

## AURA\_ A MEDIA DEVICE FOR NEW NARRATION SPACES IN MUSEUM CONTEXTS

*Alessandra Cirafici\*, Carla Langella\*, Orazio de Vita\**

\*University of Campania "Luigi Vanvitelli" – Caserta, Italy.

### Abstract

The long months of social distance to which the pandemic has forced us have certainly accelerated the idea that the remediation of the concept of distance in a digital horizon can open up new spaces of negotiation for many social and cultural practices in the future. But it has also, dramatically, highlighted the limits and risks contained in the very idea that the experience of the meta-universe can really do without the mediation of physical reality and human direct intervention. The reflections and design experience proposed here therefore aim to reflect on the role that the new technologies and traditional professionals are playing in relation with the *phygital* cultural experience. The idea of the contemporary museum is indagated, questioning, however, the quality of the 'relationship' between the work of art and the user and the ways in which design can respond creatively to the demand for cultural consumption by activating new processes of attribution of meaning.

### Keywords

Museum, empathy, multisensorial experience, human

### 1. Introduction

The scientific/cultural horizon within which the project described in this paper has developed relates to new technologies for museum systems and moves, in the wake of the significant paradigm changes that characterise the universe of cultural experience and more generally the very idea of a museum that is now experiencing its definitive transition from the idea of a place which contains collections to that of a place of narration. The paper questions, in light of the current health pandemic, the role that the museum experience can play in strengthening that value of the relationship between work and user which is crucial in generating a society that is truly oriented towards the production of culture. The value of cultural heritage is strongly correlated to the quality of the relationship that it is capable of weaving with its user, and it is in this relationship that the role of new technologies is relevant, but only to the extent that they are able to respond creatively and not only technically to the demand for the consumption of culture by activating new attribution processes of meaning. The obligation of physical and social distance imposed by the pandemic has forced a large number of social, cultural, work and educational practices into a significant digital remediation. This has led to the

opportunity to critically reflect not only on the notion of distance but also the correlation that this notion intertwines with contemporary media and the vast horizon of cultural practices. David Bolton and Richard Grusin (Bolton, Grusin, 1999) were the first to introduce the concept of remediation in the field of media studies, indicating the uninterrupted operation of commentary, reproduction, and reciprocal substitution between one medium and another, through which the new incorporates and transforms the previous. It is a condition that has always existed, but which – considering that Bolter and Grusin were right – today takes on a different and greater importance. It is part of a completely new technological horizon, in continuous and rapid metamorphosis, which tends, moreover, to significantly change the ontological structure of our relationship with the concepts of space and time. Talking about the remediation of distance inevitably means reflecting on the relational dynamics that is being established between the technological tools and the devices of proxemic interaction that characterise so many of our daily practices, but it also means rethinking the way in which all this influences and modifies our perception of space and time (Bolter, Grusin, 2003; Casetti, 2020; Treleani, Zucconi, 2020).

It also means reflecting on how new media are progressively reconfiguring, in a digital sense, the communication devices that have always been used to connect physical spaces and environments, with unsuspected potential, but also with some risk in the possible dissolution of the specificities of media languages (Shah, Ghazali, 2018).

In this context, social distancing and digital technologies constitute the binomial from which to start for an overall rethinking of an unprecedented concept of 'proximity', which becomes even more interesting if declined in the specific context of museum use.

It is a question of expanding and specifying in the condition of the present time, a theme that is already central to the contemporary debate around the strategies of valorisation and audience development. We can consider the role that digital technologies can play in characterising the relationship between artwork and user.

We ask ourselves how new technologies can effectively respond to the ever-increasing demand to experiment with new forms of access to knowledge, overcoming the limits of physical presence, while inaugurating new virtual and immersive spaces.

However, we also ask ourselves how new digital technologies have questioned the need for 'human mediation' in the transfer of cultural experience, almost suggesting the possibility that it can totally do without the function of a mediator, (a guide, a teacher, a curator, a director), a narrator, in short, in flesh and blood with whom to interact, thus ending by enunciating the risky principle according to which a substantial 'disintermediation' of the cultural experience is possible.

Along these lines of reflection, the experience of the current pandemic and the 'social distancing' that was its inevitable consequence triggered not only a sudden acceleration but also indicated new interpretative paths of which, in some way, the Aura project is an expression.

This paper presents the reference cultural scenario and the context in which the reflection was developed, as well as the initial design results that became the first prototype.

## *2. Museums after the health emergency: a new business strategy*

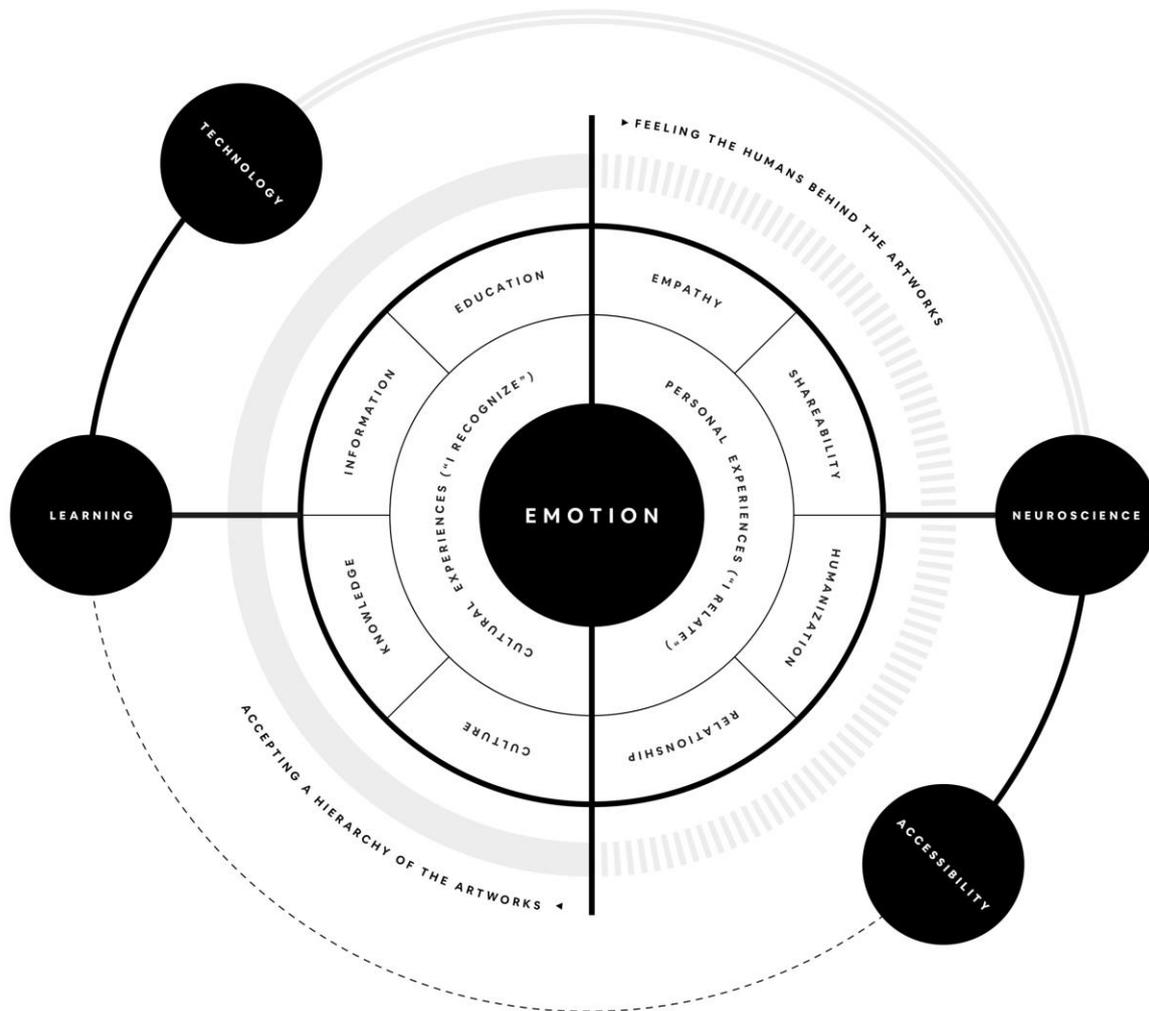
The impact of the pandemic health emergency on the international museum system, and, in particular the Italian one, has been devastating. ISTAT estimated that there were 19 million fewer museum visitors during the first lockdown, with a loss close to €78 million. A figure that, extended to the first seven months of 2020, includes only 8 million visitors compared to over 28 million in the same period of 2019 (Gambino, 2021). A loss that in Italy is so significant since the revenues from our museums, unlike most of the foreign counterparts, which for about 90% are based on ticket sales and the drastic reduction in visitors, risks undermining the whole system for an indeterminable period.

