



CENTRE FOR USER ORIENTED IT DESIGN / KNOWLEDGE MANAGEMENT RESEARCH GROUP



CID  
Centre for  
User Oriented IT Design



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# The KMR-group at CID

## People:

- [Ambjörn Naeve](#) (senior researcher, head of the group)
- [Mikael Nilsson](#) (grad. student, mathematics didactics)
- [Matthias Palmér](#) (grad. student, computer science)
- [Fredrik Paulsson](#) (grad. student, MDI)
- [Claus Knudsen](#) (grad. student, media technology)



# Research Areas

- Knowledge Manifolds
- Conceptual Modeling
- Conceptual Browsing
- New paradigms and tools for mathematics education
- E-learning frameworks / Semantic web technologies
- Component-based learning technologies
- Semantic Interoperability
- Presence production



# Some of our Collaborative Projects

- Conceptual Modeling of Organisations (HI, SIH, UR)
- Arhives Portfolios Environments (WGLN) [finished]
  - Content & Context of Mathematics in Engineering Education
  - Communication and Visualization Environments for Learning
- Personalized Access to Distributed Learning Resources (WGLN)
  - Edutella (KBS/Hannover, DBL/Stanford, UDBL/Uppsala)
  - Personalized Mathematic Courselets (Math/Stanford, DSV/KTH)
- Personal Learning Portfolios - Folio Thinking (WGLN)
- Public Service E-learning Platform (UR, SV, CFL)
- Electronic Commerce Integration Meta Framework (CEN/ISSS, Webgiro)



# Intl. Conference Presentations 2001

- 2nd European Conference on Web-based Learning Environments (WBLE-2001) (Lund, Oct 24-26, 2001)
  - Knowledge Manifolds (Naeve)
  - The Concept Browser (Naeve)
  - E-learning in the semantic age (Palmér, Naeve, Nilsson)
- 8th Intl. Conf. on ACS (Mielno, Poland, Oct 17-19, 2001)
  - Presence production in math. education (Knudsen & Naeve)
- SIGGRAPH 2001 (Los Angeles, Aug13-17, 2001)
  - CyberMath (Taxén & Naeve)
  - Geometric Algebra Course (Naeve et.al.)
- 20th ICDE, (Düsseldorf, April 1-5, 2001)
  - CyberMath (Taxén & Naeve)



# Upcoming International Conference Pres.

- Nordic conference on the transformation of higher education through the implementation of net-based learning environments (Svalbard, May 6-9, 2001)
  - Naeve (Invited Speaker)
- 11:th Intl. WWW Conference (Hawaii, May 7-11, 2001)

Accepted papers:

- Edutella (Nejdl, ..., Naeve, Nilsson, Palmér)
- Architectural Guidelines for Semantic Web Meta-data (Nilsson, Palmér, Naeve)



# A Knowledge Manifold

- is a conceptual framework for designing interactive learning environments that support **Question Based Learning**.
- can be regarded as a **Knowledge Patchwork**, with a number of linked **Knowledge Patches**, each with its own **Knowledge Gardener**.
- gives the users the opportunity to ask questions and search for **certified human Knowledge Sources**.





# A Knowledge Manifold (cont.)

- has access to distributed archives of **resource components**.
- allows teachers to **compose components** and construct customized learning environments.
- makes use of **conceptual modeling** to support separation of **content** from **context**.
- contains a **concept browser (Conzilla)** that supports these principles and activities.



