World Heritage Digital Library in Portugal: The Convent of the Order of Christ and the Castle of the Order of the Temple

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Abstract: Creating a Digital Library for the Convent of Christ and Templar Castle will gather vast resources with information related to these monuments and related to themes within them (e.g. Templars, Discoveries). Our goal is to contribute to the Europeana Digital Library with items coming from the Digital Library of the Convent of Christ and items coming from the other world heritage monasteries classified by Unesco in Portugal. Those contents may be not only architecture plans, manuscripts or photographs, but also publications of different origins today unknown or in dispersed owners. New education services and new other services like the access to information through a PDA during the visit to the monument can be promoted. Also, new merchandising and new tourist products can be developed to commercialize either locally or through ebusiness. This project promotes better culture understanding, innovation, research and development, tolerance and a new awareness of the common European heritage by having it new and online.

1. Introduction

The Portuguese Institute for Management of the Architectural and Archaeological Heritage (IGESPAR), is responsible for World Heritage in Portugal and has created a "Route through World Heritage Portuguese Monasteries" involving the creation of an open knowledge network. The nodes of that route are the Convent of Christ in Tomar, the Monastery of Batalha, the Monastery of Alcobaça, and Monastery of Jerónimos in Lisbon.

The Polytechnic Institute of Tomar (IPT) as a higher education school has a Department of Information and Communication Technologies and has an eLearning Center, both having specialized human and technical resources.

The multidisciplinary competences of the IGESPAR and of the IPT resulted in promoted the "Thousand Years of Wisdom, from the Middle Ages to the 21st century" initiative aiming at applying ICT to the Convent of Christ by creating new products, services and applications. One measure already done was the development of the web site of the Convent of Christ in which is an option to access to it Digital Library.

A new digital library is being created as a result either of digitization of some items or as an aggregation of scanned items. Those include contents such as texts (printed or hand written), maps, iconography, videos about the Convent of Christ or others. The concept is to

replicate this experience at the Convent of Christ to other monasteries in the Route, as well as to any other European world cultural heritage.

In this article, we will shed light on the information concerning the Route's Monasteries, the way this information will be retrieved and organized in a database that will fulfill the requirements posed by Europeana in terms of metadata. Finally, we will focus on a group of new products and services that can be offered to the citizens.

2.   Objectives

There is a significant amount of knowledge about the Castle of the Templars and about the Convent of Christ that is not digitalized and it is dispersed. The same happens to other Portuguese world heritage monasteries. That knowledge is very important once of the wisdom that exists in itself - such as history, government, social organization, art and architecture, religious and military Orders (Cister Order, Templar Order and the Order of Christ), discoveries, renaissance and main battle grounds. That knowledge is also important because of what it represents for the world cultural heritage.

Once doing the website of the Convent of Christ the idea of creating a digital library happens. We thought about doing the same for other Portuguese world heritage monasteries and so that having this important heritage preserved and accessible by the citizens.

Monasteries are groups of buildings concentrating richness, complexity and thematic multiplicity both within themselves and in terms of urban and territorial development. In the middle Ages, large part of the economy, society and culture evolved around the monasteries. Monasteries were centers of territorial structuring and development that were based on the interaction of religious communities, and often military communities with the local community. In this globalization era, they will contribute to sustainable development, as well as social integration.

What better lessons can contemporary man draw from its heritage and cultural inheritance if not from the monasteries and their legacies?

As a matter of fact, their meaning throughout the ages constitutes a reference of values with a remarkable meaning today, as keys to the transformation of "old" knowledge into "new" knowledge. There isn't in Portugal an integrated collection to be made available to the public, as its photographic, documentary and artistic holdings are spread in different places as a result of conflicts and natural disasters. The purpose of this work was therefore to create a digital library with contents from world heritage monasteries.

Having that library, it is possible to access information anytime from anyplace. Accessing information that is coming from different sources (Convent, IGESPAR, partners, associations, web 2.0, other sites, etc.) in different formats (doc, pdf, mpg, mp3, jpg, gif, png, tiff, rtf, ram, wav), in a multilingual platform, and in a personalized way.

