

Chapter 2

Combining Semantic Web and Web 2.0 Technologies to Support Cultural Applications for Web 3.0

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ABSTRACT

The aim of this work is to help cultural web application developers to benefit from the latest technological achievements in Web research. The authors introduce a 3-tier architecture that combines Web 2.0 principles, especially those that focus on usability, community and collaboration, with the powerful Semantic Web infrastructure, which facilitates the information sharing among applications. Moreover, they present a development methodology, based on this architecture, especially tailored for the cultural heritage domain. Cultural developers can exploit this architecture and methodology in order to construct web2.0-powered cultural applications with rich-content and responsive user-interface. Furthermore, they outline some indicative applications in order to illustrate the features of the proposed architecture and prove that it can be applied today and support modern cultural web applications.

DOI: 10.4018/978-1-60960-044-0.ch002

INTRODUCTION

Although modern cultural web applications increasingly tend to adopt the technologies and trends of web evolution in general, there is still a lot to be done in order to keep up with the latest advancements in web application development.

Current trends in Web research and development seem to revolve around two competing, at first sight, approaches: Web 2.0 and the Semantic Web. Although Semantic Web and Web 2.0 were firstly introduced separately by groups with completely contrary beliefs on the evolution of World Wide Web and even targeting different audiences, they are complementary visions about the evolution of web applications, that can learn from each other in order to overcome their drawbacks, in a way that enables forthcoming web applications to combine Web 2.0 principles, especially those that focus on usability, community and collaboration, with the powerful Semantic Web infrastructure, which facilitates the information sharing among applications.

In addition, both Semantic Web and Web 2.0 principles will be the two major technological pillars in next generation's web applications, often entitled as the Web 3.0 (Lassila & Hendler, 2007; Hendler, 2008).

In an attempt to help cultural web application developers to benefit from the latest technological achievements in Semantic Web and Web 2.0 areas, in this work we propose a methodology for cultural web applications development based on a 3-tier architecture. This architecture can support the structuring and development of complicated rich-content cultural web applications that will fit into the Web 3.0.

At the lower tier of the architecture, there is an advanced semantic knowledge base infrastructure that can support integration of multiple disparate cultural data sources, without requiring a concrete underlying semantic structure. In addition, the upper tiers of the architecture provide greater flexibility in the user interactions with the underlying

ontological data model. As a result, it supports user collaboration and community-driven evolution, core features of the next generation cultural web applications.

This architecture, supported by the respective methodology, gives the developers the ability to build complicated web applications for the cultural heritage domain which combine the philosophy of Web 2.0 applications, and the powerful technical infrastructure of the Semantic Web.

The following text is organized in five sections. In section 2 we start by providing some broad definitions and discussing the concepts of Semantic Web and Web 2.0. Furthermore, we discuss the need for their adoption by the cultural web developers. In section 3, we describe some specific cultural web projects that make use of either Semantic Web or Web 2.0 technologies, some of which were developed by our team. In section 4, we describe in detail the proposed architecture, its components, as well as the corresponding methodology for developing web applications for the cultural domain, and we outline some indicative applications in order to illustrate the features of the proposed architecture and prove that it can be applied today and support modern cultural web applications. Finally, we summarize our conclusions.

BACKGROUND

A modern cultural web application, because of its specific nature, has to comply, not only with the specific information-structuring and retrieval requirements of the cultural heritage domain, but also with the innovations of web technologies in general.

As every human conceivable domain, cultural heritage is hard to be accurately modeled. In addition and due to its nature, cultural heritage information use to be hidden in libraries and museum archives, and when available on-line is usually poorly or not at all structured. In such a

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