“THE SILENCE OF THE LANDS”

Promoting the Virtual Museum as a Place of Cultural Negotiation

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Abstract. The Silence of the Lands is a virtual museum of natural quiet. The project promotes a model for preservation, experience, and renewal of natural heritage that empowers the active and constructive role of local communities in the collection and interpretation of natural quiet as a cultural object. This is accomplished by using ambient sounds as conversation pieces of a social dialogue aimed at transforming the virtual museum in a place of cultural negotiation; that is, to make the virtual museum a living organism linking the people, visions, interpretations, and values that pertain to a specific environmental setting. The project combines multiple interaction spaces and social practices into a large socio-technical architecture affording: (a) data catching (sound collection and geographic referencing by means of mobile devices); (b) data description (creation and management of individual soundscapes on the Internet); and (c) data interpretation (collaborative production of the ideal soundscape in the public space).

1. Introduction

“Every thing that exists is a potential museum object”
(Hugues de Varine-Bohan, 1976)

According to Hugues de Varine-Bohan, director of the International Council of Museums (ICOM) from 1965 to 1974, a further dimension must be considered to adapt the museum to the modern world: the social dimension. Along with preserving the cultural object in time and space, the museum should be “the place which can and must mirror the questions which individuals and social groups are asking themselves” (de Varine-Bohan, 1996, p. 54). According to de Varine-Bohan, what makes the museum and
what the museum is made for is the community it serves. Therefore, in order to integrate the museum into the social life and make it meaningful for the whole community, the museum should take its keynotes “from the problems of present-day man, from the lines of force existing in the life of the community,” and finally “from the dialectical relations between man and its environment” (de Varine-Bohan, 1996, p. 55). Although this invitation has been taken up by efforts such as neighborhood museums in the United States and eco-museums in France, the design and implementation of new media and technologies in support of cultural heritage preservation and communication focus primarily on the collection and preservation of the cultural object in time and space, that is, on the digital archive (Koshizuka and Nakamura, 2000).

Silence of the Lands (http://www.thesilence.org) is a virtual museum of natural quiet. The project promotes a model for preservation, experience, and renewal of natural heritage that empowers the active and constructive role of local communities in the process of collection and interpretation of natural quiet as a cultural object. This is accomplished by engaging the members of the community in recording and mapping their own experienced soundscapes and in collaborative construction of an idealized, virtual one. By using ambient sounds as conversation pieces for a social dialogue on the preservation and enjoyment of natural quiet inside the urban and natural environment of the community, the project focuses not merely on the digital archive of ambient sounds, but on the whole repertoire of knowledge and social relations responsible for the creation, transmission, and interpretation of natural quiet as a cultural object. The envisioned collaborative design of the Silence of the Lands aims to transform the museum into a place of cultural negotiation: a living organism linking the people, visions, interpretations, and values that pertain to the environmental setting of a specific community (Tacita and Millar, 2005).

In line with the efforts expressed by the Natural Sounds Program Office, the Center of the American West at the University of Colorado, and the City of Boulder Open Space and Mountain Parks, we believe that promoting reasoned discussion among people with different, and sometimes competing visions is more desirable than enforcing top-down environmental policies, and ultimately this endeavor engenders more sustainable solutions. However, the preservation and enjoyment of natural quiet is not only an issue of environmental planning and participatory democracy; it also is an issue of cultural heritage in relation to which the active and constructive role of local communities is fundamental (Adams and Goldbard, 2001).

The Silence of the Lands raises and addresses a series of theoretical issues and design opportunities, concerning: (a) the concept of the virtual museum (Section 2.1); (b) the new relationship between physical and digital, natural and cultural, which is engendered by new media (here in the context of the cultural production of soundscapes; see Sections 2.2 and 3); (c) the potential of novel technologies and interfaces in supporting processes of subjective perception, collective interpretation, and public participation in the construction of the virtual museum (here in the context of the collaborative construction of a museum of natural quiet; see Sections 2.3 and 5); and finally, (d) the design approach capable of comprising all these aspects in a coherent framework (Section 4).
The project, offering an extraordinary testing environment for our research challenges in socio-technical environments and virtual heritage, is currently under development at the Center for LifeLong Learning & Design (L³D), University of Colorado, Boulder. Given the scope of the project and the multi-layered complexity of the social and technical issues raised, we have adopted an *in use* or *in situ* research methodology (Fields et al., to appear). Rather than using high-fidelity scenarios, our prototypes will be introduced into the “real” world in collaboration with local partners (Section 6) and their social and cultural impact will be assessed once they have been in use for some time. This paper doesn’t offer technological solutions; rather, it opens up a range of questions for virtual heritage and museology, which our project addresses from the specific and unique perspective of metadesign (Giaccardi, 2005; see Section 4).

