Chapter 14
Through Achille Castiglioni's Eyes:
Two Immersive Virtual Experiences

Cecilia Maria Bolognesi
Polytechnic University of Milan, Italy

Damiano Antonino Angelo Aiello
University of Catania, Italy

ABSTRACT

The experimentations described here concern the virtualization of the Studio Museo Achille Castiglioni, a small museum that hosts important artefacts designed by one of the most famous architects and designers of the 20th century, winner of 7 "Compasso d'oro" awards. The digitization process creates two virtual experiences to enjoy the place and the design objects to give visibility to the small context far from the big museum. The first (less complex and immersive) experimentation deals with the semantic implementation of 360° panoramic photographs, giving rise to a virtual tour of the museum available on the web with no interaction: it is the description of the state of the art of this place. The second one (a real VR simulation) derives from a more complex workflow based on digital surveying, digital modelling, and developing of virtual environments and interactions. The two proposed case studies demonstrate how new technologies can represent indispensable instruments for the safeguard, enhancement, and communication of Cultural Heritage.

INTRODUCTION

In recent years, the spread of digital technologies is gradually expanding the possibilities of fruition of places and collections, with favourable effects in economic terms (Ambrose & Paine, 2018). In the same period, cultural tourism is becoming a priority on the European agenda. This is the reason why one of the main challenges that European Union is facing deals with the 3D visualization and documentation

of Cultural Heritage (CH) in order to preserve its memory and use it to increase cultural education and tourism.

In the past, the use of digital technologies in order to disseminate CH allowed to create basic case studies characterized by very simple interactive elements, often made up of links able to connect objects to explanatory digital contents. The creation of the first web sites as a museum "showcase" had not yet faced the potentialities offered by 3D modelling or virtual tours, Virtual Reality, etc. in terms of enriching the museum offers (W. Schweibenz, 1991); but soon cultural institutions would have begun to understand the potential of new technologies improving and using them more and more within their apparatus.

In the 1980s, the demand of digitization went hand in hand with the need to catalogue the collections in the form of simple bi-dimensional images. As a consequence, many museums have started using the possibilities offered by the Internet (such as web sites and home pages) in order to collect and disseminate information about their exhibitions (Encyclopaedia Britannica, 2017). Year after year, with the development of new surveying techniques (such as laser scanner and photogrammetry), 3D modelling and digitization, the possibility of strengthening the archives and collections with 3D objects (virtual replicas of the real ones) has been expanding, increasing researches on the digital model, its geometry and its texturisation (Remondino & Rizzi 2010).

Nowadays, the theme of the safeguard and enhancement of CH through digital surveying and 3D modelling techniques is becoming more and more topical. Every issue related to digitization is related to the search for new balances between the great amount of data (collected during the digital survey and the historical research) and the innovative ways of dissemination, connected to new technologies and virtual environments, such as Augmented Reality and Virtual Reality (Banfi, Brumana, & Stanga, 2019).

In this context, it is necessary to define three concepts to understand the relationships between the existing data and their necessary virtual presentation (Figure 1):

- **Virtual Reality (VR):** It is an interactive computer-generated experience that takes place within a simulated environment. VR mainly incorporates auditory and visual feedback but can also allow other types of sensory feedback. A person who uses a VR equipment is able to "look around" in the artificial world, move within it and interact with the context (manipulating objects or activating interactive elements).
- **Augmented Reality (AR):** It is an interactive experience of a tangible environment in which the objects of the real world are "augmented" by virtual information generated by the computer through multiple sensory modalities.
- **Mixed or Merged Reality (MR):** It is not limited to the overlapping of virtual information with the real world, but it anchors virtual objects to the real world, allowing the user to interact with them. Sometimes it is defined "hybrid reality": it is a fusion of real and virtual worlds where physical and digital objects coexist and interact in real time.

This chapter, in addition to demonstrate the effectiveness of VR in learning processes, on the one hand tries to contribute to that branch of research that deals with experiments in the field of new technologies, VR, 3D modelling and digitization of Cultural Heritage, on the other hand is configured as a guide for those who approach VR for the first time. The finished product aims at a large-scale audience because it has a character of immediacy, intuitiveness, ease of use and understanding; however, in the narration there are ideas for researchers who wish to undertake the experience

26 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/through-achille-castiglionis-eyes/241606

Related Content

Lessons Learned from the Design and Development of Vehicle Simulators: A Case Study with Three Different Simulators
Sergio Casasand Silvia Rueda (2018). *International Journal of Virtual and Augmented Reality (pp. 59-80).*
www.irma-international.org/article/lessons-learned-from-the-design-and-development-of-vehicle-simulators/203068

A Review of Augmented Reality in K-12 Education Environments
Adam C. Carreon, Sean J. Smithand Kavita Rao (2020). *International Journal of Virtual and Augmented Reality (pp. 32-61).*
www.irma-international.org/article/a-review-of-augmented-reality-in-k-12-education-environments/283064

A Review of Augmented Reality in K-12 Education Environments
Adam C. Carreon, Sean J. Smithand Kavita Rao (2020). *International Journal of Virtual and Augmented Reality (pp. 32-61).*
www.irma-international.org/article/a-review-of-augmented-reality-in-k-12-education-environments/283064

An Exploratory Study Examining Group Dynamics in a Hackathon
Alana Pulayand Tutaleni I. Asino (2019). *International Journal of Virtual and Augmented Reality (pp. 1-10).*
www.irma-international.org/article/an-exploratory-study-examining-group-dynamics-in-a-hackathon/239894

From Pride to Prejudice to Shame: Multiple Facets of the Black Metal Scene within and without Online Environments
Vivek Venkatesh, Jeffrey S. Podoshen, David Perriand Kathryn Urbaniak (2014). *Educational, Psychological, and Behavioral Considerations in Niche Online Communities (pp. 364-388).*
www.irma-international.org/chapter/from-pride-to-prejudice-to-shame/99313