



“The maptelling as an embodied protocol for tourism design: A pilot study on Sardinia (Italy)”

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Abstract *: In the contemporary era, tourism research increasingly focused on the *tourist* experience, in response to the growing diversification of tourism typologies and the different forms of performance enacted by visitors. This shift was accompanied by an emphasis on the relevance of accessing territorial specificities and local identity in order to engage with realities that differed from the logic of mass tourism. Consequently, it has been recommended to identify paradigms capable of addressing such an emerging practice by leveraging communicative mechanisms that tourists could perceive as appropriate and engaging as conspecifics. This work presented a pilot study conducted in Sardinia (Italy) to test *map-telling*, a research methodology that combined storytelling and mapping as shared human activities to foster connections between visitors and residents of the selected destination. The activity was included within a NRRP-funded technology transfer project operating across the entire island, with the objective of supporting a form of tourism grounded in territory needs and in the respect of local inhabitants as key stakeholders. Based on the paradigm of embodied cognition, the study introduced a first prototype of geolocated, community-based storytelling. Further research is going to aim at assessing its replicability as a user-centred, non-representational model suitable for phygital tourism.

Keywords *: Maptelling; Embodied Cognition; Technology Transfer; e.INS; Alta Gallura.



Introduction

The evolution of performative acts renders necessary to embrace the potential of multiple *tourisms*, in line with the typological pluralisation deriving both from the increase in travellers/visitors and the diversity of their personalities, and from a more heterogeneous delineation of destinations, which is a consequence of post-Fordism. Such a reconfiguration shifted the attention on destination image's development as well as visitors' perception within the tourist experience (Malvica et al., 2022; Malvica et al., 2024b). Also, it implied a focus toward the contemporary tourist's need to access the most authentic features of a destination. An increasing number of visitors link their level of satisfaction to experiences that could go beyond what is presented through the logic of mass communication, seeking contact with local communities and, in accordance with a stage metaphor, with the backstage of places (MacCannell, 1973; Pearce & Moscardo, 1986). This scenario suggests investigating appropriate communicative approaches capable of provided -even within today's phygital tourist performances (Ballina, 2019)- an adequate as well as respectful dialogue between tourists and what residents preserve and are willing to share as place-related tacit knowledge.

The integration of storytelling into geographical scholarship (dell'Agnese, 2023) and tourism studies (Luo et al., 2023) translated into an increased research on the visitor's subjective experience (Su et al., 2022) and its grounding in emotional engagement, through symbols that facilitate the understanding of the narrated story associated with the destination (Gabriel, 2000; Lundqvist et al., 2012). Within this turn, a specific framing of the shared tools through which conspecifics interpret reality and its associated meanings is also recommended. Among these, particular attention is devoted to maps, which move from the concept of representation to that of performative, individual agency. Thus, maps provide an active process of dialogic and dynamic connection between the mapping subject and the mapped object (Malvica & Capodici, 2021).

The present study is grounded in an interdisciplinary dialogue, enabling an exchange between the geographical sciences and the cognitive sciences: such a choice is well aligned with the actual shift in the ontology of geography towards non-representational theories (Tanca, 2018). Within this framework, and from the perspective of tourism promotion, a precise notion of *maptelling* emerges as a mapping practice accompanied by the need to frame territory through stories, which support and co-construct the destination. As a results of a dynamic dialogue between mapping and storytelling, the proposed paradigm is intrinsically connected to embodied cognition, where mapping and storytelling are processes shared among conspecifics and anchored in motor and exploratory affordances. The intended maptelling was



applied to the pilot study of Tempio Pausania (Sardinia, Italy) as part of a technology transfer activities promoted by a National Recovery and Resilience Plan (NRRP)-funded project. The aim was to investigate how maptelling-related stories can contribute to an appropriate framework of sustainable and responsible tourism.

The maptelling as a case of embodied cognition

Embodied cognition emphasises that cognitive processes arise both from the internal organisation of the organismic system and from its capacity to generate information through interaction with the environment. An embodied mind represents an essential element for agency and action, which, in line with a phenomenological approach, should not be separated from perception (Borghi & Caruana, 2015; Clark & Chalmers, 1998; Pfeifer & Bongard, 2006). The organisation of the world is therefore a reflection of the organisation of the individual, in accordance to a continuous circularity that is never closed in on itself (Capra, 2014). For these reasons, the embodied cognition approach is now recommended within tourism strategies (Everingham et al., 2021; Kock et al., 2019; Liu, 2024; Malvica et al., 2024b; Yang, 2025).