# The different Knowledge Roles of a KM

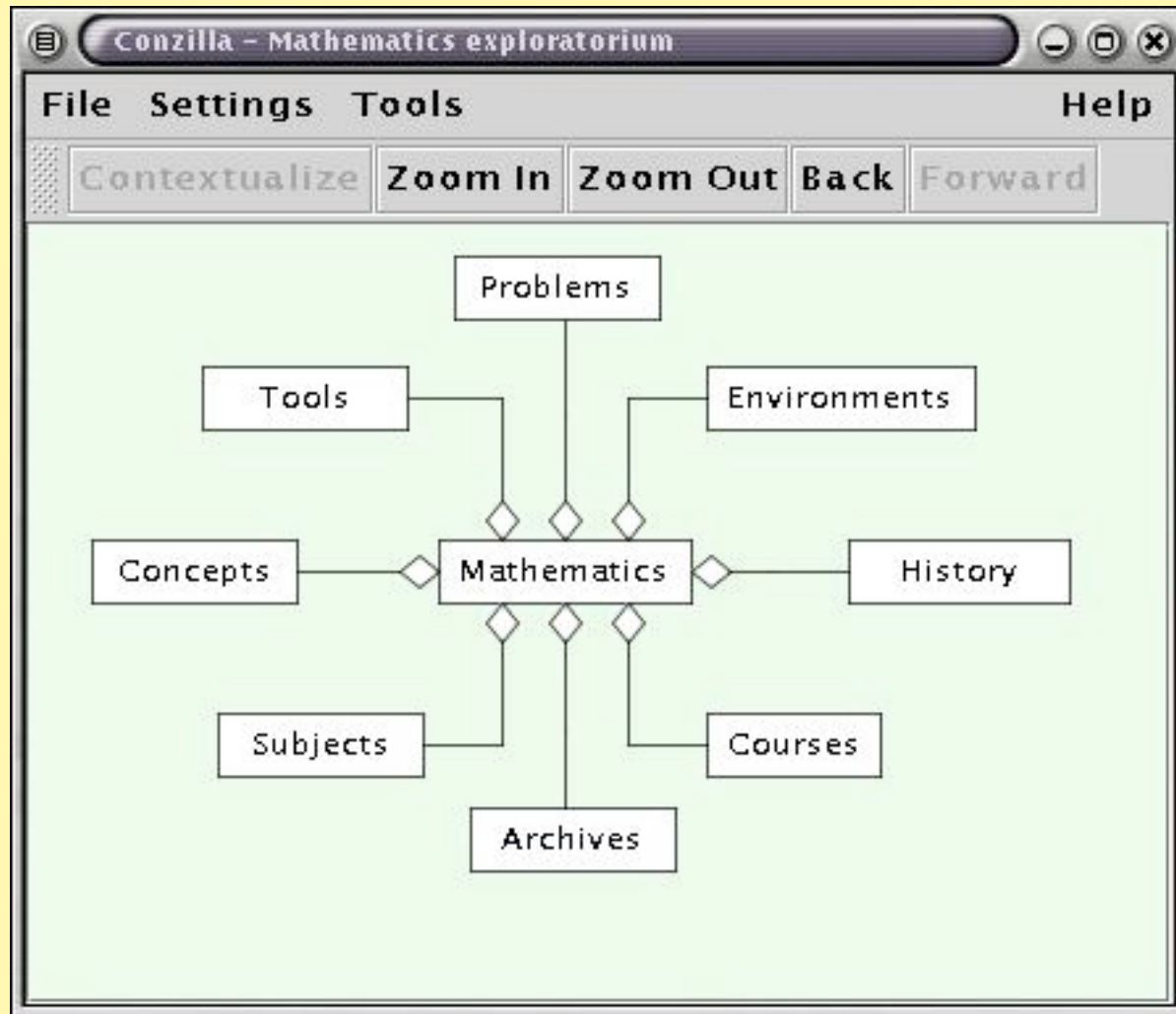
- The knowledge **cartographer**
  - constructs **context-maps**.
- The knowledge **librarian**
  - fills the context-maps with **content**.
- The knowledge **composer**
  - composes content components into **learning modules**.
- The knowledge **coach**
  - cultivated **questions**.
- The knowledge **preacher**
  - provides **live answers**.
- The knowledge **plumber**
  - connects questions with **appropriate preachers**.
- The knowledge **mentor**
  - provides **motivation** and supports **self-reflection**.



