



# Designing to Restory the Past: Storytelling for Empowerment through a Digital Archive

Hanna Nordin <sup>1,2,\*</sup>, Teresa Almeida <sup>2,4</sup>, and Mikael Wiberg <sup>2,3</sup>

<sup>1</sup>Department of Computing Science, Umeå University, Sweden

<sup>2</sup>Department of Informatics, Umeå University, Sweden

<sup>3</sup>Interaction Design and Software Engineering, Chalmers University of Technology, Sweden

<sup>4</sup>Interactive Technologies Institute (ITI/LARSyS), Portugal

Storytelling is a frequently used approach to design. Stories and storytelling also have a role in mediating information and contributing to people's understanding of the world around them. Previous research suggests that storytelling can be empowering to marginalized and diverse communities, such as Indigenous peoples, by offering a platform to voice their (hi)stories. In this paper, we present a *research through design* project in which we explore the design of the *living archive*. This is a web-based digital archive that encourages a user-based approach to *restorying the past* by focusing on storytelling for empowerment and involving members of Indigenous People, the Sami. We demonstrate how a digital archive can contribute to (re)storying the past in a manner that preserves Indigenous ways of knowing and ethical archiving of social memory. Through this archive, we provide the digital tools for the communities to take on the role to *tell their truth* and, in doing so, become central in the design and communication of their own stories. In short, design for storytelling to empower those who need a voice.

**Keywords** – Design for Empowerment, Digital Archives, Marginalized Groups, Research through Design (RtD), Sensitive Design, Storytelling.

**Relevance to Design Practice** – To restory means that one can rewrite already existing stories. In this paper we highlight the non-neutrality of design and the critical role of design in restorying the past while empowering futures.

**Citation:** Nordin, H., Almeida, T., & Wiberg, M. (2023). Designing to restory the past: Storytelling for empowerment through a digital archive. *International Journal of Design*, 17(1), 91-104. <https://doi.org/10.57698/v17i1.06>

## Introduction

Storytelling is a frequently used approach to design, and stories and storytelling have had, and have until this day, an immense impact on the society in which we live as stories affect our perception of the world around us. Stories provide us with a notion of *who we are, why we are here, and what we should value* (Driscoll & McKee, 2007). Through stories, knowledge is passed down through generations (Ingold, 2009). The telling of any story, in particular that which is inherently connected to *making history*, is critical. On the one hand, modes of knowing that construct knowledge legitimize and advance *what counts as knowledge*, one which is likely aligned with a rather conventional yet *dominant narrative* (Clemens, 2020). On the other hand, historical accounts and knowledge that have been appropriated or devalued, i.e., rendered silent or invisible, have long contributed to a legacy that embraces a colonialist construction of knowledge. This means that the stories that are heard are the stories that are privileged, i.e., as told from the perspective of a dominant culture, and, either truthful or imaginary, will have an impact on people's perceived reality. Moreover, this means that stories that are being silenced (and therefore not listened to) carry less power as they do not have an impact on people's lives to the same extent as favorable stories. To counter this, the writing of (hi)stories that include the voices of marginalized groups is crucial to provide not only justice but, as importantly, to empower and give agency to these communities *at the margins*.

In this paper, we adopt the concepts of dominant and counter-narratives to enquire how design is entwined in storytelling, in the sense that a dominant narrative privileges a specific viewpoint in detriment of others, and that stories that are silenced serve a dominant culture in its recount of history. As the design of structures of power and power relations shape understandings of living and coexistence, so does belittling one perspective in favor of the other. This, in turn, can lead to designing (hi)stories that benefit and give permission to harmful practices and influence collective memory in detached or decontextualized ways. Specifically, in this paper, we turn to a marginalized Indigenous people, the Sami, to enquire how a prospective digital archive could lead to *restorying* a narrative that i) has been designed outside the bounds of their livelihood and ii) involves these communities in the knowledge creation process. To *restory* means that one can rewrite and share already existing stories and, in this way, a culture can be reclaimed as the people from within said culture can tell, possibly, more truthful versions of already

Received July 7, 2021; Accepted December 10, 2022; Published April 30, 2023.

**Copyright:** © 2023 Nordin, Almeida, & Wiberg. Copyright for this article is retained by the authors, with first publication rights granted to the *International Journal of Design*. All journal content is open-accessed and allowed to be shared and adapted in accordance with the *Creative Commons Attribution 4.0 International* (CC BY 4.0) License.

**\*Corresponding Author:** hanna.nordin@umu.se

occurred events. *Sami history is a fairly quiet history* (Ljungdahl, 2018), the Sami language not having been written until the early nineteenth century and, for that reason, knowledge, stories, and history being disseminated orally from one generation to the next. While documenting Sami history might collide with old ways of thinking (Virdi, 2018), opportunities that may arise from archiving include recognizing representation as holding unique kinship, identity, and cultures as distinct peoples (Faulkenbury, 2019). Furthermore, and particular to this research, it opens up the possibility for empowering a historically marginalized group with a voice in ways that open onto restorying (Moutafidou & Bratitsis, 2018), more precisely with regard to Indigenous ways of knowing and ethical archiving of social memory.

In the pursuit of meaningful engagement with and the active participation of the Sami, we engaged in a designerly process that involved participation from the stakeholders of the Sami communities alongside a multinational and interdisciplinary team of researchers across the Nordic countries of Finland, Norway, and Sweden. This Research through Design (RtD) process centered around the development of a digital archive dedicated to the history and present day of the Indigenous people of northern Scandinavia and the Kola Peninsula, the Sami. Together we designed a digital archive—*The Living Archive*, that envisions user-based storytelling and the Sami people as collaborators and co-authors in the description of records in archival materials (ICA, 2019). The Living Archive is a digital archive with social features commonly found on social media platforms. Users of the archive may, for instance, contribute with their own archive material, comment on other(s) archive material, and group the material into user-created collections.

Through this living archive, we provide digital tools for these communities to engage with and take on the role of telling their own stories. We acknowledge the politics of knowledge production and report from a live case of how storytelling and restorying through digital platforms can take place in practice. We combine this with

a renewed focus on Indigenous studies. We contribute to ongoing conversations that place marginalized communities at the forefront by exploring RtD and advocating for Indigenous design equity.

## Background and Related Work

### Stories, Storytelling, and Living Stories

Stories and storytelling have had an important role throughout the history of humankind as they have communicated culture and values throughout generations, resulting in the formation of the structures that we today have come to call society. Stories and narratives have the function of *sensemaking* which is a powerful and effective resource in education and the distribution of knowledge (Bietti et al., 2019). According to Fog et al. (2005), stories provide cohesion through our existence and just as to Aristotle it is through stories and storytelling that we have a shareable world (Kearney, 2001). Furthermore, Bell (2020) argues that stories “set the stage for affecting change” (p.14) through empathetic engagement which makes information easy to understand. Due to the increase of digital devices, contemporary stories and storytelling commonly take place through digital platforms. These digital platforms are, as we will discuss in detail below, non-neutral, in that they impose a technological structure on the story that makes it different from its original, organic form.

In addition, there are various ways of telling a story, or to storytell. One way is through orally telling the story. As the name suggests, the storyteller is utilizing its mouth and body to communicate verbally. In oral storytelling the storyteller and the receiver are physically close, which facilitates the potential of co-experiencing the situation and what is being told (Marlar Lwin, 2010). Due to the verbal aspects of oral storytelling, there is a complexity in which the storyteller’s voice plays an important role in conveying ideas and feelings (Lipman, 1999). Other than the verbal aspects of oral storytelling—which, for instance, involves pitch and tone of voice (Elam, 2002)—the storyteller can also use visual tools such as gestures and facial expressions to convey the intended message (Marlar Lwin, 2010). The digital storytelling that we describe in this paper is technologically constrained, omitting aural and physical aspects of the stories told.

Digital storytelling can be understood in the form of, for example, written text, videos, and audio which together can form immersive media such as movies and video games which can be used, e.g., for entertainment (Rizvic et al., 2020; Miller, 2019), or educational purposes (Rizvic et al., 2020; Miller, 2019), or educational purposes (Bromberg, et al., 2013; Mohamad, 2021; Matchacheep et al., 2020). Digital storytelling is also seen on social media platforms where each user has the potential to be a prosumer (Dusi, 2016; Kotler, 2010), as they can take part in others’ stories and tell their own (Lundby, 2008). Furthermore, beyond entertainment and education, digital storytelling can be used to facilitate social justice through representation, participation, and identity formation (Lambert & Hessler, 2018), and therefore to address critical issues (Rouhani, 2019) which, according to (Moutafidou & Bratitsis, 2018), provides the distribution of a voice. Marginalized groups, which can include women

**Hanna Nordin** is Communications Officer at the Wallenberg AI, Autonomous Systems and Software Program—Humanities and Society, a national Swedish research program on the opportunities and challenges with artificial intelligence and autonomous systems with a strong focus on the humanities and social sciences. She holds an MSc in HCI (human-computer interaction), which she obtained at Umeå University, Sweden. Nordin has freelanced as a graphic designer and web designer with clients from both academia and the business sector. She has a strong interest in digital communication and storytelling.

