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Postprint

This is the accepted version of a paper presented at *Linking Theory and Practice of Digital Libraries - 27th International Conference on Theory and Practice of Digital Libraries (TPDL 2023)*, Zadar, Croatia, September 26–29, 2023..

Citation for the original published paper:

Maceviciute, E., Olson, N. (2023)

Real Experienced Needs for Accessible and Inclusive Cultural Heritage: First Results in MuseIT

In: Alonso, O., Cousijn, H., Silvello, G., Marrero, M., Teixeira Lopes, C., Marchesin, S. (ed.), *Linking Theory and Practice of Digital Libraries. TPDL 2023: Proceedings* (pp. 349-356). Cham: Springer

Lecture Notes in Computer Science

[https://doi.org/10.1007/978-3-031-43849-3\\_32](https://doi.org/10.1007/978-3-031-43849-3_32)

N.B. When citing this work, cite the original published paper.

The finalised printed version can be accessed via DOI [10.1007/978-3-031-43849-3\\_32](https://doi.org/10.1007/978-3-031-43849-3_32)

Permanent link to this version:

<http://urn.kb.se/resolve?urn=urn:nbn:se:hb:diva-30997>

# Need for Inclusive Use of Digital Cultural Heritage – First Results in MuseIT

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**Abstract.** The aim of this paper is to present an overview of the preliminary findings in an ongoing study conducted in MuseIT – a Horizon Europe project (Oct. 2022 – Sept. 2025) – that proposes technologies facilitating and widening access to cultural assets in an ‘inclusive way’. The paper reports on the results of a literature review and the first ideation workshop conducted in January 2023. The workshop participants were representatives of cultural institutions and users of cultural institutions, and/or consumers and producers of cultural assets, with a focus on people with disabilities. The findings indicated that digital environment is greatly appreciated by participants with disabilities for both communication with others and for self-expression. Cultural institutions are aware of the variety of needs, including the need for collaborative development of services accessible to all. There remain, however, challenges and unmet needs. To address these, there is a need to involve people with disabilities – who are experts on such needs based on lived experiences – in the design of tools and services aimed at meeting their needs. Furthermore, there is a need for improved understanding of disability and diversity of needs, in projects involved in developing technological systems to facilitate and broaden accessibility.

**Keywords:** Accessible cultural assets, digital cultural heritage, people with disabilities, need for cultural inclusion, MuseIT

## 1 Introduction

The EU-funded MuseIT project proposes technologies that facilitate and widen access to cultural assets and preserve cultural heritage in an inclusive way.

Extensive scholarly publications explore the relationship between information, digital technologies, their design, and societal implications [1; 2; 3; 4] highlighting the biased embedded intentions which can reinforce inequalities that privilege some members of the society and exclude others. According to a report by the WHO “[a]n estimated 1.3 billion people experience significant disability. This represents 16% of the world’s population, or 1 in 6 of us” [5]. The *UN’s Universal Declaration of Human Rights* [6] proclaims human rights for all people, including people with disabilities to receive information (article 19) and to “*participate in the cultural life*” (article-27). Similarly, the *Convention on the Rights of Persons with Disabilities* (CRPD) [7] proclaims the rights of *all persons with disabilities* “to take part on an equal basis with others in *cultural life*” and have access to places for cultural services, such as museums

and libraries. Appropriate measures shall be taken “to enable persons with disabilities to have the opportunity to **develop and utilize their creative, artistic and intellectual potential**, not only for their own benefit, but also for the enrichment of society” (Article-30). However, in practice, the extent of accessibility still remains limited for those with disabilities [8] and many requirements remain unfulfilled [e.g., 9]. To address some of the shortcomings, MuseIT proposes novel technologies that enable alternative expressions and layered multisensory representations (including visual, audio, text-based, kinetic 3D/4D, and haptic representations). The proposed innovations will enrich the experiences of all, while enabling those with disabilities to engage with cultural assets, with agency, based on their individual needs and preferences. The focus is based on the idea that through inclusion of all disabilities, we include all people of all abilities. While a technological project, MuseIT addresses a major social issue and encourages a rethinking of cultural heritage as a first-person experience for all people.