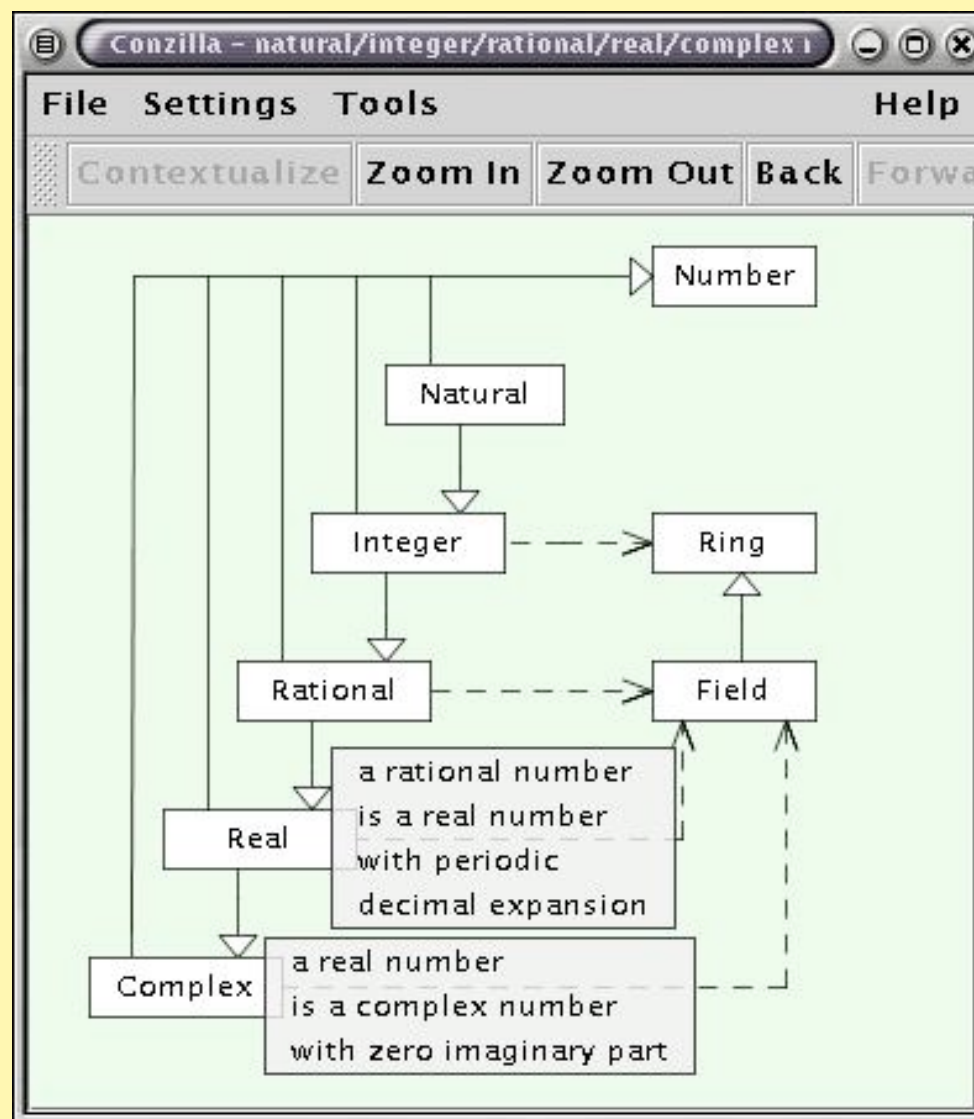
# Design principles for Concept Browsers

- separate **context** (= relationships) from **content**.
- describe each **context** in terms of a **context-map**.
- assign an appropriate set of **components** as the **content** of a concept or a conceptual relationship.
- label all resources with a standardized data description (**metadata**) scheme (**IMS-LOM**).
- **filter** the content components through different **aspects**.
- transform a content component which is a context-map into a context by **contextualizing** it.