As already claimed, embodied cognition considers equally individual perception and action, in line with the notion of affordances as qualities of objects which, although invariant, can be perceived by individuals only by virtue of their sensorimotor possibilities (Gibson, 1979). This aspect is integral part of various geo-technologies: for example, well-known webGIS platforms (e.g., the standard mapping applications provided on smartphones such as Google Maps) are characterised by their ability to track and continuously update the users' position and to embed them within the map itself, thereby constantly modifying it in accordance with the observer's location. As these applications are continuously 'vigilant', they can reconstruct a 'map of the individual' by storing preferences, favoured destinations, and related data (Greenfield, 2017). Thus, both the map and the individual constitute a single complex system, in which feedback enables a cyclical influence of both subject and object/environment (Noë, 2010).

The engagement fostered by maptelling is grounded in an understanding of the cognitive bases that humans display in their interaction with the external environment. Embodied cognition, in its various articulations, integrates non-representational theories that position perception and action as tightly coupled mechanisms, consistent with a sensorimotor framework of action-oriented representations (Zipoli Caiani, 2013). The notion of sensorimotor contingency within representations offers crucial insights for a renewed conceptualisation of mapping. Spatial mapping is deeply rooted in a sensorimotor paradigm: humans have developed tools, such as physical maps, to enhance spatial navigation -a capacity closely connected to the evolution of symbolic thought and language. The body remains the fundamental



reference point of spatial experience, critically shaping how individuals map, interpret, and navigate the surrounding environment (Malvica & Capodici, 2021).

This perspective highlights that mapping transcends mere engagement with the world, instead configuring itself as a process of meaning attribution and cognitive interpretation. Maps function as cognitive tools (De Brigard & Sinnott-Armstrong, 2022; Tolman, 1948) and should therefore never be considered a static object; on the contrary, it operates as a medium of spatial interpretation. To the human predisposition for mapping and the conception of the map as the product of a participatory process (del Casino & Hanna, 2006; Kitchin & Dodge, 2007) is added the narrative dimension, understood as the comprehension of reality through a narrative structure.

Materials and Methods:

- ***The e.INS project and the case study:*** *Ecosystem of Innovation for Next Generation Sardinia* (e.INS), funded by NRRP, aims to foster dialogue between the research community and the regional territory of Sardinia, with the objective of promoting an inclusive and territorially cohesive development model. Falling within the Area of Specialisation *Humanities and cultural studies, creativity, social transformations, and inclusive societies* of the National Research Programme, the project advances a model of sustainable growth grounded in systematic technology transfer pathways, widespread digitalisation, and the integration of traditional knowledge with innovation. It is organised according to a Hub-and-Spoke model, in which ten Spokes correspond to distinct thematic areas of intervention. Within the global scheme, Spoke 2 (<https://eins-spoke2.uniss.it>) is dedicated to the tourism and cultural heritage sector, and is therefore oriented towards the entrepreneurial ecosystem of this field as well as towards the involvement of local communities in territorial enhancement initiatives, within the broader framework of the digital transition promoted by the NRRP programme.

Within the activities of Spoke 2, a central role is played by technology transfer. In line with the communication principles of sustainable tourism, the objective is to deliver a tool capable of conveying territorial identity, while considering the local community as the primary stakeholder, particularly in contexts where residents' mementos and lived experiences provide the essential narrative value (quid) of the place. The present research is grounded in a clearly defined area of investigation: Alta Gallura, that is, part of a historical-geographical region in northern Sardinia strongly characterized by distinctive landscape, food and wine, cultural, and socio-territorial features. This territorial focus derives from a survey conducted within the framework of Spoke 2 -which cannot be discussed in detail here- through which local inhabitants expressed a clear awareness of the need to communicate a territorial



distinctiveness that extends beyond the administrative boundaries of individual municipalities. The pilot study was carried out in the historic centre of Tempio Pausania, which hosts both the Union of Municipalities of Alta Gallura and the Local Action Group (LAG) Alta Gallura-Gallura. This location was selected with the explicit intention of replicating the proposed model in other municipalities of the region.

