

Jun 8th, 9:00 AM - Jun 12th, 5:00 PM

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Citation

Gasparotto, S. (2026) Cultureaction! An Interaction and Experience Design Project to Explore San Marino's Historic Center as a Living Archive., in Simeone, L., Gray, C. M., Verhoeven, A., de Götzen, A., Bakırloğlu, Y., Zohar, H., Stead, M., and Buwert, P. (eds.), *DRS2026: Edinburgh*, 8–12 June, Edinburgh, United Kingdom.
<https://doi.org/10.21606/drs.2026.575>

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Cultureaction! An Interaction and Experience Design Project to Explore San Marino's Historic Center as a Living Archive.

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doi.org/10.21606/drs.2026.575

Abstract: This research explores how design-driven approaches can boost engagement with cultural heritage and archives, centering on an experimental initiative in San Marino's historic center. The project envisions the city as a dynamic archive brought to life through interactive installations. A system featuring an interactive device called Iride and six site-specific installations was created to reveal the hidden historical and meaningful layers within the urban landscape. These installations use multisensory components to craft experiences that enhance visitors' cognitive and emotional connections with local cultural narratives. This project illustrates how design and digital technology can connect tangible and intangible heritage, institutional archives and community memory, as well as static preservation and dynamic interpretation. The project provides a model that small historic towns can replicate to utilize their cultural resources and create engaging heritage experiences.

Keywords: Tangible archive; Interaction design; Experience design; Design for Cultural Heritage; Walled towns

1. Introduction

Since its origin, the archive has embodied a dual function, operating both as an apparatus of institutional authority and as a repository of collective memory (Giannachi, 2016), and progressively evolving into a relational, interpretive, and participatory domain central to the construction of historical narratives and cultural identity through diverse material forms—texts, images, artifacts, and digital traces alike.

Within this trajectory, the “archival turn” of the late twentieth century marked a decisive moment, further intensified by digital technologies. Digital and digitized archives have challenged the boundaries between archives, libraries, and museums, making their roles more fluid and participatory (Clement et al., 2013). This shift allows archives to function not only as repositories but also as platforms for social interaction, enabling users to become producers, consumers, and transmitters of content (Giannachi, 2016; Schnapp, 2008).



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The evolving concept of an archive transcends its traditional function as a static repository of historical documents and artifacts. In contemporary settings, archives have evolved into dynamic entities capable of actively engaging with both users and communities (Caswell et al., 2017). This ‘blurred boundary’ definition of archives transforms it into digital platforms, community-led projects, or even interactive exhibitions that enable real-time engagement and interpretation of archival content (Breakell, 2015). Consequently, archives now function not only as preservers of the past but also as catalysts for ongoing dialogue, research, and cultural production in the present (Bosco et al., 2023). As Stoler (2009) notes, the archive has become both a subject and a source, and within this dual role, it embodies the complexities of power, memory, and narrative construction (Trocchianesi, 2024). More generally, the blending of digital and physical elements in cultural heritage enhancement is becoming increasingly pervasive (Lupo, 2021). In recent years, museums and other cultural institutions have adopted practices aimed at enriching visitor experience through hybrid spaces that combine digital and physical information (Mason, 2020; Mason & Dziekan, 2025). Parry and colleagues (Parry, 2013; Mason et al., 2025) describe this as the “post-digital museum,” where digital elements are seamlessly embedded into institutional missions and practices. This evolution moves beyond point-and-click interactions to engage the body, senses, and social context (Ciolfi, 2015), fostering deeper connections between historical materials and audiences while blurring distinctions between curators, contributors, and users. In this context, archives are understood not as static repositories but as living structures—complex ecosystems that interact with spaces, technologies, and communities through multiple media, disciplines, and forms of knowledge. Building on this perspective, the research aims to investigate how interaction and experience design can reposition the archive as an active interface for collecting, accessing and interpreting cultural heritage, fostering more inclusive and meaningful engagement for diverse audiences.

To address this objective, the study adopts a design-driven methodology applied to the historic center of the Republic of San Marino, combining archival research, field analysis, and the development of experiential design interventions. The results demonstrate how integrating archival content within hybrid physical-digital environments can support the collection of new heritage materials, stimulate participation, and generate new interpretive narratives, ultimately positioning the archive as a catalyst for cultural understanding and contemporary heritage valorization.

