# MultiMatch - Providing Multilingual/Multimedia Access to Cultural Heritage Content

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# Overview

Introduction

User requirements

Prototype system

User interface

Evaluation

Summary

# The initial idea

Problem (back in 2005!)

- The Web contains a wealth of cultural heritage (CH) information
  - Web pages (e.g. Wikipedia)
  - Digital Libraries managed by cultural institutions
- But it's hard to access this information
  - dispersed and fragmented
  - multiple formats and languages
  - not all information publicly-accessible (e.g. archives)
- Users are left to discover, interpret, and aggregate it

# MultiMatch

MultiMatch project (http://www.multimatch.org)

- enable users to explore and interact with online accessible cultural heritage content, across media types and language boundaries

European Union research project (FP6)

- Technology-enhanced Learning and Access to Cultural Heritage
- approx budget of 3.2 million Euros
- 11 European partners
- ran May 2006 – October 2008

# Objectives

Develop a (vertical) search engine to provide targeted, enriched access to heterogeneous "cultural objects"

- across all media types and language boundaries
- supporting various user classes
- with aggregate views on complex task scenarios

Assist cultural heritage institutions in raising the visibility of their content (online)

- link from their content to related material online

Museums
Libraries
Archives
Newspapers
News agencies

Personal Pages
Blogs

crawling

Museums
Databases

Van Gogh Museum (NL)

Musée d'Orsay (F)

acquisition

National Gallery (UK)

MultiMatch

HOME | LOGIN | LANGUAGE | HELP | ABOUT US

Summary | Docs | Image | Video | Audio | Events | Map

Vincent van Gogh - Dutch painter (dates)

BIOGRAPHY

TIMELINE (PAINTINGS)

SEARCH
search within results
advanced search
1,232,343 results (0.12s)

Related Terms
- van Gogh museum
- Theo van Gogh
- van Gogh painting
- Post impressionist

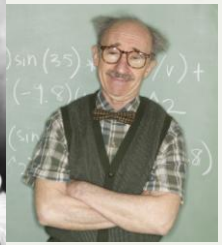
Related Categories
- Arts & Entertainment (66%)
  - Gogh, vincent van
- Shopping (22%)
- Society and Culture (10%)

Document Language
- English (48%)
- Dutch (28%)
- French (16%)
- Spanish (8%)

RECENT SEARCHES
Van Gogh
Di Vinci
Michelangelo

OTHER BIOGRAPHIES
- Wikipedia
- Van Gogh Museum
- National Gallery of Art
- Van Gogh's Letters
- Vincent van Gogh Gallery

# Users and intended functionality



## Target audience

- cultural heritage professionals (archivists, researchers, etc.)
- educational users (students, professors)
- general users (tourism, etc.)

## Provide functionalities that allow users to

- search across languages (query translation)
- search for web pages, audio, video, and images simultaneously
- explore connections and relationships between creators, creations, time and place

# The consortium

## Academia

- Istituto di Scienza e Tecnologie dell'Informazione (ISTI-CNR)
- University of Sheffield (USFD)
- Dublin City University (DCU)
- University of Amsterdam (UvA)
- University of Geneva (UniGE)
- Universidad Nacional de Educación a Distancia (UNED)

## Industry

- OCLC (Sheffield, UK)
- WIND Telecomunicazioni S.p.A. (WIND)

## Cultural heritage providers

- Fratelli Alinari Istituto Edizioni Artistiche SpA (Alinari)
- Netherlands Institute for Sound and Vision(Sound and Vision)
- Biblioteca Virtual Miguel de Cervantes (UA)

# Project activities

User-oriented activities

- e.g. requirements gathering, interface design

Component development

- multilingual indexing and retrieval
- multimedia indexing and retrieval
- information extraction and classification
- user interface components

System architecture and component integration

Evaluation and field trials

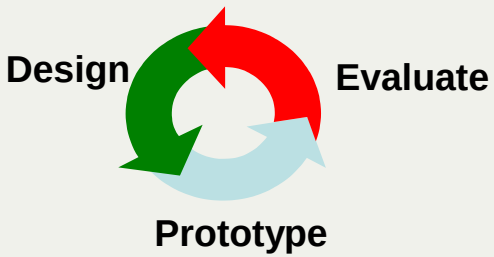
Dissemination and exploitation

# MultiMatch design process

Multi-technique “task-driven” design process

- developed to meet the needs of users carrying out prototypical tasks in the cultural heritage domain (scenarios)

Iterative design involving two main cycles (prototypes) with five stages




- needs assessment and task analysis
- preliminary design using low-fidelity prototypes
- design and development of interactive prototype
- heuristic evaluation and re-design
- user evaluation

# Requirements gathering

Important aspect of user-centered design

- identify potential users and their information needs

Sources of input

- literature and past research
- analysis of related sites
- log file analysis
- user studies and interviews
  - » cultural heritage professionals/experts
  - » general users (e.g. tourism)

Minelli, S. H., Marlow, J., Clough, P., Cigarran Recuero, J.M., Gonzalo, J., Oomen, J. and Loschiavo, D. (2007), **Gathering requirements for multilingual search of audiovisual material in cultural heritage**, In Proceedings of Workshop on User Centricity - state of the art (16th IST Mobile and Wireless Communications Summit), Budapest, Hungary, 1-5 July, 2007

# Competitor analysis (56 sites)

| Functionality | Percent | Example |
|---|---|---|
| Free text search | 91% | - |
| Browse by category | 71% | www.archinform.net |
| Advanced search | 70% | - |
| News/Calendar | 61% | www.tate.org.uk |
| Registration/login | 45% | - |
| Multilingual | 34% | www.louvre.fr |
| Geographical search / Map | 29% | http://whc.unesco.org/en/map |
| Shopping | 29% | - |
| Search within results / See "more like this" | 29% | www.fotolia.com |
| Ability to segregate multimedia results by type (if applicable) | 29% | www.archive.org |
| Timeline / Search by time | 21% | www.birth-of-tv.org |
| Change results layout (order by..) | 21% | www.artandarchitecture.co.uk |
| Hierarchical browse | 20% | http://www.staffspasttrack.org.uk/ |
| Sitemap | 20% | - |
| Controlled vocabulary | 9% | www.tate.org.uk |
| Colour/layout search | 7% | www.hermitagemuseum.org |
| Query translation | 5% | www.fotolia.com |
| Faceted browsing | 3% | http://orange.sims.berkeley.edu/[11] |

# Log file analysis

## Categorisation of top 100 most frequent queries

| Category | Site | Named Entities | Subject | Place | Time |
|---|---|---|---|---|---|
| Art | Tate Online | 63 | 36 | 2 | 1 |
| General CH | WIND | 66 | 24 | 7 | 3 |
| Literature | Cervantes | 73 | 24 | 3 | 0 |
| Photography | Alinari | 33 | 29 | 39 | 1 |
| Photography | St Andrews | 10 | 25 | 64 | 0 |

**Example Queries:** Van Gogh

Surrealism

Florence

Middle Ages

Useful in design, component testing and user task-based user evaluation

# User studies and interviews

100 interviews carried out with ‘expert’ users

Also carried out more in-depth studies

- focus groups and interviews (15 people)
- with educational users, video professionals and image professionals

Information gained about

- tasks that users perform (typical and challenging)
- multilingual and multimedia requirements
- examples of use and suggestions for improvement

Also carried out studies with ‘general’ users

# Main findings

Reliance on Internet search for everyday work

- depend largely on general-purpose search engines (although often unsatisfied with results)

Work includes

- finding material for presentations/clients, fact-checking details, background research

Multiple sources searched

- internal databases and archives
- external sites on the Web

# Search characteristics

Reinforced previous findings in CH domain

- names, places, dates, titles, subjects

"The Man Midwife"

Giotto self-portrait

People on strike

| | Text | Images | Video | Audio |
|---|---|---|---|---|
| Percentage of users Interacting with media type | 100% | 87% | 47% | 7% |

# Example scenarios

| User type | Typical task | Media and languages involved |
|---|---|---|
| CH professional | Searching for video footage on Pier Paolo Pasolini, needs to gather background information on who he was | Text, Images, Video<br><br>English, Dutch |
| CH professional | Looking for images of (non-famous) people drinking coffee –images that capture a certain emotion | Images English, Italian |
| Academic | Preparing a presentation on Don Quixote and how it has influenced the arts | Text, Images, Video, Audio (?) English only |
| Cultural tourist/ general user | Planning a visit to Turin, wants to know about museums to visit, what can see whilst there | Text, Images, Audio (podcasts) English, Italian |

# Design requirements

## Classification and aggregation of content

- enrich the associated metadata (for creators and creations)
- enable cross-document and cross-collection linking

## Enhanced multilingual support

- query translation (MT and dictionary-based translation)
- document translation (e.g. translated snippets and key terms)

## Enhanced multimedia retrieval

- still images based on fusing visual features and text
- audio content based on speech transcripts and metadata
- video content based on text and visual queries and keyframe-based video browsing

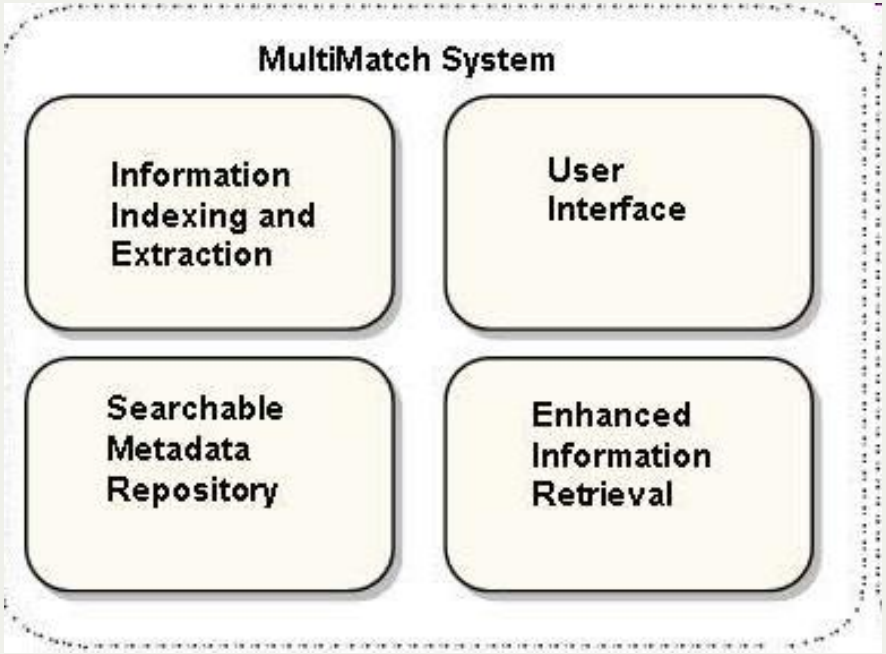
## Faceted search/browse (semantic navigation)