### 2. Virtual Heritage and Emergent Cultural Objects

The term *virtual* is usually associated with the idea of an extension of reality. Similarly, the expressions *virtual museum* and *virtual heritage* are commonly adopted to mean the process of reproduction of a physical museum or a specific cultural heritage that is enabled by information technologies. For example, the virtual museum has become a common attribute for multimedia products and websites capable of providing new and fresh experiences of a specific museum heritage; as well, virtual heritage has become a familiar synonym for 3D environments recreating archaeological sites, to which we can be “transported” and where we can do things impossible in reality.

To explore and envision further opportunities, however, a reflection is necessary.

#### 2.1. Extending the Notion of Virtuality

All museums are virtual, independent of information technologies. Museums extract each piece from an environment that, as the site of origin, is deemed to hold some significance. The piece is then transferred to a new site, the museum, in which the relationships with its original environment and time are recreated. In this sense, museums are virtual because they collect pieces that work as a switch to “something else”; they represent, as André Malraux suggested in the middle of the twentieth century, a *meta-place* (Malraux, 1951).

Cultural objects—that is, the pieces placed and arranged within a museum—should also be conceived as virtual. They present the ambiguity of being physically tangible as a museum piece, but also being subject to change according to the different perspectives in which they can be interpreted and displayed. As argued by Benedetto Benedetti (Benedetti, 2002), information and communication technologies empower the *creative interaction* among the tangibility of a museum piece (the “physical”), its current interpretation (the “cultural”), and its future meaning (the “virtual,” in the philosophical sense of non-yet-actualized). They allow us to attribute to these components different functions and degrees of importance according to the characteristics of what needs to be *(re)presented.*
However, the first applications of the concept of virtuality to the museum did not take into account the complex reality of cultural objects; rather, they enhanced the virtual component that is inherent to the museum by making physical artifacts digitally accessible (e.g., on CD-ROMs or via the Internet). These applications have significantly contributed to the development of new forms of learning and knowledge construction by allowing more personal explorations of the museum contents, but they have failed to address the challenges and opportunities opened up by the encounter between the complex reality of the museum and information technologies. Even though, at an individual level, these applications have opened up the process of cultural interpretation that curators and visitors exercise on a museum piece, they have failed to empower the creative interaction among the different levels of reality that compose such an object.

Virtual museums should push us instead to question and investigate the contemporary role of the museum and then challenge this by producing innovative visions and experiments by asking the following questions: How can conservation and production, information and creativity, representation and real-life coexist in a virtual museum? To what society and communities does a virtual museum relate? Can a virtual museum promote the social dimension of creativity and connect it to the collection and preservation of new cultural objects?

2.2. SUPPORTING THE IRIDESCENCE OF CULTURAL OBJECTS

The idea of iridescence, in contemporary museology, refers to the fact that the perception of cultural objects—how we “see” or “listen” to them—is subject to change according to the different perspectives in which they can be interpreted and presented. Normally, this perception is the result of the cultural and historical interplay among the physical tangibility of the artifact (the physical component), its actual interpretation (the cultural component), and its future interpretations and meanings (the virtual component).

Today, by means of information and communication technologies, we can make these components interact more dynamically. Iridescence becomes the form of virtuality that—rather than focusing on duplicating pieces of reality, recombining digital contents, or interconnecting different museums—empowers creative interaction among the physical, cultural, and virtual components of cultural objects, and allows attributing to these components different functions and degrees of importance according to the need. This form of virtuality entails new forms of museum construction and social creativity, keeps the structure of the museum open and dynamic, and enables the emergence of new and previously unimaginable cultural objects.

