

THE IMPACT OF INTERACTIVE DIGITAL STORYTELLING IN CULTURAL HERITAGE SITES

Museums are storytellers. They implicitly “tell stories” through the collection, informed selection, and meaningful display of artifacts, using explanatory visual and narrative motifs with their exhibits and exhibitions. Traditional storytelling has recently been introduced by museums as another means to contextualize objects, by including in exhibitions personal stories related with historical events. As a consequence, objects are “demusealized”, they become closer and more relevant for visitors. The adoption of a more explicit storytelling contributes to make exhibits and collections more accessible and engaging for different kinds of audiences: it creates a relaxed environment that raises self-confidence and establishes a universal way of communication.

In this paper we present CHESS, a system leveraging interactive digital storytelling to enhance and improve the visitors’ experience in museum visits. It a) uses personalized information about cultural artefacts to create customized stories that guide individuals or groups through a museum and b) aspires to (re-)inject the sense of discovery and wonder in the visitor experience. The CHESS system employs mixed reality and pervasive games techniques, ranging from narrations to augmented reality on smart phones. Targeting to replace the traditional set of exhibit-centric descriptions by story-centric cohesive narrations with carefully-designed references to the exhibits, CHESS follows a plot-based approach, where *story authors* (curators, museum staff, script writers) write stories around pre-selected museum themes. Two museums participate in the effort, namely the Acropolis Museum, in Athens, Greece, and the Cité de l'Espace in Toulouse, France.

We first present a short example of the CHESS storytelling experience in the Acropolis Museum to illustrate the various aspects it includes. We explain the main authoring phases in the museum setting and we present the main results reached from several formative evaluations, focusing on the impact of digital storytelling in the museum visitors’ experience. We conclude by proposing to leverage the power of digital storytelling for attracting visitors to museums and engaging them with their cultural treasures and we highlight the importance of investing on cultural heritage sites in times of crises. Finally, we reflect on the potential to involve the visitors into the story authoring process, enabling them to create their own stories, for being experienced by other visitors on-site or online.

1 CHESS Visitors’ Experience

The CHESS experience is a unique combination of the story presented through the terminal, the visitor’s actions, the exhibits in the cultural heritage site, as well as the surrounding environment itself. When the visitor experiences the story on-site, (s)he is submitted to five interlinked “experience modes”: (a) walking from exhibit to exhibit, (b) observing an exhibit, (c) listening to narrations from the terminal, (d) interacting with the terminal to make choices, and (e) using the terminal in interactive activities. Of course, these modes are not mutually exclusive; on the contrary, they often co-exist to enhance story immersion.

The CHESS experience starts as soon as the visitor is handed the CHESS terminal and a pair of earphones. The visitor goes to a specific web location, logs-in into CHESS application and fills out a short quiz, enabling the system to gather initial evidences regarding his/her attitudes. Then a virtual character appears on screen, talking about his/her identity and introducing the backbone of the upcoming experience. This is the main character of the story, unfolding the story’s plot while prompting the visitor to take specific actions within the museum space.

The following figures illustrate the five experience modes in a sample story part that takes places at the archaic gallery of the Acropolis Museum. The Horse narrator gets introduced at the entrance of the gallery (location 1 in Fig. 1). He starts unraveling the story's plot and then prompts the visitor to find four of his fellow horse friends (location 2 in Fig. 1). When location 2 is reached, the Horse prompts the visitor to look at the exhibit and talks about the four horses. When the narration finishes, the terminal displays an image showing how the exhibit might have originally looked like, filling in the missing parts (Fig. 2). Certain parts of the image are highlighted, indicating there is more to tell about them. As soon as the visitor taps on a highlighted area, the Horse starts to narrate a related part of the story.

