Cultural Heritage and Disability: Can ICT Be the 'Missing Piece' to Face Cultural Heritage Accessibility Problems?

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Abstract. Improving the usability conditions for all is one of the basic concepts underlying the enhancement of cultural heritage. Usability must be declined both in terms of physical accessibility and sensory-perceptive of the places of cultural interest, both as accessibility of contents of which they are witnesses.

In this field, ICT technology can become very useful especially in terms of communication and thus effective before and during the visiting of a site.

ICT technology is analyzed, also by examples, by identifying the limits, mainly due to the fact that in most cases the means are preferred rather than the goal, and the potential that is very promising if the same are designed to support undifferentiated users with the aim of transmitting cultural and not spectacular messages.

Keywords: Cultural heritage · Accessibility · Disability · ICT · Universal Design

1 Introduction. Accessibility to Cultural Heritage: A Multifaceted Question

> *"...Vengo anch'io? No, tu no*
> *Ma perché? Perché no..."*[1]
> [Enzo Jannacci]

Article 2 of the *Faro Convention*, adopted by the Council of Europe in 2005, describes cultural heritage as «a group of resources inherited from the past which people identify, independently of ownership, as a reflection and expression of their constantly evolving values, beliefs, knowledge and traditions»[2]. In other words, cultural heritage includes all the tangible (movable and immovable) and intangible (language, customs, traditions, etc.) assets with which the identity of a nation is expressed.

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[1] Translation by the authors: "Can I come too? No, not you/But why? Because you can't".

[2] The *Framework Convention on the Value of Cultural Heritage for Society* (informally known as *Faro Convention*) emphasises the contribution of cultural heritage to the construction of a democratic and peaceful society and to its sustainable development [1].

In Italy this idea was explained for the first time in 1967 when the *Franceschini Commission* suggested the following definition of cultural heritage: «any material evidence of civilization (…) all types of property having reference to the history of civilization belong to the cultural heritage of the Nation»[3]. This description has expanded the concept of cultural assets from an idea of uniqueness and rarity based on a purely aesthetic and artistic judgment (the so-called *Fine Arts*) to a historical and ethno-anthropological evaluation by which an object has a cultural value not for what it intrinsically stands for, but for what it can represent (*witness*).

In this sense, the concept of cultural heritage is strictly connected with that of communication, as highlighted significantly in the ICOMOS *Ename Charter*: «every act of heritage conservation - within all the world's cultural traditions - is by its nature a communicative act»[4].

But, over time, means and content of communication have changed according to the times, living situations and technological developments. In the last years much attention is paid to the new digital technology that seems to have the potential for making significant improvement in many fields; such as, allowing persons with disabilities to enhance their social, cultural, political and economic integration as acknowledged by the UNESCO *New Delhi Declaration*[5].

ICT can play a key role in particular, with cultural heritage, in facilitating the enjoyment of a historical site by everyone, taking into account not only the various forms of disability, but also cultural diversity both in terms of different nationality and personal education. In this sense and according to the article 30 of the United Nations Convention on the Rights of Persons with Disabilities [5], ITC may approach accessibility interventions to the principles of Universal Design with a significant advantage not only for users, avoiding marginalizing situations, but also for the protection of cultural heritage itself by reducing the works to be carried out (less facilities and devices, limited impact and lower costs of implementation, management and maintenance).

Otherwise, as noticed by Baraldi: «It is not just a problem of the methodology of conservation, but rather the dynamic nature of the interconnection between culture and society, a cornerstone of the democratic development (…) If we assume that culture is the basis for the development of critical skills for democratic participation, conceptual accessibility becomes a form of social responsibility» [6]. Knowing the past is essential to understand the present times and to guarantee democratic development. For this

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[3] The *Commission of Inquiry for the Protection and Enhancement of Historic, Artistic, Archaeological and Landscape Assets* (commonly called the *Franceschini Commission* after the minister Francesco Franceschini who presided over it) was established in 1964 with the aim to conduct a research on the state of cultural heritage in Italy. The Commission's work ended in 1967 and was summarized in 84 Declarations, the first of which contains the aforesaid notion of cultural heritage [2].

