum by Pollock, Griselda.
1 edition – first published in 2007

The virtual museum of Manchester Computing by K. S. Gill
1 edition – first published in 1996

Virtual actor technology by National Museum of Photography, Film & Television (International Conference) (1997 Bradford)
1 edition

Virtual environments on the desktop by National Museum of Photography, Film & Television (International Conference) (1997 Bradford)
1 edition

Collaborative Access To Virtual Museum Collection Information by Bernadette G. Callery
2 editions – first published in 2005

Heritage in the digital era by International Conference on Virtual Systems and Multimedia (14th 2008 Limassol Cyprus)
1 edition – first published in 2010

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Rome 1
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Empire, 30 B.C.–476 A.D. 1

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2003 3
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Archaeolingua 2
Museum of Contemporary Art 2
Association for Computing Machinery 1
Association of Computing Machinery 1
more

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English 28

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Agathe.gr | ... | Research | Help

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1 of 2

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Catalog Cards (39,992)

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Excavations 1998: Preliminary Report on the 1998 Excavation ...

John Camp ... Excavations were carried out in the Athenian Agora from June 6 to July 31, 1998 with a team of some 40 American students representing 25 universities and colleges. This brief preliminary summary is the ...

Excavations 1999: Preliminary Report on the 1999 Excavation ...

John Camp ... Excavations were carried out in the Athenian Agora from June 7 to July 30, 1999; in all, 53 people participated, including volunteers, supervisors, and permanent staff. This report has been prepared for ...

Excavations 2000: Preliminary Report on the 2000 Excavation ...

John Camp ... Excavations were carried out for 8 weeks in the summer of 2000, from June 5 to July 28, with a team of some 55 people made up of student volunteers, supervisors, staff, and workmen. This report is a very ...

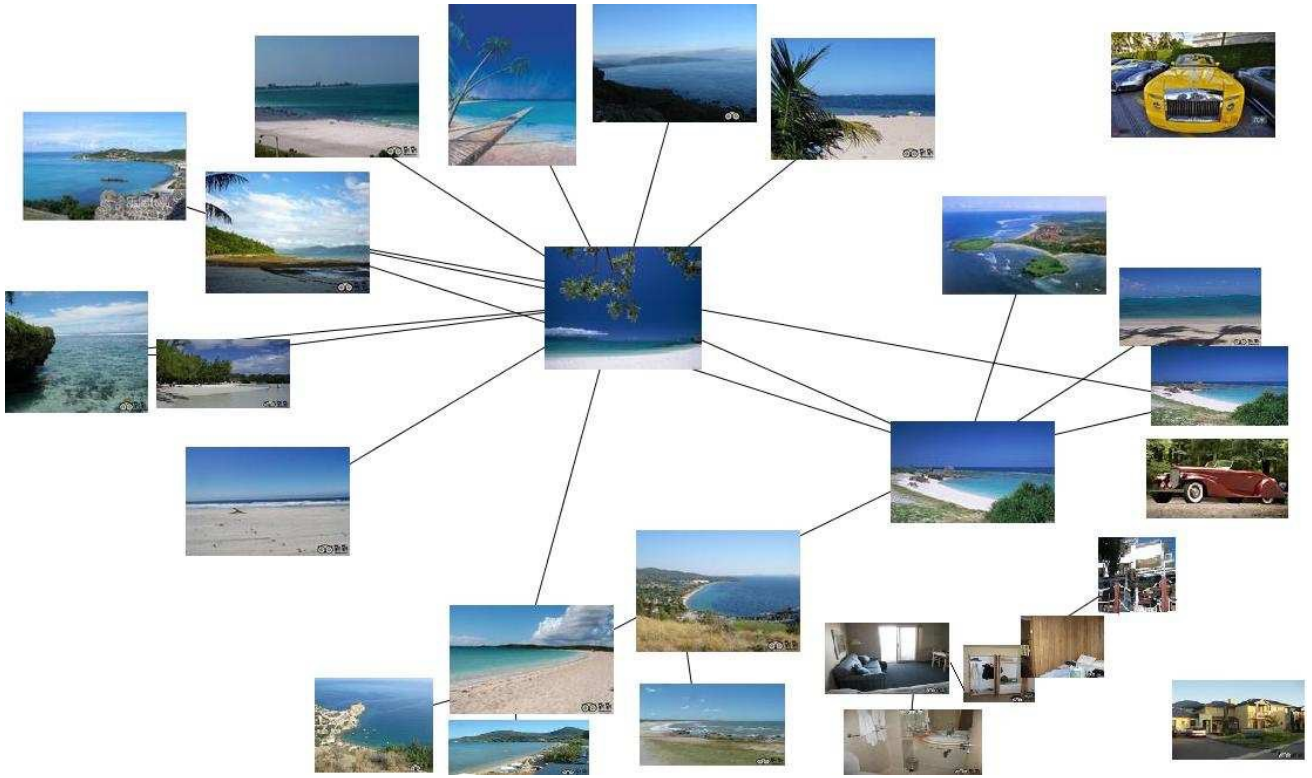
Excavations 2001: Preliminary Report on the 2001 Excavation ...

