

Using Terminology Web Services for the Archaeological Domain

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1. Overview

The AHRC funded STAR project (Semantic Technologies for Archaeological Resources) has developed web services for knowledge organisation systems (KOS) represented in SKOS RDF format, building on previous work by the University of Glamorgan Hypermedia Research Unit on terminology web services. The current service operates on a repository of multiple (English Heritage) thesauri converted to SKOS format, containing terms and concepts that would be familiar to those working within the archaeological domain. It provides facilities for search, concept browsing and semantic expansion across these specialist terminologies.

2. Web Service Details

SKOS_WS is a SOAP web service written in C#, running on Microsoft .NET framework and accessing a MySQL RDF 'triple store' database. It is based on a subset of the SWAD-Europe SKOS API, with extensions for concept expansion. SKOS is a formal RDF representation standard for KOS such as thesauri, with an informal semantics designed for information retrieval purposes. This offers a lightweight, cost effective approach for annotation, search and browsing oriented applications that don't require first order logic.

The SKOS_WS web service consists of a series of function calls which can be readily integrated into textual or metadata based system allowing searching to be augmented by SKOS-based vocabularies and semantic resources. Queries are often expressed at a different level of generalisation from document content or metadata, so using the service a query may be expanded by synonyms or by semantically related concepts to act as a mediation layer between query and document content. Semantic expansion of concepts is achieved by automatic traversal of SKOS relationships, yielding a ranked list of semantically close concepts.

The service is immediately applicable to other specialist domains just by loading it with different SKOS thesauri. As a practical proof of concept this service was recently integrated with the DelosDLMS prototype next-generation Digital Library management system built on the OSIRIS middleware environment (ETH Zurich and

University of Basel), and an account of the work was published in the 2nd DELOS Conference (Pisa) proceedings.

3. Demonstration Client Application

In order to visually demonstrate how these web based terminology services may be utilised a prototype (C#) desktop client application has also been developed (Figure 1). The application allows searching and browsing across the terms and concepts in all SKOS vocabularies accessed via the web service. Full-text operators and wildcard characters may be used to qualify the search. Once a suitable concept has been located, users may browse the immediate concept space to explore and become more familiar with the specialist terminology, navigating either via named relationships or via concept expansion.

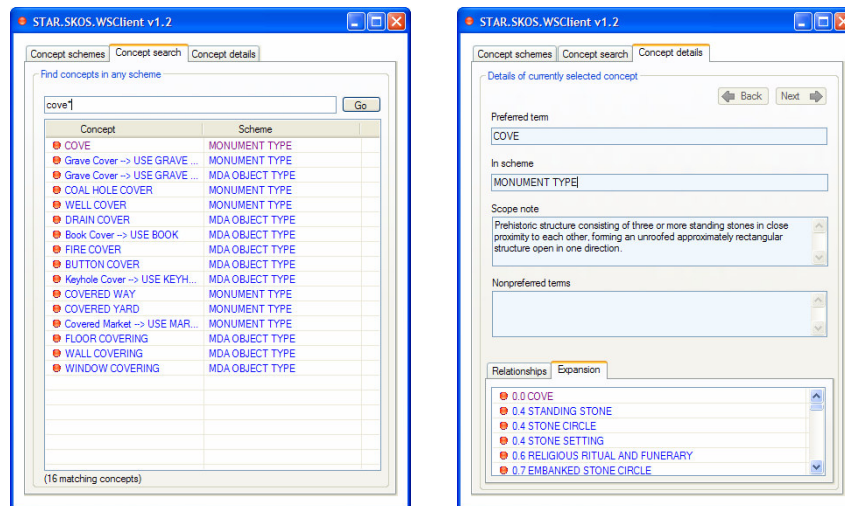


Figure 1. The demonstration client application in operation

In practice initially the demonstration client application was found to be inherently 'chatty' with the service, so a concept caching system was implemented to eliminate unnecessary repeat requests to the server. This action coupled with the use of asynchronous service calls produced a marked improvement in performance and resulted in a very usable desktop application accessing remote specialist terminology data.

In the longer term our intention is to integrate functional elements of this demonstration application with a suite of other client applications and web services currently under development for the STAR project.