

Landscape as Narrative in the Virtual Realm: Interactive Mapping and Digital Storytelling for Rural Heritage Conservation in Brebu, Romania

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Abstract. This paper develops a methodological framework for translating Brebu's rural cultural landscape into an interactive digital route. Through narrative mapping, digital storytelling, cumulated heritage records, and layered documentation, it structures tangible and intangible values into an interpretive platform, showing that digital mediation can strengthen documentation, accessibility, public engagement, and long-term heritage transmission for future generations.

Keywords: Digital Storytelling, Rural Heritage, Cultural Landscape.

1 Introduction

In contemporary debates on heritage conservation, interpreting heritage through the lens of landscape is essential for understanding and articulating the full range of its values. Although the two concepts are structurally interdependent, their cultural dimension emerges through the way they interact, a relationship that can be understood through the notion of cultural landscape. The concept of cultural landscape can be analysed hierarchically, from the global scale, where it is recognized as valuable cultural heritage, to the local scale, where it is composed of interconnected and recurring structures. This hierarchy is based on two major components: the tangible dimension, defined by objects or ensembles of material and built heritage, and the intangible dimension, represented by the practices, customs and collective memory of the communities associated with that landscape. In the context of this research, cultural landscapes are expressed through tangible territorial components: anthropogenic footprints, understood as living forms through which the relationship between people, landscape and heritage has unfolded in time and space.

The dynamics of anthropic imprints are particularly relevant in rural areas, where cultural landscapes take the form of “bio-structural mosaics” (International Council on

Monuments and Sites & International Federation of Landscape Architects, 2017), representing the co-products of human - nature interaction. The components of the rural landscape - traditional households, old routes, and local customs - form a kind of “constellation” that reveals both the visible form and the latent memory of place, so that landscape becomes a “living text,” continuously read and rewritten by community and time (Benjamin, 1982).

Applying these concepts to the structure of the memory of space, the place no longer appears as a fixed entity, but as an aggregation of traces, symbols and practices that coexist in a timeless network, a palimpsest. Thus, reading the landscape as a narrative constitutes a viable conservation tool, as it allows for the identification, articulation and transmission of values both tangible and intangible - within a coherent interpretation path.

2 State of the Art

Heritage conservation has traditionally been built on a logic in which the unit of intervention was the “object” - the monument, building or built ensemble. Theoretically, the first theories of restoration in the 19th century treated the built heritage as an autonomous object, with the emphasis on maintaining its material integrity and formal authenticity (Ruskin, 1849; Viollet-le-Duc, 1854–1868). In this perspective, the monument was interpreted as a relatively isolated artistic entity, with restoration becoming an intervention focused on the architectural object, while the cultural context remained secondary.

During the 20th century, the importance of the cultural context in which monuments are inscribed gradually began to be recognized, doctrinal documents such as the Athens and the Venice Charter (International Museums Office, 1931; International Council on Monuments and Sites, 1964) contributing to the substantiation of perspectives oriented towards the cultural landscape on a territorial scale, an idea also supported by the European Landscape Convention in 2000, which defined the landscape as “a part of a territory perceived as such by the population, the character of which is the result of the action and interaction of natural and/or human factors” (Council of Europe, 2000, Council of Europe, n.d.). The document promotes not only the practical logistical aspects of landscape conservation through protection, management and planning, but also their symbolic dimension, by invoking the public.

In rural contexts, the limits of object-based logic become even more evident, as heritage is not concentrated in a single nucleus, but manifests instead as a complex cultural landscape, dispersed across the territory and embedded in everyday life. In this context, the vernacular component becomes central, being regarded as “the fundamental expression of the culture of a community” (International Council on Monuments and Sites, 1999) and defined through the relationship between the community and its living environment (Grecea (Bănescu), 2022). The conservation of a rural cultural landscape cannot be reduced to interventions focused solely on materiality and requires the maintenance of the relationships between land use, community, and the cultural meanings as-

sociated with them, dimensions that strictly object-based approaches capture only partially. This reality highlights both the essential role of the community in transmitting values to future generations and the need for conservation methods capable of preserving and mediating these relationships to the wider public, since interpretation and presentation are essential components of the conservation process (International Council on Monuments and Sites, 2008b).