We intend to create elearning services with learning objects, e-books, downloading by promoting it through eMarketing. The contents can be accessed pay per view or not. The user can also do searching, selection, capture and integration of the information. The website will have a publicity area and the layout will be accordingly to the using.

A methodology to have the assessment of the results is being prepared.

3.   Methodology

Civil, military and religious entities, public and private, national and international are involved in collecting information for the Route.

As far as technology is concerned, digital libraries are one of the most advanced, complex information systems, as they often involve collaborative support, digital preservation of documents, database management, hypertext, information filtration and

retrieval, instruction modules, copyrights and IPR, multimedia information services, reference systems, resource research and selective dissemination of information.

A new look into traditional library information services will only be possible as a result of the digital preservation of contents in two perspectives: digitizing physical documents and preserving web documents. Within this context, search engines are a priority element in the new paradigm of knowledge creation, as they can capture, store and give access to resources, while making a digital library available in each computer with internet access.

4. Technology Description

The development of digital libraries dates back several years but, in the beginning they were confined to the digitalization of contents. In 1996 it was created the Internet Archive, the first Project of digitalization of WebPages. In the next Figure 1 it is possible to observe different versions kept in the Internet Archive from the Google website.

Search Results for Jan 01, 1996 - Nov 09, 2008										
1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
2 pages	12 pages	73 pages	685 pages	154 pages	61 pages	205 pages	910 pages	348 pages	458 pages	24 pages
Nov 11, 1998 *	Jan 17, 1999 *	Feb 29, 2000 *	Jan 18, 2001 *	Jan 23, 2002 *	Feb 02, 2003 *	Jan 03, 2004 *	Jan 01, 2005	Jan 01, 2006 *	Jan 01, 2007 *	Jan 02, 2008 *
Dec 02, 1998 *	Jan 25, 1999 *	Mar 01, 2000 *	Jan 19, 2001 *	Jan 24, 2002 *	Feb 04, 2003 *	Jan 13, 2004 *	Jan 01, 2005 *	Jan 01, 2006 *	Jan 01, 2007 *	Jan 02, 2008 *
	Feb 08, 1999 *	Mar 01, 2000 *	Jan 19, 2001 *	Jan 24, 2002 *	Feb 05, 2003 *	Jan 21, 2004	Jan 02, 2005	Jan 01, 2006 *	Jan 02, 2007 *	Jan 14, 2008 *
	Apr 22, 1999 *	Mar 02, 2000	Jan 19, 2001 *	Feb 06, 2002 *	Feb 08, 2003	Jan 26, 2004	Jan 02, 2005 *	Jan 02, 2006 *	Jan 02, 2007 *	Jan 16, 2008 *
	Apr 23, 1999	Mar 03, 2000	Jan 19, 2001 *	Feb 22, 2002 *	Feb 14, 2003 *	Jan 29, 2004	Jan 03, 2005	Jan 02, 2006 *	Jan 03, 2007 *	Jan 19, 2008 *

Figure 1: Part of the Results Obtained in the Internet Archive for Google Website

Afterwards, the boom and the use of the Internet never ceased to increase. Internet is considered today a huge information center, nevertheless not yet a Digital Library due to the disappearance of millions of WebPages, usually 44 days after its creation.

In this extremely quick and permanent evolution and the almost exclusive characteristic of publication of the online contents, most projects are focused only on the digitisation process. If nothing is done, a great number of web contents will disappear, thus making the web a one-dimensional space with only one version of each page. A new perspective to promote these Digital Libraries assumes two forms: physical digitalization and preservation of web pages, both of considerable growth in the coming years [1].

At an international level a number of initiatives in the area of web preservation have been explored and leaded by research teams, yet restricted to the capture of a specific team or area of research, but none in the field of the world heritage. Our project is therefore centered in the contribution to the preservation of digital culture and knowledge protection and by doing so preventing the loss or disappearance of contents.

