

From the dig to cyberspace. A case study of virtual worlds as a tool for interpretation centers.

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ABSTRACT

This paper will describe the process of making and implementation of a virtual world specially designed for a small museum-interpretation center of the Roman Mosaic, which displays a collection of pieces found in an archaeological excavation in Casariche (Spain), on the remains of a 4th century Roman villa. The virtual *domus olearia* was built pursuing a close match to what the original house would look like, based on architectural and archeological criteria and honoring the traces of foundations and materials found in the excavation. The virtual *domus* contains the fully reconstructed version of the thirteen mosaics discovered in the dig, which are put in place in their corresponding virtual rooms. These rooms are furnished ad-hoc and contain interactive multimedia informative panels illustrating all aspects of the everyday living which took place in the *villa*. The telepresential features of the virtual world permit to give lectures and guided tours to remote visitors of the interpretation center.

KEYWORDS: virtual world, interpretation center, Roman villa, mosaic, avatar, OpenSim,

1. INTRODUCTION

Interpretation centers have become a very adequate and viable solution for effective communication of heritage information in municipalities and rural areas which lack the resources needed to establish a traditional, full-scale museum, and where heritage can be an important factor for tourism development.

Unlike traditional museums, interpretation centers do not usually aim to collect, conserve and study objects; they are specialized institutions for communicating the significance and meaning of heritage. They work to educate and raise awareness.

Many studies have demonstrated the capabilities of virtual worlds to enhance the learning process in all educational levels. Some of them, including previous works by the authors of this paper obtain the same conclusion in a scenery involving museums and schools for telepresential visits (Barneche 2014).

Although there are numerous cases of the use of heritage reconstruction in virtual worlds, (Harrison, 2008) (Sequeira 2013) (Barneche 2010) few examples can be found in the context of a real museum, like the case of Villa Livia (Forte 2008). The present work deals with the design of a dedicated, OpenSim based virtual world as a part of a real exhibition taken place in a small interpretation center: the Museum of the Mosaic of Casariche (Spain) devoted to exhibit the mosaics found in the dig of the Roman villa of El Alcaparral (4th-5th century AD).

The virtual model was intended to accomplish two objectives. On one hand, it should display a complete recreation of the mosaics found in the nearby excavation, allowing the visitors to contemplate the appearance of the pavements in their full size instead of just fragments. On the other hand, the villa model should be designed to act as built environment that could provide as context for the interpretation of the mosaics.

2. METHODOLOGY

This work has been carried out in two phases; the first one, consisted in the construction of the virtual model to hold the virtual exhibition and activities, and the second one included all aspects of virtual musealization.

2.1. Construction of the virtual model.

Reconstruction of the mosaics:

The mosaics to be displayed can be separated in two groups. The first one includes those only formed by geometrical motifs. Here, the modular, and repetitive characteristics of the formal structure of the drawings allowed to easily obtain a possible full version of every original design. Patterns were repeated, in search of a coherent formal structure for every case accordingly to the dimensions and shape of every room. Apart from possible unknown irregularities or unexpected lost elements that could break the homogeneity of the design in the original mosaic, the reconstructed versions offer an image of every mosaic that would correspond very approximately to the appearance of those ancient pavements. (fig.1)

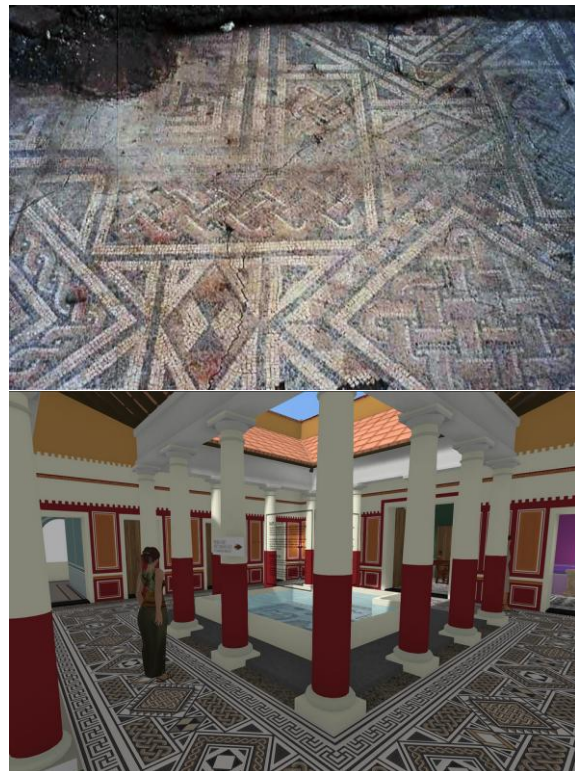


Fig.1. Geometrical mosaic in the atrium of the impluvium and reconstruction. (photos from the intervention Report – above– and from the virtual world – below)

The second group of mosaics is composed by those containing figurative drawings. There were three mosaics on this group, with very different states of preservation. The mosaic depicting the “Judgment of Paris” (figure 2) was almost complete, and only needed to

include a few retouches to obtain its virtual replica.