For the Italian cultural system, and not only, it has been catastrophic. The impact of the demand crisis inevitably hit the entire economy of culture. Damage in terms of the valorisation of human capital due to the lack of experience and huge economic/social damage for entire sectors of the cultural economy.

Museums have gradually reopened, facing the disorientation of people and the almost total absence of schools, but also the effect of new cultural tourist flows and a renewed enthusiasm of those who have had to give up public cultural experiences for so long. These revolutions have led to an unprecedented scenario and impose a total rethinking of the strategic and design approaches to be taken in Italian museums.

The consequences of the pandemic will not be limited only to the immediate future but will also call into question the strategic model of Italian museums, prompting a radical reflection on what a museum can and should be in the near future, and how it should develop its own cultural and business model.

In the immediate future, the current situation for the Italian museum system does not only mean a fall in the number of foreign visitors but also the significant reduction in school tourism. For small and large museums, which weave throughout the entire peninsula a fabric that is as precious as it is fragile, the risk of a radical downsizing of the cultural offer is relatively high.



**Fig. 1:** Elements such as empathy encourage accessibility allowing, in the case of cultural heritage, the user to feel the human behind the work of art; elements such as culture and information, increasingly accessible thanks to the widespread diffusion of technologies, allow those who look at the work of art to position it in a cultural hierarchy

Those who suffer the most are the operators working in the museum systems and in particular museum guides, narrators of culture and beauty who potentially represent that ineluctable bridge between the cultural experience and the visitor.

Their crisis had already begun with the spread of technological guiding devices that replace people based on audio-guides, augmented reality, virtual reality, and video-didactics, which for several years have been challenging the museum and tourist guide sector, threatening their possible extinction. Moreover, they are figures of utmost importance for the conservation of the Italian cultural identity. The work of the guides is based on a profound knowledge not only of the material heritage but also of the intangible one, made up

of stories, anecdotes, and personal research through which they are able to respond to the requests and curiosities of users which translates into empathic narrative replace.

The safeguarding of these human-based values that enrich Italian museums is undoubtedly one of the urgencies of this phase, as is that of reflecting on the new reality that has its specific condition in the 'distance' from the places of the museum. In this context, seizing the opportunity of digital is an imperative, since it means, in a broad sense, responding in new ways to the right to enjoy culture and at the same time to the duty to generate new cultural offerings. It means helping museums to reinvent their methods of use by mixing conditions of remote synchrony and

diachrony into the visit experience. It is precisely from these considerations that the Aura project was developed, proposing a product/service system which, without renouncing the digital dimension and its ability to build emotional universes and engaging scenarios, nevertheless engages the experience of the narrator, valorising his role and reinventing his function with non-marginal implications from a social and economic point of view.

Created as part of the research activities led at Officina Vanvitelli, the design and fashion creative hub of Vanvitelli University, the Aura project has the following objectives:

1) make each visit a unique and unforgettable combination of predefined digital content and extempore narratives of the visit preserving and strengthening the relationship between museum guides and visitors, both in the case of face-to-face visits as well as in the case of remote visits;

2) enrich the experience of visiting in person through the use of a unique multimedia and

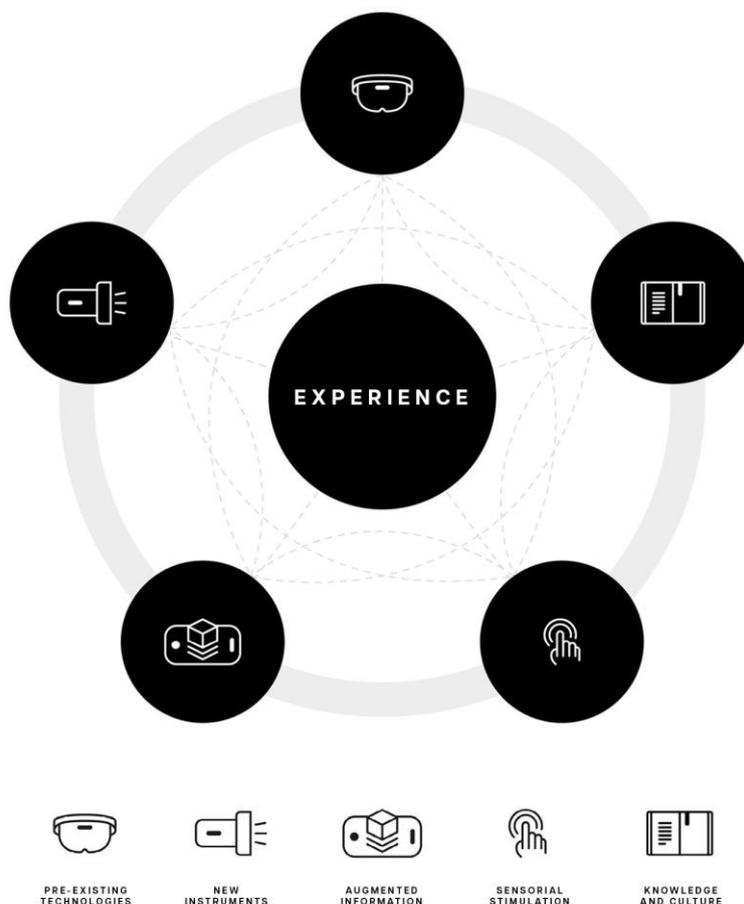
multisensory augmentation device that integrates existing technologies, recombined in an innovative and modular way, available to museum guides;

3) strengthen the experience of the remote visit by offering a synchronous method that enriches the online dimension with an interactive experiential quality (online);

4) enable museum guides to personally construct customised multimedia content to be used creatively in their tours;

5) propose new formats for the development of content from a *design for all* perspective that takes into account the different skills and makes the experience more interesting for all target groups;

6) propose a new tool for the collection of user needs and opinion data through a remote visit platform useful for the elaboration of scientific research and strategic plans, with the aim of helping museum management to improve the exhibition proposal according to the tastes, attitudes and desires of the different target groups;



**Fig. 2:** The starting points of the project are the remodelling of existing technologies, the approach to cultural heritage, the mediation of narration and the digital extension of content

7) allow large museums to offer innovative services for the international tourism and school tourism sectors, penalized by preventive measures against the risk of contagion also in the near future;

8) allow local museums, business museums, specialized museums, small museums to access innovative technologies at reduced costs to enrich the visiting experience and above all – thanks to the new integrated device – to attract new visitor sectors with an advantage in terms of audience development.

