Yes, You Can Touch This: Designing Prototypes for Interactive Museum Spaces
Preliminary Educational Project Results and Designs
Poster Abstract

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Abstract. Traditionally, museums have been spaces where visitors are asked to look but not touch items on display. Currently, professionals in museums, particularly in the United States, are working to improve visitor experience by using interactive displays and technologies. Interactive media allows visitors to be immersed in the information displayed rather than simply reading a text label. Improving the visitor experience is a goal of every museum department, a vision shared by directors and administration that trickles down to the curatorial, education, and exhibit design departments. With threats of budget decreases and funding issues, many museums in the United States are fighting to remain relevant in order to keep people coming through their doors. Furthermore, museums are spending money on visitor experience studies to enhance their facilities and support visitor needs and wants [6]. Museums around the world work to collect, manage, and preserve information. One obstacle these institutions face is the challenge of effectively disseminating this information to their visitors[1]. Interactive museum spaces could bridge the gap by making information more attractive, inviting and memorable. While several museums in the United States are in fact implementing technology in their exhibits, they are not always executed to the best of their ability. The purpose of this study is to analyze the ways game design and interactive media can engage museum goers and improve information retention. Additionally, we aim to determine the aspects of interactive media design that make it effective and ineffective, and use this criteria to develop prototypes. Our project began with a concern for the threats posed to cultural sites of indigenous Americans. We wanted to explore how to preserve cultural information at sites that are endangered from neglect and encroaching urbanization. The preservation of indigenous culture is more pressing now than ever with the effects of climate change. Furthermore, many of these sites are not recorded, and their histories are passed down orally. With many indigenous groups lacking a written language, preservation is a literal race against time. A major example of interactive media used to preserve culture is the video game Never Alone by E-Line Media. Never Alone was developed in collaboration with the Iñupiaq, an Alaskan Native people. It paid homage to the Iñupiaq culture by having members of the tribe directly involved in its design. In the game’s trajectory,
the player earns “Cultural Insights,” which are documentary snippets that include interviews with tribe members and cinematic views of the Alaskan landscape. The player can optionally interact with these videos to learn more about the Iñupiaq. The “Cultural Insights” vary from discussing the Iñupiaq drumming ceremonies to the importance of nature and community. The main storyline of the game is based on a story passed down from generations of Iñupiaq and features their artwork. Aside from being educational, Never Alone is objectively a good game. It is rated with nearly 5/5 stars on the PlayStation Store and very positive on the Steam, a popular digital Game store. Within the next six months, our team will design and build an augmented reality prototype and a digital game prototype. The prototypes will be in connection with the Smithsonian’s National Museum of the American Indian (NMAI) exhibit titled “The Great Inka Road: Engineering an Empire.” The Great Inka Road focuses on the Qhapaq Ñan, the road of the Inka. The Qhapaq Ñan spans 20,000 miles and includes mountains, rivers, and deserts. It connected Cusco, their capital, to the rest of the empire [2]. We chose this particular exhibit to focus on because we were fascinated by the Inka and their ability to build this massive road without the aid of modern tools and materials. By focusing on the information in this exhibit, we will create interactive experiences that help preserve and share Inkan culture. To prepare for the design stage, our team has analyzed visitor studies commissioned by the NMAI that deal with pre-existing interactives within The Great Inka Road exhibit. In addition, we toured the NMAI with an exhibit designer to observe interactive installations throughout the museum. After visiting The Great Inka Road exhibit and viewing their interactive devices, we found several areas that could be improved upon. In one interactive activity featured in the exhibit, visitors press buttons that map Inkan constellations appearing in the night sky. As the visitor presses a button, a constellation is lit in front of them, along with a paragraph of information on the constellation’s meaning. While the idea behind this activity was interesting, we found the installation’s interactivity still had room for improvement. We observed visitors spending more time looking at the images of the constellations, rather than looking at the information below. As a result, we found this interactive to lack support for information retention. The exhibit also contains a mini-game related to infrastructure, a mobile application, and an interactive touchscreen ‘table.’ In the infrastructure mini-game, visitors approached a large vertical touchscreen and selected a question about Inkan culture. After selecting a particular question, the infrastructure game would appear. The game asked players to correctly order substances such as soil, bedrock and sand, to form an infrastructure that prevented crops from being washed away by running water in a mountainous landscape. While entertaining and informational, this game was not easily accessible due to misleading information architecture. The exhibit also included an interactive storybook application. Visitors are able to listen to a story about the Inkan gods, narrated by an bilingual child speaking in English and Spanish. Though the storybook application was well-executed, it seemed too simple for mature visitors as the main interaction with the book was to flip a page on the screen. The style of the application was designed in a manner that appealed to both children and adults, but with the addition of a child’s voice, and the lack of further stimulation, it catered more to that age group. While people of all ages were able to learn something new from the storybook application, it did not ask visitors to critically think about the Inka culture. Our team found the touch screen table to have the best design of all the activities in the exhibit. The table contains a map
of the Cusco empire, panoramic videos and images of areas within the empire, and videos on different areas on the Great Inka Road. We observed several people exploring its features, and the table set-up encouraged collaboration, as it was a multi-user interface. However, there were issues with the table’s audio; its speakers were placed below the table, making the sounds drown out with other commotion in the exhibit. The Yes, You Can Touch This project is currently in its pre-production phase and consists of five team members, each from different universities in the United States. Our team is currently in phase one, which includes developing a literature review and developing design specifications. By the end of the year, we plan to have designed and built polished, functional, beta prototypes. An augmented reality prototype will be designed for users to explore Inkan ideologies related to constellations and astronomy by using an iPad stationed in the constellation section of the exhibit. Augmented reality can be extremely effective for enhancing the visitor experience and immersing visitors into an exhibit. The Detroit Institute of Art recently premiered their “Lumin” device, which allows visitors to take an augmented reality tour of their exhibits. [5] We aim to build off of this idea and design a prototype that improves the current constellation interactive by making the experience less static and more mobile using a handheld device. Our game prototype will be a 2D competitive decision-making multiplayer trivia game. We will be focusing on the relationship between the Inka as human beings and their superiors: emperors and deities. We will be using the Unity game engine to create the prototype. Two players will be playing against each other as Inkas to appease the greater powers and ultimately gain eternal life. This project uses qualitative methods to study interaction design, game theory, augmented reality, and the use of interactive media in museums. Qualitative methods will also be used to test for usability of the prototypes in a museum setting. We plan to conduct surveys to gauge how the users are retaining the information on Inka culture through the prototypes, and complete observations during usage. With our research, we hope to gain a better understanding of how gaming and augmented reality prototypes can be used and designed to preserve culture and enhance information retention and learning.

**Keywords:** Interaction, Museums, Smithsonian, Preservation, Indigenous, Culture

**References**

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