



# **Creating Perceived inhabited Worlds: A Study of Environmental Storytelling in Video Game**

**Versão final após defesa**

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# Abstract

This dissertation explores the role of Environmental Storytelling in the development of game environments that feel like they exist beyond the player's presence, or as addressed through the dissertation, perceived inhabited worlds. While traditional narratives often rely on explicit exposition and dialogue, the interactive nature of videogames allows for a unique form of narrative delivery, where the setting itself becomes an important part of the storytelling. This study investigates the mechanisms through which intentional design choices, including the placement of objects, architecture, and contextual text, communicate information about the world's history, culture, and recent events. The core argument is that Environmental Storytelling transforms a mere setting into a dynamic one by encouraging the player to actively participate in the discovery and deduction of narrative information, thereby creating a sense of player agency.

The research employs a qualitative methodology, first establishing a theoretical foundation in worldbuilding concepts, differentiating between macro-level storyworld structure and micro-level environmental details. It then provides a framework for analysing the specific components of Environmental Storytelling and their contribution to non-explicit narrative delivery. That framework is then applied to three case studies, suggesting that the success of creating a perceived inhabited world lies in creating contextual coherence and providing sufficient evidence to imply life outside the player's immediate interaction.

# Keywords

Narrative; Environmental Storytelling; Videogames; Virtual Environment; Storyworld

## Resumo

Esta dissertação explora o papel da narrativa ambiental no desenvolvimento de ambientes de videogames que dão a sensação de existir além da presença do jogador, ou como descrito ao longo da dissertação, mundos percebidos como habitados. Enquanto as narrativas tradicionais muitas vezes dependem de exposições e diálogos explícitos, a natureza interativa dos videogames permite uma forma única de narrativa, onde o próprio cenário se torna uma parte importante da história. Este estudo investiga os mecanismos através dos quais escolhas de design intencionais, incluindo a colocação de objetos, arquitetura e texto contextual, comunicam informações sobre a história, cultura e eventos recentes do mundo. O argumento central é que a narrativa ambiental transforma um cenário meramente estático num cenário dinâmico, incentivando o jogador a participar ativamente na descoberta e dedução de informações narrativas, criando assim uma sensação de agência do jogador.

A pesquisa utiliza uma metodologia qualitativa, estabelecendo primeiro uma base teórica em conceitos de criação de mundos narrativos, distinguindo entre a estrutura do mundo da história a nível macro e os detalhes ambientais a nível micro. Em seguida, fornece uma estrutura para analisar os componentes específicos da narrativa ambiental e a sua contribuição para a transmissão narrativa não explícita. Essa estrutura é então aplicada a três estudos de caso, sugerindo que o sucesso na criação de um mundo percebido como habitado reside na criação de coerência contextual e no fornecimento de evidências suficientes para sugerir vida fora da interação imediata do jogador.

## Palavras-chave

Narrativa; Narrativa ambiental; Videogames; Ambiente virtual; Mundo narrativo



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# Introduction

Video games have solidified their position as a significant narrative media in the twenty-first century. No longer confined to simple mechanics or linear plots, contemporary games can offer deep, often expansive virtual realities that challenge and reward the player engagement in ways that traditional media cannot. Central to this evolution is the growing relevance of the concept of storyworld, the diegetic universe in which the narrative unfolds. a Game's storyworlds are very effective in creating a space that feels like it exists independently of the player's agency.

The construction of these highly detailed digital worlds relies on more than explicit dialogues or cutscenes, with the physical environment itself taking on the burden of imparting historical depth, cultural norms, and antecedent narrative events onto the player. This concept is known as environmental storytelling (ES). Environmental storytelling is the act of embedding narrative information into the spatial layout, architecture, object placement, and visual composition of a game level. Through environmental storytelling, the game designers can imprint onto the scenery different ideas and emotions that suggest presence, actions, and the fate of non-player characters (NPCs) and communities, transforming the setting from a simple backdrop into an active narrative agent, inviting the player to become an interpreter of the scene, talking to an archaeologist or detective.

Despite the universality of environmental storytelling as a technique across all manner of genres, it remains an under-theorized and under-formalized discipline within game studies due to being a recent concept. Existing works often address individual instances but stop short of providing a systematic framework for how environmental storytelling combines and operates to create that feeling that the world of the game exists independently of the player itself.

This concept's significance has dramatically accelerated over the last decade and a half, fuelled by technological advances that allow game developers to put more of these details in videogames, and by a fundamental change in design philosophy that made narrative-driven games focus on creating a storyworld and not just a narrative. This design philosophy came from a need for player-driven discovery, which yields better results in terms of engagement due to its interactive and investigative nature, forcing the player to not just act out pre-planned scenes, but making them think over details that may go unnoticed otherwise. Multiple games started utilising this design philosophy during the 2010's, such as the franchise who made me interested in this topic, *Dark Souls* (2011-2016) with its hidden lore, which can only be found through looking at the environment, be its architectural choices or the deliberate placement

of certain elements, reading item descriptions, and sometimes, theorizing to the point that some widely accepted lore elements amongst the fans of the franchise were never confirmed by the developers.

## Methodology

The problematic of this dissertation derivates from an ambitious question that I asked myself while doing research for a university project related to environmental storytelling, which was: Can a game tell the entirety of its narrative solely through the environment?

This initial question led to subsequent investigations into the mechanics and feasibility of such a feat, giving room to the question “What would need to be done?” to achieve complete environmental narration.

Upon researching environmental storytelling techniques, I realised that there is a lack of a centralized compendium that analyses these techniques, explaining how they function, and more crucially, how they might influence player interpretation.

The main research question for this dissertation is the following: **“How is environmental storytelling used in narrative-driven videogames?”**

As the research progressed, it became necessary to expand this original question, adding a secondary question: **“What are the main ES techniques and how do they shape the perception of the Storyworld?”**

The main objects of the dissertation are to:

1. Do a literature review on world-building and storyworlds, focused primarily, but not exclusively on contemporary media.
2. Define and explain environmental storytelling, the core concept and how it ties with player agency
3. Develop a comprehensive categorization of environmental storytelling techniques, utilising the theoretical foundations from diverse fields of study to demonstrate how these techniques can be applied and how they might affect the player’s perception of the storyworld.

The methodology used in this study is case analysis, more specifically Narratological analysis. I elected a small sample of different narrative videogames, with distinct narrative strategies, that use Environmental Storytelling as a main attribute.

This dissertation is structured to move from the theoretical revision to the practical use of these techniques starting with the concept of world-building in chapter 1, which establishes the foundational concepts of the storyworld, reviewing existing literature on the subject across transmedia platforms (literature, films, and games) to define terminology, examine the functions of the storyworld, and dissect its essential components.

Chapter 2 introduces the central concept of the study by providing a rigorous definition of environmental storytelling and its most common techniques, having an in-depth theoretical review of each one. It analyses how architecture and level design are used to communicate history, how scattered items and collectibles function as narrative devices, and how carefully constructed micronarratives are employed to create the perception of a world beyond the player.

Finally, chapter 3 utilises the theory discussed in the previous chapters to give a detailed examination of select narrative-driven games, focusing on specific levels or segments of these titles to show how designers deploy the techniques of environmental storytelling to generate the effect of an inhabited, authentic space.

# 1. Worldbuilding

## 1.1. Introduction

Videogames' ability to immerse players stems from their ability to mentally transport the latter into richly detailed and seemingly endless fictional realities. This sense of being "present" within a game's environment is not a simple byproduct of graphic fidelity - otherwise stylized games, such as the *Borderlands* franchise (2009- , Gearbox Software) wouldn't be able to replicate this state of immersion. Rather, it is a meticulously crafted process that happens through worldbuilding. Before delving into the environmental storytelling techniques used to create the perception of a "lived-in" world, it is essential to outline a theoretical foundation regarding the nature of these fictional spaces. This chapter, therefore, serves as the foundation to explain what constitutes a storyworld and the multifaceted practice of worldbuilding.

The concept of a storyworld extends beyond being a background for narrative events. It should be a coherent and consistent fictional universe with its own internal logic and history. From high fantasy sagas such as *Lord of The Rings* (1954-1955, J. R. R. Tolkien), to science fiction dystopias such as *Blade Runner* (1982, Ridley Scott), creators meticulously craft these universes to provide context, enhance narrative comprehension, and create a sense of believability, making it so that, sometimes, the world in itself is as important as the Narratives represented in it. This chapter will draw upon established narratological theories, media studies, and practical worldbuilding guides to provide a comprehensive understanding of the process behind these fictional universes.

## 1.2. What's a storyworld

### 1.2.1. Core definitions

Any narrative is founded on a believable and immersive fictional reality. This reality, usually referred to as storyworld, is a meticulously crafted universe that operates under its own logic, rules, and possesses a rich history contained within itself. These storyworlds have the potential to contain countless narratives within themselves. Understanding the nature of these storyworlds and the process of crafting them is essential to create the circumstances under which environmental storytelling can foster a sense of a "lived-in" world, thus enhancing player experience.

Fundamentally, a storyworld can be defined as a consistent and coherent fictional universe in which narratives unfold, extending beyond the immediate events and characters of a single story. Unlike a simple setting, which only defines the time and place where the narrative unfolds, a storyworld represents everything beyond that, transcending the confines of a simple plot. Herman (2009) defined storyworlds as “...global mental representations enabling interpreters to frame inferences about the situations, characters, and occurrences either explicitly mentioned in or implied by a narrative text or discourse.” (p. 72-73), meaning that a storyworld is a conceptual space that provides the necessary context to narrative events, characters, and their actions. It represents the fictional reality that provides meaning and plausibility to the story, even if sometimes not explicitly, like Herman defined “... storyworlds are mental models of the situations and events being recounted—of who did what to and with whom, when, where, why, and in what manner. Reciprocally, narrative artifacts (texts, films, etc.) provide blueprints for the creation and modification of such mentally configured storyworlds” (p. 73).

Creating a clear distinction between storyworld and setting is crucial. A setting pertains to the immediate space where action is taking place, such as “Dunwall” in *Dishonored* (2012, Arcane Studios) which is a city based on late 1800’s, early 1900’s, London, providing atmosphere and historical context to that specific place. The storyworld, however, encompasses not only “Dunwall”, but every other area within the game, its entire history, the political climate of the “empire of the isles” where the city of Dunwall is located, the societal norms, the magical forces at play, and the specific advanced technology that exists within this fictionalized 19th century setting.

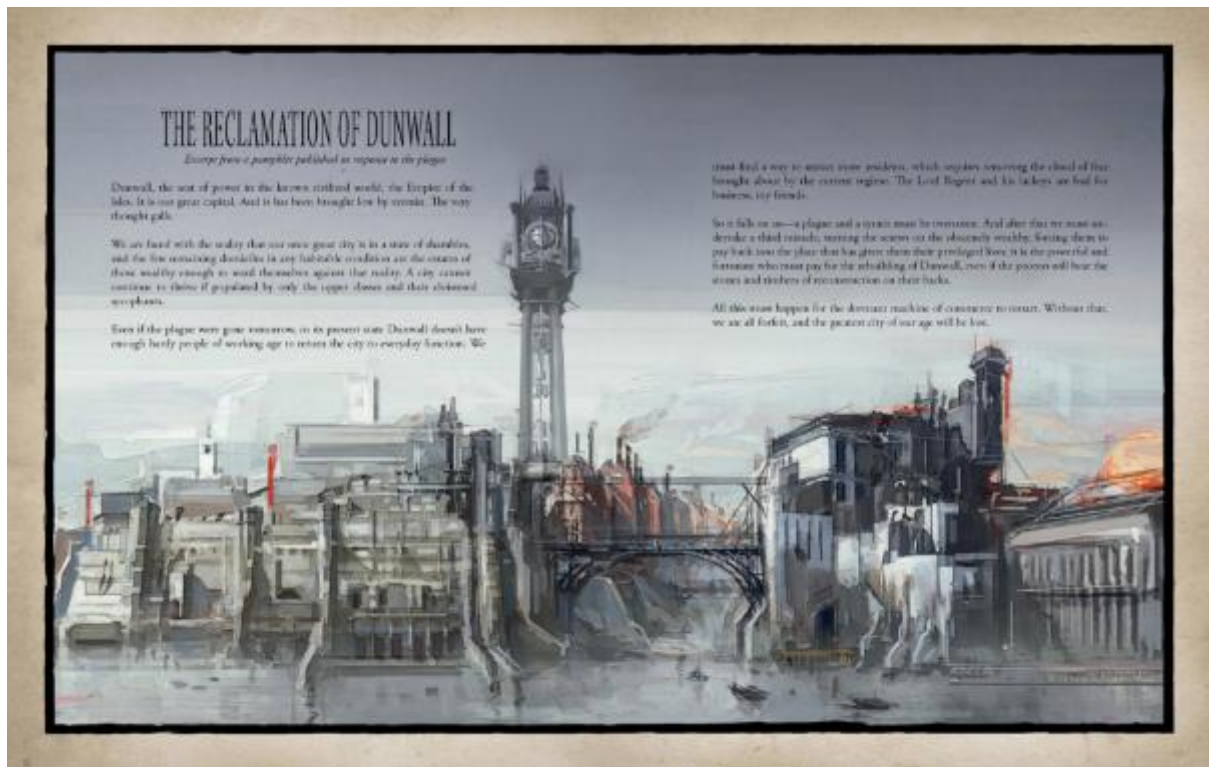


Figure 1 Dishonored: The Dunwall Archives, p.200, The reclamation of Dunwall concept art, [https://archive.org/details/pdfcoffee.com\\_arkane-studios-dishonored-the-dunwall-archives-2014-pdf-free/page/200/mode/2up](https://archive.org/details/pdfcoffee.com_arkane-studios-dishonored-the-dunwall-archives-2014-pdf-free/page/200/mode/2up)

The act of constructing these intricate realities is what's known as worldbuilding. As previously mentioned, this is a deliberate process that encompasses designing and developing various elements that make up the fictional world. This includes, but is not limited to, its geographical features, historical timeline, cultural traditions, social structures, political systems, economic frameworks, technological and scientific advancements and, if applied, magical laws as well as physical laws. Steven Savage, in his book *Way with worlds book 1: crafting great fictional settings* (2016), clarifies that world building is about “1) Creating a stable setting . . . 2) . . . where stories take place . . . 3) . . . that is consistent . . . 4) . . . and works by its own rules.” (p. 13). He argues that worldbuilding is about creating something independent of a story, having its own principles and rules, while being the host for a story, which must abide by the said rules and principles. The conjunction of all these processes makes it so the fictional space has a sense of authenticity and depth, more organic and lived-in, rather than a predetermined stage, built for the sole purpose of the main character of the narrative. Another way to demonstrate the importance of the narrative world in contemporary times is precisely through the way it can manifest itself in different works and formats.

Mark J. P. Wolf (2012) dives into the concept of transnarrative, transmedial, and transauthorial storyworlds. These three characteristics demonstrate the expansive and adaptable quality a well written fictional worlds have:

- **Transnarrative:** Wolf talks specifically about transnarrative characters as “the simplest literary indication that a world exists beyond the details needed to tell a particular story” (p. 66). A transnarrative character is nothing more than a character that appears in more than one of the narratives existing inside that storyworld. For example, Basim Ibn Ishaq, from *Assassin’s creed Valhalla* (Ubisoft Montreal, 2020), is also the main character of a latter game of the same franchise, *Assassin’s creed Mirage* (Ubisoft Bordeaux, 2023). Per Wolf’s words, “when multiple characters, objects, and locations from one story appear in another story, the world in which they all appear becomes larger than either story” (p. 66). This characteristic also shows that there is more to said characters than what was initially presented.
- **Transmedial:** Wolf defines that a transmedial storyworld “must be able to be present in multiple forms of mediation (which contain and convey world information), such as text, imagery, sound, three-dimensional shapes, and interactive media.” (2012, p. 247), meaning that a transmedial world needs to maintain its core consistency and identity regardless of the medium through which it is representing itself, even though each media will inevitably highlight and emphasize different aspects of said world. For instance, a novel may describe a city’s history and culture, while a videogame set in that same city will allow the player to navigate it and interact with its inhabitants. Lisbeth Klastrup and Susana Tosca, in *Game of Thrones - Transmedial Worlds, Fandom, and Social Gaming* (2014), call this concept of maintaining consistency and identity regardless of the medium as “worldness” and divide it in three different dimensions: Mythos - The story and legend of the world; Topos - The setting in space and time; Ethos - the explicit and implicit ethics and moral codes.
- **Transauthorial:** Transauthorial stories are often seen in comic book worlds, such as the Marvel universe and DC universe. This characteristic shows that a storyworld can be built, expanded, and even reinterpreted by multiple authors.

