From Data Integration Towards Knowledge Mediation

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joint work with Thomas Eiter

The problem: diversity of knowledge sources

- IT developments of the last decade rapidly changed the possibilities for data and knowledge access.

- World Wide Web and underlying Internet provide backbone for information systems of the 21st century.

- need powerful reasoning capabilities able to combine various pieces of information, stored in heterogeneous formats and with different semantics.

- information from sources/software packages with plain semantics need to be mixed with semantically rich sources like domain ontologies, expert knowledge bases, temporal reasoners etc.

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The vision: knowledge mediation

- Goes back at least to Wiederhold's classical 1992 paper "Mediators in the Architecture of Future Information Systems"

- *"A mediator is a software module that exploits encoded knowledge ... to create information for a higher layer of applications."*

- Provides services beyond technical aspects of merging and integration.

- Includes aspects like situatedness, context awareness, social choice, user goals, abstraction, summarization, ranking ...

- *"An important requirement we'd like to place on mediators is that they be inspectable by the potential users."*

- Tools from LPNMR required to help realizing the vision.

- Nonmonotonic features, working with defaults and implicit assumptions inherent to intelligent mediation.

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- Distributed execution platforms.

- New forms of inconsistency management.

- Interpretation/transformation of vocabularies.

- Communication and interaction between entities.

- Text analysis and understanding.

- Preference and goal handling.

- Combining quantitative and qualitative uncertainty.

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- DL widely perceived as *the* KR formalism underlying the semantic web (see OWL).
- Why have we failed?
- Aren't our systems competitive with theirs?
- Aren't our languages as useful for representing knowledge as theirs?
- Aren't we convinced since more than 30 years that classical reasoning is insufficient?
- Why, then, has the semantic web been able to live without us?

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