We propose a system (see Figure 2) designed for research, collection, preservation and retrieval of information in this specific area based on the digitization of physical material and on the preservation of digital contents. Considering the main area of interest of this project the retrieval of information in a first phase should be based upon a selective capture of contents by opposition to a random selection.
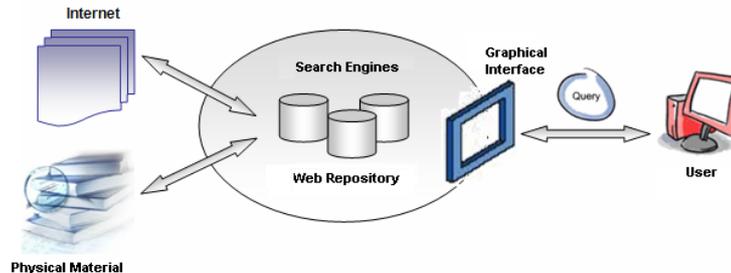

Figure 2: Architecture.

If it is true that the existence of the Digital Library within information systems is a step forward in the contents preservation it is no less true that it should be executed with a clear definition of an access online to the resources [2].

www.eChallenges.org

The system is designed to allow the management of digital objects including text, images, audio and video, metadata, the access and display of such items and a database for the users to search and browse through metadata in the personalized indexes. It also allows advanced search through free text in full text documents, visualize digital objects and store, print and send by email the desired registers thus allowing managing a great variety of digital objects in different formats such as: text (DOC, PDF, RTF); image (GIF, JPEG, TIFF); audio (MP3, RAM, WAV); and video (MPG, QuickTime, RM).

The system is based on item cataloguing through the use of metadata. Today coexist different standards of metadata differentiated by the number of elements, its characteristics, the language code [3] and so on.

We consider the use of the structure Dublin Core identified by ISO 15836-2003 e NISO Z39.85-2001 more appropriate for the Digital Library of the Convent of Christ. This structure has been developed since 1995 with the objective of improving the research of digital contents and received contributions from librarians, digital libraries researchers, contents specialists and metadata experts [4]. This Content Management System (CMS) has two levels – simple Dublin Core and Qualified Dublin Core.

The simple Dublin Core has 15 elements and the Qualified Dublin Core has 18 as well as a group of descriptors making the search more accurate [4]. Dublin Core metadata structure is translated into 25 languages, including Portuguese, and has already been adopted formally by 7 governments [5].

This metadata structure code may be achieved through meta elements HTML/XHTL [6], using the language XML [7] or the language RDF/XML [8].

The Illinois Digital Cultural Heritage Community Project, The National Library of New Zealand and Europeana are among a many digital libraries using standard Dublin Core.

The Europeana was launched by the European Commission in 2005 to open to the citizens the scientific and cultural heritage of the 27 member states. Through this portal is possible to search, and simultaneously browse, the digitalized collection of European libraries, archives and museums. The need to ensure that the Convent of Christ Digital Library is accessed through Europeana made us consider, from the very beginning, all the metadata fields (see Table 1) as defined by Europeana Semantic Elements (ESE).

Table 1: Some of the Europeana Semantic Elements (ESE) [9]

Element	Refinements	Data Set	Definition
Title		DCMES	A name given to the resource.
	title alternative	DCMES	An alternative name for the resource.
creator		DCMES	An entity primarily responsible for making the resource.
subject		DCMES	The topic of the resource
…	…	…	…
hasObject		Europeana	Indicates the availability of thumbnails of digital objects for the Europeana system to understand and process them.
country		Europeana	This is the name of the country in which the content provider is based or "Europe" in the case of Europe-wide projects.

5. Developments

In the very beginning of the project, it was developed a database using Simple Dublin Core (see Figure 3) which enabled the store of all digital resources related to the Convent of Christ during the development of its portal (www.conventocristo.pt)

Figure 3: Form for Digital Contents of the Convent of Christ

To meet the standards of the Europeana, the missed metadata fields were added and an insert content system was developed (see Figure 4).

Figure 4: Content Insert Resource Layout

For those tasks, two web applications are being developed and a database was created. The database was created using the open-source Sun (MySQL) for its clear advantages. The management of the database was made using phpMyAdmin.