### *2.1 Museums, technologies and audience development: from abstract value to shared value*

The most significant change taking place in cultural policies derives, first of all, from the new notion of ‘accessibility to information’ declined in the horizon of the knowledge society. There is no doubt that in this process the role played by digital technologies – which have definitively also become part of the cultural heritage sector, after a long time of reluctance to be contaminated by the culture and languages of digital – is essential. Nevertheless, technology in itself remains an abstract factor if it is not culturally ‘reworked’; if it is not able to give back to society results that actually respond to the changing needs and requirements of society.

What today appears evident is the need to respond not so much, or at least not only ‘technically’, but creatively to the unexpected, and increasingly growing, demand for experimentation of new forms of access to knowledge. It has happened that, with the widespread entry of digital culture into museums, archive, or libraries the new rhetoric of access to data has inaugurated unexpected spaces for mental processing and in some way legitimized a radical change of perspective by reversing the roles between the reasons for conservation and protection and those, now prevalent, of valorisation, use and communication. What is worth highlighting here is how the exhibition sites are required to play more and more the role of real ‘narrative habitats’, places in which the exhibition dimension is far exceeded by personal experience, by interaction, from emotional involvement (Norman 2013). As already mentioned, this is the significant transition from the collection paradigm to that of narration paradigm that make museums places where memory becomes a tale where the

idea of a ‘visit’ is transformed into active participation in a cultural event, in a performance. This way of understanding the relationship with the work of art summarizes the fundamental transformation of the spectatorial function into a participatory function and sees the user as the central figure of the process, in a dialectic that is essentially expressed through the universe of his emotions (Holtzblatt, Wendell, & Wood, 2004).

It is precisely through the use of new technologies that museums and cultural sites can approach the visual and communicative canons of digital, cinema, video games, comics, apps, intercepting the tastes of young people and many users who do not regularly visit museums, thanks to that ‘extension’ of reality that contemporary media somehow makes practicable.

Support technologies for this type of experience include virtual reality, augmented reality (Bekele et al, 2018) and mixed reality (Rouse, et al. 2015; Rouse, & Barba, 2017), as well as 3D audio, gesture recognition, spatial sensing, voice recognition, haptics, drones and cameras.

The expression ‘Extended reality’ is used to describe the entire spectrum of immersive technologies (Silva & Teixeira, 2021). Many museums have discovered in recent years that their use allows visitors to interact with their works in a particularly unusual way, allowing them to be not only more curious, but also more emotionally close to them. Using these technologies in museums, visitors can, for example, feel immersed in the landscape of a painting or admire lost fragments of a statue. Furthermore, it is precisely thanks to the use of these technological innovations that those who are unable to go to museums can be given the opportunity to admire the collections that they otherwise would not have been able to visit from afar. There is more: immersive technology gives artists the opportunity to experiment with new, more engaging forms of art, capable of reaching a younger audience accustomed to the use of digital devices.

The Aura project was created from the intention of using digital extended technologies within a portable and manageable device with an empathic and emotional approach to valorise cultural heritage (Pedersen et al., 2017), along with a specific objective in terms of audience development and valorisation of the museum experience. The project is based on neuroscientific studies about potential of digital technologies with

the psychology of perception, also approaching some considerations on the role of neuroscience in the design project. It emerged that these tools could fascinate new generations, who are more and more difficult to attract and involve, while less and less inclined to focus attention and interest on cultural issues, especially if treated physically (Finkelstein, Las, & Ulanovsky, 2016; Jacobsen, 2018). The experience of Augmented Reality, and even more of Mixed Reality, can be understood as a sort of text that allows to travel in time, space, virtually touch, look beyond things, listen to the history of works and time, feel empathy for life stories and for the people who are protagonists of the stories and works, as well as even play and socialize with other users. All activities that are generally not allowed in museums and cultural sites. The feeling of freedom and expansion of possibilities, sometimes even of transgression, tends to generate in users, especially young people and children, intense emotions such as surprise and amazement. The use of downloadable applications on personal devices allows, more and more often, to have independent, individual, customizable, and flexible museum experiences. At the same time, however, they risk making the experience artificial and cold, while also visually distracting the user from the surrounding environmental context and physical contact with cultural heritage.

In the AR experience, which uses opaque devices as tablets or phones, the perception is

mediated by the camera of the device and the monitor, significantly weakening the cognitive and emotional component.

The device interposes itself as an obstacle, a barrier, between the user and the object observed, which is no longer appreciated in its concrete aspects such as the material quality or the perception of details (Langella, 2018).

The proof of this is that there are more and more people in museums busily trying to make dedicated apps work and following the images and effects produced by them on their devices, neglecting the direct relationship with objects of inestimable testimonial value that in all likelihood they will never have the good fortune to observe closely again.

Numerous studies carried out in the field of neuroscientific have shown that direct perception allows to fully enjoy different types of cultural heritage (Chen, et al., 2015; Chatterjee, & Vartanian, 2016; Onians, 2018). The combination of different and simultaneous stimuli on different sensory channels evokes a far greater neural response than the response evoked by a unimodal stimulus (Ronga, 2014). The extent of this enhancement effect is surprising as it has a neural impact on the response of 400% also allowing information to be recorded at a deeper level (Bolognini, 2015). A result that can be further increased by the emotional component.

The philosopher of visual perception Richard Gregory observed how the museum experience



Fig. 3: Left, Aura, the empathic reality device; right, an example of empathic augmentation

with a didactic vocation must have a strong component of concreteness; create an atmosphere of intellectual challenge; make the invisible or the hidden visible; capture the visitor's imagination; produce surprise, because it is from surprise that questions arise and from questions the motivation for further exploration.

Gregory's approach has been confirmed and updated by the most recent neuro-scientific research according to which museum experiences that include emotional and immersive factors have a greater capacity for cognitive enhancement (Gregory, 2001).

### *2.2 Tell me a story, tell me your story: the narrative potential of museum guides.*

This way of understanding the relationship with the work of art summarizes the fundamental transformation of cultural enjoyment from a 'spectatorial' function to a 'participatory' function and sees the user as the central figure of the process, in a dialectic that it is essentially expressed through the universe of his emotions. In this scenario, the role of the museum guide is anything but marginal since he can play a fundamental role in the development of new participatory models, increasingly oriented towards the inclusion of the community in the process of interpreting cultural heritage, and which are based on storytelling (Cirafici, et al., 2014).

This methodology identifies in the narrative a communicative and cognitive tool able to recall experiences, to make them relive through the attribution of meanings that are associated with the facts narrated, to help generate a common sense through the social sharing of the story, using emotional and immersive strategies, capable of giving life to an identification process with the object of the story. A process in which the narrator can and must be able to modulate the story; to identify interpretative levels; to construct new narrative paths dedicated to the users in front of him, whether a public accustomed to the museum experience or a neophyte in whom the pleasure of beauty and culture can be triggered.

Whatever the case may be, the application of the storytelling method to the communication of cultural heritage, with its playful, captivating and stimulating approach, can help attract new audiences, especially young people, up until now kept away from the austere and solemn image

conferred on cultural heritage, often perceived as tedious and repulsive.

