# 12 Pluriverse perspectives in designing for a cultural heritage context in the digital age

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**Abstract:** Interactive technologies are increasingly being applied to the cultural heritage design context; digital archives, online exhibitions, and interactive museum pieces have become common approaches in the digital age. In this chapter, we explore how interactive technology can be used for sensitive cultural heritage contexts, discussing how to include decolonising design and pluriverse as an approach. Three case studies are presented, where the design context includes indigenous Sámi cultural heritage, a World War II memorial and archival materials. In these examples, digital technologies, including virtual reality and digital 3D models, are used to create interactive experiences with cultural heritage. We approach the topic through participatory design methodology and research through design approach. Our work can be useful when designing cultural heritage content for museums, digital cultural heritage sites and games, in the end enabling future experiences with more pluralistic and diverse content.

**Keywords:** Decolonising design, pluriverse, cultural heritage, technology, research through design, participatory design, human-computer interaction

## Introduction

The digital age has brought the omnipresence of technologies and connected applications to different sectors of life. Digital technologies also provide new opportunities for the area of cultural heritage, offering possibilities to obtain access to historical materials and virtually visit remote places. This offers us new tools to access information, compile stories and narratives with rich presentation techniques, learn from different cultures and present and understand different viewpoints related to cultural history. On the other hand, applying new technologies can create new ethical challenges (Marshall, 1999), with examples ranging from thoughtless content sharing to exposing sites treated as sacred (Häkkilä et al., 2020).

In this chapter, we explore how interactive technologies can be applied to cultural heritage context, for example, museums and archives, and how the pluriverse and decolonising approaches can be embedded into the design. We present three projects as cases: indigenous Sámi cultural heritage, a World War II memorial and digital archive materials. In these examples, virtual reality, 3D modelling and creating connected services are used to create interactive experiences with cultural heritage.

We approach the topic through participatory design methodology, integrating different stakeholder perspectives into the design process and with research through design approach. We believe that our work is useful when designing cultural heritage

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pieces for museums, digital cultural heritage sites and games. This will enable future experiences with more pluralistic and diverse cultural heritage content for everyone.

## Context of our research

### *The rising role of interactive technologies with cultural heritage*

Interactive technologies are being applied to cultural heritage (CH) design contexts in increasing amounts. Global trends from physical to digital and from local to connected services are also being applied in the CH sector. Digital archives, virtual online exhibitions and interactive museum pieces have become more and more common applications for the CH domain in the digital age.

Digital technologies can bring different benefits from presenting CH content; they can be applied both to enrich the user experience by physically visiting the CH locations and for accessing the historical materials remotely. Wolf et al. (2018) study the experience of visiting a physical exhibition and virtual exhibition, showing that for virtual museums, space, time, location and money are no more barriers to visiting. Digitally augmented physical museum exhibitions with personalised content have been found to engage visitors better than predefined content (Hornecker & Stifter, 2006). The visitor can, for instance, be visualised as being part of a narrative, as in the body tracking-based installation of the traditional Heavenly Hunt story (Genc & Häkkilä, 2021). Altogether, augmented and virtual reality technologies are being applied in an increasing manner to museum experiences, as illustrated in the overview by Bekele et al. (2018).

Whereas there are undeniable benefits that digital technologies can provide for the CH domain, it also brings to light new design challenges. Designing for the CH context raises many sensitivities that influence the design process and outcome. To conduct the design process successfully and connect with the design context, cultural sensitivities need to be taken into account. In the context of CH, sensitive design aspects can include, for example, (de)colonisation, artefacts related to deceased people and different political or religious viewpoints (Häkkilä et al., 2020).

To achieve successful outcomes for the design process, the principles of user-centred design and participatory design have generally been recommended. Involving different stakeholders during the design process helps designers understand different viewpoints and take them into consideration. Kambunga et al. recognise 'how new forms of CH can be co-created based on the audience's everyday experiences' (2020, p. 785). Inclusion of the end users—as well as the cultural communities—in the design process is relevant for preventing any unpleasant surprises in the final product. In the next section, we discuss the meaning of the pluriverse and decolonisation in the context of design.

