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NATURAL HISTORY MUSEUM RIJEKA COLLECTIONS ONLINE PROJECT

Abstract: Natural History Museum Rijeka is a regional museum that collects, preserves and documents the objects of natural science primarily from the Primorsko-Goranska County (Croatia). More than 90,000 collected specimens are present in 28 museum collections. The aim of this Project was to create a searchable online museum database so our colleagues and virtual visitors can freely browse and access the basic information about many specimens from Natural History Museum Rijeka inventory register. Each database record includes information and an image of the selected museum object. Particularly interesting, rare and protected species have additional detailed description and photo. There are approx. 13,000 museum object records from those collections available online, and the data presented on the portal changes constantly as the result of ongoing curatorial research. Using FileMaker relational databases, we developed our own custom-made Museum collection management system. This system is a backbone of our Collections Online Project. Work on the Project, to put our collections online is constantly ongoing and includes digitizing museum objects and adding new ways to access and present them more easily.

Keywords: Natural History Museum, collections online, database

1. Introduction

The Collections Online Project started with the idea to present and share information about rare and endangered species of flora, fauna and geological materials stored in collections of the Natural History Museum Rijeka. The presentation of those valuable museum objects in the Museum permanent exhibitions is sometimes impossible due their special ways of storage and protection. The aim of this project was to create an interactive and searchable online database to present information on those valuable objects kept in our collections.

The data of all museum objects is kept in the museum inventory register. The inventory register is part of the primary documentation and along with the museum collections presents greatest treasure of the museum. It is a good source of information of natural resources of a specific area, and gives us the opportunity to understand the changes in nature that we are not aware of at present time¹.

Nowadays, Natural History Museums actively participate in scientific research and its role in past, which was just observing, collecting and recording the changes in nature has grown into a scientific research, which lead to collection of better specimens for collections and improved the quality of museum specialists' work. So, after the material is collected and processed by the curators, newly gathered information increases the scientific value of the collection². In order to share the new information and scientific conclusions, one requires specialized staff, equipment and quality systems for the storage and presentation of related data.

¹ Arko Pijevac, M., Prirodoslovni muzej Rijeka od osnutka do danas. // Prirodoslovna istraživanja riječkog područja, Prirodoslovna biblioteka 1, Prirodoslovni muzej Rijeka, Rijeka, 1998.

² Maroević, Ivo. Informacije i dokumentacija u muzejima. // Informatica museologica 12(2000), str 14.

With this systematic sharing, as part of the museums communication function and with all other museum functions collection, protection and presentation will make a compact functional unity. We realized, after multiple queries addressed to the museum, electronic mails, attendance at meetings, conferences and exhibitions, the need to increase the quantity of data presented in electronic services. This project would improve our public service and data availability. Although, this method of displaying data from the inventory is not new and is used by the other great Natural History Museums³ in the world, we were the pioneers in the Croatian museum community.

2. Project Description

The aim of Collections Online Project was to create a web portal as a new electronic service of the Natural History Museum Rijeka. The intention was to make a simple searchable portal, so that interested visitors, educational and professional institutions can browse all museum objects in one place. The content of the portal should be generated from existing databases of museum collections, which would guarantee permanent preservation and accessibility of data. In this way, we will reduce the required handling of museum object for the making of copies, and thus its damage, because the digital copies through this system will be constantly available to the museum staff and external visitors. We planned that the portal should be available in the English and Croatian languages. Photographing and preparing the content for each collection should be a process of teamwork (collection curator, information specialist and conservator) and be a good motivation to the other museum staff to get involved. We should also engage outside resources for the English translation, for the web design and web portal interface programming.

2.1. Pilot project. Before starting this project, we created a pilot project with the goal of searching and browsing the library database of the Natural History Museum Rijeka outside the Museum. The library database is a FileMaker⁴ database shared on the Server in the museum available to all users within the museum documentation system. We tested if it was possible to show information from the local museum database over Internet with searching and browsing capabilities. The pilot project demonstrated that this was possible, but there were some problems, too. In fact, the link to the internet, which was at that time ADSL (Asymmetric Digital Subscriber Line) with throughput of 512/128 Kbps was insufficient for hosting any larger project and could let unauthorized access to the server from outside.

