

VRexhibition: A Virtual Reality experience in an exhibition at the municipal Art Gallery of Chania, Crete

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Introduction

This paper summarizes a project aiming to create a new experience in the municipal Art Gallery of Chania, Crete, Greece implemented through the technology of Virtual Reality (VR). Within the framework of an art exhibition inspired by and dedicated to modern Greek history. The goal is to experiment with a new approach of getting in touch with the gallery and the artwork, through an interactive virtual experience that exploits digitization and 3D mapping, highlighting the cultural content of the exhibition. The main scope is to offer the opportunity to the visitor to get to know the place and the artwork, promoting her/his active participation in the project of setting up the exhibition, acquiring knowledge about the artwork through a task-based learning approach. The paper also theoretically discusses the potential to integrate the experience into the metaverse world.

Scope and Methodology

The exhibition¹ was among the biggest events taking place in the context of the 100th anniversary of the liberation of Greece (1821-2021). The artwork consists of rare paintings and sculptures, watercolors and drawings, utensils, watches and costumes, weapons and publications, in total 167 exhibits publicly presented for the first time from October 30, 2021 to May 30, 2022. The Art Gallery of Chania is an elegant building of the 20th century, in the city centre, consisting of three exhibition floors.

The project was focused on three axes: First of all, the goal was to provide to the curator of the physical exhibition a tool that would be useful to experiment with the exhibition and simulate setup

¹ "1821-2021, Treasures of Post-Revolutionary Greece, Krasaki collection"

ideas prior to their finalization. In this way, we were able to observe how the curator interacts with a technological tool - which provides digital clones of the space and of the artifacts - to create the arrangement she/he desires by leveraging knowledge for each exhibit. Secondly, the work was focused on how to remotely immerse interested people into the world of the exhibition in the Art Gallery and provide them with the necessary knowledge for each artwork regardless of their physical location. Finally, the project's main goal was to combine both approaches (human-system interaction and remote exhibition visit) to create an educational framework where users would familiarize themselves with the exhibition and become curators of their own version of the exhibition by changing the sequence of the exhibits within the virtual world according to the acquired knowledge and desired installation.

By 3D - scanning the place, we generated a 3D model, which was used as a shared base for the study, the installation of the virtual exhibition, for the aesthetic approach of the virtual exhibition room and the placement of all the artwork. Inside the virtual space of the 3D model of the gallery, the curator of the physical exhibition was able to decide on details such as coloring and the concept of each floor of the physical exhibition (Fig.1, Fig2).

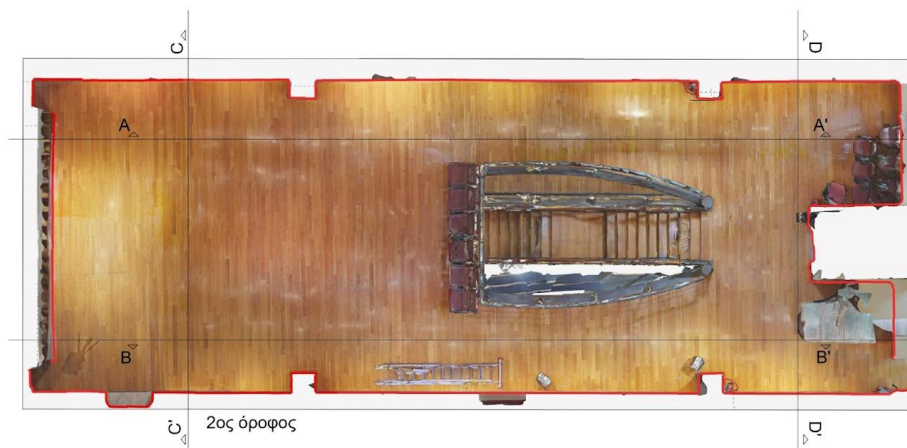


Fig. 1 Development of second floor of the Art Gallery

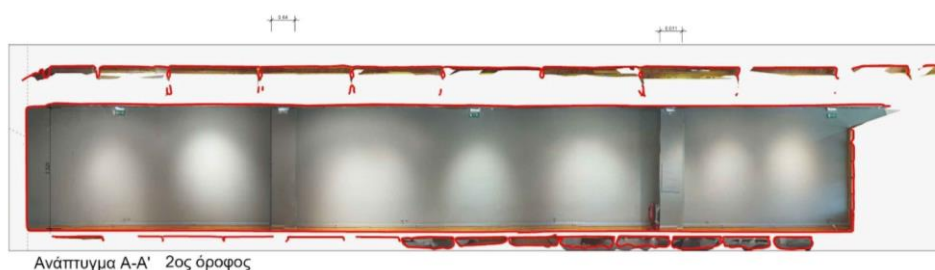


Fig. 2 Development of second floor of the Art Gallery (section A-A')

When the interior space of the Gallery was finalized to host the exhibition and prior to the placement of the exhibits, the empty - in terms of exhibits - but colored interior space of the Gallery was



Fig. 3 Onsite installation of VR

3D scanned again. In parallel, the largest part of the exhibits was also scanned and cataloged, thus creating a digital archive of the exhibition. Through the updated 3D model, the curator of the physical exhibition finalized the exact position of each exhibit. The same model, once finalized with all exhibition details, was also shared with the graphic designers, who, in turn, decided the small details for the description, title and numeration of each exhibit.

