Cost-effective Framework for the Diffusion/Transmission of Archaeological Research

Paulo BERNARDES, Natália BOTICA, Manuela MARTINS, Luís FONTES

Over the past two decades the Information System (IS) developed at the Unit of Archaeology of University of Minho has grown systematically and consistently to integrate and manage more data in a wide range of raster and vector formats.

The initial version of the IS managed mostly some recorded field data. However, the need of having an IS that covers all the stages of the archaeological process required the inclusion of new modules with functionalities that enable a consistent growth. Currently the IS architecture combines the earlier bibliographical data of a site, the record of archaeological surveys and excavations with images, graphics and cartography. The access to these IS input data is a tools used for the archaeological research. However the archaeological analysis itself produces another level of information that will also serve as input to the IS. The combination of these distinct levels of information is used in a posterior stage to integrate GIS applications and to produce both procedural and constructive solid geometry (CSG) models. The GIS data, as well as the virtual 3D models, are essential and add value to the archaeological research.

The different level of information are integrated into the IS through a back-office application designed for users who have an archaeology and heritage background. This application naturally assists the archaeological research. But the IS also should promote the dissemination to a wider audience, since this stage is important to complete the archaeological process. Therefore, since the WWW is the most effective and democratic way to disseminate information, a web application to publish the archaeological data was developed.

This webpage enables the access to data through a cartographic or metadata-based interface. Both interaction methods allow the access to heritage sites. On each site the user is able to choose the kind of information he is interested in. Therefore it is possible to consult the site's associated bibliography and to see a set of related images and cartography. If possible, there are also virtual 3D reconstructions linked to the heritage site. The 3D models are always a result of the archaeological interpretation and are an intuitive and user-friendly way for non-expert users to understand and visualize the data of the site.

The application development tools are, whenever possible, open-source software, since they have lower costs and have similar features as the equivalent commercial software. The IS is based on a MySQL database and the back-office and web application combine MySQL with PHP. Also, for the web-design the Bootstrap framework is used. One major problem to publish 3D models is the number of polygons that are used to describe a scene. Therefore the initial 3D models were post processed in order to reduce the number of polygons and to simplify the textures. The

resulting simplified 3D representation was processed with Sketchfab to be integrated on the web page.