

# From the Hypogeum Culture to Cities of the Future: Ars Excavandi

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**Abstract:** The Ars Excavandi international exhibition, created by ETT S.p.A. (International Creative and Digital Industry) for the Matera 2019 Foundation and curated by architect Pietro Laureano (a UNESCO consultant), opened the celebrations in Matera as it became European Capital of Culture 2019. The exhibition highlights the importance of underground art culture and investigates art and excavation practices that brought about architecture, civilisation and rocky settings over the centuries. The visit, linking the National Archaeological Museum “Domenico Ridola” and the hypogea of Palazzo Lanfranchi in Matera, takes visitors on a journey ranging from the Palaeolithic to the present, stimulating them to consider how topical the cave world is when designing future models of human progress. The multimedia path has been created in order to follow a chronological order, with references at the bottom of the timeline. Continuous timeless analogies are present on the walls with art, craft, traditions, folklore, music and rituals. The exhibition virtually recreates a space-time tunnel going from Matera to the cities of Petra and Jericho, from the first excavations to a model for future bio-architecture. Visitors, through the use of sounds and scents, projections, backlit walls, videos, and a gaming station, will be catapulted on a journey taking in the past and the present, making all past civilisations seem modern.

**Keywords:** *Multimedia experience—Hypogeum—Virtual reality—Videoprojection—Gaming*

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## Introduction

The Ars Excavandi international exhibition, curated by architect Pietro Laureano who drew up the dossier to add the *Sassi* and the *Murgia materana* into the World Heritage List, is created by ETT S.p.A. for the Matera 2019 Foundation in collaboration with the Polo Museale della Basilicata (Museum Hub of Basilicata region). The exhibition investigates art and excavation techniques that gave birth to architecture, civilization, and rocky settings over the centuries. It retraces, from a contemporary perspective, the hypogeum art and culture history from the first usage of natural hollows and rock engravings to the realization of caves, settlements, monuments, and waterworks based on excavation. The visiting path, divided between the “Domenico Ridola” Museum and the Palazzo Lanfranchi hypogea, drives visitors into a journey from Palaeolithic to the present, showing how topical the cave world is when designing future models of human progress.

The visiting path is developed in five stages characterized by the elements Air, Fire, Eros, Water, Earth marked by the colors Yellow, Red, Ultraviolet, Blue, Green and by a series of sounds and scents. It takes place chronologically with references in low to the timeline, and on the walls there are continuous timeless analogies with art, craftsmanship, traditions, folklore, music, rites. The conceptual paradigm is that all ages are contemporary and all civilizations are current.

The multimedia exhibit includes, along with a tunnel created using Lightboxes, projections, holograms and monitors, the use of RFID bracelets, which allow the registration of the visitor's interests during the visit and VR station located in the hypogea in Palazzo Lanfranchi in Matera, created to give visitors a virtual visit experience in underground spaces. Using Virtual Reality headsets, a 360-degree video in subjective point of view can be watched, making the not easily reachable areas of the visiting path enjoyable to all.

### **The role of digital experience**

The role of digital technologies is profoundly transforming not only people's daily life but also cultural sectors. There is a growing interest in the world of culture and research for the application of technology in the enhancement of cultural heritage and the use of technological solutions to share and spread the knowledge of artworks and territories. It is a new way of thinking about cultural enjoyment as an experience.

ETT has focused its activities for this project on the search for the most suitable technological solutions for the individual project, designing a multimedia and immersive path aimed to creating valid experiences and the enhancement of the visitor experience. By being active for years in the New Media sector, ETT has developed a wide expertise in creating innovative applications exploiting the potential of new technologies in contexts related to edutainment, culture and tourism. By combining original design, storytelling and cutting-edge technologies to create engaging experiences for museums, the focus of the project design process is on taking care of the users, with the main purpose of giving them immersive experiences. The customer and his needs are at the heart of ETT's projects, which are built through customized design and technology solutions.