Ultimately, the primary function of a well-crafted storyworld is to provide solid context and significantly enhance narrative comprehension to the user (in this context, I use the term “user” to englobe readers, viewers, listeners, and players alike). When a story unfolds within

such an elaborated, well-defined world, users can more easily suspend their disbelief and immerse themselves in the narrative.

### 1.2.2. Audiences' perspectives on storyworlds

Beyond the structure of a storyworld, its true purpose emerges through the active engagement and interpretation of its audience. This section will focus on the cognitive and participatory processes by which users construct, understand and experience these worlds.

One of the most important theoretical approaches to understanding how audiences perceive and interact with storyworlds is the “Possible Worlds Theory” (PWT). When applied to narrative, PWT proposes that engagement with a fictional text involves the mental construction of an alternative reality - a “possible world” - that the audience treats as actual while engaging with it. Marie-Laure Ryan, in her book *Narrative as Virtual Reality: Immersion and Interactivity in Literature and Electronic Media* (2001), argues that “The basis of PW theory is the set-theoretical idea that reality—the sum total of the imaginable—is a universe composed of a plurality of distinct elements, or worlds, and that it is hierarchically structured by the opposition of one well-designated element, which functions as the center of the system, to all the other members of the set. The central element is commonly interpreted as ‘the actual world’ and the satellites as merely possible worlds. For a world to be possible it must be” (p.99). The PWT is a very old concept, first theorized by the philosopher and mathematician G. W. Leibniz, and later being applied to narratology by authors such as David Lewis and Lubomír Doležel (Merino, 2015).

This concept explores how narratives invite users to mentally “relocate” themselves to these fictional realities Ryan says “The idea of textual world presupposes that the reader constructs in imagination a set of language independent objects, using as a guide the textual declarations, but building this always incomplete image into a more vivid representation through the import of in-formation provided by internalized cognitive models, inferential mechanisms, real-life experience, and cultural knowledge, including knowledge derived from other texts. The function of language in this activity is to pick objects in the textual world, to link them with properties, to animate characters and setting—in short, to conjure their presence to the imagination.” (p.91), meaning that users, through a pattern recognition that uses a combination of present information and their own real-world knowledge, transform the abstract descriptions and implied rules into a concrete mental model of the storyworld, making it so they can interiorize it better and immerse themselves in it.

Cognitive narratology, as defined by Manfred Jahn in *Routledge Encyclopedia of Narrative Theory* (2005) is linked to Cognitive theory “Cognitive theory investigates the relations between perception, language, knowledge, memory, and the world; cognitive

narratology is interested in the roles of stories within the ranges and intersections of these phenomena.” (p.67). The author complements the PWT by offering a more detailed examination of the mental processes that the user undergoes while trying to understand a storyworld. This perspective argues that any form of immersion into a storyworld is not a passive reception on the part of the user, but a dynamic and constructive activity where users build intricate cognitive maps of the fictional world. The concept of “mental mapping of narrative” (2005, p.300), highlights how users form “detailed mental maps” or “mental spaces”. This cognitive model is continuously refined and updated as the user processes new information, integrating new details and adjusting previous knowledge.

Another area within cognitive narratology that directly addresses user perception is the interpretation of “impossible storyworlds”. Jan Alber, in his article “Impossible Storyworlds—and What to Do with Them” (2009), specifically explores how users react to narratives that present “... bizarre storyworlds which are governed by principles that have very little to do with the real world around us.” (2009, p. 1). These might involve a plethora of uncommon, often reality defying elements, such as logical inconsistencies, paradoxical events, or scenarios that defy known physical laws. Crucially, Alber argues that even with these challenges, users can still make sense of such worlds in an adept manner by employing a range of cognitive strategies. These strategies include:

- **Reading events as internal states:** This strategy involves explaining such impossible events as if they occur within the character’s mind, such as dreams, fantasies and hallucinations.
- **Foregrounding the Thematic:** This approach tries to make sense of physically impossible scenarios by viewing them as examples of specific themes, rather than a realistic explanation, such as sudden rain when a character dies symbolizing sorrow and loss.
- **Reading allegorically:** This is a deeper form of “foregrounding the thematic” where readers interpret elements as parts of allegories that convey a general theme about the storyworld, - sometimes the central theme of the narrative - rather than a specific character.
- **Blending scripts:** This strategy encourages the user to combine two or more pre-existing cognitive frames or schemata to create new ones that can make the unnatural scenario acceptable in one’s mind. The humanization of animals is one such example, as users combine the cognitive frame of humans telling stories with the cognitive frame of animals.
- **Frame enrichment:** This strategy requires users to considerably bend the existing frames beyond the real-world possibilities in order to make sense of

the unnatural elements, such as a character dying and reappearing multiple times. This often involves multiple cognitive steps and more effort than a simple blend.

These strategies are particularly relevant to video games, where spatial distortions (perspective manipulation in *Superliminal* (2020, Pillow Castle)), reality-bending mechanics (like time manipulation in *Braid* (2008, Number None)), and abstract concepts (the psychological landscapes of the *Silent Hill* franchise (1999- , Team Silent)) are common. Players can actively use these strategies to better understand and interact with game worlds that defy real-world logic or narrative linearity.

Beyond these cognitive processes, the role of the user also encompasses a dynamic of co-creative engagement with the storyworld. Mark J. P. Wolf emphasizes that the audience's engagement is essential to how worlds are experienced. This is even more apparent in interactive media like video games, where players are not only interpreters but also active participants whose actions directly contribute to the unfolding of the narrative and the details of the storyworld. As mentioned throughout this chapter, even in non-interactive media, users contribute to the perceived depth of the storyworld by filling the narrative gaps with their own pre-existing knowledge.

### 1.2.3 The Purpose of Worldbuilding

As demonstrated in the previous chapters, worldbuilding serves more than an artistic purpose: it's fundamental to creating a compelling narrative. Worldbuilding extends beyond aesthetics, serving as a foundation for the construction of believable and engaging fictional experiences.

Firstly, the main purpose of worldbuilding is to cultivate believability within the user's psyche. Even within the most fantastical and futuristic settings, a well-constructed storyworld must adhere to its internal logic, allowing the users to suspend their disbelief and fully immerse themselves in the narrative. Worldbuilding is not about making the fictional real but making it "real enough".

This "real enough" quality is not a matter of imitating reality but rather establishing a coherent set of rules, whether physical, magical, or social, and consistently applying it as Savage puts it, "A well-designed world that has rules and locations that are stable is one people can understand. Because it makes sense, it feels real – and the stories within that setting are more interesting because of that sense of reality." (2016, p. 14). When these rules are clear and consistent, users gain a sense of understanding of the fictional world, even if the rules themselves are "impossible" outside the realm of that particular setting. For example, if a

storyworld establishes that incantations can activate magic, then characters who use magic must comply with this limitation, or their deviations must be logically explained within the world's framework. This consistency is what allows for the "suspension of disbelief" that makes it possible for users to accept the fictional setting as temporarily real.

This internal consistency directly contributes to the feeling of a "lived-in world", a world that feels as though it existed long before the user "entered" it (when the narrative starts) and will continue to exist long after the user leaves it (when the narrative ends). When a world feels "lived-in", in all its details, from the architecture to the customs of its inhabitants, it will implicitly tell stories about past and present. This subtle environmental storytelling allows the user to deduce information and build a better mental model of the world, a subject that this dissertation will explore in a later chapter.

Secondly, worldbuilding enriches narrative and character development. A well-built storyworld provides a sound basis for plot ideas and character motivations. The conflicts, challenges, and opportunities within a narrative are often direct consequences of the world's unique characteristics, such as its political landscape, its technological limitations or advancements, magical properties, or societal tensions.

Timothy Hickson, in his book *On Writing and Worldbuilding: Volume 1* (2019), explains how what he calls the three C's, communication, control, and commerce, make the basis of an empire, but can also be its downfall. In his own words, "Losing communication structures can cripple an empire's capacity to coordinate and defend itself across its territory, as well as efficiently regulate its citizens and economy." (p. 214), "An empire does not fall just because it loses its emperor. It falls when it loses the methods of control" (p.215), and "Economic disaster is almost an historical constant prior to change in a government system, either violently or peacefully." (p. 219). This argument illustrates how the very basis of the world may dictate the grand narrative that will unfold. If a storyworld is created with these details in mind, the narrative has multiple ways to unravel, creating a depth that makes users theorize and engage more with the world. The protagonist and antagonist's motivations can appear from multiple angles, making it so the world itself can act as a character, influencing the story as much, if not more, than the main characters themselves.

Worldbuilding also creates an easier path for implicit storytelling, which is particularly important in visual and interactive media. Instead of relying purely on expositional dialogue, a well-designed environment can convey vast amounts of information about its history, culture and current state. This "environmental storytelling" allows the user to immerse themselves within the world as they actively explore, discover and interpret the narrative, making the world seem more dynamic and responsive, as if events have genuinely occurred within it.

Finally, worldbuilding has significant practical implications for creators across different media, potentially allowing for longer longevity and a bigger expansion. For writers,

worldbuilding provides a sort of bible that has a stable and consistent framework for multiple stories, helping to prevent inconsistencies and plot holes across the series. For game developers it encases everything from level design and game mechanics to character abilities and enemy types. A detailed world provides a consistent logic for gameplay systems, making interactions intuitive and meaningful to the player. For transmedia franchises, good worldbuilding provides grounds to easily adapt its narratives for multiple media, enabling fans to engage with the same universe in several ways, not only broadening the user base, but also deepening their investment as each piece of media contributes to a larger understanding of that shared universe.

In essence, the purpose of worldbuilding is to provide the necessary context for narrative, enrich character development, facilitate environmental storytelling and offer a practical framework for creators to build expansive fictional universes.

## 1.2 Types of storyworlds

Having established the basics of what constitutes a storyworld and the overarching purpose of worldbuilding, this chapter will explore the diverse forms these fictional worlds can take. Storyworlds can vary significantly in their scope, internal logic and in the specific elements that define them. This chapter will categorize and discuss the most common types of storyworlds, exploring how their characteristics are often shaped by the genres where they are being portrayed.

The categorization of storyworlds is not always rigid, as many of them blend elements from multiple genres, however, identifying the main characteristics will help us not only to understand what expectations the user might create with different types of fictional realities, but also what worldbuilding strategies can be employed in its construction.

### 1.2.1 Categorizations of storyworlds by genre

One of the most common ways to categorize storyworlds is through their primary genre, which often dictates some of the fundamental rules, common tropes, and expected elements of the fictional universe.

## Fantasy Worlds

Fantasy worlds are probably the most recognizable example of extensive storyworlds, often categorized by the existence of magic, mythical creatures and non-human sentient races. Those worlds often use medieval and pre-industrial periods as inspiration for their historical background, though they can also present modern, contemporary settings. The core idea of these fictional worlds lies in their distancing from the physical reality, offering worlds where the impossible turns into possible through an established fictional system.

With fantasy being such a broad category, most authors tend to separate it into two sub-categories, “High Fantasy” and “Low fantasy”, which can be distinguished through how much their setting departs from the real world.

1. **High Fantasy:** Coined by Lloyd Alexander, the term refers to a fantasy story set in a world entirely separate from our primary world (real world). These worlds often possess their own unique geographies, histories, cosmologies, and cultures, with magical and fantastical elements that are often ingrained into the fabric of its fictional reality. The scope of high fantasy narratives is typically big, involving epic quests, struggles of power between good and evil, and a deep engagement with its world’s ancient lore. Worldbuilding in the context of high fantasy is usually extensive and explicit since its creator must clearly establish the rules and details of this entirely new reality. J.R.R. Tolkien’s Middle-Earth, with its meticulously detailed languages, mythologies and vast history, is the prime example of a high fantasy world.
2. **Low Fantasy:** Low fantasy appears as a counterpoint to the term coined by Lloyd Alexander and refers to a storyworld set in our primary world or a world that closely resembles it. Magical and fantastical elements are present but are often subtle, hidden, and operate separately from the common people, usually on the fringes of society. They do not fundamentally alter the everyday lives of most inhabitants and may not even alter the known laws of physics. The focus is within the human characters and their struggles within a familiar context, with the added fantastical elements that serve to add an unexpected twist or a layer of hidden depth to the otherwise normal world. The worldbuilding in this case often involves integrating the fantastical within the mundane while creating defined rules that explain how the two don’t collide or seep into each other. The Marvel Cinematic Universe (MCU) (2008-, Marvel Studios), which encompasses movies and series about different superheroes from the comics, presents such a case, where magic, advanced and alien technology all coexist in a world similar to ours.

Furthermore, the most defining feature of fantasy worlds, their magic system, can also be categorized into two types. Timothy Hickson, in, *On writing and Worldbuilding: Volume I* (2019), discusses these two types, which are “hard” and “soft” magic systems. A “hard” magic system has “more clearly defined rules, consequences, and limitations that govern what one can or cannot do with magic.” (p. 108). This precision contributes significantly to the world’s consistency and believability, even though the magic itself is fantastical. On the other hand, a “soft” magic system, conversely, “has a vague, undefined, or mysterious set of rules and limitations to being used in the story.” (p. 108). While less structured, this magic system still contributes to the world’s unique atmosphere. Hickson also argues that these are not something that’s rigid but are instead part of a spectrum.

### Science Fiction worlds

In contrast to fantasy, science fiction storyworlds are grounded in scientific principles, advanced technology, and imagined future societies. These worlds often explore the implications of scientific discovery and technological innovation on society’s evolution, serving as thought experiments about humanity’s future or alternative paths. While fantasy asks, “what if magic was real?” science fiction asks, “what if science or technology advanced to this point?”. The core components of science fiction worlds often revolve around technological advancements. This includes everything from interstellar travel and artificial intelligence to genetic engineering and advanced weaponry.

Science fiction also frequently explores societal structures and political systems in sub-genres like dystopian worlds, such as the oppressive regime in *1984* (George Orwell, 1949) or *Blade Runner* (Ridley Scott, 1982), examining and theorizing about the consequences of unchecked power and technological progress. Utopian works, although less common, counterpoint the dystopian ones, presenting idealized societies, often questioning their feasibility and exploring their hidden flaws.

Another type of science fiction worlds is represented in space opera worlds, such as *Star Wars* (George Luca, 1977), *Star Trek* (Gene Rodenberry, 1966), and *Doctor Who* (Sydney Newman, C. E. Webber and Donald Wilson, 1963), all of which feature vast galactic empires, diverse alien species, and epic large scale conflicts that span across multiple star systems, thus requiring more extensive worldbuilding in order to properly connect disparate planets and cultures into a cohesive universe.

## Historical and Alternate-History worlds

Historical, and alternate history storyworlds are characterized by their grounding on real-world historical periods, events, or geographical locations. In historical worlds, the worldbuilding focuses on meticulous research to accurately depict the era recreated in the world, including social customs, technology, political climate, and the daily life of the people from that time. The challenge in these storyworlds comes from making something already known to the public feel fresh while ensuring accuracy.

Alternate-history worlds, however, introduce to this dynamic a specific point of divergence from actual History, exploring how a different outcome in a key historical event may reshape the world as we know it today. This type of worldbuilding, similarly to the ones based on History or historical events, requires a deep understanding of the actual historical context to be able to extrapolate the consequences of the divergence in a plausible manner. Hilary Dannenberg, in *Routledge Encyclopedia of Narrative Theory* (2005) explains that “Only plausible scenarios are valid for historical theorists; [...] In contrast with historical research, fictional narratives that depict counterfactual historical scenarios, [...], do not necessarily foreground counterfactual reasoning.” (p. 86). For example, a world where the axis powers won World War II, such as Philip K. Dick’s *The Man in the High Castle*, requires rigorous worldbuilding to depict the consequences of such drastic changes, such as cultural shifts, technological developments, and, obviously, the political landscape.

## Contemporary or realistic worlds

While appearing to require less worldbuilding due to their similarity to our own reality, contemporary or realistic storyworlds still need careful construction to feel authentic and “lived-in”. These worlds are set in the present day, in a very near future, or a very near past, with real-life locations or at least based on real life locations. However, even the depiction of a modern city requires the creator to consider its specific socio-economic conditions, local culture, architectural styles, and its inhabitants’ daily life. The worldbuilding here is often subtle, focusing on details that ground the narrative in a specific, believable reality rather than a generic backdrop.

For instance, a crime drama set in a specific neighbourhood of a real city may detail the local slang, the types of businesses, community dynamics, and the specific challenges faced by its residents. This level of detail may not be as demanding as in other genres but is still a form of worldbuilding that contributes to the world’s authenticity. Video games like *Grand*

*Theft Auto* (Rockstar Games, 1997-) exemplify this by creating ultra detailed fictionalized versions of real cities.