John Camp ... Excavations were carried out in the Athenian Agora from June 11 to August 3, 2001 with a team of about 45 students and supervisors. Work was concentrated at the northwest of the Agora, with a second group ...

Portrait of an Imperial Priest 2002: A Portrait of an Imperial Priest

John Camp ... Roman portrait head found in Section EΛ. A Roman portrait

Image pattern recognition to support keyword-based search (here: google Images: "beach")



Chunlei Yang, Large-Scale Image Collection Cleansing, Summarization and Exploration, Diss. Charlotte 2012 (http://libres.uncg.edu/ir/uncc/f/Yang_uncc_0694D_10369.pdf)

IMAGE COLLECTION EXPLORATION

- Method of searching large image databases and repositories to find, display, summarise and browse image data quickly, effectively and intuitively.
- Answer to the Semantic Gap problem caused by heterogeneous / multimodal data (text, image, symbol, etc.).

Jorge E. Camargo, Juan C. Caicedo, Fabio A. Gonzalez, A kernel-based framework for image collection exploration, Journal of Visual Languages & Computing, Volume 24, Issue 1, February 2013, 53–57.

IMAGE COLLECTION EXPLORATION

- **Summarisation:**

Summary search for representative image sets (clustering by prototype).

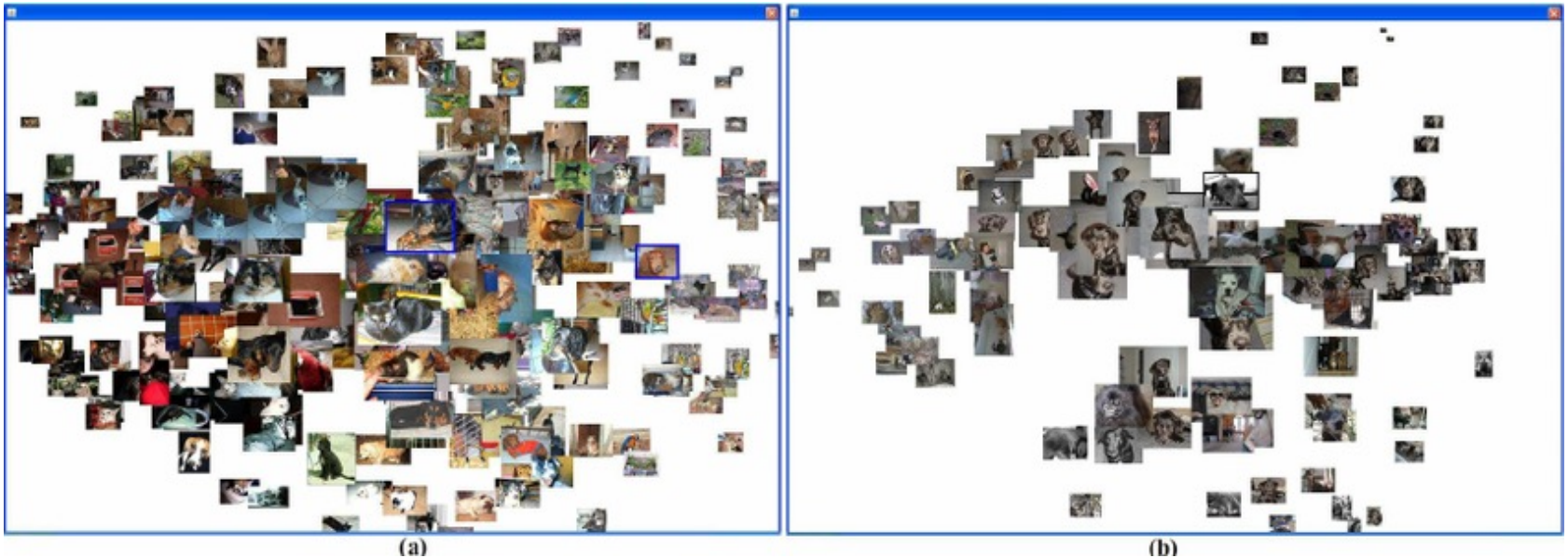


IMAGE COLLECTION EXPLORATION

- **Summarisation:**

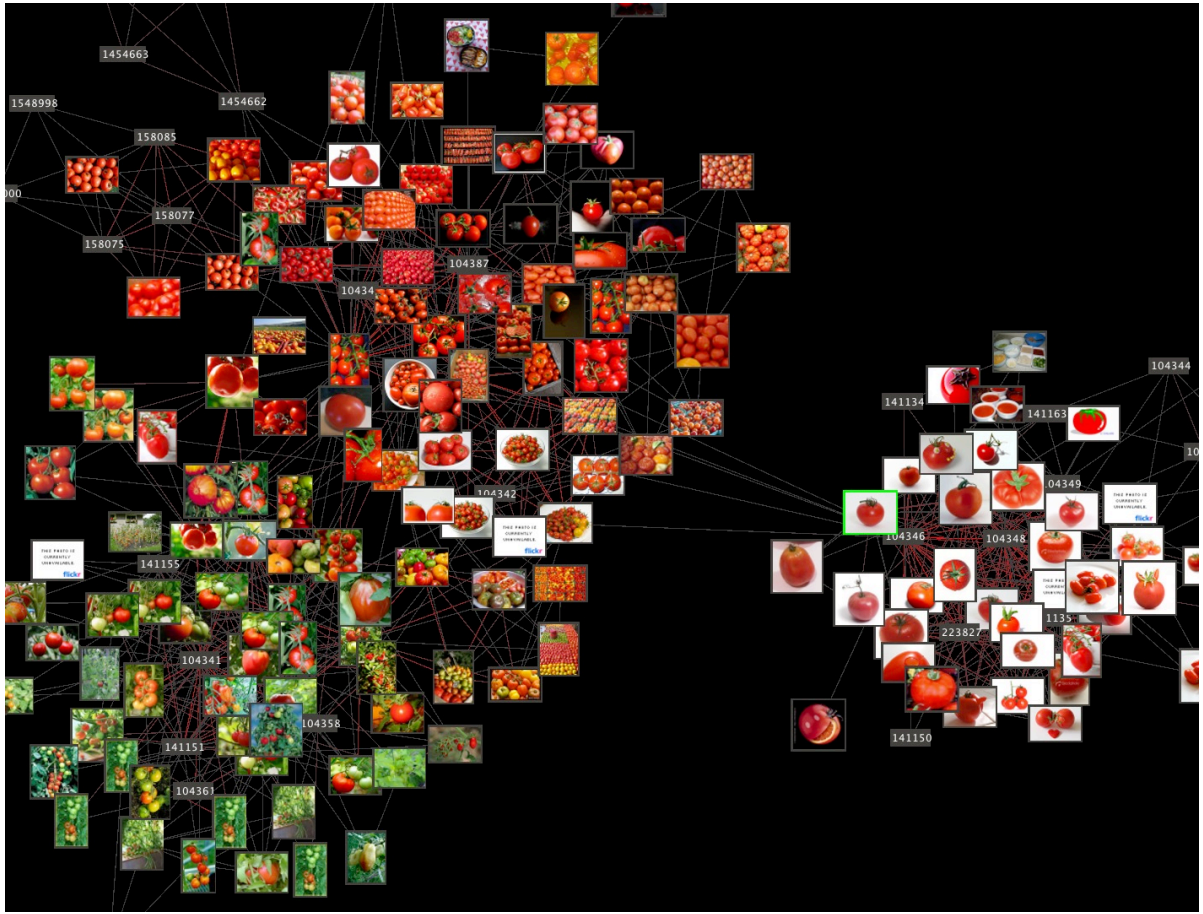
Summary search for representative image sets (clustering by prototype).

- **Visualisation:**

Visualisation process of the image sets via a visualisation metaphor / function by visualising relationships between images in a special layout.