- facets related to creators and creations (e.g. date, place)
- presentation of creator/creation in context (e.g. timeline, map)

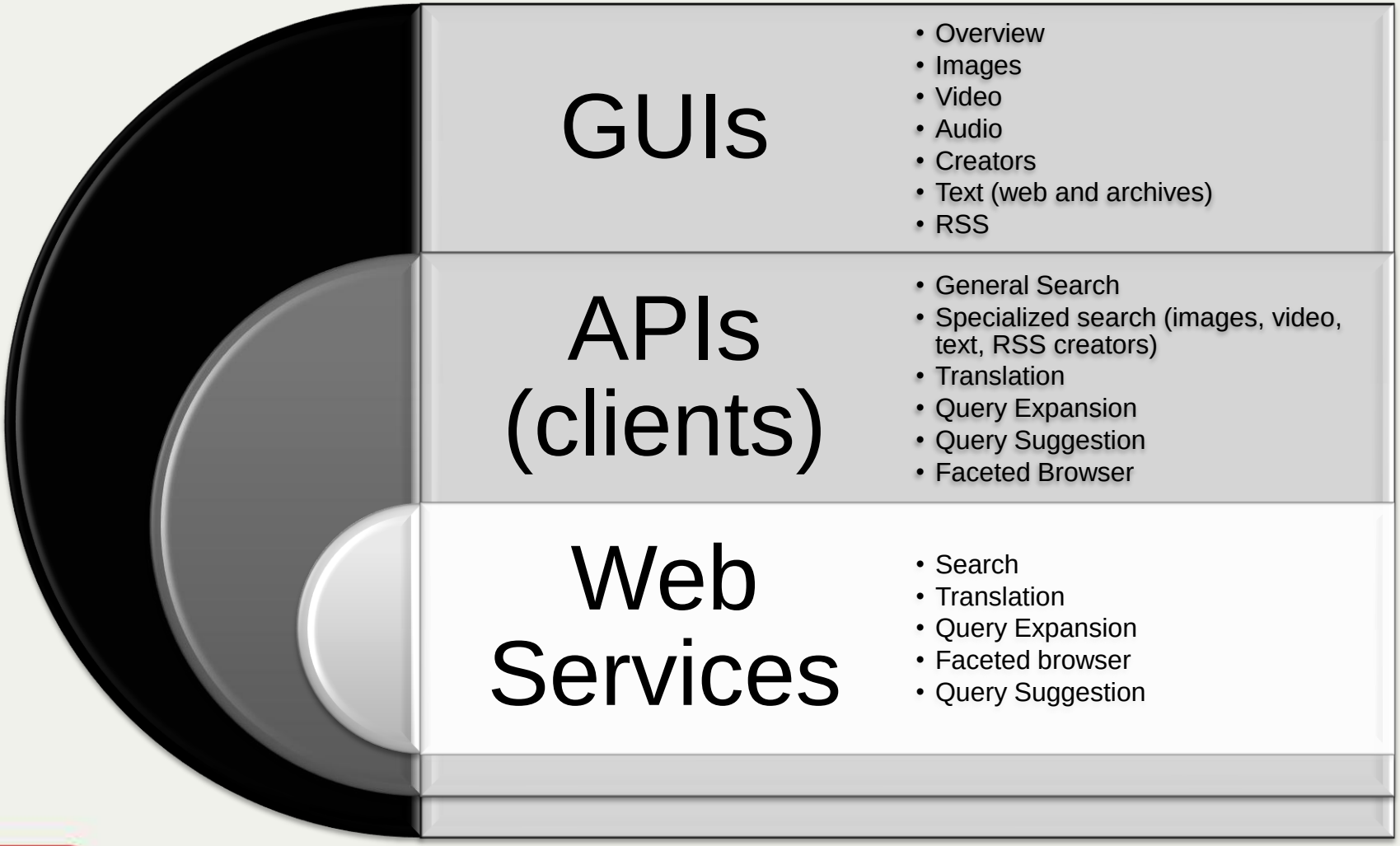
# Protoype system

Two prototype systems developed during project

- Service Orientated Architecture (SOA)
- Four independent but co-operating sub-systems



# Prototype


GUIs
• Overview
• Images
• Video
• Audio
• Creators
• Text (web and archives)
• RSS
APIs (clients)
• General Search
• Specialized search (images, video, text, RSS creators)
• Translation
• Query Expansion
• Query Suggestion
• Faceted Browser
Web Services
• Search
• Translation
• Query Expansion
• Faceted browser
• Query Suggestion

# Content indexed

Selected content used for prototype systems

- cultural heritage sites
- educational sites related to CH
- encyclopaedic sources
- IPR-protected CH material
- OAI compliant resources (e.g. TEL)
- dynamic content (RSS feeds)

Representative cross-section of CH information

- multimodal, multilingual, dynamic and static, multiple sources

# Metadata modeling and interoperability

Defined a conceptual reference framework suitable for cultural heritage content

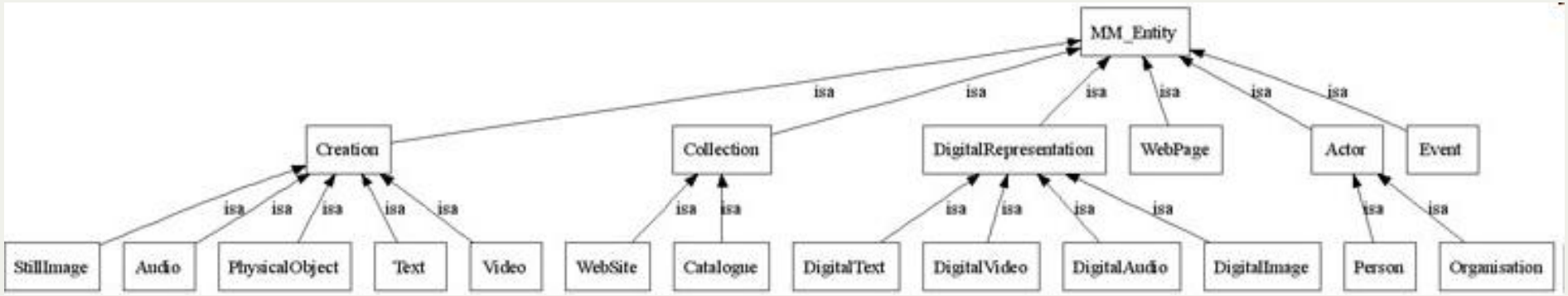
- metadata schema and data model
- thesauri for artists names and descriptions, geospatial information (Getty)
- mapping between CH providers and common data model

Simple to use (interoperability)

Suitable for automatic population

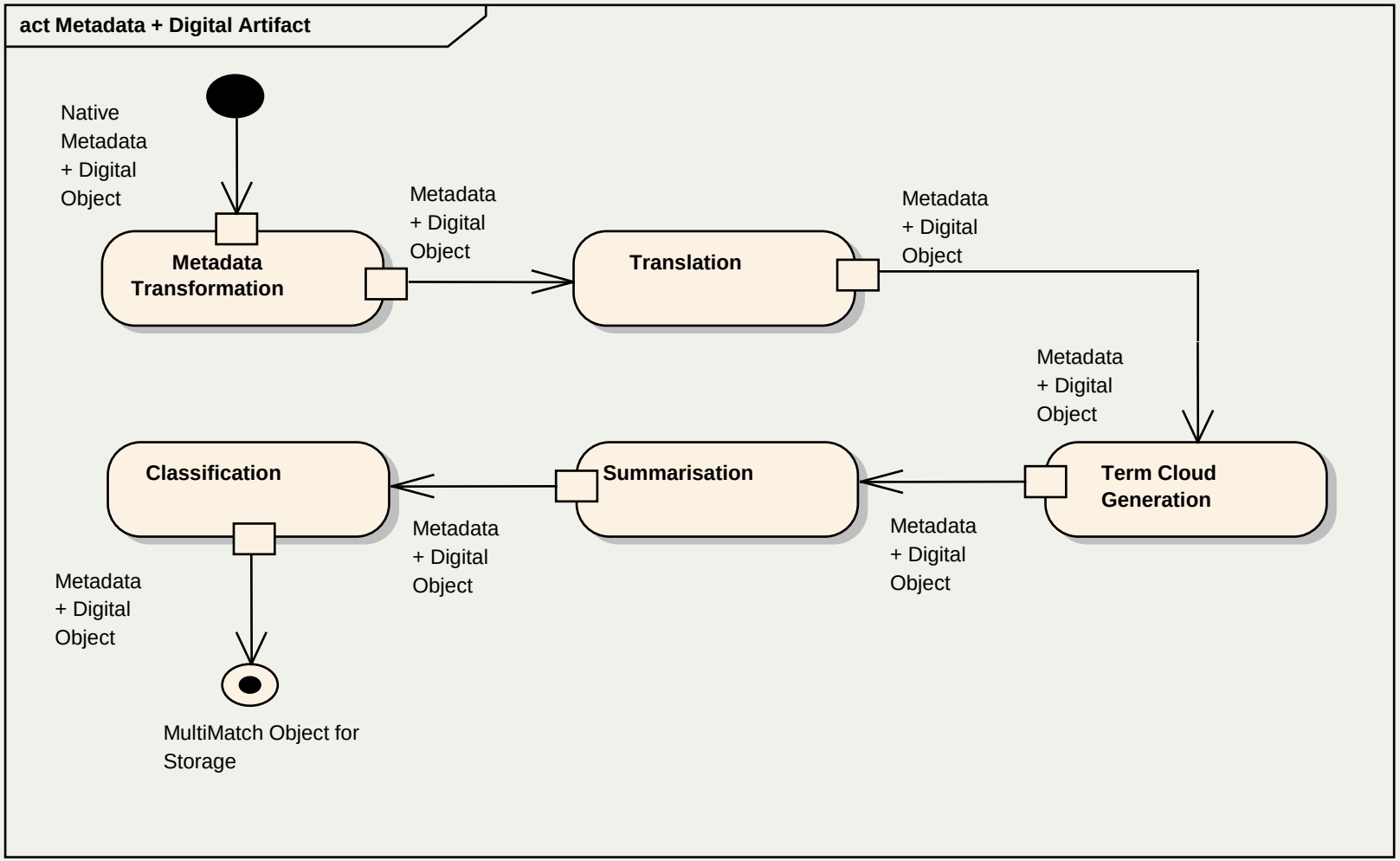
First Analysis of Metadata in the Cultural Heritage Domain , Deliverable D2.1
http://www.multimatch.org/docs/publicdels/D2%201-FINAL-2006-23-10.pdf

