Design Sensibilities in a Museum Exhibition Design Process in Indigenous Context

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In this paper, we describe our on-going work on creating interactive museum exhibition pieces for an indigenous context. The interactive exhibition pieces aim to present the historical cultural heritage in an engaging and interactive manner, with paying respect to the indigenous culture and traditions but also linking it with modern way of life in indigenous communities. The work is conducted as part of a multidisciplinary project, which aims creating a new ways for exhibition languages at indigenous Sámi museums located in Finland, Sweden, and Norway.

CCS Concepts: • **Human-centered computing** → *Empirical studies in collaborative and social computing*.

Additional Key Words and Phrases: culturally sensitive design, cultural heritage, ethics, conflict resolution, cross-cultural design

1 INTRODUCTION

Museums presenting history and cultural heritage items are increasingly updating their exhibitions to include interactive elements. To complement the early introduced interactive public displays, tangible user interfaces [15], and augmented reality (AR) and virtual reality (VR) are used in museum exhibitions [4]. Interactive exhibitions are deemed to be more interesting than non-interactive ones [10, 18], and are created especially to attract the younger generation as an audience. Designing and developing interactive museum exhibitions typically requires collaboration from a multidisciplinary team, which is able to produce and implement the interactive content.

Many challenges may arise in the process when designers work with museum contents and objects related to sacred or sensitive themes, which they are not necessarily previously familiar with. One current aspect to this is the ongoing debate about decolonizing museums [22], i.e. returning museum items to the cultures that they were initially taken from. One example of this is the Finnish National museum items that are being restored to the Siida Sámi museum in Inari [14]. Similarly, design practices have been questioned in the contexts of decolonizing design [1] and in human-computer-interaction and interaction design [6, 28]. In this paper, we discuss the challenges of creating culturally sensitive interactive exhibition demos from the HCI design point of view, and describe our on-going work in the context of an indigenous museum exhibitions.

2 RELATED WORK

There have been numerous works and studies on HCI for museum contexts, which have reported tangible outcomes to help future interactive exhibition designers. Digital augmentation with public and/or private displays are the most common technologies used in museum settings. In the context of digitally augmented museum exhibition pieces, Ciolfi and Liam emphasize, e.g., how the installation needs to encourage the visitor towards interaction and provide affordances on how to interact with it [7]. Hornecker and Stifter [16] report field study findings on how digitally augmented museum installations that allowed the creation of personal content, instead of predefined interaction, were used more intensely. Also, they found that interactive hands-on exhibits were successful in engaging all kinds of visitors, including different age groups and profiles of interest. Goulding provides a nice overview of different aspects of museum

experience, including different social and cognitive aspects, which all indicate that the visitor needs to be engaged by offering stimulating material that can be processed in a meaningful way [11]. There is a code of conduct for visitor behaviour in museums, and this is also reflected in the technology use in the context. Museum visitors are aware of other visitors, and do not want to disturb them while using technology, e.g. electronic guidebooks [12]. Museums are often visited in groups, and visitors want to have fun and experience the exhibition together. Thus, allowing group experiences and supporting ways to enjoy the exhibition together is important [16].

Interactive technology in contemporary cultural heritage settings also focuses on tangible and immersive media as well as sensor based interaction techniques, to tell stories and to engage visitors with the museum content. Vaart and Damala embedded a handheld AR application that lets users see textual information on physical objects in museums [27]. Researchers also explored holographic displays for creating mixed reality applications. Belluci, Dia and Aedo implemented a multitouch see-through display that lets its users record their experiences through a video, and then overlays the recorded videos on the physical artefact [5]. Lee et al. embedded a projection-based holographic display in an exhibition, enabling visitors to observe the details of a digital cultural artefact in three dimensions [20]. Senecal et al. proposed a one-to-one scale projected hologram of a historical character, Lady Ada, interacting with visitors and communicating her story [24]. Alongside mixed reality applications, museums also offer virtual experiences [25], that can be viewed through, e.g., VR headsets [23], web-based interfaces, or dome-like structures built within the exhibition setting. A review of VR and mixed reality technologies in museum applications suggests that such media are capable of satisfying purposes such as education, exhibition enhancement, museum exploration and enabling virtual tours [4]. Also, Trajkova et al. investigated how museum visitors can explore the information through embodied interaction techniques such as bodily gestures [26].