Local museums are particularly interesting in this regard. Some of them have been able to successfully collect, preserve, and activate both the tangible and intangible resources of the territory to which they belong, tie these resources together, trigger new forms of participation and social creativity in the museum construction, and find ways to actualize new cultural objects. The Virtual Museum of the Collective Memory of Lombardia (MUVI), for example, provides evidence of how a living heritage can be translated into actual cultural objects (Giaccardi, 2006). MUVI shows how the collection and preservation of physical artifacts (family albums) can be connected to expressions of social creativity by means of processes of...
participation and collective storytelling (oral histories) that are sustained and empowered by the convergence of different media and information technologies.

2.3 THE POWER OF AFFECTIVE GEOGRAPHIES

Within this framework, we believe mobile technologies and locative media can provide strong support to the emergence of new cultural objects. By enabling the annotation and visualization of competing cultural interpretations inside a specific territory, mobile technologies and locative media enable users to create affective geographies of their individual and collective perceptions about a specific or potential cultural heritage. Mobile technologies and locative media give maps a new emotional life: they provide a tool for the visualization of different or even competing cultural interpretations, thus offering powerful means for storytelling (Wood, 1992; Turchi, 2004).

As proposed by our project, affective geographies can encourage and support processes of social dialogue and negotiation by affecting collective perception and transforming public authoring in a form of collaborative design. Our hypothesis is that by allowing people to collect and describe their perceptions by means of locative technologies, and then to visualize and modify these perceptions in both an individual and collective manner (on the web and/or in the public space), locative technologies and location-based content can substantially impact public participation and collaborative design, especially in the context of local communities.

In the Silence of the Lands, location-based content is represented by the ambient sounds collected by the members of the community. These sounds represent subjective interpretations of the soundscape of the urban or natural settings that affect their everyday life. These data are transferred among different interaction spaces and visualized on a Geographic Information System (GIS) map according to various parameters. Among them, color coding allows one to easily spot areas of consensus, dissension, and uncertainty about which places are quieter or noisier according to a collective perception (e.g., areas of Boulder Open Space and Mountain Parks or places along the Boulder Creek Path; see Fig. 1 and Fig. 4) and thus identify elements of conversation designed to feed back the social debate over long periods of time.

Current projects using locative media, instead, typically focus on reality augmentation or forms of narrative archeology that are not designed to feed back the social debate over long periods of time. In the specific field of the museum, mobile technologies are primarily used as exhibition guides personalized for visitors’ interests and behaviors in the real space of the exhibition or meant to provide a unified and coherent overall experience of different installations and contents. Only recently, particularly in relation to the museum exhibit, have few projects started to pay attention to the social dimension of exchange and interpretation (Bannon et al., 2005; Sparacino, 2004).
3. Natural Quiet and the Cultural Production of Soundscapes

As demonstrated by public debate, the concept of natural quiet is subject to change according to varying perspectives. In order for natural quiet to be preserved and experienced as an object of both natural and cultural heritage, it is crucial to empower the interaction among its current understanding, its potential interpretations, and the physicality of the sounds to which natural quiet is associated. Rather than just to collect sounds as an intangible artifact, the task must be to sustain the system of knowledge and social relations responsible for the interpretation, communication, and renewal of the concept of natural quiet as a “living entity” (Kirshenblatt-Gimblett, 2004). We believe that these goals can be achieved by constructing a virtual museum conceived as a place of cultural negotiation, in which natural quiet is understood and interpreted through the actual interaction with ambient sounds, and where virtuality is intended as the method of producing new relationships and new meanings.

