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The Vitro Integrated Ontology Editor and Semantic Web Application

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Abstract. Vitro is an open-source, community-driven semantic web application development platform best known as the software underlying the VIVO researcher networking tool (http://vivoweb.org). Vitro has been developed since 2003 primarily to support VIVO, first at Cornell and since 2009 as a scientist networking platform for the NIH-funded VIVO Consortium of seven universities, research institutes, and medical schools in the U.S., VIVO: Enabling National Networking of Scientists. VIVO integrates the Vitro software with the VIVO core ontology and a thin software layer to support editing functions and visual theming specific to that ontology. Vitro provides three major functions in a single web-based tool: OWL ontology creation, import and editing; import or interactive creation and editing of RDF content conformant to the ontology; and display of the content in a public website with navigation, search, and browse features while also serving linked data to semantic web clients. Vitro makes it possible to develop ontologies and populate instance data for public-facing web applications within a single web platform. Because the results of ontology modifications are immediately reflected in the user interface, it also serves as a useful tool for distributed and collaborative cycles of ontology creation, population, review, and revision.

Keywords: VIVO, OWL ontology editor, linked open data, Drupal

Vitro [1] is an open-source, community-driven semantic web application development platform best known as the software underlying the VIVO researcher networking tool (http://vivoweb.org). Vitro has been developed since 2003 primarily to support VIVO, first at Cornell and since 2009 as a scientist networking [2] platform for the NIH-funded VIVO Consortium of seven universities, research institutes, and medical schools in the U.S., VIVO: Enabling National Networking of Scientists [3]. VIVO integrates the Vitro software with the VIVO core ontology and a thin software layer to support editing functions and visual theming specific to that ontology.

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For applications requiring additional functionality offered by a complete content management platform, the open-source RDFimporter module [4] for Drupal [5] has been developed to pull remote RDF resources from Vitro or other RDF sources and map their content to Drupal nodes. The College of Agriculture and Life Sciences Research and Impact portal [6] at Cornell demonstrates the re-use of Vitro-hosted RDF in Drupal with the addition of map views and customized faceting of search results.

An internal authorization system provides role-based control over core system functions and ontology or content editing actions, and Vitro has been successfully linked to institutional authentication systems using Kerberos and Shibboleth for end-user content editing.

Vitro is a Java application for the Tomcat servlet container. It uses the Pellet library [7] for reasoning and the Jena library [8] to store

the ontology and instance data, and can be configured to use the variety of database back ends supported by Jena.

In addition to the VIVO project, Vitro software is being used by the Data Staging Repository (DataStaR) [9] at Cornell and has been adapted and extended by groups in Australia [10] and China [11], [12].

The Vitro open-source platform is available for checkout from Subversion at http://vivo.sourceforge.net. A short video demonstration of VIVO is available at http://vivoweb.org/video-library.

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