Virtual Archaeology

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Franco Niccolucci

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FROM MUSEUM TO MOUSEUM. THE VIRTUALISATION OF DAILY LIFE MUSEUMS

Maria Elena Bonfigli
CINECA, Bologna, ITALY

Antonella Guidazzoli
CINECA, Bologna, ITALY

Maria Chiara Liguori
Dipartimento di Discipline Storiche, Università di Bologna, ITALY

Museums of Daily Life are structures dedicated to reconstructions related to every day life. Usually applied to 19th and 20th centuries, this concept can be extended to all the reconstructions describing daily life, whatever the pertaining historical period is. Permanent reconstructions imply relevant problems, as the availability of wide dedicated areas with a high degree of staticity. Immersive graphics may solve some of these problems and offer new and interesting opportunities.

1. MUSEUMS OF DAILY LIFE

Museums of Daily Life are structures dedicated to reconstructions related to every day life. Usually applied to 19th and 20th centuries, this concept can be extended to all the reconstructions describing daily life, whatever the pertaining historical period is. This kind of realisation, concretely executed and widespread in the Anglo-Saxon countries, is very useful in order to make easily comprehensible different ways of life from every historical period. Examples related to ancient History can be seen in the reconstruction of Roman Baths at Wallsend http://uknets.8m.com/; http://www.tsn.worldwide.co.uk/seg/index.html, of a Mithraeum in Newcastle Museum of Antiquities or of a Viking village in Dublin http://www.visit.ie/countries/ie/dublin/top_at/08_dublinviking.htm. This kind of realisation is particularly useful for perceiving the essence of an even very remote past, for which it is difficult and nearly impossible to find completely preserved and accessible environments.

However valuable from a cultural and didactic point of view, permanent reconstructions imply relevant problems, first of all of economic kind (wide spaces dedicated to the museum and specifically arranged; the frequent need of upholsterers, restorers, keepers, guards; definitive or temporary acquisitions of the objects and, therefore, the storing of the collections). High costs of realisation favour limited reconstructions, dedicated to a single "object". Seldom, in particularly important sites, it is possible to find more than one reconstruction and, even more rarely, different sites with many reconstructions are located sufficiently near one to another to enable a visit to several places, ideally connectable, in a short time. Particularly meaningful to this respect is the series of realizations along the Hadrian's Wall, the only Roman World Heritage site in Britain and the largest of all the British examples http://www.hadrians-wall.org/ Starting from South Shields, on the eastern coast, up to Maryport on the western coast, there is a sequence of Museums and reconstructions, of which it is possible seeing one or more in each site.

Figure 1. *South Shields (Arbeia), the West Gate of a supply base for the forts.*

For example, in South Shields (Arbeia), the West Gate of a supply base for the forts, in Wallsend (Segedunum) a full reconstruction of a section of Hadrian's Wall has been completed adjacent to the ruins of a 35 metre section of wall, excavated by Tyne and Wear Museums in 1991-2, and Roman Baths. Vindolanda, a very important site, has a temple, part of a fort, a shop and a soldier's house. And so on. In each site there is a different reconstruction to be seen but, even if the distance isn't particularly long, and the sites are not too scattered away, it takes a long time to be covered. Therefore, permanent realisations, even in peculiar areas as the Hadrian's Wall, remind us of a set of relevant problems starting from the dispersion of the reconstructions on the territory, of high costs, and of the high degree of staticity, in terms of space and time.

2. THE VIRTUALISATION OF DAILY LIFE MUSEUMS

Immersive graphics may solve some of these problems and offer new and interesting opportunities. Basic concepts of museums - collect, preserve, communicate and display - can be conveyed in new ways through "Digital Museums",

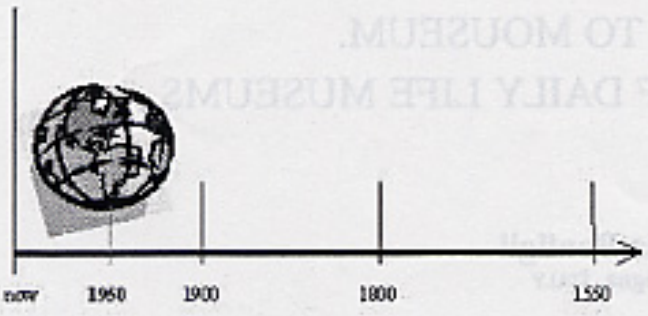

Figure 2. *The first selection is about the two fundamental variables about historical period and location.*

thought as multi-dimensional databases made of geometrical models and historical sources. Thanks to information technology it is possible to carry out 3D reconstructions of historical environments. Working with appropriate software tools, it's possible to create "technological places" (i.e. material can be used in a six-screen CAVE or as a virtual set for television programmes, up to downsized models, suitable for web access).