Fig.2. The judgement of Paris mosaic (photos from the intervention Report – above- and from the virtual world – below-)

The second one, called “The Spring” mosaic had a big part of the face of a person represented lost, but the characteristics of the shape of the human face permitted to reconstruct it fairly well. (figure 3)

The third case, the mosaic that covered the bottom of the *impluvium* was almost lost and only small parts were present. Nevertheless, those parts indicated clearly that the original drawing depicted a scene containing two Nereids riding a Triton.



Fig.3. The Spring mosaic in the virtual world.

The detailed formal analysis of the remaining fragments displayed multiple similarities with other mosaics of the same age and similar theme found in excavations located in neighboring regions. That took the authors to consider a great influence or even a common school authorship that may induce to think that the motif depicted in the original mosaic could be very similar. Hence, the scene was fully reconstructed, and the clear character of hypothesis of such reconstruction was indicated in the associated descriptive panel that floats over the element. Nevertheless, the virtual version helps to understand the frequent use of marine scenes in *impluvia* and other hydraulic elements (fig. 4).



Fig.4. The *impluvium* in the virtual world with the reconstructed mosaic of nereids riding Triton.

Finally, a generic mosaic was designed to be used in the rooms that presented more uncertainty in their layout, as a mean to remark them as the most hypotetic part of the interpretation of the house.

Reconstruction of the villa:

In order to facilitate a better comprehension of the late Roman architecture, the three-dimensional representation of this *villa olearia* which was made for this project tries to be as accurate as possible, based on all data obtained from the archaeological dig, but considering the fact that the remains are neither abundant nor well preserved. Additionally, the authors interpreted the historical and ethnographical data available and the analysis of other near *villas olearias* that present a similar terrain organization based on terraces of the same period such as the *villa vinicola* of Fuente Alamo and the *villa agricola* of Villaricos.

Other reconstruction criteria for the making of the model were based on the archaeological current of thought named Archeology of Architecture (Steadman 1996) (Azkarate 2002). This discipline provides analytical models and methodological tools that contribute significantly to the study of the different dimensions of the built space. This work used the constructive analysis to obtain the characteristics of the domestic architecture of the archaeological site, the formal analysis to construe and understand the functionality of the structures and the syntactic analysis of the space to grasp the subjacent social significance.

The virtual reconstruction mimics the constructive materials found in the dig that are properly described in the corresponding excavation reports (Sierra 1985) (Hoz 1987). Those reports also give important clues about the possible distribution of spaces and how they are grouped in terraces following the slope of the terrain. Those clues were especially taken into account to obtain the hypothetical layout of the complex.

From the previous analysis, the model of the villa was designed, organized in three zones following the alignments of the terraces found in the site. The first one corresponds to the *pars urbana*, the noble area where the *dominus* and his family lived, and the area dedicated to the thermal baths (*balnea*). The second one is related to the accommodation of the servants, slaves and all personnel who worked on the crops in the surrounding fields. The third area includes the spaces for storage of farm equipment and stables. The final distribution is displayed in the figures (fig 5)