*Figure 2 Grand Theft Auto V, Rockstar Games, View from Los Santos, a fictionalized version of Los Angeles, where we can see a representation of the famous Santa Monica pier*

### 1.2.2 Approaches to Worldbuilding

The creation of a storyworld, regardless of genre and medium, can be approached from diverse viewpoints, using various methodologies. While the end goal remains the same, the construction of a believable fictional reality, the process itself can differ significantly in its starting point and during its development.

One of the most commonly used methodologies is the “Top-Down” approach, a concept derived from the study of systems that can be used in diverse fields. The definition of Top-down, according to the Cambridge Business English Dictionary, is “starting from the highest levels or from the most general ideas of an organization, system, plan, etc.:" (Cambridge Business English Dictionary, 2025). This approach, as explained in the definition of the very concept, starts with the grand, overarching concepts of the fictional universe and progressively trickles down into the finer details.

Using this approach, the author starts at the macro level, designing the cosmology of the world (its place in the universe and its creation myths), its fundamental laws (both physical laws and magical laws if applied, depending on the genre), its geological formation, major historical timeline, and a broad generalization of the races and creatures present within the world. Only after these foundational elements are established does the author move on to more specific details, such as countries and cities, cultures, characters, and specific plot points.

This approach is often used when building epic narratives, since they tend to favour expansive universes that are intended to have multiple stories within them, spread across different media. Its primary advantage lies in its ability to ensure internal consistency and coherence from the beginning, by defining the basic laws that constitute the world, minimizing the chance for contradictions within the narratives. However, this methodology can be incredibly time consuming and potentially overwhelming due to the sheer volume of detail that can be achieved.

In contrast to the “Top-Down” methodology, the “Bottom-Up” approach, defined in the Cambridge Business English Dictionary as “starting at the lowest levels or from the smallest details of an organization, system, plan, etc.,” (Cambridge Business English Dictionary, 2025), begins with a specific, localized detail and expands outward as needed by the narrative. This might involve starting with a single character, a unique cultural custom, or specific conflict, and then building up its surrounding world to support and enrich that initial idea, growing the world organically and as the narrative demands.

This method makes it so every piece of worldbuilding is relevant to the narrative being told, preventing unnecessary details and allowing the author to fully focus on that specific point. For example, in a story that requires a character to have a unique magical ability, the author might develop a small magic system to explain such ability, only expanding it if the plot so demands. The primary advantage of this approach is its immediate relevance to the narrative. However, this approach carries the risk of inconsistencies emerging as the world expands, since nothing is really defined beforehand, making it so later additions can contradict earlier ones. It can also lead to a world that feels less cohesive if the connections between separate elements are not carefully managed.

Beyond the practical methodologies, there are also some basic concepts that significantly influence the storyworld. These key considerations are:

- **Purpose and intent:** As mentioned before, a world can vary greatly depending on its genre and media, even when using the same approach to worldbuilding. As such, the intent behind the world can shape how it will be built, for instance, a world built for a “dark fantasy” videogame will be inherently different from one built for a children’s book.
- **Tone and mood:** The tone and mood of the world will shape the user's perspective on the storyworld. Using the previous example, a world built with the intent to be used in a “dark fantasy” videogame will have a very distinct architecture, weather pattern, societal behaviour, and even colour palette.
- **Realism:** This choice dictates how closely the fictional world resembles the real-world. This directly relates to the previously discussed concepts of “hard” and “soft” magic systems (Hickson, 2019) and the concept of “impossible

storyworlds” (Alber, 2009). The author must decide how much deviation from the reality the audience is expected to accept and how consistently these rules will be applied.

## 1.3 Components and Characteristics of a Storyworld

Having established what a storyworld is, why worldbuilding is essential, and the various types of approaches to its creation, this chapter will dive deeper into the fundamental building blocks that constitute a fictional reality. These components, when meticulously designed and consistently applied, contribute to the world’s believability, depth, and its capacity to feel “lived-in” by its audience.

The strength of a storyworld lies in the way its various parts connect. Just as in the actual world, where geography influences culture, technology shapes society, so too do the elements of a fictional world interact dynamically. To understand the construction of these fictional realities, the components of the storyworld can be broadly categorized into several independent parts.

### 1.3.1 Physical and Environmental Elements

The physical and environmental elements form one of the pillars of a storyworld, more specifically, its fundamental layout. These components actively shape the world’s history, influencing cultures, and societies.

#### Geography and topology

The geography and topology of a storyworld represent its fundamental layout, influencing everything, from migration patterns and trade routes to military strategies and cultures, that includes the layout of the continent / continents, the oceans, mountain ranges, deserts, fertile plains, forests, and rivers. Each component carries implications similar to those in the real world, for instance, a big mountain range can serve as a barrier, allowing for distinct cultures on each side, or it may be a valuable source of minerals, inciting conflict between different countries, while a huge river system might allow for commercial trades and communication. When making this layout, the placement of resources, travel routes, and the distribution of the

population all need to be accounted for and are a direct consequence of the world's physical layout.

The design of a world's geography is an important step in worldbuilding, since it directly impacts the other elements. Mark J. P. Wolf highlights the importance of creating maps as a "secondary World Infrastructure" (2012, p. 156), saying that they are essential and hold the world together, allowing audiences to fully understand the space where the narrative takes place. Users can mentally map and navigate the space more easily, which contributes to their understanding of the storyworld's cohesion.

### Climate and ecology

Directly related to geography, climate and ecology are also of extreme importance to a storyworld. Climate encompasses weather patterns, including temperatures, precipitation, and seasonal variations, while ecology refers to the biomes, fauna, and flora that exist within those biomes. These elements will define the overall conditions of life, influencing resource availability, agricultural practices, architectural styles, clothing and survival strategies of its inhabitants.

A world with extreme temperatures, like a perpetually frozen tundra, will inevitably shape the cultures present into resourceful societies, who will focus more on survival than any creative or non-essential endeavours. The presence of specific biomes will determine the types of plant and animal life, which in turn defines the resources available in the world. Steven Savage (2016) emphasizes how ecological considerations affect the whole environment, saying "It's not just how the universe/world/setting was made, but how it functions and how various phenomena happen like wind, disease, or where edible plants grow" (p. 51), reinforcing that "Thinking about Ecology means the setting you write is one people can 'get' because, essentially, it's alive in its own way, and readers can detect the consistency." (p. 52). Wolf (2012) categorizes the invention of new kinds of plants and species within the "natural realm" (p. 36), regarded by the author as the third level of invention, and defined as the degree to which default assumptions based on the Primary World, which is the real world of the user, have been changed, regarding such things as geography, history, language, physics, biology, zoology, culture, custom, and so on." (p. 34). He states that "Invention in this area sometimes extends beyond individual species of plants and animals to entire ecosystems that integrate a number of them together (as in the film *Avatar* (2009))" (p. 36). This consistent use of climate and ecology ensures that the world feels biologically plausible and responsive to its natural laws.

## Cosmology

In a plane above the terrestrial one, the cosmological systems of a storyworld define its place within the broader universe and its relationship with astronomical phenomena. This includes the nature of its primary star, possible natural satellites, neighbouring planets, stars, and constellations. Cosmology can also encompass the world's creation myths or the presence of divine or cosmic forces that influence its existence.

The celestial elements can have immense practical and symbolic implications. The presence of multiple moons might affect tides, nocturnal light levels, or even magical energies, depending on the magical system. Unique astronomical systems might also be tied to prophecies, magical rituals, or significant historical and cultural events, and can also influence flora and fauna by having distinct day and night cycles, impacting the light levels. Going back to Wolf's categorisation, cosmology is inserted within what he calls the "ontological realm" (2012, p. 36), or the fourth and deepest level of worldbuilding invention, which "determines the parameters of a world's existence, that is, the materiality and laws of physics, space, time, and so forth that constitute the world." (2012, p. 36). When these celestial elements are consistent and well-integrated into the world's lore and daily life, they contribute to a sense of vastness and ancient history, creating a sense that the world is much older than the length of time that the user has been interacting with it.

### 1.3.2 Societal and Cultural Elements

Beyond the physical landscape, the societal and cultural elements form the "human" part of a storyworld. These components define how its inhabitants organise themselves, perceive their reality, and live their daily lives. A well-built social and cultural infrastructure is essential to the feeling of being a "lived-in" storyworld, as they give the space discussed in the previous subchapter a sense of history, collective identity and believable "human" behavior. Wolf defines these characteristics as part of the "second level of invention" which he calls the "cultural realm", arguing that this is the realm of "invention" where most changes from the real world are found.

### Political Systems

The political system of a storyworld dictates how power is structured, used, and maintained. The nature of the political system heavily impacts the lives of its citizens, dictating laws, freedoms, justice and the distribution of resources. For example, a tyrannical empire will create a world vastly different from a republic, affecting everything from daily interactions to big conflicts.

A well-made political system is dynamic, having its own factions, history, and internal struggles. These political realities can serve as direct drivers for narrative conflict. Mark Rosenfelder in *The planet construction kit* (2012), outlines various forms of government, including “Absolute monarch,” “King and council,” “Oligarchy,” “theocracy,” and different forms of “democracy” (2012, p.14). He further explains the nature of these systems, noting that autarchies “vary in how absolute the ruler’s power is, and in how the ruler is chosen.” (2012, p. 117), that oligarchies are “ruled by a group— wider than an individual, pointedly much smaller than the general population.” (2012, p. 118).

Steven Savage (2016) states that “the setting, the world, provided background, drove events, and occasionally reigned in bad ideas. Worlds were the real character behind all other stories.” (p.7), equating the importance of the world’s foundational structures to that of the characters within it. Marie-Laure Ryan (2001) also highlights how a world provides a “field of activity for its members” (p.91) when defining the concept of world, which

### Economic structures

The economic framework of the storyworld defines how goods and services will be produced and distributed. This includes the available resources (which, as discussed previously, are defined during the creation of the physical environment), the principal industries (such as agriculture, mining, manufacturing, etc.), trade routes (also influenced by the topology discussed earlier), currency systems, and the socio-economic classification of the inhabitants.

Economic systems are highly influenced by the physical characteristics of the environment and by the political and social structures, as resource scarcity might lead to conflicts, while abundant resources can foster cultural exchanges, potential alliances, and prosperity. Savage (2019) argues that “economics is where culture/civilization, intelligent life, and the ecology intersect”, emphasising how fundamental the role of economy is within the world and its impact on characters’ lives. The flow of wealth and goods can give space to new motivations, conflicts, give rise to adventures, and highlight social inequality. Timothy Hickson also notes the importance of commerce in his book, defining it as mentioned previously, as one of the possible reasons for the fall of an empire (pp.175-176).

### Cultures and customs

Culture, as defined in the Cambridge English Dictionary, is “the way of life, especially the general customs and beliefs, of a particular group of people at a particular time” (Cambridge

English Dictionary, 2025). It encompasses everything from daily routines to art forms, fashion, cuisine, and entertainment. These elements provide a unique identity to different groups within the storyworld and shape interactions between groups and individuals.

Creating distinct and plausible cultures requires careful consideration of previously mentioned factors, such as their location within the physical world, their political systems, and their economic structure. Wolf (2012,) emphasises that invention in the cultural realm “consists of all things made by humans (or other creatures), and in which new objects, artifacts, technologies, customs, institutions, ideas, and so forth appear.” (p. 35). Savage (2016) further explains that “Culture is language and rules and institutions that help a sentient species interact with each other and their environment.” (p.199) highlighting how culture is shaped by other factors but can also impact those same factors.

The contrast between different cultures can be a source of conflicts and character development, forcing characters to navigate unfamiliar traditions or prejudices. Ryan, in discussing how readers construct textual worlds in their minds, notes that they do it “through the import of information provided by internalized cognitive models, inferential mechanisms, real-life experience, and cultural knowledge” (2001, p. 91), highlighting how the existence of cultures that share similarities with real ones can help create the sense of a “lived-in” world, if made correctly and used consistently.

## Language

Language is one of the fundamental pillars of culture. The languages spoken within a storyworld, their origins, dialects, and the ways in which communication flows significantly impact every aspect of interaction between the world’s inhabitants. A world where a single, universal language is used will be vastly different than one where multiple languages exist, which will require translations, and can lead to misunderstandings.

Wolf (2012) defines languages as part of the “nominal realm of invention” (p.35), detailing how they can “define new concepts, since language bears an inherent cultural worldview within it” (p.35). The presence of fictional languages, even if only used through names, adds depth to a storyworld.

## Belief systems, and mythologies

Religions, mythologies and belief systems provide a moral and spiritual framework, and are often associated with cosmology, which was previously discussed. They offer explanations for creation, the nature of existence, the afterlife, and other philosophical questions. These

systems often influence societal laws, ethical codes, cultural practices, and even architecture and art.

Belief systems are one of the components of Wolf's "cultural realm", and, as he highlights, "Mythology emerges from a combination of the previous layers and is how a culture understands, explains, and remembers its world." (2012, p. 155). Rosenfelder believes that "Religion is a misleading term, because to many people it just means Christianity. I prefer belief system, since it covers things that act like religions but don't seem to fall under the term" (2012, p.172). He further argues that "One of the major purposes of a belief system is to provide a moral framework... especially for those things that get in the way of our baser desires." (2012, p.188). Rosenfelder also talks about what belief systems encompass, linking it to cosmology, saying "Cosmologies may extend over time as well as space, giving an outline of the history of the universe: how it was created, what sort of times preceded our own, what comes next, how everything ends." (2012, p.186).

### 1.3.3 Rules and Systems

As mentioned throughout this chapter, storyworlds are built upon a number of systems, be it a realistic storyworld or a fantasy one, these systems make up the foundation of the storyworld. Wolf puts these elements within the "ontological realm of invention", which "determines the parameters of a world's existence, that is, the materiality and laws of physics, space, time, and so forth that constitute the world." (Wolf, 2012, p. 36).

Although some of these systems have already been addressed in previous chapters, such as political systems, this chapter will focus on the systems that define the underlying principles that govern the storyworld, dictating what is possible or not within it. Unlike the systems within the physical and cultural elements, which are usually visible, these rules function as the invisible forces that provide consistency to the world.

#### Magic systems

Magic systems are a defining characteristic of fantasy storyworlds, providing a means for characters to manipulate reality beyond what is commonly understood. These systems' theoretical approach usually falls within a spectrum from "hard" to "soft" magic, where the former has clearly defined rules, limitations, and costs, allowing both characters and the audience to more easily understand how magic works, predict its effects and strategize, while

the latter is less defined, working on a sense of wonder and mystery, with its rules often revealed only when necessary for the plot.

Timothy Hickson, in *On writing and worldbuilding* (2019), discusses this spectrum in detail, noting that “A harder magic system [...] has more clearly defined rules, consequences, and limitations that govern what one can or cannot do with magic.” (2019, p. 91) and that “The more a reader comprehends and understands the magic system as an element of the narrative, the more it can be used to solve problems in the story in a satisfying way.” (2019, p. 97-98).

Savage also highlights the theoretical implications of magic’s presence within a storyworld, pointing how it affects things like intelligent life, ecology, origins of the world, culture and economy (2016, p.90-91), stating that “MaT\* is pretty much part of anything you're creating setting-wise. In your own worldbuilding endeavors you've probably been designing a lot of spells, starships, or super computers anyway. This is just a good reminder that it may go even farther than you realize.” (2016, p.91). (MaT = Magic and Technology)

## Technology

The technological level of a storyworld immensely impacts the daily lives of its inhabitants, the social structures, economy, and potential conflicts. The spectrum of technology can vary from primitive to futuristic interstellar technology. Steven Savage treats Technology with the same regards as magic, stating that “For the sake of building a setting, magic and technology are no different. Magic and technology are the ways characters manipulate themselves and the elements of their settings to achieve results fitting a specific goal and thus are really no different” (2016, p.89), emphasizing how influential both are within a storyworld.

Mark Rosenfelder, in *The planet construction kit*, dedicates an entire section to technology (2012, p.224-242), detailing how most advancements in technology usually appear in a specific chronological order, where one advancement gives birth to another while also highlighting the impact they may have on society, noting how, for example, “The printing press allowed an enormous democratization of knowledge” (2012, p. 235).

## Physics and natural laws

The fundamental physics and natural laws of a world are the most basic rules that constitute the fabric of reality. In realistic or contemporary storyworlds, these laws closely resemble or even work exactly those of our actual world (for example gravity, thermodynamics, etc.). However, in a fantastical or science fiction world, these laws can be subtly or dramatically changed, creating unique challenges. Even in “impossible storyworlds”, where logic and physical laws seem non-existent, internal consistency is key to make it believable.

