

Dear Outsider

Design Brief of the project *Dear Outsider*

Designed for the exam “Digital Heritage and Multimedia” a.y. 2024/2025

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The Deer Cave of Porto Badisco (Grotta dei Cervi)

1. THE CONTEXT

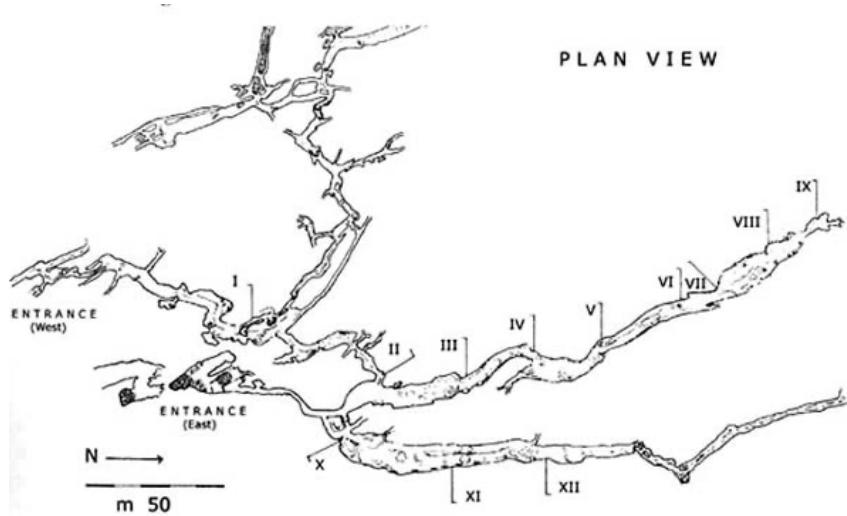
The **Deer Cave of Porto Badisco** (La Grotta dei Cervi di Porto Badisco), discovered in 1970 near Otranto, is one of the most extraordinary prehistoric sites in Europe. Here, more than 7,000 years ago, communities left the largest and most complex ensemble of **Neolithic wall paintings** known on the continent. For a long time, the cave was a true **underground sanctuary**, frequented by groups even from distant regions of the Mediterranean.

1.1 The cult dedicated to the Great Mother

Archaeological research indicates that the cave was linked to an important prehistoric cult: that of the **Great Mother**, a female deity venerated in many Mediterranean cultures. Indeed, in the Near East, the Balkans, and the Greek area, numerous statuettes have been found representing her as **Lady of Life, Ruler of Death** (Reggitrice di Morte), or **Goddess of Regeneration**, protector of the cycle of humans, plants, and animals. The very structure of the cave, with corridors dozens of meters deep, reminded the ancient visitors of the **womb of the Goddess**, a symbolic belly in which to perform ceremonies related to the fertility of the fields, rebirth, and the protection of the community.



Female clay head, dated to 4000-2000 BC



Total plan of Grotta dei Cervi

Many traces of the ritual practices remain:

- remains of **hearths**,
- vases placed inside natural cavities or holes dug specifically,
- **animal offerings**,
- **carbonized grains**,
- **ornaments** and **tools** in various materials, even from far away.

All these elements indicate that the cave was a chosen place for important rites and shared ceremonies.

The ancient visitors did not limit themselves to entering the cave: they transformed it. Inside the tunnels:

- they built **dry-stone walls**,
- they **carved steps**,
- they created **artificial embankments**.

These modifications demonstrate that the cave was not a simple natural shelter, but a **ceremonial complex designed** in a unitary manner and used for centuries. The internal paths, perhaps of an initiatory nature, led to the darkest and most hidden spaces, where the most secret rites were probably celebrated. It is possible that **ritual deer hunts** also took place during these ceremonies, a kind of initiation trial aimed at young archers. This symbolic reference to the hunt is also known in other prehistoric sanctuaries, such as some hypogea in the Bari area, where the corridors are decorated with a sequence of deer skulls.

1.2 The paintings

The Grotta dei Cervi extends for over **700 meters** and features three main corridors, divided into twelve zones. The paintings are gathered in **81 groups**, made with pigments derived from:

- subfossil guano (brilliant brown),
- clays and ground bones (yellowish brown),
- ochre (red).

Most of the images are **abstract**: spirals, sinuous lines, complex motifs, and "arabesque" shapes. Some figures derive from increasingly stylized human bodies, eventually becoming almost unrecognizable symbols. The so-called "**anthropomorphic collectives**" are also present, groups of figures united in composite images, perhaps linked to the sense of community and belonging. Figurative scenes are less frequent but very evocative:

- **deer**,
- **men armed with bows**,
- **dogs**, depicted in hunting episodes, often interpreted as ritual or mythical moments.

This choice of representing the symbol more than reality marks a profound difference compared to Paleolithic art. In the Neolithic, in fact, it was not important to imitate the natural world: the main focus was on **recalling ideas, beliefs, and rites**, linked to the religious life of the community.



The shaman (ph. P. Graziosi, 1980)



Pictograms (ph. ML Leone, 2009)

1.3 A place of meeting and alliances

The ceremonies held in the cave probably involved different groups, coming from distant territories. This sanctuary was probably the place where **pacts, alliances, and**

exchanges of gifts were made, under the protection of the underground deities. The presence of materials from distant areas reinforces this idea of a place frequented by multiple communities, united by shared religious practices.

1.4 The discovery

The discovery of the cave is linked to an anecdote. On February 1, 1970, some speleologists from the "Gruppo speleologico salentino de Lorentiis" of Maglie (Severino Albertini, Enzo Evangelisti, Isidoro Mattioli, Remo Mazzotta, and Daniele Rizzo) were on an excursion in the inlet of Porto Badisco, where an ancient legend narrates that Aeneas landed (from a study conducted by archaeologists from the University of Lecce, it seems that the precise location is in nearby Castro, in a place called Castrum Minervae, where there is a temple dedicated to the goddess cited by Virgil). One of them noticed a strange cool air coming from a crevice in the rock and after moving the surface material, he brought to light the first representations of cervids along the walls of the Cave. They baptized it "Grotta di Enea" (Aeneas Cave), from the nickname of the Port, but soon named it "Grotta dei Cervi" (Deer Cave) due to the frequent presence of deer hunting scenes.

1.5 The Exhibition at the Aragonese Castle in Otranto (LE)

The cave is not open to visitors because the delicate conditions of humidity (98-100%) and temperature (18°C) that have allowed the paintings to be preserved until today would be altered by the presence of visitors, which would thus cause a rapid degradation of the drawings, completely erasing the traces left there by the ancient frequenters of the cave. Access is permitted only for environmental monitoring or for study purposes to those who make a formal request to the Archaeological Superintendence of Taranto.

Therefore, in February 2004, a project was initiated, coordinated by the University of Salento (Università degli Studi di Lecce) in collaboration with the National Research Council of Canada and the Archaeological Superintendence of Puglia, for the realization of a high-resolution 3D model of the cave for in-depth study, remote accessibility, and enhancement of the cave itself.