2. Research Contextualization

The experimental project constitutes a component of a broader research entitled “Stretch the Edge – Design Driven Processes for Reactivating Small Walled Towns and Inland Areas” carried out from 2022 to 2024 by the Research Units in Design of the Università degli Studi della Repubblica di San Marino (Dall’Osso & Gasparotto, 2025). This project was developed in collaboration with the Alma Mater Studiorum – Università di Bologna and the Beijing City University. The primary aim of the project was to explore design as an instrument for revitalizing small walled towns located in inland areas and enclosed by natural or artificial barriers. These places often face challenges related to their size, shape, and environmental or anthropogenic conditions. Nonetheless, their distinctive characteristics and values give them a strong identity and make them socially, economically, and environmentally relevant. These qualities should be enhanced, reinterpreted, and systematically organized in future

repopulation and community-building processes, transforming such areas into ecosystems that support diverse species and interspecies interactions, and creating tangible spaces for sustainable living (Brignoni et al., 2023). Among the various research activities undertaken in this context—most notably the establishment of an observatory comprising approximately 150 international case studies and the organization of an international symposium held in San Marino on 22 and 23 June 2023—an experimental project was conducted within the walled city of San Marino, a small independent Republic in central Italy, with a population of about 34,000 people. This village features a historic center situated approximately 600 meters above sea level and is encircled by artificial walls.

San Marino's historic center can be conceived as a living archive (Burgum, 2020)—a palimpsest where architectural elements, spatial arrangements, and everyday practices serve as repositories of collective memory. While material culture is institutionally documented, intangible heritage—oral traditions, performative practices, traditional music, and affective geographies—often remains undocumented or excluded from formal archival systems. Recognizing this, San Marino ratified the Faro Convention (Council of Europe, 2005) in January 2024, encouraging the systematic collection and documentation of intangible cultural heritage. Among the diverse ways in which cultural heritage can be experienced, open-air itineraries (Ivanov & Velkova, 2022; Olinson, 2023) stand out as particularly immersive and affectively engaging. This perspective also encourages the development of broader initiatives for the collection and documentation of local intangible cultural heritage. In this context, interaction design provides a methodological framework for mediating encounters with tangible and intangible heritage by activating sensory, cognitive, and affective dimensions, making overlooked aspects more accessible and meaningful (Capece et al., 2024). While open-air environments can fragment attention, interactive systems support sustained, situated experiences of place.

The project, developed with 18 students, addresses these challenges through a six-stage-experience for San Marino's historic center. Each stage features a site-specific installation activated by a device visitors carry throughout the path, generating unique perceptual and narrative experiences at each site. The historic center is thus reconceptualized as a tangible, dynamic archive—a performative repository of cultural memory activated through presence, movement, and interaction. This design-driven intervention enhances visitor experience while addressing epistemological and curatorial gaps in documenting intangible heritage by creating evolving "containers" for gradually added and modified content.

3. Project phases and methodology

The project was conducted from mid-September 2023 to mid-February 2024, following preliminary research and setup activities aimed at establishing its theoretical and methodological framework. The brief proposed the design of an integrated interactive experience that would transform San Marino's historic center into a living archive. Particular emphasis was placed on identifying, collecting, and structuring intangible heritage through fieldwork, which informed the gradual construction of a shared archive of narratives, memories, and local knowledge. This transformation was articulated through an activation device, six site-specific installations, and a digital platform conceived to document and communicate the resulting narrative.

The design process, articulated in several main phases and summarized in Table I, sought to achieve a set of interrelated objectives. The project aimed to elicit, rediscover, and enhance collective memory and local identity by identifying and making accessible the tangible and intangible heritage of the territory. It sought to narrate local histories as instruments of knowledge and awareness. Through immersive and participatory experiences, the initiative promoted alternative modes of learning and engagement, fostering a renewed sense of belonging. Ultimately, it envisioned the creation of a dynamic and evolving archive—an open system integrating natural, cultural, and emotional dimensions to sustain and reinterpret San Marino's living heritage over time.