- *Maptelling as a visual research methodology:* The maptelling proposed in this work is structured in accordance with visual research methodologies applied in geographical research. In particular, it follows the photovoice approach, i.e., a participatory methodology commonly employed to elicit and represent local communities' perspectives on the processes under investigation: for this reason, photovoice is frequently used to produce outcomes that are meaningful for policymakers and, more broadly, for territorial stakeholders. This methodology involves the subjective collection of photographs generated during fieldwork in response to researchers' prompts focused on specific research topic and is complemented by moments of collective discussion (e.g. focus groups). In line with its qualitative nature and its strong reliance on individual responses, it typically draws on small sample sizes, in order to ensure direct and in-depth participant engagement, with the literature generally recommending a small sample of participants (Malvica et al., 2025a).

The maptelling process follows this procedural framework, replacing photographs with geolocated narratives (Fig. 1). In an initial design phase, maptelling was conceived as a form of photo-based mapping, in which tourists could seek engagement through visually driven itineraries proposed by a peer community. In this earlier approach, the sequential arrangement of photographs enabled the recognition of an immersive narrative unfolding across space (Malvica, 2024). Subsequently, maptelling was further investigated in relation to its capacity to justify the construction of a specific destination through the unity provided by a coherent territorial storytelling, upon which the map itself is structured (Malvica et al., 2024a; Malvica et al., 2025b). In both cases, the underlying assumption was that narrative acts as a structuring device and the map as the geographical translator, delineating the boundaries of places to be visited as a destination and legitimizing their singular framing. Maptelling therefore provides a multiscale spatial framework. In the case presented through this work, the process explicitly foregrounds the local community, with the aim of share a narrative closely aligned with the genius loci and consistent with slow tourism principles, i.e., the exploration of limited spatial extents over extended temporal frames. Participant-citizens are thus invited to convey their personal experiences of the territory through stories anchored to specific locations, which are subsequently represented as narrative landmarks within the map.



Being embodied-centred and oriented towards the representation of a territory for tourism promotion purposes, the maptelling unfolds as an iterative design process integrating conceptual, operational, and evaluative phases typical of the User-Centred Design (UCD):

1. Phase 1, user-centred conceptual design: This phase consists of the identification of the 5Ws (*Who?*; *What?*; *Where?*; *When?*; *Why?*) to clearly define the intended audience, the contents, the spatial and temporal contexts, and the objectives of the narrative to be mapped. At this stage, the location for the field survey, the participants involved in the narrative mapping process, and the target user are identified. For the present study, the 5Ws framework was articulated as follows:
 - *Who?* The map-based storytelling process was entrusted to the local community of Tempio Pausania. This choice aimed to provide an engaging narrative for tourists interested in a more intimate form of exploration, as if they were being personally accompanied by local inhabitants in discovering anecdotes, legends, and small-scale stories that would otherwise remain unspoken or inaccessible through conventional tourism narratives.
 - *What?* Within the broader framework of tourism destination framing, maptelling could operate across three distinct scenarios: 1) as a starting point for a general research question, opening the way for further theoretical or empirical developments; 2) as a support tool for emerging destinations or destinations experiencing difficulties in articulating a coherent storytelling strategy; 3) as a means of configuring an alternative reading and mapping of a destination that does not conflict with, but rather complements, the narratives already successfully established by a consolidated destination. Tempio Pausania fell within the third scenario, as it has already developed thematic and tourist itineraries related to urban trekking and cultural heritage, to which the proposed maptelling approach offers a parallel and community-driven interpretative layer.
 - *Where?* As the design setting for the pilot study, the historic centre of Tempio Pausania was selected, as it hosts key strategic stakeholders for the Alta Gallura region.
 - *When?* A fieldwork session lasting approximately two hours was conducted with the participants, allowing for free exploration according to individual needs and preferences.
 - *Why?* All activities were conducted in compliance with the objectives of Spoke 2, aiming not to replace the ongoing destination framing of Tempio Pausania, but rather



to provide an alternative and complementary reading and mapping of the territory, without generating interpretative or strategic conflict.