Wolf notes that some in some storyworlds, even “time and space behave differently” (2012, p. 36), highlighting that “A number of common science fiction conventions, including faster-than-light travel, other dimensions, time travel, and wormholes used for interstellar travel, usually imply laws of physics that are different from those currently understood...” (2012, p. 36).

## 2. Environmental Storytelling: Concept and Techniques

### 2.1. Introduction

The discourse around environmental storytelling in video games started between the end of the 20th century and the beginning of the 21st and only got wider attention with Don Carson's (2000) article about the similarities of theme park design and the worldbuilding in video games. Since then, environmental storytelling has become a fundamental part of video game narratives. It lets players experience storytelling in a more immersive and interactive fashion, stepping away from the traditional dialogue-based exposition and cutscenes. As explained by Henry Jenkins (2004), environmental storytelling creates a set of preconditions that allow for a more immersive narrative experience, such as the way game developers may embed narrative information within their mise-en-scene and "provide a staging ground where narrative events are enacted" (p.6). These two preconditions allow players not only to understand and theorize what happened on the stage that was set by the game but to interact with it and see the narrative events happen. In this way, players can uncover and interpret narrative details at their own pace, keeping them more engaged and creating a more personalized experience.

As per Michael Nitsche's (2009) words, these narrative elements encourage players to project meaning onto events, objects, and spaces in game worlds. Evocative elements are spread throughout the environment in certain ways to evoke a reaction from the player, to encourage them to deduce and investigate, therefore creating their own interpretation of the narrative. The objective of these elements is not to tell a story in the traditional sense, instead they aim to create a non-linear story in order to enhance the player's experience and make it more meaningful.

Clara Fernandez-Vara (2011) expands this concept by introducing the term **Indexical Storytelling**, a "strategy to construct the narrative of the game, based on leaving traces and affecting the space, either on the part of the designer or the player" (p.4). This concept is based upon Charles Peirce's philosophy of language in which a sign is a representation that conveys an idea about something to someone. Peirce divide these signs into three types:

- **Icons** - Signs that demonstrate an idea by imitating it, like onomatopoeias, drawings and photos.
- **Indexes**- Signs where the idea is physically connected with it, Such as sign posts that indicate direction, or how smoke indicates fire.
- **Symbols** - Signs that are arbitrary and must be culturally learned, such as the alphabet.

Taking into consideration these definitions, Clara-Fernandez' indexical storytelling is defined by a story told mainly through a series of indexes. As defined, an index has a direct relation to an event, and is often a consequence, or a warning of it, therefore incentivizing the

player to theorize and create their own interpretation of what happened, what is going on, or what will happen. Indexes can also help the player situate themselves in the storyworld, both in space and time, relating their current experience with their previously acquired knowledge about the storyworld.

In a game world, indexes can work as clues to what needs to be done in the game, or as indication of previous events that happened before the player entered that particular scenario. Through this method of indexical storytelling, the game designer utilizes objects to convey elements of the story, scattering throughout the game world so that the player has to actively search for them and interpret them in their own way, piecing together the narrative, or parts of it, through their own investigation.

As we have seen, the concept of environmental storytelling is relatively new and is grounded on video game studies. Nevertheless, it offers a solid theoretical framework of each technique and how it affects the way it conveys the game's storytelling. Finally, the chapter will compare how these techniques affect the process of world design, comparing open-world cases to instance-based cases, demonstrating how different approaches impact player engagement and narrative interpretation.

## 2.2. Environmental Storytelling

Building upon the initial definitions established in the introduction, the following section aims to deepen the theoretical concepts of environmental storytelling by closely examining foundational contributions made by key scholars. This analysis will further dissect the core techniques and principles that govern how narrative is embedded into the architectural and spatial design of game worlds.

As previously mentioned, the discourse surrounding environmental storytelling started gaining traction with Don Carson's article titled "Environmental Storytelling: Creating Immersive 3D Worlds Using Lessons Learned from the Theme Park Industry". In this article, Carson, a veteran theme park designer, talks about the intersection of creating a virtual world and theme park design, revealing parallels between different modes of immersive entertainment.

According to Carson, one of the base principles in designing immersive environments, be it digital, or physical, is the integration of storytelling within the physical space, using elements such as lighting, colour and texture to evoke emotional reactions from the user. By harnessing the audience's pre-existing knowledge and expectations, the world designer can create environments that feel authentic.

Building on this idea, Carson clarifies that a fundamental aspect of worldbuilding in digital gaming is the establishment of a cohesive and consistent narrative framework. Rather than relying solely on linear storytelling, a well-developed game world operates under a set of rules that guide its design and maintain narrative coherence. For example, if a game is set in a pirate-themed environment, every design element—including architecture, sound, and interactive objects—should reinforce the thematic consistency of that world. Adherence to these principles ensures that players remain immersed in the game’s setting without encountering elements that break the illusion of authenticity.

Another crucial point Carson makes about this concept is the role of spatial awareness and player orientation in game design. Within the first moments of gameplay, players should be able to answer fundamental questions such as "Where am I?" and "What is my relationship to this place?" This immediate contextual awareness is best achieved through environmental cues rather than explicit exposition. Carson uses the example of *Half-Life* (Valve, 1998), which, per his own words, does an “award winning job” at giving the player a chance for self-identity, but only through interactions and environmental storytelling rather than through direct narration.

To further enhance the depth of environmental storytelling, Carson suggests the use of "cause and effect" vignettes. This technique incorporates environmental details—such as broken doors, remnants of an explosion, or scattered notes—that provide players with contextual clues about past events and potential future dangers. By enabling players to piece together the game’s narrative through exploration and observation rather than direct exposition, this method fosters a more engaging storytelling experience. On top of this, Carson advises the use of familiar elements to help players “anchor” themselves in an otherwise alien environment. If an environment is entirely abstract or unfamiliar, players may struggle to establish an emotional connection with the space. Subtle familiar elements, such as recognizable architectural features or everyday objects, can help anchor players within the game world and contribute to a more immersive experience.

Building on Carson’s Concepts, Jenkins expands the concept of environmental storytelling in the already mentioned “Game design as narrative architecture” (2004). In this article, Jenkins explores the relationship between design and storytelling, but rather than adhering to a binary framework that sees games as either mechanical systems or storytelling vehicles, Jenkins proposes an integrative perspective where games serve as narrative architectures. He argues that video games are spatially oriented storytelling mediums, offering players an immersive and interactive narrative experience that is distinct from traditional forms of storytelling such as literature and cinema.

Jenkins begins by addressing the academic divide between ludologists, who emphasize gameplay mechanics and rule-based systems, and narratologists, who analyse games through

the lens of traditional storytelling structures. He critiques the reductive nature of both perspectives, arguing that while games may not always adhere to conventional narrative forms, they still engage in meaningful storytelling through environmental design, spatial composition, and player agency.

While in traditional media, narrative is primarily conveyed through linear progression and structured storytelling, videogames can use spatial storytelling, where narrative elements are embedded within the game world itself. Jenkins asserts that the interactive nature of games allows for unique storytelling structures that diverge from film or literature while still fulfilling important narrative functions. His argument reframes the debate, urging scholars to consider games as an emergent medium that marries aspects of both systems and storytelling to create rich, engaging experiences.

Jenkins identifies and elaborates on four ways in which games convey stories, each how narrative elements are embedded within and shaped by interactive spaces. He starts by exploring the idea of evocative spaces, where pre-existing references, be it cultural, thematic, or historical, provide a level of familiarity that contributes to the game's narrative without requiring direct exposition. A dystopian cityscape, a medieval town, or a postapocalyptic wasteland all evoke certain expectations and emotions on the player.

The second approach Jenkins talks about is "enacted stories", where the narrative is unfolded through the player's actions and choices. Unlike most media, which tend to be more passive or based in cognitive interactivity, video games encourage players to actively shape the events and influence the direction of the story. Most Role-Playing Games, like *Mass Effect* (BioWare, 2007) have this as their biggest focus, allowing players to actively decide the outcome of certain events, explore open-ended scenarios, and interact with NPC's (Non-Player Characters) who respond dynamically to their actions.

Jenkins also dives into the idea of localized incidents, or what he calls micronarratives. These are smaller, self-contained story moments that may or may not happen due to the player's interaction. These micronarratives may emerge from choices made by the player, or even by pre-planned moments made by the game designers, that typically aim to add more nuance to the larger scope narrative at play.

Jenkins then talks about the concept of embedded narratives, where storytelling elements are scattered throughout the game world for players to discover. Environmental storytelling is essential in this regard, as players engage with fragmented details such as hidden notes, audio logs, or visual cues, to reconstruct backstory elements. This method encourages exploration and rewards curiosity, as seen in titles like the previously mentioned

*BioShock* (Irrational Games, 2007), *Dark Souls* (FromSoftware, 2011), and *The Last of Us* (Naughty Dog, 2013), where worldbuilding unfolds organically through environmental interaction rather than through direct exposition.

Lastly, Jenkins identifies that some games rely on emergent narratives, in which storytelling is not prescribed but arises dynamically through player interaction with the game's systems. Open-world and simulation-based games, such as *Minecraft* (Mojang Studios, 2011), *The Sims* (Maxis, 2000), and *No Man's Sky* (Hello Games, 2016), exemplify this model, as players create their own stories by engaging with the world and mechanics in unique ways. Each playthrough offers a distinct experience, shaped by spontaneous events, unpredictable AI behaviours, and the creative agency of the player.

In examining the contributions of both Carson and Jenkins, it becomes evident that environmental storytelling is a multidimensional approach that bridges the gap between traditional narrative techniques and interactive design. Carson's principles highlight the importance of integrating narrative elements within the physical and digital spaces, ensuring thematic consistency and player immersion through environmental cues. Jenkins expands on this foundation, emphasizing the spatial nature of storytelling in games and redefining how narratives can emerge from player interaction, world design, and environmental detail. By recognizing games as narrative architectures rather than mere mechanical systems or linear storytelling mediums, both theorists offer valuable insights into the evolving relationship between design and narrative in interactive experiences. Ultimately, the integration of environmental storytelling enriches player engagement, allowing for deeper immersion and more meaningful interactions within virtual worlds.

### 2.3. Environmental storytelling techniques

Environmental storytelling in video games can be broken down into specific techniques that are utilized to construct engaging and immersive experiences. These techniques leverage spatial, visual, and textual elements to provide deeper narrative layers within the game world. This chapter will explore the various techniques, or indexes, used in environmental storytelling, focusing on the theoretical reasons for those techniques to be applied. These techniques include:

- **Architecture and Level Layout:** The structure and design of a game environment influence how players navigate and interpret the world. The use of distinct

architectural features, hidden pathways, and environmental hazards can provide the player with deeper narrative context.

- **Item Descriptions:** Many games employ item descriptions as a means to convey lore and background information. These descriptions offer insight into the history of an object, the people who used it, or the events it was involved in.
- **Micro-Narratives:** Small-scale stories that unfold within the game world through visual cues, minor events, or secondary interactions.
- **Props and Objects:** Everyday objects, such as broken weapons, abandoned belongings, or graffiti, can be used to communicate key narrative details and hint at past events.
- **Natural Elements:** The environment itself can serve as a storytelling device. Weather conditions, overgrown ruins, or eroded landscapes can indicate the passage of time and the history of a location.
- **Notes, Diaries, and Logs:** Written documents found throughout the game world that can serve as direct narrative clues, providing insights into character motivations, historical context, or ongoing conflicts.

### 2.3.1. Architecture and level layout

The biggest difference between videogames and other media is that the former allow the user to explore the space. One of the most important facets of this is the architecture and level layout of said games due to their capacity to shape player perception, guiding narrative flow, and evoking emotion through design. To better understand how one should shape the level layout and architecture to mold player's experience and evoke the desired emotions, drawing on the insights of urban theorists and architects is essential, even if games usually present "unnatural" scenarios, which Jan Alber (2009) defines as "physically impossible scenarios and events, that is, impossible by the known laws governing the physical world, as well as logically impossible ones, that is, impossible by accepted principles of logic." (p.80). These unnatural scenarios still need to be based on some existing knowledge and style. Jan Alber substantiated this idea through Marie-Laure Ryan's principle of minimal departure, "Ryan (1991: 51), Fludernik (1996: 43–46), and Herman (2002: 23; 370) argue that narrative comprehension is based on a set of real-world cognitive frames. For instance, Ryan's principle of minimal departure predicts that "we project upon [fictional] worlds everything we know about reality, and [. . .] make only the adjustments dictated by the text" (1991: 51)." (2009, p. 80-81), using this as a foundation we can comprehend that if something is too unnatural, even if the designer behind the setting understands it, the user won't comprehend it and ultimately, will feel

frustrated. Games like *Stanley Parable* (2013, Galactic Cafe) create surreal outcomes due to the capacity the players have to go against the narrator's story but maintain a realistic scenario that puts the player inside an office or factory.

To better understand how to build upon this, Kevin Lynch's book *The image of the city* (1960) offers valuable insights. Central to Lynch's theory is the concept of **imageability** "that quality in a physical object which gives it a high probability of evoking a strong image in any given observer" (p.9). According to Lynch, environments with high imageability feature elements that are not only recognizable but also emotionally resonant, allowing individuals to navigate and remember the space more intuitively. He also defends that these environments should be "well formed, distinct, remarkable; it would invite the eye and the ear to greater attention and participation" (p.10) which, in the context of environmental storytelling, is the most desired outcome as it would allow the player to understand the story world better.

This concept is exemplified in *Return of the Obra Dinn* (2018, Lucas Pope), which utilizes a confined and highly imageable environment to deliver its complex narrative. The setting, a single merchant ship frozen in time, is meticulously constructed, allowing players to navigate with increasing confidence despite the nonlinear storytelling. Each part of the ship serves as a narrative fragment, and through repeated visits and gradual discovery, players internalize the space, connecting its physical structure with their emotions and the narrative.

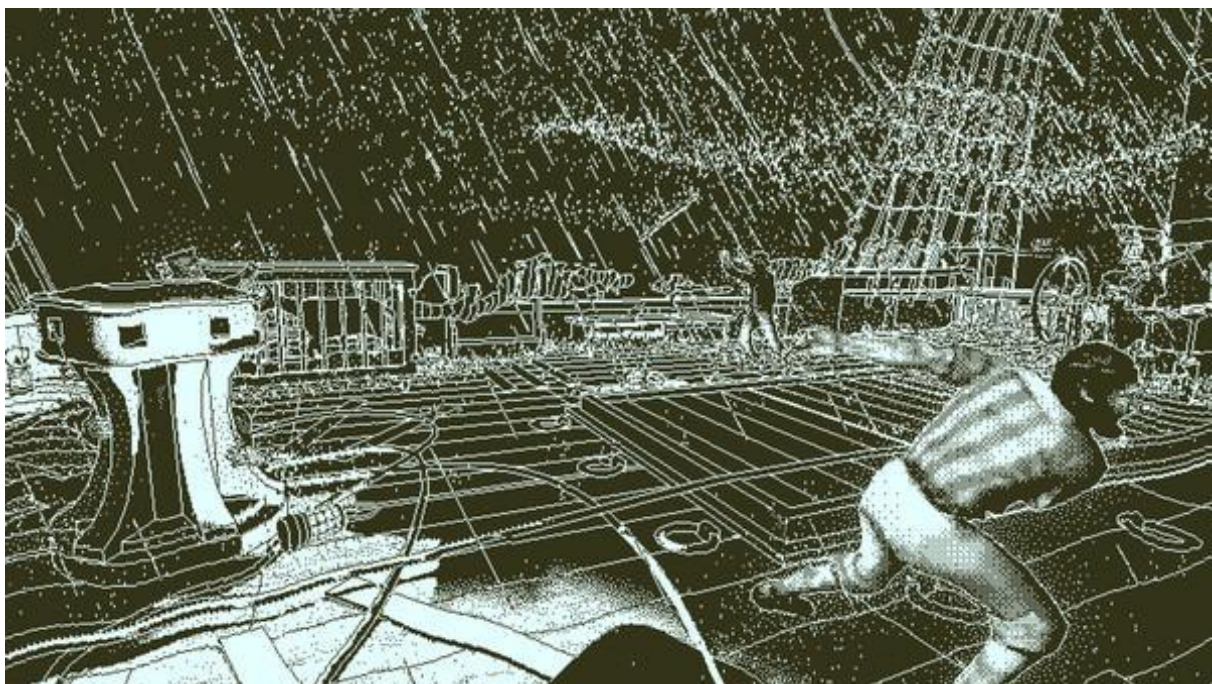


Figure 3 *Return of the Obra Dinn* (2018, Lucas Pope), *Obra Dinn's Deck*, [https://store.steampowered.com/app/653530/Return\\_of\\_the\\_Obra\\_Dinn/](https://store.steampowered.com/app/653530/Return_of_the_Obra_Dinn/)

Complementing imageability is the concept of **legibility**, which refers to how easily the structure of a space can be understood at a glance, which is crucial when designing virtual environments, since if the space is hard to understand, the player is most likely to get lost, and therefore, get frustrated - although there are cases where this might be the intention and therefore, this doesn't apply. In his analysis of urban landscapes, Lynch identifies five key elements that contribute to a city's legibility: paths, edges, districts, nodes, and landmarks:

- Paths - Lynch defines paths as "the channels along which the observer customarily, occasionally, or potentially moves" (1960, p.47), he also notes that these are usually the predominant elements in a person's mental image of the city. This aligns with Jenkins' idea that the environmental storytelling creates a "staging ground where narrative events are enacted" (2004, p.6). In video games, these paths guide players through the narrative space, and the design of these paths, along with the elements placed along them, can convey story information. For example, a narrow, overgrown path might index a forgotten or dangerous area.
- Edges - Edges define the limits of the walkable space. As defined by Lynch they are "the linear elements not used or considered as paths by the observer. They are the boundaries between two phases, linear breaks in continuity" (1960, p.41). These elements may be strict or penetrable barriers, but they always define where one region ends, and another starts. In the context of video games, and using the *Return of the Obra Dinn* (2018, Lucas Pope) example, a locked door represents a penetrable edge that the player can't unlock until certain objectives are achieved, marks represent strict edges that show traces of past conflicts acting as an index of past events.
- Districts - Districts represent the aforementioned regions. They are "the relatively large city areas which the observer can mentally go inside of, and which have some common character..." (1960, p. 66). Districts are usually easily recognized and can be used as a point of reference for a person to go towards them, this makes it, so every district has unique traits in terms of texture, space, color, topography and especially activity. Games like *Cyberpunk 2077* (2020, CD Projekt RED) represent this very well with its game world where different zones represent different factions, which in turn resonates with Jenkins' idea of evocative spaces that allow the players to immerse themselves in the narrative settings. The visual and auditory cues within a district contribute to its identity, allowing players to form a mental image and understand the history of a location through environmental details.