**Teresa Almeida** is Associate Professor at Umeå University in Sweden and a researcher at the Interactive Technologies Institute in Lisbon. Her work is interdisciplinary, design-led, and interventional, and she explores Research through Design (RtD) and participatory methods to research sensitive topics and design with marginalized communities of practice. In her work, she draws from feminist theory and the social sciences as critical to advancing equity, diversity, and inclusion in technology design and development. She received her PhD from Newcastle University, where her work explored HCI design approaches in women’s health and wellbeing.

**Mikael Wiberg** is a full professor in Interaction Design at Chalmers University of Technology, and full professor of Informatics at Umeå University, Sweden. He has held positions as Chaired Professor in HCI at Uppsala University, as development director for Umeå Arts Campus, Umeå University, and as Guest professor in HCI at Södertörn University. He has a PhD in informatics from 2001, and Wiberg’s main work is within the areas of interactivity, mobility, materiality, and architecture. He has published his research in top design journals including *Design Issues*, *Design Studies*, and the *International Journal of Design*. His most recently published book is *The Materiality of Interaction*.

and other minority or minoritized persons subjected to sexual harassment (see e.g., Ali, 2014; Hlalele & Brexa, 2015), people with intellectual disabilities (see e.g., Saridaki & Meimaris, 2018), through to Indigenous groups (Iseke & Moore, 2011) have also been empowered, in the sense that their voices have been heard.

There are various kinds and definitions of stories. In this paper, we define stories based on Boje's (2008) definition of living stories. Boje contends that *as we live we contribute to living stories*. Living stories are created by many storytellers who together add different fragments, based on their own experiences and knowledge, to an extensive story. Living stories also have the power to bring the past to the present, but this can only be done as long as the stories of the past are being told. Living stories are continuous and ongoing.

### Empowerment through Digital Design

How users can be empowered through the design and use of digital platforms and technologies has been frequently studied in the areas of Human-Computer Interaction (HCI) and Computer-Supported Cooperative Work (CSCW). As described by Schneider et al. (2018), the different ways people can be empowered through technology is of increasing concern, but there are also different interpretations of empowerment—ranging across the full spectrum from empowering experiences to community empowerment and empowerment through design (from the most public to the most intimate including approaches to what empowerment might mean to different communities, stage of life, or the individual (e.g., Cazacu et al., 2021; Meissner et al., 2017; Van Mechelen et al., 2021; Tomasello & Almeida, 2020). We take this full spectrum into account in our work since we are both interested in how single individuals, as well as the Sami people as a community can be empowered. In addition to this, we are interested in empowerment through design as a consequence of our RtD project that seeks to, as one of its explicit aims, empower the Sami people through the design of a platform that can provide a space for voices and storytelling—a web-based living archive for the wider community. With this ambition as our point of departure, we were inspired by previous research that has explored empowerment through design. For instance, Johannsen and Kensing (2005) looked at empowerment in relation to healthcare and IT systems. Further, and for the explicit purpose of empowering the Sami people, a marginalized group and community, we build on the work by Odongo & Rono (2017), who have foregrounded digital empowerment in the context of marginalized communities in Kenya. Following these, we explore the process(es) that leads to empowering specific demographics through the design of technology and knowledge on using digital tools with a focus on restoring and amplifying voice.

### Indigenous and Digital Archives

One way of storing stories from the past, and the present, is by recording them in archives (Ketelaar, 2001). In digital archives, one can store digital stories and storytelling which affect our collective memory and understanding of the past (Ketelaar

et al., 2005). In recent years, the fields of design research and Human-Computer Interaction have embraced heritage and digital archives as central to cultural heritage and preservation (Boamah & Liew, 2017; Wertheimer & Asato, 2016). Archiving preserves and promotes heritage while stimulating and increasing awareness of, e.g., different cultures. For example, research in areas such as cultural heritage has seen a growing body of work that explores exhibition design or the digital life of tangible artefacts and collections in settings such as museums (Claisse et al., 2020; Giglito et al., 2019) through to intangible heritage such as drama and traditional dance (Bogdanova et al., 2010; Lombardo et al., 2016).

Moreover, government authorities, such as in Australia, have recognized the importance of making archives an *ethical space, of encounter, respect, negotiation and collaboration without the dominance or judgement of distant and enveloping authority* (ICA, 2019). With an increase in popularity, digital archives have also become a growing strand of research, and there are multiple accounts of design and research focused on Indigenous people (Lawrence et al., 2020; Moradi et al., 2020; Mukurtu, 2007) as well as digital storytelling for Indigenous people (see e.g., Iseke & Moore, 2011). However, less is known about designing digital archives for the purpose of empowering through storytelling and restoring of cultural narratives.

### Study

To explore stories, storytelling, living stories, and different digital approaches to empower communities at the margins, specifically with the view to engage them in the process of designing a digital archive, we adopted a Research through Design (RtD) approach that invited an Indigenous community, the Sami, in partaking in multiple activities that allowed for everyone involved to better understand the nuance, needs, and desires when catering for the design of digital interventions dealing with Sami Heritage.

### Sami Heritage

The Sami culture has its roots in Sapmi, which is a region located across the national borders in the northern parts of Norway, Sweden, Finland, and Russia. According to (Mikaelsson, 2016), the Sami cannot be separated from the land. He argues that “We (Sami) are the land and the land is us; we have a distinct spiritual and material relationship with our land” (p. 21). Despite this fundamental relation to the land, the northern non-Sami nations forced the Sami to go through mass displacements by moving them by force from their lands (Labba, 2020). Today, some Sami argue that the Sami history should be displayed and distributed in order to mark cultural historical settlements. Moreover, some argue that there is a need for the Sami to “demonstrate their existence” (Roche et al., 2018, p. 66. Currently, traces of the Sami culture can be found in contemporary archive collections. Archives and archive material can be found not only in Scandinavia but also all throughout Europe.

## Method

### Design Process

We engaged in a Research through Design (RtD) process as a resource for the production of new knowledge and to explore understandings of and develop a new and rich artefact (Gaver, 2012; Storni, 2015; Zimmerman & Forlizzi, 2014), the Living Archive. The project was organized as a design-oriented and mixed-method exploratory study. The project was made possible through a large-scale research grant, which enabled researchers in Norway, Sweden, and Finland to come together and collaborate over 36 months. The project included both researchers and practitioners, including representatives for the Sami community as well as web designers, programmers, representatives from the Sami national archives, search engine experts, and representatives from the Sami museum. The research team consisted of HCI researchers, interaction designers, and web and graphic designers from three different countries (Norway, Sweden, and Finland). This team was a total of 23 researchers that worked together on seven integrated work packages as part of this large-scale research project that aimed to explore technological solutions for archiving the culture of the Sami and making their history and cultural heritage accessible to a wider audience. Participants in this research included representatives from the Sami community in the Sami Homeland in Finland, the Sami Museum at Siida in Inari Finland, and participants from the Sami National Archives Organization (Norway and Finland).

The research approach was manifold. We initiated our design process by keeping weekly meetings and discussions among the design team and holding a series of community-engaged events and activities, including brainstorming sessions, two participatory demonstrations, and semi-structured interviews. This series of community-engaged sessions were beneficial both ways, 1) the Indigenous communities, 2) the research team had the opportunity to gain insights into different aspects and traditions of the culture through stories told about the culture from the community.

Over these three years, we worked in close collaboration with the representatives of the Sami community through a number of different activities and events. This included standard iterative design work (going back and forth between observations, interviews, on-site participation, joint workshops, sketching, prototyping, demonstrations, brainstorming sessions, etc.). We met, discussed, tried out design alternatives, and re-designed the living archive. Still, we stayed focused on the design concept—to design a living archive to empower the Sami people through online storytelling but how we reached this goal was not a given from the start or a straightforward process, but rather a process that can be described as highly iterative, and community-driven. In short, a community-engaged approach throughout this design-oriented project.