2. Phase 2, Co-creative and participatory mapping (physical design): It corresponded to the fieldwork, during which participants were actively involved both in the initial construction and in the subsequent validation of the contents. This approach fostered the emergence of situated knowledge and shared interpretations of the territory.
3. Phase 3, Usability testing: This step focused on translating the collected data into an interface suitable for conveying the overall narrative experience. The results of the usability tests should lead to an iterative process of revision and refinement, allowing a return to the earlier phases of conceptual and physical design and the appropriate reintegration of the map-telling outputs. In line with the use of digital tools that nevertheless preserve the centrality of physical experience (phygital), this entails integrating the traditional *5Ws* with the *H* of *How?* (Singer, 2008). In the present case, this step corresponded to the selection of an interface capable of communicating both the narratives and the associated mapping outputs. The choice of interface was informed by the principles of phygital tourism, according to which visitors are generally inclined to use digital technologies, if these do not overshadow the centrality of the physical environment during the exploration experience.

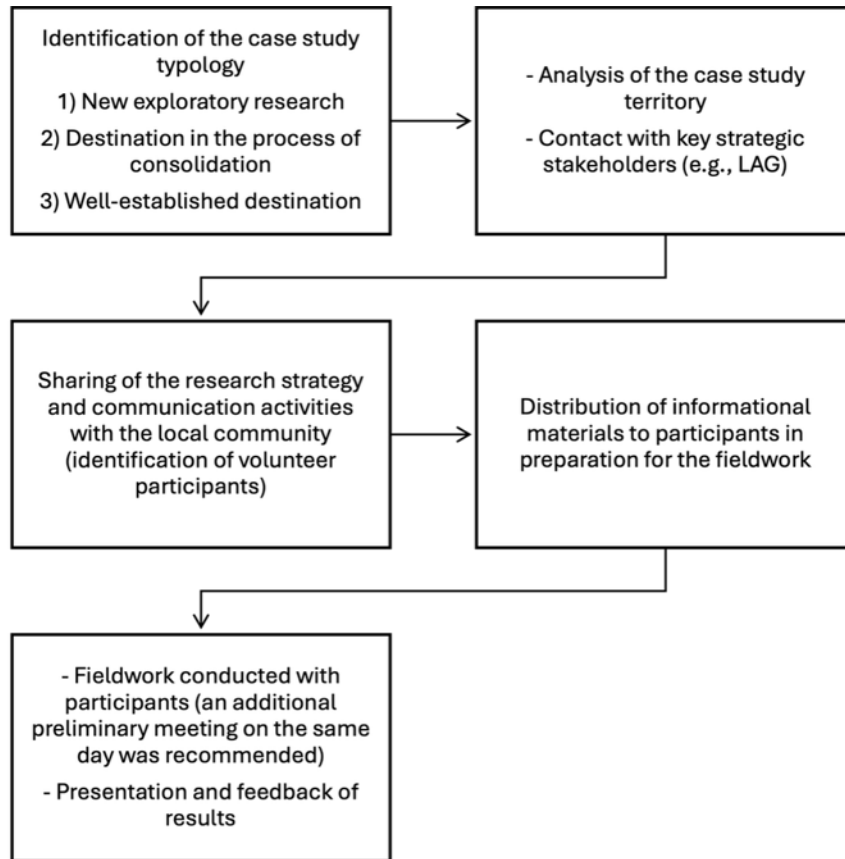


Fig. 1. Tourist maptelling experimental protocol: synthesis of the main steps.

Participants and Data collection

Data gathering was structured through a progressive and bottom-up approach, beginning with the direct involvement of territorial stakeholders (i.e., *Unione dei Comuni Alta Gallura*; *LAG Alta Gallura-Gallura*; Municipality of *Tempio Pausania*'s Department of Tourism and Department of Education). These actors played a mediating role between the research team and the local community, facilitating access to the territory and supporting the activation of participatory dynamics. Through their intermediation, the local community was engaged in an on-site maptelling activity aimed at testing and co-creating the first set of geolocated stories-points, combining spatial mapping with narrative content. Prior to the field-based activity, some preparatory meetings were organized, including both in-person and online sessions. These moments were dedicated to the dissemination of multimedia materials and to the introduction of the project objectives and methodologies, with the aim of familiarizing participants with the maptelling approach. On the day of the field activity, an additional introductory meeting was held at the municipal headquarters to further provide participants with methodological guidance, define the case study and



align expectations regarding the data collection process. The objective was explicitly defined as the representation of Tempio Pausania as experienced by its citizens, conveying the lived reality of a place rooted in personal experience. This was achieved by associating streets and/or objects with narratives intended to communicate this heritage to potential visitors.