The vulnerability of cultural components to fragmentation and rapid transformation justifies the complementation of classical conservation methods with contemporary documentation and accessibility tools, including digital ones, capable of coherently integrating tangible and intangible components and transmitting them in an interpretative format. This completion does not replace classical conservation but extends it to the real scale and complexity of the rural cultural landscape (International Council on Monuments and Sites, & International Federation of Landscape Architects, 2017).

In this sense, digital mapping technologies and geospatial databases (GIS) represent an appropriate tool. Interactive mapping platforms allow the integration of spatial data with historical, narrative and photographic materials, providing an accessible means of representing the evolution and structure of a site or cultural landscape (Abdelgawad et al., 2025; Malinverni et al., 2024). In the present research, GIS-based tools constitute the foundation for defining the site intervention route and for structuring the interactive mapping process. Another fundamental tool is represented by multimedia platforms such as Europeana or standards as IIIF (International Image Interoperability Framework), which allow access to heritage resources through digital archives. These resources facilitate access and interoperability of collections of historical documents, while data models like the Europeana Data Model (EDM) allow the integration and correlation of information from different institutions and archives (Doerr et al., 2010). Overall, these categories of tools pave the way for the development of an integrated digital storytelling approach.

3 Digital Storytelling as a Mediation Tool Between Heritage and the Public

Situated along the left bank of the Doftana River, the commune of Brebu is one of the oldest settlements in Prahova's Subcarpathian area, with a history extending back several centuries. The formation of a settlement core in this location was not accidental, as both the natural landscape and the surrounding area offered favorable conditions for community life, providing an ideal setting for agriculture, fruit growing, and animal husbandry. This context offered optimal conditions for the formation of a compact community and for the development of a balanced relationship between households and the natural environment. Its cultural structure was shaped by the forms of the natural landscape, the practices and customs that shaped the settlements and that dictated social relations and cultural practices over time.

The formation of the village core was closely linked to these natural resources and its positioning, attested by many archaeological discoveries and charters that recount

the early beginnings of the commune, as well of the construction of the Brebu Monastery, which became the sacred and cultural nucleus of the area, in both tangible and intangible terms. The village still retains elements of the vernacular matrix, such as the sinuous street pattern, the elongated parcelling, the discontinuous fronts and the close relationship between households, orchards, hayfields and the natural setting, that date back to its origins as a as a spiritual and cultural nucleus of the area.

The site analysis highlights five major typologies of anthropogenic landscapes, resulting from the interaction between the natural setting, the housing practices and the historical processes that shaped the Brebu commune: agricultural-pastoral, vernacular domestic, monumental-sacral, artistically inspired and ethnographic. These typologies of anthropogenic footprints illustrate the main forms through which the community structured and signified the territory, from the productive use of the land and the organization of housing to spiritual, cultural and artistic manifestations, and together they highlight the stratified character of the local cultural landscape and constitute the basis for the selection of landmarks used in the construction of the narrative route.

Among these typologies of the local cultural landscape, the intervention site of Mălu-roasei Street runs along the hilly peaks, being representative of the relationship between the vernacular housing structure and the natural setting of the Subcarpathian plateau. Historical cartographic sources, such as the Habsburg military maps from the 19th century and the general military map from 1910 (Fig. 1), highlight the formation and stabilization of the street pattern and the rural parcelling, confirming the historical character of its current urban structure.

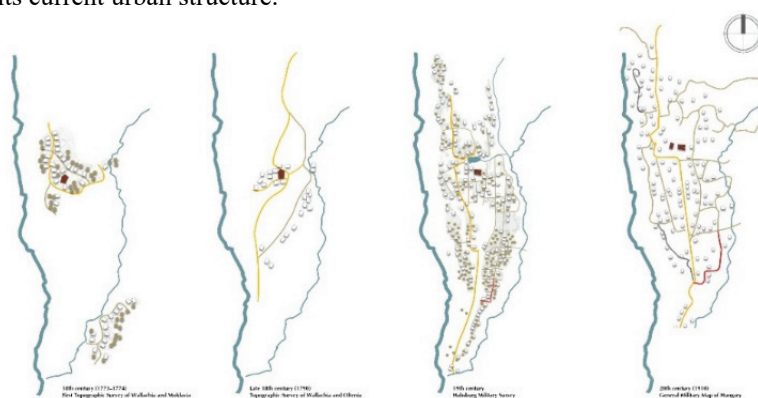


Fig. 1. The historical evolution of the settlement structure over the centuries.

