# Chapter 3.6
# Architecture of the Organic.Edunet Web Portal

**Nikos Manouselis**
*Greek Research & Technology Network (GRNET S.A.), Greece*

**Kostas Kastrantas**
*Greek Research & Technology Network (GRNET S.A.), Greece*

**Salvador Sanchez-Alonso**
*University of Alcalá, Spain*

**Jesús Cáceres**
*University of Alcalá, Spain*

**Hannes Ebner**
*Royal Institute of Technology (KTH), Sweden*

**Matthias Palmer**
*Royal Institute of Technology (KTH), Sweden*

**Ambjorn Naeve**
*Royal Institute of Technology (KTH), Sweden*

## ABSTRACT

The use of Semantic Web technologies in educational Web portals has been reported to facilitate users' search, access, and retrieval of learning resources. To achieve this, a number of different architectural components and services need to be harmonically combined and implemented. This article presents how this issue is dealt with in the context of a large-scale case study. More specifically, it describes the architecture behind the Organic.Edunet Web portal that aims to provide access to a federation of repositories with learning resources on agricultural topics. The various components of the architecture are presented and the supporting technologies are explained. In addition, the article focuses on how Semantic Web technologies are being adopted, specialized, and put in practice in order to facilitate ontology-aided sharing and reusing of learning resources.

Copyright © 2010, IGI Global, distributing in print or electronic forms without written permission of IGI Global is prohibited.

## INTRODUCTION

Following their introduction and commercial growth after 2000, Web portals have lately attracted increased research interest that focuses on a variety of aspects such as their business models, interface design, technical development, or their quality (Mahadevan, 2000; Tatnall, 2005a; Moraga et al., 2006; Tatnall, 2007). The term Web portal has been initially used to refer to well-known Internet search and navigation sites that provided a starting point for web visitors to explore and access information on the World Wide Web (Warner, 1999; Winkler, 2001). A Web portal can be generally viewed as a single, distilled view of information from various sources that integrates information, content, and other software services or applications (Averweg, 2007). Therefore, today Web portals can be simply defined as *gateways to information and services from multiple sources*, and their continuous development has been highlighted by relevant publications (Tatnall, 2005b).

A type of Web portals with particular interest are educational ones (Conceicao et al., 2003; Boff et al., 2006). Educational Web portals generally serve as gateways to information and services of some learning or teaching relevance and may cover a variety of types. They range from institutional Web portals that provide access to course listings and institutional information (such as Ethridge et al, 2000), to community portals that serve the needs of particular communities of learning and practice (such as DeSanctis et al., 2001; Luke et al., 2004). One category of educational portals that have recently received considerable interest (Neven & Duval, 2002; Richards et al., 2002; Hatala et al., 2004) is that of Web portals that provide access to some organized collection of learning resources. These portals usually facilitate users' access to the content in one or more learning repositories – that is, to database systems that facilitate the storage, location and retrieval of learning resources (Holden, 2003). Popular examples include both independent learning resources' portals such as MERLOT (http://www.merlot.org) and Teachers' Domain (http://www.teachersdomain.org/), as well as portals that list or aggregate learning resources from various other sources (e.g. other portals or repositories) such as OERCommons (http://www.oercommons.org).

Richards et al. (2002) stress that Web portals with learning resources may offer a wide variety of services based on what they seek to give to the user community behind them, although the more common are those aimed at facilitating users' search, access, and retrieval of the resources. For this purpose, they include services that will facilitate these processes, utilizing different types of user-related information (such as personal preferences) or resource-related information (such as the learning resource characteristics). One of the most recent trends in portal development is the use of Semantic Web technologies (Maedche et al., 2001). Semantic Web is an evolving extension of the World Wide Web (WWW) in which web content can be expressed not only in natural language, but also in a format that can be read and processed by software systems, thus permitting them to find, share and integrate information more easily (Berners-Lee, 1998). Numerous applications and case studies of Semantic Web technologies (e.g. ontologies for annotating information and expressing its semantics in a machine-processable manner) have been reported during the past few years. For instance, the World Wide Web Consortium (W3C) reports on several systems that have been put in production in existing organizations, as well as a number of commercial products (http://esw.w3.org/topic/CommercialProducts). Yet, the Semantic Web technologies have not so far reached the wide public. Some of the experts in the field claim that the reason is that large-scale applications, serving the needs of large user communities, have not been delivered yet (Shadbolt et al., 2006). To further illustrate their potential (and especially for Web portals), there is a need for implementing state-of-the-art Semantic Web

13 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:
www.igi-global.com/chapter/architecture-organic-edunet-web-portal/37661

## Related Content

Analysis of User's Browsing Behavior and Their Categorization Using Markov Chain Model
Ratnesh Kumar Jainand Rahul Singhai (2017). *Web Usage Mining Techniques and Applications Across Industries (pp. 29-79).*
www.irma-international.org/chapter/analysis-of-users-browsing-behavior-and-their-categorization-using-markov-chain-model/162888

Checking Opacity of Vulnerable Critical Systems On-The-Fly
Amina Bourouis, Kais Klai, Yamen El Touatiand Nejib Ben Hadj-Alouane (2015). *International Journal of Information Technology and Web Engineering (pp. 1-30).*
www.irma-international.org/article/checking-opacity-of-vulnerable-critical-systems-on-the-fly/135302

Access Control and Information Flow Control for Web Services Security
Saadia Kedjar, Abdelkamel Tariand Peter Bertok (2016). *International Journal of Information Technology and Web Engineering (pp. 44-76).*
www.irma-international.org/article/access-control-and-information-flow-control-for-web-services-security/150001

The Pedagogical Implications of Web 2.0
Matthias Sturm, Trudy Kennell, Rob McBrideand Mike Kelly (2010). *Web Technologies: Concepts, Methodologies, Tools, and Applications (pp. 1536-1553).*
www.irma-international.org/chapter/pedagogical-implications-web/37702

Biometric Cloud Services for Web-Based Examinations: An Empirical Approach
Meennapa Rukhiran, Sorapak Pukdesreeand Paniti Netinant (2022). *International Journal of Information Technology and Web Engineering (pp. 1-25).*
www.irma-international.org/article/biometric-cloud-services-for-web-based-examinations/299022