Challenged by postmodern culture and information technologies, the notion of cultural heritage is evolving toward a new understanding. Definitions of the boundaries between tangible and intangible, built and natural are being questioned and discussed in order to refine classifications and policies (Munjeri, 2004). In this context, our focus on sound is not the only one meant to privilege an aspect (sound) that has usually been ignored by cultural heritage. Other projects, such as Museo della Bora (http://www.museobora.org/) and Sounding Dartmoor (http://www.sounding.org.uk/), have focused on the collection of ambient sounds as valuable cultural objects. In contrast to their work, however, we do not focus only on the act of collection. We use sounds, rather than words, as
the conversation pieces of a social dialogue about preservation and enjoyment of natural quiet in the belief that “objects, collections, buildings, etc. become recognized as heritage when they express the value of society and so the tangible can only be understood and interpreted through the intangible” (Munjari, 2004, p. 13). As will be discussed in Section 5.3, the combination of sounds and visual mapping is then critical to highlight elements and structures of this conversation.

4. Metadesign and Social Creativity in the Construction of the Museum

As we explore new possibilities to support the emergence and interpretation of cultural objects in the virtual museum, it is important to understand that the complexity of the museum—made of relationships that are outside and inside the “walls” of the museum itself—creates an environment that can be exploited to make the museum a more open and dynamic reality. Our effort in promoting the museum as a place of cultural negotiation builds on perspectives of social creativity (Fischer et al., 2005) and metadesign (Fischer and Scharff, 2000; Giaccardi, 2004) with the goal of sustaining the system of knowledge and social relations responsible for the interpretation, communication, and renewal of cultural objects as living entities.

4.1. SOCIAL CREATIVITY

Creativity is often viewed as an individual process, although this perspective ignores the context of interaction and collaboration that fosters individual creativity. Social creativity emphasizes that the heart of human activity is not only the individual but also the interaction among individuals and between individuals and their environments. Cultivating an understanding of the cultural object must bring together not only the physical artifact that represents it, but also the multiple perspectives that shed light upon how it was and is perceived and understood by others. However, the social interaction and the deep understanding of various perspectives that are needed to resolve conflicting interpretations cannot be achieved at arm’s length. Instead, it is important to express one’s own perspectives and to engage and struggle with the various other perspectives—in short, to participate (Fischer et al., 2005). It is important to recognize that participation has limits that are contingent on the nature of each individual’s situation, as well as the processes provided for participation and the available technology and media (Arias et al., 2000). Finding new ways to address these challenges is key to keeping alive the cultural heritage and the various perspectives that contribute to it.

In our project, we try to address this challenge by engaging the local community in producing and describing the audio objects and soundscapes that will compose the museum collection, and allowing them to negotiate their experience and understanding of natural quiet in a tangible manner. Ambient sounds, once recorded and made available, will work as the primary means of translation of the various individual perspectives. They will enable different people to communicate and coordinate their different knowledge and perspectives by acting as the conversation pieces of a social dialogue about natural quiet.
4.2. METADESIGN

To incorporate these aspects into the virtual museum, we need a different perspective on design that builds upon dynamic and open realities. The perspective of metadesign characterizes objectives, techniques, and processes for creating new media, environments, and organizations that enable and encourage participants to engage in co-creative activities (Giaccardi and Fischer, 2005). What we envision from this perspective is a museum that is collaboratively designed and constructed by curators as well as participants through repeated cycles of action and reflection\textsuperscript{14} that involve looking to one’s experiences, connecting with one’s feelings, and building new understandings to inform our actions in the situation that is unfolding (Schön, 1992). Rather than curators developing exhibits as more or less static entities to be explored and experienced by visitors, curators in this model would create frameworks for design and encourage participants to contribute to the very construction of the museum.

Based on these concepts, what we envision for this project is to develop an environment in which:

- the role of preservation and conservation is not simply to archive natural sounds but to give voice to a broad repertoire of interpretations;
- the role of display and exhibition takes on a dynamic and open interplay with education and outreach in the form of social creativity and participation; and
- the entire framework is transformed by collaborative construction based on metadesign.

5. (Re)Interpreting Natural Quiet in the “Silence of the Lands”

In order to support social dialogue and the collaborative design of the museum, the Silence of the Lands builds upon the vision and principles of the Envisionment and Discovery Collaboratory (EDC) (Arias et al., 2000), a collaborative environment integrating physical and computational representations. The innovative aspect of the Silence of the Lands is the combination of locative technologies\textsuperscript{15} and tangible social interfaces\textsuperscript{16} in a socio-technical architecture of distinct but integrated interaction spaces (see Fig. 2).