### Data Analysis and Collection

Data from the community-engaged sessions (brainstorming, participatory demonstrations, and follow-up semi-structured interviews) was coded using the software ATLAS.ti. Data

were combined and systematically analyzed using the method of qualitative content analysis (Sandelowski, 2000). We used qualitative content analysis and conducted the analysis using a deductive analysis approach to inform our continued design efforts, identify themes, and get an in-depth understanding of how and to what extent the design of the digital archive worked as a platform for storytelling and for empowering people to restoring the past through cultural narratives.

### Community-Engagement Sessions

#### Brainstorming

The process was initiated by conversing with people from the Sami community in Sweden. This was done by the research team attending two workshops related to the Sami culture. One workshop took place in Oulu and the other in Rovaniemi (Finland), both included invited representatives from the Sami in Finland. These workshops consisted of getting together activities, activities exploring the potential of new digital technologies (e.g., head-mounted displays, AR, mobile devices, etc.), as well as collective speculations about what technologies including 5G connectivity, IoT and AI could offer for the Sami people from the viewpoint of *giving them a voice*, making them seen (without being exposed), and activities (e.g., brainstorming and sketching sessions) related to imagining use scenarios, and use context for these technologies). Overall, the whole project process was as such highly collaborative and design-oriented.

Based on the knowledge and input from these workshops, a follow-up brainstorming session was held in which the researchers contributed with potential design features for a digital archive, which would aid in rendering stories and storytelling. The features that were considered to be the best suited were then put together to form the first version of the prototype. This was followed by a visual mockup that used Adobe Photoshop (software).

#### Participatory Demonstrations

We organized two events with representatives of the Sami people, the designers, and the Sami archives. The first event took place in a public cafe during Sami Week<sup>1</sup> in Umeå, Sweden, with walk-in participants. Participants in this public venue were anyone interested and were welcome to observe, interact with the early-stage prototype, ask questions, and give feedback. The session lasted four hours. During the participatory demonstration, each feature of the prototype was thoroughly discussed in relation to whether it could render storytelling and stories. Eight people participated (four men and four women, ages ranging between 25 and 60 years). The participants' relations to the Sami culture varied; one had worked closely with the culture, three had Sami friends, and four identified as Sami. Their knowledge regarding archives and digital archives also varied. In order to keep a record, field notes were taken using a smartphone.

The second demonstration took place online via the video conferencing tool Zoom. Participants were recruited via email by the first author. The requisite for this second demonstration was

that participants would have experience of either the Sami culture and/or archives. In total, five people participated in the session, two men and three women. All participants identified as Sami or had a close relation to the Sami culture, and most participants had extensive knowledge about archives. Each participatory demonstration took approximately 45 to 90 minutes. Each session was recorded, and the recordings were later transcribed. The first author conducted the five online sessions, and the researcher and the participant (except for one) had their webcam on during this session for the sake of better communication. In pursuing the argument that the prototype serves as a catalyst for the discussion (Zimmerman et al., 2007), each participant was offered a link to the prototype beforehand so that they could review it at their own pace prior to the online session. During the online participatory demonstration, each feature of the prototype was thoroughly discussed in relation to whether it could render stories and storytelling in ways that empower their users.

### Semi-Structured Interviews

We conducted semi-structured interviews with all 13 participants across the two participatory demonstration sessions. These supported our enquiry into what the participants' relation to the Sami culture and community was, what a story and storytelling was to them, if their view of a story differed from their view of traditional Sami stories and storytelling, and how storytelling could help restoring and therefore empower them in telling their true

story. During the first demonstration, open-ended questions were asked as the participant was exploring the prototype. However, this was revised and changed during the second demonstration, where the semi-structured interview was performed before the exploration of the prototype. Consequently, this conversation was more focused on the features of the prototype in relation to stories and storytelling.

## The Living Archive

Following our mixed-method and community-engaged exploratory study, we set to develop and design the Living Archive. The basic design rationale for this digital archive was that it should be designed as a digital archive where the design should share many features with other online archive websites, including 1) standard search filters, 2) visual research, 3) login functionality, 4) standard filters to sort the results, and 5) different types of archival material. It should work as an online archive to allow access from anywhere, and it should work as a *digital archive portal*, i.e., as a web interface, or web entrance to the archive. It should also be a *living archive* with similar functionality with many social media platforms as to allow for the sharing of stories, photos, location, and to support the sharing, commenting and liking of stories and materials shared on this online space. In short, we aimed for the implementation of a Living Archive deliberately designed to support restoring the past while empowering futures, through functionality that supported and enabled the telling, sharing, and storing of stories and related materials.

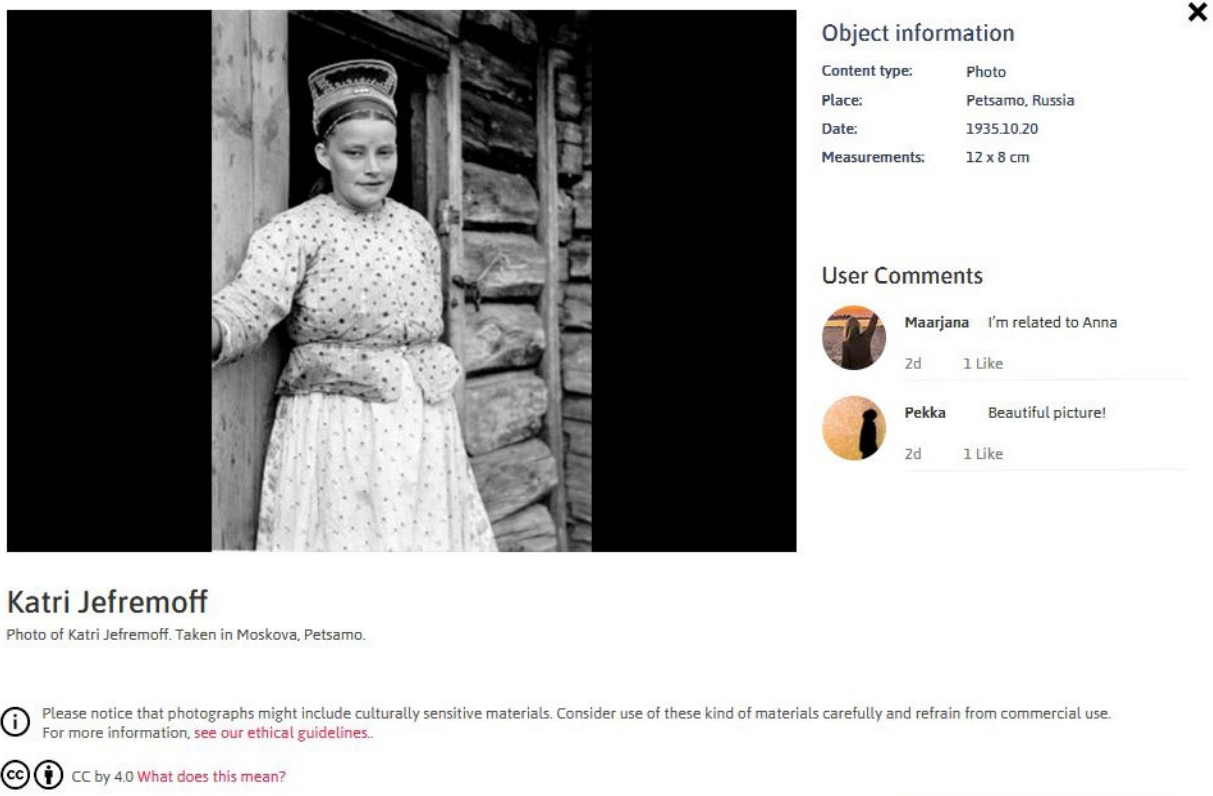


Figure 1. Archive material, add to the collection, user comments, hearts, add comment feature.

## Design and Implementation

In order to achieve a Living Archive, we implemented several features seen on contemporary social media platforms. The user can, for example, create their own account and sign in to the platform to interact with other users. Once the user is signed in, they have access to commenting on archive material and to like other users' comments in the archive (Figure 1). The social features of the Living Archive include a comment section related to each archive material, as well as *likes* (represented as hearts) related to each comment.

## Experience Design

The Living Archive aims to encourage user-based storytelling through features commonly found on social media platforms. Its design shares many features with other online archive websites, including 1) standard search filters, 2) visual research, 3) login functionality, 4) standard filters to sort the results, and 5) different types of archival material. In addition to these standard features, we also developed three main features to support the Sami community. This included: a) a map, b) a community function that includes the collections, user contributions, and stories, and c) ethics. The community function: We noticed that many of the Sami communities were interested in researching their family trees and stories related to their ancestors and related to the fact that the community is an important entity among the Sami, we created the community aspect. This feature included the possibility of creating a personal profile, uploading archival material, creating personal collections and following other popular collections, commenting on material, and liking comments. Overall, we had to work with iterations that involved interactions with the Sami

people, design work, demos, sketches and workshops. We worked back and forth in order to be sensitive to our users and in relation to what we designed for and with this user group. The outcome was our web-based digital design.