On the same day, the field survey was conducted. The area of investigation was limited to the historic centre of Tempio Pausania, in order to delineate its boundaries and to observe potential convergences and/or divergences with the official mapping of points of interest (e.g., cultural assets). Participants (i.e., ten locals aged 18 and over) were provided with a notebook and a pen to support their data collection (i.e., geolocated stories); Participants were encouraged to actively document places, stories, and meanings through a combination of written notes, audio recordings, and photographic materials as well. Although maptelling is strongly grounded in sensorimotor exploration, older participants shared their memories with the researcher at the municipal offices, in parallel with the field survey conducted by the other participants. The field activity lasted approximately two hours. At the end of the survey, the group reconvened at the Town Hall, where participants shared reflections and handed over the collected materials to the researcher. Subsequently, all participants were debriefed.

Participation in the field survey was voluntary, and consent was inferred from participants' presence and active involvement at the survey location. All contributions were voluntarily shared with the research team and treated as qualitative data. Following the field activities, the collected materials were systematically reviewed, interpreted, and re-elaborated by the researchers.

Results and discussions

The prototype delivered a maptelling experience through the ArcGIS StoryMaps platform (<https://storymaps.arcgis.com>; Fig. 2). In line with the theoretical background, the tool is neither a simple map nor a simple collection of geographic data, but rather an interactive *phygital* narrative in which geography becomes a true narrative language, capable of connecting places, information, and meanings within a coherent and guided framework.



Fig. 2. Initial screen of the StoryMap.

From a technological and digital perspective, ArcGIS StoryMaps represents an effective web-GIS-based platform for geographic storytelling. The environment enables the integration of dynamic maps, geospatial data, and multimedia content without requiring programming skills; such a framework makes the prototype easily replicable and adaptable to other territorial or thematic contexts, while maintaining a high level of communicative quality. A core element of the prototype was its strong focus on user experience: the interface is designed to be intuitive and user-friendly, fostering natural engagement even among users with no prior GIS expertise. Navigation is primarily based on page scrolling and direct interaction with story-maps, avoiding an overload of commands or technical elements. Users are guided along a narrative itinerary that alternates moments of descriptive in-depth analysis with spatial visualizations, enabling a progressive interpretation of the territory.

Each section contributed to the construction of an overall interpretative framework, with the aim of allow users to focus on the narrative rather than on the tool itself (<https://arcgis.com/HO4fD1>):

- *Introduction:* The introductory section presented the overall aims of the project and explicitly foregrounds the fundamental role of the local community in narrating the territory. Rather than relying on institutional or top-down representations, the StoryMap positioned inhabitants as primary knowledge holders,



emphasizing their capacity to convey meanings, memories, and practices that could otherwise be invisible in official cartographic or tourism-oriented narratives.

- *How to Experience Maptelling*: This section briefly introduced the conceptual and experiential principles of maptelling, outlining its narrative and participatory spirit. It also provided access to a dedicated vademecum (<https://osf.io/3r8hc>), developed by the researcher, which included methodological guidelines and practical recommendations for engaging with the StoryMap. The objective was to support both users and contributors in understanding the logic of narrative mapping and the role of storytelling in spatial representation.

- *A Historical-Geographical Region*: The third section framed the case study within the broader historical-geographical context of Alta Gallura, the region in which Tempio Pausania is located. This section emerged directly from the narratives shared by participants, who articulated strong connections between Tempio and surrounding localities (e.g., Sassari) through idiomatic expressions, shared traditions, and references to historical commercial exchanges. These accounts revealed a regional identity that exceeds contemporary administrative boundaries, highlighting Alta Gallura as a lived and relational territory.

- *Start: The Maptelling of Tempio Pausania*: This section constituted the core of the StoryMap and presents the maptelling itinerary within Tempio Pausania through a sequence of geolocated narrative stages. The resulting spatial narrative differs significantly from officially recognized cultural points of interest. Instead, it focused on places associated with former market streets, abandoned venues that once hosted internationally renowned artists, and anecdotes related to past inhabitants and community customs. Such elements were largely inaccessible to visitors without direct mediation by residents, underscoring the value of situated, experiential knowledge in constructing alternative territorial narratives (Fig. 3).