In fact, it is not obvious that there is only one approach to follow in the creation of cultural experiences: the choice of the multimedia solutions to be adopted is strictly linked to a deep knowledge of the specific contents and a detailed analysis of the project. According to modern museology theory, in recent years, the trend towards improving the visitor experience has taken a great leap forward. We are entering a new era in museum design as the technologies for immersive, interactive experiences become more sophisticated and widespread. This new approach to museum exhibitions is based on the use of the most recent technologies and devices in order to enhance visitor engagement and interaction; give visitors an active role to play and define the goal of an "immersive museum". The aim is to revitalise communication with visitors, transforming them from passive to active forces through an "immersive" experience. Modern literature implies that all forces operating in the culture sector, should not attempt to provide experiences of value to passive visitors, but rather should incorporate value into the co-creation process through interaction. The traditional experience at the museum is gradually turning into an emotional event, which means that technologies like

simulations, gaming and virtual reality represent some of the new methods to use to increase participation and involvement.

With the increase in competition on a global scale and the emulation of experiences, the cultural sector must also explore in a structured way the new opportunities related to the co-creation and use of technologies, in order to dynamically create “enhanced” experiences. Technology is therefore configured as a mediator of experience and at the same time its use becomes experience itself. With this project we have therefore achieved an innovative experience that offers elements of surprise, generates knowledge and involves the visitor on several cognitive levels.

The multimedia solutions designed for the Ars Excavandi project offer a new way to know the art and practices of excavation that have given rise to architectures, civilisations and rocky landscapes through the centuries. In particular, the design of the project Ars Excavandi involved the development of different multimedia experiences, such as gaming, video projection and virtual reality, that employ different forms of interaction with the public.

The main challenge that has been faced during the project design period has been related to the fact that the original exhibition concept did not contemplate the presence of physical antique objects. The curator wanted to create an immersive journey through time and space by using only multimedia tools. This design choice has had a profound impact on the final user experience. On one hand, the visitor has the chance to completely enjoy the emotional and didactic multimedia environment, exploring a different cultural approach in opposition to the classic museum experience. On the other hand, the multimedia exhibits have been designed to use different technologies and physical set-up solutions, e.g. projections, lightboxes, monitors, to create an organic yet differentiated visiting experience. The main design choice revolved around the concept of choosing the most suitable technological solution for the different topics of the exhibition, by analysing the sub-topics of the path.

During the visit different multimedia experiences are presented. The visit in the route is modelled through different sensory experiences indicated by colours, sounds and odours which allow the visitor to immediately identify the different themes presented and to increase the participation, memory and involvement of visitors. An experience where different senses are engaged, sight, hearing, smell and an emotional component dictated by images and videos, which provide an additional sensory, cognitive and relational value.

The use of different devices, manages to capture and keep active the attention of the users who are encouraged to interact with the contents, as in the case of touchless devices. The RFID bracelet is intended to generate an interaction between the installation and the visitor who, through his choices during the visit, will generate his own personal experience in the museum, which will then be described through a final digital certificate. At the end of the multimedia path in Palazzo Lanfranchi, the visitor is invited to take a virtual visit with a 360-degree video of the hypogeum of the building.

With the development of technology, the virtual dimension has grown, offering spaces and experiences that go beyond architectural spaces and beyond museum collection limits. It is precisely this possibility that has led to the creation of the Virtual Reality experience that allows the visitor to immerse himself in a simulated environment, while always remaining stationary, with a vision of accessibility to the site.

The different areas of the multimedia exhibit are presented below, as well as the subdivision of the room with the different suggestions presented to the visitor.

### **Who we are? The questions of the exhibition and the interactive game**

The exhibition aims to stimulate the curiosity of visitors through a series of questions that will be answered during the exhibition. Why was the first excavation done? Are the art and thinking of caves current? What is the oldest city in the world? An interactive game will be organized along the way. Who are we? which poses similar questions to visitors who can participate thanks to a RFID bracelet. Technology is often used to create moments of interaction that encourage connections between visitors and installations or exhibits. The RFID technology is a simple method to promote a cognitive interaction and offer a simple interface between people and digital installations and this is an accessible technology for all visitors. The interaction is therefore based on the individual's physical proximity to the panel or video. This speeds up the information flow and allows the visitor to interact quickly. The game ends with the answer that we are what we know and the visitor will receive a certificate of Digital Nomad indicating his degree of universal empathy with the figure that identifies him to one of the characters of the exhibition and can therefore be one or one: Perceptual Neanderthal; Sapiens Innovator; Discoverer Shaman; Paleo Astronaut.