Figure 2 represents an overview of the Living Archive, including the home page, an interactive map, login features, and ethical guidelines. As the Sami community has an inseparable relationship with the land (Mikaëlsson, 2016), we implemented the interactive map with the intention that it could be used to find archive material, and thus stories, based on location. This feature was also implemented in order for the users of the Living Archive to get a richer background story and history of the archive material as the site of the original location is provided. A collections feature was also implemented (Figure 3). Our intention for the collections feature was for people to collect any archive material together in collections. As they are doing this we intended for the user to be able to add the archive materials and interpret them as a coherent story. For more social, and living, purposes the user is also able to follow other users' collections.

Throughout the design process, we were made aware that user-based stories and storytelling can hold personal and sensitive material. Therefore, in order to protect potentially sensitive stories, we implemented the ethical guidelines which the user has to agree to in order to complete their account (see Figure 4).

The design process that encompassed developing the later-stage prototype took approximately 10 months. In order to probe and further understand how the experience of such a platform would allow for storytelling and ensure that the user and interface design is well aligned with the experience design goal of providing this platform to voice stories, i.e., to empower these users through digital design, we shared the prototype with five participants.

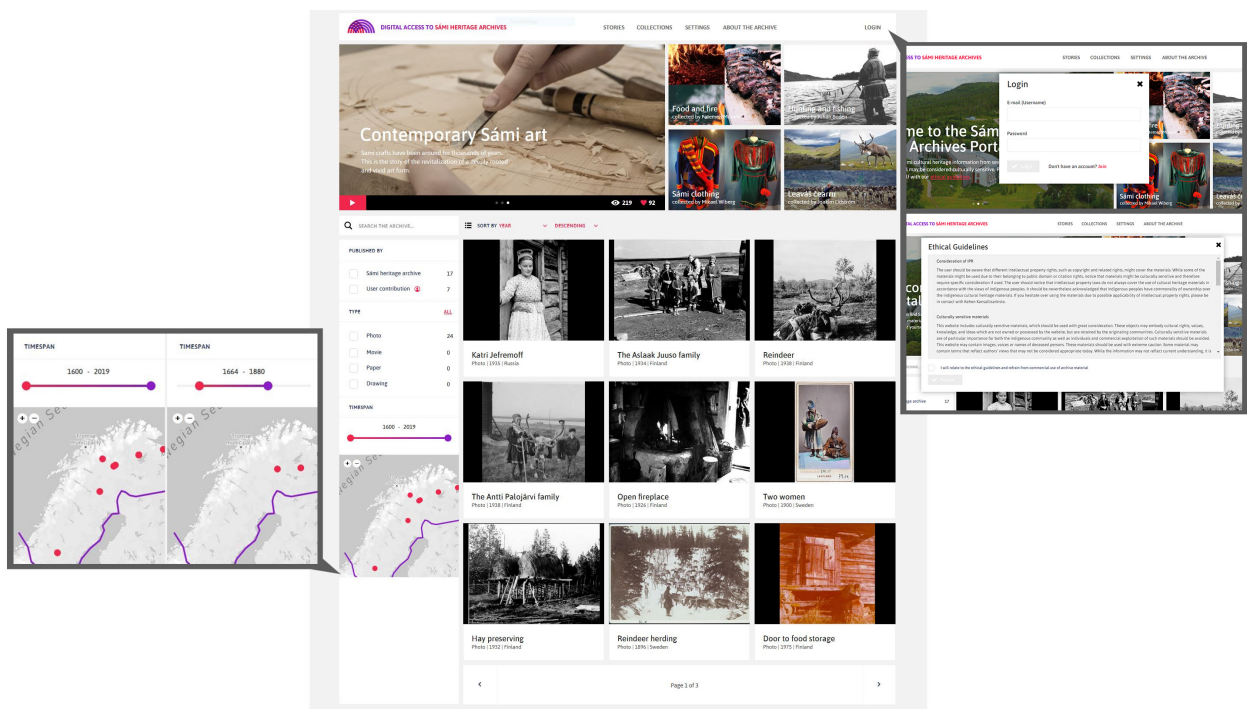


Figure 2. Overview of the prototype of digital archive, interactive map, login and ethical guidelines highlighted.

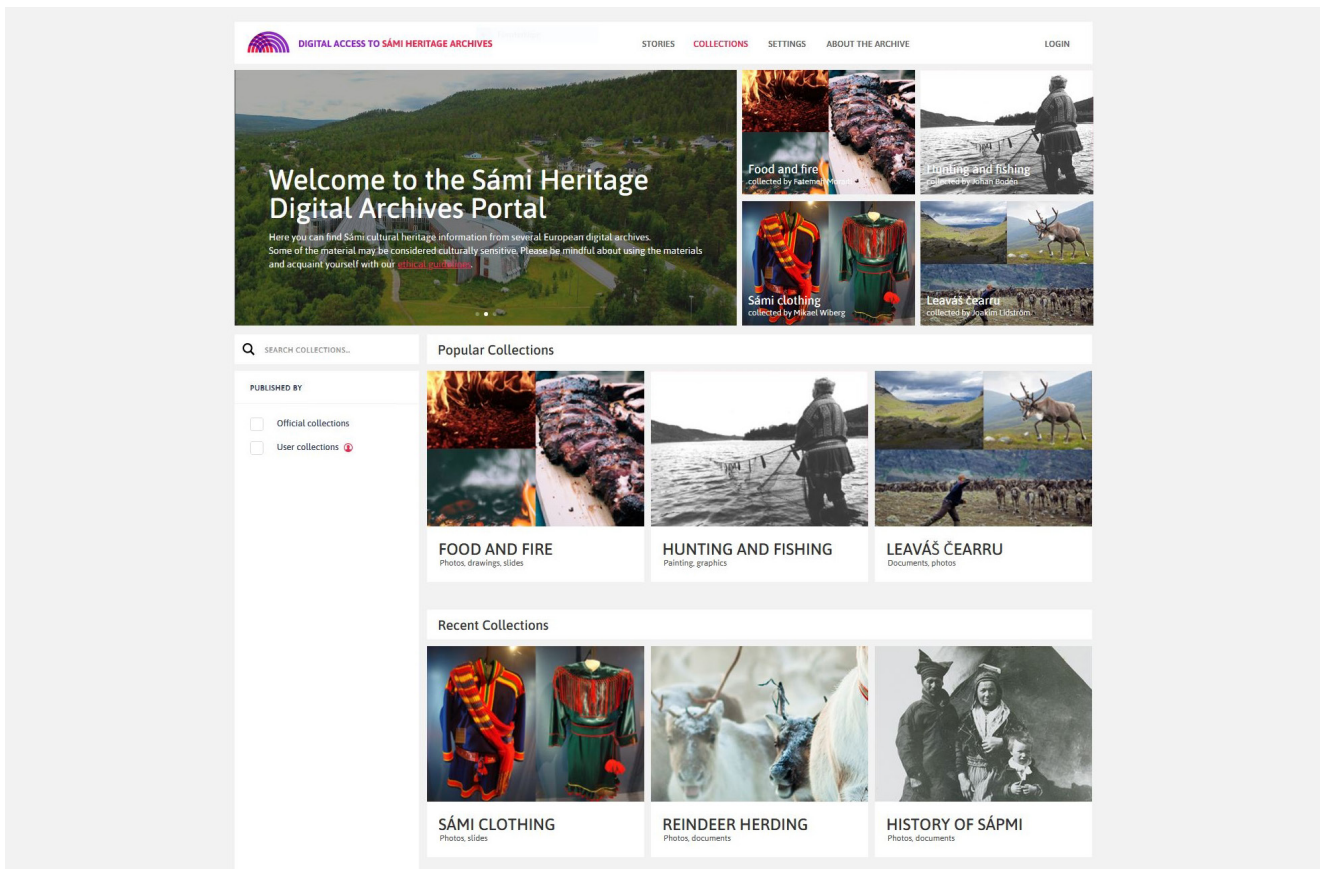


Figure 3. Collections feature, an overview of Popular Collections and Recent Collections.