The theme becomes particularly interesting when using the storytelling technique to communicate research paths taking place within the museum, transforming them into a community growth itinerary. The very idea of the museum as a "place of culture" has changed profoundly: new generation museums are increasingly imagined as scientific research centres 'without walls', where the experience begins before reaching the physical location of the exhibition and it perpetuates afterwards, sometimes even transcending it; where the visitor is stimulated through multiple levels and multiple interpretative channels. In this context, the practices related to storytelling prove to be particularly effective when applied to the field of museum teaching as well as the narration of research paths, even complex from a scientific and operational point of view, which are the heart of a museum, its very reason for existing. The self-referential idea of a research hidden away in the closed places of the laboratories, inaccessible in a physical and metaphorical sense, incomprehensible to most, gives way to an idea of research that becomes narrative not only in the moment of its representation in an exhibition path, but in its very fulfilment as a spectacle and wonder of discovery, activating processes of awareness that not infrequently then stimulate actions of collective participation. In this way, the two often distinct areas of scientific research and scientific dissemination can mutually reinforce each other, helping to define the mission of a museum and its ability to dialogue with its heritage as well as with the public. However, this complex system of transferring skills and values is unthinkable without the fundamental role of museum guides, their expertise, their ability to transfer experience and information. The Aura project is dedicated to them, in order to intensify the emotional and surprise dimension that the story can generate, while also providing guides with an agile tool to digitally 'increase' the potential of the story. In the meantime, Aura doesn't reduce the 'authorial' quality of the narration, making possible to use the device and the narrative techniques that derive from it in a mixed mode in sync, but at a distance. That provides an intelligent and effective response to the objective difficulties that both museums as well as museum guide services are experiencing at this particular time due to the drastic reduction in the number of users. Upon closer inspection, the

use of the device could prove to be fundamental for the entire category of museum guides which could find new vitality in this specific application of the digital dimension by innovatively interpreting the condition of 'distance' imposed by the current condition.

The Aura project aims to rethink the guide service within museums by proposing a new mode of use based on the valorisation of storytelling skills through the use of a portable digital video mapping system that can also be used in remote interaction conditions with museum users. In illustrating the museum and its artefacts, the guide uses a wireless digital projector, particularly small and light, as a sort of torch that is able to integrate his storytelling skills through the direct projection on the objects of visual and acoustic content specifically designed for each exhibit that will be empathically expanded. An 'empathic reality' conveyed by a cultured and aware professional who uses this tool to reinforce with themes, gestures, and comments that are partly predefined and partly extemporaneous, therefore adaptable to the needs, attitudes, and requests of the users.

The project uses the tool to enhance both the physical and remote experiences. The guide's narration, enriched by the ability to adapt the story to the user, to the instantaneousness of the

moment, can amplify the emotion that the user feels by perceiving the privilege of being near unique, precious, unrepeatably objects, to be able to observe them live, from different angles and at different distances. The combination of the narrative ability of the guide and the additive ability of projection technology, in the intentions of the project, allows to strengthen the perception of the corporeality of the cultural artefacts, eliminating the risk of alienating people from concrete reality as often happens in the presence of digital experiences. This is especially important for young and very young people who will be increasingly immersed in a digital world and who risk being completely detached from concrete reality and all its experiential, relational and emotional baggage. It is vital that physicality continues to balance the evanescence of the digital since man has an important body component, consisting of pheromones and sensory perceptions, as amply demonstrated by the emergence of embodiment studies (Regenbrencht, et al., 2017).

Finally, it is also worth highlighting how the Aura device was designed to be managed by the guide in a very simple and intuitive way through the use of commands based on natural languages and gestures, in order to make the visitor



Fig. 4: Left, the Aura device in operation; right, the device can be placed on its stand when not in use or when unloaded



**Fig. 5:** The Aura kit includes a box containing the device, its support and a cable that can be used both for charging and for transferring data from different peripheral devices

experience more spontaneous and direct than other methods based, for example, on touch screens, which require a focus of attention on the screen that risks distracting from cultural heritage. By observing the projection, listening to the sounds and the guide's story, visitors keep their gaze high, rather than immerse themselves in a screen and remain hands-free, which allows them to conduct a more relaxed, continuous and natural visit, while also interacting with other users. The interpersonal relationship with the guide and with other users gives an added value that enriches the experience in terms of sentiment and memorability. Furthermore, the possibility for the guide to project visual content in specific positions strategically placed in the direction towards which the attention is to be focused, allows users to converge the gazes of the space that, hierarchically, are considered most important to favour an oriented, adequate, and aware use of the artefact. Finally, the device has the advantage of making the museum reality observed with different eyes, stimulating additional, alternative, unusual points of view compared to those included in catalogues or audio guides, which the user otherwise would not have had the opportunity to see.

The implementation in the fruitive experiences made possible by the use of Aura in the expert hands of the guide, can help the user to identify a hierarchy, a scale of value among the works exhibited in the same exhibition context and to highlight, the exhibited artefacts that must not be missed, the musts, in front of which users, aware of being in front of particularly precious objects,

experience stronger emotions that strengthen interest and solicit emotional as well as intellectual involvement.

The ability to excite and develop empathy of the museum experience are highly effective tools in design for museum systems. Empathy encourages accessibility and improves interpersonal relationships, allowing the delineation of more autobiographical experiences which, in the case of cultural heritage, allow the user to feel the human behind the work of art (Koupric, & Visser, 2009).

The empathic dimension can also be used by guides to propose multiple interpretations of cultural heritage in a dynamic and hierarchical form, allowing them to personalize their paths according to the needs and attitudes of visitors, to differentiate them from time to time, and to confront each other with them and adapt the path to the needs of the user, based on their professional experience (Vitale, 2013). This allows both to carry out very short visits, without neglecting the most important pieces, as well as to gain awareness of the value and uniqueness of the artefacts. The awareness of being physically close to such important values has the effect of arousing greater attention in the user and an emotional involvement that is associated with the intellectual one (Hooper-Greenhill, 2013).

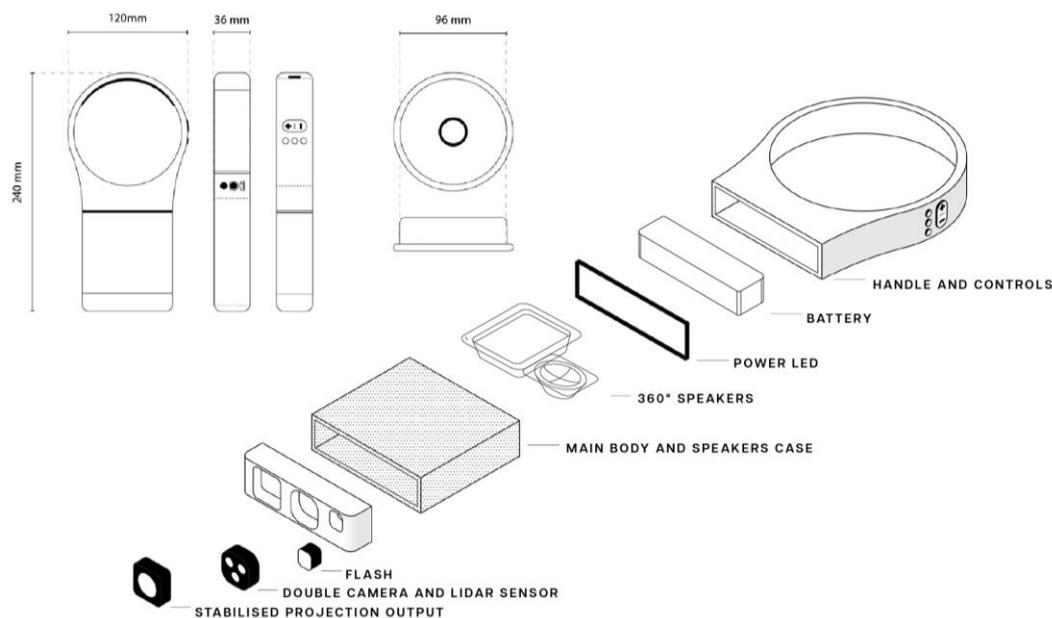
The definition of a hierarchy among the works exhibited in a museum site also allows to strengthen and make explicit the curatorial choices and intentions of the museum by highlighting those artefacts that are considered

the most representative for various reasons (value, quality, rarity, didactic, emotional impact).