The method of interaction with the insertion of gamification elements, is based on the principle of edutainment, in other words the conjugation of educational content in a playful context (entertainment), which allows not only to emphasize the sense of "discovery" that a museum can evoke, but also to test the effectiveness of the communication processes implemented by the museum and the engagement produced on the visitor.

### **The museum route**

The exhibition was arranged as a space-time tunnel within the National Archaeological Museum "Domenico Ridola" in Matera. The steel tunnel, together with the lightbox fabric built specifically for the exhibition, was designed as a break from traditional museum spaces. As a result, visitors go through the tunnel into a dimension, not of this time and space, and are lead along a path of sound, smell and visual suggestion that helps them to discover the art of excavation from which architecture, civilization and rocky settings derived over many centuries.

The exhibition is organised in five stages, each of which is characterised by an element (air, fire, eros, water and earth), by a colour (yellow, red, ultraviolet, blue and green) and by a series of sounds and fragrances that guide the visitor through the multimedia journey; all revealed to their eyes and ears, one stage at a time.

This installation has been conceived with a view to post-experience, with the aim of re-elaborating the contents observed and recalling the memory of the emotions experienced during fruition, thanks to the different sensorial planes that create in the visitor a real immersion in the contents.

## Stage 1 – In the brain cavern

*White-Yellow color, Air element, jasmine scent*

The space without dimensions of the caves makes one reflect on the concept of time whose illusory nature has been demonstrated by Einstein and on the role that perception plays in the reconstruction of events. From Plato's myth to the dark room invented by the Arab Al Azhem in the tenth century and used by the masters of the Renaissance up to the invention of cinema and holograms, the projections show that vision and interpretation depend on how we perceive and know. Entering the hall, visitors pass in front of a light source which casts their shadows on the opposite wall. The projection of the shadows of the visitors on the two walls reveals a series of rear-projected images that float as if suspended and reflect Plato's myth. The more people there are in the room the more their shadows reveal the rear-projected image.

In the room there is also a monitor on the history of Al-Hassan Ibn al-Haytham as a starting point for reflection on the evolution of optics as a modern science.



Fig. 1. Ars Excavandi Logo (© ETT).

## Stage 2 – Alliance and symbiosis

*Red color, Fire element, benzoin scent, sound of explosions*

Our species has been successful through migration and art. The conventional image of evolution as a linear progression from hominids towards current physical appearances is false. Evolution is best represented by a series of branches, crossings, and contaminations. Humanity survived through co-evolution and symbiosis. In this evolutionary line, the invention of fire represented a fundamental

step for the evolution of humanity itself, as can also be seen from the monitor which proposes a video on the discovery of fire. Instead, in the projection, Prometheus appears in the shadows from the darkness, holding the fire to be given to men hidden in a ferrule. Prometheus is the mediating hero between divinities and men. He is the first shaman, visionary sorcerer who breaks the rules. It is the period of the great cave art witnessed by the Lascaux cave dating back to 15,500 BC. which is shown in the other projection that focuses on the figure of the bull. The bull is present in later mythologies as a symbol of the cosmic principle (see Fig. 2).



*Fig. 2. A lightbox and the projection of stage 2 Lascaux paintings (© ETT).*

### Stage 3 – The Creator Sound

Culture, the cosmos-vision and the conceptions of the communities have determined the transformation process and the technological revolution. The singularity of the Big bang, which originates the shape of the space-time universe, is anticipated in the myths of creation with the representations of buffaloes in the Palaeolithic caves. In the first projection, starting from a black screen, the expansion of the Universe from the Big Bang is simulated according to a representation of expanding lights and galaxies.

In the monitor, a looped video shows the destruction of the chariot of the Madonna della Bruna which is repeated cyclically every 2nd July. There is also a projection in the room that shows a black screen, followed by the Big Bang and the expansion of the Universe, with its lights and galaxies.



Fig. 3 The Creator Sound in stage 3 (© ETT).

#### Stage 4 – Water labyrinth

*Blue color, water element, lotus flower scent, sound of water shower*

Water is the vital principle, creative and destructive force. Its management is fundamental for the creation of the first settlements. In the first projection, a map is displayed that shows the spread of Neolithic culture and focuses on the main settlement sites, Jericho, Harappa, Murgia Timone, Ur, Stonehenge, Menfi, Hili, Dilmun, Troia, Knossos. The second projection takes up the importance of this element through the reproduction of a cascade of water. Another monitor shows an in-depth video on the symbiosis between the city of Petra and Matera.