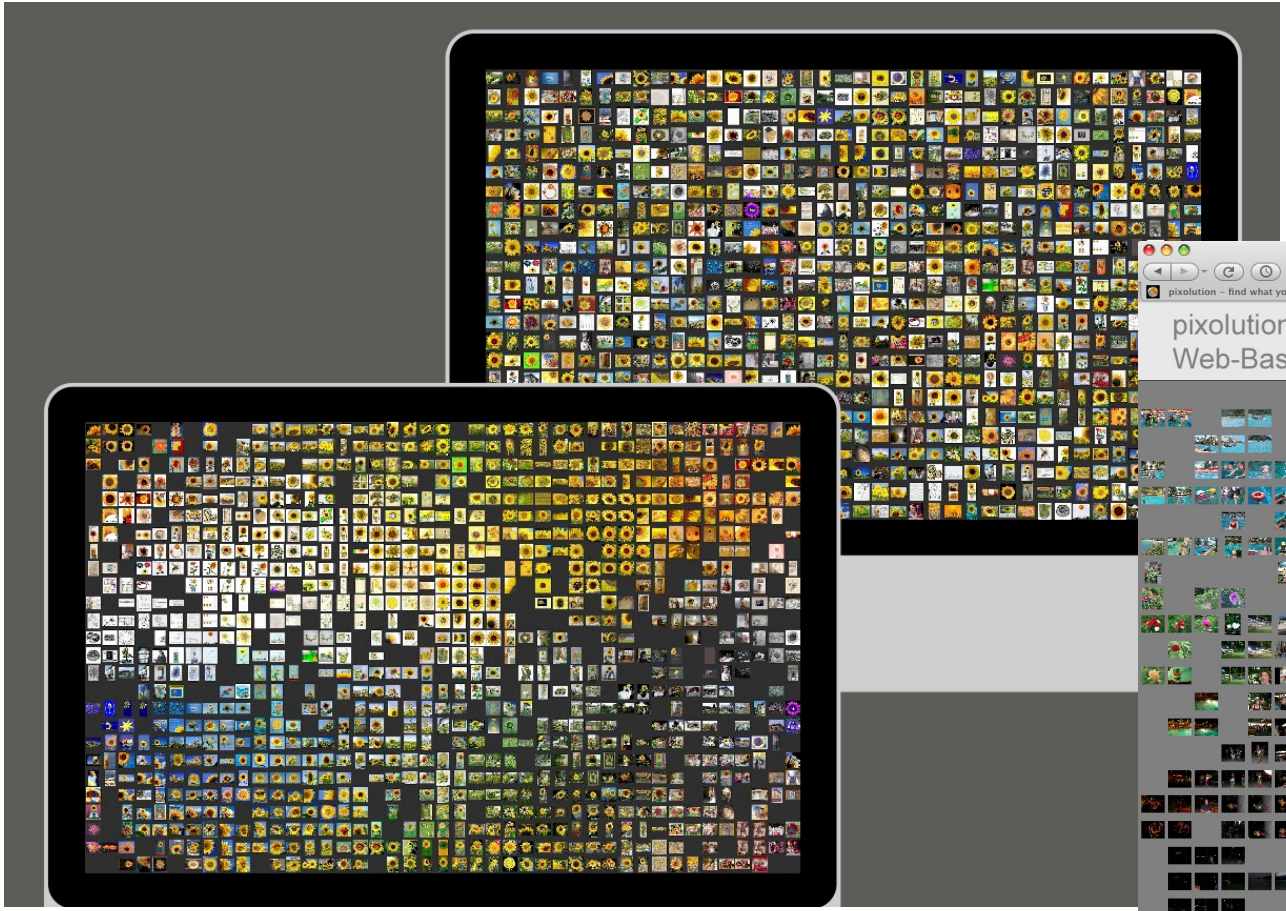
- **Interaction:**

The system learns from / through the feedback of the users.