Based on this background, the MuseIT project addresses three main challenges:

(a) **Extending accessibility of cultural assets:** This is done by developing multisensory representations and alternative expressions to enable engagement by the public regardless of functional or sensory impairments, based on their own needs and preferences. These layered representations are then brought together in an integrated interactive way in an immersive user experience (AR/VR, haptic) environment.

(b) **Broadening engagement with cultural assets and cultural co-creation:** The creative production of cultural assets is met with many impediments, such as barriers in mobility and hence co-presence in the same physical space, lack of accessible tools and technologies to enable co-creation from distance. MuseIT proposes an accessible platform for co-creation and performance of music from a distance with zero latency. This platform will incorporate tools for intricate emotional communications and other clues between the performers to compensate for lack of co-presence and to enable collaborative performances from distance.

(c) **Extending methodologies for inclusive preservation of cultural heritage:** These methodologies will improve accessibility to the preserved material, and enable storage of layered multisensory representations in an integrated way, including means of storing and preserving new modalities such as haptic information.

That is, MuseIT brings together expertise from information science, museology, and policy studies with others such as computer science (including ML, NLP, AR, VR), engineering, haptics and more to develop cutting-edge technologies for an interactive and multisensory engagement with cultural assets. MuseIT aims to address real experienced needs and, therefore, it involves participants from two main user groups: a) people with disabilities seeking engagement with cultural heritage and involvement in cultural activities, b) representatives of cultural institutions. The project includes extensive participatory elements in defining design priorities and carrying out related decisions, hence, users play a central role in explorative activities of the project as *co-researchers*, *co-designers* and *co-creators*.

The aim of this paper is to present an overview of the preliminary results from ongoing studies in MuseIT seeking to: (i) explore and better understand real experienced needs and expectations of the two user groups, and (ii) provide insights on the specific user requirements and constraints to orient the technical development of the project and to create a shared understanding of the user needs. The results presented

here are based on a literature review and the first ideation workshop conducted in January, 2023.

## 2 Literature Review

Scholarly publications on the needs or experiences related to cultural heritage use or cultural activities by people with disabilities remain rather limited. Leahy and Ferri [10] have conducted a narrative analysis of existing literature to identify barriers and facilitators to cultural participation of people with disabilities. This review has a view of disability that is shared by the MuseIT, in which, disability is seen as a social construct (rather than a medical condition) caused by social, environmental, and attitudinal barriers. Similarly, the ‘people first’ language convention (‘a person with a disability’, ‘persons/people with disabilities’) is adopted.

The view of culture presented in that review involves multiple dimensions: “*culture as possibility for personal expression (creation), culture as enjoyment of other people’s creation (consumption), and culture as the qualifications or skills needed to create, or competence and knowledge needed to build a critical opinion or make cultural choices*” [10, p. 69]. The authors identify five social barriers to the general access to cultural participation: 1) lack of effective/adequate legislation, policies, and legal standards; 2) lack of funding and/or of adequate services; 3) negative attitudes; 4) lack of accessibility; 5) lack of consultation with, and involvement of, persons with disabilities in cultural organisations. These barriers relate to some general types of needs visible in other previous research:

- need for a comprehensive approach from physical access to cultural heritage institutions, multi-sensory signage, general inclusion of people with disabilities in providing accessibility to every part and event in these institutions [11];
- need of access to content through digital technologies for people with sensory disabilities and people with ID, neuro-divergent conditions such as dementia, and a broad range of cognitive disabilities [12; 13];
- need for representation of people with disabilities as equal citizens in art, and culture; staff awareness in cultural heritage institutions about the needs of people with different disabilities [10];
- need for facilitation of professional artistic expression through education and shifting attitude from therapeutic effects of arts on people with disabilities to understanding professional needs of artists with disabilities [14];
- need for life satisfaction inhibited by predominantly lonely leisure and need for support to be able to participate in leisure activities [15; 16; 17]. These studies also show the need of self-management, control and freedom in many aspects of leisure [18], need for self-enrichment and personal growth, socialising, and responsibility to and for others [19];
- using multiple sign languages, guides, large print and good visibility, simplified and easy to use interfaces; accessible information about cultural events, venues, goods, and services [20; 21; 22; 23].