The novelty with respect to similar systems of hierarchization of the value attributed to the different objects present in exhibitions is in entrusting the task of building and modulating the hierarchy, and therefore the scale of value, to a ‘person’ and therefore to attribute to a narrative professional, and not to an audio guide, the task of identifying and personalizing a hierarchy in the exhibition/narrative experience modulated on the needs, attitudes, cognitive abilities of the public, in order to facilitate their understanding, and consequent memorization, of cultural information compared to traditional systems. The possibility offered by the system to connect a museum synchronously or asynchronously with another museum that contains artefacts related to those indicated should not be underestimated, for example, assisting the construction of “networks of cultural and environmental artefacts”. The product-service system conceived is suitable for use in all types of museums and allows for the creation of connections between historically or culturally related museums in the same territory or far apart, so as to encourage the user to visit other sites, creating an effect of “augmented network” between museums or between cultural and environmental assets in a broader sense. This type of approach also offers the possibility of

encouraging the users’ sense of belonging to a specific story or cultural context.

This approach is particularly useful for minor cultural artefacts, still little known or not adequately valued, not only because it allows them to be inserted within the cultural circuit using the driver of the most important institutions, but also because the Aura device has a decidedly affordable cost that can be faced by any museum to create an element of attraction that can then “create” interest in the site. In a hypothesis of commercial development, it is possible to offer packages on the market with even a few augmented experiences, which can be subsequently implemented, accessible even to small cultural realities such as private foundations or sites considered “minor” which can be attractive in terms of audience development. The modularity and flexibility of the system also offer the possibility of proposing experiences reduced in space and time. Time is an increasingly rare and precious resource, so the opportunity to offer very “dense” user experiences with informative and emotional content even in a very short time is particularly appreciated by the cultural heritage market. Aura must serve to attract, intrigue, inform, and therefore encourage to study in detail, perhaps return to devote more time to the visit experience. In this sense, Aura collaborates in the process of the temporal extension of the visit experience that remains



**Fig. 6:** Aura, the empathic reality device, has an ergonomic handle on which the buttons are positioned, a LED torch, a stabilized projector, a triple camera and a 360° speaker

among the main objectives of all public engagement policies in the museum sector.

*3. Aura. Beyond time and space. A hybrid analogue-digital product-service*

Through the Aura portable mapper, the museum guide can “extend” the works of art in real time, making them come alive. Technology, therefore, is no longer something that imposes a filter during a museum experience but rather is a tool through which information can be conveyed by helping interpretation.

The device implements several existing technologies: a pocket projector, easily transportable and able to offer a clear and sharp projection even in contexts where the lighting conditions are not favourable (for example, outdoors); augmented reality; mixed reality; holograms; 3D audio. Aura is not only a device capable of technologically increasing the use of works of art, but it is a system of experiences whose purpose is not only to create a bridge between present and past but, above all, to create for the museum system the possibility of a fruition strategy that enhances the uniqueness of the experience and the sense of wonder in contact with the work of art. Both the idea and the name are inspired by the well-known concept of ‘aura’ of Walter Benjamin (Benjamin, 1936). The result is a decidedly personal and customizable experience. This is the guiding principle that moved the design activity not only of the device and the experience, but also of its visual identity and its applications.

*3.1 Components and technology*

The object has an ergonomic shape and is relatively small (measuring 120mm x 240mm x

36mm): this allows the guide to carry it easily and, at the same time, maintain the agility of movement. Furthermore, the conformation of the device, whose buttons are all arranged on one side only, allows for it to be used with either hand. The mapper uses four fundamental hardware components, all intended to enhance the artefacts: an advanced image projection device with a stabilized output lens; a double camera (including one 12-megapixel wide cameras and one 10-megapixel ultrawide camera), with it being possible to make 5K videos, even in low light conditions, a Lidar sensor for precise mappings of the surrounding space; a 360-degree speaker with an internal microphone.

The device can be included in the family of “Pico-projectors”, pocket projectors with above-average power capabilities. The projector provides 1080-pixel definition with a 200 lumens lamp power and optical stabilisation and angle auto-correction.

It is equipped with an internal memory of 64GB, capable of holding thousands of files of different extensions (audio, images, videos, three-dimensional models, etc.), which can be managed through a dedicated app for smartphones and tablets.

A 5000-mah battery with a 25-watt wireless charging base affords energy consumption. The battery can provide approximately 3 hours of operation (considering projection for most of time). The charging base, which is a circular turret, where to place the device when the battery is discharged or when not in use, recharges Aura in about 40 minutes, making it possible to charge it between the visits and alternating devices for continuous operation. The base can be applied to both horizontal and vertical surfaces.

“Lidar” is one of the main implemented technologies providing the mapping functions.



**Fig. 7:** The different configurations of Aura: each combination of colour and light movement corresponds to a specific state of action of the device

				
Environmental sound	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Narration	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rebuilding parts	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Scene simulation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Detail zooming	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Digital colouration	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

 INTERNAL MICROPHONE	 360 DEGREE SPEAKER	 STABILISED PROJECTOR	 TRIPLE LENS DEPTH CAMERA
---	--	--	--

**Fig. 8:** The table shows through which technologies the device is able to offer the selected service

Lidar, (Light detection and ranging) is the evolution of radar, developed for small distances. It is a sensor whose task is to send thousands of light pulses per second invisible to the human eye. The pulses bounce off nearby objects and provide the sensor with real-time information on distances and the morphology of the surroundings, within a radius of 5 metres.

The use of four speakers placed on both sides of the device (two passive and two active speakers) provides a 360-degree sound diffusion, two speakers for the midrange and two for the treble for a total of 8.5 watts of power and active noise cancellation (fundamental to the acoustic conditions in large spaces such as the museum). The microphone implemented allows the guide to amplify the voice.

There are four buttons, three for expansion and one for adjustment, which is further divided into two inputs, one for increasing and one for reducing the main output feature (volume for audio expansion, brightness for video expansion, etc.). It can be turned on and off, respectively, by disconnecting/reconnecting it to the base.

The table in fig. 8 lists all the possible conditions of technological increase offered by the device during the activity (left) and which of its hardware components respond to those specific functions (top). The device manages its activity through the already mentioned innovative technological components.

By pressing one of the expansion buttons, the light strip of the device begins to emit a flashing yellow light, indicating that it is searching for an artefact to map. Only the artefacts already registered in the database of the device would be recognised: the LED light becomes multicolour. The light strip was designed to allow the user to interact with the device, without necessarily having to resort to a screen where notifications appear. It has five colour combinations, each of which affects a different state of action: green for projection; yellow for mapping; red for battery status; blue for data transfer; multicolour when recognising artefacts.

### 3.2 Visual identity system

It has already been said that the name of the Aura product/service explicitly refers to the well-known ‘aura’ concept masterfully expressed by Benjamin in *The work of art in the age of mechanical reproduction*. The recovery of authenticity and wonder in the experience of the work of art is a central element of the entire project, which is also coherently inspired by the definition of the visual identity. The elements of the brand/logotype system therefore propose an A, initial of the name of the device, redesigned to recall a wide beam of light, a typical and essential element of the main function of the device itself, that is projection, but able to broaden the horizons of the perceptible up to all new realities to discover. The Aura brand is intended to travel in correlation with the brands of the institutions with which it will collaborate, the complexity of which is not possible to know.