The architecture of the Silence of the Lands builds on multiple dimensions of distribution—temporal, spatial, conceptual, and technological (Fischer, 2005)—as a means to achieve not only the integration of individual and social creativity, but also to broaden the participation platform for such integration and bring about action and reflection on a large scale. By providing different entry points, promoting the different properties of each interaction space, and supporting different interaction roles over a sustained period of time, such an architecture aims to: (a) empower the creative interaction between current and future interpretations of the cultural object engendered by collaborative design, (b) enable participation and collaboration that fits more naturally with existing social practices and the way in which people act and interact with their local environment, and (c) support processes of informal learning and social awareness.
Figure 2. Overview of the socio-technical architecture of the museum: A combination of multiple interaction spaces and social practices mediated by locative media and tangible interfaces. (1) Satellite and GPS signal; (2) Participants in the wild; (3) Mobile interface (sound catching and geo-referencing); (4) Antenna for wi-fi connection; (5) Server for database management; (6) Web interface (visualization and description of individual soundscapes); (7) Tangible social interface (collaborative production of the ideal soundscape).

The storytelling and collective conversations among participants produced by the collaborative design of the museum is expected to transform the cultural object into a living entity that changes according to current and future interpretations. In this way, the Silence of the Lands not only increases individual sensitivity and social awareness about ambient sounds; it also provides local communities with a tool for the visualization of collective perception and public trends.

5.1. DATA TRANSFER AND INFORMATION FLOW

Data transfer and information flow link the actual experience of the acoustic environment with the individual and collective interpretation of the environment itself (see in Fig. 3 the interconnected aspects of place experience and place vision).

This result is obtained by combining direct experience, cognitive mapping, and face-to-face interaction; that is, by combining: (a) data catching (sound collection and geographic referencing by means of mobile devices and locative technologies); (b) data description (creation and management of individual soundscapes by means of web tools on the Internet); and (c) data interpretation (collaborative production of the ideal soundscape in the public space by means of the tangible social interface). Ambient sounds are collected from the natural environment by means of handheld devices. Each sound is linked to the participant that collected it and is associated with Geographic Positioning System (GPS) data (which determine its location in space and time). Sounds and sound walks (i.e., the
paths followed by participants during a recording session) are stored on the web server and visualized on the web site as individual soundscapes, one for each participant. On the web, users can access and manage their individual soundscapes (eventually modifying and changing them). They can also visualize the collective soundscape resulting and growing from the overlap of all individual soundscapes. Such a collective soundscape represents the starting point for participants in the community to collaborate on the creation of the virtual soundscape (i.e., the ideal soundscape). In the public space, both old and new participants can interact with the collective soundscape by means of a tangible interface. Each public session produces a temporary soundscape, reflecting the understanding and creativity of the people that participated in that session, and contributes to the creation of the historical soundscape. A visualization of the historical soundscape is provided both on the web site and in the public space.

In this way, although transferred through different media, information will be enriched with meaning as a result of the engaging opportunity to collect and reinterpret both individual and collective data over a sustained period of time, according to the different properties of the space with which a participant is interacting and through which data are traveling.

![Figure 3. Data Flow in Silence of the Lands.](image)

5.2. MULTIPLE ENTRY POINTS AND ENGAGEMENT TRAJECTORIES

The combination of different interaction spaces and media offers to community members multiple entry points (the wild, the web, the public space) and engagement trajectories (from the wild to the web, from the web to the wild or the public space, and so forth). The Silence of the Lands’ architecture and characteristics provide the community with a participation platform that enables collaboration to fit more naturally with existing social practices and the way in which people act and interact with their local environment (Section 6).
Once activated, the information transfer among different interaction spaces and media will integrate into the design and visualization process both tangible and intangible resources (in that individual concerns, values, and fun will play a fundamental role in the exploration, collection, and interpretation of the actual ambient sounds). Moreover, by activating emotional and social mechanisms of collective storytelling, collection and interpretation will renovate and support mutual learning and hopefully inter-generational synergies within the community itself. Over time, the participation platform of the Silence of the Lands is expected to inspire spontaneous engagement from the local community and strengthen its cultural identity and sense of belonging to an identifiable territory.