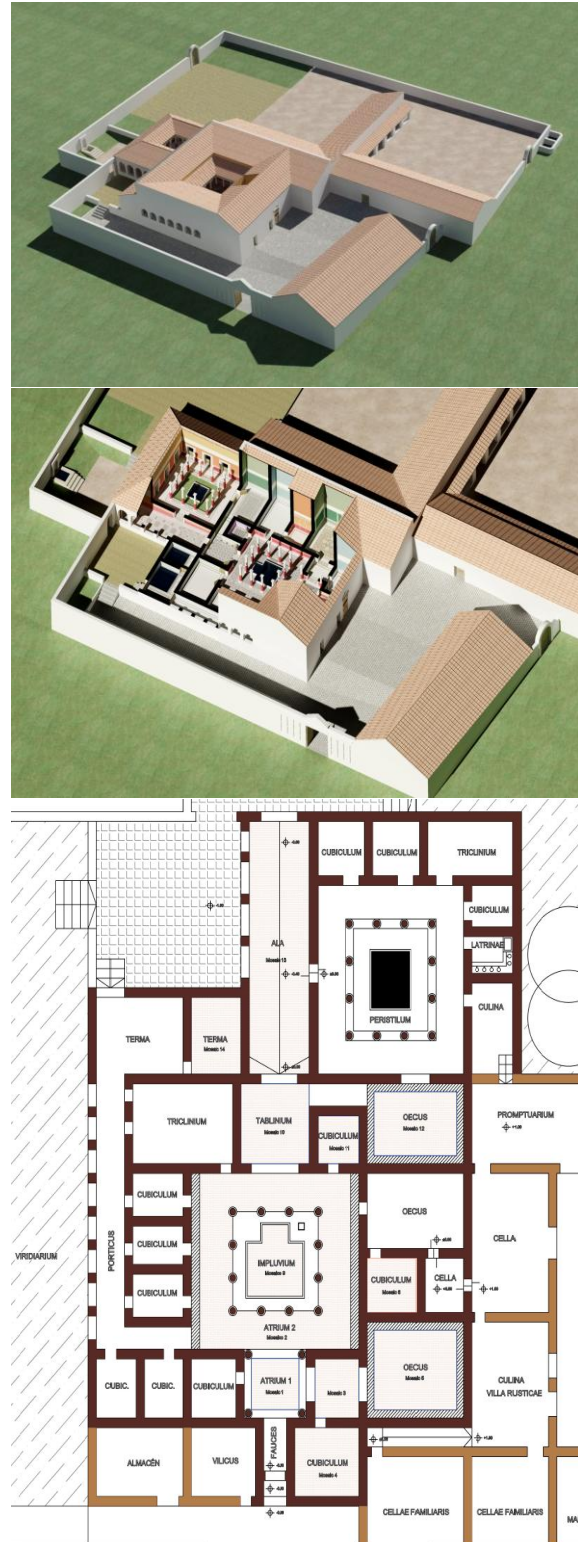


Fig.5. General views of the villa – above– and hypothesis of distribution of the of the *pars urbana*. Pavements with mosaics are remarked –below–.

2.2. Virtual musealization

Musealization of the model:

The virtual representation of the *domus* is fully visitable. The user, represented by his or her avatar, dressed as a Roman inhabitant of the *villa*, can walk freely throughout all the

complex, enjoying not only the architecture of the building, but also the wall paintings, furniture, mosaics, and other elements of material culture (*anphoras* for oil and wine, *tegulas*, oil lamps, etc.) (figure 6). The setting of the different spaces (*atria*, *peristila*, *lararium*, *triclinium*, *tablinium*, etc.) helps to interpret the daily life in such facilities. The main focus is the mosaic of the "Judgement of Paris" since this piece is unique in Hispania, being one of the only five known cases found in all the Roman Empire depicting this theme (Blazquez 1985)



Fig.6. *Anphoras* for oil and wine and explanatory panel.

All notable elements in the virtual villa have a descriptive panel written in Spanish and English (switchable) that gives information about every specific topic. Some rooms act as containers of descriptive elements like maps, (figure 7) pictures and videos related to the activities that took place in the villa and the art of mosaic making.



Fig.7. Room explaining the oil commerce from the villa.

Implementation and support for the interpretation center:

The virtual villa is implemented as a database in an OpenSim server, so it can be accessed through the Internet using any compatible viewer such as Singularity, Kokua or Imprudence. Anyway, a custom configured

viewer was prepared for this project to be downloaded from the website of the virtual world.

Independently from the remote access, the virtual world is designed so it can be used as a local simulation of the ancient house from within the interpretation center, using a regular personal computer located in one of its expositive rooms. This way, this virtual museum accomplish several objectives of center:

Depiction: The virtual world displays formal aspects and characteristics of the elements to interpret, their full shape, location and use in the villa, relative importance, etc.

Evocation: The virtual villa fosters the use of the imagination to make the visitor feel as part of the ancient world, thus helping to understand the key concepts and grasping better the knowledge that is offered.

Experience: The visitor can perceive the villa and the mosaics located inside through a virtual, but vivid experience, feeling the relations among the spaces, contemplating the elements displayed, and experiencing the visit to the virtual villa as he or she would do it in a real museum.



Fig.8. Educational activity with remote users.

Last but not least, the multiuser enabled remote access brings the possibility to put distant visitors in touch, allowing to meet in the virtual facility where text and voice chat are enabled. This way, it is possible to organize events such as lectures, guided visits to remote groups of visitors (i.e. schools) in the virtual villa, expert meetings, etc. (figure 8)

2.3- Avatars and gamification

As it was mentioned above, users enter this world using avatars that can be chosen from a small variety of male and female, both adult and child examples. Those avatars dress Roman garments and jewelry and can be personalized for every user. This is made in order to reinforce the feeling of presence of the visitor in the virtual world.

There is a questions game implemented in the virtual world, specially designed for young visitors. The player has to face a bas-relief sculpture of Medusa that will ask them a question whose answer is easy if the visitor has paid attention to the information displayed all over the villa. If the player succeeds answering the question, Medusa gives him or her an image of a golden apple like the one depicted in the Judgment of Paris mosaic (figure9).



Fig.9. Visitor playing the question game.

3. CONCLUSIONS

Virtual worlds can be used as a very effective tool for the dissemination of the cultural goods of an interpretation center. Virtual replicas can not only be displayed but also put in context, allowing for a better understanding of their cultural meaning. Those virtual environments can be used both as on-site simulation of historical reconstruction and also as a mean for remote visits, gathering attention from visitors from all over the world, thus reaching people which would probably never visit the physical place. All of this make virtual worlds a notable tool to enhance the didactic capabilities of centers.

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