# A Phygital Space-Related Storytelling of a Cultural Intangible and Social Experience. The *Telve Humanscape / Mappe del sentire* Application

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**Abstract.** The paper aims to address the transformation of the relationship between the *physical* and *digital* experience of urban space in the field of Cultural Intangible Landscape Heritage. In order to do that, it introduces the concept of the *phygital* and discusses its potential application in the field of CILH storytelling thanks to a pilot case study. *Telve Humanscape / Mappe del sentire*, has been conceptualised and designed to map, explore and narrate the transformation of the Talvera River area in Bolzano, thanks to the memories, stories and experiences of local people.

**Keywords:** Phygital story-telling · Cultural Intangible and landscape Heritage · site-specific experience design

## 1 *Phygital*: Converging Spaces and New Human-Interactions Paradigma

The way we know and relate to the physical environment and people far and near us has been profoundly transformed in the face of technological change.

The Internet in the 1990s [1], the mobile revolution inaugurated in 2007 and the continuous return of devices and environments of virtual and cross-reality, from Sutherland's *Sword of Damocles* [2] to the hype of meta-verses (from MUDs to MMOs, from Second Life to the Meta-Metaverse), our experience is no longer even *mediated* by the digital, but even *post*-digital [3, 4]. The level of integration or interference of digital devices and technology has now become an organic part of our seamless living, but the spectrum covered or mediated by devices or supported by smart domains is broad and ranges from interaction limited to our smartphone or personal devices as a source of information in a situated context, being present in a place and at a time, to the more fluid and transparent ones where our moving around in space generates, even without us being aware of it (or because of surveillance), interactions and data. Furthermore, the paradigm of our very being is leaping of discontinuity [5], thanks to the convergence with artificial intelligences (such as the generative ones). Such a transformation that

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has completely eroded certain ontological statutes has yet to find its own epistemology capable of redefining and conceptualising the collision between the different planes, the *physical* and the *digital*, the *real* and the *virtual*, understood in their multiple and ambiguous definitions.

In its disarming banality, perhaps, the term *phygital* seems to be able to encompass and render the complexity of the collapse of the two planes, opening up a multitude of possible interpretations, but above all restricting it to the necessary co-efficiency of the dual condition of being/existing or being able to experience in the two reals, that is, in a continuum of the *physical* and the *digital*. "Obviously, it is a mixture of the words physical and digital. It was coined in 2007 by Chris Weil of the [Australian] advertising agency Momentum Worldwide. In its original context of marketing communications, it refers to building relationships with customers in both the physical and digital worlds. From this communicative origin, it has spread to many other disciplines. In each field, phygital is used with a different meaning." [6].

The professional world has created and appropriated this umbrella term, which nevertheless coexists with several other terms and definitions, most of which are oriented towards the technology – Augmented Reality (AR), Virtual Reality (VR), Cross Reality (XR), to name just a few of the most common—rather than the human experience. The potential that remains to be explored, however, lies precisely on this side of the question. That is, how the fusion of the real, embodied, situated experience and the digital, broadly speaking, mediated, enabled, enhanced or augmented by technology, generates new possible modes of experience and knowledge. Or, interpreting the phenomenon, from the point of view of design possibilities, as the hybridisation between the two realms, can be explored, designed and understood. Possible developments are also promising in areas very different from corporate marketing and omnichannel retailing; indeed, it is in the cultural, intangible and historical realms that this blended form of experience seems to be fulfilling its potential to provide people with a meaningful, rich and articulate experience of knowledge.

In fact, digital media is increasingly used to enrich and contextualize physical spaces, like museums or historical sites, giving visitors a more immersive and participatory experience. The technologies mentioned create a new dynamic between the physical and the digital, enhancing traditional ways to explore an exhibit or, more generally "displayed" information. In fact, by focusing on digital technologies as a means for a deeper and multilayered narration of cultural heritage, they open the possibility of keeping the significance of the existing space while being able to connect information directly to the location. Emplacement [7, 8] reframes information or digital content as not just something that exists in digital space but is specifically "placed" within physical spaces and is intended to interact with people in the context of those spaces. It connects the physical environment and the digital one in a way that both influence people's perceptions. This is pivotal in sites where infrastructural intervention would alter the physical spaces (such as heritage sites), weakening the relationship between the person and endangering the authenticity of the place itself. Emplacement allows the individual to be immersed in the significance of the material space, while they are given the chance to digitally access context-aware information, enhancing or altering the user's understanding. Furthermore, embodied cognition suggests that digital elements in

physical environments support and enhance cognitive engagement, making interactions with physical objects more intuitive and meaningful [9].

Not only does emplacement grant visceral, emotional and cognitive engagement to physical spaces without jeopardising (heritage) sites [10], but most importantly, it allows them to develop according to the necessities of time and society, preventing their *museification*. In the digital realm, layering is potentially limitless and offers infinite chances to re-frame, compare, and add information and details [11].