Since 2016, a **3D virtual tour** of the cave has been set up at the Aragonese Castle of Otranto (Lecce), which allows the paintings to be appreciated to the fullest; Jean Marie Chauvet, discoverer of the Chauvet Cave in France, collaborated on the realization of this film. Life-size reproductions of the paintings, ceramic materials, and *pintaderas* (stamps) are also exhibited at the Aragonese Castle of Otranto, for a total of approximately 250 finds from the cave.

Starting from September 23, 2025, the Exhibition "**The Places of Prehistory and the Deer Cave**" (I luoghi della Preistoria e la Grotta dei Cervi) will be active at the same Castle.

The exhibition, born from the collaboration between the Municipality of Otranto, the Culture and Tourism Office, and the Superintendence of Archaeology, Fine Arts and Landscape for the provinces of Brindisi, Lecce, and Taranto, is presented as the re-installation of a previous permanent exhibition and intends to enhance important paleontological and prehistoric evidence discovered along the coastal strip of the Otranto territory, as well as a careful selection of the finds discovered in Grotta dei Cervi.

The exhibition is divided into three rooms displaying finds discovered in the territory of Otranto dated from the Pleistocene to the Metal Age and a large room entirely dedicated to the cult site of Grotta dei Cervi. Here the narrative unfolds through the exhibition of incised and painted ceramic finds with motifs and symbols that recall the pictograms created on the walls of the cave, together with finds related to shamanic and propitiatory rites of fertility (Neolithic period, late 7th - early 4th millennium BC), and then concludes with the materials from the Metal Age, also from Grotta dei Cervi. The exhibition itinerary, aimed at dissemination to an increasingly vast and diverse public, integrates the projection of the 3D model of the cave.

1.6 Institutional Goal

The institutional goal is to increase **engagement** with a site of exceptional cultural value, expanding its national and international visibility and strengthening the institution's capacity to reach broader and more diverse audiences. The project also aims to capture the interest of the many visitors who travel to Salento each year, offering an innovative experience that makes an otherwise invisible heritage recognizable and memorable. Through this digital valorization strategy, the initiative further seeks to position itself as an experimental model capable of attracting **new funding**, both public and private, by demonstrating how immersive technologies can amplify the cultural and social impact of an inaccessible heritage site, thereby encouraging additional investment in research, documentation, and outreach activities related to the cave.

1.7 Cognitive Goal

The cognitive goals of the project aim to foster a deep and informed understanding of the Grotta dei Cervi, its pictograms, and the Neolithic cultural context in which they were produced. Through a structured digital experience, users are guided in developing interpretive abilities that help them recognize shapes, symbols, and visual narratives,

connecting them to the lifeways and belief systems of the communities that once frequented the site. The initiative seeks to transform simple curiosity into **active learning**, stimulating historical reasoning, critical reading of images, and the ability to link material evidence with the ritual and social meanings of the Neolithic context.

1.8 Star Assets

The **Star Assets** of the project lie in its ability to transform an inaccessible and otherwise invisible archaeological heritage into an engaging and innovative digital experience. At the core of the proposal is the development of a **video game** that integrates a 3D model of the Deer Cave, allowing users to virtually explore the site and interact with its pictograms.

The experience is built around some of the cave's most iconic elements: **the shaman pictogram**, among the most enigmatic and symbolically charged images of the sanctuary; **the hunting scenes depicting deer**, which not only represent one of the most dynamic narrative sequences in the cave but also inspired its modern name; and **the wall of handprints**, a powerful testament to ritual practices and identity-marking gestures performed by Neolithic visitors. These highlights guide the structure of the interactive experience and serve as narrative anchors throughout the game.

Conceived as a digital resource supporting the museum exhibition, the game functions as a powerful **learning tool**: it enables users to understand the meaning of the wall representations, situate them within their Neolithic cultural context, and bring diverse audiences closer to a site that cannot be visited physically. Through this combination of virtual reconstruction, interactive storytelling, and technological accessibility, the project enhances the historical and symbolic significance of the Deer Cave, increases **public awareness of the site**, and strengthens its presence within the collective imagination.

1.9 Target Audience

The project addresses a broad and varied audience, including curious visitors, school groups, and enthusiasts of history and archaeology. The digital experience is designed to be accessible even to users who are unfamiliar with the Deer Cave, offering intuitive tools and immersive content capable of engaging both newcomers and more experienced individuals.

2. THE AUDIENCE

The project is aimed at all those who wish to deepen their understanding of the Deer Cave: both local visitors interested in rediscovering the history of their origins, and the many tourists who travel to Salento every year, including foreign visitors who often ignore the existence of this site despite its European relevance. For this heterogeneous audience, made up of curious visitors, traveling families, students, and enthusiasts of history and archaeology, the video game experience represents a unique opportunity to explore a place that is normally invisible and inaccessible to the public, transforming the visit into a moment of immersive and memorable learning.

Motivations: Visitors are drawn to the experience because it offers a form of **time travel** capable of connecting them with a remote reality. The Deer Cave, inaccessible and little known, represents a “cultural mystery” that immediately stimulates **curiosity**, especially among visitors who do not know what to expect from the exhibition but wish to be surprised by something unique, unusual, and out of the ordinary. The pleasure of discovery, combined with the opportunity to explore a prehistoric site available only through digital means, constitutes a strong motivational element.

Barriers: The main obstacle for visitors is the total physical inaccessibility of the cave, which prevents any direct contact with the site. On a practical level, **accessibility** barriers may arise: different levels of familiarity with prehistoric history and the risk that a highly specialized theme may be difficult to understand without adequate digital mediation. Moreover, for tourists visiting Otranto for short periods, a lack of time may represent an additional barrier to engaging with complex or text-heavy content. Another aspect considered during the design phase concerns the physical or cognitive needs of some visitors, who require suitable tools to fully enjoy the experience, a condition not always guaranteed in traditional museums. For this reason, the digital experience has been conceived to be clear, guided, and inclusive, minimizing obstacles for all users. To further support this, a tactile component has been introduced: visitors can touch physical replicas of archaeological finds from the cave, which also appear in their digital version within the video game. This multisensory element allows all users, regardless of ability, to establish a more immediate and accessible connection with the archaeological heritage.

Capabilities: The experience is designed to be accessible to a broad audience with varying levels of technological familiarity. To fully benefit from the activity, it is helpful for visitors to possess basic skills in using websites, social media, and simple gaming systems, abilities that are now common among adolescents, adults, and families. It is not

necessary to be an expert gamer or to have specific archaeological knowledge: the interface is designed to guide users step by step, fostering intuitive and immediate learning. The project leverages users' ability to recognize visual patterns, interact with digital content, and follow simple instructions, transforming initial curiosity into an active, understandable, and engaging experience.

