In Patrimonium: A Data Model for Museum and Cultural Heritage Information

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Abstract

In this paper we presented the process that lead us to In patrimonium, a data model for managing information in museum and cultural heritage organisations. We described the conditions of the project development, the context of Portuguese museums and the main goals for the development of the computer system.*

1. Introduction

Between 1997 and 1999 we participated in a project – GEIRA – directed by two Universities located in the north of Portugal (Universidade do Minho and Universidade de Trás-os-Montes e Alto Douro) the main goal of which was the use of the Internet and CD-ROMs to present information about Portuguese cultural heritage in the north of the country.

This project allowed us to develop a line of action dealing with the management of museums collections, paying special attention to archaeological museums. The reason for this was the importance of this kind of data in the region and also because no computer based tool for museums (in accordance to the recent international developments in museum information standards) is present on the Portuguese market.

The GEIRA project was organised in several ways according to three main themes: Science, Nature and Culture Heritage.

The Cultural Heritage theme was divided into several additional divisions. One, the museum, was defined with the following main goals:

- Establishment of a museums network
- Promotion of computer science
- Use of the Internet
- Research on computer science and museums
- Educational activity of museums with computer science.

According to an evaluation of museums' needs, we defined several activities with several levels of impact in museums' activity:

- Web pages: Development of web pages for about 50 museums. These pages present the museums, their collections and main activities.
- ISDN connections: 30 museums had an ISDN connection to provide Internet access, email and other facilities. This service included a help desk by email and phone.
- InfoMuseum: An information system for museums and museum professionals with several types of information organised in databases. An email distribution list is also being used in order to exchange information.
- Virtual Gallery: A VRML model used in order to allow museums the realisation of virtual exhibitions.
- Management of museums collections: Development of a computer tool which could be used for cataloguing and management of museum collections.

2. Management of museum collection

The development of this activity was based on the requirement of a system that could use all the international experience on standards and collections management. The increasing technological evolution with new boundaries like the Internet and public access to information, were also an important factor to this decision.

2.1. Starting points

- A system we designed in 1989, developed with 4TH DIMENSION. The cataloguing and management features included several forms of museum data and documentation: objects, library, images and conservation. However, used by 10 Portuguese museums, this system did not have the required developments, especially in the technological aspects.
- A system we designed in 1996, developed with ACCESS, designed according to the needs of certain museums and used by several museums all over the country. This system took advantage of important facilities in the integration with the Windows operating system, multimedia capabilities, Web integration and other features. However this system did still not use the international proposals from the Museum information standards.
- Experience on documentation in museums, based on a number of years of professional activity dealing with museums and other cultural institutions. For this experience the most useful were the contacts with initiatives and organisations that, especially in Europe and North America,

deal with information systems in museums and cultural heritage.

- Knowledge as regards Portuguese museums/museums professionals: their manual and computer based systems for cataloguing and managing collections, their skills in computer science and professional data training on computer science and information systems in museums.

2.2. The context

2.2.1. Evaluation of Portuguese museums

Regardless of the rising indicators on the Information Society and the Internet, museums are still not aware of the importance of their role as content providers and the multiplicity of uses that technology can have in museums: management, research, interpretation and presentation. Museums directors do not fell that the investment in computer science is a strategic one. On the other hand, the required investment, including training, is to large for their budgets.

The amount of work in a non-familiar environment such as the technological world is of a large concern: organisation of museum documentation, research, definition of standards and procedures, systems and equipment acquisition, data entry, maintenance, training, and so on.

The condition of Portuguese museums and its professionals as regards documentation systems and training in computer science is by no means excellent: computers are basically used with programs like Word and Excel; the concept of documentation still remains with the idea of card files to document the collections. When they think of using computers to deal with collections they simply reproduce the card file model they are used to.

Based on case studies, we analysed museums in relation to information: the museum as an owner and keeper of cultural information and also as an information producer. This analysis allowed us to define several patterns of museums needs and a better understanding of the complexity of museums concerning the diversity of the information they preserve and what the way they can use it.

Most museums do not have a planned documentation system nor a clear understanding of what may be the benefits of the information integration for its daily activity (collections, documentation, conservation, activities and so on).

The 1997 survey amongst the 80 museums that exists in the North of Portugal showed that very few museums[1] (to be precise only 3) used computer systems to deal with their collections and only 2 museums had their own homepages[2]. At this moment, in about the same number of museums, these numbers have radically changed: 47 museums have their own homepage[3] and 16[4] use a computer system to manage their collections.

Museums are being forced to move into the technological world. The Internet, email and other services are pressuring museums to move forward. The potential role of training and conscience in the Information Society are two very strong ideas necessary to be developed over the next years.