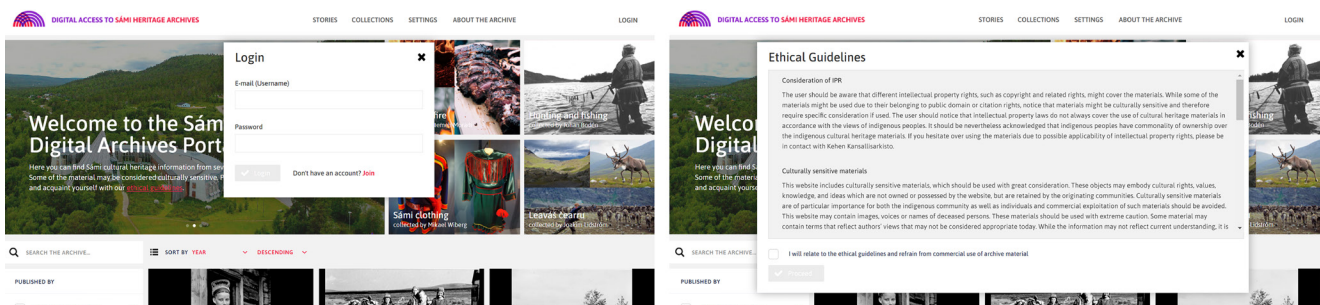


Figure 4. Login and ethical guidelines.

### Participant Interviews

We conducted individual web-based interviews with a total of five participants. The interviews lasted between 60 minutes to 90 minutes. This length of time was chosen so that the conversations would provide a deep and comprehensive understanding of the interviewees' reactions to the Living Archive. Three out of the five participants self-identified as Sami, whereas the other two had experience and extensive knowledge about the culture. Four out of five participants worked with archives, whereas the remaining participants' occupations were unknown. The majority of participants were a part of the project already before participating in the interviews.

Table 1. Overview of participants.

	Relation to the Sami Culture	Relation to Archives	Gender	Age Group (years)
P1	Identifies as Sami	Archivist	Male	30-59
P2	Through work	Archivist	Female	30-59
P3	Identifies as Sami	Archivist	Female	30-59
P4	Sami relatives	Archivist	Male	30-59
P5	Identifies as Sami	Unknown	Female	30-59

## Data Collection and Analysis

The data was collected over the video conferencing tool Zoom, partly due to the current pandemic, but also because this platform afforded the opportunity to easily interview people across countries. The data collection process was divided into two parts: first, participants were interviewed, and open-ended questions regarding their relation to the Sami community and culture were asked. The participants were asked about what a story was to them and if and how their view differed from conventional Western stories. Second, after the interview, the participant was provided with a link to the prototype, which they were asked to explore at their own pace. Once the participant felt ready, s/he was asked to share their screen with the interviewer. The interviewer then guided the participant through the features of the prototype and discussed whether these could contribute to stories and restoring and why.

We analyzed the interview dataset using the notion of empowerment as a lens. In order to do so, we extracted relevant data by using the Framework of Empowerment in HCI as presented by Schneider et al. (2018). The authors established this framework based on a literature review in HCI. The framework consists of the following eight lines of research: Empowering Experiences, Skills and Education, Self-Enhancement, Holistic Approaches, Empowerment through Design Process, Technology for Development, Protective Technology, and Community Empowerment. For the purpose of this study, we extracted seven out of eight of these research lines and utilized them as categories for a deductive thematic analysis (Braun et al., 2019). However central to personal empowerment, the holistic approach proposed by Schneider et al. was the one research line that was excluded since it can be regarded as an umbrella category encompassing many of the other categories. Thus, data related to this holistic category will be found in the other themes categories. The interviews were transcribed and two researchers started by coding the data based on the themes extracted from Schneider et al. One researcher finalized coding the data and organizing them according to the themes as mentioned.

## Findings

The results from the deductive thematic analysis are presented below. For clarity, Schneider et al.'s (2018) definitions are briefly presented, followed by our findings.

### Empowering Experiences

According to Schneider et al., Empowering Experiences refer to *the experience of being empowered*. Once one feels empowered, one's autonomy and self-esteem may be affected and thus one's behavior may change. In our study, P4 argued that due to the social features of the archive, feelings of safety are something that cannot necessarily be designed for but something that will be affected by the overall user climate:

I believe that you cannot have all the answers before the users start to use it (The Living Archive). Because I think that the user community is also a really big part of the feeling secure... Like

who is sharing, and what people are sharing. If it is done in a tasteful and helpful way I think it adds a lot to the feeling of being secure. This is something that is related to behavior. (P4)

How the users of the archive behave when using the Living Archive may affect the overall feeling of safety which will further lead to experiences of either empowerment or disempowerment. P2 further mentioned that the fact that users can contribute with their own material to the Living Archive would make the users feel in control of their own stories, and instead of lending it over to an institution, they could share a digital version of it themselves. This aligns with the Empowering Experiences premise as the user's perception of being in control of their material may lead them to be more prone to sharing their stories with the world through technology.

### Skills and Education

Skills and Education highlight empowerment as an *attempt to help users acquire skills or knowledge*. Schneider et al. mainly refer to how users of technology can acquire skills and knowledge that further provide them with better job opportunities or better skills needed to achieve a task. Whether or not our technology can provide the users with skills for job opportunities is unknown, but we refer to Skills and Education as giving further knowledge and insights about the Sami culture and community. Furthermore, aligned with Schneider et al.'s definition, empowerment is persistent and lasts beyond the use of technology. Both P3 and P5 believed that the collections feature would be beneficial for the purpose of stories and storytelling and that the feature would help acquire knowledge as one can make sense of the collected archive material. Furthermore, P1 mentioned that the comment section could be useful for providing more details to a story as it enables users to both ask and answer questions:

The comment section is where storytelling is most present. One can ask questions related to the presented archive material... It creates a context related to the pictures because pictures are just pictures. (P1)

P1 indicates that our Living Archive can facilitate storytelling through its social features and can give in-depth knowledge about chosen topics. Together, the users of the archive can facilitate skills and education about the Sami culture.

### Self-Enhancement

The Self-Enhancement category refers to technology empowering users to do something that they would not be able to do without it. It may for instance, enable productivity, efficiency, independence, and engagement. P3 mentioned how new technologies, such as the snowmobile, have been a useful tool in making one's way through a snowy forest in a shorter amount of time. However, despite the positive aspect of not having to dedicate as much time as before to making one's way between two (or more) destinations, P3 says that the speed of the snowmobile cancels out time for reflections of the surroundings. Furthermore, the snowmobile is loud, which also disturbs these reflections:



Something that I find very interesting is, for example, when you are out hiking. Modern means of arrival, like the snowmobile, has a tendency to kill the storytelling. It is too fast, you pass by the land so fast that you don't really have the time to reflect... When you go by foot, or by skis, then it's not as fast so you have the time to think and then tell way more. (P3)

These reflections are important for Sami's storytelling as the land is such an important part of the culture and the people. The participant further mentions how Sami families are getting smaller and that stories, and thus knowledge, are communicated more often through the use of social media platforms. Additionally, P5 tells that atmosphere and physical context are crucial aspects of storytelling and that these cannot be replicated in a digital setting such as the Living Archive. Also, P1 argues that tone of voice and tempo are important aspects that are being lost through technologies such as the Living Archive. This indicates that the Living Archive may facilitate contemporary digital Sami storytelling, and knowledge distribution, through social features. As digital storytelling cannot be performed without digital technology, there lies empowerment in utilizing this technology. Users of the archive can produce stories independently and efficiently and further engage other users of the archive by utilizing the social features. There are, however, indications that some important aspects of traditional Sami storytelling, such as atmosphere and physical context, as well as the tone of voice and tempo, are being lost.

### Empowerment through Design Process

Within the category of Empowerment through Design Process, empowerment lies in participation in the design process. As the participant is partaking in the process of designing and creating the technology, they are put in a position where they have the power to impact and change the final result. P3 insisted on how the technology must be somehow altered in order to show critical historical events. The Sami have been put through great forces of colonialism that have had an immense impact on people's lives. According to the participant, and in order to respect Sami's history, this has to be made apparent:

I think that the map is too specific... Here is a tag close to the city of Kiruna and it's tagged as Låvas. Yes, but Låvas is a larger geographical area... If someone sees this whose grandma is from Låvas then it is not certain that that person has the previous knowledge about that the people from Låvas lived in Norway (not only Sweden). It is like, please keep in mind that these were nomads. The fact that they were nomads means that they have lived in very different locations, and their lives have been very different at each location. (P3)

The participant's frustration indicates that the Living Archive can be improved in order to mediate important cultural and historical events. The statement also indicates that the design of the technology can be improved to please and benefit the primary target groups, i.e., the people from the Sami culture. As a participant of this study, P3 is a part of the design process as we highlight the frustration and bring it with us to future design stages. The voice of the participant has been heard.

