Design for Intelligent Access to Cultural Heritage Information

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Overview - VRR
(1) I-Mass & the Virtual Reference Room
(2) Metadata
(3) Knowledge
(4) Agent technology
(5) Design
(6) Prototype II
(7) Evaluation

I-Mass project
Information management and interoperability of content for distributed systems of high-volume data repositories through multi-agent systems – in cultural history
A cognitive system/librarian for virtual museums:
- Digital libraries and museums in Limburg and Italy
- Virtual Reference Room – information contextualisation
- Agent Technology – interoperability & adaptivity
- Metadata

A reference room

Overview - metadata
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Metadata
IFLA: Metadata is data about data. The term refers to any data used to aid the identification, description and location of networked electronic resources.
- A set of text fields or containers
- Definitions of the contents of fields (semantics)
- Rules on content and formatting of fields (syntax)
- Lists of names and words (authority files)
### I-Mass user access

**User profile**
- Reference works: classifications, dictionaries and encyclopedias
- Metadata procedures, cataloguing rules and authority lists
- Catalogues and databases
- Publications, primary and secondary sources

### Overview - knowledge

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### The knowledge landscape

- **Levels**
  - Classifications
  - Reconstructions
- **Content**
  - Interactions / Individuals
  - Processes / Societies
- **User’s trajectory**
  - Local
  - International
- **Scope**
  - Local
  - International

### Knowledge levels (Veltman)

1. names / terms: classification systems
2. definitions: dictionaries
3. explanations: encyclopedias
4. titles: catalogues / bibliographies
5. partial contents: abstracts / indexes
6. full contents: books / paintings etc
7. internal analysis: object studies
8. external analysis: object comparisons
9. restorations
10. reconstructions

### Knowledge level examples

- **What is “Chiaroscuro” and how is it used?** - level 1
  (Art and Architecture Thesaurus)
- **What is the definition of Clairobscure?** - level 2
  (Oxford English Dictionary, Crusca, Baldinucci)
- **Explain what it is** - level 3
  (Encyclopaedia Britannica)
- **What did Leonardo write about it?** - level 4
  (Index of the Royal Library)
- **Give examples of its use in paintings** - level 6
  (Collection of the Louvre)

### Overview - agents

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Multi-agent system

- Hide or otherwise to manage the differences between metadata standards
  metadata mapping and switching information contextualisation
- Provide information, adapted to the cultural, cognitive and usage background of the user
  dynamic user models and user profiles
  user preferences, purposes, etc.

The conceptual framework

CIDOC-CRM
- As a means for information integration and mediation of heterogeneous data sources
- As a means for the user to express queries spanning multiple data sources
- To define the content of the Virtual Reference Room

Overview - design

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Design approach

Iterative scenario-based user-centred design

Observations
Requirement studies
Scenario analysis
Activity analysis
Mock-up development
Prototype evaluation
Re-design

Adaptivity and adaptation

- User preferences
  presentation and navigation preferences
- User stereotypes
  researchers and professionals - add material
  school and university students - use material
  il turistico - get informed
- Dynamic user models
  overall level of expertise and interests
  local level of expertise and interests

User interface design

- User requirements analysis
- Design push - University of Siena
  Activity analysis, user observation, scenario and prototype development
  -> Designing the unknown, dynamic aspects
- Design pull - Maastricht University
  content-provider interviews, ui mockups
  -> Quick and dirty, shows what it is all about
**User Requirements**

The user should be aware of the criteria used by the system to classify results.

The user should be aware of who is providing the listed information.

The system should provide the user with the history of her/his interactions.

**"Push" User scenarios**

Bill Mailer (a "persona") is the retired owner of a building company from New York who takes his wife Eileen for a touristic trip through Europe.

Bill knows everything about building with concrete and steel. He wants to know how these "crazy Europeans" build magnificent things with mere wood and bricks.

Task model: (typical) activities, tools and actors.

**"Pull" User questions**

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**Overview - prototype II**

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**Prototype database data**

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Code</th>
<th>Name</th>
<th>Code</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>John</td>
<td>02</td>
<td>Jane</td>
<td>03</td>
<td>Mike</td>
</tr>
<tr>
<td>04</td>
<td>Tom</td>
<td>05</td>
<td>Lucy</td>
<td>06</td>
<td>Sam</td>
</tr>
</tbody>
</table>

**Prototype select source**
Prototype concept data

Prototype drag and drop

Prototype daisy concepts

Prototype search

Prototype instance results

Overview - evaluation

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(7) Evaluation <--
Evaluation

DIY questionnaire
subject opinions & ideas about the Mass II prototype & the Mockup
Usability evaluation
subjects perform task-scenarios to evaluate the Mass II prototype
Cognitive walkthrough
expert evaluation of Mass II prototype

DIY questionnaire
Familiarisation + 20 questions:
- Do you think the prototype would help you do your work?
- <Ease of use is ....> How do you evaluate the ease of use of the prototype?
- Which functions (commands) would you like to add?
- Please explain ....

Usability evaluation

Task scenario's + experimental (alike) testing
- Content-providers & colleagues
- Measure success and failure rates
- Observe difficulties, emotive expressions
- Video-taping, thinking-aloud
- A post-test retrospective interview

Example tasks

Find some general info about Boccaccio (simple search)
What is Petrarch's Itinerarium about? (AND operator)
Find examples of Palladio's architecture (search with constraints)

Cognitive Walkthrough

UI expert "walk-through" a set of task-scenarios applying heuristics at each step
- Visibility of system status
- User control and freedom
- Recognition vs recall
- Find design flaws

Questions?

Further information:
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