- Nodes - Nodes are spots usually contained within districts and represent “strategic foci into which the observer can enter, typically either junctions of paths, or concentrations of some characteristic.” (1960, p.12). In a game world, nodes can function as key locations where the narrative events take place or where players might encounter micro-narratives. Things like a bustling marketplace, for instance, might be filled with cues and interactions that might reveal smaller, self-contained stories, and even show indexes of past or future events within the storyworld, contributing to the overall narrative, and letting the player discover it at their own place.
- Landmarks - Landmarks are external points of reference. Per Lynch’s words they are “usually a rather simply defined physical object: building, sign, store, or mountain” (1960, p.48), he defines that the most important characteristic of a landmark is “singularity, its contrast with its context or background.” (1960, p. 100-101). In video games, landmarks are one of the most essential types of architecture, serving as “anchors” for players, helping them orient themselves within the story world. Landmarks can also be ties to embedded narrative elements, games such as *Elden Ring* (2022, FromSoftware) utilize a plethora of Landmarks to guide the player, such as gigantic towers and castle, and most obviously, the giant gold tree that is possible to observe in almost every zone of the game, as long as the player is not inside an enclosed structure.

With these five concepts, we can determine that the architecture of a game level doesn’t just guide, it evokes emotions and memories from the player. This aligns with Clara Fernandez-Vara’s theory of **indexical storytelling**, in which environmental clues act as indexes pointing to narrative events. They encourage the player to ask questions, build theories, and project narrative onto space.

This can be especially seen in games like *Control* (Remedy Entertainment, 2019), where more than an aesthetic, the brutalist architecture is a character in itself. The ever-shifting layout of the map is both overwhelming and navigable, it guides the player while it reinforces the themes the game represents, bureaucracy, paranoia, containment and mysticism.

This represents Lynch’s idea of a well-knit place, which is an essential part of his work. A memorable level is not only functional, but also capable of evoking emotions and memories. Players don’t just recall how to get from point A to B, but how they felt traversing that particular space. That space may connect to a memory of a near-death escape, of an NPC’s final words, of a realization about the game world.

These emotions can also be manipulated through repetition and return. Making the player revisit a previous area of the game, but in an altered state, destroyed, or decayed, can change the player's perception of their own actions and show a narrative evolution. A once safe environment that gets destroyed or taken over by enemies shows the constantly changing world and can even make the player rethink his actions. A previously inaccessible room that is now open will have new narrative artifacts and will reward exploration, deepening the player immersion. Like Don Carson (2000) emphasizes, even the texture of the floor can influence how a space is perceived, for example smooth marble tiles tend to imply reverence while cracked stone suggests decay and/or instability. Therefore, designers can employ verticality, lighting, and material to create spatial moods.

Games from the *Dark Souls* (FromSoftware) franchise are experts in this integration of spatial storytelling and emotional orientation. They're usually interconnected levels that create a web of discovery where each shortcut unlocked, and hidden path revealed builds narrative and creates a clear progression. The spaces themselves become a kind of character, rewarding the players who are familiar with them, and punishing recklessness. Players build relationships with the locations, creating a sense of kinship, dread, or longing towards them.

In practice, this means that the architectural storytelling, when fully developed, makes every part of the environment participate in the narrative. Players should always understand, at least in part, either what has happened in a space before they arrived, what is happening now, or what might happen next. Like Lynch says, a vivid environment provides a "framework for communication or conceptual organization" (1960, p.5), making game levels become stages of interaction, memory, and speculation, not only just a path the player has to take to reach their objective.

Michael Nitsche took Lynch's concepts and expanded them into video game design. In his book "Video Game Spaces: Image, Play, and Structure in 3D Worlds" (2008) Nitsche introduced the concept of "story map". He defines it as "the result of this reading of the game space in combination with the directed evocative narrative elements encountered along the way." (p.227), he then clarifies the relationship between this concept, and Lynch's concept of "image", by correlating players' navigation in a 3D world to that of the physical world explaining that every story map is simply a cognitive map that has been heavily influenced by the narrative elements the player has experienced in the game.

Nitsche's approach to video game level design focuses on spatial structure as an active narrative component, rooting his ideas not only in Lynch's architectural principles, but also on other architectural theorists such as Norberg-Schulz, Christopher Alexander, and Francis

Ching. By treating digital game environments as real architectural builds, Nitsche suggests that the level layout can serve as narrative elements as much as in physical architecture. This aligns with Lynch's principles about legibility and imageability, especially how built environments influence cognitive mapping and emotional engagement. Nitsche defends that the in-game architecture not only must be readable but also symbolic, he defends that space and narrative must be interconnected, stating, "Narrative elements help to make the space meaningful, and space helps to situate these elements" (p.45). The layout of a level of a game, its boundaries, scenery, transitions and spatial hierarchies should all be tools for storytelling through form, material, rhythm, and spatial progression.

Nitsche argues that one of the most effective ways environmental storytelling works is through the shaping of spatial experience. He identifies several types of spatial structures commonly found in video games that do more than guide the player. These spatial patterns are tracks/rails, labyrinths, and arenas.

Nitsche introduces the concept of tracks by stating "One distinguished spatial form in video games is the track. In its purest form it is realized as a single axis." (2008, p.172), referencing Michael Benedikt's "principle of transit" for cyberspace, which states that travel between two points in cyberspace shouldn't occur immediately, but instead pass through every point in between, independently of how fast it is done, and it should incur some kind of cost to the traveller proportional to the distance (2008, p. 173). This connection of points creates a structure of cyberspace.

In the case of racing games such as the *Gran Turismo* series, these tracks are obvious as they simulate the experience of high competition racing, but ultimately "They cannot aim for an architectural simulation but for a movement simulation and the overall game space's visceral impact" (2008, p. 173), they focus on the speed and the limitations of space, but not the actual real world racetrack design, usually missing things such as safety guards, both for the pilots and the spectators, as it is something not necessary for the game.

Tracks can also take on other forms which are less noticeable to the player, such as corridors and controlled scenarios. Their linearity allows for controlled pacing, focusing the player's attention and movement in specific directions while subtly revealing narrative cues along the way. These spaces prioritize momentum and clarity, Nitsche points out that "any player of the early Medal of Honor titles is taken on a ride along prescribed events and battles that demand not sheer speed but a range of different interactions." (2008, p. 175), meaning that the scenarios are designed not just to move the player forward, but to add a layer of dramatic enactment to the scene.

These linear tracks can often break or twist into more complex spaces, that usually lead to another important spatial structure which is the labyrinth. Labyrinths introduce spatial uncertainty, and “play with the notion of hierarchy as they lack outstanding visual cues that can support orientation and instead often feature repetitive rhythms of recurring patterns.” (p. 176), encouraging players to engage with the world through mapping, memory, and careful exploration. Due to this characteristic, the storytelling emerges not from direct sequences, but from the player’s process of unraveling the space. Like mentioned before, *Dark Souls* (2011, FromSoftware) has a plethora of characteristics that makes it easily navigable, but that is only after the player is able to decipher the spatial structure of the world. Initially, due to the way the game puts the player in an intersection of various paths, the world is rather labyrinthic and will slowly unravel the landmarks in which the player can sustain their navigation. The recursive nature of the world design, full of shortcuts and vertical links mirrors the game’s thematic focus on cycles, decay, and resurrection, therefore, after a first navigation through this “labyrinth”, clear landmarks can be used to navigate when the need to backtrack arrives, which links to Lynch’s (1960) idea that there can be pleasure in exploring unknown labyrinths, but “there must be no danger of losing basic form or orientation, of never coming out. The surprise must occur in an overall framework; the confusions must be small regions in a visible whole. Furthermore, the labyrinth or mystery must in itself have some form that can be explored and in time be apprehended. Complete chaos without hint of connection is never pleasurable” (p. 5-6).

This nature creates what Nitsche defines as a logic maze, a type of labyrinth that cannot be solved by simply navigating through it, but through a careful analysis of implemented conditions, he states that “The labyrinth/game space is completely revealed but is a complex puzzle in itself that needs to be processed.” (2008, p. 182), which, in the case of *Dark Souls*, is represented by the need to explore certain areas before others are unlocked, be it by the need of defeating a certain boss, or the need of a certain item.

In contrast with the two previous structures, arenas function as contained centres of action. These are spaces where narrative and gameplay usually converge in moments of confrontation. Nitsche defines this type of structure as “[...] mostly open structures with one dominating demarcation line: the surrounding enclosure, [...] As opposed to the labyrinth, they feature few visual clues that draw attention to the place as such. Instead, they provide the canvas for a performance.”, which means these structures are mostly used as a stage for an emotional climax, staging narrative revelations or important challenges for the player. Their design is often symmetrical or circular providing relatively free movement in its contained space (2008, p. 183).

Beyond these structures, Nitsche defines another type of spatial form that tries to simplify the other structures (2008, p. 187). In this type of structure, traditional levels are replaced by systems that allow emergent narratives to occur through open ended navigation and interaction. In such games, per Nitsche's words, "Spatial logic is seen as an additional guiding force for behaviour and can be applied to exploit the narrative potential of virtual spaces" (2008, p. 187-188), making it so the environment turns into one of the principal drivers of the narrative experience. For example, in *The Legend of Zelda: Breath of the Wild* (2017, Nintendo), the player can approach any location in any order at every single point in the game after its tutorial. The ruins of cities, broken guardians, and diaries hidden throughout the structures offer cues and slices of a shattered past that players reconstruct through their own journey.

In conclusion, through the use of materials, textures, colours, lighting, and even sound, a level layout and subsequent architecture can deliberately "feed" the player with narrative cues, making them subconsciously absorb the game's narrative without the need for long cutscenes or text walls. The designers can create a controlled environment where the player's emotions are carefully planned, making the game more engaging. Using tracks/rails, the designers can create extremely controlled environments that, on the downside, can become boring and predictable for the player, while labyrinths can create too much chaos that, if out of control, can become frustrating. This way, through the use of architecture and level layout, the designers can ensure that the player not only has an enjoyable experience exploring the map but also can theorize and engage with the narrative through the environment.

### 2.3.2. Items and item descriptions

The use of items and their corresponding description is one of the most overlooked methods by the players, but it is one of the most effective ones. While items, at a first glance, may appear to serve a functional or mechanical purpose, such as equipping the player with better gear or acting as quest items, their true narrative value lies within the way they anchor stories to the environment, contributing to a broader understanding of the gameworld and its narrative or even creating their own self-localized stories. As Jenkins and Nitsche have emphasized, game spaces often derive their narrative richness not only from dialog, cutscenes, and architecture, but from the accumulation of layers of meaning embedded in "evocative elements" (Nitsche, 2008, p.44), which are objects that "...are included in virtual environments to improve the meaning-building process of the player. The elements are not stories but suggestive markings. They are clustered in certain ways and aimed to trigger reactions in players in order to help them to create their own interpretations." (p.44). In this context, item descriptions serve as a

key vehicle to convey lore, character development, and themes in an indirect manner, encouraging the players to look for the meaning behind such things.

Item-base storytelling works primarily through the use of indexes. These indexes invite players to piece together fragments of the narrative in a deductive, player-driven fashion, embodying Clara Fernández-Vara's concept of indexical storytelling. As Fernández-Vara's (2011) explains, indexes have a direct connection to the events or agents they signify, a worn-down axe next to a broken door is not just a visual cue, but a consequence of an action, and the remnant of a conflict. When combined with textual description, often found in menus or by inspecting such items, these objects transform from simple assets into narrative devices, encouraging the players to theorize about what occurred in the environment and why, which in turn allows for a more personalized experience when engaging with the storyworld.

This design aligns with Nitsche's idea of "evocative narrative elements", which do not tell stories directly, but act as narrative triggers that provoke interpretation through spatial and object-based discovery (Nitsche, 2008, p.3)

As previously mentioned, item descriptions can contribute to environmental storytelling by providing layers of time within the game world. They hint at histories, collapses, and events that stretch beyond the player's direct experience, situating them within a broader narrative framework. In this sense, items become what Jenkins calls components of embedded narratives, saying that "Within an open-ended and exploratory narrative structure like a game essential narrative information must be redundantly presented across a range of spaces and artifacts" (2004, p.10). These embedded narratives allow games to avoid linear exposition while still conveying complex histories.

When properly utilized, the items do not exist in isolation but function as a vehicle for the broader motifs and ideologies presented by the game. Returning to the example of *BioShock Infinite*, the consistent use of Founders-themed propaganda posters, and descriptions all come together to create a nationalistic rhetoric, reinforcing the ideological framework of Columbia. These items then form an environment where the players situate themselves, analysing the politically charged environment shaped by these ideological conflicts. Furthermore, this item-based environmental storytelling provides a means for enacting localized micronarratives as defined by Jenkins, a concept that will be explored in the next chapter.

In summary, items and item descriptions represent an essential technique within environmental storytelling, as they offer players entry points into the game's

world, history, and themes, while letting them misinterpret those themselves. Through their physical placement, textual detail, and visual design, they can serve as indexes that enable the players to engage with the environment in an investigative manner. When placed with thought, these items can turn an abstract digital space into lived-in, storied environments, reinforcing the idea of an inhabited world by presenting traces of life and legacy.

Moreover, they serve as evidence of presence, they indicate that someone or something once acted within the space the player now walks. Therefore, in the effort to create perceived inhabited worlds, items are not a peripheral part of the game. They enable the games to tell stories that are spatially grounded, that show the temporal nature of the game world, and also is player driven.

### 2.3.3. Micronarratives

Micronarratives are one of the building blocks that shape the perception that the player has of the storyworld. These micro-level story elements, while not always central to the main plot, contribute to creating a layered approach to the narrative experience. They are often embedded in the architecture, objects, and patterns of interaction that exist within a game, encouraging players to actively piece together meaning through exploration and observation.

Jenkins (2004), says that “Narrative can also enter games on the level of localized incident, or what I am calling micronarratives.” (2004, p. 8), he defines this concept to reinforce the idea of **embedded narratives**, which are narratives that emerge through the use of narrative elements scattered throughout the environment. These are often delivered through environmental cues, like an abandoned campfire with scattered belongings. Each detail contributes to a silent story, often allowing the player to infer emotional or historical depth onto the scene without any direct exposition. This also ties with Clara Fernández-Vara’s (2011) theory of indexical storytelling since the environmental cues present in micronarratives are nothing more than indexes, turning the player into a “detective” who reconstructs past events through these indexes.



*Figure 4 Fallout Tv series episode 2 (2024, Amazon Prime video), micronarrative about a family who killed themselves with poison to not suffer from the nuclear fallout.*

What distinguishes micronarratives from more structured narrative components is their scale and modularity. They operate within the other environmental storytelling techniques, and as narrative mechanics embedded into the gameplay itself, and often they do not advance the central plot directly but only enriching it through emotional exposure and thematic cohesion, they may even be completely separate from the central plot, only serving the purpose of giving depth to the story world. These fragments may not be noticed by the player at first instance, but through accumulation, their importance rises within the confines of the plot.