For these changes to take place, we think it would be useful to define special programs to do the digitalisation of the information available in museums. These programs would be important con-

tributions to a more active role in the Information Society of museums by creating cultural contents and creating new forms of achieving their tasks.

2.2.2. State of the art: Management of museums collections, standards and terminology

This phase of the Project dealt with the study of museum documentation systems, the evaluation of several packages of software developed for the management of museum collections and the analysis of different data models and international proposals on this subject.

We based our research on several documents, namely:

- International Guidelines for Museum Object Information (http://www.cidoc.icom.org/guide/guide.htm),

- A European Core Data Standard for Archaeological Sites and Monuments (http://www.natmus.min.dk/cidoc/archsite/coredata/e_cds.htm),

- MIDAS - a manual and data standard for monument inventories (http://www.rchme.gov.uk/midas/index.html),

- Spectrum (http://www.mdocassn.demon.co.uk/spectrum.htm) and

- Normas Documentais para Museus of the Spanish Ministry of Culture.

A number of web sites from various organisations and initiatives[5] allowed us the approach to several issues like terminology developments, systems, products and metadata developments.

The complexity of museums regarding the nature of their collections, activities, organisational structures and technical know-how, increase the difficulties for the definition of standards. At that time there was no kind of co-operative work for the definition of standards in Portugal.

However, the main problem we have to consider is the different levels of approach concerning the documentation in museums. Some museums have a quite reasonable understanding about the museum documentation system. However, most of them find it hard to pull away from their daily tasks and integrate their work into a global approach.

3. Main goals

- Use of international experience as regards standards:

  A lot of work on museum documentation systems is being performed by numerous organisations and initiatives. This is taking place at a moment when globalisation is an important issue and public access to information is becoming a common goal for museums and cultural heritage organisations. Different systems, different software packages and even different languages must not be an obstacle to easy public access to cultural information.

  The use of international proposals will allow us to exchange experience and carry on with a continuous development of conceptual models.

- Modularity and scalable functionality:

  The museum information system can be rather complex, depending on the complexity of the museum itself. Sys-

tems must be designed to fulfil all of the different levels and purposes of a certain museum.

The same idea must be applied to the different modules of the programme: museums must have what they need according to their organisation, purposes and technical skills.

- Integration of several collection types of data:

  Small and local museums usually have different types of collections. We wanted to be able to integrate different collections in a very understandable data model that allows a general as well as a detailed approach to collection specifications.

- Vocabulary control and thesauri:

  As a component of museum documentation system standards, the system must provide facilities to its management, encouraging research and exchange of experiences between museums.

- Public access:

  Museums must have full control of the data they allow public access to. The data accessible over the Intranet or Internet must be useful for all different types of public and must exploit all multimedia possibilities that the museum is interested in.

- Full integration with the operating system:

  It must be possible to analyse the integration with the Windows operating system through two different approaches. The first approach is through the utilisation of the operating system capabilities, while the second should be through the creation of an environment similar to the Windows operating system.

- Full Multimedia facilities:

  Full integration of digital files: text, image, sound and movie.

4. Conclusions

Since the beginning of this project we have had almost two years of experience, which have turned out to be rich in the understanding of the complex changes that are being introduced into museum practices. Technological development forces us to constantly update our use of technology and to constantly revise what we can achieve with it.

- The positive feedback exceeded our expectations:

  One of the characteristics of our data model is its simplicity and, at the same time, its complexity. This characteristic, associated with modularity and scalability, allows several different approaches according to the needs of the organisation. We have concluded that professionals who have any kind of experience in cultural heritage information systems, will find this model to be easy and understandable.

- Training on cultural heritage information management:

  The evaluation phase of the model resulted in tests in several levels of training at a secondary school and university level. The tests were performed by pupils and students who have a special interest in cultural heritage.
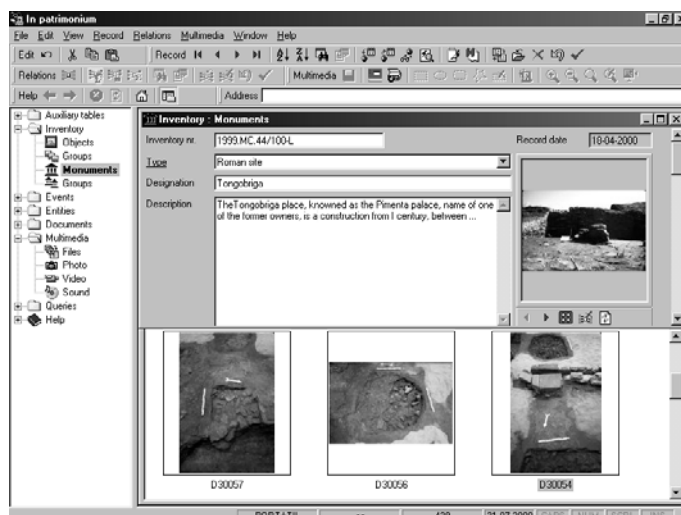

Figure 1: Page showing the organisation of information in In patrimonium.