#### Stage 5 – Matera matrix

*Green color, Earth element, mauve perfume*

The final stage of the journey deals with the importance of the underground world, linked to the symbolism of vegetation and rebirth. In the room, a projection shows a series of underground images, which then pans out to a panoramic view of Matera and continues outwards until Mars comes into view.

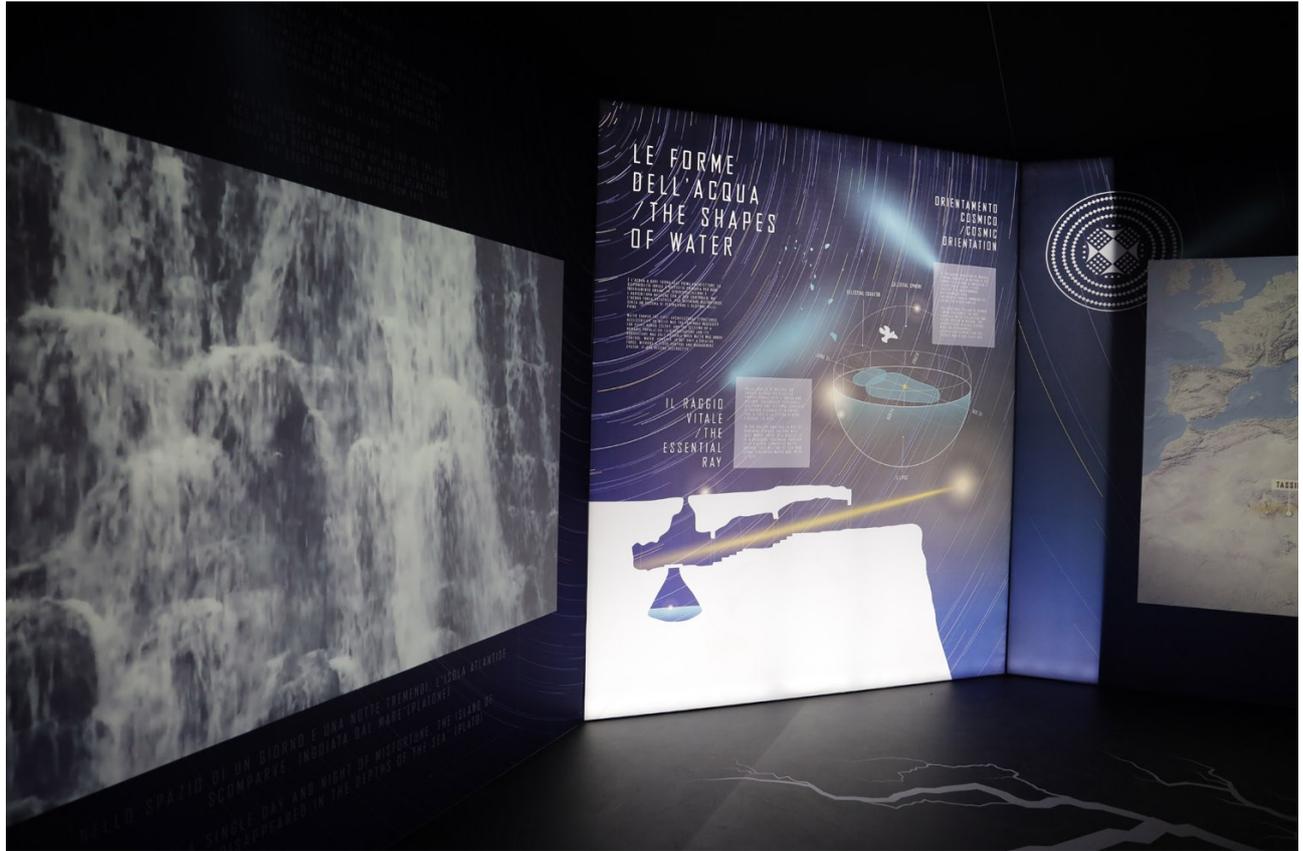


Fig. 4. Waterfall Projection and lightbox in stage 4 (© ETT).