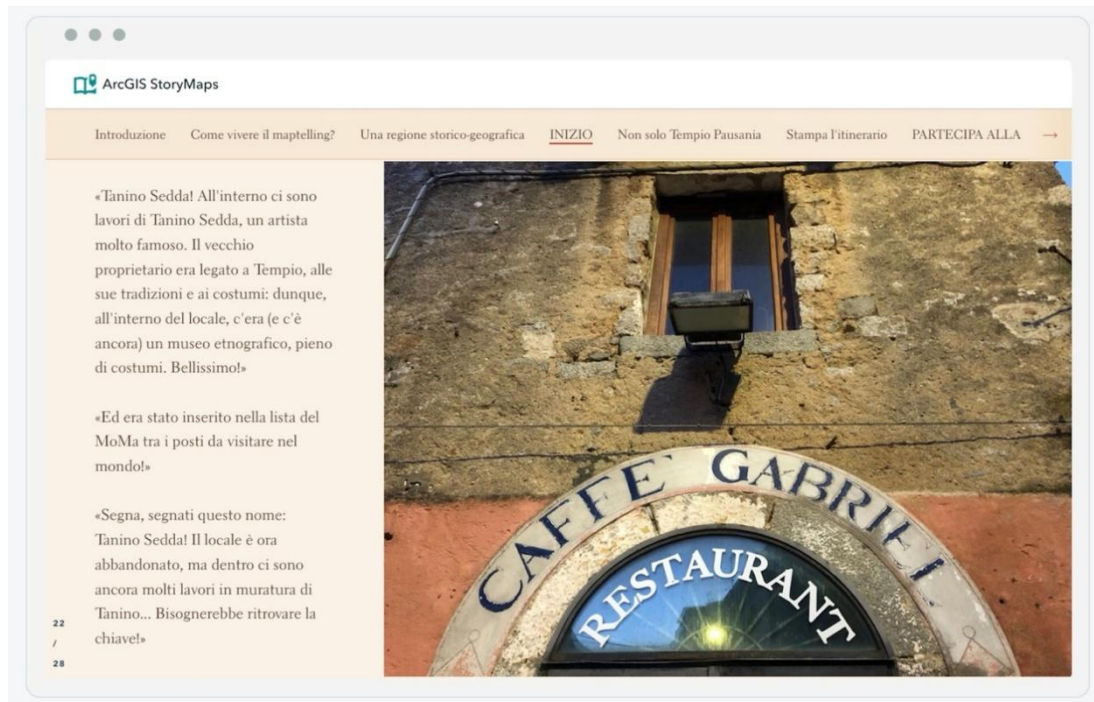


Fig. 3. Example of a geolocated narrative contributed by participants. The site corresponds to a currently abandoned and deteriorated building that once housed a café where works by a local artist -also recognized by the Museum of Modern Art (MoMA)- were exhibited.

- *Beyond Tempio Pausania:* The concluding narrative section opened towards a broader territorial perspective by introducing the possibility of extending the maptelling process to neighbouring municipalities, particularly Aggius. This extension was grounded in participants' testimonies that linked the Church of San Giuseppe in Tempio Pausania to a specific viewpoint overlooking Aggius, historically associated with the final moments of individuals condemned to death. This example illustrated how community narratives naturally transcend municipal borders, justifying the conceptualization of a wider, yet cohesive, destination shaped by shared historical and emotional geographies.

- *Print the Itinerary:* This section allowed users to access a printable map of the maptelling points. The availability of a paper-based itinerary complements the digital StoryMap hosted on ArcGIS, offering a dual navigational support system. This choice responded both to practical orientation needs and to the persistence of traditional cartographic practices among certain users (Fig. 3).