5.3. GEO-SPATIAL ANNOTATION AND COLLABORATIVE MAPPING

Sounds are geo-referenced, streamed, and visualized on a GIS map as evolving matrices of audio objects aimed at revealing the collective perception of the community by showing areas of dissension, consensus, and uncertainty based on color-coded attributes (see Fig. 4) and other descriptors such as keywords and photographic pictures.

Our first mapping has been focused along the Boulder Creek Path, an area within the City of Boulder that presents a heterogeneous mix of both urban and natural sounds and is easy accessible. By taking advantage of the integration of Google Maps with our MapServer, participants can read as well as write their maps while recording sounds, and can produce geo-spatial annotations of their own experiences (Roush, 2005). The combination of sounds and visual mapping is critical to highlight elements and structures of the social conversation and to transform ambient sounds into objects capable of acting as pieces of conversation among different individuals. This should provide an instantaneous and dynamic visualization

Figure 4. Prototype of the Web Interface and Color-Coded Attributes (along the Boulder Creek Path).
method for judging patterns and let information be explored at the level of both the individual and the community. The goal is to develop a nonlinear method of visualization and interpretation based on a set of filters enabling data permutation, in which the surface of the image is placed in opposition to the linearity of the discourse and the representation of the individual is opposed to that of the group.

5.4. TRIGGERING COLLABORATIVE EVENTS IN THE PUBLIC SPACE

Placed in the public space, the tangible social interface of the EDC (Fig. 5) enables participants to negotiate their interpretations of natural quiet and collaborate to create the ideal soundscape in which the community would like to live.

To encourage this process, the interface presents two modes: (a) explorative and (b) collaborative. The first mode is meant to engage participants in the pleasure of an immersive and free exploration of the soundscape produced by the overlapping of the soundscapes that have been individually created by members of the community. The second mode is meant to provoke participants’ reaction and collaboration. A set of triggers will act as a switch to this second mode and bring participants into playful situations that can be resolved only by discussing and negotiating their own interpretations. See Fig. 6 for a scheme.
6. Seeding Community Participation

In the Silence of the Lands, the perception of natural quiet—as a cultural object—is the by-product of the continuous process of interaction and interpretation occurring within the local community and supported by the technical infrastructure. Sounds are retrieved and interpretations produced as a result of the interplay among experience (as a cultural resource), computational representation (as actual interpretation), and collaboration (as a resource of potential interpretations).

However, the development of a technological system is not sufficient to engage the local community and make the project successful. Designing the museum as a seed subject to evolution over time (Fischer et al., 2001), weaving it into the fabric of existing practices and activities inside the local community, identifying social and emotional support mechanisms, and collaborating with local partners and social networks are all crucial elements for the success of the project.

The important factors here are what we call seeding—the participative mechanism to be activated—and the sensitivity in sustaining and regulating the social interaction and interpretative acts of the participants over a long period of time (Giaccardi, 2006). In order to effectively interface social and technical systems, initiatives must be taken in collaboration with local groups and stakeholders to encourage community participation and regulate it over a long period of time. However, the multiple interaction spaces and complex activities that compose and instantiate the socio-technical architecture of the Silence of the Lands make it difficult to answer the question of how the affordances provided by the technical infrastructure will actually articulate the social interaction among the members of the community. Will it work?

Currently, we are in the initial stage of prototype development. In collaboration with local partners, including the City of Boulder Open Space and Mountain Parks (OSMP) and the Watershed Approach to Stream Health (WASH) Project, we are soon going to introduce our prototypes within the local community and assess their use in the context of existing practices and activities such as the OSMP Natural Selections Hikes and the WASH Field Activities. As mentioned in the introduction, we are adopting an “in use” or
“in situ” research methodology (Fields et al., to appear). Rather than using high-fidelity scenarios, our prototypes will be introduced into the real world, and their social and cultural impact assessed in collaboration with our partners once they have been in use for sometime. This collaboration will allow us to better identify the social and emotional mechanisms supporting public participation and collective storytelling, which involves answers to several questions. For example: What emotional responses do ambient sounds elicit, and how are they used and interpreted? What correlations can be traced between individual and collective soundscapes? How do areas of consensus, dissension, and uncertainty or anomalous perceptions emerge and change over time, and what structures of conversation do they produce? Does the social visualization provided by geo-spatial annotation and collaborative mapping feed back participation, and are our interface and tools effective? What are the most common entry points and engagement trajectories, and are new social practices emerging? And finally, do users construct a meaningful cultural experience?