### Technology for Development

In the category of Technology for Development, empowerment is viewed as equality and balancing power structures long-term. Schneider et al. (2018) posit that technologies can, for example, facilitate social advancement, self-determination, and more fulfilled lives for those who are disempowered. As a category, as it relates to the Living Archive, we define Technology for Development as a way of facilitating Sami ways of living, such as traditions and traditional storytelling, further fulfilling and advancing Sami traditions. P2 and P5, as well as P3, all pointed out the importance of the land and places for the Sami: "Place and the land are everything for Sami. Places and place names because that is who you are as a Sami." (P2). This statement was further supported by P3, who argued that one could not separate the Sami from the land, thus being very valuable to the people. Related to the importance of the land, the majority of participants expressed appreciation of and the importance of the interactive map feature. P5 mentioned that there is a lot of storytelling related to geography and geographical locations and that these are significant and important parts of Sami storytelling traditions. Further, however, P1 and P3 both mention the importance of oral storytelling as it is the traditional way of telling stories within the Sami culture. P3 and P5 also mention the *joik*, a traditional form of song in Sámi music, and how audio files should be supported to support Sámi storytelling performances.

As we define Technology for Development as a way of facilitating, fulfilling, and advancing Sami traditions, we explore how features, such as the interactive map, may facilitate cultural Sami storytelling traditions. The technology does, however, lack audio support, which neglects oral traditions such as Sami joik.

### Protective Technology

With Protective Technology, Schneider et al. (2018) argue that empowerment is made apparent related to the technology itself. Users may, for instance, be disempowered due to loss of control caused by interacting with technology. In relation to the Living Archive, Protective Technology relates to the capacity the technology can make the user feel safe enough to use and share their stories and knowledge.

All participants agreed that the ethical guidelines were an important part of the technology for safety purposes. However, they argued that it would not be enough for users to feel safe to share their stories. Both P2 and P3 mention that stories can include sensitive and personal information, and P2 clarifies that different stories would be shared depending on who the receiver is. P2 also says that different levels of privacy would be appreciated within the Living Archive. Related to the issue of sensitive material, P3 and P4 suggested some kind of page moderation to make people feel safe when sharing sensitive information. P4 comments:

If it's to be exposed to the public... I think there should be some good charring. Because those (collections) could work for the whole community if they are charred and done well. (P4)

The remarks show that our attempt to create a safe environment for sharing stories and knowledge is appreciated. It is, however, not enough to make the users from the culture feel safe

enough to share sensitive stories related to the culture. Users may feel a loss of control over their shared stories and material which, related to this category, does not fully facilitate empowerment.

## Community Empowerment

Schneider et al. (2018) explain the Community Empowerment category to *describe a power imbalance between specific groups* and that the disempowered group is provided help by technology and to gain power over the group who is already in power. Here, technology is used as a tool to facilitate communication and negotiation between those in power and those disempowered. In relation to the Living Archive, we define Community Empowerment similarly to Schneider and colleagues.

Political power imbalances are mentioned by P3, who highlights the power relation between the Sami and the governmental institutions. P3 further argues that, because of this, the comment feature is important, since it can be used for the Sami to present their own version of society. P3 also mentions that it is empowering to use the social features in the Living Archive as it adds to their own metadata. Additionally, P2 mentions that being able to contribute with their own material (user contribution) will widen the view of society and perhaps depict a more truthful and genuine version:

It (the user contribution feature) would make the digital archive even more personal and it would be great for the traditional archives involved. More material would be added and it would widen the picture of society. (P2)

As P2 draws attention to this issue, there is a well-documented power imbalance between the culture and institutions. As the users of the archive can utilize the social aspects of the technology, the participants believe that this technology can facilitate communication which strengthens the disempowered cultures' point of view and thus empowers the community as a whole.

## Discussion

The aim of this Research through Design project was to study, design for and facilitate empowerment through design. Accordingly, we designed, implemented, and tested a prototype of a digital archive (The Living Archive) dedicated to the history and present-day life of Indigenous culture in northern Scandinavia, the Sami. We refer to this digital archive as the Living Archive due to its social features. Through the social features of the archive, people from the culture can utilize the Living Archive to communicate various issues. This is similar to how Moutafidou and Bratitsis (2018) argue that marginalized groups can be provided with a voice through digital systems. Through the findings of our study, however, we argue that providing marginalized groups with what the authors mention as a voice is more complex in practice than in theory. This is further discussed in the following subsections.

## Restorying through the Living Archive

Through interactive and social features, such as comments related to the archive material within the platform, the users of the Living

Archive can share their stories and their knowledge about various topics in the Sami culture and community. Thus, the people from the community are provided the opportunity to teach and distribute knowledge about the Sami culture. As suggested by Schneider et al. (2018), this means that the Living Archive can consequently promote empowerment along the line of skills and education. The Sami community has been put through colonization and forced relocations by the national regions (Labba, 2020), and through the social aspects of the Living Archive, the collective community voice can be utilized to restory (Moutafidou & Bratitsis, 2018) and depict a past that potentially can be agreed upon by the Sami. In this case, the Living Archive can be utilized to facilitate communication and strengthen the voice of the Sami community, in line with Schneider et al. (2018) definition of community empowerment.

The social features, such as the comment section, 'likes', collections, and archive material contribution, are features that may empower the user further with a voice to tell their stories and share knowledge through digital storytelling. According to P3, digital storytelling is a contemporary form of Sami storytelling that can be facilitated through the Living Archive, and as such, it can empower Sami people also by self-enhancement.

Traditional Sami storytelling includes a lot of audio-based information, such as the *joik*. The *joik* can, however, not be supported through the design of the Living Archive since oral storytelling involves audio (Lipman, 1999). Moreover, stories are also conveyed with the aid of visual means, such as body language and facial expressions (Marlar Lwin, 2010), which neither can be communicated since the Living Archive does not support visual means to convey social interaction. Other instances of traditional Sami storytelling, like atmosphere and contextual location, cannot be communicated either.

Our study with the Living Archive shows different views on which this approach may or may not facilitate empowering interactions. On the one hand, it offers a number of opportunities for the community to own their stories and re-write them if necessary. Furthermore, the Living Archive affords easy distribution and accessibility. These opportunities may, however, be deceiving because, on the other hand, users from the community may choose to communicate through platforms such as the Living Archive without reflecting on the traditional aspects that are being lost. Over time, the design features of the Living Archive may come to impact the Sami community, and then the traditional ways of performing tasks and behavior may be lost to some extent as these are not facilitated by the new design. Because of this, we contend that design is never a neutral concept. While some aspects of the Sami culture are empowered (accessibility and a community voice), other aspects may be lost and disempowered (atmosphere and oral storytelling). Although the community voice is empowered, which, in theory, facilitates restorying, the fact that atmosphere and oral storytelling are not empowered does disempower that of restorying as there are important cultural storytelling aspects that are not facilitated. As a consequence, we also argue that, in order to design for restorying, one should account for the different qualities of storytelling in order for relevant and critical storying aspects not to get lost.

## Sensitivity, Safety, and The Living Archive

At first glance, the Living Archive can provide the Sami culture and community a voice (Moutafidou & Bratitsis, 2018). Through the social features, comment sections, likes, collections, and archive material, this voice can be used to re-story historically important events. Although the social features can be used to facilitate this voice in theory, it does not mean that it will do so in practice. There may be personal material within a lot of the stories that would potentially have to be shared in order to restore. This can be a sensitive issue for some.

The findings of this study suggest that the issue of sensitivity is related to the feeling of safety. Users may be more prone to share their archive material and stories if they experience a sense of control over the material. In the case of the Living Archive, participants argue that this is due to the fact that they can share their physical archive material digitally. In other words, they do not have to give it away to facilities but can keep them amongst their personal belongings while still sharing them with the world. This feeling of being in control of one's shared fragments of stories may establish empowerment, according to Schneider et al.'s (2018) definition of empowering experiences.

Although the findings of this paper suggest that the users of the archive may experience empowerment in regards to empowering experiences, skills, and education, empowerment through design process, and community empowerment, it also shows that the Living Archive is not perceived as fully protective. Despite our attempts and efforts to create a safe and protective environment by implementing the login feature and the ethical guidelines, the Living Archive does not fulfill all requirements related to protective technology as defined by Schneider et al. (2018). How the users of the Living Archive will behave cannot be guaranteed without putting it into practice.