## 2 The Cultural Heritage Dilemma

This paper will frame heritage as a social construct where its meanings are negotiated through past-present and power relations, with an active role in meaning and identity-making. Consequently, it becomes evident that while heritage has always been a part of human history, what has evolved is rather how it is defined, framed, and valued within (Western) society. Institutionalisation has played a crucial role in the preservation of heritage, facilitating both international interest and cooperation. This process has resulted in the safeguarding of remarkable cultural sites and practices across the globe, allowing us to experience and witness the richness of diverse cultural traditions. However, like any institutional framework, heritage preservation is inherently centralized, following top-down directives [12]. Consequently, cultural heritage underwent a process of categorisation that, while enabling the development of modern preservation practices, also embedded values and models of heritage rooted in the context from which these categories originated (the West). Laurajane Smith [12] introduced the concept of *Authorised Heritage Discourse* (AHD), which highlights the elite, nation-state-driven nature of institutionalized heritage practices. This does not suggest that institutions (such as ICOMOS *the International Council on Monuments and Sites*, ICOM the *International Council of Museums*, and UNESCO) have nation-state-driven agendas. Nevertheless, they are inherently bound to values and views which resonate in the society (Western) and time (post-WW2) they were founded. This inevitably influences the policies, structure and approaches to heritage, inevitably "overlooking some communal, intangible cultural practices that are other from the Western conception of heritage." [13]. In other words, the AHD promotes a Western vision of cultural construction and conservation, privileging elite values and their own cultural traditions assuming them as the parameters of heritage. The AHD is facilitated by one double-edged founding principle: *universal* value which undoubtedly originates and operates as a way to foster international cooperation and cohesion. However, as Cleere [14] points out, the notion of universality has been subject to criticism, as it is deeply rooted in the European cultural tradition, and shaped by historical and aesthetic parameters derived from classical philosophy. He argues that such a concept can only truly apply to the earliest phases of human cultural development or to the global culture of the late twentieth century. Moreover, the cultural diversity of human experience means that different societies perceive significance in different ways, and not all cultures share the same understanding of heritage and its values, sometimes to the extent that these differences become insurmountable. This highlights the tensions inherent in the application of universal value as it may unintentionally impose a Eurocentric framework on diverse heritage expressions. If we accept heritage as a process of

meaning-making, we must also seek out the spaces and practices through which meaning is actively mediated in contemporary life. Heritage is not merely a static testimony of the past [15]. Rather, it exists in the continuous and dynamic negotiation between past and present. This perspective urges us to move beyond a fixed institutionalised notion of heritage and recognise it as an evolving social construct, shaped by ongoing cultural interactions, reinterpretations and reimagining. Heritage is as much about the past as it is of the present and recognising it as such qualifies preservation. This shift towards an often-standardised notion of heritage, facilitated by a disconnect between the general public and the intangible, is also a consequence of the rise of heritage experts. These experts, as spokespeople for institutionalised notions of heritage, play a crucial role in shaping the dominant narrative. It is, then vital to understand what heritage means today and whether trends of institutionalisation prevent us from protecting and valuing the meaning-making processes of contemporary collective identity. To do so, it is paramount to focus on the concepts of space and place. Laurajane Smith noted in her fieldwork that many communities cherished heritage sites as much as the intangible cultural practice that took place there. In her view, these sites may not always be architecturally impressive, but their significance stems from the participatory collective value that local people and communities attach to them [16] The "sense of place" that residents identify as heritage is site-specific to the practices, experiences, and histories. By stressing the importance of place and action as a unified whole, we agree that heritage cannot be fully relished if these elements are disconnected. One notable example highlighted by Smith [17] is the Wanyi Aboriginal Australian community, where "it became obvious that it was important for the women to recite and record these histories, not at home over a table, but in their cultural territory or 'country' and, where relevant, at the appropriate cultural site" [12] There is, in fact, an abyss between "space" (an abstract, undefined concept) and "place" (a space that is given meaning through human experience and interaction) [18].

Soja's *thirdspace* theory [19] transcends the traditional dualism of physical and imagined spaces by merging the two into a unified realm where both the real and the perceived coexist. In this sense, heritage can be seen as a "third space" where the past and present continually interact and reshape one another. This aligns with the idea that heritage is not static but actively created through the lived experiences and interpretations of individuals and communities, thus allowing for a more inclusive, fluid understanding of cultural practices and places. By applying Soja's thirdspace to heritage, we can better appreciate how spaces of memory, identity, and cultural practice evolve and how these meanings are constantly renegotiated through collective experience and social interaction.

A difference was investigated with different yet related perspectives by both Yi-Fu Tuan [18] as well as John Brinckerhoff Jackson [20]. The former focused on the social construction of the concept of places that become meaningful through the emotions, memories, and identities that people attach to them, while the vernacular landscape, theorised by Jackson are "those everyday landscapes shaped by ordinary people, rather than designed by architects or urban planners."

In this context, therefore, exploring the concept of cultural heritage connected to an inhabited and lived space implies a reflection on its holistic transformation that persists beyond the moment in which its symbolic meaning is fixed in cultural-historical terms.