[4] The *Charter for the Interpretation and Presentation of Cultural Heritage Sites* (informally known as the *Ename Charter*) emphasizes the need for clear principles for interpretation and presentation of worldwide heritage sites as essential components of heritage conservation efforts and as a means of enhancing public appreciation and understanding of cultural heritage [3].

[5] The *New Delhi Declaration on Inclusive ICTs for People with Disabilities: Making Empowerment a Reality* (2014) aims to highlight the power of technological and scientific progress for inclusion and empowerment of persons with disabilities [4].

reason, it is necessary to pay specific attention to the social role of cultural heritage which motivates and requires the most extensive and effective understanding of the intrinsic value of cultural assets by the community itself. And for the same reason, access to culture is a right that must be guaranteed to everyone, regardless of ability or disability. So quoting Sørmoen: «Before starting the work with ramps, lighting, braille text etc. we need to have this basic understanding of the function of heritage (…). Physical access in itself does not mean a lot if one does not have access to the message, the values, or the meaning thereof» [7].

2   The Role of ICT in Communicating Cultural Heritage Accessibility

C'è il boom della comunicazione tutti a comunicare che stanno comunicando[6]
[Altan]

The visit to a place of cultural interest begins (or should begin) almost always by collecting documentation and instructions on the site and its contents regarding both the *level of accessibility* and access modalities. Nowadays the most common methods is the use of the *internet* where some information can often be found. But how true is the information? When was it last updated? Whom and with what preparation has accessibility been judged? What usually happens is that the information (exclusively referring to *physical* accessibility), is fairly generic and refer to a phone contact. Certainly the issues do not depend on the means with which they are provided[7]. However, in these cases the use of ICT could have a potential that no other means can provide for example through the development of an *app* that, by exploiting the GPS, guides the visitor along the accessible route using *Google Maps*.

Arriving on the site the necessary information concerns both the usability of the site, and the cultural content it offers. Regardless of the *material* and *immaterial* dimensions of communication, the first question to be faced is whether it is necessary to distinguish the ways and means according to the user and, therefore, whether it is necessary to have different systems. In general, according to the Universal Design approach, it is wrong to *atomise* the users and thus it is always preferable to have a single support that can be useful for as many users as possible.

On the other hand, especially in cultural sector, the content (information and communication) to be transmitted may not be the same for a child or for an expert in the field, just like the means of communication with the blind and deaf should be defferent. Universal Design must be declined by seeking maximum flexibility in order to adapt the solutions to the greatest number of possible needs such that they can be

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[6] Translation by the authors: "There is the boom of the communication, everyone communicates that they are communicating".

[7] It should be underlined that «Communication, therefore, has a "material" dimension concerning the means to implement it, and an "immaterial" dimension, which includes the different uses of the words, of languages and images» [8].

customized for user profiles. In this perspective the use of ICT can become an extraordinary resource to specialize the information for user profile as long as the technology does not become the goal, but only a means to achieve the results of transmission and communication of knowledge [9].

A recent example of what has just been mentioned is the project *Le chiese di Milano…in tutti i sensi*[8] concerning the study, design and manufacture of plastic type panels made with the so-called *adduction technique* (Fig. 1).

Fig. 1. Basilica di San Marco, Milan. The tactile information panel with the QR Code and NFC to download the audio-video with the translation in LIS (Italian Sign Language).

On each panel there is a short text in Italian and English, with basic information on the building. The central part is occupied by the church plant, an essential tool to facilitate the orientation of everyone, with a numerical indication for each individual

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[8] The project (*The churches of Milan … in every sense*) has been developed mainly by Tactile Vision Onlus and Lettura Agevolata Onlus. It includes fifteen churches in Milan and it was completed in July 2016.

part, reported in the corresponding legend. Through *QR Code* and *NFC* (Near Field Communication) an audio-visual guide to help read each panel is also provided. This art-historical enrichment is supplied in various ways: audio for the blind and visually impaired people, videos for deaf people (with subtitles and translation of texts in LIS - Italian Sign Language). To access the contents of the guide a *smartphone* or *tablet* with internet connection and with QR Code software or equipped with NFC is needed[9].