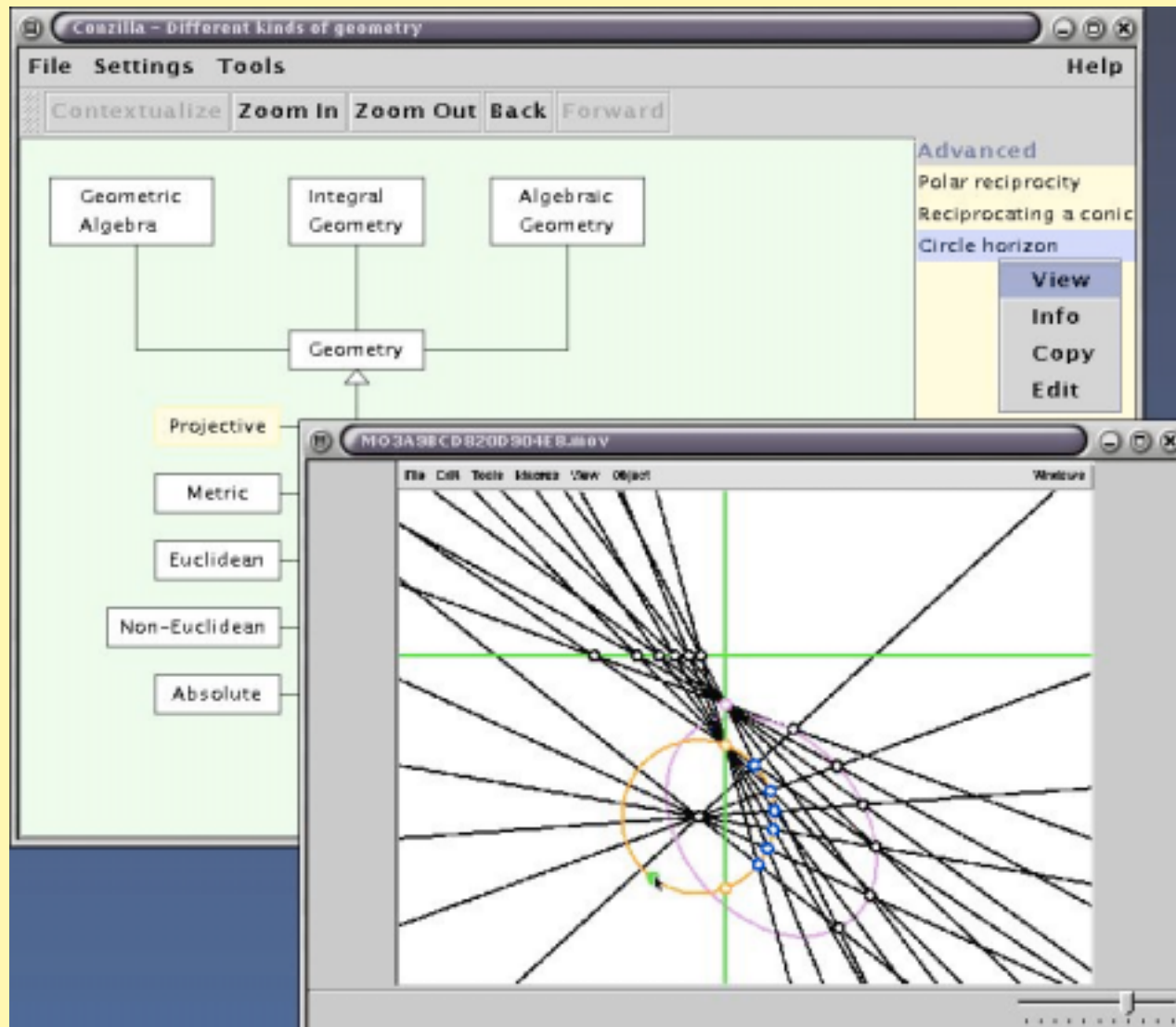
# Virtual Mathematics Exploratorium-1



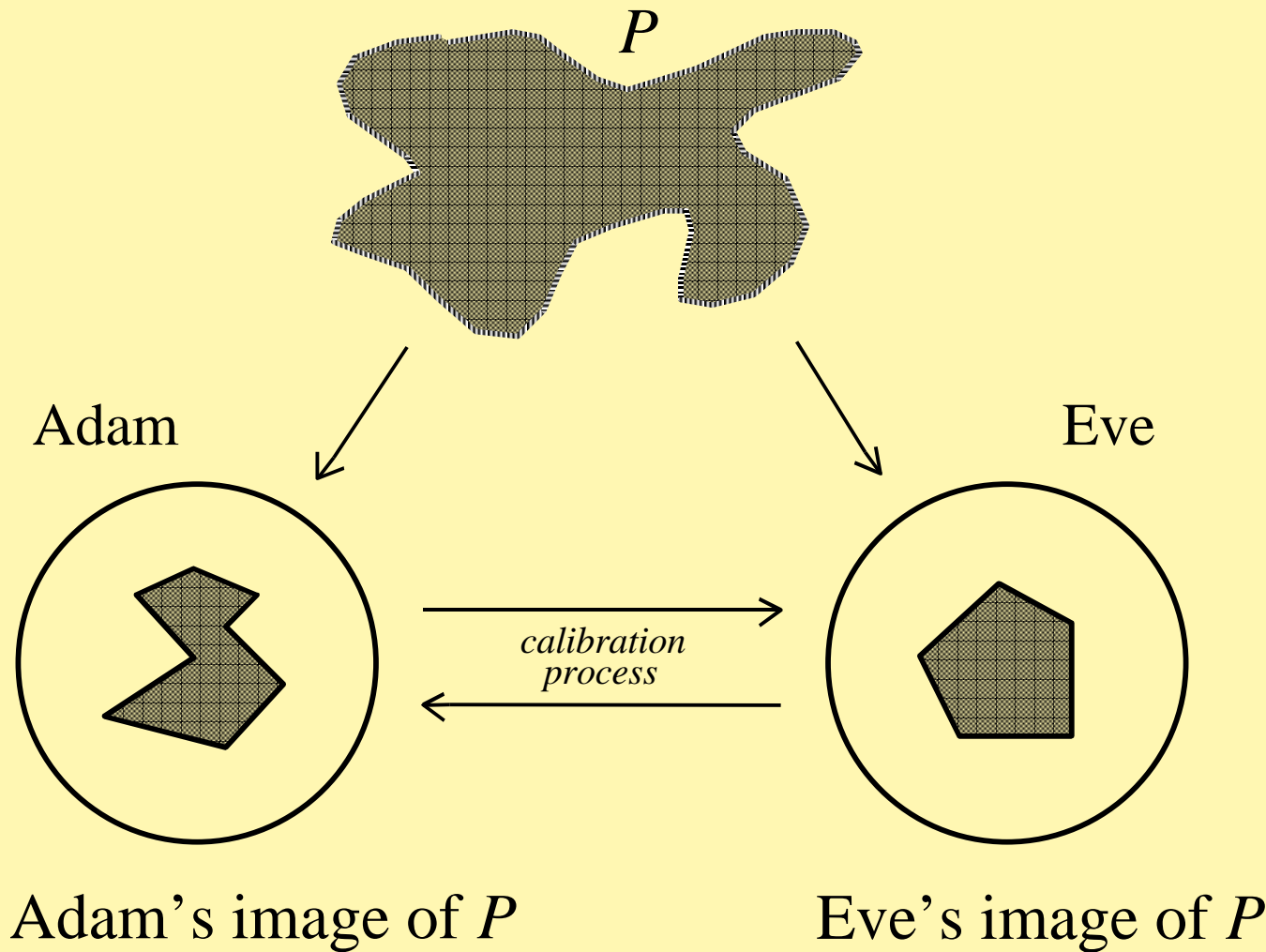