Two opposing forces must be grasped, a centripetal one that would like the space crystallised in its *meaningful* representation at a given moment, as the only one possible. On the other hand, a centrifugal and vital force that invests it and continues its transformative flow. To them also corresponds a sort of dual statute, that of the external and cultural gaze that looks at a specific place as a *museum-object* and expropriates it of its experience by virtue of the higher value of its preservation and transmission to the future as a memory of present/past. On the other hand, there is the internal, grassroots one of those who have shaped that place over time, loading it with their own personal and collective values, rituals and experiences, the very ones to whom it owes its value in cultural, social and intangible terms. The paradox, therefore, is to disconnect these two elements, the *place* and the *community* that produce its *meaning* through its own human fabric and daily experience.

However, the Talvera River, together with the Isarco and the Adige, which flow just outside the city, constitute a significant orographic basin both in environmental terms and in terms of urban structure. The two most recently built parts of the city concerning the original historic core, in fact, are respectively beyond Talvera - the Italian area later conurbated with Gries, an originally autonomous German-speaking urban core, and then towards the increasingly newer districts in the different waves of urbanisation of the area up to the urabian limits represented by the Novacella area, Don Bosco and the autonomous and eco-sustainable Casanova neighbourhoods. On the other side, beyond Isarco, the city is also characterised by the trade fair, the industrial area and the technological pole constituted by the NOI Tech park and the new seat of the faculty of engineering, noncjé by the shopping centres and the airport is configured as an almost autonomous structure for the rest of the urban territory (Fig. 1).

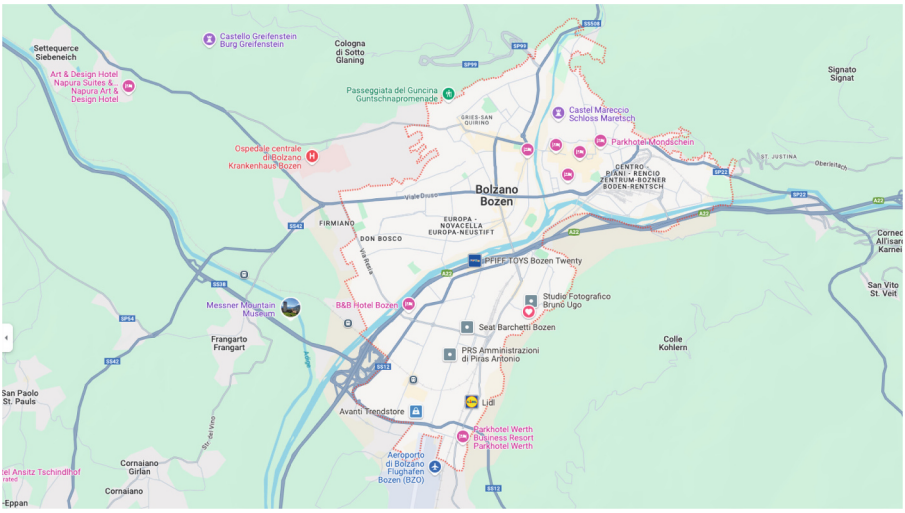


**Fig. 1.** Map of the city of Bolzano, showing the Talvera flowing into the Isarco/Eisack and, outside the urban area, the Adige river.

## 3 Landmarks and the Social Construction of a Place

The project ALICE *A-maz(e)-ing: phygitaL storytelling in desIgn for Cultural landscapes & hEritage* – funded by the Free University of Bozen-Bolzano as a Start-up project between 2021 and 2024 – explores the evolution of interaction design and digital communication, with a focus on multimodal narratives, the perception of phygital space, and the people and social experience, both from the theoretical as well as a methodological point of view in strong relation with the landscape and intangible heritage context. In its initial phase, the study explores how to apply the concept of generous interfaces – proposed by Whitelaw [21] – in space-based [22] and multimodal interactions [23] in the blended/phygital scenario. The research also investigates the shifting of the historical idea of cultural heritage (GLAMS, monuments, collections and so on) to more grassroots phenomena of the intangible heritage, including the immaterial social expressions and traditions aimed to preserve cultural and knowledge diversity.

In cities like Bolzano, where urban spaces continually evolve, the project addresses the complexities of representing tangible and intangible heritage in its contemporaneity. Through the application of multimodal narratives, augmented reality, and geolocation tools, the project seeks to move beyond traditional forms of heritage representation. It aims to transcend static depictions of heritage by incorporating more dynamic, participatory approaches rooted in the local context and social experience. This is particularly relevant in exploring how digital tools can interact with and preserve the vernacular landscape together in everyday, lived environments that are often overshadowed by official narratives.