# Data model




Metadata Schema and Mapping Evaluation and Revision, Deliverable D2.2.2
http://www.multimatch.org/docs/publicdels/D2.2.2.pdf

# Ingesting content



# Information extraction

Topical Web crawling

- selection of content *within* specific sites (e.g. CH in Wikipedia)
- dynamic data (e.g. RSS feeds)

Automatic extraction of indexing features for all media (text, speech, images, video) and crawled data

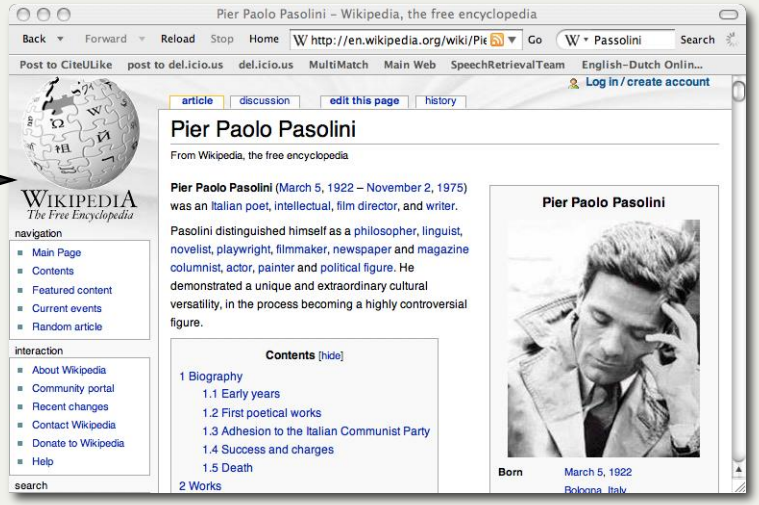
Development of algorithms for classification and information extraction

- creators, type/genre, subject, place/time, art objects/works

Automatic linking of documents

- link related documents by content (inter-doc linking)
- detect terms that should be marked as anchor tags within a text and identifying target pages the terms should be linked to (intra-doc)

# Example – B&G videos



# Multilingual support

Provide system with monolingual and multilingual search functionalities

- English, Dutch, Italian, Spanish, German and Polish

Provide effective translation strategies

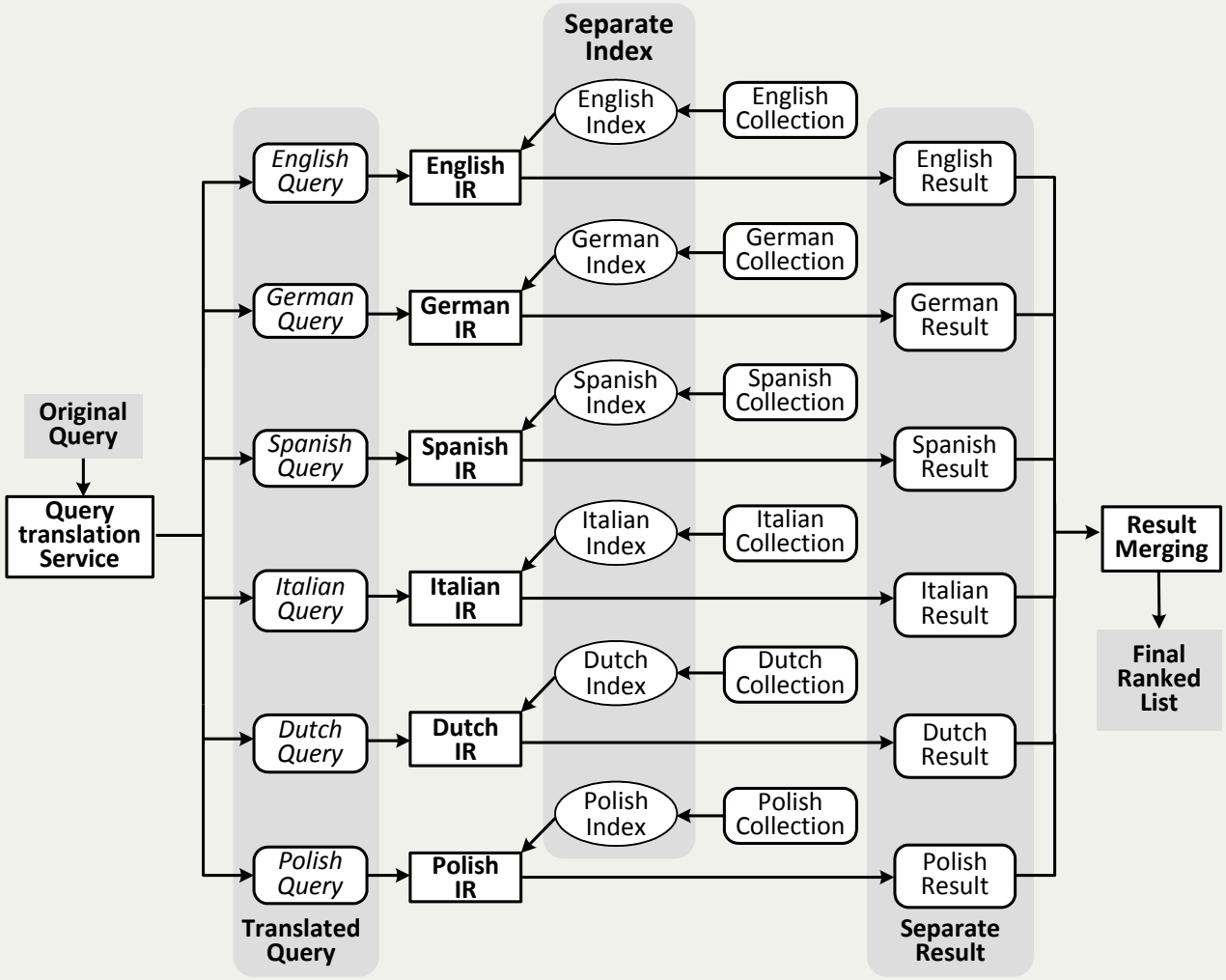
- multilingual dictionaries
- machine translation
- combined hybrid translation methods
- translation  uses domain-specific dictionaries

Provide expansion services

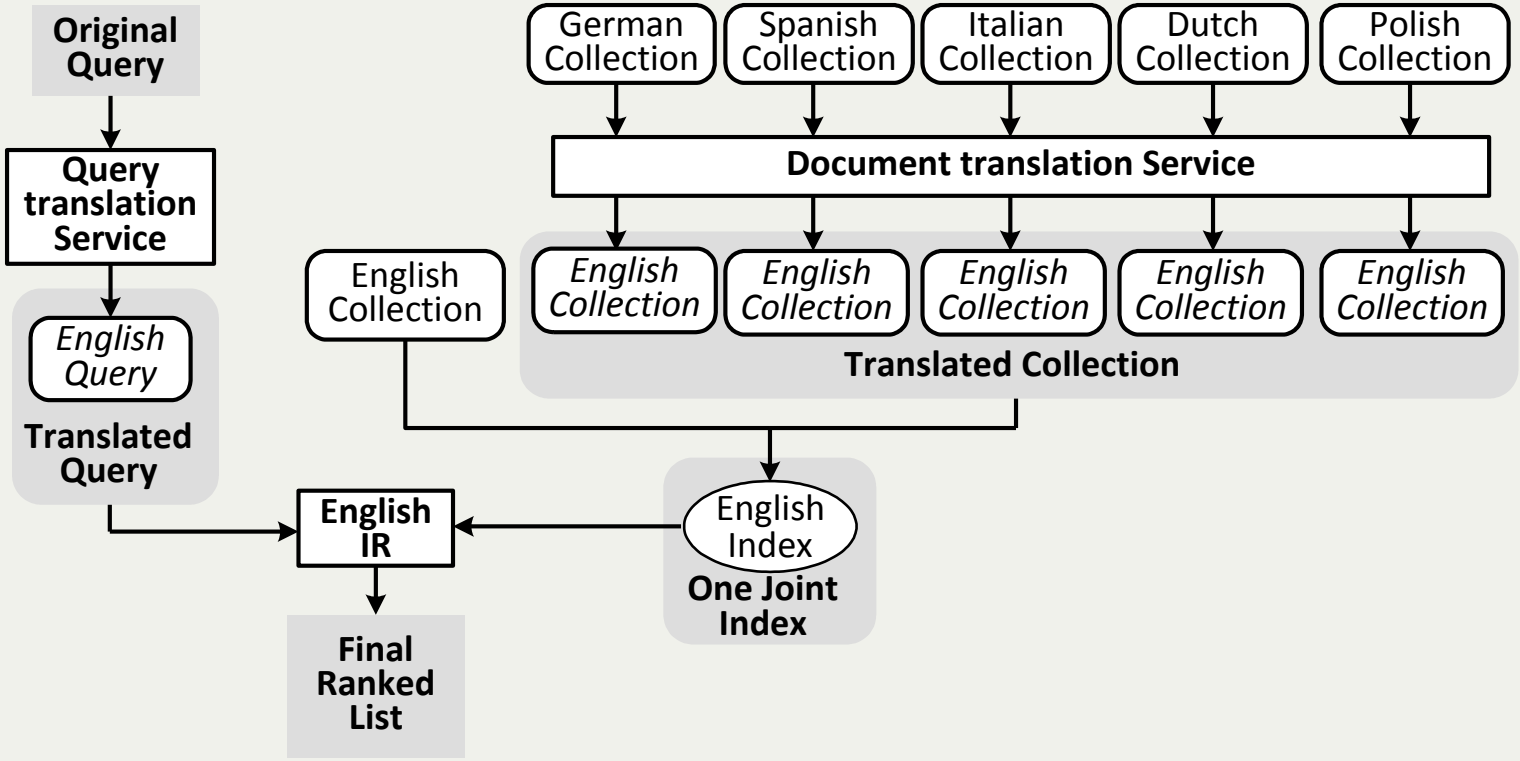
- relevance and pseudo relevance feedback

G.J.F.Jones, Y.Zhang, F.Fantino, E.Newman and F. Debole, Multilingual Search for Cultural Heritage Archives by Combining Multiple Translation Resources, In Proceedings of the ACL Workshop on Language Technology for Cultural Heritage Data (LaTeCH 2007), Prague, Czech Republic, June 2007.

