



Improving an Environmental Ontology by Incorporating User-Input

Bettina Bauer-Messmer, Thomas Scharrenbach, Rolf Grütter,

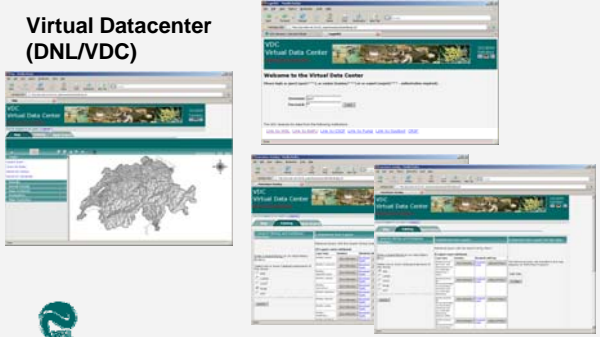

Swiss Federal Institute for Forest, Snow and Landscape Research, WSL
Switzerland

This project is part of a research cooperation with the Swiss Federal Office for the Environment FOEN.



The Project: Datacenter Nature and Landscape (DNL)

Virtual Datacenter (DNL/VDC)





Heterogeneous Data -> Ontology

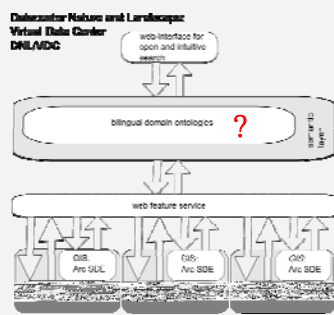

Heterogeneous data types:
thematic data, GIS data, documents, metadata,...

Heterogeneous domains:
biology, geo sciences, soil science, fauna, flora, lichen, funghi, environmental science, biotopes,...

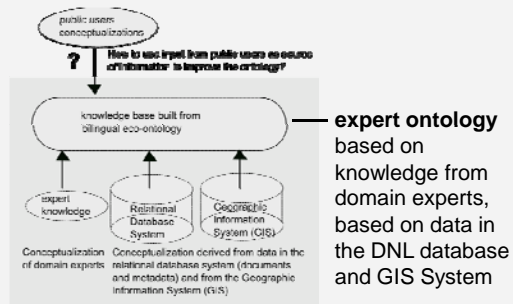
Heterogeneous conceptualizations experts vs. public users



Open and intuitive Search.....

Expert- vs. User-Ontology



User Input

Each failed query indicates, that the ontology does not fit the user's conceptualizations.

Explicit user input:

- ask the user to specify, what he was looking for
- ask user to enter missing item (i.e. concept/individual) in the ontology

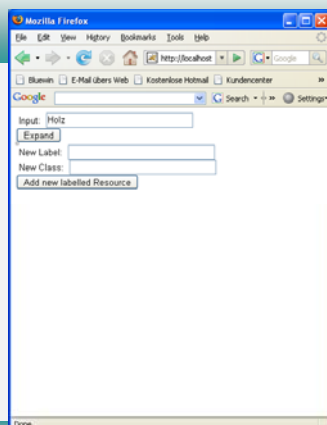
Implicit user input:

- derive from additional information (e.g. list of search terms) the context and enter missing item accordingly

Probabilistic approaches!

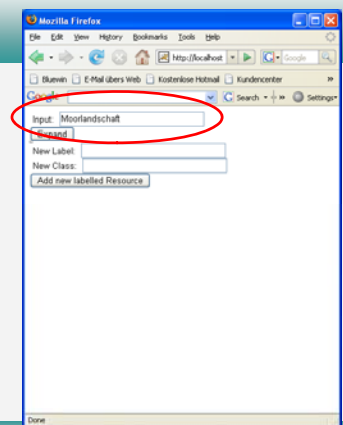
Entering explicit user input:
The WOW-Editor
(WSL Ontology WebEditor)

Step 1:
Web-Interface



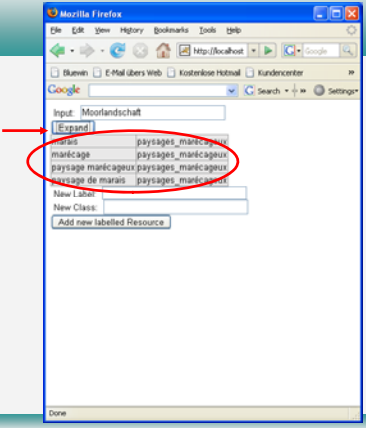
Entering explicit user input:
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Step 2:
enter term for expansion



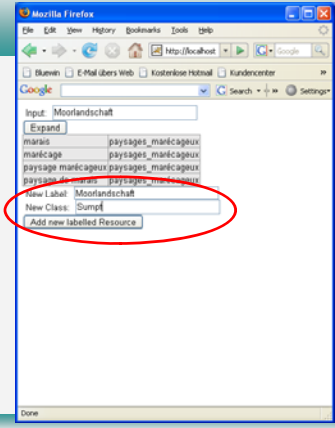
Entering explicit user input:
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Step 3:
 expand the input-term
 (semantic expansion
 using the ontology)



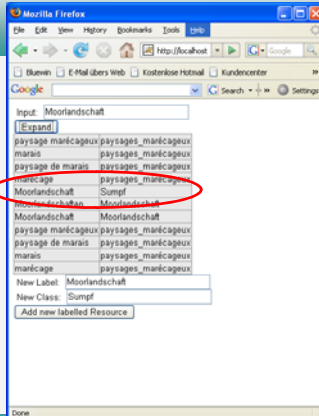
Entering explicit user input:
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Step 4:
 enter new label and new
 class, which will be added
 to the ontology



Entering explicit user input:
The WOW-Editor
 (WSL Ontology WebEditor)

Step 5:
 check... the expansion of
 the original search term
 now yields also the newly
 added class/label pair:
 Moorlandschaft / Sumpf



How to keep the ontology consistent?

New entries may conflict with the consistency of the whole ontology.

Storing (even if only temporarily) of inconsistent concepts, individuals or relationships makes reasoning impossible.

Reasoning is fundamental for each knowledge-system. Therefore compulsory consistency checks must be made for each new entry.

How to keep the quality high?

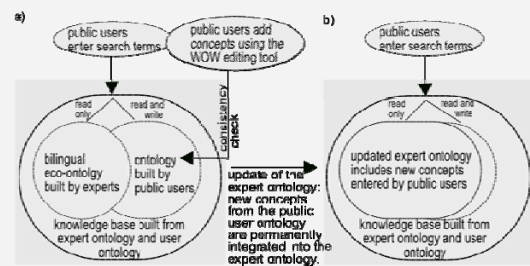
The expert ontology was compiled by domain experts.

Can we rely on the „Wikipedia-effect“ and hope, that misleading or wrong entries will be cancelled out soon by the user community of public users? **rather not**

Quality will be enforced. Experts regularly check the public entries in the ontology. Only entries, which the experts judge as good, will be permanently integrated into the „expert-ontology“.

Updating mechanism

How to keep the knowledgebase consistent...



Conclusion and Outlook

A conceptual framework was presented on how to integrate user input into an existing ontology.

The WOW ontology editing tool allows user to modify (add items to) the ontology.

Evaluations with large numbers of users are planned for the future. It is expected that different user profiles will be needed for a highly heterogeneous user community.

Technical details will be presented at the ISWC in Karlsruhe, October 2008.



Thank you for your attention!