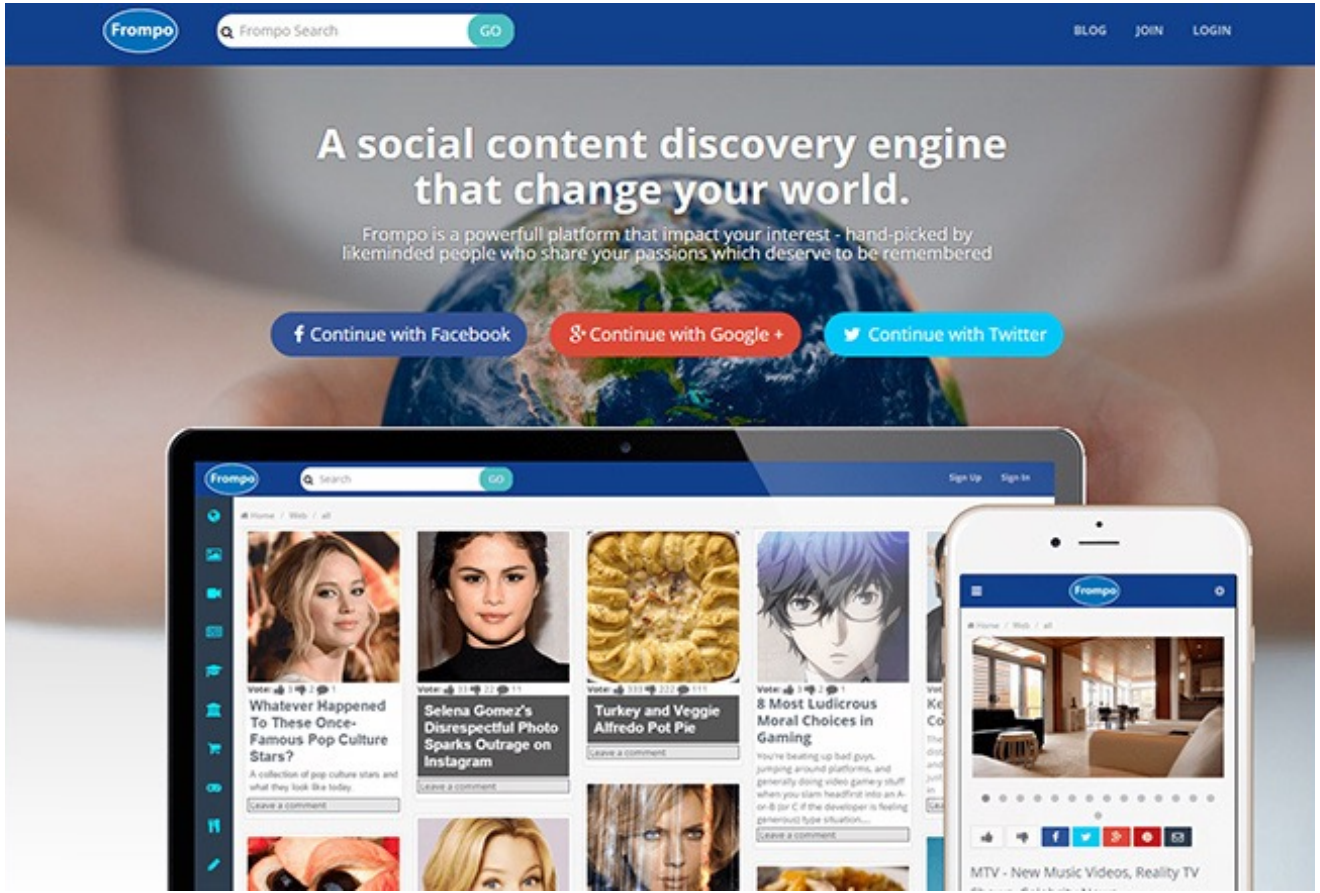


- Based on the learned image relationships, suggestions for semantically similar images can be made (https://pixolution.org - meanwhile commercial)

IMAGE COLLECTION EXPLORATION: EXAMPLE



Visuelle Sortierung von Bilddateien (https://pixolution.org)



The first platform to consistently focus on image collection exploration in 2014: FROMPO Social Discovery Tool (Sharing content, images and videos): http://frompo.com (Now only adult content)