5. *In* patrimonium

Prepared to work on *Windows (*98, NT or 2000) this application has been improved, either on development terms, or actualising information and interface with users. Using the most recent *Windows* programmes, this product (thanks to its module construction) allows the management of information in an integrated way. Therefore, it is possible to access information about an object, view the archaeological site where it is or was placed, the ambient where it is inserted, the related documentation, etc.

In a global management concept, *In* patrimonium integrates (in a single product) all the existent information, such as *Collections, Monuments* and *Archaeological Sites*, allowing a better management and integration of the information on cultural heritage.

5.1. Organising the information

The information is organised briefly, presiding from large forms and the specific information fields can be configured according to the user's interest.

All the information, included in the programme, can be linked. There is a module, in a certain way "revolutionary", that allows the sharing of all existing information found in the forms. All the modules can be linked between each other.

Therefore, it is possible to link Objects with Conservation and Conservation with Exhibitions; Exhibitions can be linked to files and data from the Multimedia module.

5.2. Modules

Multi-user: the configuration of different users and respective type of access. In this application it is possible to create user accounts, thus enable specific users to insert data or only consult the database. We can also create one or more database administrator accounts whose titular must have some knowledge in informatics.

Scalability: Although using a format known as Client/Server, In Patrimonium can also work with a single workstation. It is possible to upgrade it to the Client/Server format without any loss of data.
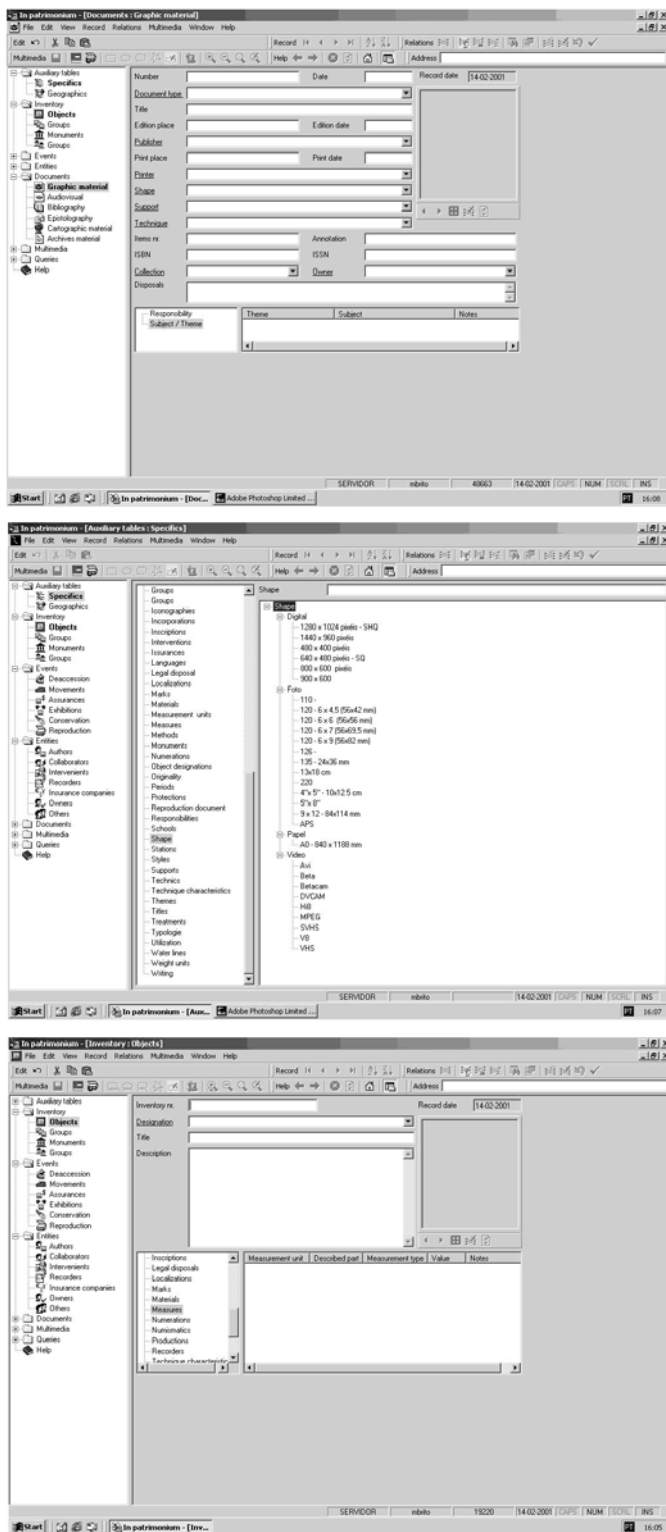
Figure 3: Physical model of In *patrimonium.*

Groups: data records related to the collections and monuments groups, with the possibility of associate photos, video and sounds.