Starting from the exploration of the local area, certain elements, both spatial and social, emerge clearly. But precisely because of its historical-cultural, ethnographic and linguistic complexity, the city and the territory of the province make the discovery, analysis, understanding and study of this urban and human space particularly complex, especially for those who are not organically part of one of the local communities. However, in the course of the exploration and discovery of the city, certain symbolic elements emerge overbearingly as belonging to one of the communities and/or historical stratifications, see, in this regard, the research such as the one conducted and presented at the ICCSA 2023 [24] on the *Laubengasse,* or the in-depth studies on the Fascist era and the "Italian" city, and the new urbanisation and the musealisation of certain neighbourhoods as in the Bolzanism experience [25].

However, the Talvera River, together with the Isarco and the Adige, which flow just outside the city, constitute a significant orographic basin both in environmental terms and in terms of urban structure. The two most recently built parts of the city for the original historic core, in fact, are respectively *Oltre Talvera* (Beyond Talvera) – the Italian area later conurbated with Gries, an originally autonomous German-speaking urban core, and then towards the increasingly newer districts in the different waves of urbanisation of the area up to the urban limits represented by the Novacella area, Don Bosco and the autonomous and eco-sustainable Casanova neighbourhoods. On the other side, *Olte Isarco* (Beyond Isarco), the city also characterised by the trade fair, the industrial area and the technological pole constituted by the NOI Tech park and the new headquarters of the faculty of engineering, as well as by the shopping centres and the airport, is configured

as an almost autonomous structure with respect to the rest of the urban territory (Figs. 2 and 3).




**Fig. 2.** The newly built Talvera bridge connects the municipalities of Gries, Dodiciville and Bolzano, 1900–02. (Source: Collection of historical postcards, 52. https://opencity.comune.bolzano.it/. CC BY-NC-ND 4.0)

The Talvera seems to be a natural and urban *limens* in this area, a watershed in a literal sense, concerning the zoning of the city, but on the contrary a social catalyst. A sort of free zone designed to become the promenade and urban park capable of bringing nature back into the centre of an urbanised and anthropic territory that contrasts with the city's mountainous surroundings. In addition, the very history of the city's relationship with the river turns out to be paradigmatic for social relations and the processes of symbolic construction of certain underlying values. The research therefore took this privileged relationship as a starting point and explored the post-modalities offered as a local case study, as well as a paradigm of other modes of relationship between urban spaces and river courses. Starting from these considerations, the research, therefore, analysed a series of case studies in which the relationship between city and river – one of the most common conditions in the processes of settlement in a territory and the development of urban structures in human history – developed according to different paradigms and recognisable, archetypal patterns. Among the possible ones, some recurring constructs have been identified. While not representing an exhaustive mapping, those identified propose significant patterns in terms of urban planning and the relationship or social experience of the territory. Among these, it is worth highlighting a few significant typologies, of which the Talvera represents one of the possible models for the subsequent development of the communication project of the case study. a) a



**Fig. 3.** The former town hall at Ponte Talvera (Source: Public Works Photographic Fund, 638. https://opencity.comune.bolzano.it/. CC BY-NC-ND 4.0)

*negation* relationship. This is the model adopted, for example in Italy by cities such as Genoa, Milan or Bologna and many others. Watercourses, whether torrential or with a stable course, have often been buried, covered or made to flow under buildings and transport infrastructures, denying their natural presence and forcing them into artificial beds. The adoption of this model often corresponds to episodes, sometimes dramatic, of overflowing and flooding. Especially under the transformations due to climate change, this solution increasingly shows its inadequacy in the construction of a homeostatic relationship between the city and its territory; b) A *dialogical* relationship in which the city and the river coexist. The former welcomes the river's course into its space while containing it and controlling it within routes and embankments that can also capture its seasonal variability and extreme events. Whether it is Paris or Rome, the course of the river also becomes an opportunity for the use of natural space within the urbanised territory; c) a relationship of *coexistence* in which the natural space of the river finds its freedom within the urban structure with ample room for flooding or variations in the course of natural cycles and extreme events; d) and finally a relationship of *cancellation*, as in the case of the city of Valencia, where the river was even diverted from its natural course, precisely because of the catastrophic nature of its floods, and the urban void left behind became an opportunity to rethink space in a social and shared dimension. Recent events (the torrential rains and the flooding in the winter of 2024 with dramatic consequences in terms of deaths) deeply question this model that seemed to be winning in its artificial balances.

The Talvera, in this sense. Represents a compromise in terms of the reorganisation of its space within the urban structure, but is unique in terms of how its "reorganisation" was conceived and realised.