# Multilingual IR – query translation



# Multilingual IR – document translation



# Searchable metadata repository

Data to manage is varied, including different formats

plain text, XML documents, colour histograms, etc.

All content in Multimatch is enriched with metadata (and unique identifier) and stored in repository

allows these documents to be optimally searched

Supported by MILOS

- Multimedia Content Management System for Digital Library Applications (http://milos.isti.cnr.it/)

  Lucene plug-in for full-text searches

  fusion plug-in for multi-modal searches

  entity disambiguator

  MPEG-7 index plug-in

# Multimedia support

Audio streams (e.g. podcasts)

- automatic speech recognition to generate transcript (searchable)
- segmented (based on theme not just energy levels)

Video streams

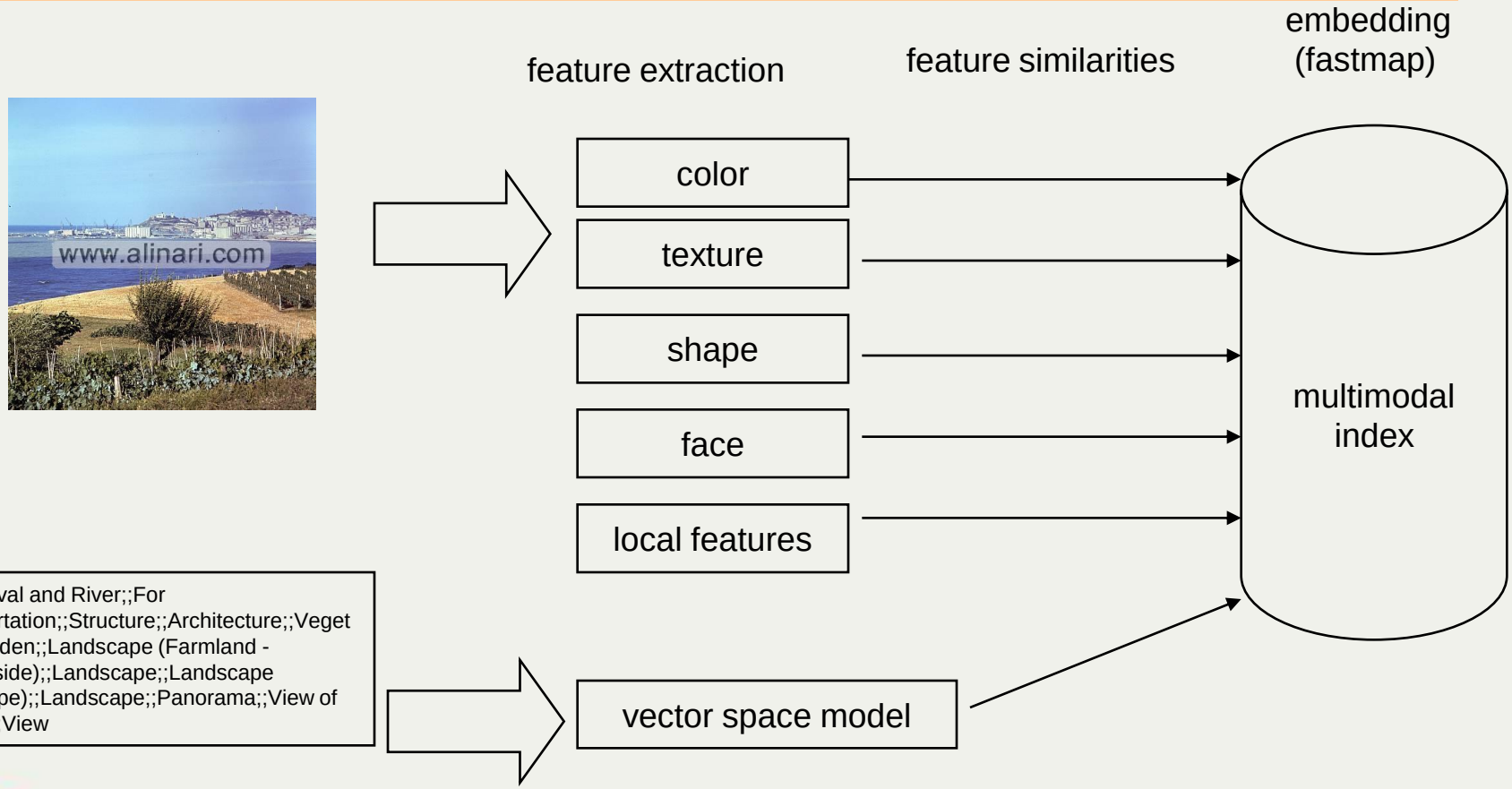
- metadata is translated and searchable
- videos are segmented (shot boundary detection)
- keyframes extracted from segments
- used Real Helix streaming video server for playback

Still images

- low-level visual features extracted and indexed
- accompanying text also indexed allowing multimodal search and browse

# Cross Modal Search Engine

Eric Bruno, Jana Kludas, and Stéphane Marchand-Maillet (2007) Combining multimodal preferences for multimedia information retrieval. *MIR 2007,* Augsburg, Germany.



# User interface (UI)

Default/overview search

- no assumptions made about user and their query
- access to general interactive features

Set of specialised search interfaces

- allow users to query specific search services
- provide access to advanced features

Search levels

- default and advanced modes

Allow users to customise interface

- e.g. specify interface language

# Architecture

Interface implemented using the GWT (UNED)

- common protocol developed (based on URL messaging) to communicate between GUIs
- provided a library of core components (widgets)
- templates provided for writing new applications

Additional work involved in creating the interface

- creating APIs (client services) which interact with MultiMatch web services and the GUI
- dynamic parsing of metadata structures to extract required information for individual interfaces

Interfaces developed as standalone applications (GUIs)

# Overview UI

Common entry point for (mainly) general users

- starting point for specialised interfaces
- results aggregated across sources and media types

Users can add/remove results windows

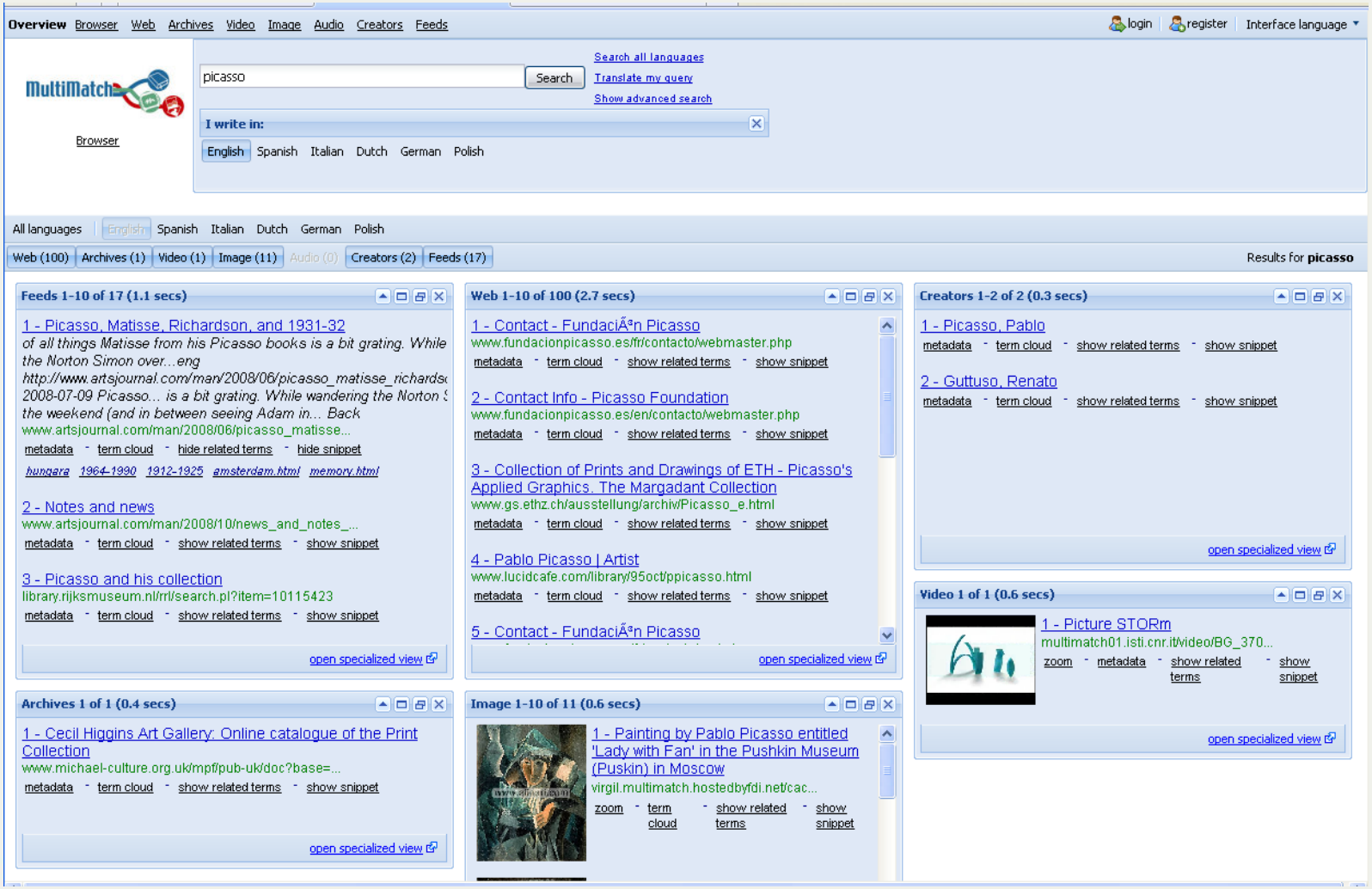
- Web, Archives, Video, Image, Audio, Creators, RSS
- use of “infinite” scrolling bar
- links to metadata, term clouds, snippets and related terms