We create front and back office applications to allow the user to browse or search the contents or to insert, add, edit or erase the contents in the system, given the necessary username and password. These tools also permit to define the profile of the users who can interact with the system, permissions and tasks, and all the system management, what it is called our Content Management System.

6. Results

To meet the needs of the information about world heritage monasteries in Portugal, is a huge task requiring different levels of simultaneous search of diversified and dispersed information. This can be achieved through creating virtual exhibitions or participating in exhibitions or searching the digital library throughout the world.

One of the strategic objectives of the Portuguese Institute for Management of the Architectural and Archaeological Heritage, IGESPAR, concerns the Education for Heritage, part of the European recommendation[i] to reinforce citizenship and European identity.

Figure 5: Example of a Search

The digital library created at the world heritage monument, Convent of Christ, is designed to be accessible to the public in general but also to teachers, students and researchers enhancing the sharing of data to a universal level. It also allows that the contents of important libraries such as the Convent of Mafra and University of Coimbra can be linked to this Library with benefits for all citizens.

We intend to have a large amount of information that can be searched in an interactive and personalized way. Also, we pretend to have a layout that is automatically adapted to on the main options that users choose when browsing the library.

7. Business Benefits

The creation of a Digital Library of the Convent of Christ generates business benefits namely in what concerns the development of a diversified offer of new services and products in a perspective both cultural and tourist.

New specific merchandising products can be designed with an innovative and artistic spirit. As an example, we may refer the creation of items based on the iconography of the Templar rotunda or from the cross of the Christ or from the cross of the Temple or from a selection of a variety of the mythology and Angels, among others that the monument displays. Another example can be the selling of facsimile documents.Another important service is that to give access online to information through a PDA during the visit.

Also, thinking about tourism, we can associate to the monasteries route different packages of cultural and environmental touring. For example, from an advanced search on the digital library, it can be selected a theme that enable the visitor or the tourist operators to prepare a personalized tour (e.g. gothic architecture). Again as an example, we have themes related to the Orders of Templars, Christ and Cister, artistic and scientific, and also relating to personalities so important as the poet Luis de Camões. Offers to users such as search, integration, interactivity, games, simulation, will create new markets and increase number of visitors promoting diffusion & sharing of knowledge of world cultural heritage.

8. Conclusions

The Digital Library of the Convent of Christ may improve services, as well as the quantity and quality of digital contents, and provide access to cultural assets that were previously scattered or not scanned. As a result, a considerable part of our European collective memory will be available online for study, research, creativity, learning and leisure.

Besides, this system will enable citizens to appreciate their heritage along their lives in a multicultural and Multilanguage context. Online access to the richness and diversity of our European culture will ensure its protection from irreparable damage. The results of scientific intervention, conservation and restoration of built heritage, studies, research, articles in journals, presentations, proceedings monographs, and books will be compiled and included in the digital library. Scientific information that is spread out in various higher education institutions will be compiled, while scientific discoveries will be made available.

As a consequence, all citizens will have to gain from being able to visit the monasteries from their homes or from their classrooms in preparation of the real visit.

As more metadata is added to fulfill the requirements of Europeana, more information will be available about European heritage.

Besides, this cultural material provides new value-added services and contributes to sectors like tourism, education and the media. Cultural contents for education and lifelong learning will be improved, which will also be reflected in cultural and creative skills.

The "corpus" created will serve the existing public and create a new public, shed light on different epochs of fundamental importance for the History of Mankind, and become a repository of modern studies for researchers, scientists and experts from all over the world.

The existence of a digital library will ensure a renewed interest not only in our monumental complex – the largest in Europe – but also as a way of preserving eternal values such as memory, authenticity and identity that are common to different countries and continents. Next step is to develop WebPages for the other monasteries and simultaneously classifying the defined metadata. Then, in an experimental phase give access to the information of all the monasteries and develop an assessment method of results.

So far, the main difficulties that we have had are related to different views for the classification of the information and difficulties in gathering so many items dispersed for so many sources and places. Our main challenge is that to obtain added value from the new services that will sustain the all over activity of maintenance and growing.

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[i] Recommendation No R (98) 5 concerning heritage education , adopted by the Committee of Ministers on 17 March 1998.