# Virtual Mathematics Exploratorium-2



# Virtual Mathematics Exploratorium-3

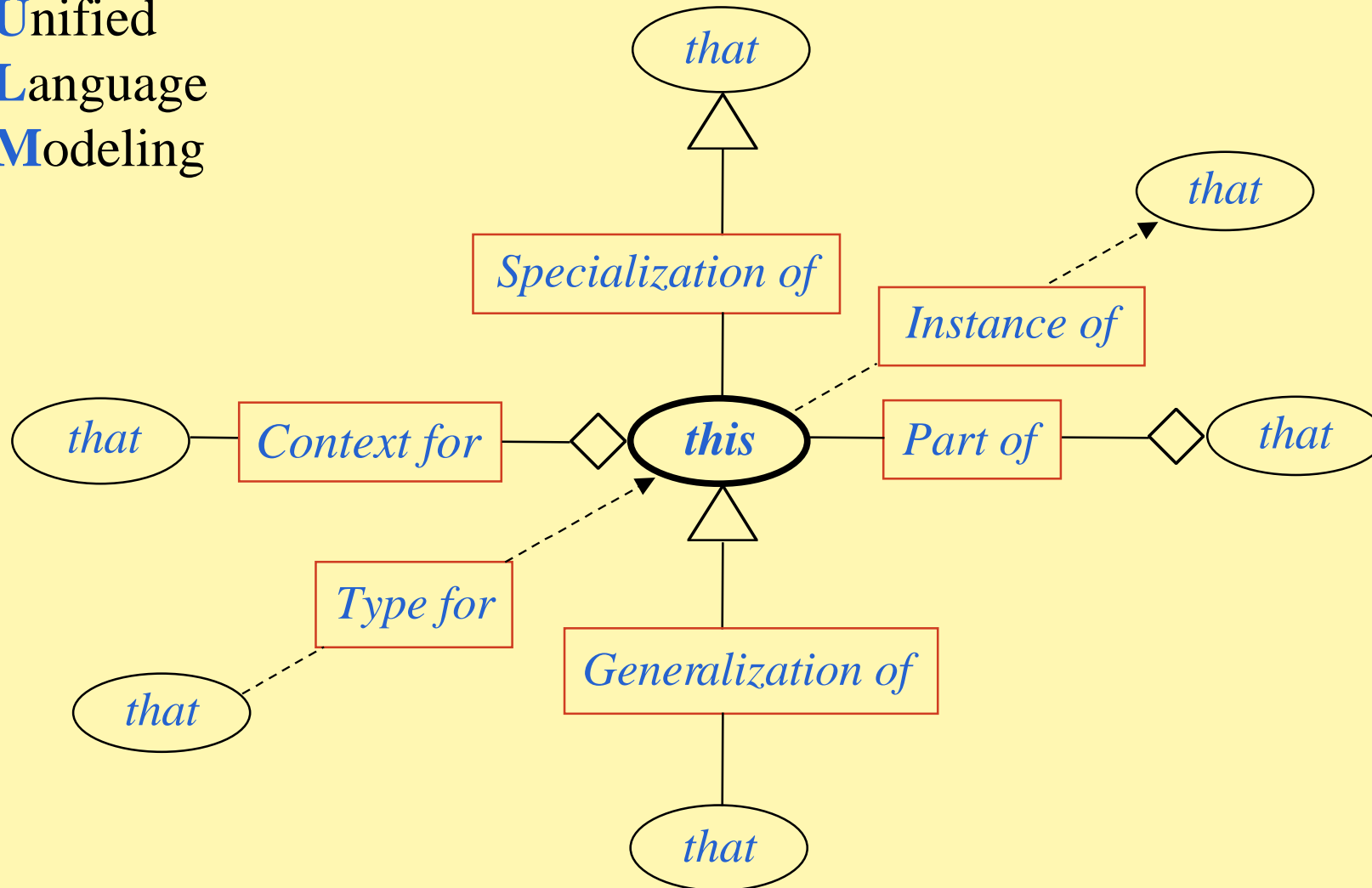