As the aim of the research project is to empower through a digital archive dedicated to the history and present day of the Sami culture, there has been a wide target group in mind throughout the design process of The Living Archive. However, in order to make the users of the Living Archive heard, someone has to hear and listen to the stories. In order for someone to listen to it, they must have access to the stories, and someone has to provide them. The digital stories have to be accessible in order for someone to listen, but to make sure how the stories are being received and how the listener reacts when receiving the message that is being conveyed, cannot necessarily be designed for. There are, in other words, plenty of users who, in theory, can listen to the stories that are being told. How the listeners react and behave related to the message conveyed through the stories cannot be guaranteed, which, according to the findings of this study, makes users feel less safe and thus less prone to sharing their stories and restore.

## Limitations

The Framework of Empowerment in HCI (Schneider et al., 2018) does not present one true definition(s) of empowerment. The authors acknowledge that their establishment of the framework is based on HCI literature only. Other definitions of empowerment may therefore have been left out throughout the work of this paper.

Conducting the interviews online made it possible to sample participants in Norway and Finland with Northern Sami and Finnish as their mother tongues. The interviews were conducted in English, Norwegian, and Swedish, and none of the semi-structured interviews were performed in both the interviewer's and the interviewee's mother tongue. This might have affected the responses due to language barriers.

## Conclusion and Future Research

Through stories and storytelling, knowledge is passed on over generations. Whether stories convey imaginary or truthful narratives, stories that are being heard have a greater impact on people's lives than those which are not being listened to. Related to this, we have in this paper adopted the concepts of dominant and counter-narratives to enquire how design is entwined in storytelling. With this conceptual point of departure, we have presented a design study with the aim of building a technological platform dedicated to the past and present day of the indigenous people of Scandinavia, the Sami. By working along the RtD approach, we arrived at a design solution for a digital archive which is called *The Living Archive* due to its social features. We interviewed five people from, or with a close relationship to, the Sami culture regarding stories and to which extent the Living Archive can convey stories and storytelling. The data was analyzed deductively, and themes were extracted from Schneider et al. (2018). In relation to the latter, there are various aspects at which the Living Archive can be used for empowering purposes for the Sami, such as empowering experiences, skills and education, empowerment through design process, and community empowerment. With this being said, however, we contend that design is never a neutral concept and that new designs may change valuable ways of performing traditions and culture. Because of this, we also highlight the importance of preserving aspects of the past when designing new artefacts. Furthermore, we argue that providing marginalized groups with a voice through digital design as mentioned by Moutafidou and Bratitsis (2018), is more complex in practice than in theory. This is due to the various sensitivities that occur once the notion of a voice is accessible to a broader online audience. Building on this, future research should explore the dilemmas of accessibility and sensitivity which occur in relation to restoring. Due to the notion of the non-neutrality of design we encourage all designers to be *care-full* before the implementation of designed artefacts into users' daily lives, as this can come to cause unintended consequences (Zimmerman & Forlizzi, 2014). In addition to this, we suggest that our approach taken here illustrates how design can serve the purpose of enabling storytelling to empower those who need a voice.

## Endnote

1. Sami Week is an annual festival held in connection to the Sami National Day across the Nordic countries. It is a celebration of Sámi culture that includes varied activities such as performances, lectures, music, and art exhibitions.

## References

1. Ali, M. I. (2014). Stories/storytelling for women's empowerment/empowering stories. *Women's Studies International Forum*, 45, 98-104. <https://doi.org/https://doi.org/10.1016/j.wsif.2013.10.005>
2. Bell, L. A. (2020). *Storytelling for social justice connecting narrative and the arts in antiracist teaching*. Routledge.
3. Bietti, L. M., Tilston, O., & Bangerter, A. (2019). Storytelling as adaptive collective sensemaking. *Topics in Cognitive Science*, 11(4), 710-732. <https://doi.org/https://doi.org/10.1111/tops.12358>
4. Boamah, E., & Liew, C. L. (2017). Conceptualising the digitisation and preservation of indigenous knowledge: The importance of attitudes. In S. Choemprayong, F. Crestani, & S. J. Cunningham (Eds.), *Digital libraries: Data, information, and knowledge for digital lives* (pp. 65-80). Springer.
5. Bogdanova, G., Todorov, T., & Noev, N. (2010). Digitalization and security of "bulgarian folklore heritage" archive. In *Proceedings of the 11th international conference on computer systems and technologies* (pp. 335-340). ACM. <https://doi.org/10.1145/1839379.1839438>
6. Boje, D. M. (2008). *Storytelling organizations*. SAGE. <https://doi.org/10.4135/9781446214305>
7. Braun, V., Clarke, V., Hayfield, N., & Terry, G. (2019). Thematic analysis. In P. Liamputtong (Ed.), *Handbook of research methods in health social sciences* (pp. 843-860). Springer. [https://doi.org/10.1007/978-981-10-5251-4\\_103](https://doi.org/10.1007/978-981-10-5251-4_103)
8. Bromberg, N. R., Techatassanasoontorn, A. A., & Andrade, A. D. (2013). Engaging students: Digital storytelling in information systems learning. *Pacific Asia Journal of the Association for Information Systems*, 5(1). <https://doi.org/10.17705/1pais.05101>
9. Cazacu, S., Hansen, N. B., & Schouten, B. (2021). Empowerment approaches in digital civics. In *Proceedings of the 32nd Australian conference on human-computer interaction* (pp. 692-699). ACM. <https://doi.org/10.1145/3441000.3441069>
10. Claisse, C., Petrelli, D., Ciolfi, L., Dulake, N., Marshall, M. T., & Durrant, A. C. (2020). Crafting critical heritage discourses into interactive exhibition design. In *Proceedings of the conference on human factors in computing systems* (pp. 1-13). ACM. <https://doi.org/10.1145/3313831.3376689>
11. Clemens, I. (2020). Decolonizing knowledge. Starting points, consequences and challenges. *Foro de Educación*, 18(1), 11-25. <https://doi.org/http://dx.doi.org/10.14516/fde.733>
12. Driscoll, C., & McKee, M. (2007). Restorying a culture of ethical and spiritual values: A role for leader storytelling. *Journal of Business Ethics*, 73(2), 205-217. <https://doi.org/10.1007/s10551-006-9191-5>
13. Dusi, D. (2016). The perks and downsides of being a digital prosumer: Optimistic and pessimistic approaches to digital prosumption. *International Journal of Social Science and Humanity*, 6(5), 375-381. <https://doi.org/https://doi.org/10.7763/ijssh.2016.v6.675>
14. Elam, K. (2002). *The semiotics of theatre and drama* (2 ed.). Routledge.
15. Faulkenbury, E. (2019). Claiming freedom: Race, kinship, and land in nineteenth-century Georgia. *Journal of American History*, 106(2), 464-465. <https://doi.org/10.1093/jahist/jaz405>
16. Fog, K., Budtz, C., & Yakoboylu, B. (2005). *Storytelling*. Springer.
17. Gaver, W. (2012). What should we expect from research through design? In *Proceedings of the international conference on human factors in computing systems* (pp. 937-946). ACM. <https://doi.org/10.1145/2207676.2208538>
18. Giglitto, D., Ciolfi, L., Claisse, C., & Lockley, E. (2019). Bridging cultural heritage and communities through digital technologies: Understanding perspectives and challenges. In *Proceedings of the 9th international conference on communities & technologies* (pp. 81-91). ACM. <https://doi.org/10.1145/3328320.3328386>
19. Hlalele, D., & Brexa, J. (2015). Challenging the narrative of gender socialisation: Digital storytelling as an engaged methodology for the empowerment of girls and young women. *Agenda*, 29(3), 79-88. <https://doi.org/10.1080/10130950.2015.1073439>
20. ICA. (2019). *The Tandanya declaration*. <https://www.naa.gov.au/about-us/partnerships-and-collaborations/international-council-archives-ica/tandanya-declaration>
21. Ingold, T. (2009). Stories against classification: Transport, wayfaring and the integration of knowledge. In S. Bamford & J. Leach (Eds.), *Kinship and beyond: The genealogical model reconsidered* (pp. 193-213). Berghahn Books.
22. Iseke, J., & Moore, S. (2011). Community-based Indigenous digital storytelling with elders and youth. *American Indian Culture and Research Journal*, 35(4), 19-38. <https://doi.org/10.17953/aicr.35.4.4588445552858866>
23. Johannsen, N., & Kensing, F. (2005). Empowerment reconsidered. In *Proceedings of the 4th decennial conference on critical computing* (pp. 203-206). ACM. <https://doi.org/10.1145/1094562.1094599>
24. Kearney, R. (2001). *On stories*. Routledge. <https://doi.org/https://doi.org/10.4324/9780203453483>
25. Ketelaar, E. (2001). Tacit narratives: The meanings of archives. *Archival Science*, 1(2), 131-141. <https://doi.org/10.1007/BF02435644>
26. Ketelaar, E., McKemmish, S., & Gilliland-Swetland, A. (2005). "Communities of memory": Pluralising archival research and education agendas. *Archives and Manuscripts*, 33(1), 146-175. <https://search.informit.org/doi/10.3316/ielapa.200601142>
27. Kotler, P. (2010). The prosumer movement. In B. Blättel-Mink & K.-U. Hellmann (Eds.), *Prosumer revisited* (pp. 51-60). Springer. [https://doi.org/10.1007/978-3-531-91998-0\\_2](https://doi.org/10.1007/978-3-531-91998-0_2)
28. Labba, E. A. (2020). *Herrarna satte oss hit: Om tvångsflyttningarna i Sverige* [They put us here: On forced movements in Sweden]. Norstedts.
29. Lambert, J., & Hessler, B. (2018). *Digital storytelling: Capturing lives, creating community* (5th ed.). Routledge. <https://doi.org/10.4324/9781351266369>