Those problems required a modification of the project, so we decided to use the existing Web server that hosts the site of the Natural History Museum Rijeka (www.prirodoslovni.com). We contacted the company "Revolucija"⁵ with which we have a long-term cooperation on various projects, and development and the design of the museum web site, to help us link very different databases. Since the Web server is running Apache Web Server on the operating system Linux⁶, and for the data storage, it uses MySQL⁷ database, we managed to obtain data exchange with our local server with FileMaker Server with

³ Natural History Museum London - Online Collections -

http://www.nhm.ac.uk/research-curation/collections/index.html

⁴ FileMaker - <u>http://www.filemaker.com</u>

⁵ Revolucija: <u>http://www.revolucija.hr</u>

⁶ Linux : <u>http://en.wikipedia.org/wiki/Linux</u>

⁷ MySQL: <u>http://www.mysql.com</u>

Microsoft Windows Server⁸. The result of the pilot project is a website where one can browse and view the contents of the museum library.

2.2. Content creation. Since the pilot project had proved successful and functional, we started the second phase of project that is publication of museum inventory register with the possibility of searching and browsing. The project from the beginning had a goal of dynamically generated content of the web portal by the museum curators. This means that it is created by the normal daily operations, inventorying and cataloguing of the museum objects that are collected and processed, with the aim that presented information about museum objects is accurate and timely.

During the planning phase of the project, there was some doubt about the functionality of this project and the lack of motivation of the curators to digitize and create additional content about the museum objects. However, all of them agreed to proceed into implementation of the project, after the Ministry of Culture of Republic of Croatia recognized and financially supported the project. There were several meetings of all participants in the project, where the project manager gave directions for making list of items for digitization and additional texts about them and collections. The directions included concise ways of preparation of objects for photographing, compiling lists, photographing items, renaming, and merging files with digital collection and returning of specimens to the museum depots. Because of the workload and resource constraints, the project was carried out one step at the time by well-defined order without parallel actions, except in some exceptional cases.

Since the first idea was to show all the museum objects in the museum, it was necessary to extract and highlight some of them considering their value. These objects are very valuable specimens kept in alcohol or formalin for more than hundred years. They are not displayed in the permanent exhibitions because the manner and ways of conservation, but the best place to show them with the detailed description was this web portal. Therefore, curators selected 6 collections on which they were constantly working for the digitization and 180 museum objects that have the greater value in the museum collections. The collection currator and the conservator performed preliminary actions before digitization of objects. These included making up a list of objects for processing, extracting objects from the museum depots. For further processing and digitizing of each collection, a team was formed that consisted of the collection curator, information specialist, conservator and two volunteers (graduate biologists) who digitally photographed the objects. The information specialist then renamed the taken photos and integrated them into documentation system, so that the collection curator can perform the final quality control of photos. The curator described the object with more details, and preferably joined an extra image to present how the object looks like in natural habitat.

2.3. The collection management system. The precondition for the realization of this project was a well-designed data customizable management system, where all the museum documentation data are stored, with possibility to connect with other similar systems and databases. Since 2006, Natural History Museum Rijeka has used a new collection management system using relational databases created in FileMaker, as is shown in Figure 1.

Collection catalogues for each museum collection are located on curator's computers, while the inventory register and other documentation accessible to everyone on the local server. Collection catalogues and museum inventory register, as well as other documentation

⁸ Microsoft Windows Server : <u>http://www.microsoft.com/windowsserver</u>



database relational database are connected with a unique inventory number. Of the 28 museum collections, 21 of them with 13,700 objects are stored in this new system.

Figure 1. Collection management system in Natural History Museum Rijeka

We have designed this collection management system to facilitate the work of the Museum experts who can focus more on professional and scientific work, rather on the administration, this new system automatically links the information from FileMaker databases to external Web server with MySQL database as shown in Figure 2.

We managed to upgrade and improve the two-way connection used in the pilot project and now use ODBC⁹ connection, the MySQL database on the Web server, has the permanent connection with the FileMaker Server like any other relational database in the system. This method now is keeping records on the web server up-to-date in real-time in three different locations available all the time, from anywhere. This system differs from other documentation systems found in other museums, were all museum object records are located on only one server.

The system manages the museum object record upon completion of entering data into a catalogue. It gains the inventory number from the system using relational connection and all data are copied into museum inventory register. Then, the data from museum registry entry are copied to the MySQL database on the web server. The system keeps the changes of record with the timestamp, so the curators can revise the changes they made to the record.

