

Solving Semantic Interoperability Conflicts

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Methodologies and Experiences under review

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Semantic Interoperability

„80 percent of the time I'm searching for the corresponding information“

„We needed more than one hour to understand that we had different understanding of an „Europalette““

Example: Book a hotel room

- Several data sources are available in Internet
- Goal: Build one application which integrates formats of different sources
- Goal format:

hotel
name
location
category
price



Name	Location	Category	Price
Radisson	Copenhagen, Denmark	Congress-Hotel	580
Mercure	Hamburg, Germany	Congress-Hotel	190
Ritz	London, England	Congress-Hotel	130
...

Example: Integrate these sources

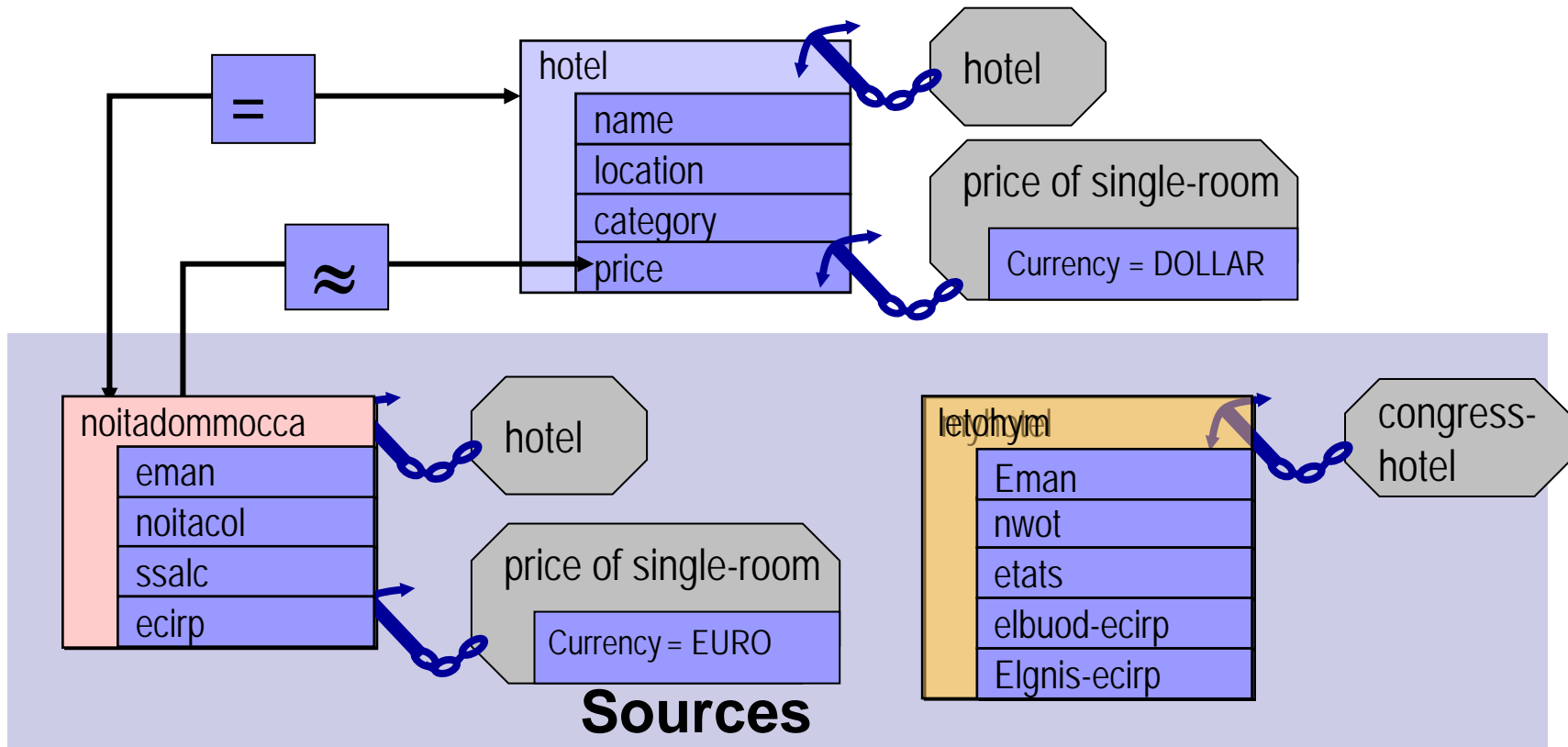
hotel
name
location
category
price

noitadommocca
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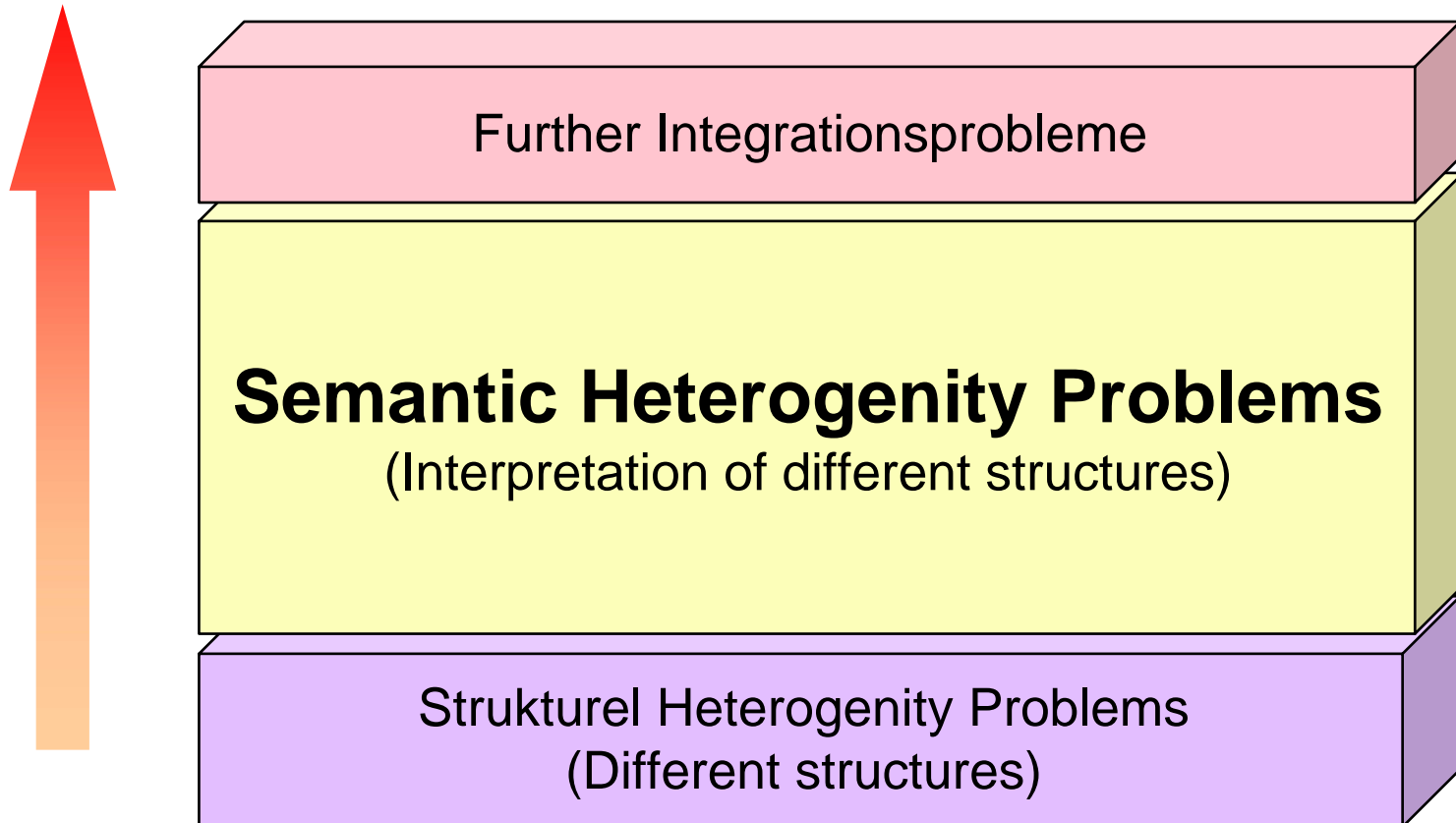
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Sources