Many cultural heritage institutions are aware of these needs and interested in implementing accessibility features to their digital collections and services and use

digital tools to enhance the participation of people with disabilities. The rise of interest in multisensory museum experiences prompted the re-evaluation of physical access to museums' collections [24] and acquired new meanings during the Covid-19 pandemic when the need for immersive exhibitions in museums became evident [25]. It becomes imperative that new ways of experiencing cultural heritage are inclusive from the start and it is not just a side effect for people with disabilities [26]. Different resources, including audio-descriptions, accessible virtual and video tours attract visitors who could no longer attend cultural heritage institutions and places in person [27].

The accessibility of cultural heritage for all should be approached from two directions - accessible cultural heritage and accessible ICTs [21]. Cultural heritage professionals are responsible for creating a message that needs transmission in an accessible way. Digital tools and means can help in communicating cultural value and enhancing access to inaccessible heritage to all using universal design that has to be useful to as many users as possible, and "*seeking maximum flexibility in order to adapt the solutions to the greatest number of possible needs*" [21, p. 72]. Experimenting with these intersections, Buono et al. [22] have reflected on the accessibility and multisensory issues as fundamental tools for transferring multilevel knowledge between physical and digital placing the user at the centre of experience.

Cultural heritage institutions on various levels involve people with disabilities in their projects to increase the inclusion and cohesion in the respective communities. Most of these projects report positive outcomes for all participants, however, most of the research shows that it is not a straightforward process with the same outcome for everyone. Davis and Boellstorff [23] exploring the collaboration of people with Parkinson disease in *Second Life* and, thus, increasing their cultural capital and Maceviciute *et al.* [24] in the study of digital divide in reading and creating comic books with peers have found that different workshops had different effects on people with different disabilities because of particular experiences related to social environment. Cecilia [27, p. 2] notes that "*while the development of accessible resources and inclusive services has been significant, the process to overcome exclusion and to create equality of access practices in museums is ongoing and it requires deep changes at institutional levels.*" This could be said of other cultural heritage institutions as well.

### 3 The First Ideation Workshop and Its Results

The first participatory activity in MuseIT was organised as an ideation workshop, in which the participants could share their views on the existing possibilities available for people with disabilities to interact with digital cultural assets and participate in online cultural activities. The participants with disability, who answered the invitation, were mainly musicians and had indicated that they could only participate online. The representatives of cultural institutions arrived at the meeting place in Paris and participated on site. Two techniques were prepared to engage the participants in sharing their ideas: 1) stimulation of the discussion with regard to personal and professional experiences through using post-its, and 2) focus group discussion on the existing limitations and the ways to overcome them.

The workshop consisted of two parts. First, the participants were introduced to the haptic tools created by the project partners. Second, the participants were split into three

groups for further activity: one online group (six participants), and two on site groups (five participants in each). Each group had two moderators and several observers. The moderators' role was to stimulate the discussion and to answer potential questions. The observers took notes of what was happening in the group and how the discussion was developing. One observer in the online group monitored the chat. The online session was recorded after having received the agreement of all participants. The quotes in the results are taken from the notes and recordings.

Most of the participants with disabilities praised digital communication tools and the Internet enhancing their life choices and enriching experiences. They emphasised the opening of a rich world of "*connections with other people from home*", overcoming mobility barriers that some of them face. One indicated surprise by the "*rich possibilities to engage in music with others*". The participants mentioned tools, such as Everdrive, digital games allowing one to make music in a "Cottage". Different apps and the use of tablets allowing people to use their body to play an instrument, or Soundbeam were mentioned as positive developments in the music world.