As mentioned before, these micronarratives can be a part of the main plot, but they can also be totally separate, with the only thing in common being the storyworld. This aligns in part with Jenkins' idea that "Narrative enters such games on two levels - in terms of broadly defined goals or conflicts and on the level of localized incidents." (2004, p. 7). Micronarratives sit in between these two levels, as they can show the player the reasons behind certain conflicts where the player was dragged into, or they can be a localized incident that the player stumbled upon while exploring the space.

This two-level approach also demonstrates how micronarratives support player agency through different levels of engagement. Players who solely focus on completing objectives might miss these stories completely, while more exploratory players are rewarded with a richer, more layered narrative experience. This design philosophy allows developers to cater to a more diverse player base, accommodating both casual and deeply invested players.

Micronarratives also have value in what Beat Suter calls "motivating game mechanics" (2019, p. 52?). These are gameplay systems that incentivize exploration and discovery, often rewarding the player with micro-story revelations. This makes it so micronarratives can act as a bridge between gameplay and narrative, tying with Jenkins' concept that the spatial arrangement of the game world becomes itself a storytelling tool, making them active components in player-driven stories.

Crucially, this storytelling strategy reinforces the idea of an inhabited world. They create a sense that game space has a temporal dimension to it, a history where certain events occurred in the player's absence, and that the world is not just a stage for the gameplay, but a living, breathing environment. This aligns with Michael Nitsche's idea that such evocative narrative elements help the players "project meaning onto events, objects, and spaces" (2009, p. 44), encouraging a deeper engagement with the game world.

Micronarratives also show a shift in narrative authority. Although not quite like **emergent narratives**, which as Jenkins defines, "Emergent narratives are not pre-structured or pre-programmed, taking shape through the game play," (2004, p. 13), micronarratives are also authored in collaboration with the players. The player's interpretative work becomes essential to the story's existence.

In conclusion, micronarratives are an essential technique in environmental storytelling, offering a means of enriching the narrative without any direct exposition. Through spatial cues, object placement, and textual descriptions, they invite the player into a collaborative effort of building meaning into the game world, rewarding exploration and deepening the emotional and ideological complexity of the world. By creating these small but significant stories, the game designers can give every corner of the game world a depth that keeps the players invested, helping create an environment more prone to immerse the player in it.

## 2.4. Final considerations on environmental storytelling

The methodology and impact of environmental storytelling shift dramatically when comparing instance-based games to open-world games. While both design models rely on the principles introduced by Carson, Jenkins, and Fernández-Vara, their applications diverge due to structural differences in game architecture and player agency. Understanding these differences is essential to comprehend how games engage players in their worlds while using distinct frameworks.

To fully understand these distinctions, the concept of boundaries in video games must be analysed first. As Tracy Fullerton notes, "Boundaries are what separate the game from everything that is not the game." (2024, p.92), this applies to both the physical boundaries, and to the perceived limits it imposes on the player. She discusses how boundaries serve a dual function, they do not only define where players can and cannot go, they also guide the expectations and emotions of the players. Boundaries give structure to the game world, helping designers choreograph the player's movement, regulate pacing, and control the unfolding narrative elements.

Ernest Adams (2010) also explores this theme of boundaries, more specifically, the “physical dimension” of game worlds, not the true physical dimension, as that would pertain to player interaction, but the simulated physical dimension of a game. He emphasizes that boundaries are essential in shaping the player’s spatial understanding of space and says that “it is essential to understand that the dimensionality of the game’s physical space is not the same as how the game displays a space (the camera model) or how it implements the space in the software.” (p. 86). Whether a world represents impassable mountains, invisible walls, or locked doors, these barriers convey information about the game world’s logic and scale. His explanations on scale highlight how the perceived size of the world, whether small and confined or vast and overwhelming, affects the player’s emotional and cognitive engagement. A small, intricately detailed room may feel more narratively loaded than a big district within the map, depending on the density of storytelling elements embedded within it, and the boundaries of the spaces, since a huge district may not be fully explorable.

Jesse Schell (2008) reinforces this idea by discussing how boundaries contribute to the clarity of gameplay and a narrative. Schell outlines that logical divisions of space help players organize their experience and expectations. He then outlines five common frameworks to organize space:

- Linear - A type of space that only allows the player to move forward, and, in some cases, backwards. These games often have simple and clear objectives that are all a variation within the lines of going from A to B. Games such as *Crash Bandicoot* (1996- , Naughty Dog) are a perfect example of this spatial framework.
- Grid - Grids are a form easy to understand for the players and make it easier to ensure that everything is well adjusted and in proportion. The earliest forms of Dungeon Crawlers often used grid-based maps since it’s easier to do coding-wise when creating procedurally generated maps. Strategy games, and more specifically the 4x subset of these games, such as the Sid Meyer’s Civilization series (1991- , Firaxis Games), often use grid-based systems to organize the space.
- Web - A web framework is used when several points on the map need to be interconnected, letting the players visit them in a number of different ways. This framework has two variations in itself, one where the travelling between the points is done manually by the player, giving the possibility to have meaningful interactions between the points of interest, or it can be done instantaneously but still making them connected visually. Most modern instance-based games use one of these two variations, such as *Persona 5* (2016, Atlus) who makes the transitions instant and, or the *Pokemon* series (1996- ,

Game Freak) which has used this framework since the first games of the series, using navigable “routes” between the points of interest.

- Points in space - This framework is somewhat uncommon, similarly to the web framework, this framework has several points on the map, but they are not interconnected and are often vastly different from each other. Games such as the Final Fantasy series (1987- , Square Enix), use this framework.
- Divided space - This framework is what is known as open-world. It mostly looks like a real map, where the various sections are divided, but directly connected, often having smooth transitions between them. The Witcher 3 (2015, CD Projekt Red), Elden Ring (2022, FromSoftware) and The Elder Scrolls V: Skyrim (2011, Bethesda Game Studio) are prime examples of the use of this framework.

Instance-based games predominantly use the first three frameworks presented by Schell. As the term suggests, instance-based games are constructed around self-contained spaces - instances - that are often linear or semi-linear in their design. Due to the limited scope of such spaces, the density of storytelling elements is often bigger. In these spaces the designers can more easily apply environmental cues that ensure the players encounter them, providing specific narrative stimuli in that specific sequence or context within the game world.

Conversely, open-world games rely on a decentralization of the narrative. The world is not segmented into tightly controlled spaces but instead expands into a big, directly connected map, offering the players multiple points of interest, progression. In this case, environmental storytelling also becomes fragmented, and the players assume a larger role in the construction of narrative coherence, having to interpret various cues that are widely spread across the map, while possibly encountering them in a different order than intended. As Henry Jenkins (2004) points, the narrative must remain coherent even as the player navigates them out of order, he suggests that “Within an open-ended and exploratory narrative structure like a game, essential narrative information must be redundantly presented across a range of spaces and artifacts” (p. 10). This nature of open-world games also shifts part of the burden of assembling the narrative to the player. The player is not merely uncovering a story but also co-constructing it through personal interpretation.

Moreover, in open-world games the persistence of space plays a big role. In instance-based games, spaces are often disposable once the player has finished the level once, having no incentives to return, or even being unable to do so, but in open-world games, spaces are persistent and often revisited. Their persistence allows for long term environmental storytelling, where changes to the world can show the player the passage of time and allow for new narrative elements to appear within an already explored space.

In conclusion, environmental storytelling needs to adapt its function according to the spatial and structural principles of the game it's applied to. Instance-based games act as controlled stages where narrative unfolds through deliberate design and directed interaction. Open-world games serve as scattered archives of stories and narrative elements waiting to be discovered, assembled, and interpreted by the player. Both methods offer unique qualities and limitations, but each enriches the storytelling of games by embedding narrative within the space the player acts on.

### 3. Case Studies

Building upon the theoretical frameworks established in the previous chapters, this third chapter transitions from theory to concrete, practical applications within the video game medium. While the earlier sections laid out core definitions and foundational components, this chapter aims to provide a critical analysis of how these principles are applied.

This chapter will analyse three distinct and critically acclaimed video games, *The Last of Us Part II* (Naughty Dog, 2020), *Red Dead Redemption 2* (Rockstar Games, 2018), and *Outer Wilds* (Mobius Digital, 2019), each carefully chosen to represent a different approach to how narrative is integrated into the game's setting. By dissecting their design, it is possible to observe the correlation between the theoretical concepts previously discussed, such as architecture and level design, micronarratives, and indexes, with player experiences.

The first case study, *The Last of Us Part II* (Naughty Dog, 2020), exemplifies the use of a linear narrative framework. In this model, the environment is meticulously crafted to function as a series of indexes that guide the player, typically packed with details due to the fact that the levels tend to be closed off and of limited spatial dimensions. The game's designers use embedded narratives and evocative spaces to guide the player's emotional journey, with every piece of scenery serving as an index to a pre-planned story. In this case, environmental storytelling is controlled and can be highly effective in enhancing an authored story, ensuring the player encounters every intended part of the narrative.

In contrast, the second case study, *Red Dead Redemption 2* (Rockstar Games, 2018), showcases a more decentralized narrative, spread across a vast open-world design. The world isn't just a single, linear story but a collection of countless interconnected stories, linked to a main storyline. The player, assuming a larger role in the construction of the narrative, must actively seek out and interpret the fragmented clues scattered across the landscape. Here, environmental storytelling encourages exploration and player-driven discovery, where geography, society, and other elements of the world itself act as vehicles for its lore, but due to the size of such worlds, they can sometimes feel empty, and exploring can feel like a chore.

Finally, the last case study, *Outer Wilds* (Mobius Digital, 2019), represents a unique application of these concepts that is hardly ever seen, and it would probably be impractical to apply to large-scale games. In this game, the environment's rules and systems are central to the narrative. The primary story is not told through direct dialogues or cutscenes, but through the player's understanding of its universe, requiring the gathering of clues scattered throughout the environment, journal entries, and other varied indexes that help the player to connect the narrative together. After the tutorial, there is no single instance where the game drags the player to a specific part, hence, the player must deduce what's supposed to be done and explore the game world by themselves. The game's cosmology becomes the story itself,

and the act of exploring and learning from the physical environment is the only form of progression.

By doing an analysis of these three distinct titles, this chapter seeks to demonstrate the importance of environmental storytelling as a core narrative tool in video game design. It aims to show that the environment is not just a backdrop, but a dynamic entity capable of communicating a story that words alone could not convey, creating a sense that there is to this world that goes beyond the player's presence.

### 3.1. The Last of Us Part II



Figure 5 Developers: Naughty Dog; Publisher: Sony Interactive Entertainment; Year: 2020;  
<https://www.playstation.com/pt-pt/games/the-last-of-us-part-ii-remastered/>

As mentioned, this title serves as a model for how linear narrative frameworks utilise environmental storytelling to create the perception of a lived-in, ever-evolving storyworld. The designers of the game have deliberately chosen to forgo the expansive, player-driven freedom of open-world games in favour of this meticulously crafted journey. Each location is therefore more than just a setting, but a component of the narrative, with every space contributing directly to the game's overall theme.

The game's world, a post-apocalyptic United States, is an active participant in the story since it functions as a vehicle for the fungus that caused the apocalypse to evolve, with abundant details about how the apocalypse evolved and how people were affected are etched all over the environment, leaving the player with the task of piecing together the backstory of the world. The following analysis will demonstrate how *The Last of Us Part II* (Naughty Dog, 2020) utilizes world-building and environmental storytelling techniques to create a sense of a world that existed before the player's arrival and continues to unfold around them.

### 3.1.1. Storyworld

The categorization of storyworlds by their genre provides the essential framework for a user's expectations. This classification, as outlined previously, establishes a set of shared conventions and tropes that the audience unconsciously recognizes. *The Last of Us Part II*, however, doesn't neatly fit into any "box" of the genres addressed in the "World-building" chapter, having elements of post-apocalyptic science fiction, but set in a contemporary storyworld and finished off with a bit of horror elements.

However, to simplify it, we can define the game's storyworld as a post-apocalyptic narrative, since the contemporary elements are buried under decades of apocalyptic decay. The science fiction tropes are represented by the presence of the fungus, which previously only infected animals, evolving to infect humans, while the horror elements are scarce, even though they are important to the overall setting.

This categorization is crucial because it informs the users about the main aspects of the narrative's design, such as the physical environment and the societal structures, or in this case, the possible lack of said structures. This categorization implants in the user's mind certain preconceptions about the game, immediately creating two possible threats: the infected, which encompass immediate danger, and the more complex and morally ambiguous threats that other survivors tend to represent in this genre.

This definition of post-apocalyptic zombie narrative, therefore, provides context for the characters' motivations and actions, justifying their desperation, violence, and the fleeting moments of hope presented in the game.

The game's use of the conventions associated with the post-apocalyptic zombie genre is evident in its every design choice, the familiar, realistic urban environments overtaken by nature and dilapidated. Every residential street and decaying shopping mall are now a dangerous, unsettling spaces, where danger may lurk at every corner. This transformation of our known world is a key trope that intensifies the feeling of horror, as it makes the world's decay more relatable and consequently, more disturbing. The constant presence of the

infected, be it by face-to-face encounters, or by the eerie sounds that they make in the distance, is consistently reinforced to put the player on high alert, which coupled with how the game employs the genre's usual moral complexity by presenting the human survivors as equally, if not more, dangerous than the infected, create the perfect dichotomy usually presented by the genre.

This dual-threat trope is even more important in the context of the game compared to the usual post-apocalyptic storyworlds due to how the writers used it to blur the lines between protagonist and antagonist, making the player to start with the first game's protagonist, Ellie, who watches the character who is initially presented as an antagonist, Abby, kill Joel, her father figure. After the first climax in the game, where Ellie, after killing all of Abby's friends, who were with her when she killed Joel, is found by Abby and they have a physical confrontation where both leave injured, the player is now forced to play with Abby, showing them her entire life story, the reason she killed Joel, and showing that more than an antagonist, she is another victim of the cruel world they live in, forcing the player to confront the brutal realities of survival and the moral compromises it demands from the characters.

The physical and environmental elements that define this world are the building blocks of its believability. The game starts in a small community, surrounded by mountains, built by survivors in Jackson, Wyoming, but most of the narrative is set in Seattle, Washington, while the ending is set somewhere in Santa Barbara, California. As defined previously, two of the most important elements of the physical world are the geography/topology and the climate/ecology, and by defining the setting of the game between these three locations, which exist in real life, the developers immediately defined these elements.

Jackson is presented as a dry place, with warm summers but extremely cold winters due to being set near a mountain range, which is shown in the game through the snow and the mountainous paths the characters traverse. Seattle has the city's known climate, moderate, but with very wet winters, making rain and fog a constant presence within the city, creating a heavy mood for the unfolding narrative of vengeance. While in Santa Barbara, the weather is hot and dry, a pattern only broken during the last scenes of the game, where a tropical storm hits the location where the main characters are.

Furthermore, the game's ecology serves as a symbol of nature reclaiming dominance over the world, with overgrown vegetation everywhere, from trees bursting through concrete to vines wrapping around abandoned cars and buildings, visibly demonstrating the passage of time and the collapse of human civilization.



