ourSpaces - A Social Semantic Web Environment for eScience

Richard Reid and **Peter Edwards**
School of Natural and Computing Sciences
University of Aberdeen
Aberdeen, AB24 3UE
{ r.reid, p.edwards } @ abdn.ac.uk

Abstract

The *ourSpaces* Virtual Research Environment has been constructed using aspects of both the Social and Semantic Web. In this short paper we outline some of the characteristics of the system, before presenting a structure for a system demonstration.

Introduction

The PolicyGrid (www.policygrid.org) project, a collaboration between computer scientists and social scientists, is exploring how Semantic Web and Social Web approaches can be integrated to provide tools that aid in social science research. In particular, we are developing a software infrastructure that will assist researchers involved in aspects of evidence-based policy research. Evidence is used at various stages of policy making, from the design of new policies to the evaluation and review of existing policy, and can be derived from a wide range of sources.

One of the challenges we faced early in our work was resistance from users to a static, top-down approach to metadata. This led us to explore a hybrid approach employing aspects of both the Semantic Web and the Social Web to construct a solution. Our aim was to develop methods that would allow structured semantic metadata to interoperate with community-driven metadata.

ourSpaces (www.ourspaces.net) is a Virtual Research Environment (VRE) that owes much to social networking sites such as MySpace and Facebook. Support is provided in the prototype version for the following: social networking (messaging, collaboration invites, etc.); digital resource management (upload, search, annotation); creation of project "spaces" (allowing project teams to manage membership, aggregate digital artefacts, organise activities according to project stages); privacy controls; publishing of blogs and wikis; execution/monitoring of work ows. Each of these activities is enabled by a rich and pervasive metadata infrastructure that allows researchers to describe their evidence resources and research methods, and to situate these within a social network connecting people, projects, digital artefacts and research activities. To allow users to create, query and browse metadata we have created the LIBER interface

(Hielkema, Mellish, and Edwards 2008); this employs natural language generation techniques to provide access to hybrid semantic-social metadata.

Three OWL-Lite ontologies are used by *ourSpaces* (inspired, in part, by the Open Provenance Model specification (Moreau et al. 2007)). These model *agents* (people, organisations), *scienti c resources* and *research tasks* and the relationships between them. Folksonomies are associated with each property within these ontologies, so that users may develop their own domain vocabularies. We are also exploring how such vocabularies can be made more specific to contexts such as a particular project collaboration, while still preserving external connections to other projects or communities. Instance data created from these ontologies forms an enhanced social graph which connects not just people and Web pages, but researchers, organisations, scientific resources and the activities in which those individuals participated. We argue that such a graph is essential to capture the social characteristics of the scientific process (De Roure 2008) and to facilitate the discovery and interpretation of knowledge generated by others.

Other VREs include myExperiment (De Roure and Goble 2007), an environment that allows users to publish work ows to an online community, and which supports common social networking functions including tagging and commentaries. VERA (Virtual Environment for Research in Archaeology) (Baker et al. 2008) allows researchers to document their field activities in a customisable portal framework with features for enhanced collaboration. While *ourSpaces* also supports a range of Social Web features, it differs from these other VREs in a number of ways. All resource and task descriptions are situated within an interconnected provenance representation, providing an audit trail for researchers and policy makers; in addition, *ourSpaces* has been designed to blend ontologies and folksonomies throughout.

ourSpaces uses several technologies to realise the social semantic web vision. These include the Sesame[1] RDF triple store, a tag database (used to manage folksonomy information), and a digital object repository (to provide local storage of research resources). The VRE provides access to a range of external Web and Grid services, and provides tools to allow users to manage layout of their home and project

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[1]http://www.openrdf.org/

Figure 1: A user's home page in the *ourSpaces* VRE.

pages by selecting from a range of components, including tag clouds and timeline views.

Demonstration Content

During the demonstration, we will present the *ourSpaces* prototype and will perform a walkthrough of its various features as follows:

A user's personal home page (Figure 1) and the associated customisation features including component selection and appearance; this will be followed by a brief demonstration of the standard Social Web features (such as contact lists, messaging and tagging).

Space browsing and creation features, including creation of a new project space.

Resource management facilities, including resource upload and creation of descriptions using the LIBER metadata interface which exists within *ourSpaces*. This part of the demonstration will also illustrate how lightweight metadata (in this case, folksonomies) are integrated with ontologies.

The enhanced social graph and provenance. Methods for creating and visualising the interconnected graph of researchers, resource and task descriptions, and the associated digital artefacts will be presented; these include a timeline component.

Multiple approaches to searching and navigation; users can search via tag clouds, keywords or using the LIBER natural language interface.

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