VISUALISATION LAYOUTS: IMAGE BROWSER

BELOW THE SURFACE

2005


NZD1.00027KST002 H:4 0:45


NZD1.00620MTL039 0:39

NZD1.00610MIX022
LxWxH:101x34x20


NZD1.00444KST001 0:25

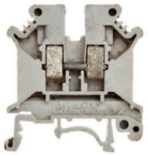

NZD1.00323KST001
LxWxH:134x54x32


NZD1.00042MTL014 0:25


NZD1.00042MTL035 0:21


NZD1.00007KST003 LxW:85x54


NZD1.00087KST002 LxW:85x54


NZD1.00542KST007
LxWxH:46x41x6


NZD1.00068KST001 L:78 0:44


NZD1.00042MTL016 0:23


NZD1.00303KST002 LxW:85x55


NZD1.00042MTL028 0:19

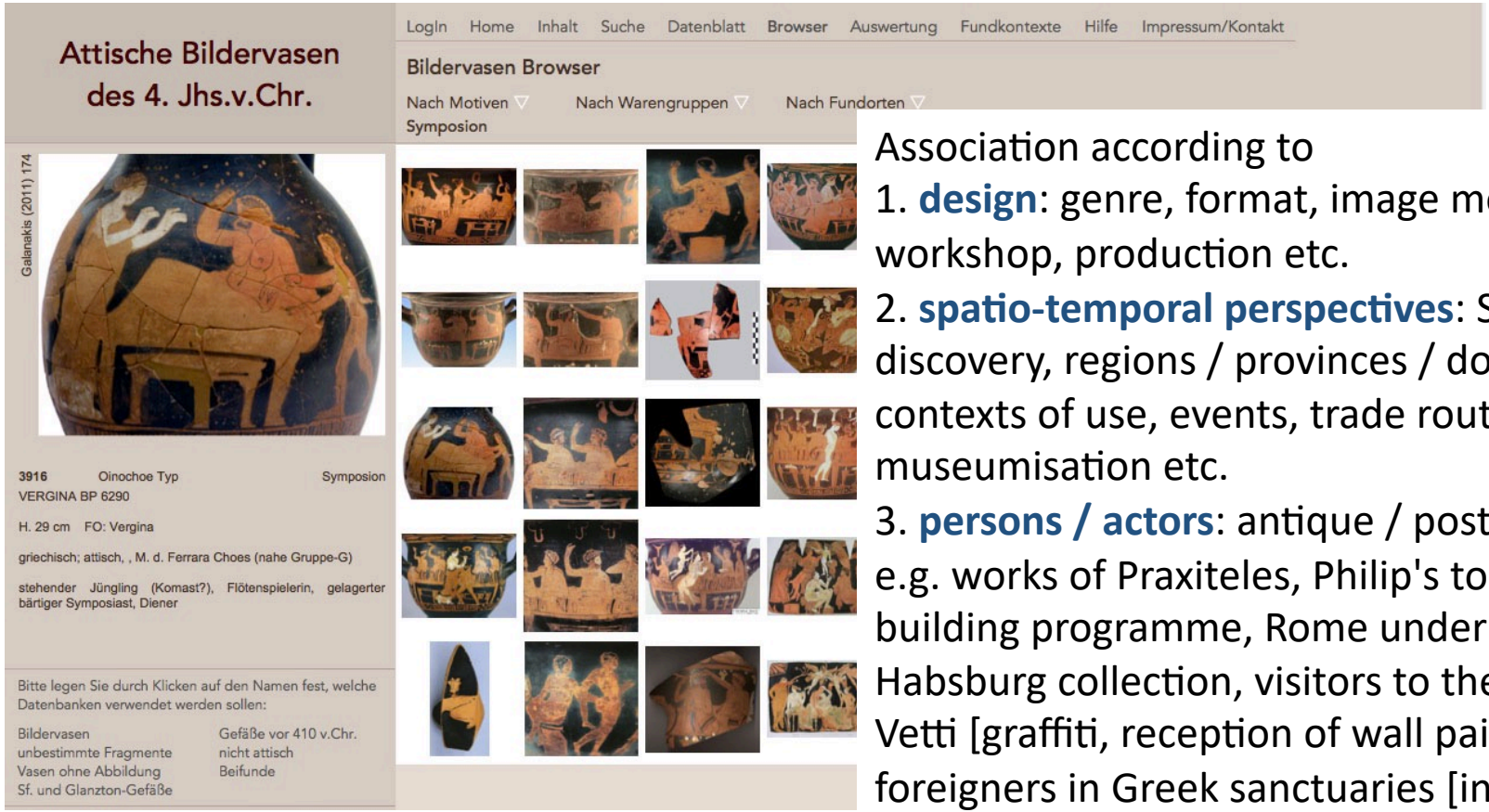
NZD1.00540KST019 LxW:22x24


NZD1.00365KST001 LxW:85x54

NZD1.00093KST004 0:40


NZD1.00068KST007 LxW:27x21

https://belowthesurface.amsterdam/en/vondsten