Devices: The experience is designed to be enjoyed through stations equipped with tablets, arranged in a circle within the dedicated room, symbolically recalling the presence of the five speleologists who discovered the cave. Each user interacts directly with their device, which features a simple and immediate interface designed to be intuitive even for those without advanced technological skills. Only a basic familiarity with tablets is required, a competence now widespread among most visitors, as the game guides the user step by step, minimizing the need for external instructions. The choice of the tablet also ensures an accessible, comfortable, and immersive experience, allowing each visitor to engage autonomously, naturally, and without technological barriers.

At this stage, three **user personas** were also identified, useful for representing different visitor profiles and for guiding design decisions related to the digital experience in a more targeted way.



Carlo,
12 years old
(Rome)

On holiday in Otranto with his family for a week.

Interests:
Big fan of *Ice Age* and *Brother Bear*. He loves animals, adventures and videogames.

Motivations:

He is curious about anything that covers the prehistoric era. The idea of "*being able to get inside a cave*" intrigues him a lot. He also loves videogames because he can learn things without feeling like he is at school.

Goals:

- Participating to a fun and immersive experience;
- Discovering stories on human's ancestors.

Digital Behavior:

- Tablet
- Videogames
- Youtube videos

Barriers:

- Gets bored quickly if the content has too much text.
- May find it difficult to stay focused without engaging visuals and sound stimuli.

How the project meets his needs:

- The mini-games keep his attention high and transform teaching into playful experiences.
- The final gesture of leaving a handprint gives him a strong sense of gratification.



Hendrik,
37 years old
(Bonn)

Tourist coming from Bonn. He is on holiday in Salento. He loves history, culture and nature, but he doesn't know the Deer Cave at all.

Interests:
Cultural trips, archaeological sites, trekking. Reads tourist blogs and guides.

Motivations:
He is always looking for particular and non-touristy places. He is fascinated by "hidden" sites because he perceives them as authentic and precious.

Goals:
Understand why the cave is so important and be part of a unique experience that he can't find elsewhere.

Digital Behavior:

- Smartphone
- Digital Services
- Audio-guides
- Museum Applications

Barriers:

- Does not speak Italian, so he needs a multilingual system.
- Does not know the Mediterranean Neolithic historical context.
- He is not interested in overly technical or long explanations.

How the project meets his needs:

- Accessibility improves thanks to multilingual, interactive storytelling.
- The role-playing element matches his love for exploration, making him feel actively engaged.
- No background in archaeology is required to understand the site.
- The rare, exclusive access boosts his motivation.



Marinella,
52 years old
(Lecce)

She teaches history in an high school in the province of Lecce, and wants to take her students to an exhibition showcasing its artifacts.

Interests:
Innovative teaching, local archaeology, territorial heritage, digital educational tools.

Motivations:
She is always looking for activities that make history concrete, emotional, and interdisciplinary. She wants to use local heritage to strengthen her students' cultural identity.

Goals:

- Provide an alternative learning method that is engaging yet academically solid.
- Experience the site herself and offer students an activity that reinforces local identity, showing how Salento holds cultural resources of European value.
- Encourage observation, interpretation, and critical thinking skills.

Digital Behavior:

- Interactive whiteboards
- School platforms
- Educational apps.

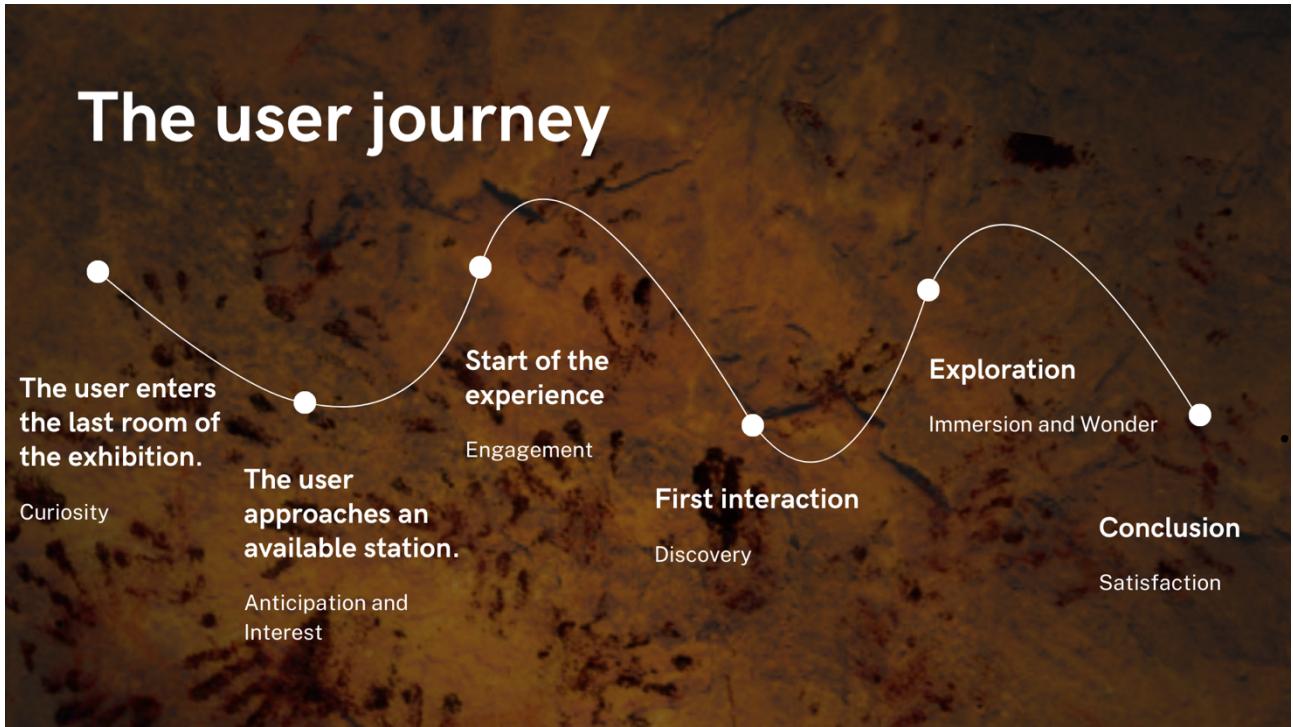
Barriers:

- Needs the experience to be scientifically rigorous.
- Requires tools that make it easy to guide school groups.

How the project meets her needs:

- It includes accurate, simplified yet scientifically reliable content.
- The short format fits school visits.
- Handling replica artifacts allows for multisensory learning.
- Gives her an innovative way to enhance local heritage.

To better illustrate how visitors interact with the experience, the following image presents a simplified **user journey**. It visually summarizes the key steps that each user goes through, from the moment they enter the final room of the exhibition to their progression through the digital exploration of the cave, highlighting actions and emotional responses throughout the process.



