

# Chapter XLI

## Digital Libraries Beyond Cultural Heritage Information

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### ABSTRACT

*This chapter introduces digital libraries as a means of cultural heritage access and diffusion. It argues that digital libraries, combined with superimposed information techniques, offers a potentially more substantive approach to understanding the historical documentation analysis problem. Furthermore, the authors hope that understanding the documental and technological assumptions constructs through the use of programming and automatic interpreter will not only inform researches of a better scheme for labelling cultural heritage information but also assist in the need of involved other areas such as multiagent systems, pattern matching, information management and information visualization based on content association, to solve the vast majority of problems set out in the work context, and the result is a versatile digital library prototype which covers the cultural heritage information that the users need.*

### INTRODUCTION

Thanks to a research project granted by the Regional Ministry of Science, Technology and University, the research work team has detected problems in the limitations of the classical mod-

els of representation and information retrieval which are insufficient due to the large amount of information at the potential users' disposal. These problems were seen as serious in the second half of this decade, and they were the origin of Berners-Lee and Fischetti's (1997) new proposal known as the semantic Web.

The experiences and the projects undertaken to date have been gradually revealing that the approaches based on the mere digitalization of the information and documentation on cultural heritage are not sufficient to face the information needs of the different types of users. The immense amount of multimedia information about cultural heritage does not come with the complementary referential information that the users need (Crane, 2002).

The chapter is organized as follows: a background about the more relevant cultural heritage digital library contributions using labelling languages. The second section describes the problem of managing historical documentation in digital format, the methodology followed to develop an automatic interpreter, which analyzes and manages historical texts, the role of a built-in multiagent system to improve the information retrieval process combined with pattern matching techniques and the information management and visualization. Finally, the last section presents some concluding remarks.

## **BACKGROUND**

By and large, cultural heritage digital libraries are characterized by the diversity of their collection contents (Crane, 2002). The bibliography available on these digital library types shows that in situations of heterogeneity, the metadata schemes used to describe the different contents become extremely important since they are used to deal with problems related to information retrieval and interoperability. Baldonado, Chang, Gravano, and Paepcke (1997) proposed a metadata-based interoperability model which used the Dublin Core (Tolosana-Calasan, Noguera-Iso, Béjar, Muro-Medrano, & Zarazaga-Soria, 2006) and MARC schemes (Chandler, Foley, & Hafez, 2000).

Given its simplicity, the use of the nonqualified Dublin Core Metadata Scheme in cultural heritage digital libraries predominates.

Nevertheless, the use of Dublin Core presents problems which have been pointed out by some researchers. Foulonneau, Cole, Habing, and Shreeves (2005) posed the problem, which assumes the lack of consistency of the Dublin Core metadata in OAI repositories. The comparative study on repositories with cultural heritage metadata undertaken by Hutt and Riley (2005) pointed out it and Halbert, Haczmarek, and Hagedorn (2003) had already warned about the problems detected in the use of Dublin Core in these contexts.

In the field on which our work centers, the use of Dublin Core has had to be gradually completed by integrating tools which offer the semantic relations that the metadata scheme does not offer (De Gendt, Isaac, Van Der Meijt, & Schlobach, 2006). So, we can present two starting points from the works reviewed:

1. Dublin Core is excessively simple for its use in cultural heritage digital libraries without other complementary schemes.
2. A more complete model must be proposed which incorporates a descriptive metadata scheme of both an element and collection type, and the description tool scheme (thesaurus, ontology).

## **HISTORICAL INFORMATION ANALYSIS**

The Web information service, under consideration, is the Digital Aragon Encyclopedia (<http://www.enciclopedia-aragonesa.com>).

Since the cultural heritage information preservation is a very wide and diverse field; the current chapter shows how to manage a portion of this information: historical texts.

Currently, there are two aspects to deal with the task of historical text analysis in digital libraries. It is obvious that by means of human effort it is possible the whole analysis of all the existing

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