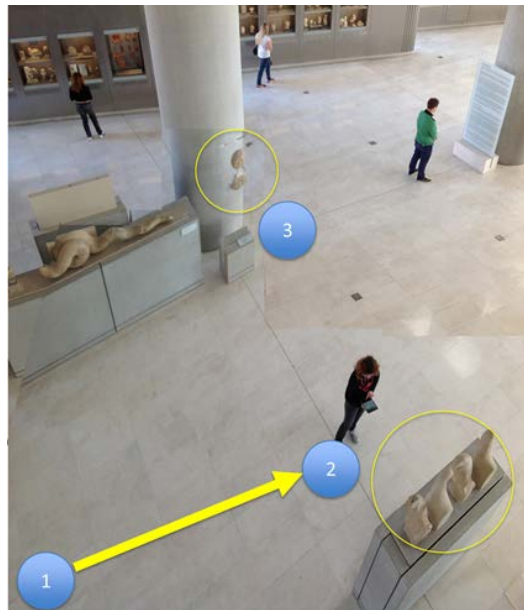


Fig. 1. A sample story part at the Acropolis Museum

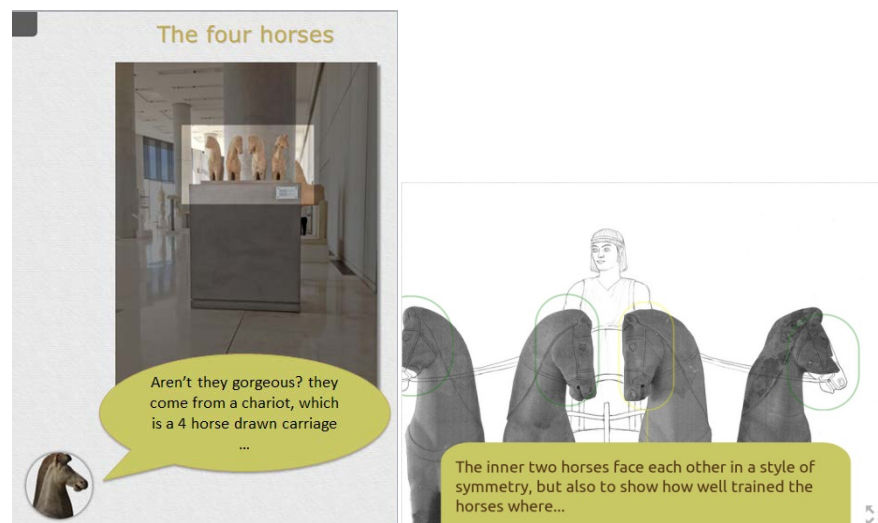


Fig. 2. Digital productions for the Four Horses exhibit

At any point during the experience, the visitor may decide to interrupt the story flow by performing certain actions (pause, skip, etc). Furthermore, from time to time, the visitor is presented with menus asking to make choices on how to continue with the story (Fig. 3).

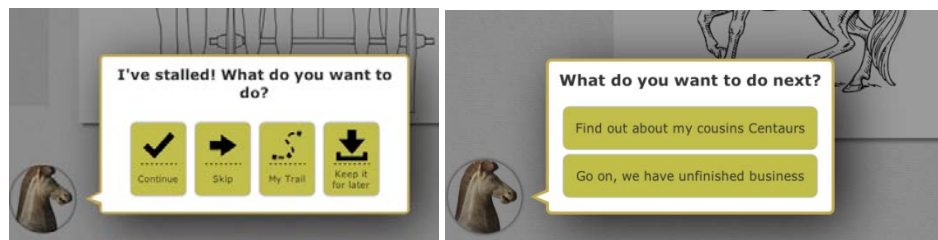


Fig. 3. Sample menus controlling the story flow

Obviously, the described experience requires careful orchestration of several different resources.

2 CHESS Authoring Phases

Similarly to the making of a movie, our approach to the creation of interactive stories includes four main phases, namely scripting, staging, producing and editing (Fig. 4). During scripting, the author chooses the main story concepts, sketches the plot, and writes the narrative text, i.e., the script. In staging, the author associates parts of the script with exhibits, paths and other spots in the physical museum space. Then, a set of multimedia resources is produced for the staged script, including audiovisual material, games, quizzes, augmented reality models, and other illustrative applications. Finally, the author does the montage, selecting, and ordering of the multimedia digital resources to turn the final script into a storytelling experience.