**Fig. 9:** The Aura brand

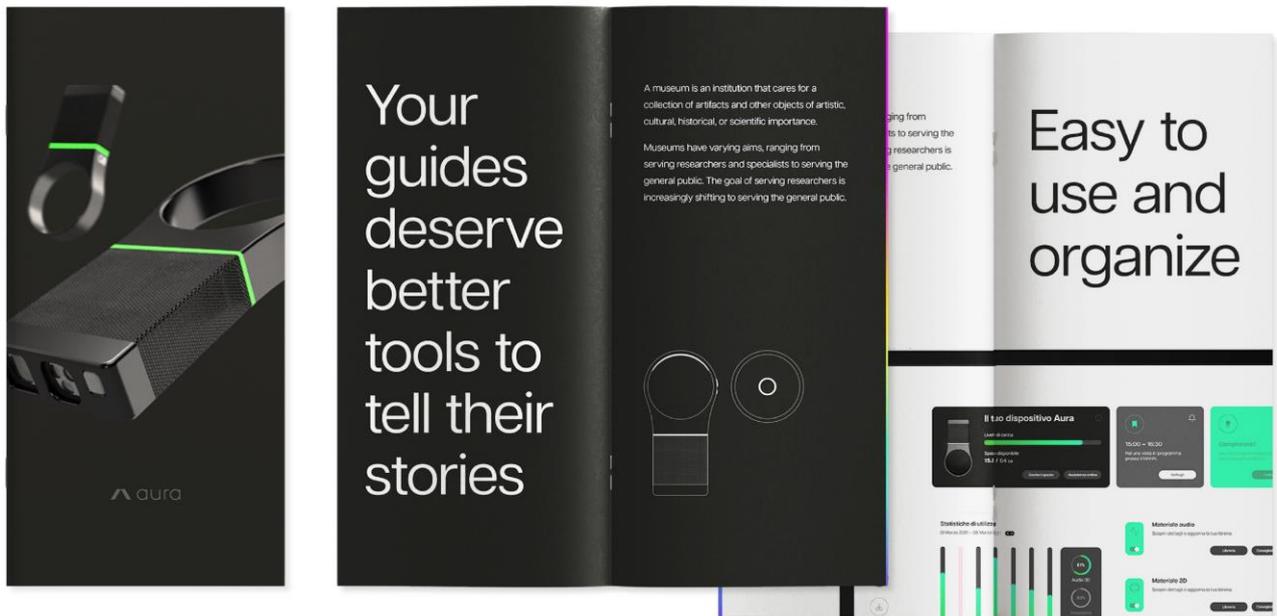


Fig. 10: The advertising brochure of the Aura service, to be sent to museums and cultural companies to sponsor the offer

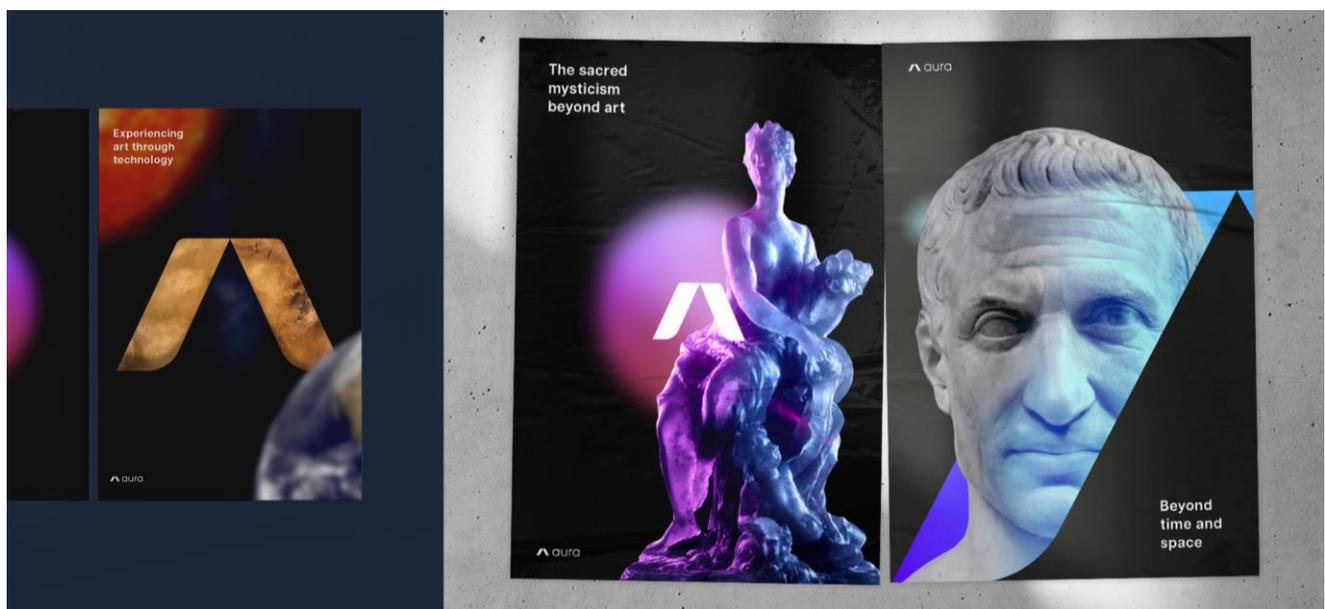


Fig. 11: The offline communication of the Aura service consists of a set of templates that are given to the partner, who will communicate the experience offered

Therefore, in the creation of the icon, due account was taken of how simple it should be in form and essential in the expression of its concept.

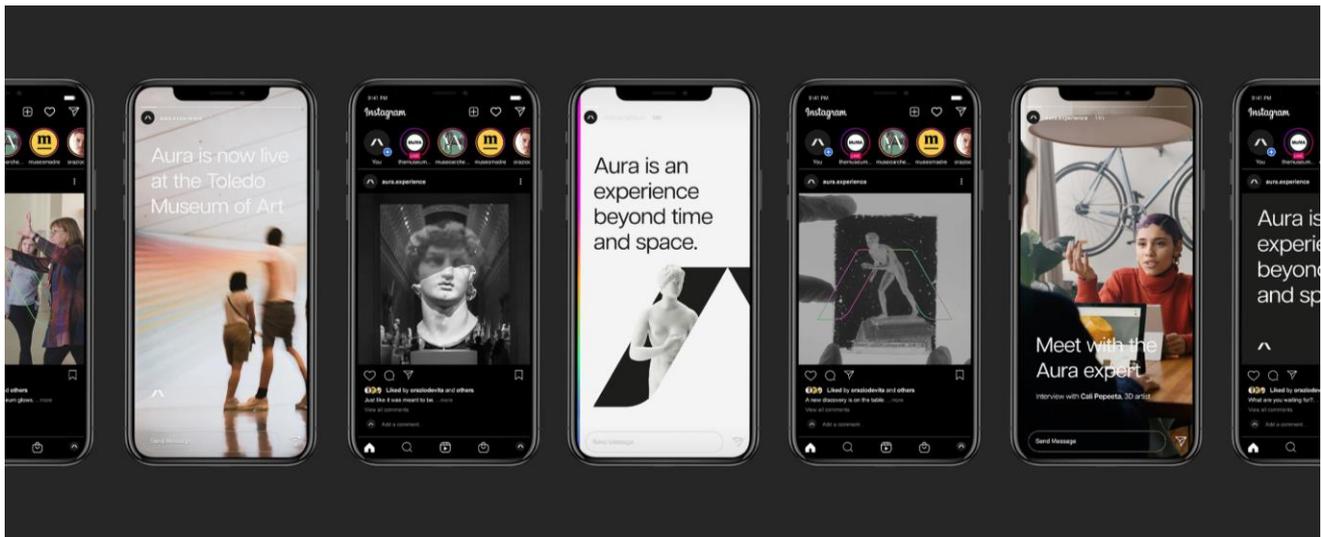
Considering that Aura is a device intended for distribution to a public of companies/cultural institutions and not private individuals, a communication system has been designed with