Users can filter language of results

New functionality for cross-language support

- use of combined MT and dictionary service
- ability to select/de-select alternative translations
- search all languages (English interlingua)
- localisation (Dutch, Spanish and German)

# Example Overview UI



# Image UI

Simple functionality to access visual material

- assume that users begin with verbalised query

Results include

- image (thumbnail), title and URN

Users can also view

- metadata, term cloud, snippet, related terms, similar images

Find similar images (“more like this”) function

- images with similar visual content
- images with similar visual content and semantic content matching the query (uses fusion service)

2 - Painting by Pablo Picasso of the Italian Harlequin. The painting by the famous artist is in the Pompidou Museum in Paris

virgil.multimatch.hostedbyfdi.net/cached/image_jpeg/image_jpegdea554667ff40d7... -

metadata - zoom - term cloud - more like this image - more like this image and query - show related terms - show snippet

MultiMatch

All languages | English Spanish Italian Dutch German Polish

1 - Painting by Pablo Picasso of the Italian Harlequin. The painting by the famous artist is in the Pompidou Museum in Paris

virgil.multimatch.hostedbyfdi.net/cached/image_jpeg/image_jpegdea554667ff40d7... -

metadata - zoom - term cloud - more like this image - more like this image and query - show related terms - show snippet

2 - A hippopotamus threateningly showing its tusks

virgil.multimatch.hostedbyfdi.net/cached/image_jpeg/image_jpeg4943f814744c295... -

metadata - zoom - term cloud - more like this image - more like this image and query - show related terms - show snippet

3 - Rumanian peasants and gypsies

virgil.multimatch.hostedbyfdi.net/cached/image_jpeg/image_jpeg561af608b3c5fa6... -

metadata - zoom - term cloud - more like this image - more like this image and query - show related terms - show snippet

4 - fascismo

virgil.multimatch.hostedbyfdi.net/cached/image_jpeg/image_jpeg83e12d3bfd6f373... -

metadata - zoom - term cloud - more like this image - more like this image and query - show related terms - show snippet

5 - Detail of the fresco depicting The Last Judgement, by Giotto, inside the Scrovegni Chapel, in Padua. The detail shows two demons seizing a partially clothed man

virgil.multimatch.hostedbyfdi.net/cached/image_jpeg/image_jpeg2593cef918eac62... -

metadata - zoom - term cloud - more like this image - more like this image and query - show related terms - show snippet

6 - The Archangel Raphael and Tobias, detail, attributed to Giovanni di Piamonte, located in the Museum of the Basilica of Santa Maria delle Grazie in San Giovanni Valdarno

virgil.multimatch.hostedbyfdi.net/cached/image_jpeg/image_jpegca905a5e6d4055f... -

metadata - zoom - term cloud - more like this image - more like this image and query - show related terms - show snippet

7 - A plum-tree branch with fruits

virgil.multimatch.hostedbyfdi.net/cached/image_jpeg/image_jpeged3666d94760828... -

metadata - zoom - term cloud - more like this image - more like this image and query - show related terms - show snippet

All languages | English Spanish Italian Dutch German Polish

Related terms: *RELATED:URN:MULTIMATCH:CACHED:IMAGE_JPEG:DEA554667FF40D79A7EFB42A91C4EF87* *PICASSO*

1 - Painting by Pablo Picasso of the Italian Harlequin. The painting by the famous artist is in the Pompidou Museum in Paris

virgil.multimatch.hostedbyfdi.net/cached/image_jpeg/image_jpegdea554667ff40d7... -

metadata - zoom - term cloud - more like this image - more like this image and query - show related terms - show snippet

2 - 'House in Rue de Boir', painting by Pablo Picasso in the Pushkin Museum in Moscow. The picture shows a house surrounded by a low wall. In the foreground a tree is lifting its bare branches upwards

virgil.multimatch.hostedbyfdi.net/cached/image_jpeg/image_jpeg059959b589b83c2... -

metadata - zoom - term cloud - more like this image - more like this image and query - show related terms - show snippet

3 - Painting by Pablo Picasso entitled 'Lady with Fan' in the Pushkin Museum (Puskin) in Moscow

virgil.multimatch.hostedbyfdi.net/cached/image_jpeg/image_jpeg881a24a233e9023... -

metadata - zoom - term cloud - more like this image - more like this image and query - show related terms - show snippet

4 - Painting by Pablo Picasso entitled 'Harlequin and companion', in the Pushkin Museum (Puskin) in Moscow

virgil.multimatch.hostedbyfdi.net/cached/image_jpeg/image_jpeg142ca144904d661... -

metadata - zoom - term cloud - more like this image - more like this image and query - show related terms - show snippet

5 - Paiting by Pablo Picasso entitled 'Girl on the Ball', in the Pushkin Museum in Moscow. A man with powerful limbs is seated before a young acrobat shown balancing on a ball. In the background a woman with an infant in her arms and a child at her side can b

virgil.multimatch.hostedbyfdi.net/cached/image_jpeg/image_jpegfe3bd7008a641f5... -

metadata - zoom - term cloud - more like this image - more like this image and query - show related terms - show snippet

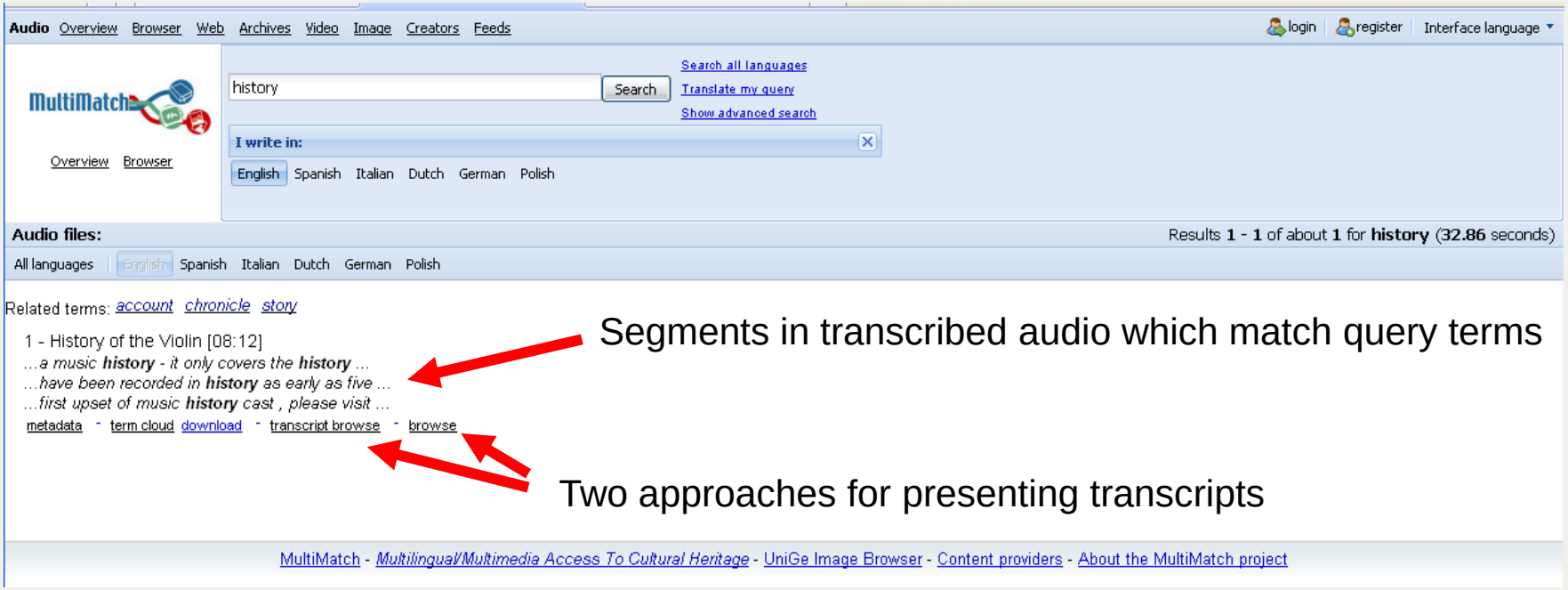


Information Society Technologies

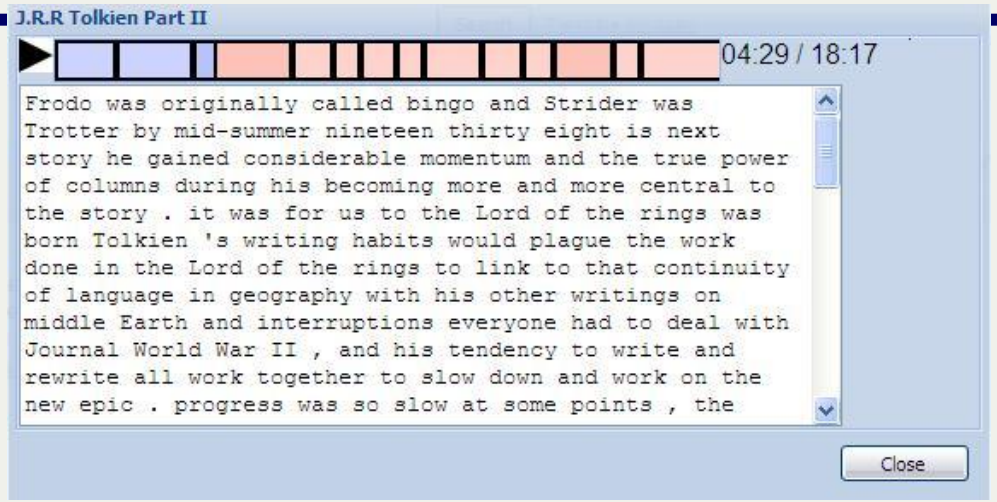
# Audio UI

## Generic playback for any web browser

- JavaScript-based wrapper provided playback controls independent of audio file type