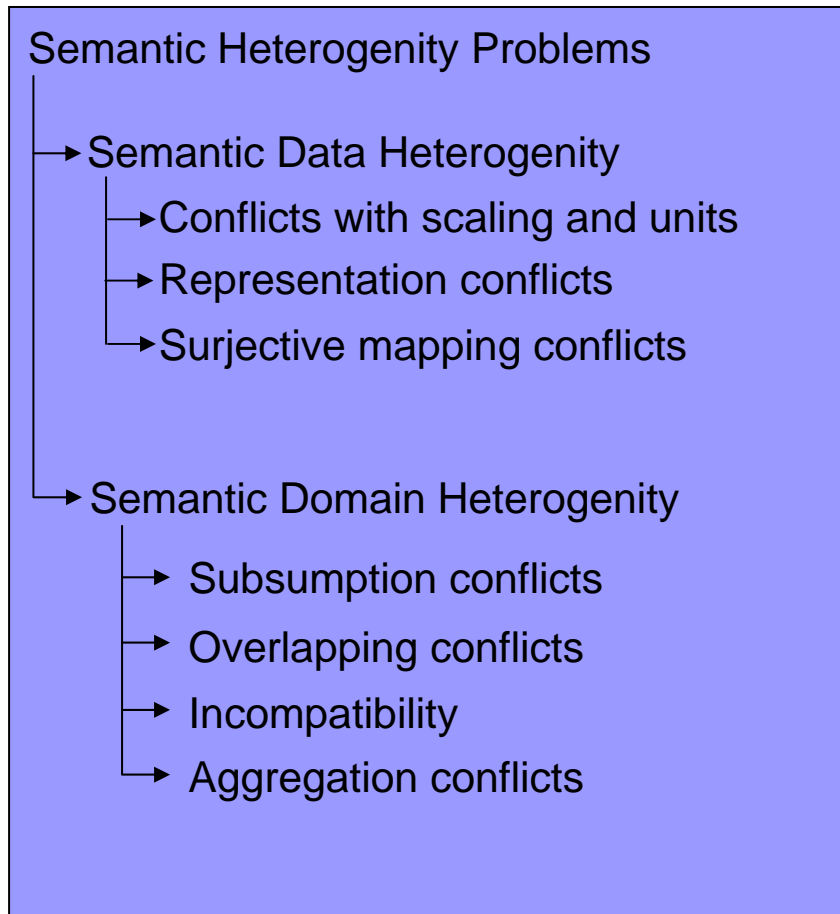
Example: Integrate these sources



Classification of Integration Conflicts



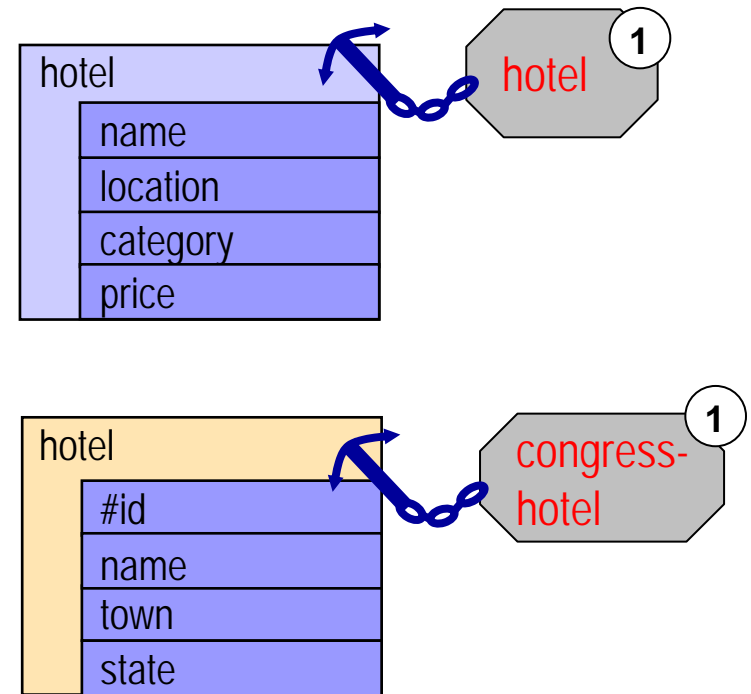
Semantic Heterogeneity Problems



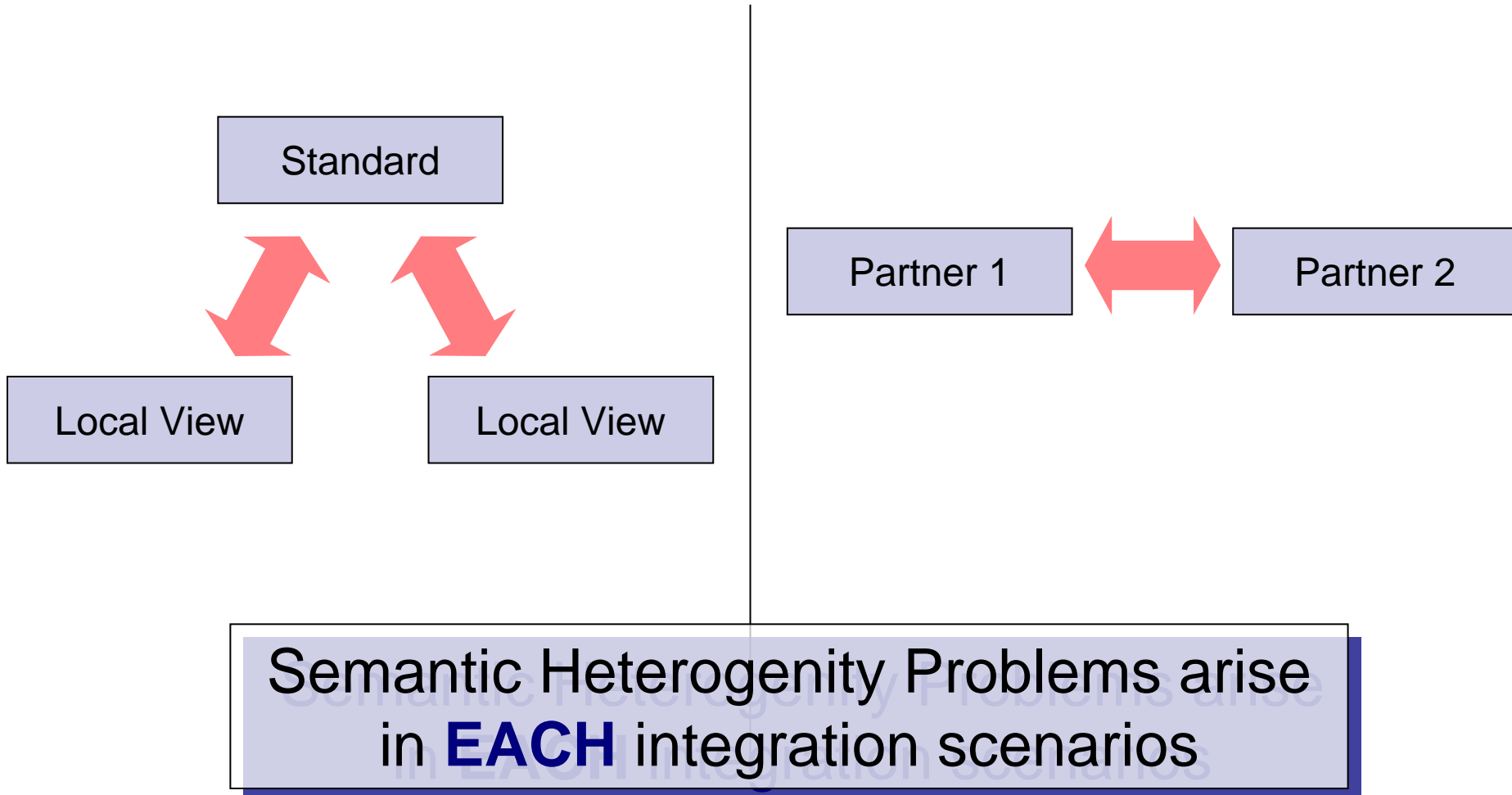
- **Semantic Domain Heterogeneity**
 - different Conceptualisation
 - No Conflict = Semantical Correspondence (mapping possible)
- **Semantic Data Heterogeneity**
 - Semantical identical information is represented in different Formats

Major Problem: Semantic Domain Heterogenities

- ① ■ Subsumption conflicts
E.g. “congress-hotels” are “hotels”
- Overlapping conflicts
e.g. Hostels and Hotels
vs. Hotels and Camping areas
- Incompabilities
e.G. Hostels vs. Hotels
- Aggregation conflict
e.g. hotel company vs. hotel



Where do Semantic Heterogeneity Problems appear?



How to reconcile Semantic Heterogeneity Problems? (I)