Table I Schematic exemplification of the main phases of design process (Credit: The Author, 2025)

Phase	Student Work	Other Stakeholders	Output	Transition to Next Phase
Phase 1 – Design of the interactive activation object (Iride)	Each student individually designed a concept for the interactive object		18 proposals for interactive objects	Selection of 1 object among the 18 proposals
Phase 2 –Site selection	Field research	A local guide accompanied the groups during a site visit	First knowledge of the place	Identification of a specific location for each group
Phase 3 – Desk and field research on the context	Desk and field research	Each group engaged citizens, institutions, and experts through interviews and discussions to elicit and document intangible heritage, including oral histories, local practices, and collective memories.	Contextual insights and content for the experience	Deepening knowledge and literature on the subject
Phase 4 –Design of the interactive installation	Students worked in groups of three	–	6 projects of interactive installations	Weekly review sessions at the University
Phase 5 – Prototyping	Prototyping of both the interactive object and the site-specific installation	Lab technicians and prototyping experts	Functional prototypes of both the interactive object and the site-specific installations	Weekly review sessions at the University
Phase 6 – Design of the interactive platform	Each student individually developed a concept for the platform	–	18 Functional prototypes of the digital platform	Selection and implementation of 1 prototype among the 18 proposals

Particular attention was devoted to defining the activation gestures, which not only serve as an interface between the user and installation but were also designed to be both symbolically and functionally consistent with the content covered and the narrative language

adopted. From an aesthetic and communication perspective, a strong and recognizable visual identity was chosen, with all installations realized in bright yellow, making them immediately distinguishable in the urban and landscape context and consistent with each other as part of an integrated system. Finally, the choice of technological solutions was guided by sustainability, durability, and practicality. All site-specific installations were conceived as passive elements, without internal electronic components, to avoid issues related to exposure to atmospheric agents. Iride, as the only active and portable element, contains the technologies necessary for interaction, ensuring the functionality of the entire system in a safe and efficient way. Furthermore, the deliberate exclusion of personal smartphones (e.g., QR codes, NFC) fosters visitors' awareness of the experience as an open-air archive, encouraging more immersive and attentive interaction with the site.

4. Iride: The Activating Object

Iride is the name given to the interactive device specifically designed to accompany visitors during exploration. Utilizing light, sound, and haptic feedback, Iride 'brings to life' the installations distributed along the path, enabling users to engage with the space in a multisensory and engaging manner. Consequently, the visitor transitions from a passive observer to a protagonist, shaping the rhythm and interpretation of the experience through direct interactions. The device is compact and manageable, allowing it to be easily carried throughout the visit, although it could be further miniaturized.



Figure 1 Iride prototype. (Credits: The students, 2024)

The prototype shown in Figure 1 was sized to accommodate the technological components supporting the interactive functions and can be fabricated using rapid prototyping tools and open-source hardware. The device includes Arduino Nano, battery, NFC reader, built-in speaker, sound sensor, buzzer for vibration, and an integrated LED ring for visual feedback. From a material and structural perspective, Iride consists of two 3D-printed components: a lower section housing the RFID reader and an upper section incorporating a transparent circular element designed to diffuse the light emitted by the concentric LED rings. Small perforations along the surface facilitate sound propagation from the internal speaker. The two sections are connected by a screw-closure system, allowing stability and easy maintenance. An elastic strap enables visitors to carry the object comfortably. At the base, the object includes a support area for secure placement on top of the RFID tags embedded in the site, activating specific interactions. The openings distributed along the surface of the device serve functional purposes, allowing the emission of light and diffusion of sound, and

contribute to the aesthetic identity of the object, reinforcing its symbolic role as an interface between the visible and invisible dimensions of experience.

These elements contribute to constructing a layered narrative environment in which the visitor's movement and gestures trigger site-specific content and responses.

The designation "Iride" aptly encapsulates the device's function, serving as a metaphorical lens through which users can engage with and interpret the village's intangible heritage. Analogous to the iris of the eye, which regulates light to facilitate vision, Iride facilitates access to otherwise obscured narratives embedded within the landscape, thereby unveiling cultural memory, symbolic significance and emotional resonance.