Source: Arcanum Maps, graphic elaboration by the author.

The route follows the sinuous line of the landscape and is marked by the alternation between semi-closed spaces, defined by traditional households, and openings towards orchards, gardens and the hilly landscape, generating a sequential perception of space. This spatial structure, together with the proximity of a historical transit path and the connections with local tourist routes, gives the area a high potential for cultural and educational interpretation, justifying its use as the basis for a narrative route integrated into the digital storytelling framework.

In this context, a tool such as digitization is not understood as a simple archiving of information, but as an active process of interpretative organization of the landscape, through which the elements of the site's cultural landscape are correlated in an accessible, coherent and narrative system.

3.1 Methodology of Digital Storytelling

Within the digital storytelling framework, the methodology for translating the narrative route into the digital environment aims to move from an in-situ route experience to an interactive model of representation and public interpretation, through which rural heritage is organised, presented, and communicated as a digital museum of Brebu's cultural values.

The identity of the site is not concentrated in a single monumental object, but distributed across the relationships between vernacular housing, natural settings, historical traces, memory, and everyday practices, thus requiring an interdisciplinary approach capable of addressing the complexity of the site. The process begins with the inventory and selection of landmarks based on a set of convergent criteria: relevance to local identity, historical and documentary value, capacity to illustrate anthropic landscape typologies, legibility on site and potential to support narrative interpretation.

Recent digital heritage initiatives further support this direction. For example, UNESCO's Dive into Heritage platform (UNESCO World Heritage Centre, n.d.), combines 3D models, maps, photos, videos, and immersive digital storytelling to interpret World Heritage sites in an interactive environment. Likewise, the UNESCO *Urban Heritage Atlas* (UNESCO, 2024) demonstrates the current relevance of cultural mapping and layered digital interpretation for historic settlements.

3.2 Selection of Story Nodes

Based on these criteria, narrative nodes were defined, through which the route is read as a narrative sequence - exposition, development and climax. These nodes do not correspond exclusively to individual objects, but to spatial situations in which cultural relations are concentrated: the introduction of the visitor into the vernacular landscape, the immersion in the historical route and the natural setting, panoramic openings towards the Lupei's Valley and the slopes, and the contact with productive spaces such as orchards and hayfields.

Each node is associated with a digital heritage sheet, conceived as an interpretive unit. These sheets bring together descriptive and analytical information about the selected landmark, graphic and photographic materials, archive fragments, field images, cartographic location and, where possible, references to collective memory or associated cultural meanings. Their role is both documentary and mediatory: they allow the user to understand why an element is relevant in the cultural landscape and how it relates to the rest of the route. To preserve this complexity, the information is structured in three complementary registers: natural (relief, hydrography, vegetation, viewpoints and visual relationships), anthropic (households, sacred landmarks, vernacular infra-

structure, historical route and traces of productive land use) and narrative (themes, sequences and interpretative relationships). The approach is consistent with doctrinal documents that emphasize understanding the route as a whole.

The digital tool used in this context does not duplicate the physical route, but rather expands its possibilities of representation, transforming the local experience into an accessible interpretive environment, capable of transmitting the material structure of the place, its cultural memory and the meanings that give it coherence.

4 Results

The result of this research consists of a conceptual prototype of a digital storytelling framework, which was conceptually modeled for implementation in ArcGIS Story-Maps, selected as the primary platform due to its capacity to combine scroll-based narrative sequencing with interactive cartographic content and user-friendly interface. This prototype functions both as a digital interface for exploring the route and as a medium for interpreting the cultural landscape. The proposed route is structured in narrative sequences, each containing points of interest (conceived as story nodes), associated with a corresponding heritage sheet.

The interface is organized as a vertical story map, in which upon access, the users are introduced to the general context of the Brebu commune through a presentation of its historical evolution. This is followed by an interactive map with selectable points of interest, thematic layers, and heritage sheets. Users can navigate both sequentially, by scrolling through the narrative structure, and non-linearly, by selecting individual landmarks directly from the map. The story map is structured on three overlapping layers, which can be activated from the legend, each layer corresponding to one of the three dominant landscape typologies identified in the research (Fig. 2). This overlay not only highlights the relationships between the natural and anthropized components of the site but also marks micro-areas within the commune with high conservation value, such as the intervention site.