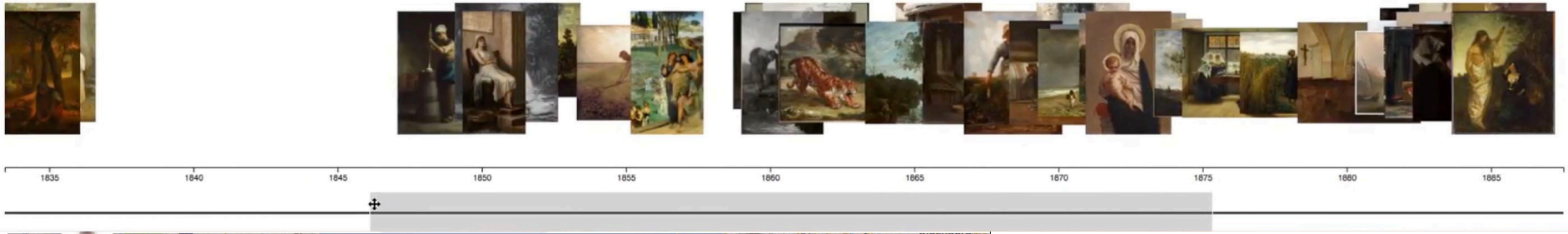


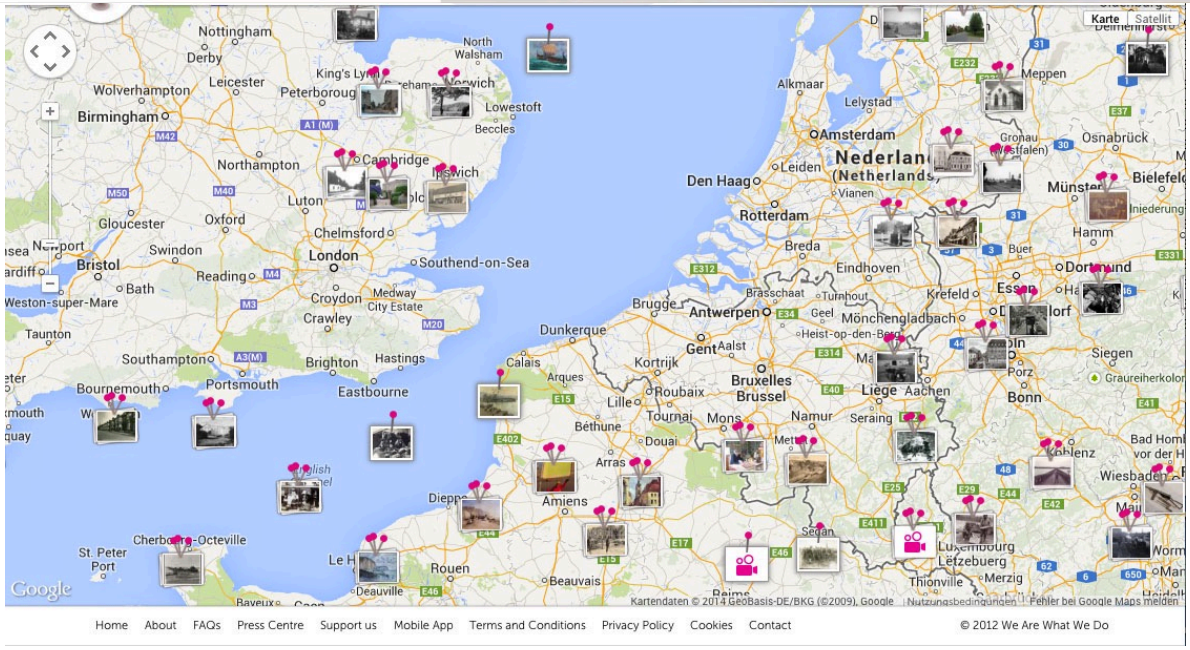
www.vasenrepertorium.de

Association according to

1. **design**: genre, format, image motif, workshop, production etc.
2. **spatio-temporal perspectives**: Sites of discovery, regions / provinces / domains, contexts of use, events, trade routes, museumisation etc.
3. **persons / actors**: antique / post-antique e.g. works of Praxiteles, Philip's tomb, Herod's building programme, Rome under Trajan, Habsburg collection, visitors to the Casa dei Vetti [graffiti, reception of wall painting], foreigners in Greek sanctuaries [inscriptions, dedications, imported objects].