5. Site Specific Installations

The students, divided into groups of three, after a dedicated guided tour of the historic center of San Marino, selected the location to be explored in depth, where the site-specific installation will be located (Figure. 2)

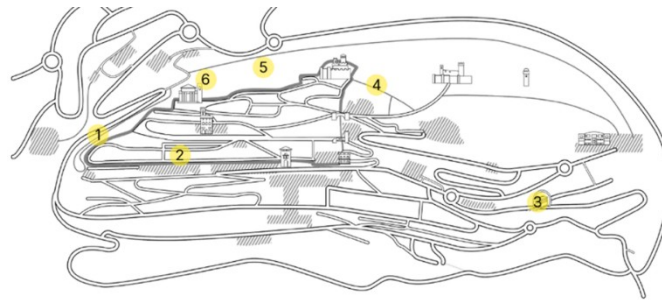


Figure 2 Map of the historic center of San Marino and location of the site-specific installations. (Credits: The students, 2024)

5.1 "Vinolta"

Vinolta, designed by Francesco Lodovici, Marta Gulino and Edoardo Oliva, is situated in proximity to Porta della Rupe, the historic northern entrance to the City of San Marino (Figure. 3).



Figure 3 Photomontage of Vinolta within the specific site. (Credits: The Students, 2024)

This installation is embedded within a context of significant symbolic value: Porta della Rupe, constructed between 1441 and 1451 and subsequently restored in the 19th century, retains the quintessential medieval characteristics of ancient city gates, serving as a testament to the historical need for control, defense, and passage. Located at the end of Costa dell'Arnella and adjacent to the Santa Chiara convent, now the site of the University, the Gate delineates the boundary between the village of Borgo Maggiore and the historic center, providing both physical and symbolic passage through San Marino's historical landscape. Architecturally akin to Porta San Francesco, it features a pointed-arch structure in sandstone, a wooden gate with a small pedestrian entrance, a guardhouse, and a hallway with a wooden ceiling and a small shrine. Despite undergoing restorations, it maintains its original form, exemplifying the transitional architecture between the Middle Ages and the Renaissance. The interaction with the installation starts by placing Iride into a central slot, initiating an auditory journey through San Marino's intangible heritage, where each stage is associated with a specific audio track, configuring the installation as one of the devices through which the archive is stored and accessed (Figure 4).

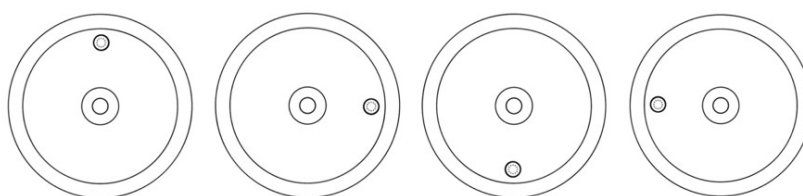


Figure 4 Visual representation of the interaction with Vinolta (Credits: The students, 2024)

The user must then insert Iride into the upper hole, activating the narrator's voice and allowing the object to function as a lever that rotates the installation, symbolically simulating the raising of a drawbridge and recalling the original mechanism of the gate.

A LED ring system enhances the experience: the inner ring indicates the object's position on the installation, while the outer ring marks the duration of the audio currently playing. The name Vinolta, which in the local dialect means "welcome," underscores the site's hospitable vocation and establishes a linguistic and cultural bridge between visitors and the local community. The installation's narrative content spans from the legend of Marino, the Christian stonemason founder of the Republic, to the contemporary political structure with the Captains Regent, to the principal national holidays and local cuisine. The entire experience is designed to transform the act of crossing the threshold into one of welcome and discovery, rendering the gateway an active device for memory and identity creation.

5.2 Intra

Intra, designed by Alessia Lo Preiato, Andrea Mannino and Amelia Messina is located in Contrada delle Mura, along a segment of the historic walls of the Republic of San Marino, adjacent to one of the bastions that constitute the defensive perimeter of the old town of Monte Titano (Figure. 5). Its strategically selected location serves as both a functional interaction with the fortified architecture and a symbolic gesture to redirect attention to the fundamental element of the Republic's identity.



Figure 5 Photomontage of Intra within the specific site. (Credits: The Students, 2024)

The project emerges from research examining walls from architectural, symbolic, social and political perspectives. The Republic of San Marino, founded in 301 AD, features three concentric rings of walls connecting its main fortresses (Guaita, Cesta, and Montale), forming a distinctive architectural complex in the Apennine Mountains. These walls, built between the 10th and 15th centuries, underwent modifications, including work by engineer Gino Zani from 1925-1943. Beyond territorial protection, the walls preserve the freedom and autonomy of the Sammarinese community—values recognized by thinkers such as Montesquieu, Hegel, and Carducci.