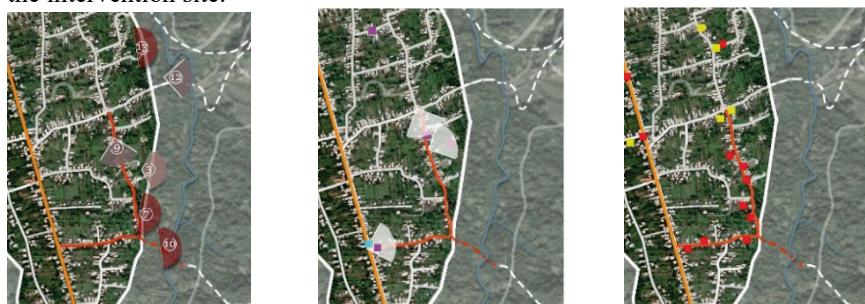


Fig. 2. The interface enables users to explore the identified points corresponding to each landscape typology established through the research.

Source: ArcGIS, graphic elaboration by the author.

The user can follow the landmarks identified in the site and can access them by clicking on individual points, which open the related heritage sheet in a pop-up window (Fig. 3). Other types of interactions include comparing the archival material with present-day documentation (Fig. 4), activating or deactivating the narrative layers, and accessing sourced materials linked to relevant pieces of the route. From an interaction perspective, the prototype preserves the sequential logic of the physical route, but at the same time allows for selective exploration of the nodes.

Visual and written materials are integrated at the level of each point, so that each landmark can be understood through the relationship between field data and archive material, as well as between material form and cultural significance.

The prototype currently integrates five narrative sequences (within the site of intervention), with 30 interactive points of interest and 30 corresponding heritage sheets. As the research was conducted across both villages belonging to the commune, the thematic layers provide information in a consistent format throughout the map. Users can navigate the map at different scales on the selected map and undertake a more detailed exploration of the site. At this stage, the prototype remains conceptual, and formal user testing has not yet been conducted.

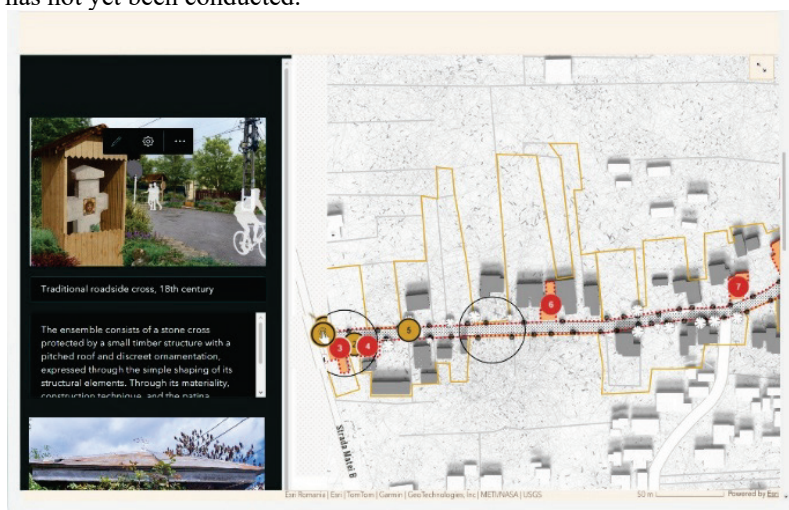


Fig. 3. Spatial structure of the proposed narrative route, showing points of interest within the story nodes, associated with a corresponding digital heritage sheet.

Source: ArcGIS, graphic elaboration by the author.

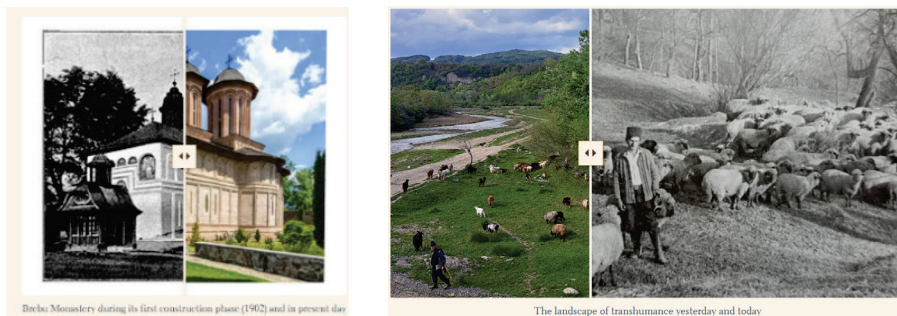


Fig. 4. Brebu from yesterday and from today. Layer based interaction.
Source: ArcGIS, Google Images, personal archive of the author.