two objectives: professional product communication capable of conveying its functions, characterised by a simple and direct language in which reference is often made to the recipient's need to own the product and use its service; internal communication suitable for conveying the possibility of accessing the Aura experience withi

the museum institutions. A great deal of attention was therefore paid to the contents and it was very important to choose the words carefully as the goal is that the recipient never perceives the technology as something that overlaps but rather collaborates with those who use it. Aura is proposed as a service of immersive experiences rather than as an innovative device.

There are two types of artefacts designed for

public of possible visitors with four different types of posts: typographic, dedicated to motivational phrases relating to the service offered by the brand; didactic, which offers a focus on certain artefacts already registered (or about to be) in the device database; experiential, in which the result of using the device on an artefact is presented in a generic way; dedicated to partners, or a sponsorship aimed at the possible activity at a



**Fig. 12:** Social networks can be used to reduce the distance between visitors and the cultural sites, to sponsor the partnerships and to let users share their own experiences



**Fig. 13:** Auring is a collectible gadget with the aim of allowing the visitor to take the experience of Aura from a public context, that of the cultural institution, to a private one, that of their own daily life

cultural institutions (museums, galleries, cultural institutions and businesses): a series of totems, whose communication focuses on the immersion of the service, and an information brochure, which is more focused on the practical and technical aspects of the device.

Both themes are always offered in a friendly but always professional tone. Social networks, on the other hand, are the means used to communicate the service and experience to the

specific location. The product service system is completed with a merchandising proposal whose element of greatest interest is Auring, an analogue device that allows the user to carry with him a fragment of memory of the experience had with Aura. Literally an "aura ring", Auring is a device made up of two parts, a body and a lens. The latter, on its glossy and transparent surface, presents the image of an artefact contained in the collection of the partner museum and, once secured in its body,

can, if crossed by a ray of external light, project the icon onto any surface.

#### 4. New proximity in teaching

There is another aspect worth mentioning in order to fully understand the potential of the Aura device and regards the interaction between educational institutions and museums in the condition of social distancing that risks limiting for an unspecified time the possibility of using the spaces of the Museum by schoolchildren who usually joyfully invade the spaces. Museums have an important social and cultural role, since they can propose themselves as observers of socio-cultural phenomena and implement strategies aimed at orienting users towards specific behaviours and fruitful models often considered virtuous. The didactic function of product and service systems for museum use (Falk & Dierking, 2018) is therefore associated with a function of "beauty and emotion education" through cultural heritage (MacLeod, Dodd, & Duncan, 2015). Considering the new reality that has its specific condition in the 'distance' from the places of the Museum means in a broad sense responding in new ways to the right to enjoy culture and at the same time to the duty to generate new cultural offerings. In this context, seizing the digital opportunity is an imperative. Since the first days of the health emergency, MiBACT has promoted initiatives that have mainly focused on the use of technological tools and social media to maintain a dialogue with their public. Museums during the lockdown continued to carry out their mission by remaining closed but opening their digital spaces to the public. However, beyond the immediate initiatives, the difficulty of planning activities, of predicting the timing of the health emergency and its medium and long-term effects, and its impact on the dynamics and behaviour of users, forces us to rethink possible scenarios and markets.

The real challenge seems to be to interpret the non-physical spaces of the museum not as mere 'secondary channels' useful for communicating activities, but 'other spaces' where culture can be spread in forms other than traditional ones, inaugurating narrative languages to generate a new 'confidence', a real habit of visiting museums as virtual places. In this process, it is necessary to enhance the level of engagement of new and old audiences by searching for forms of remote use,

which however preserve the possibility of some interaction with the works, and with the narrative worlds to which they refer, also through the aid in real-time of qualified personnel inside and/or outside the museum, able to convey not only information, but levels of emotional involvement and cultural interaction synchronously using digital devices capable of 'augmenting' the visitor's experience despite his dislocation, thus allowing to give back to schoolchildren the possibility of continuing to build their own heritage of personal experiences and beauty education by coming into contact with the museum space.

#### 5. Conclusions

The project proposed in this article was marked by a design thinking approach, understood as an interdisciplinary mental attitude oriented to the design of systems, services, processes and experiences, which sees its foundation in the human-centred approach, i.e. basing the project on desires, on the attitudes, tastes and needs of the people to whom it is addressed (Sanders, 2003; Brown, 2008; Giacomini, 2014).



**Fig. 14:** Aura can be useful in creating new proximity, through the use of the device at a distance

An approach capable of creating innovation in the field of cultural heritage since it interprets the fruitful experience as a complex systemic reality to be faced through creative projects based on relational and strategic principles. From a technological point of view, the project intends to outline new forms of integration and application of existing technologies that can lead to original and innovative product-service systems. In addition to being a tool for enhancing the museum visit, Aura also proposes itself as a solution in the hypothesis of a virtual visit, proposing a new remote but synchronous teaching method; a way to

implement the guide's ability to interact with students by orienting the projector according to feedback in order to be able to know and modulate their cognitive and emotional response to the artefacts they are virtually visiting. A modality that is proposed immediately as a solution to the problem posed by the impossibility for schoolchildren to visit museums in the near future, fully enjoying the experience, and at the same time as an opportunity to give value to the human aspects of culture and experience professional guides who, rather than being replaced by digital tools, will be able to use them to enhance their communication skills.

In a more general sense, the device and its use, beyond the situation linked to the COVID-19 health emergency, are an enrichment of the usual driving approach and constitute an evolution of the augmented reality based on digital experiences that use devices – such as phones and tablets – which constitute opaque barriers to the direct relationship of users with artefacts and their physicality. The visual channel is left free to fully enjoy the museum experience since it is the preferential channel. Furthermore, both the in-person mode and the synchronous remote mode allow to obtain valuable data for the management of museums, which can help improve the exhibition proposal according to the tastes, attitudes, and desires of the different target groups. The data can then also be used to elaborate strategic plans and scientific research.

Imagining the use of similar methods of narration within lesser-known but no less interesting museums (the myriad of small and precious museums spread throughout the territory at a regional and national scale, business museums, etc.), the unprecedented condition of 'distance' from the places of the museum that we experience today can prove to be an opportunity to inaugurate an unprecedented idea of 'proximity' in which new ways of interaction find expressive forms and places otherwise excluded from a possible cultural offer re-enter by multiplying the opportunities for cultural enjoyment.

The 'Aura' device is the outcome of the research project carried out by Orazio De Vita (tutor A. Cirafici and C. Langella) winner of the call for research grants at 'Officina Vanvitelli' financed by the Vanvitelli University in the 2019/2020 academic year.

**Acknowledgments:** The authors would like to express their thanks to Giulio Giordano for his contribution in elaborating the graphs and researching the performance and technology of the Aura product.