The installation enhances the structure by integrating tangible and intangible heritage. Intra spans between two merlons and integrates itself with the existing architecture: the central framework mirrors the landscape with reflective surfaces, while the side elements rest on the merlons, highlighting their shape and guiding views toward the horizon. Intra rises vertically, partially overlapping the walls and is visible from both the interior and exterior.

The interactive object is maneuvered along the guide by visitors who can manually slide it back and forth. Iride's movement initiates three distinct narratives (Figure. 6).

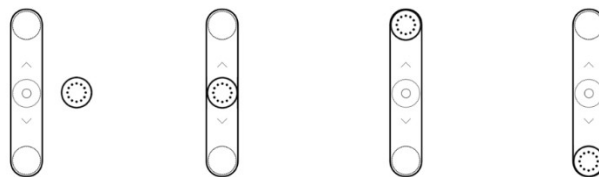


Figure 6 Visual representation of the interaction with Intra (Credits: The Students, 2024)

Positioning the interactive object at the starting point, located at the center of the track, activates a historical account of the defensive system and architectural evolution of the three rings of walls. Sliding the object outward commences a narration regarding the perspective of the walls of San Marino from the opposite side of the valley, particularly from the Fortress of San Leo. Conversely, moving Iride inward activates the written narrative by Danila Gattei, a resident of San Marino, titled “A Glance from the Walls,” which is dedicated

to the Walls of San Marino. To further emphasize the narrator's voice, the LEDs were synchronized with the audio, simulating the subtle and shifting light of candles.

5.3 *Le voci del treno (train voices)*

The installation *Le voci del treno*, designed by Giulia Costantini, Arianna Faccioli and Andrea Scorrano, is situated outside the Galleria del Montale, marking the beginning of the abandoned path of the historic Rimini–San Marino Railway (Figure. 7).



Figure 7 Photomontage of *Le voci del treno* within the specific site. (Credits: The Students, 2024)

The gallery itself is a stone underground corridor, characterized by its linear form and deeply etched with the history of the state. During the Second World War, this location served a crucial function as an escape route and refuge, providing shelter to civilians in transit or those seeking safety. The installation extends longitudinally, aligning with the axis of the gallery and positioned outside the area preceding the entrance. The structure comprises an undulating path formed by three parallel tracks elevated above the ground, which evokes the railway tracks that once facilitated train movement (Figure. 8).



Figure 8 Visual representation of the interaction with *Le voci del treno*. (Credits: The Students, 2024)

This design choice serves not only as a material reference to the site's history but also as a mechanism to guide visitors towards an experience of crossing and listening, symbolizing movement and transit as metaphors for memory. Interaction with the installation is initiated by placing *Iride* at the first concavity of the structure: an activation station slightly elevated relative to the remainder of the path, designed to clearly denote the commencement of the route. One of the lateral tracks is equipped with a textured section corresponding to that of the object, providing visual and tactile feedback to orient the user, thereby ensuring the correct insertion and positioning of the *Iride*.

Upon positioning the object, the interaction is automatically initiated via an NFC reading system that is discreetly embedded within the wooden wall of the structure. The visitor receives initial auditory feedback, confirming activation and inviting them to gently propel *Iride* along the designated path. The horizontal movement of the device is continuous yet interspersed with a series of 'stations' distributed along the installation's length. At each station, the passage of *Iride* over an NFC reader triggers an audio track giving voice to a memory of some of the refugees who paused here during the war.

From a formal perspective, the installation is characterized by the incorporation of soft curves that disrupt the rigidity of the railway's linearity, evoking a fluid and organic dimension reminiscent of the Romagna hills extending from San Marino to the sea. The foundation of the structure comprises a series of arches that recall traditional architectural elements, such as bridges or porticos. The selected narratives—comprising oral fragments, individual testimonies, and often-overlooked voices—construct a collective narrative that underscores San Marino's role as a place of welcome and transit for refugees. More specifically, the installation archives elements of intangible heritage rooted in the stories and memories of elderly individuals who directly experienced the wartime period, preserving their lived experiences as part of a shared cultural memory. Consequently, the installation provides visitors with knowledge of the site and a deeper understanding of its historical and cultural layers.