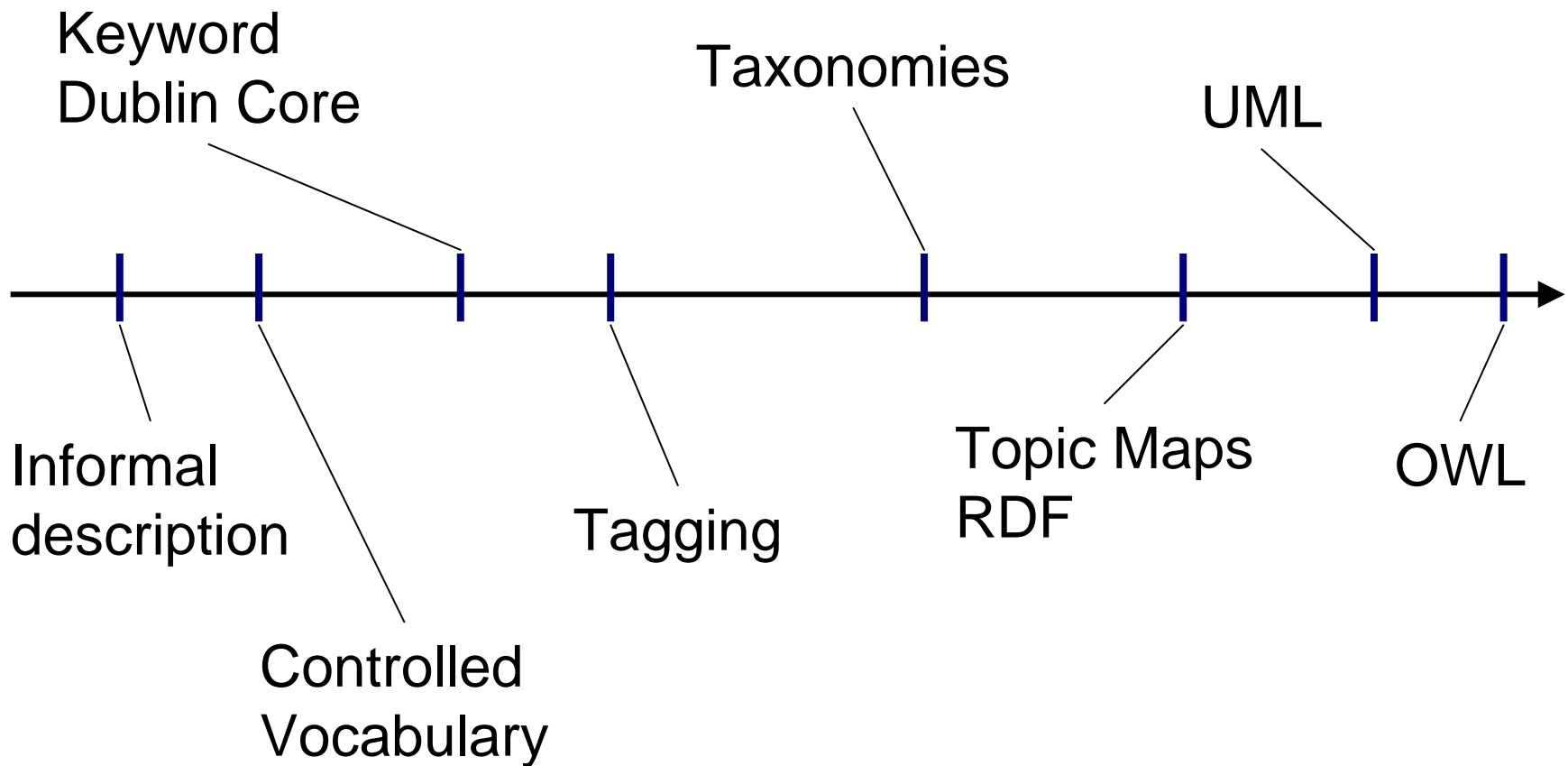
■ (Semi-)Automatic

- Describe the Semantic explicitly
 - e.g. Semantic Web: with the help of ontologies
 - e.g. Web2.0: tagging

- Identification: Compare the semantic description

- Problem:
 - how to reconcile subsumption or overlapping conflicts?
 - How to reconcile semantical data heterogeneity problems?

Representing Semantical Knowledge: Expressivity



How to reconcile Semantic Heterogeneity Problems? (II)

■ Manual

- Take the informal description and try to discover different meanings
- Reconciling during expert discussions
- Problem: how to identify semantic conflicts?
 - informal descriptions are ambiguous
 - Are we aware to detect all semantic heterogeneity problems?

How to reconcile Semantic Heterogeneity Problems?

- (Semi-)Automatic
- Manual

There is no general strategy!

A Good Strategy: Best Practice

- Adopt existing solutions to your problem
 - Try to avoid reinventing the wheel!
 - Example: UN/CEFACT

- Learn from other approaches in your domain
 - How did they reconcile their semantic heterogeneity problems?
 - Example: Expert discussion, Web2.0
 - Why were they successful?
 - Motivation
 - Business Cases
 - Project Environment

- Prerequisite: Share your knowledge

Thank you for your
Attention!

Answers?!

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