30. Lawrence, C., Leong, T. W., Brereton, M., Taylor, J. L., Bidwell, N., & Wadley, G. (2020). Indigenous HCI Workshop. In *Proceedings of the 31st Australian conference on human-computer-interaction* (pp. 17-19). ACM. <https://doi.org/10.1145/3369457.3369553>
31. Lipman, D. (1999). *Improving your storytelling: Beyond the basics for all who tell stories in work and play*. August House.
32. Ljungdahl, E. (2018). Documenting Sami cultural landscapes. In G. Roche, H. Maruyama, & Å. S. A. V. Kroik (Eds.), *Indigenous efflorescence* (pp. 65-68). ANU Press. <http://www.jstor.org/stable/j.ctv9hj9pb.14>
33. Lombardo, V., Pizzo, A., & Damiano, R. (2016). Safeguarding and accessing drama as intangible cultural heritage. *Journal on Computing and Cultural Heritage*, 9(1), 1-26. <https://doi.org/10.1145/2812814>
34. Lundby, K. (2008). *Digital storytelling, mediated stories self-representations in new media*. Peter Lang.
35. Marlar Lwin, S. (2010). Capturing the dynamics of narrative development in an oral storytelling performance: A multimodal perspective. *Language and Literature*, 19(4), 357-377. <https://doi.org/10.1177/0963947010373029>
36. Matchacheep, S., Chookeaw, S., & Nilsuk, P. (2020). A gamification digital storytelling learning based on cooperative social cloud to promote students' teamwork skill in primary school. In *Proceedings of the 3rd international conference on digital technology in education* (pp. 132-135). ACM. <https://doi.org/10.1145/3369199.3369211>
37. Meissner, J. L., Vines, J., McLaughlin, J., Nappey, T., Maksimova, J., & Wright, P. (2017). Do-it-yourself empowerment as experienced by novice makers with disabilities. In *Proceedings of the conference on designing interactive systems* (pp. 1053-1065). ACM. <https://doi.org/10.1145/3064663.3064674>
38. Mikaelsson, S. (2016). We, the Saami, are one people, united in our own culture, language and history, living in areas which since time immemorial and up to historical times, we alone inhabited and utilized. In A.-L. Druge (Ed.), *Ethics in indigenous research: Past experiences - future challenges* (pp. 19-24). Centre for Sami Research.
39. Miller, C. H. (2019). *Digital storytelling: A creator's guide to interactive entertainment*. CRC Press. <https://doi.org/10.1201/9780429440045>
40. Mohamad, M. (2021). Teacher perceptions on the use of digital storytelling among autism spectrum disorder children in Malaysia. In *Proceedings of the 4th international conference on education and e-learning* (pp. 68-74). ACM. <https://doi.org/10.1145/3439147.3439180>
41. Moradi, F., Öhlund, L., Nordin, H., & Wiberg, M. (2020). Designing a digital archive for indigenous people: Understanding the double sensitivity of design. In *Proceedings of the 11th nordic conference on human-computer interaction* (pp. 1-11). ACM. <https://doi.org/10.1145/3419249.3420174>
42. Moutafidou, A., & Bratitsis, T. (2018). Digital storytelling: Giving voice to socially excluded people in various contexts. In *Proceedings of the 8th international conference on software development and technologies for enhancing accessibility and fighting info-exclusion* (pp. 219-226). ACM. <https://doi.org/10.1145/3218585.3218684>
43. Mukurtu. (2007). *Welcome to Mukurtu CMS*. <https://mukurtu.org/>
44. Odongo, A. O., & Rono, G. C. (2017). Digital empowerment in Kenya. In *Proceedings of the 10th international conference on theory and practice of electronic governance* (pp. 592-593). ACM. <https://doi.org/10.1145/3047273.3047381>
45. Rizvic, S., Okanovic, V., & Boskovic, D. (2020). Digital storytelling. In F. Liarokapis, A. Voulodimos, N. Doulamis, & A. Doulamis (Eds.), *Visual computing for cultural heritage* (pp. 347-367). Springer. [https://doi.org/10.1007/978-3-030-37191-3\\_18](https://doi.org/10.1007/978-3-030-37191-3_18)
46. Roche, G., Maruyama, H., & Kroik, Å. V. (Eds.). (2018). *Indigenous efflorescence: Beyond revitalisation in Sapmi and Ainu Mosir*. ANU Press. <https://doi.org/http://doi.org/10.22459/IE.2018>
47. Rouhani, L. (2019). Using digital storytelling as a source of empowerment for rural women in Benin. *Gender & Development*, 27(3), 573-586. <https://doi.org/10.1080/13552074.2019.1664140>
48. Sandelowski, M. (2000). Combining qualitative and quantitative sampling, data collection, and analysis techniques in mixed-method studies. *Research in Nursing & Health*, 23(3), 246-255. [https://doi.org/https://doi.org/10.1002/1098-240X\(200006\)23:3<246::AID-NUR9>3.0.CO;2-H](https://doi.org/https://doi.org/10.1002/1098-240X(200006)23:3<246::AID-NUR9>3.0.CO;2-H)
49. Saridaki, M., & Meimaris, M. (2018). Digital storytelling for the empowerment of people with intellectual disabilities. In *Proceedings of the 8th international conference on software development and technologies for enhancing accessibility and fighting info-exclusion* (pp. 161-164). ACM. <https://doi.org/10.1145/3218585.3218664>
50. Schneider, H., Eiband, M., Ullrich, D., & Butz, A. (2018). Empowerment in HCI - A survey and framework. In *Proceedings of the conference on human factors in computing systems* (pp. 1-14). ACM. <https://doi.org/10.1145/3173574.3173818>
51. Storni, C. (2015). A personal perspective on research through design. *Interactions*, 22(4), 74-76. <https://doi.org/10.1145/2786974>
52. Tomasello, G., & Almeida, T. (2020). Empowerment and self-care: Designing for the female body. In K. Townsend, R. Solomon, & A. Briggs-Goode (Eds.), *Crafting anatomies: Archives, dialogues, fabrications*. Bloomsbury Visual Arts.
53. Van Mechelen, M., Musaeus, L. H., Iversen, O. S., Dindler, C., & Hjorth, A. (2021). A systematic review of empowerment in child-computer interaction research. In *Proceedings of the conference on interaction design and children* (pp. 119-130). ACM. <https://doi.org/10.1145/3459990.3460701>
54. Virdi, K. A. (2018). *South Saami children's choir: A successful project, despite the obstacles*. <https://press-files.anu.edu.au/downloads/press/n4626/pdf/ch12.pdf>

55. Wertheimer, A., & Asato, N. (2016). The rise and fall of the wonder Okinawa digital archive: Comparing Japanese and American conceptualizations of digital archives. In *Proceedings of the 18th international conference on Asia-Pacific digital libraries* (pp. 63-76). Springer.
56. Zimmerman, J., & Forlizzi, J. (2014). Research through design in HCI. In J. S. Olson & W. A. Kellogg (Eds.), *Ways of knowing in HCI* (pp. 167-189). Springer.
57. Zimmerman, J., Forlizzi, J., & Evenson, S. (2007). Research through design as a method for interaction design research in HCI. In *Proceedings of the conference on human factors in computing systems* (pp. 493-502). ACM. <https://doi.org/10.1145/1240624.1240704>