3. CONCEPT

The main challenge lies in providing an immersive experience capable of compensating for the complete impossibility of physically visiting the cave. At present, the only way to “enter” the Deer Cave is through the 3D reconstruction created by the University of Salento, available in a dedicated room of the exhibition *“I luoghi della Preistoria e la Grotta dei Cervi”*. To this **physical barrier** is added the difficulty of **attracting audiences** who do not usually engage with prehistory or archaeological displays, such as occasional tourists, families, and non-specialist visitors, as well as the interpretive complexity of the Neolithic pictograms, which are often difficult to understand without appropriate mediation.

To address these issues, the project aims to integrate the existing 3D model into a narrative and interactive structure that enhances **immersion** and fosters **engagement**. A well-designed digital experience can in fact tackle all three problems simultaneously: on the one hand, it mitigates, as far as possible, the limitation posed by physical inaccessibility; on the other, it transforms complex content into intuitive and engaging forms, stimulating interest even among those unfamiliar with prehistory. The combined use of a video game, the tridimensional reconstruction, and the accompanying tactile experience allows users to “enter” the cave virtually, explore its symbols, and interact with them in a guided and progressive manner, reducing cognitive obstacles and broadening participation among a diverse audience. The experience does not aim merely to inform, but to generate wonder, immersion, and active involvement.

To achieve these goals, it will be essential to support the project with an **effective communication strategy** capable of ensuring visibility and reaching as broad and diverse an audience as possible. In exploring this aspect, we analyzed various online **reviews** concerning the Deer Cave, which reveal a fragmented and unclear communication landscape with significant room for improvement. Here are some selected reviews:



As becomes evident, many visitors are unaware of the cave's inaccessibility and of the alternatives offered by current outreach initiatives. It is therefore crucial to implement clearer and more consistent communication that immediately informs visitors about the actual possibilities of access and highlights the digital and immersive experiences proposed. A coordinated promotional effort across the territory, starting from the municipality and in collaboration with the Aragonese Castle, the venue hosting the exhibition, represents a key step in building awareness, managing visitor expectations, and supporting a more informed and satisfying experience.

From a **musicological approach**, the soundscape draws inspiration from the evocative voices of the *Sirens* in *Black Panther: Wakanda Forever*, characterized by deep, enveloping, and quasi-ritual vocal qualities. These sounds do not seek to faithfully reconstruct a Neolithic acoustic environment, but rather to evoke a subterranean, mysterious, and archaic atmosphere capable of enhancing the immersive perception of the cave and emotionally supporting the visitor's journey.

The **themes selected as case studies** derive directly from the symbolic elements present within the Deer Cave. The visual and narrative inspiration includes references to *Brother*

Bear for its connection between human figures and the spiritual world; the **veneration of the Great Mother Goddess**, a central figure in the cave's paintings and Neolithic ritual context; and **initiation rites**, evoked both by hunting scenes and by the famous wall of handprints, interpreted as identity marks or ritual proofs. Indeed, as will be explained in the following sections, the ultimate goal of our digital experience is the symbolic act of placing one's own hand on the wall, a gesture that echoes this ancestral practice and allows visitors to feel part of a human continuity spanning millennia.

4. REQUIREMENTS

To achieve the institutional, cognitive, and experiential goals of the project, a series of requirements have been identified and organized according to the **MoSCoW methodology**, an important component of agile development.

Must

Mandatory requirements, essential for the project to function:

- The system must integrate the 3D model of the Deer Cave in a **stable, navigable, and scientifically accurate** way.
- The experience must be accessible through **tablets** arranged in the five dedicated museum stations.
- The video game must ensure a level of **accessibility** that allows visitors of different ages and technological skills to use it.
- The game must include content that supports the **achievement of the cognitive goals**, particularly the recognition of the pictograms and the understanding of their Neolithic context.
- The interface must be **intuitive** and **guided**, with clear instructions available in multiple languages.
- All content must respect the **scientific accuracy** of the archaeological and cultural data.

Should

Important and highly desirable requirements, though not strictly indispensable:

- The experience should include an **immersive narrative** that gradually guides the visitor through the discovery of the site.
- The system should include **mini-games** designed to assess understanding and maintain the user's attention.
- The sound environment should create an **evocative and atmospheric setting**.

- The game should foster **emotional engagement** by incorporating symbolic themes of the cave, such as the Great Mother deity, initiation rituals, and handprints.

Could

Desirable requirements that would further enhance the experience if resources allow:

- Integration of **additional content**, such as optional in-depth materials for expert visitors or scholars.
- Possibility of offering a **cooperative multiplayer version** of the video game across the five stations.
- Development of the same experience with optional **VR support**, aimed at further increasing the level of immersion and expanding the educational and sensory potential of the interaction.

Won't

Requirements that will *not* be developed in this phase of the project:

- The experience is not intended to replace educational activities or museum-guided tours, but rather to complement them.
- The game will not include dynamics that are inconsistent with the archaeological context.
- The project does not foresee, at least in this initial phase, the development of a full video game intended for commercial distribution or use outside the museum itinerary.

5. IDEATION

5.1 The user experience

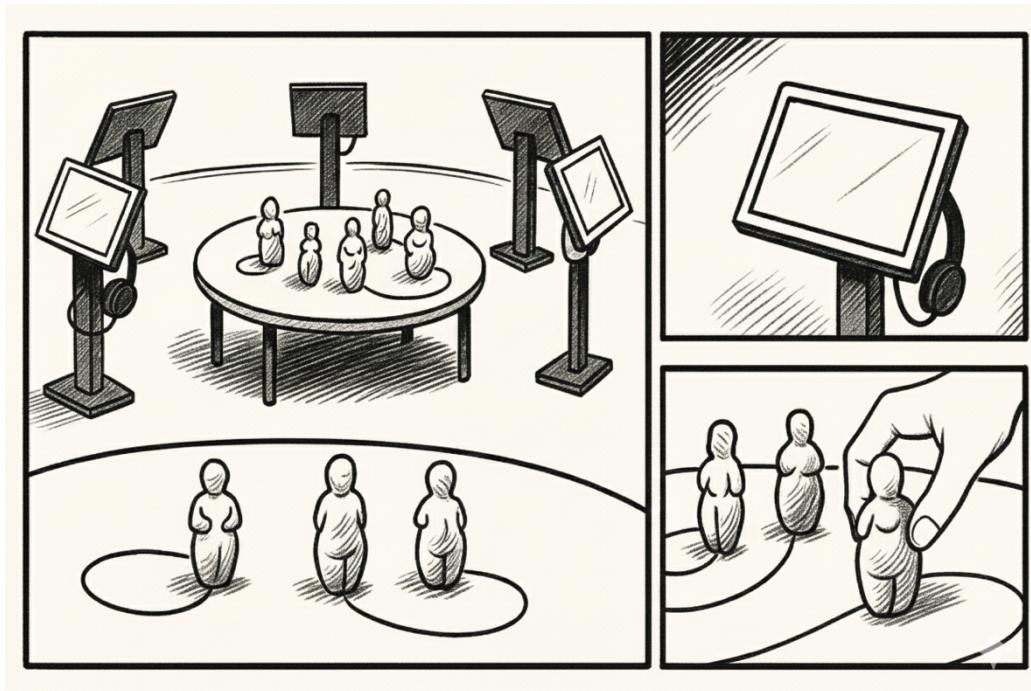
The experience is designed to place the user in the role of one of the speleologists who discovered the Deer Cave. From the player's perspective, the video game unfolds as an immersive and progressive journey: they enter an unknown environment, observe enigmatic pictograms, encounter the shaman, and face interpretive challenges that require memory, attention, and curiosity. The goal is to create an experience that blends discovery, narration, interaction, and learning, transforming the visitor into an active protagonist.

