Etruscanning

Digital Encounters with the Regolini-Galassi Tomb

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Introduction

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Etruscanning started from a basic idea of bringing objects from an Etruscan tomb together with the original space. Since this could not be done with the original objects in the original space, this had to be done in a virtual way.

The main goal of the Culture Program is to celebrate Europe's cultural diversity and enhance our shared cultural heritage through the development of cross-border co-operation between cultural operators and institutions. *Etruscanning* was aimed at exploring new visualization techniques through the virtual re-creation and restoration of Etruscan tombs. For this reason, we selected two test-beds; the Regolini-Galassi Tomb and the Monte Michele Tomb 5. The main focus of the project and this publication was the Regolini-Galassi Tomb, since the application that resulted from our collective efforts was integrated into an exhibition and since we were able to conduct several evaluation studies. The Monte Michele Tomb 5 test-bed will be described very briefly below.

Etruscanning in Short

Etruscanning was a close collaboration between museum curators, archaeologists, software developers, interactive designers, exhibition designers, specialists in storytelling, consultants in digitization and digital restoration, evaluation specialists and many others who contributed their knowledge and expertise to the project. This list of collaborators shows how this innovative project went beyond many traditional borders and domains. Within the project, we were able to establish an international cooperation in digital acquisition, digital restoration, and 3D representation. Through exhibitions, blogs, videos, and publications, we were able

View from inside the Regolini-Galassi Tomb, the Etruscan tomb that was selected for the *Etruscanning* project (photo: Christie Ray)

to realize a new approach to the communication of Etruscan tombs and collections in exhibitions in the Netherlands and Belgium. At the end of the project, the final resulting applications will be installed for permanent use in the Vatican Museums, Villa Giulia (Rome, IT) and Museum Formello (Veio, IT). Furthermore, this project proved that it is possible to enable and support cultural heritage institutions to create, run and exchange digital 3D reconstructions.

In this project, we focus on two important Etruscan tombs: Regolini-Galassi Tomb, the grave of a princess in the Sorbo necropolis of Cerveteri, and Monte Michele Tomb 5, the grave of a warrior, in Veio. The finds from these tombs are mostly in museum collections and the existing (empty) tombs are not always open to public. By making 3D reconstructions of the tombs and of the objects which originally were found inside, we can re-create the archaeological context of these Etruscan tombs.

3D reconstruction as a research tool

The 3D visualisation of the Regolini-Galassi Tomb has not only proven to be an essential tool for obtaining greater knowledge about the tomb and Etruscan funerary customs, it also provides an attractive way to present research results. In our multidisciplinary approach to the realization of this 3D visualization, we re-examined and re-interpreted earlier publications on the archaeological context of the finds, and reached new conclusions regarding the location of the objects within the tomb. Through the virtual reconstruction, we were able to place the objects virtually in the tomb, allowing us to identify inconsistencies in the source material and to determine the most plausible configuration for the objects. Using 3D visualization as our research instrument, we were able to study the tomb on another level.

Digitization and digital restoration

During the first phase of the *Etruscanning* project, the famous Regolini-Galassi Tomb from the Sorbo necropolis in Cerveteri was selected to be virtually restored. Using advanced techniques for digital acquisition, including laser scanning and photogrammetry, the tomb and most of its objects were rendered and restored, and subsequently placed in their original locations within the virtual tomb.

The project has been developing through a complex methodological approach; from the collection of existing data, to new topographical digital acquisition. Several ontologies of data have been acquired and elaborated upon, according to the typology and topology of the artefacts; including point clouds from laser scanner, photogrammetric data (dense stereo matching), and computer graphics.

The application

The Virtual Reconstruction of the Regolini-Galassi Tomb was first installed for public use in both the Allard Pierson Museum (Amsterdam, NL) and the Rijksmuseum van Oudheden (Leiden, NL), as part of a joint

exhibition on the Etruscan civilization, entitled *Etruscans. Eminent Women, Powerful Men*. The most innovative element of the Virtual Reality application developed for Regolini-Galassi Tomb is the paradigm of interaction based on the use of natural interfaces. This means that the user moves inside the 3D space through just his body movements alone.

The public now had the possibility to explore the virtual tomb, to get near the artefacts, and to listen to the narrative contents directly from the voices of the prestigious Etruscan personages buried inside; the princess and the warrior, to which the precious objects were dedicated. All of this is possible by moving in the space in front of the projection of the virtual tomb, in a very simple and natural way, without a mouse, keyboard, joystick or consol.

Evaluation

The presentation of the tomb employed a natural interaction interface which allowed users to enter and explore the virtual tomb using a map

Members of the *Etruscanning* project visiting the Regolini-Galassi Tomb during the kick-off meeting in May, 2011 (photo: Christie Ray)

on the floor with certain 'hot spots' indicated where short stories about the objects in the tomb could be heard. Throughout the exhibition period, the virtual reconstruction was evaluated to determine the added value of incorporating such an application into a museum exhibition and how users responded when confronted with a technological application in a traditional museum environment.