4.1 Doctrinal and Methodological References Supporting the Proposed Structure

Interpreting the landscape as a cultural system is supported by the aforementioned doctrinal frameworks, and treating the site as a sequential reading is compatible with a *storytelling* logic, in which cultural routes are understood as complex ensembles formed by the interaction between the tangible and the intangible. In this sense, the research and communication of these sites must not lose sight of the meaning of the route as a whole, both in the conservation process and in that of mediation to the public. In this case, interpretation is thus manifested in two planes, physical and digital.

On the physical plane, ICOMOS emphasizes that interpretation, presentation and communication are essential components of conservation, because the selection and form of the heritage presented to the public reflect cultural visions and imply responsibilities for transmission to future generations (International Council on Monuments and Sites, 2008a).

On the digital plane, the digital storytelling framework depends on the evaluation of sources, the consistency of documentation, and the accessibility of results, all subsumed under the requirement of sustainability (London Charter, 2009).

The structure of the records and their future interoperability are based on a methodological framework grounded in metadata standards. *The Dublin Core Metadata Element Set* provides a core of 15 elements for describing resources, useful as a minimum common set of records (Dublin Core Metadata Initiative, n.d.). For more complex relationships between entities, sources and events - such as habitation, practices and interventions - the CIDOC CRM is the reference standard (ISO 21127) for the integration and exchange of information between heritage organisations. On a larger scale, the *Europeana Data Model* (EDM) provides an interoperable framework that can inspire further developments of the database (Europeana, n.d.; Freire et al., 2020).

Last but not least, the orientation towards public access, collective memory and communities is in line with UNESCO's principles on digital heritage (the aim of preservation is to maintain accessibility, and loss is accelerated by obsolescence and lack of strategies) and with the emphasis on the role of the meanings and uses attributed by people to objects and places, not just on the "object" itself (Council of Europe, 2000).

5 Discussions and Conclusions

In the case of the site studied, its high historical, cultural, and landscape value provides a solid basis for the development of a coherent digital tool capable of bringing together the site's heritage and interpretive landmarks within a single framework, while making the rural cultural landscape more accessible to both the local community and the wider public.

The advantages of this approach are reflected in its capacity to document and communicate the elements that define the site's identity. In a context marked by fragmentation, abandonment of spaces, and the absence of clear local protection policies, such a tool can function as a coherent digital record of place, without affecting the physical integrity of the landscape, while supporting its tourist, educational, and commemorative mediation:

- In terms of tourism, qualities such as the harmonious integration of vernacular structures into the landscape and the proximity to existing routes represent real opportunities for including it in a broader cultural circuit.
- In terms of education, the value of the site is amplified by the possibility of organizing information in an interactive format, that can function as an architecture and rural landscape guide, made more accessible and easier to assimilate form than conventional documentation in schools/similar contexts.

However, the foundation of the proposal lies in the local community, which, at a later stage of implementation, could contribute to completing and refining the content by integrating oral memory, personal archives, family photos and local perceptions of significant landmarks. Such a process would strengthen the memorable and participatory dimension of the platform by directly involving the community in updating and transmitting local heritage. The social dimension therefore becomes one of the proposal's core strengths. At this stage, no formal community consultation has yet been carried out, as the prototype has only been conceptually created.

The proposed methodology also has significant replicable potential, as its structure and layered organization can be adapted to other rural sites. At the same time, the approach presents several limitations that must be acknowledged. In its current form, the prototype is mainly conceptual in nature, with its full implementation in a functional interactive platform to be at a later stage. Although the methodology may be transferable to other contexts, its broader scalability depends on the availability of structured local data, standardized documentation, and long-term platform maintenance.

Translating the route into the digital environment proves relevant precisely because it capitalizes on the site's strengths and responds to some of its current weaknesses and risks. In the case of Brebu, where the monumental Monastery landmark tends to dominate the perception of the place, this approach offers the possibility of bringing back the vernacular housing to the forefront and the subtle relationships between man, landscape and heritage, transforming digital storytelling into a critical tool for cultural conservation.

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