In our design, the user enters the room dedicated to the video game **at the end of the museum visit**, after having already acquired an initial cognitive understanding of the Deer Cave through the physical exhibition of artifacts and the projection of the 3D model. Entering this dedicated space represents a **moment of transition**: from the **informative** dimension of the exhibition to an **experiential** and **immersive** mode in which the visitor is invited to “get involved” and rework what they have learned. At this stage, the user also begins to approach one of the central themes of the experience: the need to develop a **critical gaze** towards representations that may not be immediately reliable. This aspect will be further explored in **section 5.2**, which addresses the concept behind the project.

The room contains five stations arranged in a circle, symbolically recalling the five speleologists who made the discovery. Each station is equipped with a tablet mounted on an adjustable stand, ensuring accessibility for users of different ages, heights, and abilities. The interface is designed to be intuitive and straightforward, allowing even those unfamiliar with gaming to navigate easily.

The experience also relies on **multisensoriality**: in addition to the immersive visualization of the 3D model of the cave and the evocative acoustics that recall a hypogean environment, there is also a tactile component thanks to the presence of physical replicas of archaeological artifacts, which also appear in their digital form within the game. Through this combination of visual, auditory, and tactile stimuli, the experience takes on a strongly **embodied dimension**: the user does not merely observe, but acts, touches, listens, and interprets, engaging in a form of learning that is both cognitive and sensory.

To complete this journey, the experience culminates in a final **reward**: after solving the proposed minigames, the user is symbolically invited to add the imprint of their own hand to the digital wall that gathers those of the ancient frequenters of the cave. This ritual gesture, deeply rooted in the real practices documented in the Deer Cave, transforms the visit into a participatory and identity-building act, creating a direct **emotional connection** between past and present.



Sketch representing the envisioned setup for the experience

5.2 The Storyline and the Conceptual Framework

Before introducing the actual storyline, it is essential to clarify the spatio-temporal context that frames the narrative. The experience is set in Porto Badisco, Otranto, on February 1st of a year intentionally marked as **XXXX**. This choice is not accidental: the day explicitly refers to the **real discovery of the Deer Cave**, which took place on **February 1st, 1970**, while the year is deliberately left undefined. This decision follows a strategy often adopted in video games when one wishes to avoid a precise temporal placement or evoke a **setting suspended between past and present**.

The main motivation lies in the **narrative concept (*Detective of the Past*)** that underpins the entire project: a contemporary world in which, partly due to the increasingly widespread, and sometimes improper, use of artificial intelligence, **it has become progressively harder to distinguish what is authentic from what has been manipulated**. This condition of uncertainty does not concern only the present, but also affects the way we interpret the past, making it more difficult to recognize, understand, and validate historical traces. Indeed, the video game integrates explicit references to this theme, encouraging the user to confront the fragility of the past and the need to interpret it critically.

Making the year deliberately indecipherable through the marker **XXXX** becomes a **functional narrative choice**: it allows the story to take place in a **suspended time**, not rigidly anchored to the past nor fully attributable to the present. This device preserves the connection with the real day of the cave's discovery while allowing the storyline to

incorporate thematic elements aligned with a more contemporary sensibility, such as interpretive uncertainty and doubt.

Leaving the year undefined therefore creates a **flexible narrative** space in which the historical and contemporary dimensions can coexist without contradiction. It is a subtle signal that immediately suggests to the user that not everything is perfectly fixed or stable, and that even the perception of time can be ambiguous, just like the images, memories, and interpretations the user will have to confront during the game.

The core of the experience, then, is not only the exploration of the Deer Cave, but the cultivation of a critical gaze capable of questioning what is presented, evaluating its coherence, and recognizing when something “doesn’t add up.”

The choice to use **XXXX** also has a **communicative intention**: to spark players’ curiosity. The fact that the real date is not disclosed immediately introduces a small enigma that leads the user to wonder about the reason behind the choice and, once the motivation is revealed, to more easily remember the authentic date of the discovery. Had the year 1970 been explicitly stated from the start, the risk would have been that the detail would go unnoticed; presenting it instead as a “hidden” element enhances its **memorability**.

As for the storyline, it unfolds during a speleological survey. A mysterious force pulls the five explorers into an underground cave system made of winding passages, whose walls are covered in enigmatic paintings. While the speleologists examine these figures, a shape begins to materialize before them: an ancient shaman, seated before a fire and engaged in what appears to be a ritual chant.