Following this step, we created the VR experience that would function as an educational tool for interested people and physical visitors. The system was installed on site and was accessible to users during their visit (Fig.3). After their physical visit to the Gallery and their familiarization with the exhibits, they could revisit the virtual space of the Art Gallery and compose their own virtual exhibition. The experience offered an interplay between users, digital exhibits and the digital Art Gallery space.

Through the VR experience, the user had the ability to walk through the virtual building, change the exhibits position on the walls, but also to scale them, to 'touch' them and to better appreciate their color, shape and value (Fig. 4). At the end of his work, the user could take pictures, video or gif of it, into the Virtual environment; in order to save her/his desired setup (Fig.5).

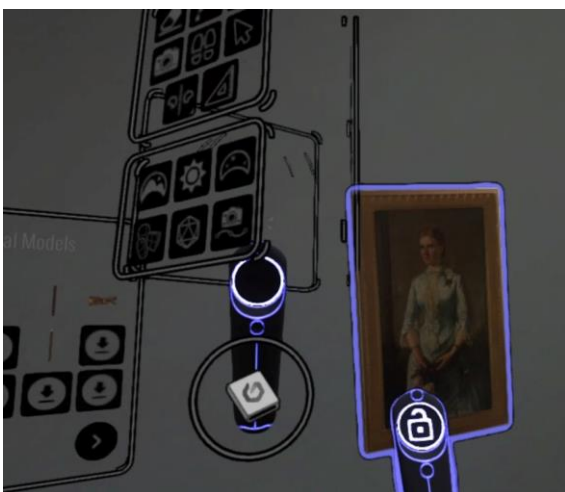


Fig. 4 VR experience



Fig. 5 Capture of the VR set up

After the final set of all of the exhibits, we scanned the whole exhibition anew. The three-dimensional scan after the installation of the exhibition, was done in order to digitize the entire ex-

hibition, thus offering users the opportunity to visit remotely, learn about the artwork, using only the link from the official website of the Municipal Gallery (Fig. 6). All stored information on the history and description of the exhibit was made available by selecting the exhibit (Fig. 7).



Fig. 6 Remotely Visiting



Fig. 7 Information on the history and description of the exhibit

The ultimate goal of this work is to enrich users' knowledge with an alternative way of learning about cultural heritage through task-based learning. The goal is achieved through a twofold process: one the one hand, generating the input of the virtual environment through 3D scanning was an important means of assistance to the curator of the exhibition, helping him to better organize and construct its overall view. The curators' interaction with the content became the base of how to

build the user-virtual curator's interaction. On the other hand, the VR experience created an enriched educational framework accessible to users based on interaction and active participation; So, understanding the work of a physical curator, we provide the interested visitor with the challenge of creating a virtual exhibition. Aiming to categorize and place the exhibits based on their history, the user is forced to devote himself to the process of learning about each one. Thus, the user acquires condensed knowledge as the natural curator of an exhibition should.

Conclusion

Visiting an exhibition or a museum can become an altered interactive learning experience with the help of Virtual Reality technology, allowing the visitor to individually emphasize and highlight the cultural value of the exhibition as well as of each individual exhibit. The aim of this work is to create an innovative virtual museum visit tool where the user has an active role in forming the visiting experience, while simultaneously gaining knowledge about each exhibit as well as the entire history of the exhibition in question. In addition, the application constitutes a very useful tool for people who specialize in managing exhibitions. Simulating the exhibition space and the layout of the exhibits, they can have a complete understanding of their setup idea and the exhibits within it and adjust it accordingly.

In the future, the intention is to make information about the exhibits available within the virtual space so that the user can use the knowledge and learn about the exhibits while using the VR tool. Moreover, an additional goal is the categorization of information for each exhibit and the organization of different theme-based exhibition layouts for the user to choose within the virtual space. Thus, the VR application would act as a useful tool to temporally, thematically or based on characteristics classify the artwork to enhance and deepen the user's knowledge.

The municipal Art Gallery of Chania could potentially form part of the metaverse world. The VR environment could simultaneously host more than one user, such as avatars interacting with each other through suggesting rearrangements of the artwork into the Art Gallery. These modifications could be saved and seen by every avatar visiting the metaverse world. Finally, the metaverse could also become the source of inspiration for users by enabling them to visit other virtual metaverse Art worlds while visiting the Art Gallery.

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