An ideal realisation of a Daily Life Virtual Museum could enable visitors to see and interact with the entire museum content, structured in a multidimensional way and linked to other Museums and realisations. A museum organised around the concept of virtuality theoretically allows to multiply the environments endlessly, along the time line and for different geographical areas (Figure 2), and in accordance with many different variables (as social class, private or public spaces, etc.).

3D Virtual Museums can be realised for the Internet and for an immersive fruition. The access through the Web enables a multilevel fruition, from the simple visualisation of 3D reconstructions to Virtual Reference Rooms, permitting to go deeper into historical sources and analysis. Usually, Daily Life experiences tend to privilege more divulging aspects, in order to offer a general point of view, comprehensible by every kind of public. In the reconstruction of a mithreum in Newcastle, when the lights go off a male voice, personifying a roman soldier, tells us what is known about these places and about the rites held there, as if we were in the temple of the past with him. The impact is particularly involving, but it doesn't allow any historical deepening. Instead, synthetic environments in Internet can be linked to a database, even a very complex one, and a high level of participation can be attained as well. Of course, in an immersive context the involvement can be deeper. If the idea of museum stems from the perception of alterity, immersive digital museums enable a step further toward the achievement of sensorial and emotional experiences that can draw nearer this alterity. The management of music, sounds and voices is simplified and a good immersive environment compensate, at least partially, the fact of not being in a real space. Moreover, in the majority of existing realizations, even when they employ totally reproduced objects (i.e. plastic furnishings that simulate those of a real Roman house) in very few cases visitors are allowed to get near, keeping them away with a cord. At least, immersive realisations enable the public to tour the environment freely, as if positioned inside it, and not only alongside its border. At this level, educational and divulging realisation can merge into entertainment.

Objects and realities, not originally created for a museum display, can be set in their primitive context, overcoming also the usual problem related to archaeological findings, taken away from their original place in order to preserve them. For example, displaced frescoes kept in museums can be artificially set again in their original placement, or, damaged realities can undergo virtual restoration and the environment can be given back to an ideal completeness.

3. MUVI: A CASE STUDY

Actually we are implementing the Daily Life Museum in the 20th century Bologna http://www.cineca.it/muvi both as an Immersive Virtual Environment and as a Web-based Virtual Environment. The project is dedicated to the reconstruction of 20th century environments, but the concepts placed at the basis of its realisation can be transferred, with appropriate adjustments, to every historical period.

Figure 3. *MUVI project, the kitchen of the Fifties.*

Figures 4. 5. 6. *A balance of the Fifties: the real object, the 3D model, the ad.*

A prototype version of MUVI is accessible at the CINECA's Virtual Theatre (http://www.cineca.it/visit/VirtualTheatre /index.html). Wearing stereoscopic glasses viewers can experience a "physical" immersion in a guided tour in a kitchen of the 1950's developed using Multigen, Performer graphical libraries and Vega development environment. The result is an immersive virtual environment where users can experience part of the atmosphere of an epoch.

Furthermore, a version for the Web has been developed in order to reach a great number of users, offering them also a multilevel fruition. For this reason and in order to develop dynamic and interactive 3D environments in a portable, standardized, platform-independent way we chose to implement MUVI using:

- XML and Dublin Core for codifying information in a compatible way with some standards already used from various international Museums;
- VRML and Javascript for developing 3D models accessible from Internet.

The basic idea is to enable the user to choose which elements are to be visualized during a virtual visit. In this way the user will be able to visualize only the virtual components in which he/she is interested e.g. architectural elements, objects and their contextualisation, photos, magazine and tv advertisements, tv movies, audio speeches, etc.

Moreover, in order to provide the visitor with "interesting" historical information, every 3D object is linked to an historical description of the resources on which the virtual reconstruction is based. Also in this case the user would be allowed to personalize the type of information to be received during the visit, obtaining for example just the visualization of the virtual environment, or simple descriptions of the 3D objects or more details about the related resources or the historical hypothesis.

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