

Knowledge Sifter: Agent-Based Search over Heterogeneous Sources Using Semantic Web Services.

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Abstract

Knowledge Sifter is a scalable agent-based system that supports access to heterogeneous information resources such as the Web, open-source repositories, XML-databases and the emerging Semantic Web. The Knowledge Sifter agent architecture is depicted in the figure below. The architecture has three layers: User Layer, Knowledge Management Layer, and Data Layer. The User Agent interacts with the user to elicit user preferences that are managed by the Preferences Agent. These preferences include the relative importance attributed to terms used to pose queries, the perceived authoritativeness of Web search engine results, and other preferences to be used by the Integration Agent.

The user indicates an initial query to the Query Formulation Agent. This agent, in turn, consults the Ontology Agent to refine or generalize the query based on the semantic mediation provided by the ontology services available. The Ontology Agent uses a conceptual model for the domain by means of the Web Ontology Language (OWL) schema specification of the Imagery Domain Model (based on ISO 19115 and 19139).

The Knowledge Sifter architecture is general and modular so that new ontologies and new information resources can be easily incorporated. The Web Services Agent uses domain knowledge regarding the data sources, such as QoS attributes, source authoritativeness, and image sizes, to optimize the execution of subqueries. The Ranking Agent is responsible for compiling the sub-query results from the various sources, ranking them according to user preferences supplied by the Preferences Agent.

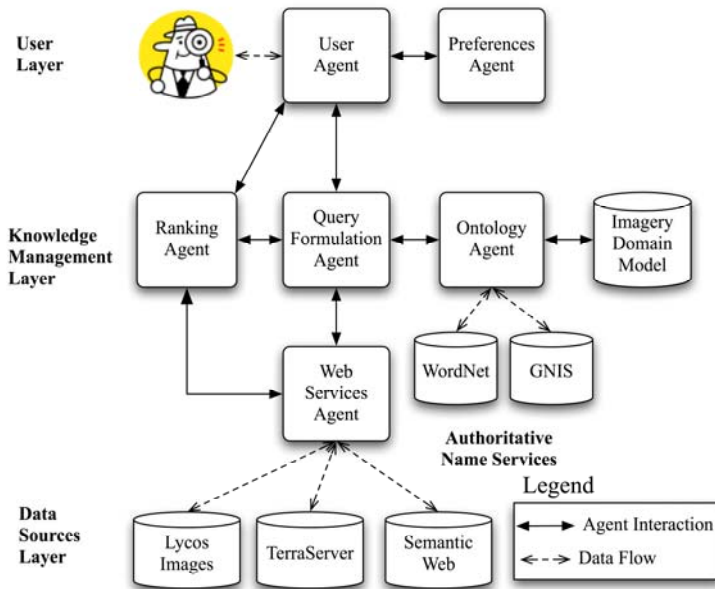


Figure 1: Knowledge Sifter Three-Tiered Architecture

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For more information about Knowledge Sifter, please visit the E-Center for E-Business [Publications Page](#).