# Transcript presentation

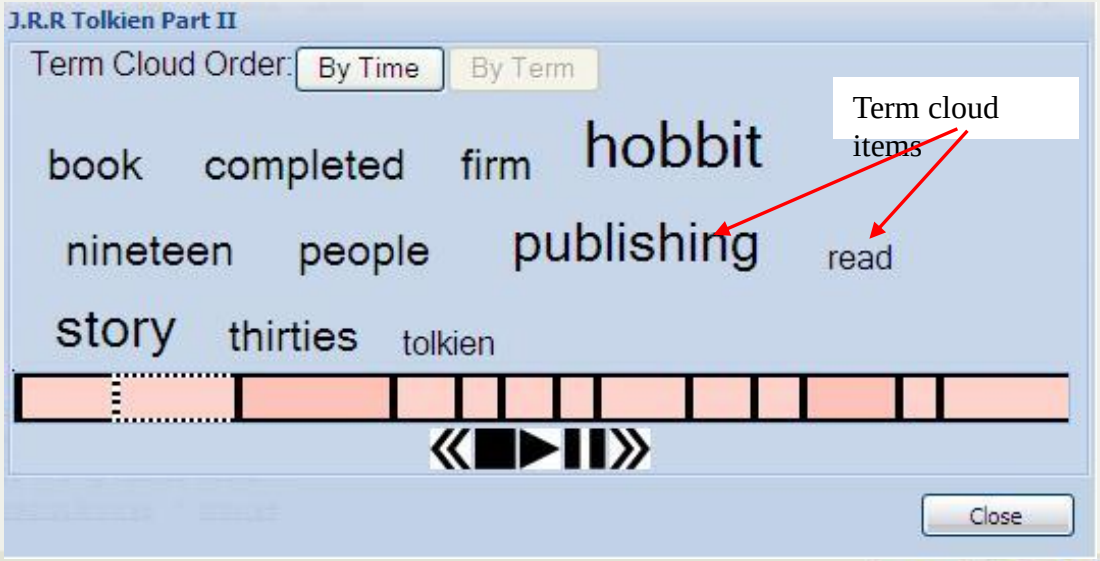



**Transcript browse**

- Clickable audio segments
- Transcript viewable

**Term cloud browse**

- Clickable audio segments
- Term cloud items can be arranged alphabetically or by time



# Results of audio evaluation

General users (12) asked to perform 4 search tasks to evaluate presentation techniques

Main findings

- slight preference for transcript browse (terms sometimes deemed as not relevant in term clouds)
- no preference given to how terms ordered in term cloud browse (alphabetically or temporally)
- many users interacted directly with the progress bar

User's comments

- could only jump to first occurrence of term in term cloud browser
- ideal speech data presentation technique would be combination of verbatim transcript display together with query-sensitive term clouds

# Video UI

Similar look-and-feel to audio UI

- view metadata, term clouds, snippets and related terms

Initial search queries video metadata

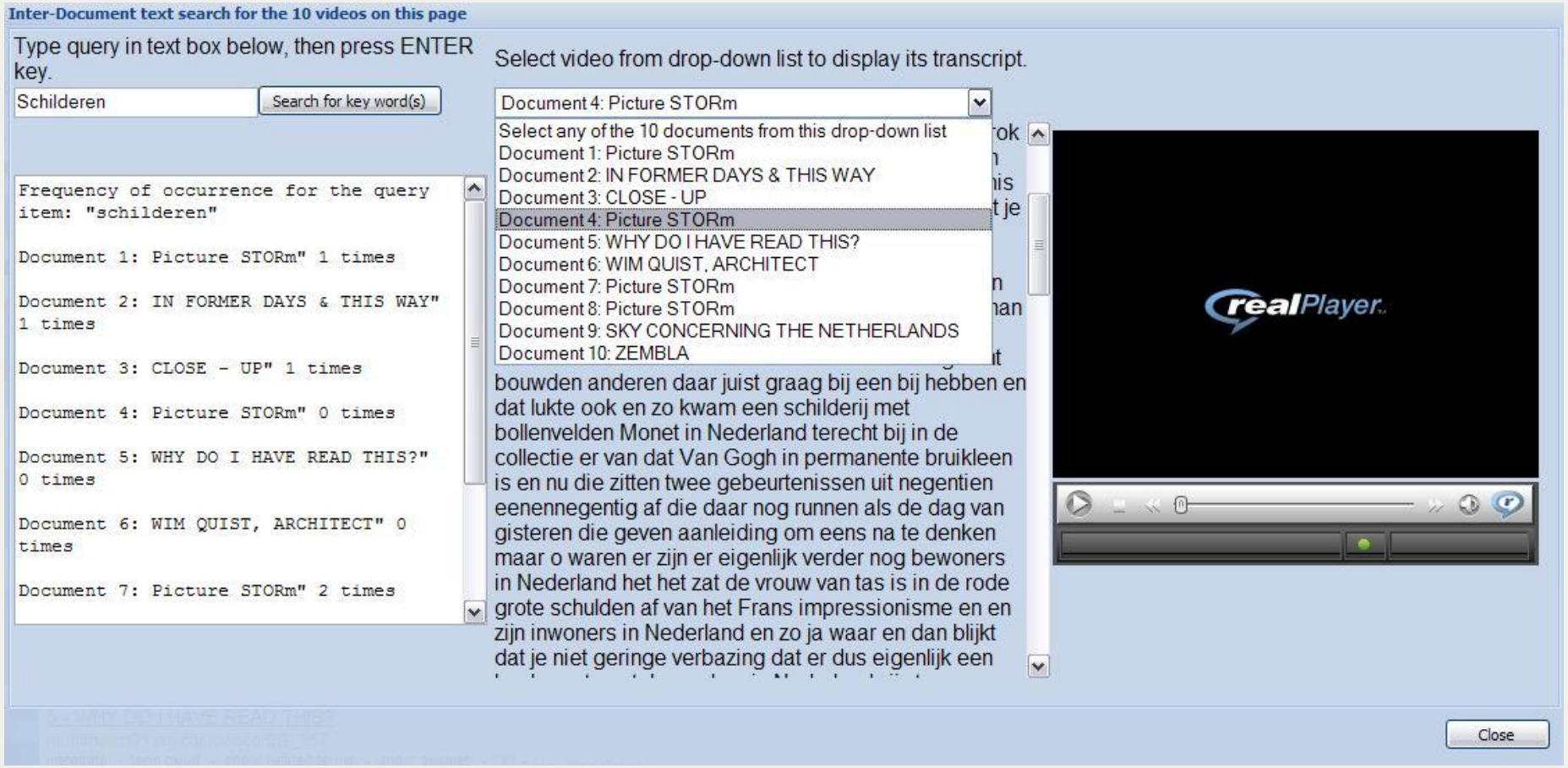
- also provided a search within results (inter-video search) function based on transcripts (requested by video experts)

For selected video users can

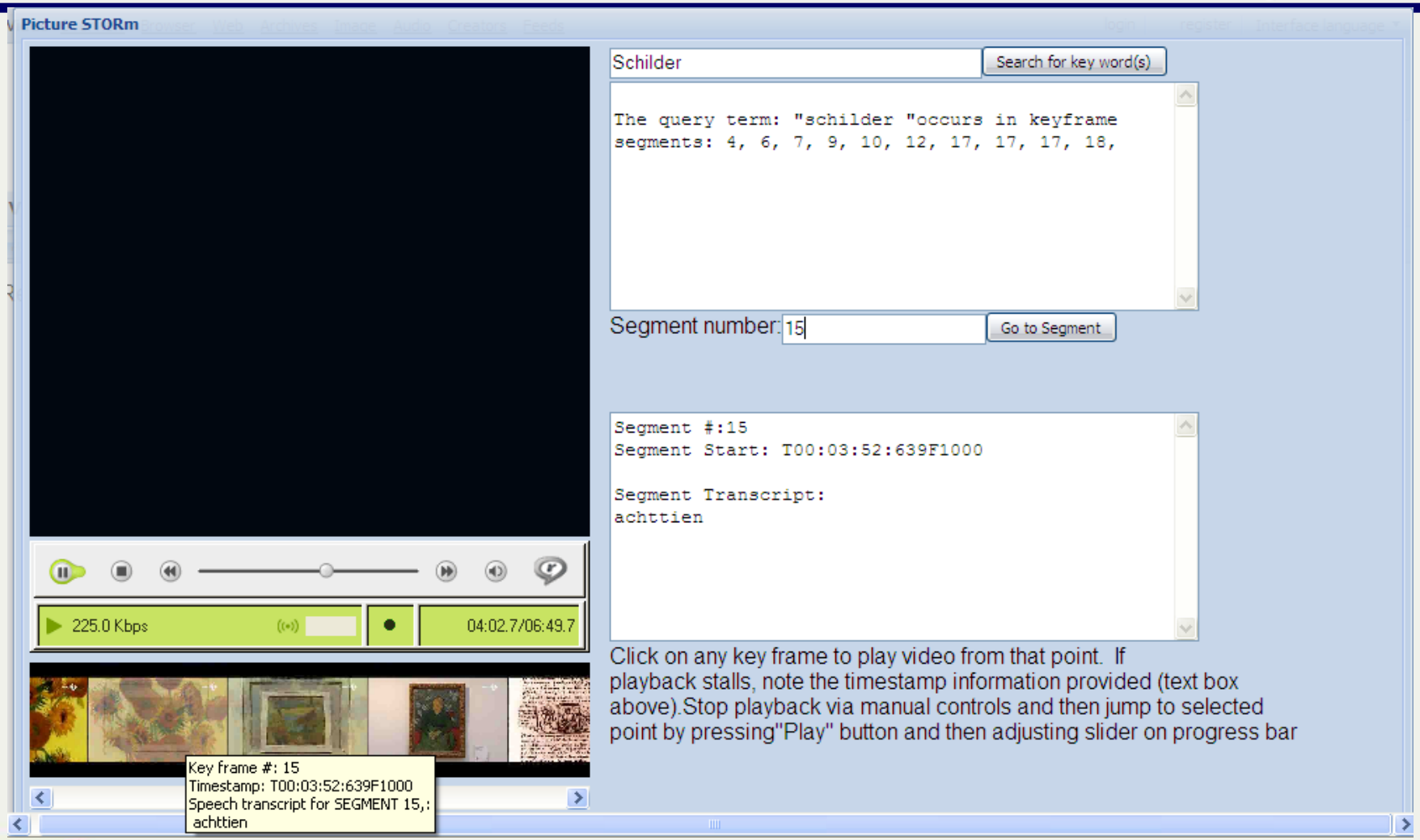
- playback video from various starting points
- view keyframes and associated transcript text
- search for (and playback) specific keyframe segments containing keywords

Carmichael, J., Larson, M., Marlow, J., Newman, E., Clough, P., Oomen, O., and Sav, S. (2008), Multimodal Indexing of Electronic Audio-visual Documents: A Case Study for Cultural Heritage Data, to appear in the Proceedings of the Sixth International Workshop on Content-Based Multimedia Indexing (CBMI2008), London, UK, 18-20th June.