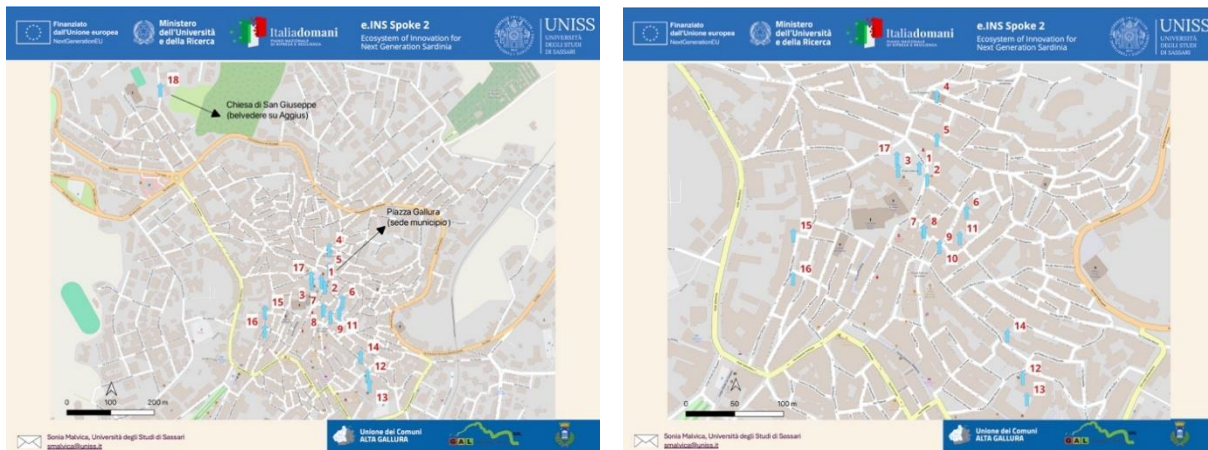


Fig. 3. Example of the printable maptelling displaying geolocated narratives, available at two different map scales. The elaboration is provided by the Researcher in line with the shared geolocalized stories.

- *Participate in Co-Creation:* The co-creation section invited locals who did not take part in the pilot study to contribute their own mapped narratives, which may subsequently be integrated into the StoryMap interface, thus encouraging direct involvement and the UCD iterative cycle. Users could contribute by proposing the inclusion of meaningful places linked to memories, experiences, or local narratives, while economic activities are given the opportunity to geolocate their premises as elements of the map, anchoring them to a territorial narrative that highlights their connection to the local context. From a gamification perspective, tourism and cultural heritage-related firms may also choose to appear as save points along the route, thus becoming functional nodes within the narrative experience and fostering interaction between the map, the territory, and the local economic fabric.

To further support this participatory approach, users may choose to leave their contact information in order to take part in future maptelling field activities and research initiatives. This function strengthens the hybrid nature of the project, which is not limited to the digital space but extends into direct territorial experience, promoting shared exploration, story collection, and continuous updating of the map.

- *Accessibility:* Accessibility represented a pivotal component of the StoryMap design and the e-INS project itself. This section outlined the accessibility features implemented and reports on their testing by participants with disabilities involved in the pilot study. The aim was to ensure that both the narrative content and the spatial interface are usable by a diverse range of users, aligning the project with inclusive design principles. Users were allowed to report strengths and critical issues within the territory, thereby informing the mapping process and supporting decision-making by territorial stakeholders.



- *Credits and Contacts:* The final section was dedicated to information on authorship, contributors, and institutional affiliations, as well as contact details for further information or collaboration.

Overall, the prototype resulted in an adequate interface: accordingly, the key stakeholders identified promising potential for replicability in other areas of Alta Gallura.

Conclusions

Contemporary tourism scholarship increasingly argued for abandoning the singularized notion of tourism in favour of multiple tourisms that better capture the heterogeneity of travellers and destinations. Within this frame, a mapping practice grounded in embodied cognition operated as a means of constructing destinations through narratives strongly anchored to the place identity delivered by an embodied, local community. The produced map-related, embodied storytelling was designed as a progressive, narrative-driven interface designed to support a participatory form bottom-up geolocalized storytelling, in which local knowledge plays a central role in shaping spatial representations, and places acquire cultural, historical, or symbolic value through the stories shared by the local community. A central and qualifying feature of the prototype was the section dedicated to the active participation of users in the maptelling process: it was designed to collect bottom-up contributions, offering the opportunity to share personal stories, and geolocated points related to the territory. The project should in fact be conceived in accordance with the iterative pattern of UCD, that is, from the perspective of repeating the design cycle to identify potential critical issues as well as to update the contents.

What has been presented in this work represented a prototype application of maptelling to narratives that do not conflict with those already developed for destinations well established on the market (as in the case of Tempio Pausania), but rather offer an alternative interpretation that better addresses tourists who are more strongly oriented toward the backstage of the places they visit. Further research will focus on the replicability of the model by testing its experimental protocol in other contexts across Sardinia, with the aim of maintaining the effectiveness of the proposed narrative approach while fully respecting local identity, both in terms of landscape and community, as required by the e.INS project and sustainable tourism.

Declaration

Informed Consent Statement: Informed consent was obtained implicitly from all participants involved in the study. The research was conducted in accordance with ethical standards and the European GDPR regulations.



Conflict of interest statement: The author has no competing interests to declare that are relevant to the content of this article.

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