5.4 *Ventus Aura*

The installation *Ventus Aura*, design by Nico Adamo, Silvia Bonfini and Marta De Vito is situated at Passo delle Streghe, a path located along the ridge of Mount Titano, offering distinctive views of the Romagna Riviera (Figure. 9).



Figure 9 Photomontage of Ventus Aura within the specific site. (Credits: The Students, 2024)

This scenic walkway connects San Marino's three medieval towers: Guaita, Cesta, and Montale. The visual spectacle is enriched by symbolic imagination informed by legends, folk beliefs, and esoteric elements. Oral tradition and local place names suggest multiple interpretative layers: originally known as the "Pass of Dogs," this segment of the path has been more recently renamed the "Pass of Witches," partly due to efforts to reconstruct and emphasize San Marino's medieval identity in the nineteenth century. The name is believed to originate from one of the turrets of the medieval walls constructed during the 13th and 14th centuries: the "Square Knight" or "Witches' Lodge." It is suggested that this location was once frequented by prostitutes, and mothers, seeking to frighten their children, would claim that it was inhabited by witches.

The installation is positioned on a low wall bordering the path, facing the sea. The installation comprises a double-circumference structure: an outer and an inner frame, the latter carved to house Iride. The visitor's experience is initiated by inserting the activating object into the central hole and blowing it into the center (Figure. 10).



Figure 10 Visual representation of the interaction with Ventus Aura. (Credits: The Students, 2024)

This gesture, invoking both poetry and esotericism, triggers an audio output: a narration concerning the duality between actual history and the practice of neomedievalism—which tends to reconstruct facts, architectures and traditions to reinforce an identity associated with the Middle Ages. In this sense, this piece of the archive contributes to preserving, valorizing, and recalling elements of lived and documented history that risk being overshadowed or simplified by such reinterpetative processes. The ritualistic act of blowing, the symbolic insertion of the eye (Iride), and the sound evoked by human breath transform the installation into a portal between historical reality and imagination, evoking wind as a connective element between myth and memory.

5.5 Voce (voice)

The site-specific installation, Voce (Figure. 11), design by Domenico De Pasquali, Giulia Marchetti and Gaia Zuccaro is situated in Contrada dei Fossi, in an area historically recognized for the Nido del Falco restaurant.



Figure 11 Photomontage of Voce within the specific site. (Credits: The Students, 2024)

The nomenclature of the location is derived from the birds of prey that once populated the area, which began to vanish in the 1950s owing to urban development projects aimed at enhancing accessibility and usability for residents. Over time, the site has undergone substantial transformations, deviating markedly from its original configuration and purpose. Until the early 1900s, the area remained undeveloped and existed as a singular plot. The initial modifications occurred in the early twentieth century with the construction of the Chalet Bianchini, a prominent structure that remained unchanged for approximately fifty years. Subsequently, a redevelopment initiative endorsed by the San Marino government resulted in the demolition of the chalet and the construction of a new complex. This complex included a section of the restaurant constructed with bricks and glass, a dance floor, and a small kiosk. In the 1970s, the restaurant experienced further expansion, augmenting its visual impact on the urban landscape. Although the area now appears significantly transformed, it retains discernible traces of architectural layers that have accumulated over time. Of the dance floor, an element deeply rooted in collective memory—particularly among older generations—only a single trace persists: a cylindrical platform that slightly

elevates the paving stones but lacks any signage or inscription attesting to its historical significance. The interactive installation was meticulously designed to evoke memories and enhance the value of a place cherished by its inhabitants. Voce comprises five acoustic totems arranged along a former dance floor. Each totem contains a trapezoidal horn speaker, and by inserting Iride into designated slots, an audio narrative derived from interviews with individuals who have resided in or frequented the location is played.

The totems, constructed at varying heights and configurations, are intended to facilitate an immersive and direct experience that positions the listener in a state of empathetic engagement. The form and proportions of the acoustic devices are predicated on three pairs of conceptual parameters—collective/individual, objective/subjective, and shared/personal—which modulate the width, height, and depth of the horn, respectively, in relation to the nature of the narrative. From a technical perspective, Voce employs horn speakers to optimize the directionality and projection of sound in open areas. The conical or trapezoidal shape of the speakers enhances sound propagation over extended distances, integrating with the spatial and performative dimensions of the installation.