# Inter-video search



# Video playback and transcript search



# Results of Video Evaluation

User study at B&G in May 2008 (10 users)

- examine usability and efficiency of video UI with professional users
- reported in D7.3 (Evaluation of second prototype)

Overall positive quantitative results and qualitative feedback

- task of selecting relevant clips from video document aided by shot-aligned speech and keyframes

Highlighted problems with ASR accuracy and multilingual speech

# Creators UI

Utilisation of MultiMatch metadata schema and annotation

- provides biographical information and cross-referencing

Provides users with access to biographical information related to particular artist

- birth/death places/dates, nationality, alternative names, description
- query suggestions (names of artists)
- list of creations by selected artist

Link to page for selected artist displaying

- related creations (images and videos)
- related web pages
- “More like this” for images (derived from image UI)

1 - Picasso, Pablo
(1881--1973)
**Birth Place:** Málaga (Málaga province, Andalusia, Spain) ()
**Death Place:** Mougins (Alpes-Maritimes, Provence-Alpes-Côte d'Azur, France) ()
**Nationality:** Spanish;
**Brief Description:** Creator decorative artist ceramicist painter artist writer sculptor draftsman printmaker
**Alternative names:** Picasso, Pablo;Ruiz Picasso, Pablo;Picasso, Pablo Ruiz;Ruiz, Pablo;Ruiz y Picasso, Pablo;Ruys, Pablo;Picasso, Pablo Diego José Francisco de Paula Juan Nepomuceno Crispín Crispiniano de la Santissima Trinidad Ruiz Blasco;Ruys Picasso, Pablo;Pablo Picasso;Picasso, Pablo Ruiz y;
**Source:** Alinari;
**Related Creations:** 8
**Related Webpages**
urn:multimatch:nor
show description - 6

New MultiMatch object which is indexed

Image Overview Browser Web Archives Video Audio Creators RSS
login register Interface language
picasso Search
MultiMatch
Overview Browser

**Creators**

Results **1** - **9** of about **1** for **urn:multimatch:nonCached:text_xml:455cf1bf48a9984a1372532e1e7f8786** (**1.8** seconds)

1 - Picasso, Pablo
(1881--1973)
**Birth Place:** Málaga (Málaga province, Andalusia, Spain) ()
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**Source:** Alinari;
**Related Creations:** 8
**Related Webpages:** 10
urn:multimatch:nonCached:text_xml:455cf1bf48a9984a1372532e1e7f8786 - 0 x 0
show description

Related Webpages
http://www.artchive.com/artchive/P/picasso.html
http://www.abcgallery.com/P/picasso/picasso.html
http://www.abcgallery.com/P/picasso/picassobio.html
http://www.lucidcafe.com/library/95oct/ppicasso.html
http://www.artcyclopedia.com/artists/picasso_pablo.html
http://www.metmuseum.org/toah/hd/pica/hd_pica.htm
http://www.mcs.csuhayward.edu/~malek/Artfolder/Pablo.html
http://www.artelino.com/articles/pablo_picasso.asp
http://www.quotationspage.com/quotes/Pablo_Picasso/
http://www.time.com/time/time100/artists/profile/picasso.html

Paiting by Pablo Picasso entitled 'Girl on the Ball', in the Pushkin Museum in Moscow. A man with powerful limbs is seated before a young acrobat shown balancing on a ball. In the background a woman with an infant in her arms and a child at her side can b
**Brief Description:** Paiting by Pablo Picasso entitled 'Girl on the Ball', in the Pushkin Museum in Moscow. A man with powerful limbs is seated before a young acrobat shown balancing on a ball. In the background a woman with an infant in her arms and a child at her side can b Dieses Gemälde von Pablo Picasso mit dem Titel "Mädchen auf dem Ball" ist im Puschkin-Museum in Moskau aufbewahrt. Ein muskulöser Mann sitzt vor einer jungen Akrobatin, die auf einem Ball balanciert. Im Hintergrund steht eine Frauenfigur mit einem Neugeborenen im Arm und einem kleinen Kind an der Seite. In einiger Entfernung grast ein Pferd Ragazza sulla Palla - Museo Pushkin, Mosca Paiting przez Pablo Picasso zatytulowany 'Dziewczyna na Pilce', w Puskin Muzeum w Moskwie. Czlowiek z poteznymi konczynami siedzi przed mlodym akrobata pokazane bilansowanie na pilce. W tle kobieta z niemowleciem w jej broni i dziecku przy jej stronie moze byc Pintura de Pablo Picasso titulada "Muchacha sobre el balón", conservada en el Museo Puschkin en Moscú. Un hombre de músculos potentes se encuentra sentado delante de una joven acróbata retratada en equilibrio encima de un balón. En el fondo se vislumbra u
**Source:** Alinari;
**Subject:** Styles and Movements before 1945 International Art of the XX Century
Painting Work Painting
Painting Movable Modern Work
urn:multimatch:nonCached:text_xml:4cede8cc37261158576a50504657b7f9 - 30 x 28
show description - zoom - more like this image - more like this image and query

Painting by Pablo Picasso entitled 'The Encounter', in the Pushkin Museum in Moscow. At the center of the picture a man and a woman are passionately embracing and kissing. Behind them a bed and a chair
**Brief Description:** Painting by Pablo Picasso entitled 'The Encounter', in the Pushkin Museum in Moscow. At the center of the picture a man and a woman are passionately embracing and kissing. Behind them a bed and a chair Das Gemälde von Pablo Picasso mit dem Titel "Das Rendevous" ist im Puschkin-Museum in Moskau aufbewahrt. In der Bildmitte sind ein Mann und eine Frau in einer leidenschaftlichen Umarmung dargestellt, hinter ihnen ein Bett und ein Stuhl L'Incontro - Museo Pushkin, Mosca Obraz Pablo Picasso zatytulowany 'Spotkanie', w Puskin Muzeum w Moskwie. Przy centrum obrazu mezczyzna i kobieta goraco obejmuja i caluja. Za nimi lózko i krzeslo Pintura de Pablo Picasso titulada "El encuentro", conservada en el Museo Puschkin de Moscú. En el centro de la imagen un hombre y una mujer se abrazan y se besan con pasión. Detrás de ellos una cama y una silla
**Source:** Alinari;

# Evaluation

Internal testing carried out during development

- held a number of “evaluation days”

Some components evaluated individually

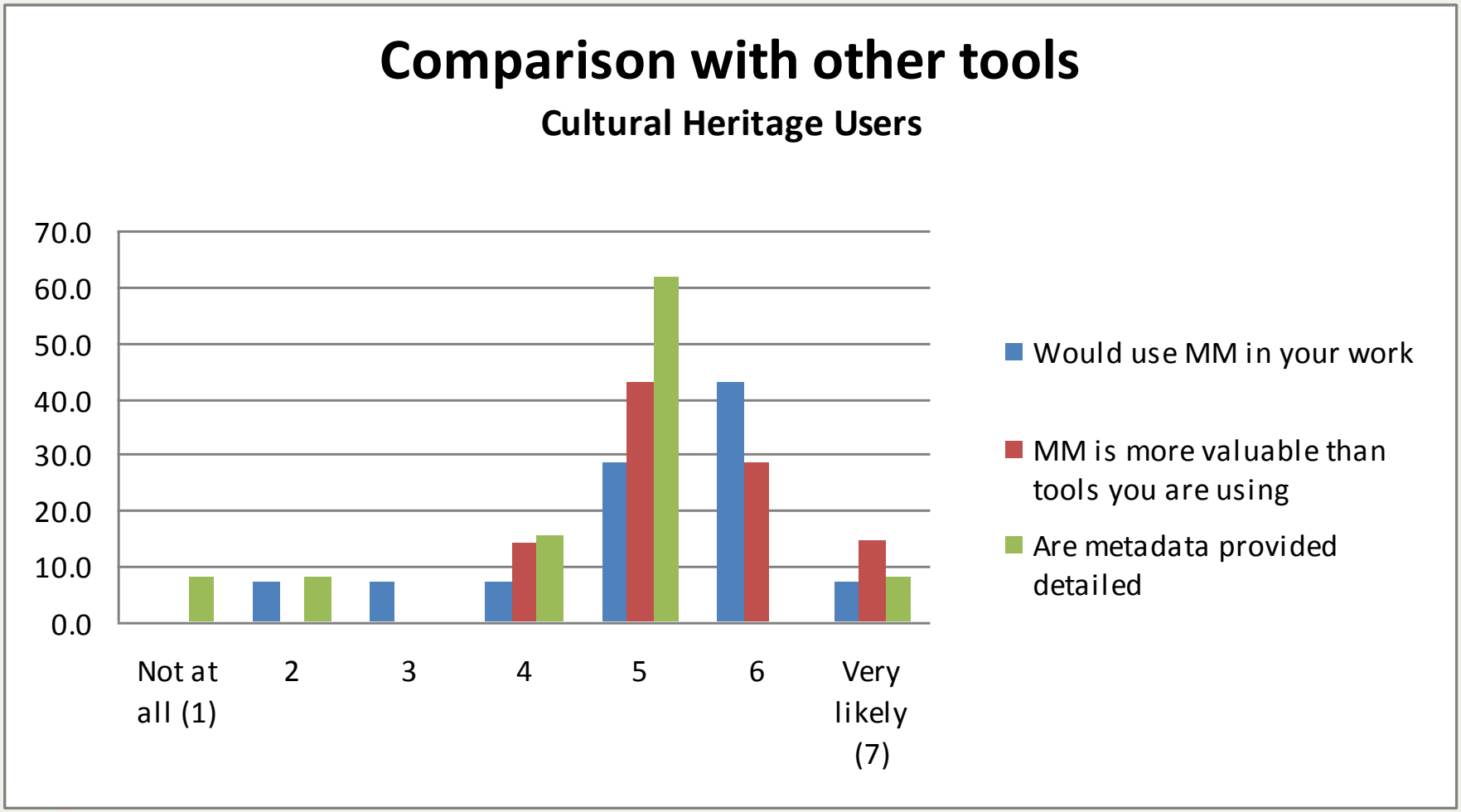
- audio UI and video UI
- faceted browsing and focused browsing