Entities: data records related to the entities - authors, interventions, collaborators, recorders, owners and others.

Events: data records related to the events - exhibitions, conservation and restoration, movements, insurance and reproductions.

Documents: data records related to the documents - graphic material, audio-visual records, bibliography, epistemology, cartography and archives material.

Queries: query wizard – insert, change, delete and visualise queries, configured by the application users.

Multimedia: module that allows the management and treatment of photos, video and sounds.

5.3. Other functions

- Compatibility with data from other products, namely Microsoft software - Office, Word and Excel.

- Easy information access through the Internet or Intranet.

- Multimedia technology in order to use digitalisation and treat images (photographs), video and sound.

- Inter-related information with easy query access due to records self-association, as for example, of museum objects with records of other modules (documents, entities, events, multimedia, etc).

- Configuration that allows working with interfaces in several languages.

- Client/Server system (scalability), without a user limit.

- The information included in the application can be integrated with GIS.

5.4. Public access

Thanks to a special Public Access Module called *In* web, In patrimonium can safely be consulted by the general public. *In* web was developed for organisations that want to make their collections, archaeological sites and monuments available on the Internet

Figure 2: Three pages representing three different modules of In *patrimonium.*

Multi-language: configuration of the application to work with a linguistic interface. Besides the Portuguese version, also English, French and Spanish versions are available.

Auxiliary Tables: enable management and configuration of different *tables/terms* in order to help at the data insertion process in the remaining application modules.

Inventory: data records related to the archaeological cultural heritage and monuments, their classification; also offers the possibility of associate photos, video and sounds.
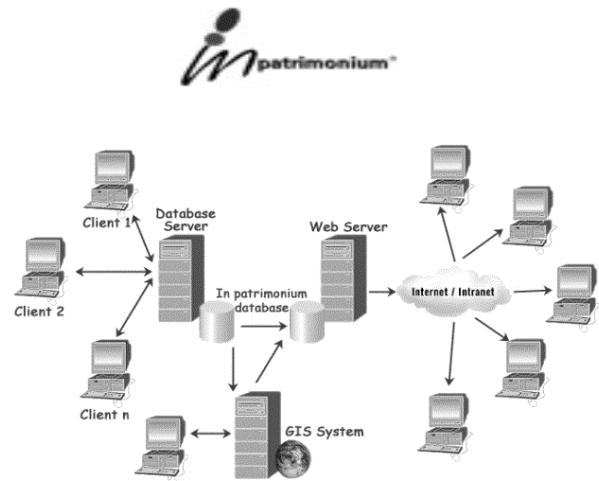
or Intranet. This interface for public access is fully adaptable to suit the house style of a museum/institution. Instead of being a product itself, with this module, the institution staff can determinate which fields and records are shown and in what way the public can retrieve and view the information.

System requirements

Requisites	Minimum	Recommended
Operating system	Windows 95	Windows 98 / NT/ 2000
RAM	32 MB	128 MB
Disk space for *In* patrimonium	15 MB	15 MB
Disk space required	300 MB	1 GB
Processor	Pentium	Pentium II
Video card	SVGA	SVGA

Notes

[1]   Museu D. Diogo de Sousa, Museu Nogueira da Silva and Museu do Ferro de Moncorvo.

[2]   Registered in SAPO, most popular research engine in Portugal.

[3]   According to ICOM-Virtual Library Museums- Portugal (http://www.letras.up.pt/dctp/icom/vlmpt.html) maintained by Mário Brito and Alexandre Matos.

[4]   Casa Museu Abel Salazar-Porto, Casa Museu de Camilo-Vila Nova de Famalicao, Museu Abade de Pedrosa-Santo Tirso, Museu Alberto Sampaio-Guimaraes, Museu de Lamego-Lamego, Museu do Abade de Baçal-Bragança, Museu do Ferro e da Regiao de Moncorvo-Moncorvo, Museu Municipal de Penafiel-Penafiel, Museu Regional de Arqueologia D. Diogo de Sousa-Braga, Museu Terra de Miranda-Miranda do Douro, Paços da Seda-Macedo de Cavaleiros, Sala-Museu Municipal de Arqueologia de Mogadouro-Mogadouro, Museu Nogueira da Silva-Braga, Museu da Faculdade de Belas Artes da Universidade do Porto-Porto, Museu dos Biscaínhos-Braga, Museu de Serralves-Porto, Divisao de Museus da Câmara Municipal do Porto, Casa-Museu Teixeira Lopes.

[5]   Please refer to Cidoc web Site (http://www.cidoc.icom.org).