5.6 Sonora

Sonora, design by Stella Azzolin, Fabio Caponetto and Giada Succi is the site-specific installation created within the Orti Borghesi, a historic garden in the heart of San Marino's city center (Figure. 12).



Figure 12 Photomontage of Sonora within the specific site. (Credits: The Students, 2024)

The intervention unfolds around the garden's central basin, which was once used as a cistern to collect rainwater and now serves as a fountain. The installation is designed to enhance this space through a sensory and interactive experience that celebrates the historical relationship between San Marino and water, a resource that has always been precious and difficult to obtain in this landlocked country. Mount Titano, in fact, lacking natural springs and characterized by permeable soil, for centuries forced inhabitants to rely on ingenious rainwater collection systems, including cisterns and conveyance channels. The Orti Borghesi basin thus becomes the focal point of a narrative that restores the image of San Marino to collective memory as a testament to the community's ability to adapt to its territory.

The interaction is activated by inserting Iride into the installation. The NFC reader checks for the presence of the activating object and triggers a subwoofer connected to a 5-volt speaker that transmits low-frequency sound vibrations through a thin, transparent silicone rubber membrane (1 mm), allowing the movement of water above and the subtle diffusion of light.

The vibrations, visible on the water's surface, vary in intensity according to the historical period being represented: a higher intensity indicates water abundance, and a lower intensity indicates scarcity and water difficulties. The waves are accompanied by light effects generated by the LED rings of Iride (Figure. 13).



Figure 13 Visual representation of the interaction with Sonora. (Credits: The Students, 2024)

Beneath the basin, a laser-engraved wooden panel displays historical content related to five events that mark San Marino's relationship with water. The basin, protected by a flat cover with an integrated mirror, allows users to observe the reflection of the water on the ceiling while preventing rain and leaves from entering. The entire structure is made of wood, with engraved columns and panels, while the only metal part is the inner frame supporting a silicone basin.

6. Conclusion

The experimental project conducted in San Marino's historic center demonstrates the potential of design-driven approaches to enhance engagement with cultural heritage and archives. The results were presented through an exhibit to citizens and authorities, who showed strong interest in a format flexible enough to be applied in this and other contexts. By operationalizing the concept of the city as a living archive through interactive installations, the project translates theoretical assumptions into a situated and experiential system, addressing key challenges in collecting, documenting, and transmitting intangible cultural heritage. Through the integration of interaction design and digital technologies, the project facilitates multisensory experiences, enhancing the accessibility and resonance of cultural heritage for diverse audiences. This approach aligns with the initial objective of extending the archive beyond static repositories into interactive and participatory environments. Moreover, the interactive installations embedded within the urban fabric operate as distributed archival units—comparable to archival files—designed to be progressively populated as new materials and narratives are identified, documented, and curated through the ongoing work of cultural institutions.

The design-led approach demonstrates the potential of interactive interventions to bridge the gap between tangible and intangible heritage, institutional archives and community memory, and static preservation and dynamic exploration. It offers a replicable model through which small historic towns can leverage their distinct identities and cultural assets to generate compelling and accessible heritage experiences. Future research might explore the expansion of this system through user-generated content, integration with digital archival platforms, or adaptation to other geographic or cultural contexts.



Figure. 14 Exhibit of the prototypes. (Credit: The Author, 2024)

Acknowledgements: The author would like to sincerely thank all the students who contributed to the development of the project with commitment, creativity, and critical insight: Nico Adamo, Stella Azzolin, Fabio Caponetto, Giulia Costantini, Domenico De Pasquali, Arianna Faccioli, Marta De Vito, Marta Gulino, Andrea Mannino, Giulia Marchetti, Amelia Messina, Edoardo Oliva, Alessia Lo Preiato, Francesco Lodovici, Andrea Scorrano, Giada Succi, Silvia Bonfini, and Gaia Zuccaro. Special thanks are due to Margo Lengua for guiding the exploration of the historic center of San Marino, and to Michele Zannoni, co-lecturer of the course. The author also wishes to express special gratitude to the Università degli Studi della Repubblica di San Marino, a unique and inspiring environment that made this research possible.

