Incompleteness and inconsistency in information integration

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Abstract

We refer to a framework for information integration where a global ontology, expressed in Description Logic, is used as a means for integrating different, autonomous information sources. Each source is in turn modeled in terms of a local ontology, and suitable mapping assertions specify the relationship between the local and the global ontologies. Users formulate their queries over the global ontology, and the system provides the answers to such queries on the basis of the information stored at the sources.

To answer queries, the integration system must take into account that the virtual integrated knowledge base should satisfy the integrity constraints that are expressed, either implicitly or explicitly, in the global ontology. This requirement poses interesting challenges to the design of the integration system, especially related to the fact that, in real world settings, sources are usually incomplete and inconsistent, i.e. provide incomplete information to the integrated knowledge base, and may contain contradictory information. In the invited talk, these problems will be discussed in detail, and several techniques for their solution will be presented.