The respondents also pointed out the shortcomings of the technologies that limit their use by people with disabilities. One of them reported that "*the size of the iPad is too small and the screen too cluttered by various apps*" and called for the possibility to "*use digital instruments without complex movements*", also having bigger devices. This could help people with spasticity who cannot aim their movements precisely to use such assistive technologies. The attempt of creating music and transferring it to Gameboy and YouTube as a new version of the song, was an example of the need to use easy file transfer and create spaces for musical expression. Some developments were pointed out as desired breakthrough technologies for the future, e.g., representing music by colour stream and pictures by sounds and haptic interfaces, affordable home recording studios for people with disabilities. They drew attention to the fact "*that many people with disabilities do not have high quality equipment, but work with simple telephones or laptops*" and that "*accessibility is a financial*" concept. This is often forgotten in designing accessible technologies.

A participant working in the field of cultural heritage pointed out that, during Covid-19 pandemics, there were many initiatives to create digital access to museums and exhibitions, but they were not aimed at people with disabilities. Accessibility was considered as "*a fringe benefit. Why would they not start with involving people with disabilities from the start?*" Another one had pointed out earlier in the discussion that "*many disabled people are experts in computers and their use, they should be moved to leading positions,*" "*sitting at the design tables from the very beginning so that they can make things accessible from the very beginning*" and not "*episodically through focus groups.*"

These ideas were seconded by others suggesting that "*differently disabled people feel differently*" and people in wheelchairs or with white canes should meet providers of services to explain what they do not like; their help in designing the services is not only desirable but necessary.

Most of the representatives of the cultural institutions were aware that visitors with disabilities, and people in general, are diverse, and may have different "*levels of disability: light – heavy*", thus digital environments should be adjusted to meet all needs, for example, "*working environments for slightly deaf or not well seeing*". All users of cultural assets have agency in making decisions and need a possibility of

various choices, especially, between physical and digital options: a virtual guided tour, synchronous with the one taking place in, e.g., a museum or an asynchronous visit through a digital device. Choices for people with diverse sensory preferences should be available both online and in physical spaces: “*For persons with hearing disorders – haptic solutions, visualising music by changing colours.*” “*Devices that appeal to the sense of smell, such as the Chronograph in Nantes. Immersive.*” “*We use recordings of cicadas in front of a painting by Cézanne and smells of particular plants for an immersive experience.*” The choice of active participation or passive observation is necessary for some, e.g., those with autism or anxiety, as well as choice of language and control of communication.

The workers from cultural institutions were concerned about meeting the requirements of Web Content Accessibility Guidelines (WCAG): accessibility plug-ins for websites, magnifying and light contrast/white balance tools, screen readers, fonts for visually impaired or dyslexic, easy read options, and “*alt-text on images on all editorial material...*”

The final part brought the participants in all three groups together. They were asked to express their experience of participating in the workshop where they provided useful comments. An important issue raised by an online participant was an underlying perspective of ableism seeping through the conversation in her particular group, indicating the need for improved moderation. This was a lesson learned leading to a review of (a) the planning of future events, (b) instructions provided for session moderation, and (c) the contents of previously planned and upcoming internal learning workshops.

#### 4 Concluding Part

Looking at the literature review and the outcomes of the first participatory ideation workshop the following issues become highlighted regarding the needs of our direct user groups:

- 1) Digital environment is greatly appreciated by participants with disabilities for both communication with others and for self-expression. Specific individual interests, wishes, capabilities and possibilities are quite different and conditioned by both individual biographies, and surrounding social reality, which includes economic, physical, technological, organisational, and social features empowering or inhibiting cultural activities. The need to be directly involved in the design of the digital cultural environments is based on the respect for the participants’ experience and expertise through language, sharing power and decision making.
- 2) Cultural heritage institutions have already developed a variety of digital means, tools and methods for inclusion, but there remains room for improvements.
- 3) Successful collaboration and participatory co-research, co-design, and co-creation requires improved clarity of information, modes of interaction, and raised sensitivity and awareness of researchers. Within MuseIT plans are already set in motion to improve the design and quality of future studies based on the insights gained and lessons learned in these preliminary studies.

**Acknowledgments.** This paper is written as part of the MuseIT project which is funded by European Union (Grant agreement 101061441). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Research Executive Agency. Neither the European Union nor the granting authority can be held responsible for them..

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