In many sites there are the *classic* 3D video reconstructions, often downloaded from Internet or purchased on the site on DVD support, which go towards *story-telling*, hardly usable by people with visual disabilities, and that somehow overcome and/or support books. These products therefore are not necessarily related to an *in situ* use.

More recently, ICT technology has been developed, especially in archeology, so that it reconstructs the place in real life size, therefore giving the visitor an idea of how the site could have been presented in ancient times. These reconstructions are neither a means of overcoming physical barriers, depending on the nature of the specific place, nor the perceptual barriers (contrary are perceptual barriers especially for the blind and visually impaired). Beyond their quality and scientific level, this technology represents a tool for accessibility to content and, unlike the previous ones, must be used only *in situ*. Among them two examples can be mentioned: the *virtual journey* inside the *Domus Romane* in Palazzo Valentini (Rome) and the experience of reality increases in the Archaeological Park of Brescia with the use of *ARt-Glass*®. In the first case with a sophisticated system of video projections, of light and sound shows the visitor can see *reborn* walls, rooms, peristyles, kitchens, baths, decorations and furniture, taking a virtual trip into a great ancient Roman Domus. The visitor can therefore grasp dimensional and chromatic aspect of spaces as they could have been.

In the second case, thanks to the augmented reality that is superimposed on the real world, the visitor wearing the *ARt-Glass*® glasses can see the reconstruction of the buildings[10] which was made possible thanks to the data which emerged from the excavations, the studies and archaeological investigations: the *Capitolium* overlooking Piazza del Foro; the central cell with the statue of Jupiter; the long flights of stairs in white marble; the shadow of the columns on the porches; the Cidneo hill behind with another important temple that standing on it. It then moves to the Roman theater, capable of seating 20,000, the taverns, the *domus*, and, in the distance, the walls, with the city gate facing Verona (Fig. 2).

An experience that the visitor can live along the points of interest with 3D reconstructions and immersive virtual reality scenarios, allowing effectiveness to have a good rendering accompanied by a narrative sequence.

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[9] When using technology that needs Internet it is essential to make sure there is signal coverage, fact not so obvious and common in indoor places, perhaps hypogeous, with very thick walls, or in isolated outdoor venues.

[10] The reconstruction of the ancient state with geo-referenced and settled buildings was carried out according to the findings of the excavations, the archaeological investigations and studies.
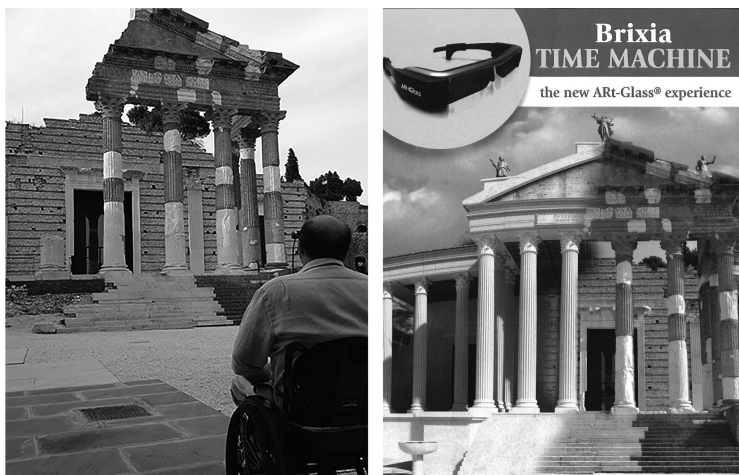
Fig. 2. Archeological Park, Brescia. The Capitolium as it is and the view wearing the *ARt-Glass®*.

3   The Role of ICT to 'Compensate' Cultural Heritage Inaccessibility

"Potevamo stupirvi con effetti speciali e colori ultravivaci,
ma noi siamo scienza, non fantascienza"[11]
[Italian Spot by Telefunken]

The impossibility of ensuring full physical or sensorial accessibility to a historical site must not automatically lead to declaring it *inaccessible*, precluding any possibility of enjoying it. If there can be actual barriers (inherent to the characteristics of the places or protection requirements), for physical and sensorial accessibility, there are no limits for the potential development of communicative measures even concerning people with specific disabilities.