Figure 6 The Last of Us Part II (Naughty Dog, 2020), The art of The Last of Us Part II, Pg. 20-21, In game Jackson (Left); Jackson concept art (Right)

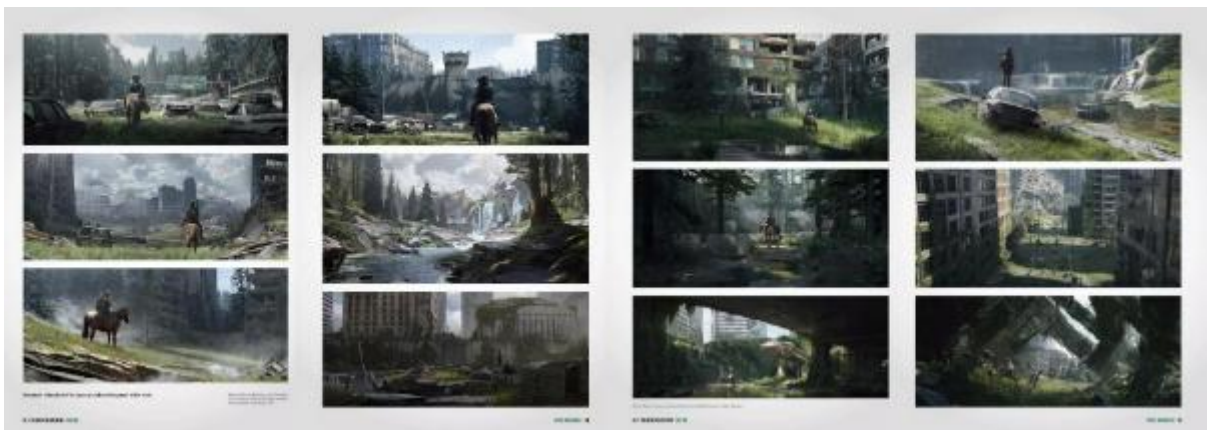


Figure 7 - The Last of Us Part II (Naughty Dog, 2020), The art of The Last of Us Part II, Pg. 20-21, In game Jackson (Left); Jackson concept art (Right)

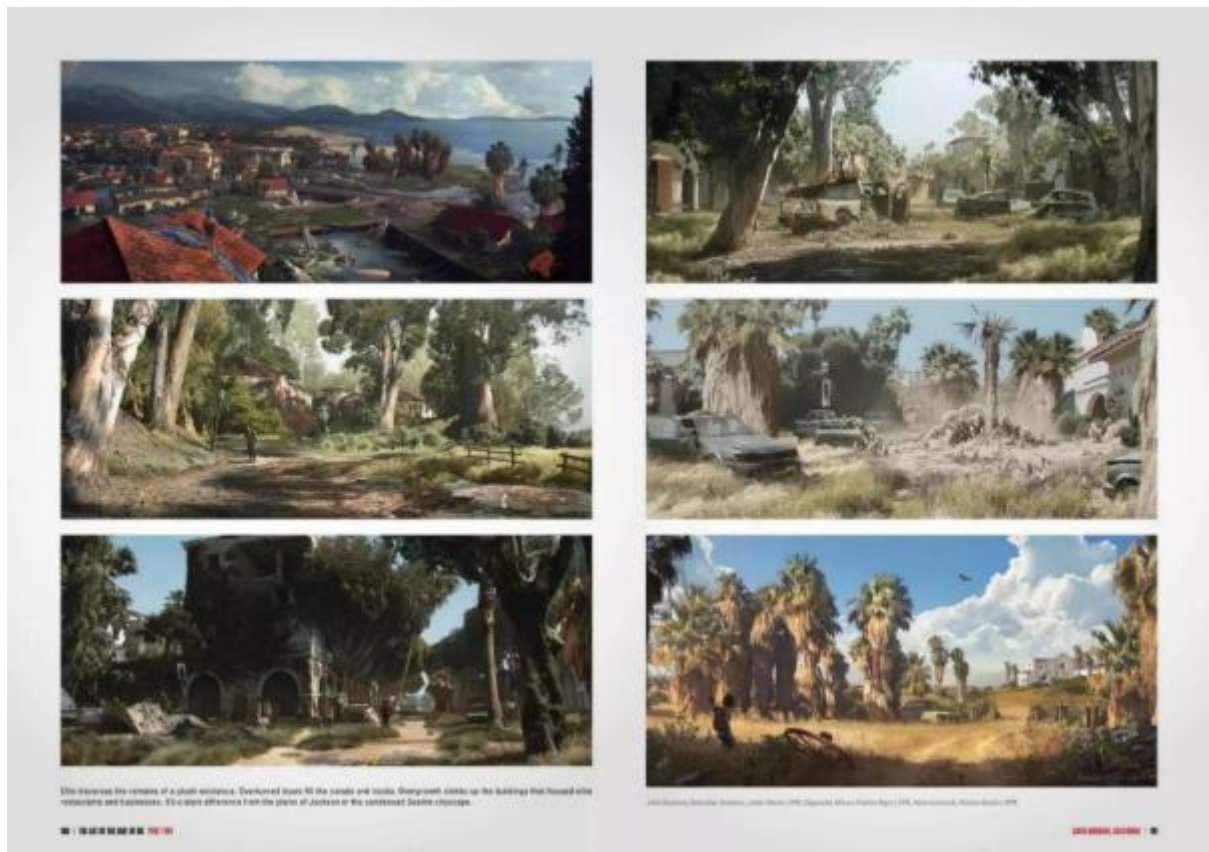


Figure 8 The art of The Last of Us Part II, Pg. 180-181, Santa Barbara concept art

One of the essential components of a storyworld, especially one in the moulds of *The Last of Us Part II*, is the social and cultural elements. As outlined in the theoretical chapters, these elements might include political systems, economic structures, and cultures and customs, all of which make up the rules and norms that shape human interaction.

The game presents the player with three different factions: the peaceful community of Jackson, which Ellie was a part of before going on her quest for revenge, the Washington Liberation Front (WLF) or Wolves, and finally the Seraphites, or Scars. The WLF embodies a highly militarised and structured political system, having clear hierarchies, military ranks, and established defences, fostering a tyrannical culture of order, control, and utilitarianism, which is reflected in their repurposed building and organised patrols around Seattle. Their economic structure is based on a communal model of resource sharing and labour, which, while efficient for survival, also ensures that there is less room for individual expression and dissent.

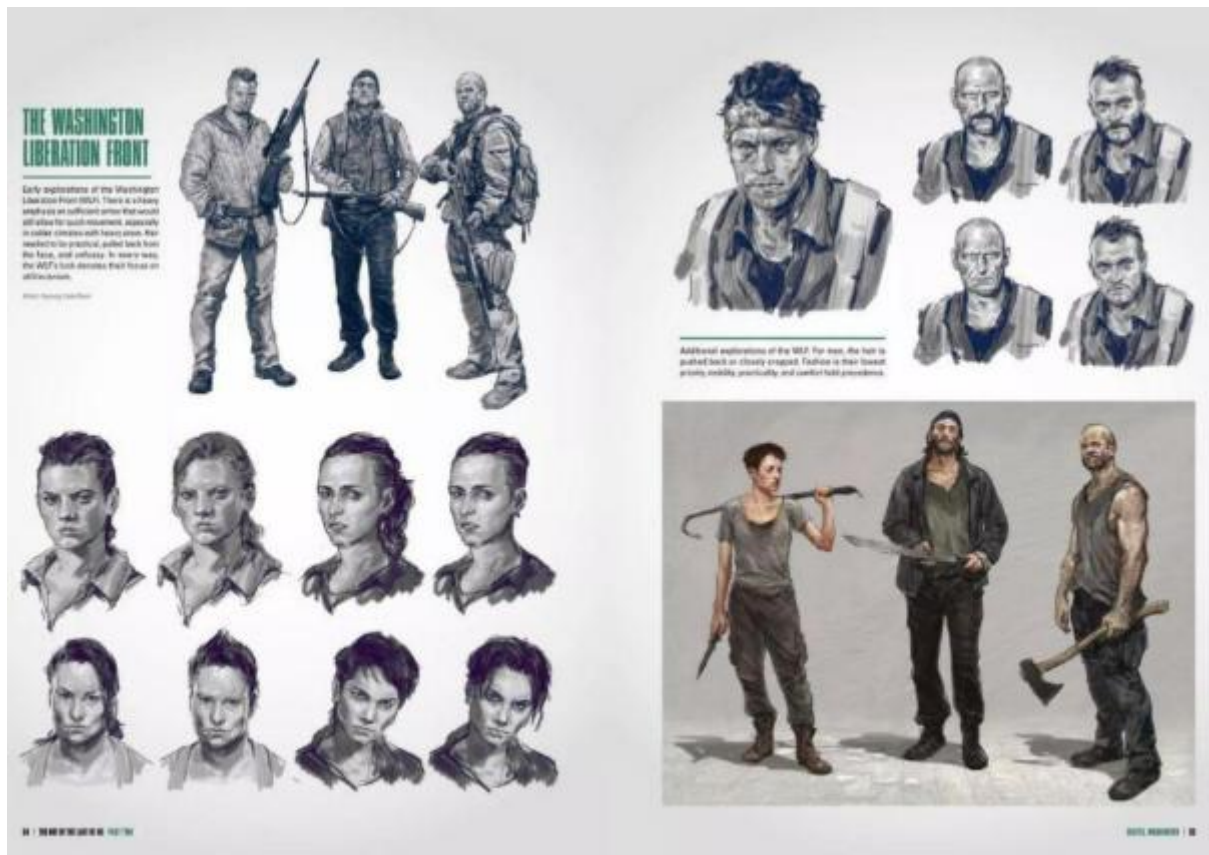


Figure 9 The art of The Last of Us Part II, Pg. 54-55, WLF concept art

In contrast, the Seraphites represent a primitive kind of societal and cultural structure based on a spiritual belief system that rejects technology and modern comforts. This is evident in their use of simple tools, their way of communicating with whistles as a code that outsiders won't understand, and their makeshift wooden settlements. Their political system is one of religious devotion and fanaticism, which once had a charismatic leader at its core, but now operates with a senate composed of the higher order elders of the cult, and their economic structure is based on foraging and sustainable living.



Figure 10 The art of *The Last of Us Part II*, Pg. 54-55, WLF concept art

The stark difference between both factions and the conflict born from their opposing societal structures makes the world feel less like a backdrop and more like a dynamic, evolving stage where different post-apocalyptic ideologies appear and are at war, showing to the player not only the cultural divides but the dire consequences of these kinds of conflicts firsthand.

The impact of the setting and the differences between the factions are present throughout the game, producing meaning, adding elements to the story, and shaping the player's actions and perception of said factions.

### 3.1.2. Architecture and level design

In *The Last of Us Part II* (Naughty Dog, 2020), architecture functions as a primary narrative medium, moving beyond its usual role as a physical backdrop. As a foundational component of the game's storytelling, the dilapidated structures and urban landscapes overtaken by nature provide information about the societal collapse. The urban decay serves as a direct index to past events, with each ruined building and discarded object contributing to a broader narrative. The game's design uses these settings strategically, functioning as evocative spaces that convey the post-apocalyptic theme.



*Figure 11 The Last of Us Part II (Naughty Dog, 2020), government mandated barricade taken over by vegetation after a decade of abandon*

For example, during the game, the player will come across an abandoned oceanarium (Image 12). The tanks are now empty, the souvenirs that used to be sold there are scattered across the floor, and vegetation has overtaken the rooms. By utilising a building that is normally used by people to have fun and enjoy themselves, the game forces the player to confront the loss of innocence that the apocalypse brought, and the sheer speed with which the world changed.



*Figure 12 The Last of Us Part II (Naughty Dog, 2020), Aquarium*

The game also makes the player walk through Seattle’s “ground zero”, the hospital where the fungus started to spread in the city, showing the usually sterile environment taken over by the fungi, with all the usual hospital material destroyed and bodies littering the ground (Image 13). By using architectural decay to visually communicate the theme of a post-apocalyptic storyworld, the game’s designers ensure that the players understand the world’s history without needing words or any kind of exposition.



Figure 13 The Last of Us Part II (Naughty Dog, 2020), “Ground Zero” concept arts (taken from the game’s menus)

The efficacy of this technique derives from its capacity to present narrative without any type of explicit narrator, with the environment appearing to have a history independent of the player’s arrival. This way, the story is not experienced just through dialogue and characters, but through the embedded elements within the physical world, detailing the ordinary life before the apocalypse, and how it all changed after it. This way, the designers ensured players' experience by using what Jesse Schell outlines as a “linear framework”, which dictates how player movement and information are exposed. A linear framework only allows the player to move forward, and, in some cases, backward, making it so the objectives are simple, usually a variation within the lines of going from A to B. The designers can then meticulously regulate this path, ensuring the player encounters every intended narrative element while hiding more niche elements that do not serve a purpose in the main storyline.

Furthermore, the strategic placement of these key architectural landmarks also aligns with Kevin Lynch’s concept of urban “legibility and imageability”, where iconic structures help people to form a mental map and orient themselves within a city. For example, in the beginning of Ellie’s quest to get revenge on the people who killed Joel, she finds out that one of them was staying at an abandoned TV station, turned watchtower of the WLF, the organization that this group is part of, called “channel 13”. The studio can be seen from afar due to its isolated location and size, turning it into a sort of compass for the player, making it so that if they ever get lost, they just need to look around and spot it.



Figure 14 The art of The Last of Us Part II, pg. 61, “Channel 13” concept art

The other concepts of Lynch’s five elements of legibility are also a foundational aspect of the game’s level design, enhancing the player’s ability to navigate and understand the fictional world. The main routes of the game, such as the overgrown streets, crumbling freeways, and flooded neighbourhoods, serve as the “paths” that guide the player. Due to the linear nature of the game, these routes are carefully crafted by the designers to guide the player. Boundaries that break the continuity of the levels, such as impassable cliffs, fortified walls, and closed doors, function as the “edges”, defining the limits of the playable area and separating distinct zones.

The game’s progression is often defined by something akin to Lynch’s description of “districts”, with each providing its own set of specific characteristics, such as dilapidated residential zones that show the tragedy of the apocalypse, or Seattle’s downtown, destroyed not only by the zombie fungus, but also because the army was ordered to bomb it entirely. Each area possesses unique characteristics that communicate different aspects of the world’s history and current state. Strategic points, or nodes, are also often placed at key narrative moments. For instance, the theatre where Ellie and Dina take refuge while in Seattle starts as a safehouse for them, which quickly turns into a place of tragedy once Abby finds them and attacks.

The game also used architecture to cleverly employ the dichotomy between the highly industrialized society before the apocalypse, and the almost primitive society that developed after, where people gathered in groups akin to tribes, some wandered around like nomads,

leaving flimsy structures through their path, while others, like the main antagonist group of the game, the Seraphites, embraced this primitive way of doing things, rejecting modern technology and creating a religious, extremist cult. This cult, amidst the towering skyscrapers and modern buildings, built primitive wooden structures to live in, rejecting the use of modern buildings as habitation due to their religious beliefs.



Figure 15 *The Last of Us Part II* (Naughty Dog, 2020), Seraphites village (top) and seraphite house next to the remnants of a modern house (bottom)

### 3.1.3. Indexes

Building upon the concepts of architecture and micronarratives, the game's environment can be understood as a complex system of indexes. As discussed in the theoretical chapters, an index is a sign or a clue that points to something else, often a past event or a hidden narrative element. In *The Last of Us Part II* (Naughty Dog, 2020), these indexes are the primary way by which the player actively participates in the construction of the storyworld, due to the game's linear framework. As described by Jesse Schell, the clues meticulously guide the player through a series of spaces, but it is the player's own interpretations, through a detective-like work, that create a rich and cohesive sense of an inhabited world.

As discussed in the theoretical chapters, these indexes manifest in various forms, such as text, visual cues, item descriptions, and sometimes even in gameplay mechanics, each functioning as a breadcrumb trail for the player to follow. The most common form of these indexes within the game is the “note”, for instance, at some point in the game, the player finds himself near a Seraphite safehouse, where they can find a note containing a message from a father to his child about how sorry he was that he couldn’t be in their initiation ceremony. While this can be considered a micronarrative, it also serves as an index to the routines, customs, and culture within this antagonistic cult that refuses any type of modernism. This demonstrates Clara Fernández-Vara's concept of Indexical storytelling, showing how the act of piecing together these fragments, found in countless other notes along the game, allows the player to become a sort of detective, basically profiling the cult and how it works, and impacting the overall mental image of the world.

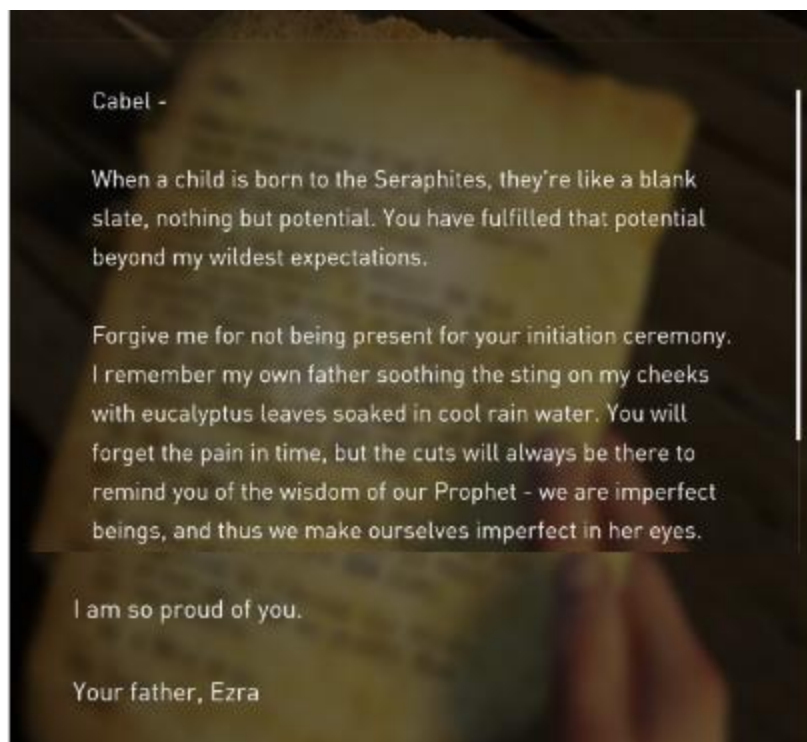


Figure 16 The Last of Us Part II (Naughty Dog, 2020), Letter from a Seraphite father.