## 4 The *Telve Humanscape / Mappe del sentire* App: A Case Study

Drawing from Herzfeld's [26] concept of cultural intimacy, which posits that national identity often relies on informal, local practices, the project focuses on the heritage that emerges from the everyday spaces and social memories of local communities. In the context of Bolzano, the Talvera River area serves as a relevant case study in demonstrating that although this area may not be celebrated in traditional forms of heritage, it holds considerable contemporary socio-cultural and meaning-making significance that underwent 4 major phases. The Talvera-Talfer River and its Promenade (also known as the Wassermauer Promenade) have undergone numerous transformations over the years, mirroring the city's development, and its relation to nature and between communities. In its early days, the river was primarily a functional element for the city, providing water for industry, particularly for mills, the slaughterhouse in Macello and the numerous vineyards. However, it also posed risks due to frequent flooding, making the area surrounding it dangerous and unpredictable. This instability discouraged the formation of a cohesive public space where people could meet and engage, limiting the river's potential to become a recognized meaning-making site. In 1934, during the Fascist regime, the architect Marcello Piacentini was commissioned to draft the expansion plan for the city of Bolzano. Piacentini's project envisioned the creation of a district with a distinctly Italian character, with the Victory Monument at its core. This project was part of a broader strategy by the Fascist regime to Italianise South Tyrol, which had been annexed to the Kingdom of Italy in 1919 (Figs. 4 and 5).



**Fig. 4.** View from the Talversa Bridge towards the Victory Monument (Courtesy of the authors).

While most of its projects have been realised, the rectification of the Talvera-Talfer has not been implemented and the riverbed together with its margins remained significantly unchanged. It was with Michele Lettieri [27] that, for the first time, the Talvera



**Fig. 5.** The actual town hall at Ponte Talvera (Courtesy of the authors).

River was truly reimagined as a space for the people. Between 1970 and 1977, Lettieri worked to transform this space into the Prati del Talvera, Bolzano's most important public park. His project was unique because it was not only a municipal effort but also involved students from the Istituto Tecnico per Geometri "Andrea e Pietro Delai", the Italian Army's IV Alpine Army Corps, and the municipal gardening department. This collaborative approach helped turn what was once an underutilized and unstable landscape into a vital green lung for the city. In the present day, the river is undergoing a further transformation. The Bacini Montani, a provincial agency responsible for water management, is working on the re-naturalisation of the river's flow. This project aims to restore a more natural and ecological balance, improving the river's environmental health and ensuring its continued role as a central and sustainable part of the city's fabric.

The Talvera River area presents a rich repository of historical traceability, archival materials, and both tangible and intangible elements of local cultural heritage. While it may initially appear devoid of immediately recognizable, visually triggered stereotypical narratives, this very quality offers an opportunity to explore urban development and its socio-environmental and political implications. The site provides a seemingly neutral ground through which the complexities and historical responsibilities embedded in the city's biography can be critically examined (Fig. 6).

In this initial phase of the research, emphasis has been placed on historical-archival investigation, prioritising the direct analysis of a diverse range of documentary sources. These include photographic, audiovisual, iconographic, and cartographic

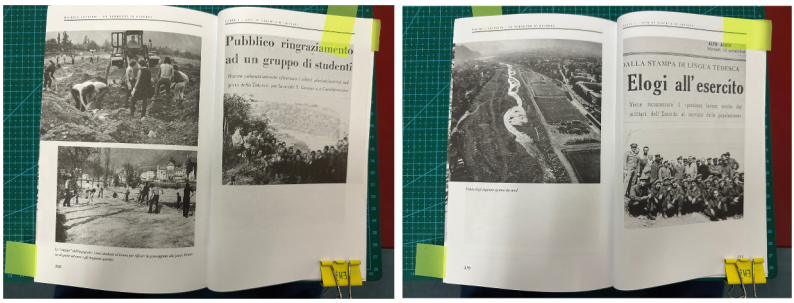


**Fig. 6.** Images of the Michele Lettieri's autobiography: *Un torrente di ricordi. Racconti conviviali della vecchia Bolzano* [A torrent of memories. Convivial tales of old Bolzano] published in 2015.

materials, alongside institutional paperwork, correspondence, and urban planning proposals. Engaging with these resources has also allowed for an intersection with pre-existing studies and projects, conducted by both institutional and non-institutional entities, such as *Lungomare, Platform Cultural Heritage Cultural Production*, the *Historical Archive*, Fondo Lettieri, Fondo Rasmo, *Bacini Montani*, *Giardinerie Pubbliche*, *Stadtarchiv Bozen*. This allowed us to historically and visually map valuable facts and testimonies and put them into relation with the present state of the area and the lived experience. These materials helped us understand the complex relationship between urban development, social cohesion and the natural environment, offering insights into historical trends, present desires and future possibilities. The outcome provided a comprehensive database of visual and written material about the development of the Talvera area, reinforcing our thesis that, while visually discreet, it is a site rich in socio-cultural and historical significance. From this evidence, it was clear that the river and its surroundings have undergone continuous change and evolution, shaped by and reflecting the mutual relationship between the socio-ecological and political contexts (Fig. 7).