The more inaccessible a cultural site is, the more communicative measures must be implemented, reaching the extreme case of buildings or works of art that have been lost or destroyed, for which only through communication can their testimonial value still be disclosed (*virtual accessibility*).

So in the case of inaccessible sites, the so-called *compensatory solutions*, which can - albeit indirectly - provide knowledge and enhancement at least of the most significant areas of the site (exhibition areas, museums, multimedia work stations, live CCTVs, publications, three-dimensional models, etc.), are fundamental to make up for the impossibility of direct access to specific areas if not the entire cultural complex. In these cases, lacking direct contact with the site (we are talking unavoidably of *off-site*

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[11] Translation by the authors: "We were able to surprise you with special effects and ultra-vivid colors, but we are science, not science fiction".

solutions), it is necessary to include specific instruments allowing the perception of the site's real consistency: dimensions, planimetric and elevation profile, but also colors, characteristics of the materials, etc. Moreover, having to replace the emotional experience connected to a direct approach to a cultural asset, compensatory measures cannot be limited to a simple and cold list of data, images and events; they should recreate the lost experience as much as possible, stimulating sensory and emotional involvement.

The painted tombs of the necropolis of Monterozzi at Tarquinia (near Rome), a unique and exceptional testimony to the ancient Etruscan civilization, are an interesting example. The archaeological area as a whole is quite accessible, but there is great difficulty in reaching the various painted rooms. The tombs are, in fact, cut into the rock and they are all underground. The entrance is reached along a narrow corridor with steep steps (physical inaccessibility). Furthermore, to ensure their preservation, the burial chamber has been sealed with glass barriers placed at the entrance (inaccessibility for protection requirements). The glass barriers keep the microclimate conditions inside unchanged, avoiding the deterioration of paintings, and, at the same time, allow a good, but partially limited view, of the interior of the tomb. Unfortunately, it is not possible to appreciate the details of the wall paintings closely. As a compensatory measure, visitors can enjoy a virtual visit of the so-called *Tomba della Caccia e della Pesca*, thanks to a 3D digital model obtained by a laser scanning technique, coupled with high-resolution images of the painted walls. A screen has been installed near the entrance of the tomb. The Superintendence aims at creating the analogous virtual reconstruction of the whole archaeological area. A specific itinerary has been created instead for the *Tomba della Pulcella*, the only painted hypogeum of the necropolis with an almost flat corridor leading to the burial chamber. A multisensory workstation has been placed at the beginning of the path, with an information panel, aids in LIS (Italian Sign Language) for the hearing impaired and an audio support for the visually impaired.

4 Conclusions

> *"...Capire tu non puoi*
> *tu chiamale se vuoi emozioni…"*[12]
> [Lucio Battisti]

Today it is possible to see many sites that offer virtual visits to museums or cities of art or 3D reconstructions of complex and monuments with historical, artistic or archaeological interest. By contrast, in most cases, in such proliferation a parallel awareness of the value and potential of virtual products as communication tools is not accompanied. In other words, only the view of explored environments is offered to the user too frequently, without the virtual tour being guided and enhanced by the contents relating to what is presented in an eye-catching and great-looking graphic design.

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[12] Translation by the authors: "…You can not understand/if you like you can call them emotions …".

The problem lies in the fact that technology is not a means to an objective, but constant and adaptable to different purposes. The research on the enhancement and enjoyment of cultural heritage should be addressed so as to become *concept-driven*. Technology is only a means to reach a purpose. Besides it is necessary that the research is also *case-based*. It is an error to think that a given technology can work for every site, on the contrary it must always be designed and conducted as *site-specific* bearing in mind the users profile to which it is intended.

The contribution of ICT can provide useful support to improve the communicative dimension for the comprehension of sites that are usually difficult to understand. On the contrary, ICT cannot substitute physical accessibility in an exhaustive manner because the unique way to have real knowledge of cultural heritage comes from being there, walking through the architecture, having a direct experience.

The visit to a cultural site must always be designed so that it has first and foremost has a cultural value and becomes an experiential path that has a significant impact on our being citizens of the world through emotions and not ephemeral illusions.

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