This understanding, grounded in the metadesign approach, will allow us to tune our socio-technical architecture by iteratively refining both the technical infrastructure and participation platform.

7. Conclusions

Designers and museum professionals need to recognize that new media can strengthen the tie between cultural resources and territory by supporting innovative models for social creativity that empower and nurture the active and constructive role of local communities. Information and communication technologies are not merely tools for processing data and making them available, but can be a force and stimulus for cultural development.

The Silence of the Lands aims to go in this direction. However, the multiple interaction spaces that compose its socio-technical architecture, in which novel technologies meet complex activities, make it difficult to anticipate how technology will be used in practice. As suggested by Fields and colleagues, the scope and complexity of the issues engendered by this project call for extending research on frameworks for assessing in situ the social and cultural impacts of these technologies once they have been in use for some time. In this sense, this paper doesn’t offer technological solutions but, rather, it opens up a range of questions for virtual heritage and museology, which the project addresses from the specific and unique perspective of metadesign.

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References


NOTES


2 ICOM is an international organization of museums and museum professionals committed to the conservation, continuation and communication to society of the world's natural and cultural heritage. It is a non-governmental organization maintaining formal relations with UNESCO and having a consultative status with the United Nations’ Economic and Social Council.

3 For a distinction between archive and repertoire, see (Kirshenblatt-Gimblett, 2004).

4 The office is part of the National Park Service, U.S. Department of the Interior (http://www.nps.gov/naturalsounds/).

5 See, in particular, the conference “The Silence of the Lands,” which was held in February 2003 and whose concerns, hopes, and title have inspired the present project (http://www.centerwest.org/).

6 See the recent community debate on the draft of the new Visitor Master Plan (http://http://www.ci.boulder.co.us/openspace/).

7 For a description of the conflict and visions expressed by different social groups in relation to preservation and enjoyment of natural quiet, see Giaccardi et al. (2005).

8 For a classification of these forms of virtuality and their characteristics, that is, (1) duplication and extension of reality, (2) recombination and personalization, and (3) interconnection, see Giaccardi (2004).


10 The expression “affective geography” was first used by the collective Calc as the title of the art project Geografia Affectiva (2002-present), which is based on the use of SMS as a tool for social networking. See: http://www.calcaxy.com/geografiafettiva. Here we use the expression to indicate the power of maps as a tool for storytelling (Wood, 1992; Turchi, 2004).

11 See note 12 for a description of the process in which soundscapes, as affective geographies, act as a trigger and a boundary object (Bowker & Star, 1999) for individual and collective storytelling.

12 By ambient sounds, we refer to composite sounds produced not only by natural sources (such as animals and atmospheric conditions), but also by human artefacts (such as, for instance, power generators and motorized vehicles). See Kraus (2002).


14 In the Silence of the Lands, action is the production of audio objects and soundscapes, whereas reflection is the interpretation of sounds and soundscapes leading to new action, and so forth. Action and reflection are here both individual and collective, that is: the individual action and reflection process of creating your personal soundscape on the basis of your subjective perception; the collaborative action and reflection process of creating a shared ideal soundscape during face-to-face interaction in the public space; and then, again, the eventual individual action and reflection process of modifying your own soundscape as a result of the understanding that has been gained through either the collective perception expressed by the map or the collaborative activity conducted in the public space.

15 Locative media are media focusing on GPS, mapping and positioning technologies.

16 Tangible social interfaces are interfaces based on the manipulation of physical objects and meant to support social interaction in public places. See Jennings (2005).