Doreen Massey argued that space is a social product, shaped by social, economic, and political relations rather than being a static, pre-existing container. She emphasizes that space is dynamic, always in the process of being made. In *For Space* (2005), she writes: "Space is the product of interrelations; as constituted through interactions, from the immensity of the global to the intimately tiny" [28]. To align with this perspective, methods of one-to-one and participatory qualitative research have been applied in this study. These approaches allow us to gather and analyse non-numerical and personal perspectives on how the Talvera area is, was, and will be lived. Additionally, they have enabled us to access individuals' social realities beyond pre-existing networks. To align with the project objectives and the chosen methodology, the following operations were outlined: one-to-one interviews with individuals who frequent the Talvera area, voice message chains, open calls for contributors in local newspapers, and open-call contributions in local Facebook groups. These operations are currently in the early stages and progressing. Therefore, results and conclusions will be available at the end of the assignment. So far, 26 participants, without age limitations, have shared audio memories, which have been categorised as follows: Italian (local linguistic group), Italian (non-local), Expats, and German (local linguistic group).

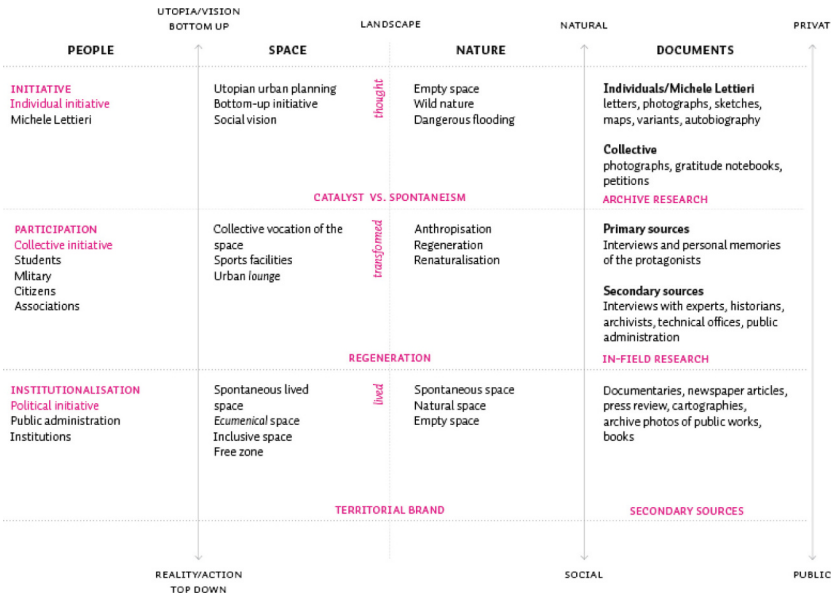


**Fig. 7.** The diagram shows the analysis made on the 4 project research tracks, 1) people, 2) space, 3) nature, 4) documents and the different levels of interpretation: a) individual, b) collective and c) institutional (Courtesy of the authors).

This project explores the blending of physical space and digital technology in the context of intangible heritage and collective experiences. It moves beyond traditional digital transpositions (like guided tours) by leveraging augmented reality (AR) to enhance the experience of *heritage* while preserving the real-world environment. The emphasis on perceiving ourselves as being in *space*, and the prosthetic potential of digital tools shape the project's focus on spatially embedded, responsive experiences. Drawing on Doreen Massey's insight that "there is no other place than the place we empathise with or perceive with", this project reinforces the notion that heritage is intimately tied to the lived experience of space. Massey's concept challenges us to rethink how places are not simply geographical locations but are understood and experienced through emotional and cultural engagement. This idea is central to the project, which uses geolocation and user proximity as triggers to create a digital experience that is both spatially embedded and responsive to the physical world around it (Figs. 8 and 9).

The use of augmented reality (AR) as a tool offers a way to connect digital interactions with physical environments without overwhelming or distorting the actual context. Rather than creating a virtual space separate from the real world, as is often the case in fully digital experiences, the AR experience interacts with and depends on the user's physical presence in the space. The digital environment integrates into the tangible one as a continuum. They enhance one another, not replace or substitute. We asked casual park regulars to share visual and/or audio memories and hopes. We then recorded, archived and geolocated where these memories belong to form a tapestry of significance. As the user navigates Prrati del Talvera, these recollections fade in and out between historical




**Fig. 8.** The *Telve Humanscape / Map*pe del sentire prototype: situated interactions with historical documentation (Courtesy of the authors).

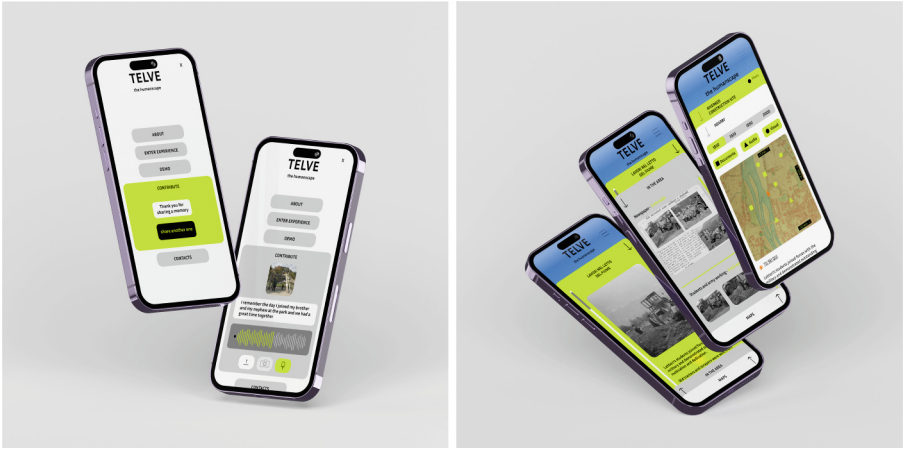


**Fig. 9.** The *Telve Humanscape / Mappe del se*ntire prototype: a) login and acoustic interactions; b) geobased interactions (Courtesy of the authors).

