A Web Oriented Database for Archaeological Spreading

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Abstract

We would like to illustrate one work developed inside "Prisma Project" (coordinated by Prof. Franco Niccolucci) presented during last CAA. The aim of the project was to test informatic instruments for archaeological museums. Our case of study was the creation of a web site for the Archaeological Museum of Grosseto - Italy. During this work it was decided to create a "virtual section" of the museum to allow people to look at objects not available in the showcases (in this case a collection of coins).
For this purpose we have utilized a web oriented DB made with Postgre and dynamic PHP pages. Omitting details of the DB plan, we have made an on-line publication, in our opinion interesting:
1. It communicates archaeological contents with a simple language.
2. It allows a guided consultation of the objects organized, in this case, in chronological phases.
3. The research form contains lists of key words to help not specialist users.
4. This work includes some forms (made with PHP) to update, to delete or to insert new data, using a simple internet connection.
This prototype can be utilized for other purposes easily.

Introduction

This contribution reports the experience of one of the case-studies realized during the PRISMA project. [1]

The objective of the present case-study was to define a method to allow people to look at objects, usually not visible, stored in museums warehouses. The presence of "invisible" materials is important specially in small archaeological museums in Tuscany addressed by the Prisma project. We want to underline that this work has been thought for a specific user that we define "general public".[2]

Focusing on this target audience, we planned work as follows:

1. Define needs and limits of small archaeological museums.
2. Chose the best method for web-publishing, determining:

   I. Tools
   II. Techniques
   III. Structures

Needs and Limits of small Archaeological Museums

Small archaeological museums in Tuscany present a series of problems:

- Many artefacts.
- Low budget.
- Few employees.
- Small space for exhibitions.

So often many artefacts are not visible, there are few publications on paper either to help visitors during the tour of the museum or for increasing visitors' knowledge about the history and culture of the civilizations that made the exhibited artefacts. Then, the few employees and the low budgets don't allow an adequate number of guided visits. In sum there are poor services for the "general public".

In the light of these facts the goal is to determine how small museums can give better services and, above all, show all their archaeological collections without increasing their budgets.

Our idea was to create for the museums one or more "virtual" expositive sections. In this case "virtual" does not refer to reconstructions known as "virtual reality", too expensive for these institutions, but it means merely "not real" exhibition, we can also call it cyber- exhibition.

Our aims were, therefore, to let museums show their archaeological collections, to increase visitors' satisfaction and to keep costs low.

The solution could be a web oriented publication, integrating the museum web sites with this "virtual section". A web publication can be consulted either in the museum, creating an internet area is really a low cost solution, or at home.

Web Publishing for Archaeological Collections

We decided to test this web-oriented publication with the small heterogeneous numismatic collection of "Museo archeologico e d'arte della Maremma, Grosseto".[3]

After the decision to use the Internet to communicate archaeological content the main problem was choosing the best way to do it. We also considered that this product should grow with the contribution of the museum employees, usually unable to manage web editors. So we analyzed two ways of web-publishing: static HTML pages and dynamic pages with a database management system in the background.

Static Pages vs. Dynamic Pages

We think that is clear that the biggest problem for small archaeological museums is money, so in the following analysis we considered mainly costs. We divided cost in two classes: development cost and management and expansion cost.

[1] Static pages

[1.1] Development cost

The starting cost for developing static pages is definitely lower than for developing dynamic pages. The following steps are required

1. Data analysis
2. Data structure design
3. Creation of static web pages (one by one the cost is lower, but even the publication of a small corpus needs the creation of a lot of pages), requiring these following sub-steps.
    1. Layout design
    2. Pages construction (editing).

[1.2] Management and expansion cost

To extend the on-line publication it is necessary to know the use of an HTML editor and of an FTP client. Moreover any change in the graphic layout or in the page structure requires re-building all the pages, and this is very expensive. As far as accessibility is concerned static web pages allow only a visit along a pre-built path.

[2] Dynamic pages

[2.1] Developing cost

At the beginning the cost is higher than static HTML. The following steps are required:

1. Data analysis (*)
2. Data structure design (*)
3. Database creation
4. Creation of dynamic web pages, more expensive then static pages, requiring the following two sub-steps
    1. Layout design (*)
    2. Pages construction (programming).

(*) Required also for static HTML

[2.2] Management and expansion Cost

Extending the on-line publication (in our case) is very simple because inserting, updating or removing one record from the database can be done using web interfaces, no computer science skill is not necessary and the task can be performed by museum employees.

Also the cost of changing the graphic layout is lower because just few pages need to be changed. Moreover, and really important for users, dynamic web pages allow a visit along a pre-built path but also using search forms.

And the Winner is...

Analyzing pros and cons, we decided to develop a database and dynamic pages, in particular because we wanted to give the museum an easy tool to widen the publication of its collections. Following project aims we chose to develop the system using open sources software, that is:

OS = Linux
Web server = Apache
DBMS = Posgree SQL
Server side pages language = Php

Something to Remember for Web Oriented Database

Using the World Wide Web you open your data to everyone who is connected, so having in mind that the target audience is the "general public", the language used for describing artefacts must be simple and it's better to create one or more guided paths for users, for instance a chronological path, a geographical path, one explaining technology and so on. All this may be easily created using data stored in the database.

Research forms must be friendly, they must show a list of key-words, either because the visitors are not experts or to avoid empty results deriving from inappropriate search terms.

Data searching in the numismatic database of "Museo archeologico e d'arte della Maremma, Grosseto"

In this work we decided to create a complete search form showing all the fields that can be used for data searching. Moreover also the page containing this form is dynamically generated, using the data stored in the database to create lists of keywords to avoid empty results. The user can choose to start a research using only one field or using more fields, in this case he can also change the Boolean operator to AND (default is OR).

The answering page collects the data submitted by the search form, then creates an SQL query depending on the Boolean operator and testing which fields are filled and which are empty. After this a connection to the database is opened and the query is submitted. Query results are used to create a web page following layout instructions listed in a separate php file. The resulting page is then displayed to the user.

Producing the code to generate the dynamic web pages (not only for searching the database but also for inserting new data and images) required two person/months work. Records were already available on paper, but not published by the museum.

This methodology can be applied to any kind of museum collection. It requires only the availability of records, generally produced in museums at least for administrative purposes, and some simple programming. We point out that all server side software used is open source and free,. therefore it can be easily adapted by small museums, regardless how small their budget may be. Our code for queries and display of results is freely available on request.

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1 One of the aims of this project, coordinated by Professor Franco Niccolucci, was to develop tools for multimedia dissemination of archaeological resources. See F. Niccolucci, M. Baldi et al.(2003).

2 People who want to get Archaeological information but do not necessarily have a professional know-how.

3 Archaeological and Art Museum of Maremma in Grosseto.

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