In addition, we planned that every record of museum objects on the web portal would have a picture. This, at the first site can be a problem, in order to accommodate 13,000 JPEG photos with size around 2-3 Mb. The system automatically resizes images to 200x150 pixels with a file size of 6-10 Kb. This picture size is suitable for publication on the Internet, but sufficiently small and unusable for any unauthorized publishing or data copying.

We are now in process of creating a thesaurus for the automatic translation into the English language of commonly used phrases and localities, because now, all the data currently are entered in Croatian language. This system is rather complex, and needs constant

⁹ ODBC: Open Database Connectivity : <u>http://support.microsoft.com/kb/110093</u>

monitoring and administration, but we are trying to implement automatic mechanisms of control in a way to improve the data manipulation.



Figure 2. Display of data flow in the system of collections to web portal

4. Content presentation

Web portal¹⁰ is a new electronic service of the Natural History Museum Rijeka developed with the company "Revolucija". The entire web portal is available in Croatian and English. Museum collections presented on the portal have a description and a direct link to access them from other internet sites and portals. Twelve collections presented on the portal are registered and preserved in the museum as cultural heritage of the Republic of Croatia, from 2010.

On the introductory page of the portal are presented especially valuable items in the collections, which can be directly accessed from there. Web portal main pane consists of three parts, the search part that consists of 12 categories, a list of items based on search requests and a detailed display of objects data. The simple search includes searching inside specific collections, by the inventory numbers, or Croatian and Latin name. Advanced search features include eight categories more such as date, place, persons etc. It is possible to search by category of valuable items including holotypes, a protected species, rare species etc.

In order to facilitate the search requests and data display form the clients to the server and client side, web portal is using AJAX¹¹ technology, which requests the required data from MySQL database. The improvement using this technology is when you re-query your request the entire page in the internet browser is refreshed, and not loaded fully again.

The are no limits regarding such data usage now, but it is our opinion in future we will limit disclosure of data for which experts believe that can jeopardize the museum object collections, or protected plants and animal species in nature. We are aware of the current legal regulation on conditions and manner of accessing museum collections and museum records. It requires a written request to gain insight into a museum with documents approved by the museum director. We will find a solution with a special regulation that would allow this kind of insight to data, with future registration of users.

¹⁰ Natural History Museum Rijeka Collections Online web portal (<u>http://www.prirodoslovni.com/inventarna/en</u>)

¹¹ AJAX: Asynchronous JavaScript And XML



Figure 3. Natural History Museum Rijeka Collections Online web portal

5. Conclusion

The main goal of this project was to improve one of the museum important functions, communication. The idea to share data form museum inventory register with other similar institutions, experts, and the public, gained even greater meaning to other museum functions collection, protection and presentation. We believe that the museum inventory register is a kind of mirror of Museum everyday work, and this project improved better museum perception in the community. The legal framework that protects the museum's documentation should be extended with this kind of insight, because such presentation of data is raising the value of museum objects.

The work on the project, even completed, did not end. We are planning to digitize remaining museum collections, maintain the achieved standards and quality of data. There is constant system administration work, and new ideas for future projects. The project has enabled better collaboration with experts from scientific institutes, because they are obliged to obtain inventory numbers within some museum collection for biological materials that are published in scientific papers. Now, as the portal is available in English, the internet search engines can better present their scientific work and achievements.

The future will show the role and importance of a good collection management system in further research and work of the museum, and the ability to exchange data with other institutions, as well as involvement in various projects. This system ensures durability and preservation of data availability, as the data concerning the museum object are stored in three locations and at the same time are accessible online.

This project improves the level of service, quality and presentation of the museum, and represents the great potential for application and participation in future projects. Project Collections online is financed and supported by the Ministry of Culture of Republic of Croatia and has been included in Croatia's cultural heritage portal¹². The results of the project are very positive reactions from the foreign collaborators and experts with whom we work, who praised the idea and realisation, and the project has facilitated the work. By implementation of this project, we were able to demonstrate that with good project planning and funding and pilot projects, the ideas that are present in the museum community for years, are now possible using the latest technology. This project could be a good initiative for similar institutions to improve quality and level of services.

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¹² Croatia's cultural heritage portal: <u>http://www.kultura.hr</u>