7. References

- Bosco, A., Bulegato, F., & Gasparotto, S. (2023). The digital archive as an inclusive tool for knowledge construction through design practices. *DIID. Disegno Industriale Industrial Design, Digital Special Issue 1*, 10. <https://doi.org/10.30682/diiddsi23t2c>
- Breakell, S. (2015). Archival practices and the practice of archives. *Archives and Records*, 36(1), 1–5.
- Brignoni, M., Dall’Osso, G., Gasparotto, S., & Varini, R. (2023). Mapping design-driven processes for the regeneration of small fortified towns in inland areas. *AGATHÓN*, 13, 281–290.
- Burgum, S. (2020). This city is an archive: Squatting history and urban authority. *Journal of Urban History*, 48(3), 504–522. <https://doi.org/10.1177/0096144220955165>
- Capece, S., Chivăran, C., Giugliano, G., Laudante, E., Nappi, M. L., & Buono, M. (2024). Advanced systems and technologies for the enhancement of user experience in cultural spaces: An overview. *Heritage Science*, 12(1). <https://doi.org/10.1186/s40494-024-01186-5>
- Caswell, M., Punzalan, R. L., & Sangwand, T. (2017). Critical archival studies: An introduction. *Journal of Critical Library and Information Studies*, 1(2). <https://doi.org/10.24242/jclis.v1i2.50>
- Clement, T., Hagenmaier, W., & Knies, J. L. (2013). Toward a notion of the archive of the future: Impressions of practice by librarians, archivists, and digital humanities scholars. *The Library Quarterly*, 83(2), 112–130. <https://doi.org/10.1086/669550>
- Ciolfi, L. (2015). Embodiment and place experience in heritage technology design. In S. Macdonald, H. R. Leahy, A. Witcomb, C. McCarthy, M. Henning, A. E. Coombes, & R. B. Phillips (Eds.), *The international handbooks of museum studies* (pp. 419–445). Wiley. <https://doi.org/10.1002/9781118829059.wbihms319>

- Council of Europe. (2005). Council of Europe framework convention on the value of cultural heritage for society (Faro Convention). Council of Europe.
- Dall'Osso, G., & Gasparotto, S. (Eds.). (2025). Stretch the edge – Design driven processes for reactivating small walled towns and inland areas. DIID. Disegno Industriale Industrial Design, Digital Special Issue 2. Bologna University Press. <https://doi.org/10.30682/diiddsi25>
- Giannachi, G. (2016). Mapping the everyday. MIT Press.
- Ivanov, R., & Velkova, V. (2022). Delivering personalized content to open-air museum visitors using geofencing. *Digital Presentation and Preservation of Cultural and Scientific Heritage*, 12, 141–150. <https://doi.org/10.55630/dipp.2022.12.11>
- Lupo, E. (2021). Design and innovation for cultural heritage: Phygital connections for a heritage of proximity. *AGATHÓN: International Journal of Architecture, Art and Design*, 10, 186–199.
- Mason, M. (2020). The elements of visitor experience in post-digital museum design. *Design Principles and Practices*, 14(1), 1–14.
- Mason, M., & Dziekan, V. (2025). *Museums and design practices*. Routledge.
- Mason, M., Parry, R., & Dziekan, V. (2025). Staging post-digitality: Interdisciplinary perspectives on museums, digital culture and design research. In G. Allegretti, B. Pietro, A. L. Diatta, & S. Ghirardini (Eds.), *Crossroads | Incroci: Proceedings of the 4th International Conference on Interior Architecture and Exhibition Design* (Vol. 1, pp. 66–72). Accademia Adrianea Edizioni.
- Parry, R. (2013). The end of the beginning: Normativity in the postdigital museum. *Museum Worlds*, 1(1), 24–39. <https://doi.org/10.3167/armw.2013.010103>
- Schnapp, J. (2008, August). Animating the archive. *First Monday*, 13(8). <https://firstmonday.org/ojs/index.php/fm/article/view/2218/2020>
- Stoler, A. L. (2009). *Along the archival grain: Epistemic anxieties and colonial common sense*. Princeton University Press.
- Trocchianesi, R. (2024). Design narrative. In F. Zanella et al. (Eds.), *Multidisciplinary aspects of design: Design! OPEN 2022* (Springer Series in Design and Innovation, Vol. 37). Springer. https://doi.org/10.1007/978-3-031-49811-4_57

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