Our on-going work addresses developing interactive museum exhibition pieces in the context of an indigenous culture. In the field of HCI, indigenous communities and cultures have been addressed in prior technology development research, although only sporadically. For instance, Awori et al. [3] focused on Kenyan diaspora in Australia. They suggested, while ICT technologies help gain knowledge about the culture and stay connected to the homeland, the technology does not support the physical embodiment of cultural knowledge (e.g. cooking). Also, workshops were conducted to share experiences on working with an indigenous community on technology projects [19] and on how the indigenous knowledge and communities are affected by research in ICT [9]. In general, designers working with the indigenous context need to pay extra attention to ethical guidelines, such as those of the the Finnish National Board of Research Integrity (TENK) or HORIZON2020. A specific ten point chart of guidelines has been created for designers working in indigenous contexts [17], promoted by International Council of Design. The charter is based in the United Nations in their Declaration on the Rights of Indigenous Peoples [2]. The points consider how the design process should be made in collaboration with the local indigenous community, and that the designs should foster mutual benefits.

3 DESIGN WORK IN PROGRESS FOR AN INTERACTIVE MUSEUM EXHIBITION

Our work-in-progress is conducted in the international Interreg Nord *Muittut* project, which aims to create a new Sámi exhibition language, which can be harnessed to create modern exhibitions that truly highlight the indigenous Sámi cultural heritage in the region. With the lead of the involved museums, the project has defined its highest priority target user group as the Sámi community itself. The exhibition contents should raise empathy in the museum visitors and should convey the story of the Sámi told by the Sámi. This the Sámi cultural heritage could be presented through a combination of technology, art and traditional knowledge. The HCI design team works in close collaboration with the involved museums, and the culture has been introduced through a series of thematic project workshops, which

Fig. 1. Working on a back projected demo with a traditional Sámi narrative. The visuals are edited from Visit Norway's video on Youtube titled as "People under the northern lights | Sámi reindeer herder Karen Anna" [21] and from Depositphotos (depositphotos.com/home.html).

Fig. 2. Experimenting with a hovering 3D model. The cat in 3D was downloaded from Scottish Maritime Museum (https://www.overleaf.com/8918664127ccyzbjxrgvcf).

focused on a specific cultural item, or aspect, at a time. To explore how this potential content could be presented to the visitors, we are implementing a set of interactive demonstrators. The aim of these demos is to illustrate to the project stakeholders the approaches that could be used, and facilitate discussion how they could fit into the exhibition, and to the project's target of communicating the cultural heritage in an up to date way.

Our interactive design prototypes explore different AR and VR techniques that could fit the the museum context. These includes projection based techniques, where virtual content is back-projected on a semi-transparent medium. Here, we are examining projection techniques on various fabrics and plexiglass, as well as leather, water and smoke. Figure 1 shows the construction of demo, where a traditional Sámi narrative is presented with a combination of tangible and projected characters, against an interactive projected backdrop of the northern lights. Another approach we are exploring includes a set-up where a holographic reflection of interactive visuals are presented in 3D. A 3D model of an museum artifact is presented on a tablet, and the image is reflected to a pyramid shaped plexiglass structure. As a results, the 3D image appears to float in the air, and can be rotated by the visitors, Figure 2.

4 DISCUSSION

Earlier research has pointed out that information visualization is a powerful tool to highlight and give understanding of tragic historical events, and, consequently, ethical aspects of the visualization style should be considered during the design phase [8]. For instance, a VR museum visit to a war time graveyard can provide an immersive visual experience

of the lost lives and the magnitude of the human tragedy [13]. The way in which information and culture are presented and visualized in an indigenous museum context has a large effect on how the exhibition is perceived.

HCI research has typically used an iterative demo based approach, but, when working in indigenous contexts, designers must be take care with interim demos, even if the presented content is not meant to be final. In the case of large international projects, where the designers and developers themselves are often not part of the respective indigenous group, it is sometimes challenging to understand the value and sensitiveness of certain contents. This requires much collaboration between the stakeholders, listening their viewpoints, and thoughtful familiarization with the culture and cultural history in question. In our experience, the intensive thematic workshops that have included deep presentations on culture have helped in understanding the cultural sensitivities, and which forms of interactive exhibition pieces would be interesting and appropriate to present. When concepting and developing the ideas, the museums play a key role in filtering the ideas and contents before they are developed further and presented to the target audience and the Sámi community itself.

Even in developing early prototypes, it has been important to use the authentic and culturally sensible content when demonstrating the ideas. This alone already requires understanding of the culturally sensitive design context. This approach is sometimes challenging for HCI researchers and developers, as HCI is used to rapid prototyping mode, and exploration of different alternatives are needed in order to find feasible, robust, and usable solutions for technology and interaction design. The use of placeholder content has to be carefully considered – it has to be representative, but yet it cannot be the final, restricted content. Either it cannot be be anything that causes negative reaction or feelings about the topic, such as fake copies of cultural artifacts. It is our aim to utilize user centric design as an approach, and actively involve the community when iterating the exhibition pieces.

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