# Modeling for Conceptual Calibration



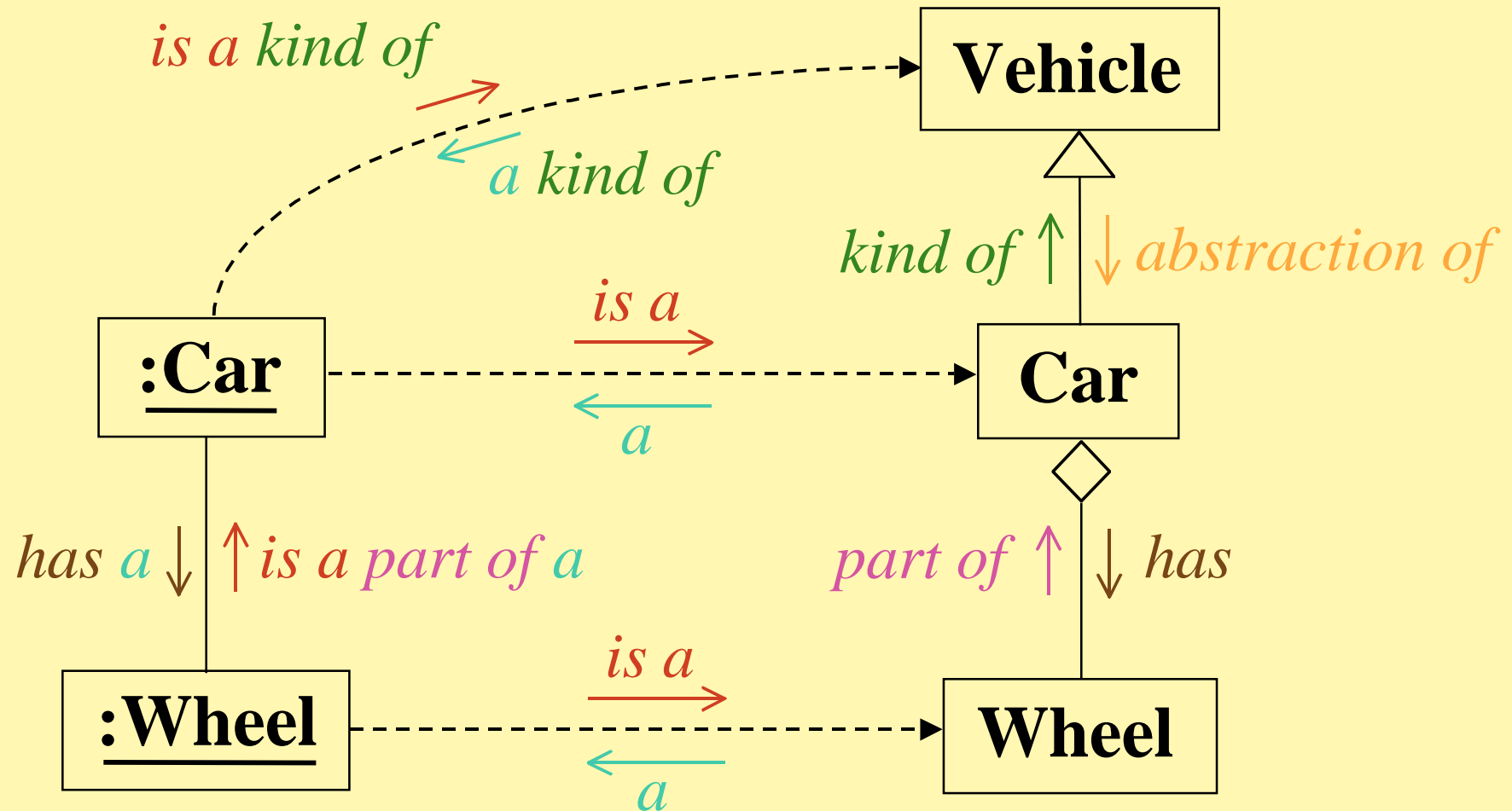
# The hierarchical directions from *this* to *that*