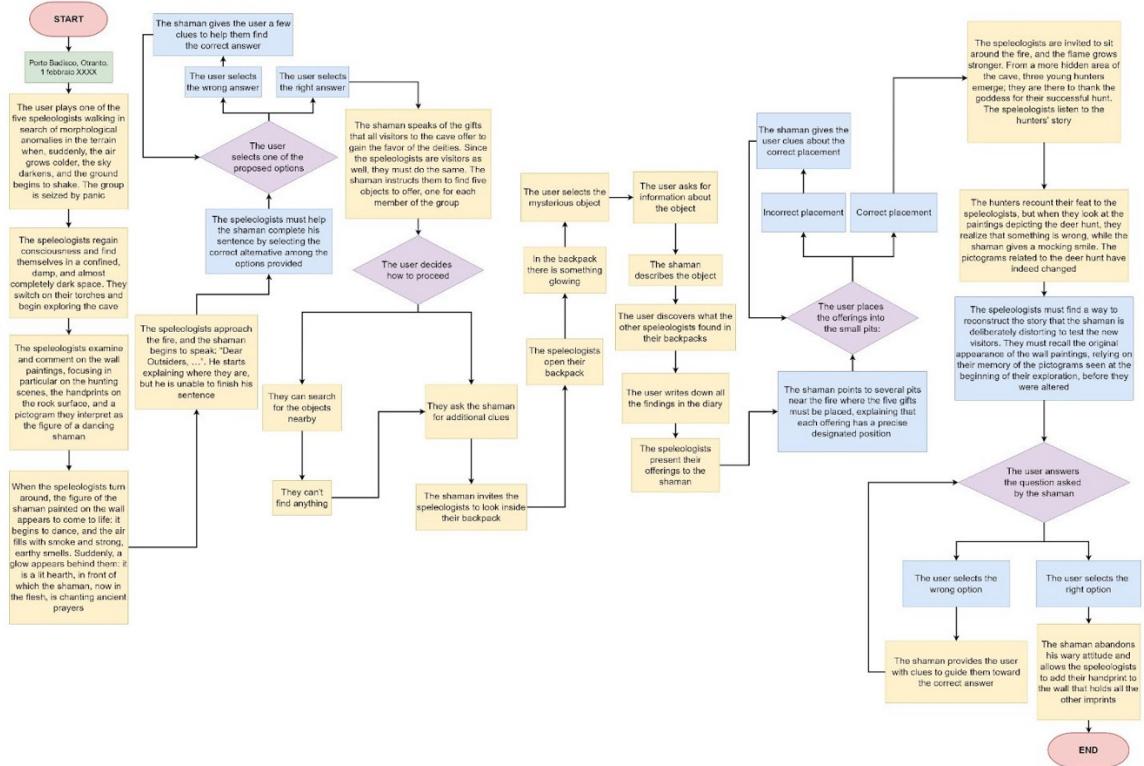
The shaman interacts with the speleologists, recounting the history of the cave and the profound cult devoted to the Great Mother, the deity of fertility, good harvests, the cycle of the seasons, and more broadly, all that concerns life and death. He invites the visitors to reconstruct the story of the cave alongside him, testing their attention to detail through a series of interpretive challenges. In doing so, the speleologists gradually become involved in the ritual dimension of the site: the shaman urges them to take part in the ceremonial offering to the sanctuary.

With the guidance of this ancient religious figure, the players learn the meaning of the five objects used in the ritual, information they can record in their personal diary, which they will carry with them once their journey into prehistory ends, as a symbolic trace of the knowledge they have acquired.

When the offering is completed, the fire blazes more intensely, almost as if signaling the explorers' growing understanding of the Neolithic world. At this moment, three young hunters make their entrance, emerging from a corridor of the cave to give thanks to the goddess. They recount their successful deer hunt, depicted in the surrounding paintings. Here too, the speleologists must demonstrate attention and memory, helping the hunters reconstruct their story, now muddled by the shaman's illusions, once again designed to test the visitors from the future.

At the end of this mission, the speleologists receive one final privilege: the chance to leave the imprint of their hand on a dedicated wall, echoing the gesture of the ancient visitors of the Deer Cave and symbolically marking their "initiation" into the knowledge of the site.

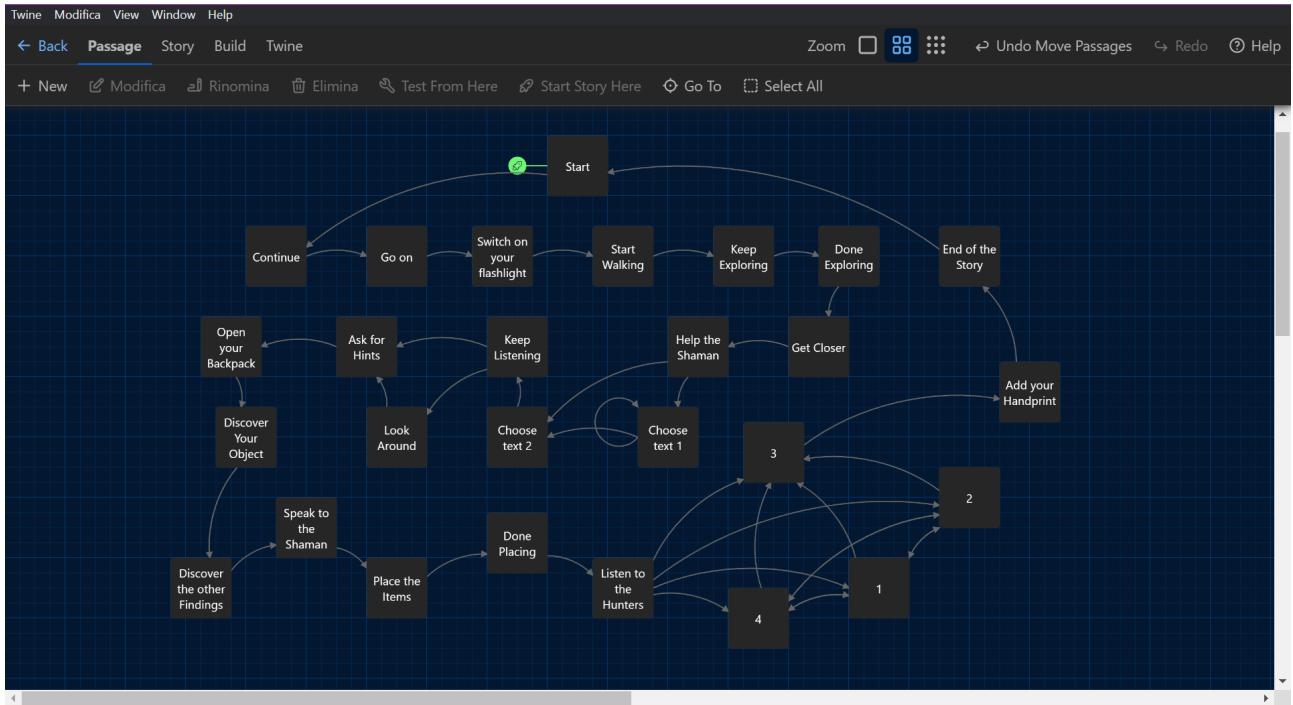
The following diagram schematically illustrates the narrative elements designed for the video game, as well as the interaction with the user:



Interaction Diagram

5.3 The prototype with Twine

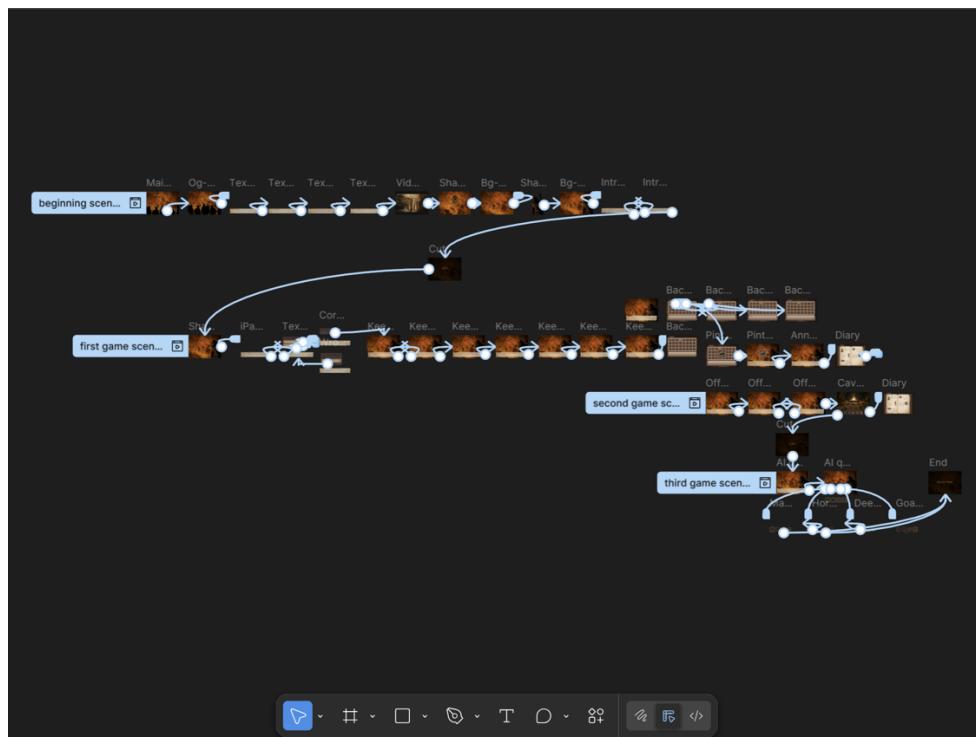
To complement the design work, an interactive narrative prototype was developed in **Twine**, used to model the narrative logic, branching paths, and the main decision-making dynamics of the experience.



The browsable version of the prototype is available in [Chapter 8](#).

5.4 The prototype with Figma

To enrich and complete the prototype of the application, **Figma** was employed as a tool. It was used to build an interactive structure and UI graphics based on the prototype made with Twine, ultimately connecting all parts of the workflow from the storyline to the final visualization.



Interactions Diagram of the game in Figma

You can check out the prototype here:

<https://www.figma.com/design/5uYv1VuZP5wqdA3bpMPLK4/Dear-Outsider-Prototype?node-id=0-1&p=f>

5.5 Canva

5.5.1 Canva for website design

The decision to create the website aligns with the goal of the project: to make the interactive experience reachable to more visitors coming from all around the world. It catches the visitors' attention and takes away the doubts that might arise while choosing to benefit from an experience or not; especially if they are coming from far away.

The banner image that has been put in the hero section of the website and can be used to promote the game experience was made on Canva. Its main goal is to simulate how the visitors would feel if they could enter the Deer Cave and also what they could find there.

The pictograms that we chose as our star assets are not disposed in the real cave in that order but the choice to take them from their own walls, using tools provided by Canva and some others like Clipping magic (see section 9.3), and putting them together in that disposition, was purely to make the visitors imagine the story of the game just by looking at the still image.



Banner Game Experience

The UI of the website draws inspiration from the game *Firewatch* and from animated films such as *Ice Age* and *Brother Bear*, which contribute to creating a warm, cave-like atmosphere. It also references *The Flintstones* for the design of the logo.

These choices evoke a sense of nostalgia for visitors who may have grown up with these visual references, while also adding a playful charm that appeals to younger audiences.



Moodboard UI website

5.5.2 Canva for UI design draft

The UI design of objects, items, images and backgrounds was mainly done by using the user-friendly interface of Canva, both with the help of elements inside the tool and images found on the Web. This draft of the UI was used to design the prototype in Figma, with adjustments where needed, and it can be seen in the GitHub repository for this project at this link here:

<https://github.com/IMD-Rewind/DearOutsider/tree/main/Canva>



Backpack with items.

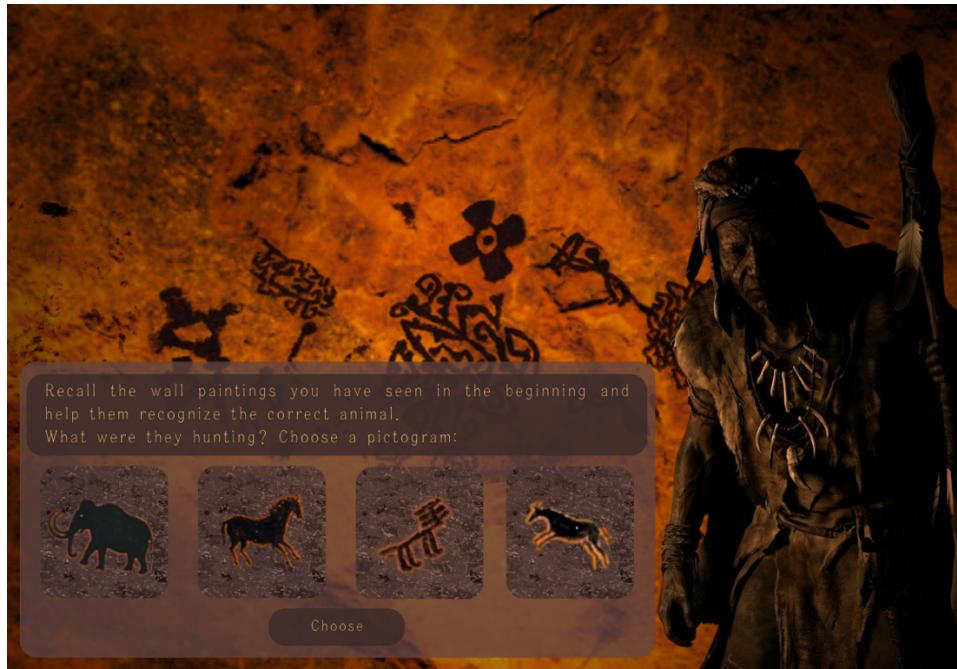
5.6 AI

Some images (the *puzzle game* background, the cartoonified version of the items in the diary, animals' pictograms from the *AI quiz game* – except the deer) and the figure of the Shaman were created using generative AI, specifically Gemini. This use of AI has only been engaged as a form of “first draft” ideation to visualize the plausibility of our project plan. In the case of actually implementing the game, the goal is to develop each object and part step by step and curate the design in every detail with more specific game environments and UI development softwares.



Puzzle game





AI quiz game*

We employed the same use of AI to generate some videos that can be seen in the *Videos* section of our home page. Again, this was done mostly to give life to how we envisioned the possibility of a cinematic game development of our narrative together with 3D modeling and rendering.

*It is important to note that the animals' pictograms here were purposefully generated using AI to align with our narrative and concept of *Detective of the Past* and would've been so generated in any case.

5.7 Set-up: Hardware, Software and Media

The following set-up is planned for this stage of the project:

Hardware

- 5 tablets with adjustable stands
- Headphones for each station
- A dedicated museum room
- Physical replicas of selected artifacts

Software

- Unity or Unreal Engine 5
- 3DF Zephyr and Blender for 3D model optimization
- Audio editing software

- User feedback tracking tools for future improvements

Media / Digital Assets

- 3D model of the Grotta dei Cervi
- High-resolution pictograms
- 2D animation of pictograms
- Evocative soundtrack

5.8 Further Development and Maintenance Issues

Potential future developments include:

- Technical updates to the game engine
- Expansion of the narrative and educational content
- Addition of languages for international visitors
- Potential conversion to a VR version
- Possible public release outside the museum environment

Maintenance will require continuous monitoring, regular software updates, and periodic checks of the tablets' performance.