### *Decolonising design*

Decolonising design has become a much-debated theme in academic discussions in the field of design studies (see, e.g., Schultz et al., 2018). In the context of human-computer interaction (HCI), decolonial thinking has made it essential to question whose interests and values are being served (Lazem, 2021). The critique has focused on how the current design has been made by—or for—male and white individuals, neglecting the 'cosmological others' (Ansari, 2019). In contemporary indigenous

studies, decolonisation is defined as ways of knowing different from the European academic traditions that originate from (see, e.g., Virtanen et al., 2021). To aid designers in understanding the issues related to the topic, publications such as the International Indigenous Design Charter (Kennedy et al., 2018) have emerged.

Although participatory methods have been presented to aid in the process of decolonising design (Smith et al., 2020), they have also been criticised for not being enough (Tlostanova, 2017). Tlostanova (2017) mentions how the whole logic of a culture should be applied, instead of just appropriating certain elements. Smith et al. (2020) also point out the lack of empirical studies in the context of participatory design and decolonisation, providing an example case with Namibian youth. Kambunga et al. (2021) present a virtual decolonising exhibition, including six demos related to cultural and historical topics from all around the world; they spotlight a diversity of voices that are normally silenced and marginalised, aiming for co-exploration and experience of pluriversality for visitors.

The particular context in which the technology is applied matters. In a systematic literature review on technology and decolonising design, Paananen et al. (2021) reveal that whereas technology itself appears to be neutral, it is applied through a lens of values that can be intertwined with politics and power. Thus, paying attention to the local context and culture is important. When designing for underserved groups or global minorities, Lazem (2021) raises issues such as local knowledge, power and pluriverse. To practice pluriverseism, one should view the world through multiple realities. Tlostanova (2017, p. 4) writes, 'decolonial pluriversality is decentered and stresses the provinciality of the universalized Western concepts by constantly juxtaposing them with their incommensurable non-Western parallels and opposites'. Schultz et al. (2018) suggest that to decolonise, we should dismiss universal solutions and focus on epistemic plurality instead.

The importance of decolonising and pluriverse related to technology is recognised by Lazem (2021, p. 48): 'Power imbalances will remain unnoticed when the diversity of users' values and realities are not appreciated by the technology makers'. This calls for technology developers to consider the values of the end users and open up to different worldviews. Escobar (2018) writes that recently, the rise of digital technologies has affected how design has become more pluralistic and collaborative as it is leaning more into user participation and interactivity. In the following section, we present examples of utilising interactive technologies with CH, discussing how design sensitivities, decolonisation and pluriverse aspects appear in the design process.

## Case studies

In the following, we present three projects with which we have been involved recently. Two of the cases involved the indigenous context, which concerns the indigenous Sámi community in the Nordic countries (Figure 12.1). The first case handles the development process of a search tool for digital archives involving Sámi content, and the second one relates to interactive museum exhibitions in Sámi museums. The third case focuses on the design of a virtual reality graveyard. In these case examples, technology enables certain content to be represented, regardless of the limitations of time and place. Providing access to lost places, items or other historical content can be a culturally remarkable experience for many people. In all of these cases, multidisciplinary development teams have been involved, and particular attention has

*Figure 12.1* Digital Access to Sámi Heritage Archives project staff visiting Kilpisjärvi, which is located in the Arctic region in the Northwesternmost part of Finland. User testing was conducted for the Nuohtti search portal service with local people at Kilpisjärvi. Two people in warm winter clothes walking in a snowy Northern landscape with sunny skies and bluish shadows in the snow.

been devoted to taking into account cultural sensitivities and respecting the topic and people involved.

### *Project 1: digital Sámi archives search portal*

First, we present Nuohtti, a search portal that improves accessibility to digitised Sámi archival materials. Nuohtti was developed in a multidisciplinary research project, integrating user-centred design principles throughout the development process. The archived CH documents, such as travel diaries, letters, drawings and photographs, are held in the collections of archives and other memory organisations around Europe. Developing a search tool for this geographically scattered and fragmented material provides the indigenous Sámi people with the possibilities to better find and access their CH. Nuohtti is available in five languages: North Sámi, Norwegian, Finnish, Swedish and English.

Although the digital search service provides new possibilities for accessing the Sámi CH, it also introduces vulnerabilities. Whereas the service is primarily developed for the Sámi community, archivists and researchers, the plurality of potential future users is broad. Digital access exposes the culturally sensitive material for a wider audience, creating the potential risk for offensive or disrespectful usage, related, for example, to commercial exploitation. Thus, it has been important to develop and provide ethical guidelines for the use of the search service.