materials. In this manner, users are afforded the ability to navigate freely within the "real space", allowing them to spontaneously gravitate towards points of interest or receive notifications upon nearing one. This dynamic not only ensures that the materials remain

spatially unobtrusive and readily accessible but also underscores the project's commitment to preserving the eco-systemic integrity of analogue environments. Consequently, in certain instances, users may be alerted to the presence of a significant point; however, access to its content will be contingent upon a requisite number of individuals occupying the same area. This density-dependent activation is particularly pertinent in cases where the materials pertain to collective experiences. By employing this approach, the project seeks to safeguard the communal nature of a blended environment while mitigating the isolating tendencies frequently associated with digital realms. Furthermore, it ensures that the experience remains congruent with the collective identity of the place it seeks to augment and narrate. Simultaneously, the project aligns with the sociological concept of *boundary objects,* as introduced by Davide Spallazzo [29], wherein users, as well as analogue and digital environments, engage in interaction at liminal thresholds.

This mirrors the concept of *heterotopia*, as described by Michel Foucault [8], where spaces can be understood as historical situations, sites of layered meaning, and cultural narratives that unfold in relation to their surroundings. This approach allows the project to preserve the historical context of the place while enhancing it with digital overlays that add depth and interactivity, rather than replacing the physical environment. The project's dynamic, where content is triggered only when a sufficient number of users are present in a given area, highlights its commitment to preserving the collective, shared experience of space, which is a key feature of intangible heritage. The use of density-based access introduces an important aspect: material content related to shared experiences becomes accessible only when the social conditions, in this case, the gathering of a certain number of users in proximity, are met. This preserves the ecological nature of heritage, where the experience is not simply about individual consumption but about the social interaction that often defines how heritage is shared, passed down, and experienced in real-world contexts. This strategy of keeping the digital experience inherently social and contextual resonates with Henri Lefebvre's notion that space is not just an empty container, but a socially produced entity that reflects the relationships, identities, and interactions of people within it. Lefebvre's model of space [30], perceived, conceived, and lived space, can be seen in this approach. By avoiding the isolation that digital technologies often impose, this project uses AR not to replace the physical, collective experience of place, but to enhance it by aligning digital interventions with the spatial dynamics of the real world. The boundary object of the AR experience lies at the intersection of digital technology and the physical world, enabling a collaborative, context-aware experience of heritage that is not only more inclusive but also more dynamic and socially embedded.

Through this approach, the project respects the ecological nature of heritage, fostering a collective, immersive experience that reinforces the idea that heritage is not simply a static object to be viewed, but a shared, lived experience that connects individuals.

## 5 Conclusions

In conclusion, this project seeks to further the development of an ethnographic map that captures the evolving and living heritage of the Talvera, weaving together archival materials and contemporary testimonies. By documenting and mapping these narratives, we aim to preserve the dynamic and collective memory of the place, ensuring that its

intangible cultural heritage remains accessible and resonant. Rather than imposing a rigid digital framework, the project prioritises an approach that enhances, rather than overrides, the organic social experience of the site. This ensures that interactions remain fluid and spontaneous, preserving the organic process of meaning-making and significance negotiation, which qualifies the Talvera as a living heritage site and its social dimension. The next phase will focus on developing a functional prototype and user testing to refine its responsiveness and inclusivity. Additionally, multilingual integration will be a key priority, fostering accessibility and engagement across diverse communities, ultimately reinforcing the project's role as a participatory and socially embedded storytelling medium.