Fig. 4. Authoring phases

The stories authored are adaptively provided to visitors through the experiencing systems (web-based and mobile), thanks to several co-operating engines (storytelling, profiling, personalization) and services (location tracking, multimedia presentation and interaction), depicted in the following figure.

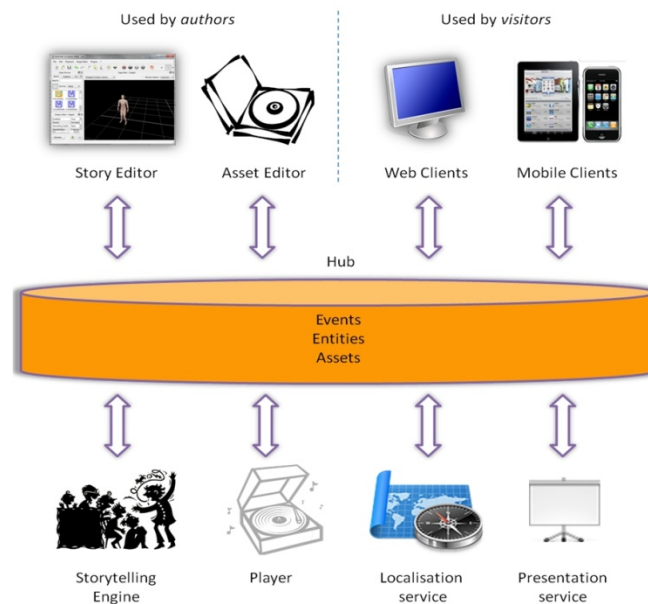


Fig. 5 CHES Architecture

3 Key Findings and Discussion

To research the complex issues raised in applying a mobile interactive personalized storytelling approach in the museum context, a user-centered iterative design methodology has been adopted. Our methodology has so far also included several formative evaluation sessions with visitors. A key finding, verified in all of the undertaken evaluation sessions, is that visitors were enthusiastic to participate in an interactive digital story in the museum's place. Most visitors stated that the presence of one or more characters telling the story was one of the highlights of the experience. As one visitor suggested: "If there is a plot, characters make it more interesting. You can look at the story through different points of view". Our results show the experience is significantly benefited from a sound and coherent plot, acting as "glue" that keeps together the informational script units. Many visitors commented that the story plot is the most important aspect of their experience: "This is what gives a meaningful context to the information presented; it makes me understand, connect and remember what I've heard and seen."

All visitors commented positively on the narrative, which in our case was written by either a professional storyteller, or museum experts. The informal first person narration, interpretations that made comparisons to the contemporary world, and the informal/humorous elements injected in the story resulted in narrative style that differed from what most visitors expected to hear in an archeological museum. Visitors responded to humorous references or rhetorical questions posed by the narrator in

the prose by smiling, nodding or thinking aloud. This visibly enhanced their engagement and personal connections to the exhibits.

Regarding the digital productions, the evaluated stories included a couple of games and augmented reality applications but the great majority of script pieces have been realized through simple audiovisual productions, containing an audio narration along with one or more images. Evaluation results showed that the visitors enjoyed all types of productions. They considered the enhanced multimedia productions to be an added-value asset for their experience. However, most visitors stated that the inclusion of many enhanced multimedia productions would overwhelm them. This verifies our hypothesis that, while a storytelling experience may benefit from complicated multimedia applications, a good story may significantly improve the visitors' experience, even if realized with simple, cost-effective productions.

4 Conclusions

Our findings have verified that the exploitation of interactive digital storytelling techniques for museum visits considerably promotes visitor understanding, reflection and engagement with the museums' exhibits and concepts, increasing the overall visitor satisfaction from the museum visiting experience. Based on that, we believe that the application of digital storytelling in museums stands out as a very promising approach in times of crises, since cultural activities and museums are unique resources for the development of economy and society.

Our cultural heritage is not a mere memory of the past, but a capital asset in understanding the present and planning the future. Innovative museums foster public awareness, promote understanding of heritage and offer educational services. They strengthen cultural identities, support social cohesion and develop intercultural mediation -activities which are fundamental in times of crisis. Besides knowledge and education, museums also create income and employment. Investing in museums and their services is the best way to develop and improve the quality of cultural tourism.