Integrating the ethical guidelines into the user interface (UI) design of the Nuohtti has taken place in several multidisciplinary workshops (see Figure 12.2). In these UI

*Figure 12.2* A multidisciplinary UI design workshop on ethical guidelines in action. Three people looking at a whiteboard with printed UI designs and post it notes, with one person pointing to a design element.

design workshops, we have joined the expertise of graphic and user interface design, technical development and law and archive professionals with both Sámi and non-Sámi backgrounds. The design goal has been that when entering the search service for the first time, the UI guides the user to consider ethical aspects. A pop-up window with a visualisation interrupts the first-time search activity and draws the user's attention to an ethical guidelines quiz or read the ethical guidelines at length.

Creating ethical guidelines for using culturally sensitive material has been a central aspect of developing the service throughout the entire project (Mäkikalli et al., 2021). The guidelines have been developed based on existing legislation and international examples of ethical guidelines on indigenous CH and have been made in collaboration with the Sámi community (Moradi et al., 2020). Here, participatory design methods and reviewing the guidelines with Sámi community representatives in the project steering group have played a central role. To address the pluralistic viewpoint, the ethical guidelines are targeted, especially for the non-Sámi users of the Nuohtti, who may have less knowledge about cultural sensitivities.

### *Project 2: virtual exhibition content for indigenous Sámi cultural heritage museum*

Our second example presents a project conducted in collaboration with Saemien Sijte, the South Sámi Museum and Cultural Centre in Snåsa, Norway. Here, an old indigenous Sámi CH museum object was turned into a 3D model through the use of photogrammetry and showcased at the local museum and online as a virtual exhibition item. Creating a digitised 3D model enables visitors to see the object up close and investigate it from all directions, including zooming in and out (Figure 12.3). This is

*Figure 12.3* A remote user exploring a virtual cultural heritage exhibition object, 3D modelled from a physical museum exhibition piece. A person sitting in front of two monitors, which are showing a 3D model of a museum object.

not usually possible with physical exhibition objects, which are old and fragile and inside of a display case.

New software and algorithms have enabled 3D objects to be created using photogrammetry and other techniques (Aicardi et al., 2018). To prepare the virtual representation, the object was placed in a well-lit room, and about 300 photographs were taken of it from all directions by a professional photographer. The free open-source software Meshroom by AliceVision was then used by the designers to create the 3D model from photos. After that, the model was cleaned up and polished in Blender, and the resulting model was then uploaded to Sketchfab for quick and easy presentation. In the future, the same model can also be used for other kinds of software if needed, for example, virtual worlds or augmented reality applications, or even 3D printing.

This example highlights how digital technology can be used to reach out to spread-out indigenous communities living in the geographical area of four countries and which have suffered from the colonising history, during which CH items have been destroyed or removed. A virtual exhibition object provides a way to access CH items over a distance. The method can benefit the community, including artisans and researchers, to see and investigate the object, no matter how far they are located, adding to the accessibility of tangible CH. This method also raises questions about ethics when it comes to making Sámi indigenous heritage accessible because it becomes easier to copy, which is one form of cultural appropriation. Therefore, the decision of which items to make accessible should be made by the indigenous communities. With this documentation technique, the culturally important object is also preserved digitally for the future if something happens to the original piece. In our process, accuracy and realism were followed as closely as possible, even though the digital version cannot reach the level of being exactly identical to the original because some details can be lost in the photogrammetry process (Sapirstein, 2018).

### *Project 3: virtual visit to a World War II memorial*

In the third design case example, a virtual visit to a World War II memorial and graveyard was developed (Häkkilä et al., 2019). The physical CH site marks the place for German soldiers' graveyard from World War II and is located in Russia, close to Finland's border. The location belongs to the old Finnish village of Salla, which was split between Finland and Russia as a result of World War II. Being in the Russian border zone, visiting the place is restricted, and travellers need to apply for visas. However, the place is of interest to plural user groups, such as deceased soldiers' family members, scholars, history enthusiasts and tourists. The virtual reality visit allows different user groups to access the historical site and enjoy the experience at their own pace. Thus, it targets at supporting the exploration of the space from pluriversal angles.

In collaboration with the Salla Museum of War and Reconstruction (Salla, Finland) and Lapland University of Applied Sciences, an immersive virtual reality experience of visiting the graveyard was created and set as an interactive exhibition piece at the museum. A 3D virtual world model of the graveyard was created based on detailed photographs of the place. The user accesses the graveyard experience through a head-mounted display (HMD), which provides an immersive viewing experience and allows the user to explore the gravestones and memorial, as well as set a virtual candle at the site. Exploring the prototype version of the virtual graveyard visit is illustrated in Figure 12.4. During the design process, the prototype was user tested and, based on the results, improved further. To launch the interactive exhibition piece, the Salla village community was invited to an event at the museum to try out the virtual graveyard visit experience. Many of the locals have family histories entwined with the history of old, now inaccessible village locations, and the virtual exhibition offers an experience that can be quite personal.