### The Lanfranchi Hypogea: VR Application

Many places can boast of being the first settlements in the world and some are older than Matera. But what makes Matera unique, among cities dug out of the rock, is the fact that it is still and once again being inhabited, making it a symbol of a fall and renaissance, of community and resilient culture. The rocky city of Matera was completely emptied because modernity considered those ways of living inadequate for consumeristic development. In 1993, it was the first city in the South of Italy to be included in the UNESCO World Heritage list. The inscription was achieved by creating a new narrative and vision that started up the recovery process up to the point of its current success. The 1972 UNESCO Heritage Convention was set up after an international movement that took place to save the underground temples of Abu Simbel in Egypt, which were dismantled and repositioned higher up, to save them from flooding caused by the construction of a dam on the River Nile.

While rebuilding the temples, an artificial underground chamber was created and the original astro-nomic orientation was maintained, so as to allow a ray of sunlight to illuminate the statues of the gods twice a year. The restoration designers therefore showed awareness and accuracy in conserving the relations of the site with the environment, the cosmos and the spirit of the work. However, nowadays we would not move the temples. Instead we would fight to prevent the dam that flooded a large part of Nubia and caused serious damage to the Nile's and Mediterranean's eco-system being built. That is why, through its experts and candidacies, UNESCO constantly renews its concept and theory of protecting Heritage. This was originally based on the ambition of universalism, on separating natural and cultural heritage, on authenticity, excellence and a museum-like vision.