The results of the evaluation study presented in this publication offered a great deal of insight into the user experience of the presented case study, the Virtual Reconstruction of the Regolini-Galassi Tomb. Reflecting upon the results of this evaluation study, the added value of embedding the installation into the exhibition was threefold; contextual, educational, and museological.

Contextualization

The participants recognized the importance of the installation for providing a clearer understanding of the original placement and purpose of the objects from the Regolini-Galassi Tomb. Providing contextualization virtually, as it was done in the Virtual Reconstruction of the Regolini-Galassi Tomb, gives museum visitors an opportunity to better understand the objects, their use and origins, while protecting the original objects from the potential harm that can come from physically handling and moving objects to prepare for a traditional, object-based exhibition. Furthermore, the installation provided a unique opportunity to experience virtual objects in a virtually reconstructed environment, which is something that would not be possible using the original objects. Generally, the participants in the study were able to identify and praise the improved contextualization of the objects that the installation offered. Although their expressed attitude was that such virtual representations of objects and environments should not attempt to replace the presence of authentic objects, rather they should complement and supplement the more traditional style of object-based exhibition presentations.

Etruscanning project members viewing the objects from the Regolini-Galassi Tomb in the Vatican Museums in May, 2011 (photo: Christie Ray)

Educational value

The Virtual Reconstruction of the Regolini-Galassi Tomb offered additional education value, to supplement the content provided in the exhibition. When participants evaluated their experience after the installation and the exhibition, the results showed greater confidence in participant responses when they had experienced both the installation and the exhibition. When examined separately, users were able to provide correct responses to the questions asked after each the installation and the exhibition, but once both parts of the study had been completed, the results show that the participants were more certain of their answers than they were after completing only the installation or the exhibition. The content presented in both the installation and the exhibition served to reinforce each other, creating a more enriching experience for the museum visitor.

Museological value

The museological value of embedding the Virtual Reconstruction of the Regolini-Galassi Tomb into the Etruscan exhibition is reflected in both

the enhanced contextualization of the presented collections and the re-inforcement of educational content shared between the installation and the exhibition. More than this, however, the results show that the way museum experiences are being defined by visitors is evolving to include a broader range of content dissemination styles, including a more generally accepted presence of technology integrated into museum presentations. The acceptance of technology and Virtual Museum applications in museums by visitors will undoubtedly impact the future study of museology, especially as more museum directors are starting to recognize the value of incorporating technology in museums.

Dissemination

The methods applied in *Etruscanning* are not only multidisciplinary but also present a new approach to cross-media dissemination. Starting with traditional museum exhibitions that attracted unto now some 134.000 visitors, and eight publications, from both academic conferences and broad public media, we also achieved widespread outreach through presentations at a Science festival, a blog (with more than 30.000 page views) and several YouTube videos. This could explain the interest from state-of-the art museums, like the Vatican Museums and the Louvre, who are eager to show the *Etruscanning* installation.

The Monte Michele tomb 5 test-bed

Monte Michele Tomb 5, located near Formello, has many similarities and differences from the Regolini-Galassi Tomb. The similarity is in the dating and the layout of the tomb, as well as objects; both tombs contained chariots. The reason why we selected this grave was because of the differences. The Monte Michele tomb was excavated and documented in the 1980's, whereas the Regolini-Galassi Tomb was discovered in 1836 and only documented in a very selective way. All the objects that were found in the tomb were quite damaged and had to be restored by the Villa Giulia, the National Etruscan Museum in Rome. Another big difference is that the physical tomb is a difficult archaeological site to visit and interpret. It is located out of tourism paths, although some visits have been organized

for the public by the Museo dell'Agro Veientano, and the only artefacts from the tomb on display are the objects in the Villa Giulia Museum.

For this tomb we needed to create an application that could be used in the presence of the original objects and focus on the needs of the public. When completed, this application will be located in both the Villa Giulia Museum and in the Museo dell'Agro Veientano, in Formello.

In the case of Villa Giulia exhibition, the perception of real objects in the showcases and the virtual fruition of the interactive application will enhance each other if they can be placed in close proximity to each other. The application will be focused on archaeology stratigraphy and excavation, rather than on the virtual reconstruction of the ancient context. In this way, a different design approach is necessary and other layers of information will be given. In both museums, the space around the showcase is limited. Instead of using a large projection for presentation, the application will be visualized on a large screen and the public will interact close to the screen with a touch screen or a touch pad.

The Virtual Reconstruction of the Regolini-Galassi Tomb on show during the exhibition *Etruscans. Eminent Women, Powerful Men* in the Allard Pierson Museum, Amsterdam (photo: Daniel Pletinckx)

Exchange mechanism in museum domain

This project was triggered by the exhibition entitled *Etruscans. Eminent Women, Powerful Men* at the Allard Pierson Museum (Amsterdam, NL) and the National Museum of Antiquities (Leiden, NL). Furthermore, we wanted to create a real exchange in such a way that collaboration on the loans from several Italian partners would be used to create digital content that we could give to the Italian partners in return. In this way, a sustainable and more fruitful relationship was created between cultural institutions. One of the side effects is that, since we have a multidisciplinary team, the museum partners were in contact with more technical researchers from other domains. This also resulted in exchange, and sometimes confrontation, of different perspectives.