*Figure 12.4* Virtual reality modelled version of the historical graveyard in the development phase. A person using a VR headset and controllers, with a screen showing the virtual graveyard they are visiting.

Information visualisation also has an ethical dimension, as pointed out by Correll (2019). In the design process, we emphasised a respectful and dignified approach for the virtual graveyard visit. For instance, gamified elements were omitted. The visualisation also includes a mode presenting human-shaped shadows representing the number of people buried at the graveyard (Häkkilä et al., 2019). Using this approach, we sought to illustrate the extent of the human tragedy related to the war in a respectful way.

## Discussion

Decolonising design in the CH context with interactive technologies has been an emerging topic recently (Paananen et al., 2021), and guidelines and good practices are needed to assist the design and development processes. The three project cases presented in this chapter demonstrate how the integration of pluriversal and decolonising aspects have been sought in practise when digital CH applications have been designed. These interactive applications have been created for public use, which inherently means that their users may come from various different backgrounds. With the users' different viewpoints and experiences, a pluriversal angle is present.

The presented design cases conducted in the three projects are all examples of contexts in which cultural sensitivities play a central role and the technology users are expected to follow a respectful and ethical code of conduct. To facilitate this, the design process has taken a participatory approach, where the community's and end users' viewpoints have sought to be taken into account. Participatory methods and co-creation allow people to work on such topics together and understand the possibilities and restrictions of the content and technological tools. For example, multidisciplinary development teams may work better together when the developers, artists, historians and other experts understand each other's perspectives, values and methods. Ethical issues are also very important in this context. The history of the research around Sámi people has been a problematic one (Drugge, 2016), for example, because of prior assimilation policies. Also, other CH design contexts, for instance, places of mourning and remembrance, such as graveyards, require a certain code of conduct. Ethical guidelines, as well as respectful design choices, are important aspects of the service development process.

The use of technology can improve access to CH in many different ways, such as over a physical distance and time and with lower visiting costs. Digital content can also be easily translated to different languages. Additionally, digitalisation can make operations more sustainable and ecological because physical travel between places is no longer required. As technology develops further, software and hardware become cheaper and easier to use, which will enable new users and smaller organisations, such as local museums, to integrate technology with their exhibitions and collections. Storytelling and local knowledge can be combined with the technology for engaging and interactive exhibition pieces, and digital technologies enable the presentation of materials in numerous alternative ways. In all three cases, presented in this chapter, digital technologies have provided a way to search for and explore remote, digitised content and have improved accessibility to CH. Here, this has probably been the greatest benefit in technology adaptation. In addition, the use of digital virtual models has provided a way to investigate fragile artefacts and gain a realistic 3D view of the physical content or space. Technology and digital media today take part in memory making in CH contexts (Kambunga et al., 2020), thus contributing to the new content.

## Conclusion

In this chapter, we have discussed the pluriversal aspects of integrating interactive technologies into the applications and services related to CH, presenting three design cases in which the result has been a digital service for a certain CH context: digital Sámi archives, Sámi museum and a World War II graveyard. When such services are used by people with different backgrounds, they inevitably bring in different experiences, interests and viewpoints. The plurality of the users' means designers must address not only the application usability and features, but also the ethical design of the system and UI. In particular, the presented work related to the Sámi heritage archives search service has taken ethical guidelines as a central part of the design. While improved access to Sámi heritage archives provides possibilities for the Sámi people and community, it also exposes it to others interested in studying and exploring Sámi history and culture. From the Sámi perspective, improved accessibility is both a benefit and challenge. These are especially sensitive questions when dealing with a community that has suffered from colonialisation history.

Our work contributes to the discussion around designing for pluriversal and decolonising contexts by describing concrete examples where the academic and theory discourses meet design practice. Technology has undeniable benefits in assisting in accessing information over distance. The Salla graveyard can be visited virtually across borders. Technology offers ways to connect the Sámi people located in multiple countries. These projects show the pluralistic ways in which technology may be designed and developed in the CH context, especially when dealing with sensitive topics.

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