

Structuralizing multimedia data in museums: The use of Internet, video and scanned 3D objects for natural history and science museums

EDUARDO RAMIREZ*

Resumo

Este texto descreve uma proposta de partilha de recursos informáticos e multimédia, em geral caros e pouco acessíveis à grande maioria dos museus de ciência e de história natural. Sugere ainda a criação, no seio do ICOM, de uma estrutura que coordene a utilização desses recursos.

The rapid advance of new technologies in multimedia have offered heritage new hope against the processes of pollution, looting, conflict, and even tourism, which have become increasingly important in the conservation, preservation, and interpretation of natural history.

Scientific videos and 3D exhibits allow us to discover and explore in great detail natural history assets in a non-destructive way. Nonetheless, video and 3D scanners are at their infancy and only few organizations have access to these technologies. I would like to propose the sharing of large and expensive resources such as video server and 3D scanner.

In this presentation, I would like to share with you

some of our experiences in relation with the production of video recordings for the Zoology Department at Bergen Museum (museum.uib.no).

We made video recordings of *Myriapoda* (millipedes) through the microscope, both preserved in alcohol and as living species for interpretation by the scientific community of Myriapodist. Video recordings were made through a CCD video camera attached to a Leica stereo microscope equipment and recorded digitally. Digital video has been edited and converted [why has digital to be converted to digital?] to digital format suitable for video streaming formats for video exhibits 'on-demand'.

Our primary goal was to develop methods and tools

* Eduardo Ramirez is Chief engineer at the Bergen Museum. Address: Bergen Museum, Documentation and IT Department, University of Bergen, Muséplassen 3, 5020 Bergen, Norway. E-mail: eduardo.ramirez@bm.uib.no.

'on-demand' of natural history museum assets - in our case Millipedes, but applicable to any other species of interest. Our museum has 40,000 specimens of Millepedes preserved in alcohol and access to these is difficult. Our Museum is currently using the videos for implementing an IT based catalogue of museum objects, trying to structuralize these scientific videos and designing a data base for scanned 3D objects.

In collaboration with the Computer Science Department, University of Malaga, Spain, a model or structuralizing scientific videos was proposed based on the Extensible Markup Language XML. This brings us to the basics by asking document creators to introduce enough clues, or structure, in the document so that an automatic process can read what the document or a section is about. This metadata approach allows more advanced systems to know more about the document than today's automatic techniques.

Video data is stored using organizational principles, like any other data. In our project we would like to organize data in a more careful way because of its time-serial nature and enormous size. Another difficulty is that current metadata for video images and other similar sources are more about the data than about their semantic content. In our project we would like to develop techniques for introducing the semantic partitioning of video, audio, and images. In the past years, considerable effort has been spent on developing automatic techniques for video and audio segmentation and for indexing images based on some basic characteristics such as colour and texture. These techniques are very useful and will surely change the way we will organize multimedia data in the future. However, we still need to organize multimedia data today and the current automatic techniques for semantic partitioning are even more basic than those

for text. The only solution – and one goal of our project – is to attempt to develop more powerful approaches for structuralizing multimedia data.

Some of the basic questions that we would like to answer are as follows:

- 1) How can we introduce semantic metadata while creating scientific videos?
- 2) What dictionary will we use for this VXML or Visual Extensible Marking Language?
- 3) How far will the emerging standards like MPEG-7 go in this direction?

Because we do not have the answers yet, I think this could be a very interesting research direction, to the benefit of both our Museum collections and virtual exhibits 'on-demand'.

Appendix – Proposal

This proposal is primarily addressed to: ICOM Reform Task Force, Barcelona, Spain, 1-6 July, 2001.

From: Dr. Eduardo A. Ramirez, Chief engineer, Bergen Museum, Documentation and IT Department, University of Bergen, Norway.

Email: eduardo.ramirez@bm.uib.no

1. Title: Sharing resources that otherwise museums could not afford

Proposal for the creation of an ICOM Common Joint Resource Centres (CJRC), housing advanced Visualisation and Broadcasting equipment, and Scientific Instruments for the benefit of Museums World-wide.

2. Intention

To propose a new model for the funding and administration of large scale resources (e.g.

Multimedia visualisation, etc.) that might be necessary for taking our Museums into the new millennium. Included are those museum activities that require large funding due to the high-tech production cost, professional skill needed, and with a high risk of technical implementation failure. Adding to these factors, a possibly limited public to justify the investments.

3. Background

The progress of multimedia, computer visualisation, and scientific equipment enable museums to perform specific tasks never before possible, e.g. computer animation and VRML in restoration and reconstruction work. For the majority of museums world-wide, a simple 3D scanning of an object, might have prohibiting costs. Moreover, professionals who operate these services and installations are also in great demand and their expertise requires continuing upgrading.

4. Proposal

The objective of this proposal is to put forward to ICOM RTF the creation of a Common Joint Resource Centres (CJRC) that could be co-ordinated under the International Committee of Museums ICOM. The intention is to share large scale specialised resources

that are of central importance for preserving, exhibit, and broadcast our cultural and natural heritage locally and world-wide, and in view of the global reality of increasing restricted governmental funding for preserving and exhibit these cultural and natural heritages.

Another spin-off effect of this proposed model of organisation (ICOM-CJRC), could be in the negotiations of special services required at our museums, such as: equipment-leasing, software licensing, service contracts agreements, upgrading, purchase discounts, in advance technology and software for Museums commencing the millennium.

4.1 Test pilot offer

This year, the Bergen Museum has acquired a multimedia server (Silicon Graphics SGI Onyx 3800). We have allocated hard disk space to ICOM-RTF for the purpose of testing Digital Video Broadcasting directly from this video server in Bergen. This service could be expanded to connect other digital resources and servers world-wide to form a cluster of digital power, with the intention to best serve ICOM goals, and therefore, museums internationally.

Please see URL: <http://mediabase.uib.no/mbase/> and press 'List'.

