

Cartographic Arc: The Art of Storytelling in Map Design

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Abstract:

The term *story-map* intrinsically links two fundamental human concepts: *story* (narrative) and *map* (spatial representation). The early 2010s saw a surge in tools designed to merge these fields. These tools often involve placing text and multimedia elements alongside maps. This leads to the research question, what constitutes narrative within the context of digital interactive cartography, and what structural lessons can be extracted from the established narrative concepts? By examining these interdisciplinary intersections, we seek to understand how maps can transcend functional data visualisation to become immersive geo-experiences. To address this, we must first establish the conceptual foundations of both components.

A *narrative* is traditionally defined as an account of imaginary or real characters and events, designed for entertainment, teaching, or memory preservation purposes. Whether conveyed orally, in writing or through images, its objective is to captivate the audience through a structured narrative. In this context, the term *narrative* is almost always associated with story. From brands using storytelling in advertising to social media platforms designed to maximise audience engagement, the effectiveness of storytelling is undeniable. Alongside the story, the *map* continues to serve human information needs in a spatial context. Whether they are used for learning, navigation or knowledge sharing, maps are far from neutral tools (Bodenhamer et al., 2015). Indeed, maps have a profound ability to tell stories: it could be argued that most maps contain a latent narrative, just as most narratives are inherently mappable (Caquard, 2013).

Since their emergence, *story-maps* have sought to add a new dimension to traditional geovisualisation by integrating temporal sequences, descriptions, and interactive multimedia. The development of tools such as Atlascine (2008), Tripline (2011), Esri StoryMaps (2012), or StorymapJS (2013) has democratised the creation of narrative spatial content, leading to the proliferation of cartographic storytelling. Consequently, maps have evolved into sophisticated instruments that facilitate the interpretation of geodata through visual information, multimedia content, and user interaction (Roth, 2021). However, integrating storytelling harmoniously into cartographic frameworks remains a major challenge for interactive applications. Although maps have established themselves as a form of narrative media, their potential is often underutilised (Thöny et al., 2018). Despite their technical appeal, the real impact of these platforms on the discipline of cartography requires critical examination.

There is a significant gap between cartography and other narrative-driven disciplines. While literature and game design are grounded in the principles of narratology and ludology, cartographic storytelling often neglects these foundations. This disparity is exacerbated by evolving consumption habits in the Web 3.0 era of social media and Large Language Models (LLMs). While it is often argued that human attention spans are shortening, the continued popularity of cinema and long-form literature proves that narrative depth is still highly valued. Current platforms often favour juxtaposing multimedia elements alongside a map, without a [coherent] narrative structure. A key component of any compelling narrative is narrative tension (Baroni, 2015), which fosters sustained engagement. For instance, visualising the history of Swiss rail transport yields a rich dataset, but without a deliberate narrative arc, it struggles to captivate the user beyond a brief glance. This highlights a major challenge in narrative cartography: the need to address narrative tension, in order to hold the user's attention for longer than a simple glance.

Supporting the evolution of narrative cartography requires an interdisciplinary approach. The aim is to recognise the map as a distinct medium that logically belongs to the broader category of narrative formats. The format (mobile, tablet or desktop), the context (educational, recreational or professional) and the audience must be considered key factors. Three axes of research have been identified to ensure the evolution of the narrative map: *Integrating classical Narratology*: applying structural narrative principles, theorised by figures such as Genette (1972), Greimas (1969) and Todorov (1969), to the modelling of geodata. *Integrating Storytelling concepts*: building a

narrative model that enables the management of geodata. Breaking down geographic narratives into foundational narrative units enables us to create more impactful geo-experiences. Applying the principles of narration to cartography elevates it to the status of a leading narrative medium across all formats and digital tools. *Audience Insights and Creative Engagement*: deepening the audience's understanding of reception and providing cartographers a dedicated creative space to explore the intersection between geodata and storytelling for map design.

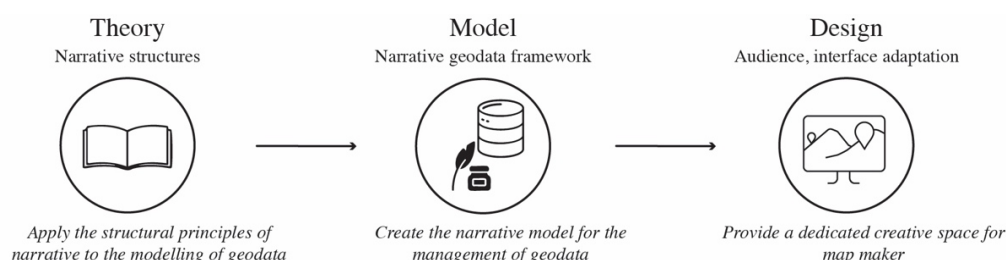


Figure 1. Axes workflow

Examining these three axes yields a proposed workflow for creating narrative maps. Rather than adopting a universal chronology, this framework uses a structural correspondence matrix to determine the selection of a narrative structure based on the nature of the story and the geodata. Todorov's five-stage transformation model, for instance, proves particularly coherent for the historical stories. Conversely, Aristotle's tripartite structure seems more appropriate for describing territorial evolution. The most significant technical contribution of this work is the formalisation of narrative cartographic building blocks. These building blocks act as a link between the geodatabase and the interface layer, turning each narrative stage into a distinct cartographic view. For instance, an equilibrium stage (Todorov) could correspond to a simple map view associated with a particular dataset geometry, thus anchoring the abstract narrative unit in a tangible spatial representation and geovisualisation. In terms of audience definition, this framework departs from the conventional approach of classical storytelling approaches, which advocate audience-first design. Here, a [geo]data-first methodology is proposed. Whereby the data and its inherent structure determine both the narrative form and content of the narrative. Audience considerations are then integrated at a later stage to inform interface design and media selection.

The map's potential as a narrative medium is vast, but rigorous methodological questioning is required. Future research will focus on the practical implementation of these theoretical frameworks, shifting the focus from the conceptual to the structural. The aim is to create a comprehensive narrative cartographic model that explores the technical integration of actantial models and narrative arcs directly within Geographic Information Systems environments. This will involve testing whether the inherent tensions of classic drama can be mapped in order to improve user engagement. Ultimately, our goal is to provide cartographers with a dedicated creative toolkit that will allow maps to regain their rightful place among the great narrative traditions of the digital age.

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