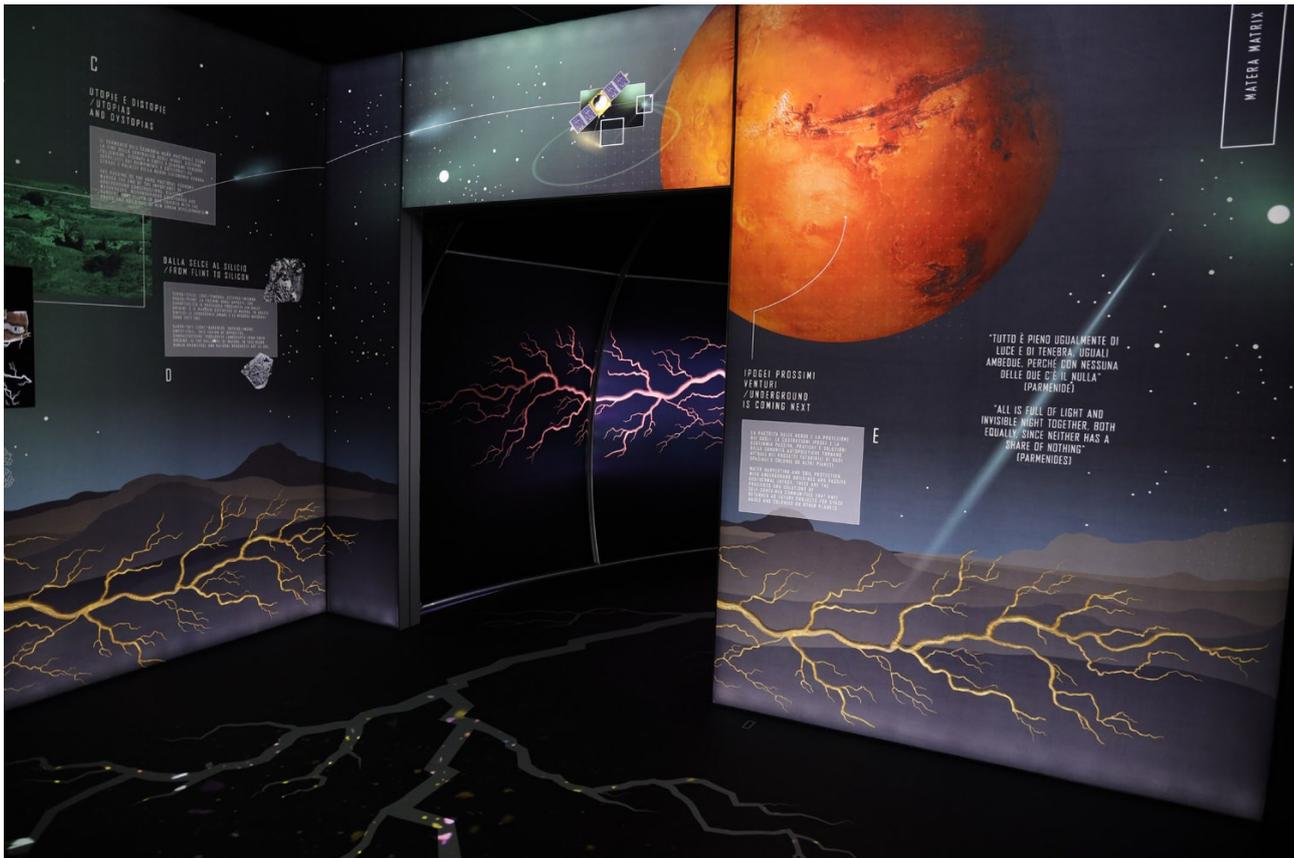


Fig. 5. Mars Underground on lightbox in stage 5 (© ETT).

Today, after the inclusion of Matera and the entry of several countries into the Convention that bring different cultures, these principles have been replaced by multi-culturalism and diversity; a holistic vision; management processes, that are a priority compared to interventions to create museums; a continuation of knowledge and asset production processes; the elimination of hierarchies of value between grand monuments and popular expressions. The inhabitants came back to Matera using ancient construction techniques for renovations and managing to reconcile ancient architecture with the new techniques required for the standards of today's life. The traditional techniques of collecting water, protecting the ground, living in caves, natural architecture, passive geo-thermics, the type of urban structure, are now a model for the most advanced research in bio-architecture, sustainable cities and green economy. The global, climatic, environmental and economic crisis, and the social dramas of poverty, migrations and destruction of cultural and biological diversity make it even more urgent to direct development differently. The creation of new models may arise from ways of thinking that were marginalised by modernity, such as those of self-sustainable rock communities. In rock shelters and in the depths of caves, the first artists' representations were created, giving a message that revolutionised perception, the senses and categories of knowledge. Listening to and thinking about the cavernous landscape today means shifting attention from places to knowledge and the people that have managed it; drawing on a troglodyte thought of saving resources, labyrinth-like, nomadic, passive, slow, a bearer of transversality, inclusion, multiculturalism and symbiosis. The teachings and warnings from this ancient art of excavation are engraved in the cities of stone, marked on their faces and sculpted into the hearts of their custodian communities.

The virtual reality application, created for the hypogea of Palazzo Lanfranchi in Matera, allows visitors to experience a virtual and interactive visit of the underground spaces, thanks to 360° shots of the rooms enjoyed by viewers, which brings the visitor back to the history and beauty of this place at first glance. The VR exhibit creates a totally immersive experience that involves a high emotional involvement of visitors, thanks also to the *POV-Point of View* technique, a very powerful tool that allows users to experience the scene in first person and feel part of the story told, facilitating thus the learning process and creating a memorable and multisensory experience.

The virtual visit to the hypogea of Palazzo Lanfranchi allows visitors to overcome the architectural barriers that the hypogea have due to their intrinsic nature and to guarantee the virtual accessibility to this priceless heritage even of the weak social categories that would otherwise be excluded from the museum visit experience in due to a physical disability.

Thanks to the application of virtual reality, visitors will be able to experience a sense of reality never perceived before and will therefore have an experience almost entirely comparable to the direct one that will allow you to discover even the most secret corners of the hypogea.

## Conclusion

We accepted the challenge of creating a challenging place, with projections, lightboxes, monitors, sounds and smells, in which visitors are no longer passive users, but prosumers; interacting with technology and actively participating directly in the multimedia exhibition. They generate sounds and shadows, also letting themselves be guided by smells and by the visual suggestions evoked by the images shown.

Today, as never before, multimedia is part of our daily lives. There is a growing interest in the world of culture, and the need to discover new ways of sharing and spreading our heritage is emerging as a compelling task. It is a new way of thinking about cultural enjoyment as an experience, not only participatory, but also completely immersive. Technologies are able to redefine the paradigms related to the decisions concerning the exhibition in the physical environments of museums and cultural institutions, remodelled and adapted to accommodate the technological solutions and to enhance the innovative visitor routes that are emerging.

We can trace a profound change and impact of new technologies in museum displays and user experience with the willingness of visitors to interact. In this project, where there are no physical objects on display, multimedia was a fundamental aspect to provide the visitor with memories, information and suggestions that remain beyond the visit.

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