Although the approach and contents of the essay are shared by the authors, it should be noted that the *Introduction*, the paragraph 2.2 and 4 are edited by A. Cirafici; the paragraph 2, 2.1, 3 a are edited by Carla Langella; the paragraph 3.1, 3,2 are edited by Orazio De Vita; the *Conclusions* are edited by Alessandra Cirafici e Carla Langella.

## REFERENCES

- Affede, A. (2011). Orientamenti e prospettive della mediazione narrativa, in L. Cataldo (Ed.), *Dal museum theatre al digital storytelling. Nuove forme della comunicazione museale fra teatro, multimedialità e narrazione*. Milano: Franco Angeli.
- Bekele, M. K., Pierdicca, R., Frontoni, E., Malinverni, E. S., & Gain, J. (2018). A Survey of Augmented, Virtual, and Mixed Reality for Cultural Heritage. *Journal on Computing and Cultural Heritage (JOCCH)*, 11(2), 7.
- Bekhtereva, V., & Müller, M. M. (2017). Bringing color to emotion: The influence of color on attentional bias to briefly presented emotional images. *Cognitive, Affective, & Behavioral Neuroscience*, 1028–1047.
- Benjamin, W. (1936). *L'opera d'arte nell'epoca della sua riproducibilità tecnica* (2000), tr. it. di E. Filippini. Torino: Einaudi.
- Bolognini, N. (2015). Causal mechanisms of mirror-touch synesthesia: Clues from neuropsychology. *Cognitive neuroscience*, 6(2-3), 137-139.
- Bolter, J. D. Grusin, R. (2003). *Remediation. Competizione e integrazione tra media vecchi e nuovi*. Milano: Guerini e Associati.
- Brown, T. (2008). Design thinking. *Harvard business review*, 86(6), 84-92.
- Casetti, F. (2020) Close-up-ness. Masks, Screens, and Cells, *img journal*, 3, 104-117.
- Chatterjee, A., & Vartanian, O. (2016). Neuroscience of aesthetics. *Annals of the New York Academy of Science - Special Issue: The Year in Cognitive Neuroscience*, 1369(1), 172-194.
- Chen, S., & Gordon, J., & Ouni, A., Sahmoud, H., Shapley, R. & Xing, D. (2015). Brightness – Color Interactions in Human Early Visual Cortex. *Journal of Neuroscience*, 35(5), 2226-2232.
- Ciancia, M. (2016). *Transmedia Design Framework. Un approccio design-oriented alla Transmedia Practice*, Milano: Franco Angeli.
- Cirafici A. Maniello. D. Amoretti V. (2015). Block NXLVI\_Parthenon\_Nord Frieze. Augmented Reality. The magnificent adventure of a 'fragment'. *SCientific RESearch and Information Technology*, 5 (2), 129-142.
- Cirafici, A., Amoretti, V., Di Fratta, V., Di Natale, I., Lallone, D., & L. Mascia, (2014). Tell me a story. New emotional and cognitive strategies to communicate and valorise the Cultural Heritage. In Campanella, L. & C. Piccioli, (Eds.). *Proceeding of Vth International Conference in Diagnosis for the Conservation and Valorization of Cultural Heritage* (pp. 67-70). Rome: Aracne editrice.
- Falk, J. H., & Dierking, L. D. (2018). *Learning from museums*. Rowman & Littlefield.
- Finkelstein, A., Las, L., & Ulanovsky, N. (2016). 3-D maps and compasses in the brain. *Annual review of neuroscience*, 39, 171-196.
- Freedberg, D. (2009). *Il potere delle immagini. Il mondo delle figure: reazioni e emozioni del pubblico*, Torino: Einaudi
- Gambino, C. (2021). Covid-19 e turismo in Italia: dagli effetti devastanti della pandemia alla politica di rilancio per un settore strategico. *Documenti geografici*, (2), 105-119.
- Giacomin, J. (2014). What is human centred design? *The Design Journal*, 17(4), 606-623.
- Gregory, R. L. (2001). Hands-on science. *Education for the Twenty-First Century*. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.1064.6549&rep=rep1&type=pdf>.
- Holtzblatt, K., Wendell, J. B., & Wood, S. (2004). *Rapid contextual design: a how-to guide to key techniques for user-centered design*. Amsterdam: Elsevier.

- Hooper-Greenhill, E. (2013). *Museums and their visitors*. Routledge.
- Ippoliti, E., Meschini A. (2011). Tecnologie per la comunicazione del patrimonio culturale, *Disegnare\_Con*, 6 (4), 1-1.
- Jacobsen, T. (2018). Neuroaesthetics and the Psychology of Aesthetics. *Neuroaesthetics*. 27-42. Routledge.
- Kouprie, M., & Visser, F. S. (2009). A framework for empathy in design: stepping into and out of the user's life. *Journal of Engineering Design*, 20(5), 437-448.
- Langella, C. (2018). Augmented Reality Implementation in Cultural Heritage for Emotional Experiences. The Case of CHEESE. *PAD Pages on Arts & Design*, 15, 93-118.
- MacLeod, S., Dodd, J., & Duncan, T. (2015). New museum design cultures: harnessing the potential of design and 'design thinking' in museums. *Museum Management and Curatorship*, 30(4), 314-341.
- Milgram, P., & Kishino, F. (1994). A taxonomy of mixed reality visual displays. *IEICE TRANSACTIONS on Information and Systems*, 77(12), 1321-1329.
- Mitchell, W.J.T. (2018). *Scienza delle immagini. Iconologia, cultura visuale ed estetica dei media*, Cremona: Jhon & Levi editore.
- Norman, D. A. (2013). *Emotional Design: Why We Love (or Hate) Everyday Things*, New York: Basic Book.
- Onians, J. (2018). *Art, the visual imagination and neuroscience: The Chauvet Cave, Mona Lisa's smile and Michelangelo's terribilità*. Retrieved from <https://pubmed.ncbi.nlm.nih.gov/>
- Pasquinelli, E. (2012). Neuromyths: Why do they exist and persist?. *Mind, Brain, and Education*, 6(2), 89-96.
- Pedersen, I., Gale, N., Mirza-Babaei P., & Reid S. (2017), More than Meets the Eye: The Benefits of Augmented Reality and Holographic Displays for Digital Cultural Heritage, *Journal on Computing and Cultural Heritage*, 10(2), p. 11.
- Ronga, I. (2014), *Multimodalità del sistema nervoso*, AlphEx.
- Rouse, R., Engberg, M., JafariNaimi, N., Bolter J. (2015), MRx: An Interdisciplinary Framework for Mixed Reality Experience Design and Criticism, *Digital Creativity*, 26 (3-4), 81-87.
- Sanders, E. B. N. (2003). From user-centered to participatory design approaches. *Design and the social sciences*. CRC Press, 18-25.
- Shah, N. F. M. N., & Ghazali, M. (2018), A Systematic Review on Digital Technology for Enhancing User Experience in Museums, In *International Conference on User Science and Engineering* (pp. 35-46), Springer.
- Silva, M., & Teixeira, L. (2021, December). eXtended Reality (XR) Experiences in Museums for Cultural Heritage: A Systematic Review. In *International Conference on Intelligent Technologies for Interactive Entertainment* (pp. 58-79). Springer, Cham.
- Treleani, M. Zucconi, F. (2020). *IMG journal. Remediating distances*, 2020.
- Visser, F. S., Stappers, P. J., Van der Lugt, R., & Sanders, E. B. (2005). Contextmapping: experiences from practice. *CoDesign*, 1(2), 119-149.
- Vitale, G. (2013). *Design di Sistema per le istituzioni museali. Il Museo Empatico*, Bologna: Zani.