Unified  
Language  
Modeling

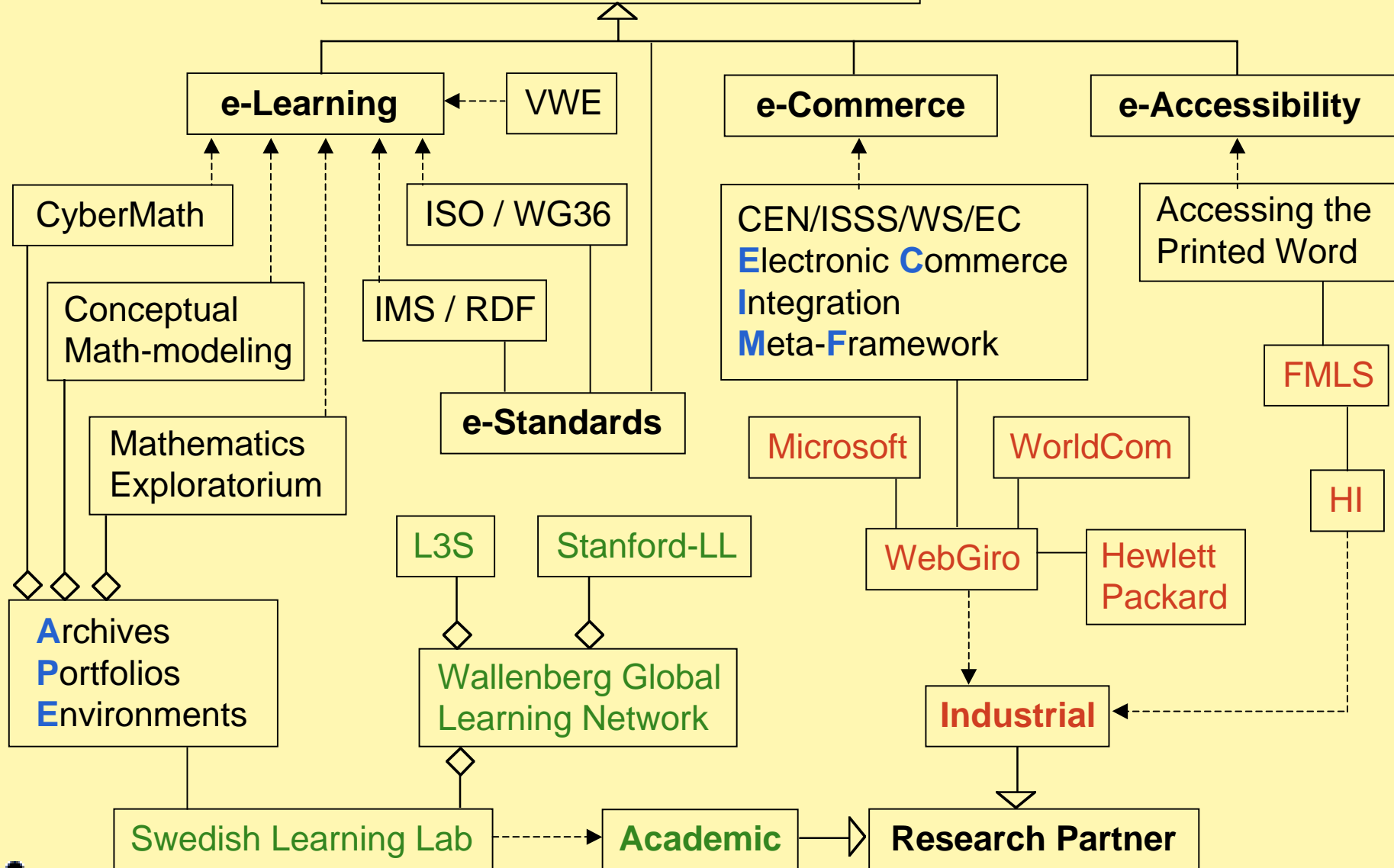




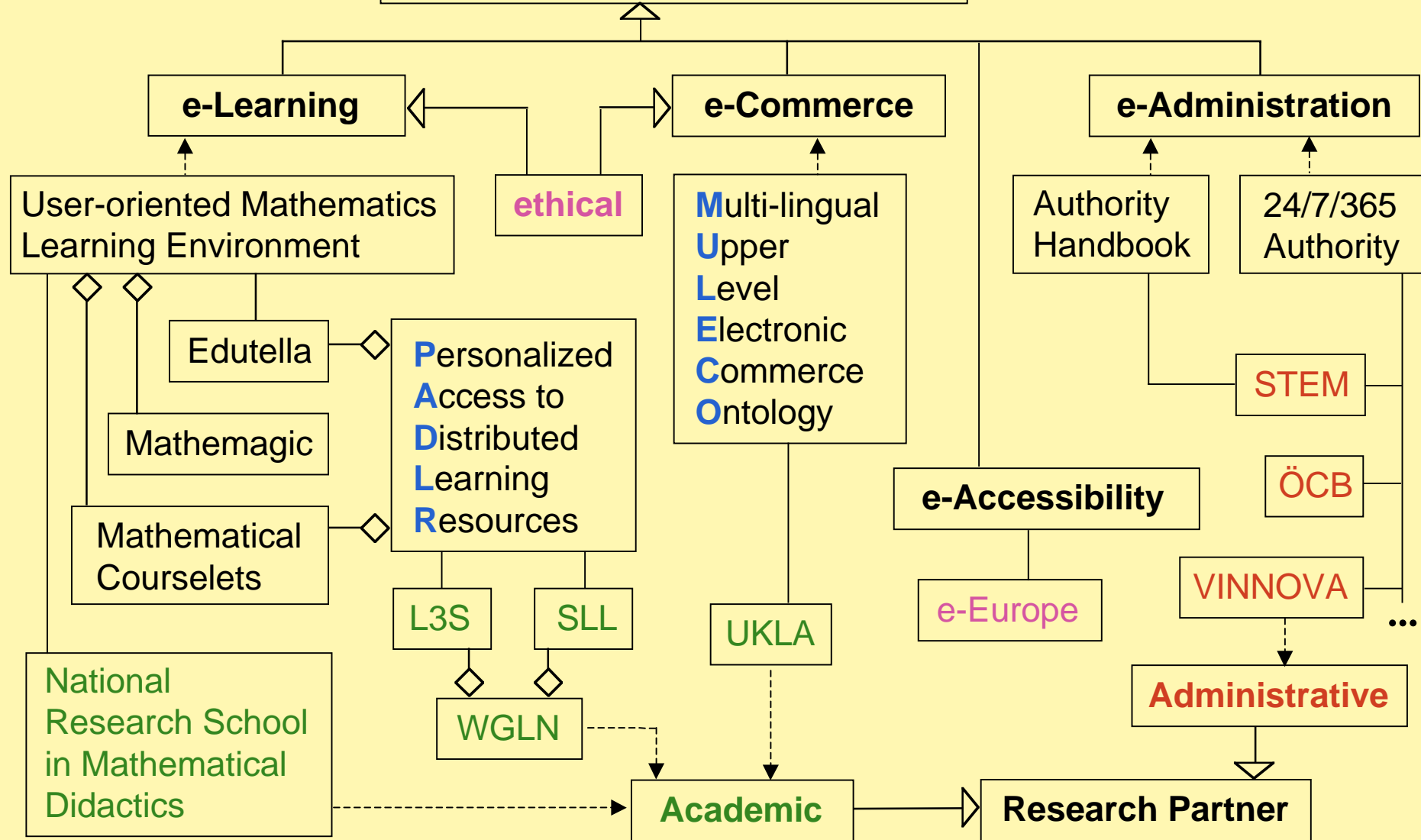
# Unified Language Modeling



# Ongoing Knowledge Manifold projects at KMR



# Upcoming Knowledge Manifold projects at KMR



## References

- [Naeve, A.](#), *The Garden of Knowledge as a Knowledge Manifold - a conceptual framework for computer supported subjective education*, CID-17, KTH, 1997.
- [Naeve, A.](#), *Conceptual Navigation and Multiple Scale Narration in a Knowledge Manifold*, CID-52, KTH, 1999.
- [Nilsson, M. & Palmér M.](#), *Conzilla - Towards a Concept Browser*, CID-53, KTH, 1999.
- [Nilsson, M.](#), *The Conzilla design - the definitive reference*, CID/NADAKTH, 2000.
- [Naeve, A.](#), *The Concept Browser, a New Form of Knowledge Management Tool*, Proc.of the 2:nd european conference on Web Based Learning Environments (WBLE-2001), Lund, Sweden, Oct. 24-26, 2001.



## References (cont)

- [Naeve, A.](#), *The Knowledge Manifold – an educational architecture for inquiry based personalizable e-learning*, To be presented at WBLE-2001.
- [Naeve, A. & Nilsson, M. & Palmér, M.](#), *The Conceptual Web - Our Research Vision*, Proceedings of the First Semantic Web Working Symposium, Stanford, July 30 - Aug 2, 2001.
- [Naeve, A. & Nilsson, M. & Palmér, M.](#), *E-learning in the Semantic Age*, To be presented at WBLE-2001.
- [Nilsson, M.](#), *The Role of RDF in the IMS Family of Specifications*, To be published as an IMS whitepaper.

Reports are available in pdf at <http://kmr.nada.kth.se>

