

Serious games and multimodal approaches for the enhancement of learning

Two case study for museum communication

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General issues

Interactive applications and passive animations, together organized in a synergic and complementary way, are an important element for the transmission of the knowledge. As results of recent studies, it is clear that all the exhibitions that have characterized their cultural offer through digital technologies and the active participation of the public, have obtained the greatest successes in terms of increase in attendance and, probably, a greater understanding of the cultural information. The integration of communication criteria based on the image and on the use of immersive and participatory technologies, is based on some assumptions. In the "image society", with the pervasiveness of television and multimedia tools, the cognitive process returns to be based on the image, conceived as a form of synthesis. However, this process has led to the consolidation of the so-called "cultural divide", the cultural gap that separates those who are familiar with books, newspapers, magazines and other information and dissemination tools, and those who have television as the only reference, from a communicative point of view. But if once were the cultural tools due to the social class, the employment or simply personal predisposition, from a few years has emerged the further line of demarcation of the "digital divide", the digital gap between those who have the possibility and the skills to use the new information technologies and those who are cut off from it. Determining factors, in this sense, are above all the age and the employment, which often favours the use of IT tools and internet. Vice versa, the familiarity with the computer instrumentation is a necessary condition but not sufficient to ensure the acquisition of culture and information.

The construction of a section of the "Museum of the Brickwork of Marsciano" (Perugia) and "Ceramic Museum of Calvello (Potenza)", both with installations for museum communication activates a dynamic mode of learning and cultural enjoyment. The digital approach to information is able to collect and simultaneously make available to its users a huge number of documentary resources, encouraging interdisciplinary approaches, promoting cross paths and unexpected connections based on cultural serendipity. All these issues are connected with the use of advanced technologies based on 3D. The use of hybrid photo restitution, digital photogrammetry, serious games and immersive narratives, makes it possible to emphasize the cognitive process through the dramatization, persuasiveness and emotional approach. Within these museum have been developed several applications, immersive videos and an interactive serious games intended as an "enabling platform", which allows visitors to learn the execution techniques of ceramics and the technical innovations in the production of bricks. The whole of these different technologies, should guarantee a response to the different requests of the public, allowing -to a certain extent- the overcoming of the digital divide and the cultural divide.

The serious game for the Ceramic Museum of Calvello

The learning mode of serious games is based on simple questions that require a knowledge base. This knowledge base is acquired by playing and interacting with the application itself. The player has fun and learns, in logic of edutainment game. The game is aimed primarily at an age group of visitors between 6-10 years, not for the particular difficulties of use, but especially because it is necessary to follow the textual suggestions appearing during use. The core of the game was developed around a three-dimensional model where the various ceramic objects are placed on a set table. In a collaborative environment, the visitor must assemble the various pieces according to some levels of completion. In association with these levels of completion, a message appears describing the various classes of pottery and the errors made. Since the game requires the involvement of only one person at a time, a large projection was introduced to allow other

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visitors to follow the game, make suggestions, collaborate. In addition to medieval pottery, the player must however recognize the food used in the same historical period, ie before the discovery of America. The set of information collected and organized in the game allows you to distinguish the different ceramics classes, an even more interesting operation in the game that concerns the ceramics of the Greek age or, in the more specific one, which concerns the Calvello ceramics.

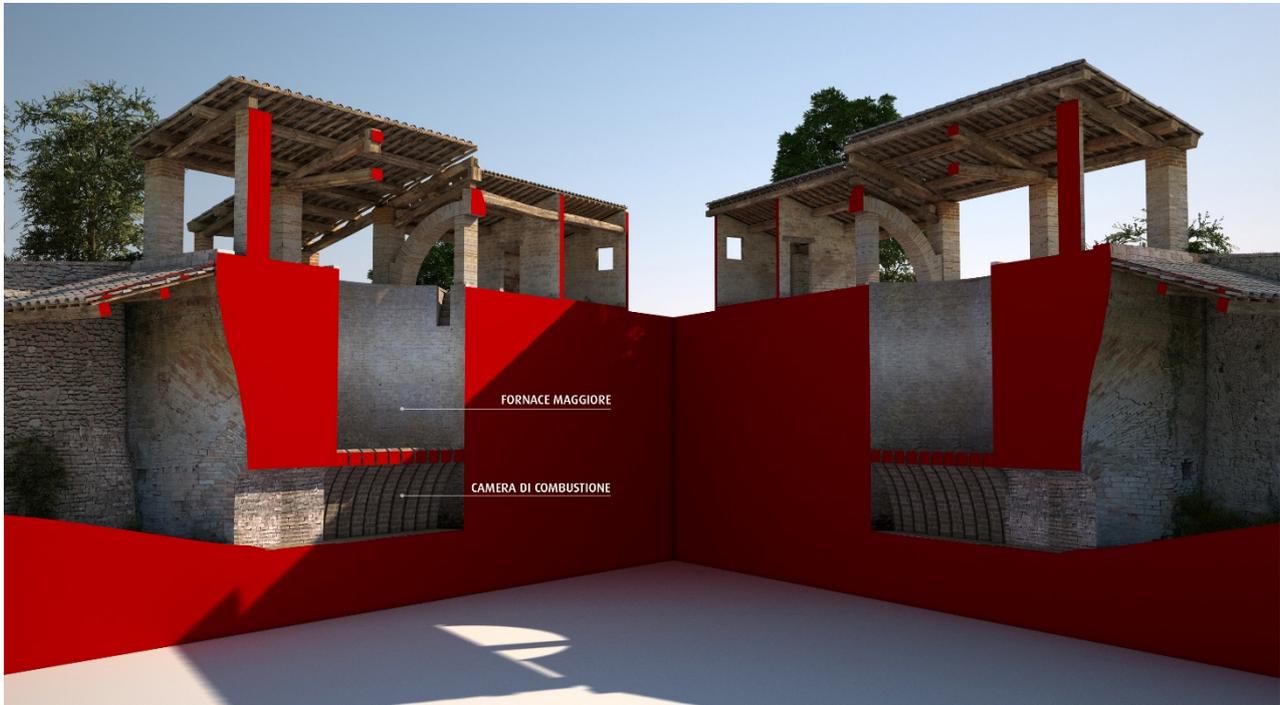


Fig. 1. Section of the Compignano furnace



Fig. 2. 3D representation of Hoffmann furnace



Fig. 3. The user experience of serious game. Home screen-shot

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