VISUALISATION LAYOUTS: TIMELINE AND GEOBROWSER

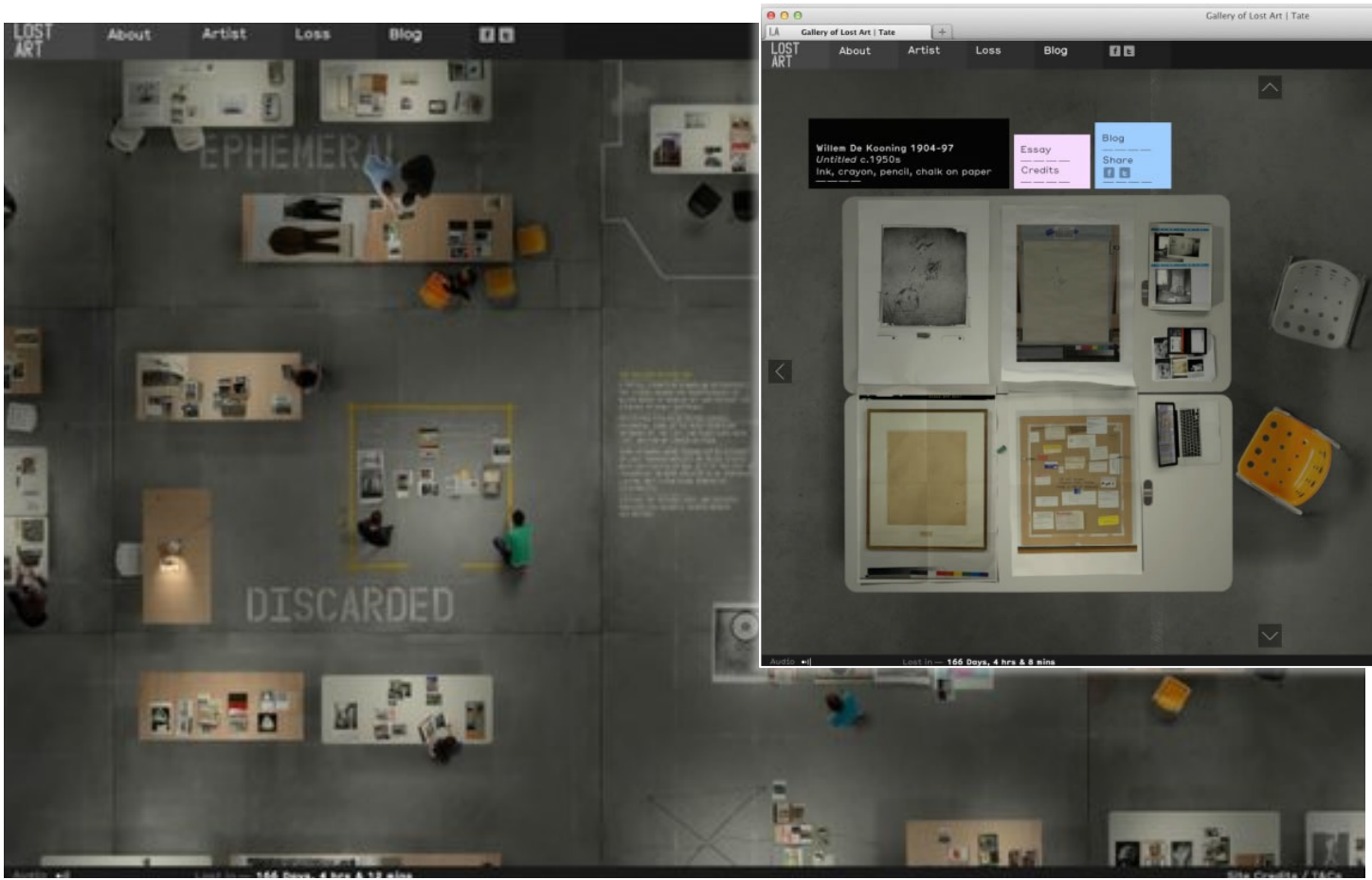




https://artimageexplorationspace.com

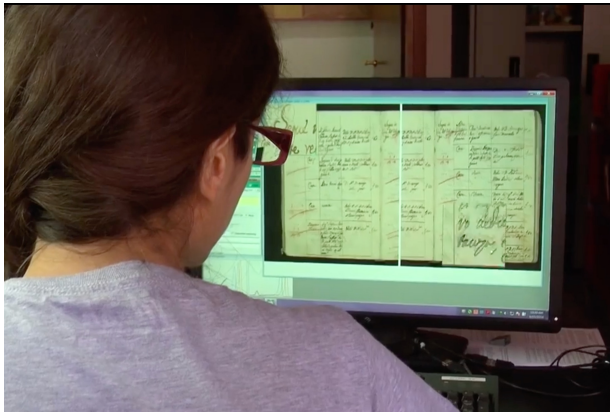
http://www.historypin.com/map

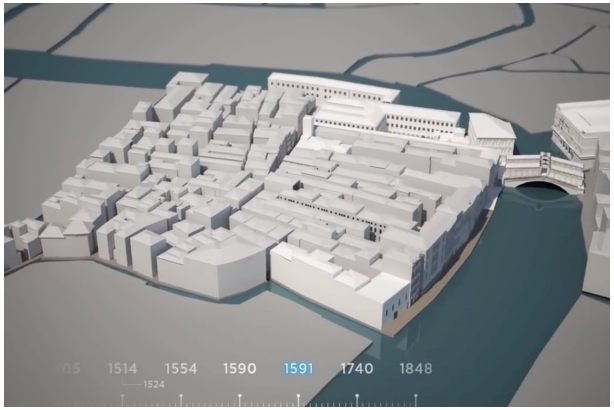
VISUALISATION LAYOUTS: TATE MODERN



https://www.tate.org.uk/about-us/projects/gallery-lost-art

http://datarama.mmg.mpg.de





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CHALLENGES FOR SCIENTIFIC IMAGE ARCHIVES AND REPOSITORIES

- Theory of data structures with regard to image and object evidence
- Critical, reflective use of image pattern recognition and search results
- Greater user-centricity in the visualisation of search results (creativity in the relationship between backend and frontend of the databases)

- Basics of structuring and visualising information in databases
- Differences in database models (relational, object-oriented, hierarchical, etc.)
- Recommendations of IANUS / German Museums Association / CIDOC Working Groups for the creation of databases
- Databases of your subject (e.g. Classical Archaeology), their material basis, history and conditions
- Relevance of controlled vocabularies / authority records, thesauri etc. for use in databases

- Selection of suitable database (systems), taking into account their significant properties for different usage scenarios
- Development of a MySQL image database (e.g. in LibreOffice BASE) for scientific questions
- Practical experience in the use of image databases (searching, sorting and replacing, importing and exporting data, creating views, relations and evaluations)

Which image databases do you know? How are they structured?

u.a. Folie 5. 70. 71. 79

What purpose do scientific image databases currently serve? What do you think is the future of scientific image archives ?

Folie 64–86

Explain the difference between data model, data structure and data type!

Folie 10–13

What is a database system?

Folie 16–20

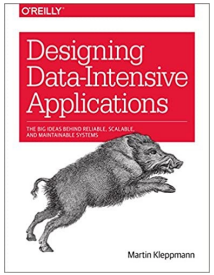
What possibilities do you know for image-based data search?

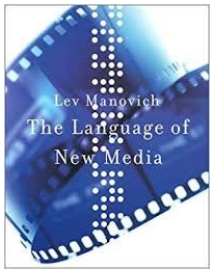
Folie 72–80

Briefly characterise three database models in terms of structure and usefulness

Folie 21–30

What would will the perfect image database look like in your opinion?





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IMPRESSUM

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