6. DISRUPTION

The development and long-term sustainability of the project must address several potential issues that could compromise both its feasibility and its preservation over time. A first challenge concerns the **economic and practical costs** of reproducing or maintaining the environment required for production. Access to the necessary equipment, namely tablets and all devices needed to experience the installation, may require a budget that does not fall within the expenses foreseen by the exhibition venue.

Another critical issue involves the **continuous deterioration of digital resources** and the **rapid evolution of technological standards**. Digital materials such as videos, textures, or audio may degrade over time, suffer file corruption, or become incompatible with new software ecosystems. Likewise, software may evolve or be discontinued, threatening the project's long-term operability. The risk is that some resources may become partially or completely inaccessible, compromising both the integrity of the experience and its potential for future updates or exhibitions. To mitigate this risk, it is essential to adopt sustainable digital preservation practices, such as periodic file migration, redundant backups, comprehensive documentation of dependencies, and the use of open or widely supported formats.

A further critical concern relates to the **licensing** and intellectual property status of the 3D model integrated into the project. Unclear ownership, restrictive usage rights, or missing permissions may limit the distribution and visibility of the work. To avoid such complications, it is necessary to verify the official license, obtain written authorization from the data providers, and ensure that attribution and usage comply with the required guidelines.

In conclusion, the main challenges involve economic constraints, the fragility and obsolescence of digital resources, and the legal complexity of managing licensed 3D data. Anticipating these issues through careful planning, responsible archiving, and clear legal frameworks is essential to safeguard the project's durability and integrity.

7. TEAM ROLES AND WORK

The team is composed of Fahmida Islam, Maria De Matteis, and Martina Marchesi, students of the Master's Degree in Digital Humanities and Digital Knowledge. The work was distributed in a balanced way: all members participated in the various phases of the workflow, as the shared goal was to develop a coherent, homogeneous, and fully integrated project. However, based on previous studies, individual experience, and personal inclinations, each member focused more deeply on specific aspects of the design process. From the development of the initial idea to the creation of a first prototype, here are the profiles of the team members who contributed to the project:

Maria De Matteis holds a Bachelor's Degree in Cultural Heritage and a Master's Degree in Archaeology and Cultures of the Ancient World. Her academic background allowed her to bring solid disciplinary expertise in Archaeology to the project and to take particular responsibility for the first phase of the workflow, dedicated to researching the historical and archaeological context of the Deer Cave through bibliographic and digital sources. This phase was essential, as one of the project's priorities was to ensure a rigorous and scientifically reliable foundation. After collecting and verifying the necessary information, Maria worked on developing a coherent narrative base upon which the video game's storyline was later built. She also wrote the Design Brief and contributed significantly to the writing of the website texts, ensuring their accuracy, clarity, and cultural relevance, and was directly involved in integrating this content into the website.

Fahmida Islam holds a Bachelor's Degree in Anthropology from the University of Bologna and, thanks to her academic background, brought to the project a valuable perspective on symbolic systems and the cultural dynamics of ancient human communities. In terms of practical development, Fahmida was primarily responsible for building the website that collects the various stages of the project and curated the

interactive narrative using Twine, shaping decision-based pathways that reflect the game's logic. She also played an important role in producing the video trailer (using parts of the video produced by the University of Salento that documents the creation of the 3D model: <https://vimeo.com/407669569>) and in editing videos and images, contributing to the audiovisual dimension of the project.

Martina Marchesi holds a Bachelor's Degree in Humanities from the University of Bologna and supported the team especially in the revision and refinement of the storyline, drawing not only on her skills in content reworking but also on the sensitivity developed through her personal experience with video games. Her creativity proved particularly valuable in the graphic design phase: Martina worked on the development of visual interfaces using tools such as Canva and Figma, helping to define the aesthetic and communicative identity of the project. Her attention to visual coherence and user experience contributed to shaping a prototype that is both harmonious and functional.

8. UX SCENARIO

In the development of the UX scenario, Twine was used to map and visualize the **interactive structure** of the user experience. Its node-based system made it possible to design the flow of actions, dialogues, multiple-choice options, and branching pathways that shape the player's journey. By structuring the narrative in this way, Twine allowed us to build a coherent, intuitive, and well-organized storyline that reflects how users will actually navigate and interact with the video game.

You can find the link here:

<https://imd-rewind.github.io/DearOutsider/DearOutsiderStory.html>

9. REFERENCES

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9.2 Sitography

- Aragonese Castle - Accordo di valorizzazione:
<https://cultura.gov.it/comunicato/federalismo-demaniale-firmato-accordo-di-valorizzazione-per-il-castello-aragonese-e-il-faro-di-punta-palascia-ed-ex-alloggio-del-fanalista-di-otranto-le-1#:~:text=sviluppare%20e%20promuovere%20la%20funzione,Leuca%20e%20Bosco%20di%20Tricase%20%9D>
- Firewatch (benchmark/inspiration):
 - <https://projectfirewatch.com/>
 - <https://www.firewatchgame.com/>
- Preistoriaitalia.it:
<https://www.preistoriaitalia.it/en/scheda/grotta-dei-cervi-porto-badisco-le/>
- Google Reviews:
https://www.google.com/search?sa=X&sca_esv=3f626f5782a50780&rlz=1C1CHBD_enIT1183IT1183&biw=1920&bih=859&tbo=cl&sxsrf=AE3TifO6IxI7Y5pz5zQqiWDKxm6b7yPeQ:1762792862102&q=recensioni%20di%20grotta%20dei%20cervi&rflfq=1&num=20&stick=H4sIAAAAAAAAONgkxKyMDQ1Nz
- Video 3D model: <https://vimeo.com/407669569>

9.3 Tools

- Canva: <https://www.canva.com/>
- ChatGPT: <https://chat.openai.com/>
- Gemini (+ Veo): <https://gemini.google.com/>
- Clipping Magic: <https://it.clippingmagic.com/>
- Convertio: <https://convertio.co/it/>
- Dafont: <https://www.dafont.com/it/>
- Figma: <https://www.figma.com/>
- Freepik: <https://www.freepik.com/>
- Freesounds.org: <https://freesound.org/>
- Google Images: <https://images.google.com/?hl=it>
- InShot: <https://inshot.com/>
- noTube <https://notube.link/it/youtube-app-275>
- Tenor: <https://tenor.com/it/>
- Twine: <https://twinery.org/>
- Vectors: <https://www.vecteezy.com/>
- Visual Studio Code: <https://code.visualstudio.com/>

