

Extending the CHAIN-REDS Knowledge Base to Open Access Document Repositories using KLIOS services

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Impact

Actually, many organizations (libraries, universities, research organisations, etc.) in the world make public their documentation on the web by standard protocols like OAI-PMH and currently the almost 2,500 repositories included in OpenDOAR (www.opendoar.org) gather well above 30 million documents.

KLIOS is developing a service to retrieve data from OpenDOAR repositories and semantically enrich them in order to create new correlations and, ultimately, new knowledge. When ready, the service will be adopted by the CHAIN-REDS project to create a federation of repositories linked among them by the standard Dublin Core metadata format.

The system's process model follows the main steps listed below:

1. Analysis of scientific resources, both in general and in specific scientific domains (e.g., health);
2. Enabling web access to data and resources via a customized Science Gateway implemented with the Catania Science Gateway Framework;
3. Integration of heterogeneous data and resources by following Open Linked Data principles in a two-fold way:
 - o Service integration based on Linked Services technology: integrating heterogeneous services from via reasoning and processing of Linked Services RDF annotations;
 - o Transforming and exposing scientific data directly as Linked Data: exposing scientific Linked Data sets and joint shared vocabularies for interlinking/annotating data;
4. Support exploratory queries, i.e. information-seeking problems that are open-ended and multi-faceted; such queries are commonly used in scientific discovery, especially across different disciplines;
5. Provision of all the above via a participatory environment that can create a virtual research community of persons, organizations and resources.

The principal services of KLIOS are data harvesting, semantic enrichment, and document searching, through simple and intuitive web- and mobile-based interfaces, and all of them will be thoroughly described in the presentation.

URL

<http://klios.ct.infn.it> - www.chain-project.eu/knowledge-base

Summary

One of the major problems in scientific collaboration lies in the wealth of heterogeneous data and information that very often consists of rather unstructured documents as well as structured but heterogeneous scientific data. While unstructured documents, by their very nature, are not machine-processable, also structured data sets usually follow heterogeneous schemas which limit very much their interoperability. The Semantic Web allows to efficiently integrate heterogeneous data into a coherent whole and to provide description of data elements.

Exploiting Semantic Web, the Knowledge Linking and sharing in research domains (KLIOS) research project is developing an open access, participatory infrastructure for linking scientists and scientific data/information/resources. In this contribution we will present KLIOS and how its services will be re-used to extend the CHAIN Knowledge Base to Open Access Document Repositories (OADRs).

Description

KLIOS is a distributed-system-based environment, implemented using the Catania Science Gateway Framework (www.catania-science-gateways.it), that allows all entities related to share and analyse materials such as publications, results, data and applications in a “social” environment. Any user, both via a web browser and a mobile app, can access the service and make semantic searches across various repositories such as KLIOS itself, DBPedia, DRIVER/OpenAIRE, OpenDOAR, Google Scholar, PubMed, etc.

The approach is based on two fundamental pillars: interconnection and integration of scientific resources through a grid of meta-data, and networking and community facilitation for scientists as well as non-experts. KLIOS allows all entities related to a given domain (e.g., doctors, hospitals, health organizations, etc., in the case of medicine) to share and analyze materials such as publications, results, data and applications. The research environment mapped onto an OWL-based ontology comprises three coexisting and strongly inter-linked pillars: individuals, organizations, and resources.

The proposed system aims to provide a participatory integrated environment for rich linking of all entities involved in the research process. A central part in KLIOS is the representation of real-life research process usually referred as scientific method.

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