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## References

1. Turkle, S.: Life on the Screen: Identity in the Age of the Internet. Simon & Schuster, New York (1997)
2. Sutherland, I.E.: The ultimate display. In: Proceedings of IFIP 65, **2**, pp. 506–508 (1965). http://www.universelle-automation.de/1965_Boston.pdf. Accessed 27 Mar 2025
3. Wiser, M.: The Computer for the 21. Century (1991). https://web.archive.org/web/20111116133741/http://wiki.daimi.au.dk/pca/_files/weiser-orig.pdf. Accessed 27 Mar 2025
4. Negroponte, N.: Beyond Digital Wired, 12 (1998). https://www.wired.com/1998/12/negroponte-55/. Accessed 27 Mar 2025
5. Accoto, C.: Il mondo in sintesi. Cinque brevi lezioni di filosofia della simulazione. Egea, Milano (2022)
6. Ilius, L.: A Definition of 'Phygital': The space where real and virtual dimensions meet, Talent Transformation (2023). https://insights.talentformation.com/a-definition-of-phygital-the-space-where-real-and-virtual-dimensions-meet/. Accessed 27 Mar 2025
7. Resmini, A.: The Spatial Turn in Information Architecture. In Bollini, L. (ed.) Per-forming Spaces. On Designing Phygital Narratives within the Cultural Heritage Ecosystem. Biblion Edition, Milano (2025)
8. Vidler, A., Foucault, M., Johnston, P.: Heterotopias. *AA files* **69** (2014): 18–22. https://www.jstor.org/stable/pdf/43202545.pdf?casa_token=UKOLhVAdVLgAAAAA:xHeqvwA-TfcEA4Bs-990L6KxdQBruJ2cnZHoKlzbgjniPcW-jkhuUkaWhUNkYzMSCn3ArD7_31Tm_k2TWPhQP2oR1kpjGP8nqe2XtmvHc9yVPinEwys. Visited 27 Mar 2025
9. Kirsh, D.: Embodied cognition and the magical future of interaction design. ACM Transactions on Computer-Human Interaction (TOCHI) **20**(1), 1–30 (2013). https://avant.edu.pl/wp-content/uploads/Avant-David-Kirsh-Embodied-Cognition-and-the-Magical-Future.pdf. Visited 27 Mar 2025
10. Morville, P.: Ambient Findability: What We Find Changes Who We Become. O'Reilly Media Inc, San Francisco (2005)
11. Bollini, L.: Dall'ipertesto alla performance multimodale: Forme di rappresentazione digitale dell'allestimento. In: Borsotti M.& Sartori, G. (Eds.): Il progetto di allestimento e la sua officina. Luogo, memoria ed evento: Mostre alle Fruttiere di Palazzo te, Mantova, pp. 33–35. Skirà, Milano (2009)
12. Smith, L.: Uses of heritage. Routledge, Abingdon-on-Thames (Uk) (2006)

13. ([15] Faccin 2025). In: Bollini, L. (ed.) Per-forming Spaces. On Designing Phygital Narratives within the Cultural Heritage Ecosystem. Biblion Edition, Milano (2025)
14. Cleere, H.: Designating World Heritage Industrial Sites. In: International Engineering History and Heritage: Improving Bridges to ASCE's 150th Anniversary, pp. 171–174 (2001)
15. Urry, J.: Sociology of time and space. The Blackwell companion to social theory (1996)
16. Bollini, L.: Territories of digital communities. Representing the social landscape of web relationships. In: Computational Science and Its Applications-ICCSA 2011, Santander, Spain, June 20–23, 2011. Proceedings, Part I 11, pp. 501–511. Springer, Berlin Heidelberg (2011)
17. Smith, L., Akagawa, N.: Intangible Heritage. Routledge, London (2009)
18. Tuan, Y.-F.: Space and Place: The Perspective of Experience. University of Minnesota Press, Minneapolis (1977)
19. Soja, E.W.: Thirdspace: Toward a new consciousness of space and spatiality. In: Communicating in the Third Space, pp. 63–75. Routledge, Abingdon-on-Thames (Uk) (2008)
20. Jackson, J.B.: The future of the vernacular. Understanding ordinary landscapes, pp. 145–156 (1997)
21. Whitelaw, M.: Generous interfaces for digital cultural collections. Digital humanities quarterly **9**(1), 1–16 (2015)
22. Bollini, L.: Per-forming Spaces. Interaction, experience, and interface design at the phygital turn. In: Bollini, L. (ed.) Per-forming Spaces. On Designing Phygital Narratives within the Cultural Heritage Ecosystem. Biblion Edition, Milano (2025)
23. Bollini, L.: Registica multimodale. Il design dei new media. Maggioli Editore, Rimini (2008)
24. Bollini, L., Mastroianni, M.L.: Typographic topology/topographic typography. reading the urban identity through the historical typescape: hypothesis for an AR situated mobile app. In: O. Gervasi et al. (eds.): Computational Science and Its Applications – ICCSA 2023, LNCS, vol 14105, pp. 613–629. Springer, Cham (2023)
25. Bolzanism Museum. https://www.bolzanism.com/. Visited 27 Mar 2025
26. Herzfeld, M.: Spatial cleansing: Monumental vacuity and the idea of the West. J. Mater. Cult. **11**(1–2), 127–149 (2006)
27. Lettieri, M.: Un torrente di ricordi. Racconti conviviali della vecchia Bolzano, Edition Raetia, Bolzano (2015)
28. Massey, D.: For space. SAGE Publications, Thousand Oaks (CA) (2005)
29. Spallazzo, D.: Exploring the role of boundary objects in mobile experiences for the cultural heritage field. In: Bollini, L. (Ed.): Per-forming Spaces. On Designing Phygital Narratives within the Cultural Heritage Ecosystem. Biblion Edition, Milano (2025)
30. Lefebrve, H.: The Production of Space. Basil Backwell (1991)