Overall prototype tested in user evaluation and field trials

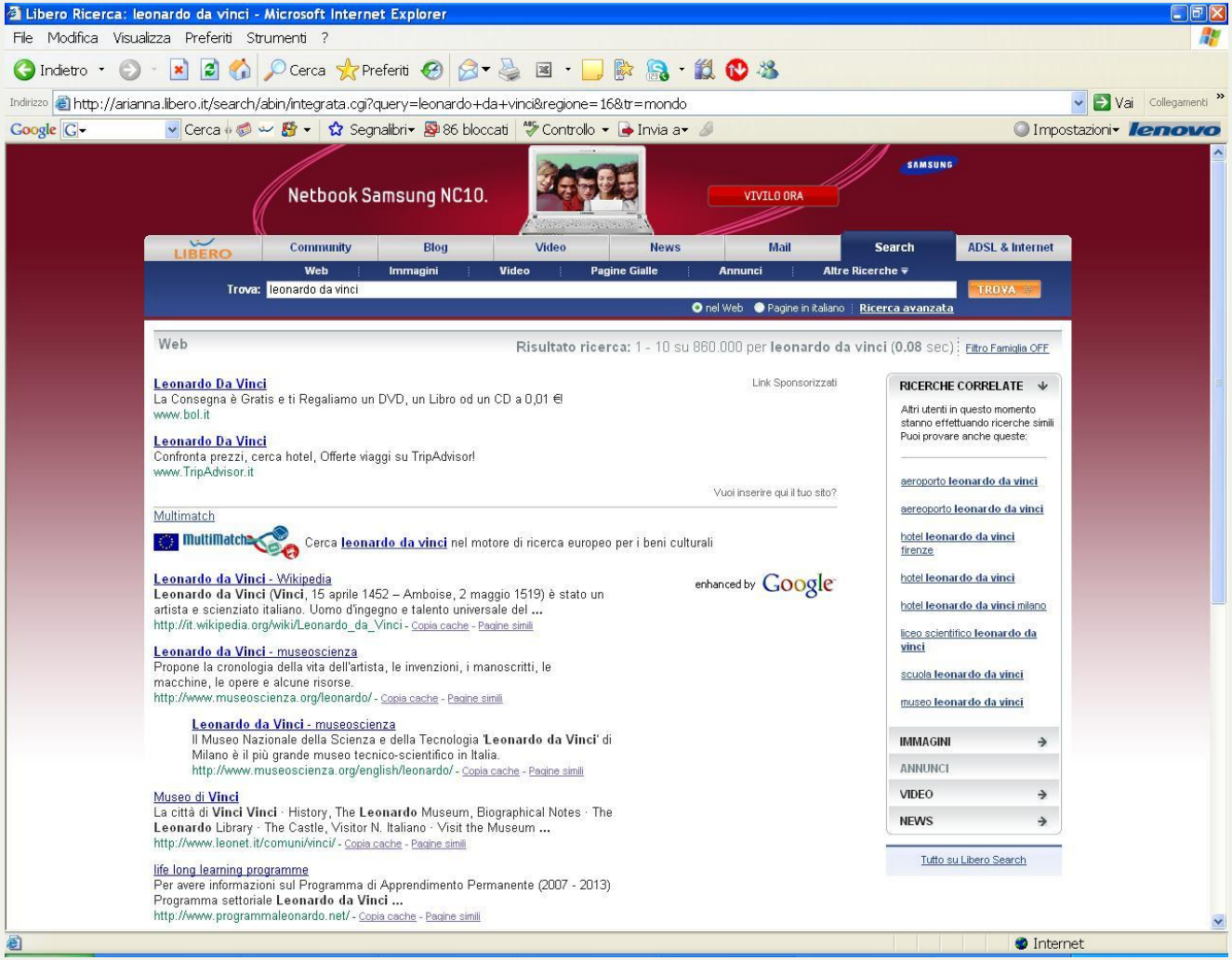
- task-based evaluation with 55 users (3 user groups)
- low satisfaction with video interface
  high satisfaction for multilingual functionalities

Further user evaluations are planned

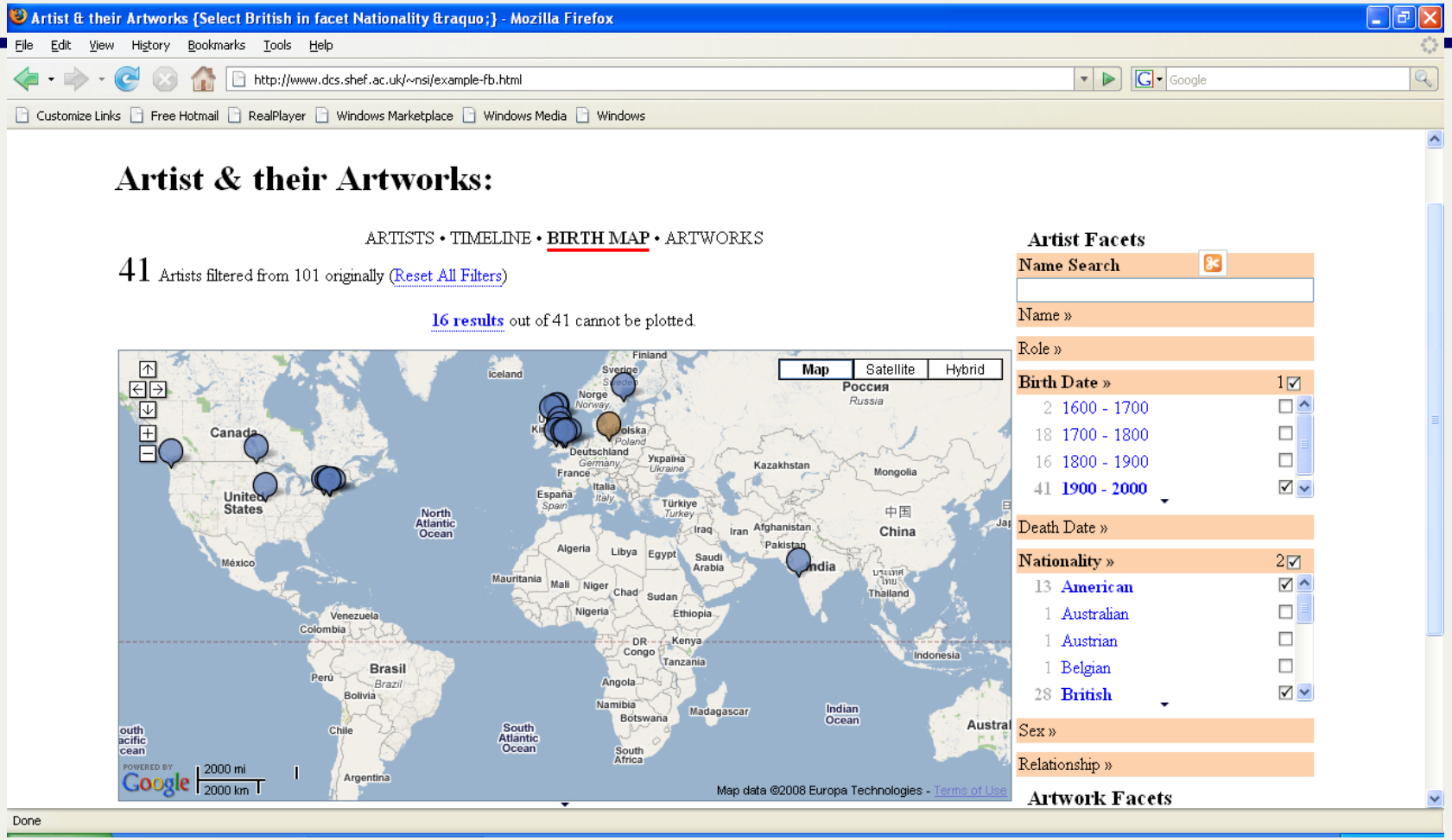
# User evaluation



# Field trials



# Example research




Clough, P., Marlow, J. and Ireson, N. (2008) Enabling Semantic Access to Cultural Heritage: A Case Study of Tate Online, Larson, M., K. Fernie, J. Oomen and J. Cigarran (eds.) Proceedings of the ECDL 2008 Workshop on Information Access to Cultural Heritage, Aarhus, Denmark, September 18, 2008. ISBN 978-90-813489-1-1

# Summary

Specialised search engine focused on cultural heritage domain

- higher quality (and authoritativeness) of results compared to general Web search engine
- include content from cultural heritage institutions

Reduces time and effort spent searching

- users don't have to perform same search on multiple sites (i.e. like metasearch)

Ability to broaden search

- search across languages, sources and media types

# You want to find out more ….


- **Marlow, J., Clough, P., Ireson, N., Cigarrán Recuero, J., Artiles, J. and Debole, F. (2008), The MultiMatch Project: Multilingual/Multimedia Access to Cultural Heritage on the Web, In Museums on the Web Conference (MW2008): Proceedings, J. Trant and D. Bearman (eds). Toronto: Archives & Museum Informatics. 2008.**
  **http://www.archimuse.com/mw2008/papers/marlow/marlow.html**

  **Clough, P., Marlow, J., Carmichael, J., Cigarran Recuero, J.M., Artiles, Gareth Jones, Stéphane Marchand-Maillet, Neil Ireson (2008) Interface for Second Prototype, Deliverable number: D6.2.2, Multilingual/Multimedia Access To Cultural Heritage (MultiMatch) project.**
  **http://ir.shef.ac.uk/cloughie/papers/D6.2.2%20_Final.pdf**

- Marlow, J., Clough, P., and Dance, K. (2007), Multilingual needs of cultural heritage website visitors: A case study of Tate Online, In International Cultural Heritage Informatics Meeting (ICHIM07): Proceedings, J. Trant and D. Bearman (eds). Toronto: Archives & Museum Informatics. 2007. Published September 30, 2007 at http://www.archimuse.com/ichim07/papers/marlow/marlow.html

- Clough, P., Marlow, J. and Ireson, N. (2008) Enabling Semantic Access to Cultural Heritage: A Case Study of Tate Online, Larson, M., K. Fernie, J. Oomen and J. Cigarran (eds.) Proceedings of the ECDL 2008 Workshop on Information Access to Cultural Heritage, Aarhus, Denmark, September 18, 2008. ISBN 978-90-813489-1-1

- Minelli, S. H., Marlow, J., Clough, P., Cigarran Recuero, J.M., Gonzalo, J., Oomen, J. and Loschiavo, D. (2007), Gathering requirements for multilingual search of audiovisual material in cultural heritage, In Proceedings of Workshop on User Centricity - state of the art (16th IST Mobile and Wireless Communications Summit), Budapest, Hungary, 1-5 July, 2007