Visual indexes, on the other hand, communicate the narrative without the use of text. The game’s designers use the deliberate placement of objects and the traces on the environment of past events, such as when Ellie and Dina reach Seattle, finding themselves in front of a reinforced gate with the words “Trespassers killed on sight!” beside a WLF logo, with a bunch of skeletons right in front of it. It doesn’t tell the whole story, such as why the people were killed, but it points to the brutality of the WLF's method, allowing the player’s

imagination to fill in the gaps. Similarly, both main characters often find themselves in now-empty, overrun offices and workplaces that still have things from the day when the apocalypse happened, such as scribbled notes on the whiteboards or prints of projects that the workers were making. These visual clues work as indexes to a vast number of untold stories that collectively reinforce the post-apocalyptic world.



Figure 17 The Last of Us Part II (Naughty Dog, 2020), Seattle's gate



Figure 18 The Last of Us Part II (Naughty Dog, 2020), Ellie in front of prints of a project (Left); Abby in front of scribbles on a whiteboard from a project (Right)

The effectiveness of these visual indexes is enhanced by the game's use of embedded narrative. At a particular point in Abby's search for Owen, in an optional zone, the player can

find themselves in an abandoned apartment. Upon entering the apartment through a window, the player will be in front of a table with very specific characteristics, such as a hole in the middle and electric sockets, and on top lie a bunch of figurines. As the player walks behind the table, they'll see a bunch of papers with numbers that represent life points, making it clear that the people living here were playing some kind of tabletop game before abruptly leaving the scene, with their ultimate fate being left to the player's imagination, relying on his ability to seek patterns and fill in the gaps of incomplete information.



Figure 19 *The Last of Us Part II* (Naughty Dog, 2020), Tabletop table with ongoing game

This type of storytelling allows the player to create a connection with the world and its inhabitants through their interpretation and deductions, making it so that the environment becomes a silent narrator that never closes off any stories, urging the player to take the role of an archaeologist/detective to piece together the fragments, making the experience more engaging and rewarding in terms of narrative depth.

Ultimately, the environment of *The Last of Us Part II* (Naughty Dog, 2020) works as a cohesive narrative system through the use of indexes, architecture, and micronarratives. The numerous textual and visual clues scattered throughout the game's spaces form a layered network of indices that the player must interpret to build a comprehensive understanding of the storyworld. This system effectively demonstrates how the physical world can serve as a core component of narrative delivery, where the player's engagement with these clues is central to their comprehension of the story being conveyed.

### 3.1.4. Micronarratives

In a world defined by a large-scale tragedy, *The Last of Us Part II* utilizes micronarratives with precision to provide emotional depth to the world, humanizing the expansive, ruined landscapes. As defined in the previous chapters of this dissertation, these small, self-contained stories embedded within the environment function as indexes, or clues, that allow the players to piece together the history of a space without an explicit narrator, because, unlike the grand, overarching plot, these narratives exist as brief elements that fill the gaps of the world's history, adding a layer of authenticity and emotional weight to it.

The most common form of micronarratives in the game is the notes, journal entries, and written messages. These textual fragments, often scribbled on walls, left on desks, or hidden in drawers, provide glimpses into the lives of individuals who inhabited the world before and during the apocalypse. For example, one of the longest micronarratives within the story is about Boris Legasov, an Olympic archer who refused to join the Washington Liberation Front (WLF, also known as wolves) together with his whole town, and, because of that, they killed his daughter, Sofia, using the excuse of her doing some protest graffiti art within their territory. He then started to plot vengeance, even though people in his town advised him against it.

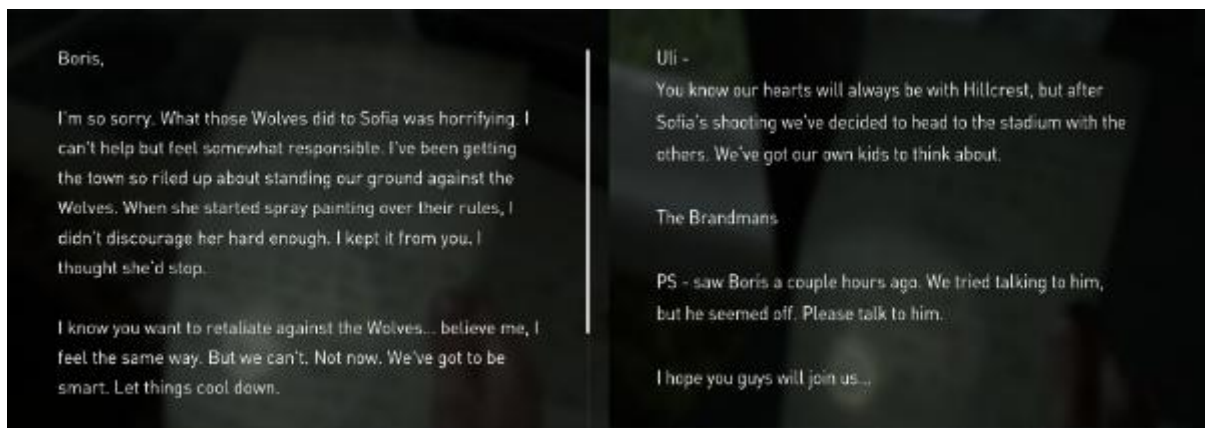


Figure 20 *The Last of Us Part II* (Naughty Dog, 2020), Letter addressed to Boris advising him against retaliation (Left); Letter to Uli, Boris' best friend, sent by their neighbours and warning him against Boris enraged state (Right)

Boris felt betrayed by his community and ignored their words, executing an ambush on a WLF patrol, leaving the message “Come and get me assholes” in one of their destroyed cars. This caused his community, which he has been one of the main protectors since the apocalypse began, to conspire against him, planning to turn him in to the WLF to gain their forgiveness and protection.

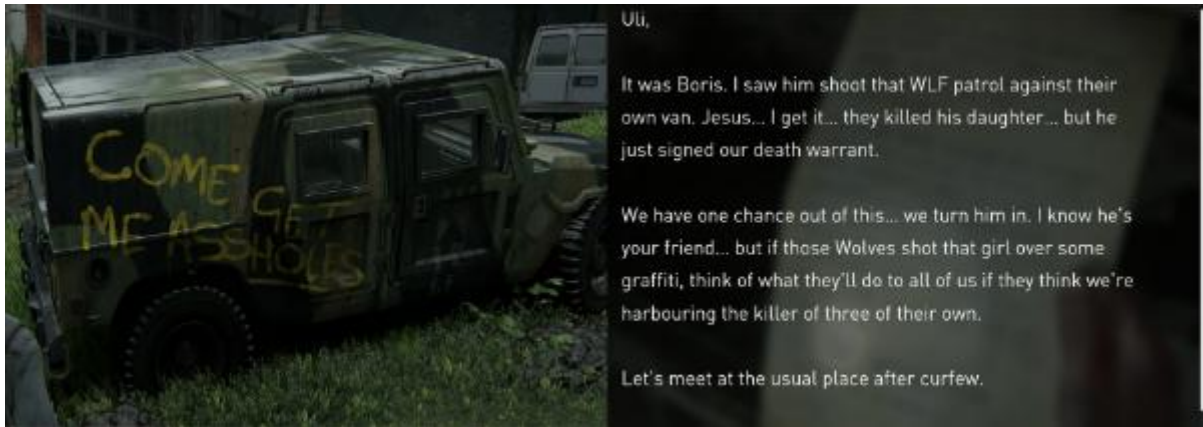


Figure 21 The Last of Us Part II (Naughty Dog, 2020), Message written by Boris on the destroyed car (Left); Letter to Uli telling him about what Boris did and planning the betrayal (Right)

Boris learnt about the betrayal and, angered at his friends' actions, he drugged all of them unconscious and dragged them into a garage full of spores, but in a turn of events, Uli, now infected but still not fully turned into a zombie, woke up and bit Boris before he got locked in the garage. Boris used his last moments to write a letter to Yolanda, a friend of theirs who left to find a more peaceful place, writing that he was sorry that he couldn't take care of Alfie, her dog, which she entrusted to him. During the game, the players, playing as Ellie, can find all these scattered notes and indexes, eventually culminating in a mandatory encounter with Boris, now turned into a zombie, which, after being defeated, will give players access to a bow and arrows, one of the many weapons in the game.

If the player doesn't find and put together the pieces of this micronarrative, this encounter won't have much meaning other than unlocking the weapon, but for those who find and search every piece of the narrative, the experience will be deeper and more meaningful. This demonstrates the concepts of Jenkins' micronarratives and how it ties with Clara Fernández-Vara's indexical storytelling, even demonstrating the idea of the two-level approach discussed by Jenkins, where he points out that "narrative enters such games on two levels - in terms of broadly defined goals or conflicts and on the level of localized incidents." (2004, p. 7). Players who chose not to, or did not find the cues, are still able to complete the main objective and be rewarded with a weapon, but have a less engaging narrative experience than those who did.

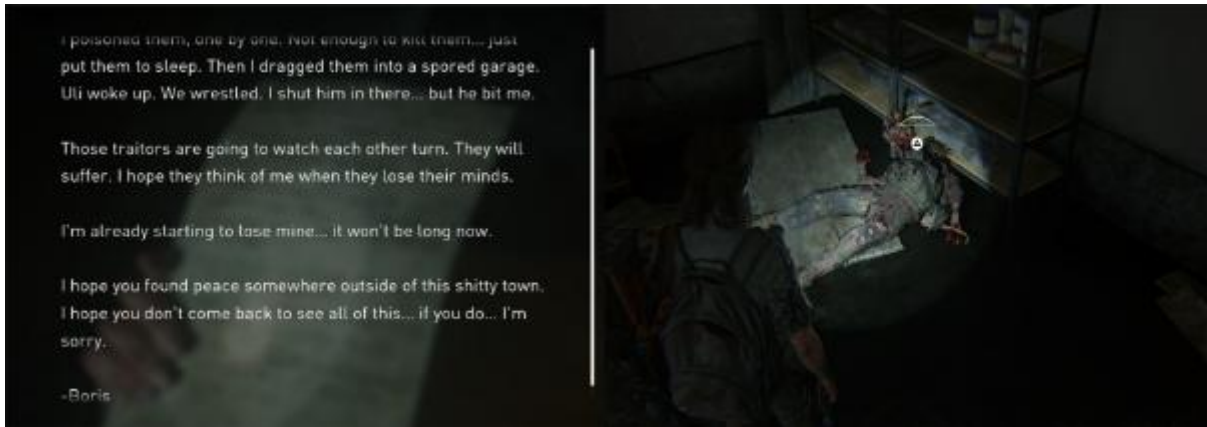


Figure 22 The Last of Us Part II (Naughty Dog, 2020), Boris' final message (Left); Boris' body, turned into a zombie, with his bow attached (Right)

Besides these micronarratives that only add depth to otherwise normal encounters or that only add depth to the world, there are a couple of micronarratives within the game that represent what Beat Suter calls “motivating game mechanics” (2019, p. 52), in the form of safe codes. These safes are filled with various types of resources helpful to the players and can even give them access to new abilities, such as crafting reinforced melee weapons or having better stealth capabilities, but their combination needs to be found first.

Two cases where micronarratives were employed to help the player find safe combinations can be found when Abby encounters a camper van that is closed. If the player broke a window, walked in, and searched the place, they would be able to find a letter from a WLF member to another talking about something that happened with the Seraphites and mentioning weapons and supplies. In the postscript part of the letter, he points out that he is still using “the big win” as the combination. Beside the note, the player will find the “terra lotto” with a combination circled. Right in front of the camper van, there is a building with a hole in the wall where the safe is, and the player can use the combination to open it.



Figure 23 The Last of Us Part II (Naughty Dog, 2020), Letter with the safe combination hint (Left); Safe combination “The big win” (Right)

The other example is in a decaying, towering hotel that is full of the infected. The players enter from the top through a crane and eventually find themselves at the hotel’s gym, where there is a note from the staff saying that employees should not leave valuables lying around and that there is an employee safe in the cleaning closet, revealing that the code is the same as the Wi-Fi, which will prompt the player to explore the whole floor in search of the Wi-Fi password, eventually finding it in a plaque on one of the walls.

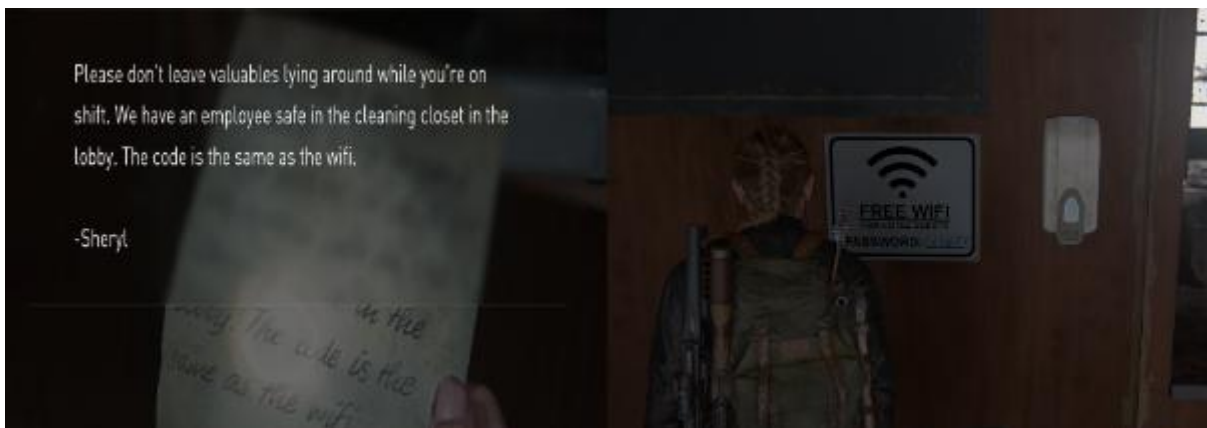


Figure 24 The Last of Us Part II (Naughty Dog, 2020), Staff letter (Left); wifi password (Right)

The collective impact of these micronarratives helps to establish a thematic foundation for the game. They serve as constant reminders that the world is not merely a hunting ground for the infected but a graveyard for millions of lives, and a survival struggle for as many. By embedding these small stories throughout the game’s linear framework, the designers can control the pacing of emotional moments, delivering painful moments at strategic points to amplify the main narrative’s themes of loss, revenge, and desperation.

## 3.2. Red Dead Redemption 2



Figure 25 Developers: Rockstar Games; Publisher: Rockstar Games; Year: 2018;  
[https://store.steampowered.com/app/1174180/Red\\_Dead\\_Redemption\\_2/](https://store.steampowered.com/app/1174180/Red_Dead_Redemption_2/)

Following the analysis of the meticulously controlled, linear narrative of *The Last of Us Part II*, this chapter now transitions to a contrasting model of storytelling, which is *Red Dead Redemption 2*'s (Rockstar Games, 2018) multilinear narrative. While the former utilises a guided journey to deliver its story, this second case study builds its narrative through a vast and dynamic open world, with a primary narrative.

This analysis will demonstrate how *Red Dead Redemption 2* (Rockstar Games, 2018) utilizes world-building to create a living, breathing digital universe that feels authentic and dynamic. The concepts of architecture, indexes, and micronarrative, which were previously explored within a linear context, take a totally new dimension in this open-world setting.

### 3.2.1. Storyworld

The foundation of *Red Dead Redemption 2*'s narrative is its storyworld, which is meticulously built to reflect a specific moment in time, making it a historical storyworld due to its high-fidelity recreation of the American frontier at the end of the 19th century, a period of profound social and technological advancements. As a historical storyworld, the game operates on the principle of recognition, crafting a setting that is immediately identifiable to the player as the American West, rich with familiar tropes like horse-drawn carriages, steam-powered trains, and budding industrial towns. The world-building is authentic, drawing from real-world geography, technology, and social structures to establish a recognizable setting, as well as from the *Western* genre. Due to the historical realism within the game, showing the transition from

the lawless frontier to an industrialized civilization, the game is a testament to the end of an era.

The physical and environmental elements of the game are the primary ways by which this historical period comes to life, with a diverse landscape that reflects a variety of topologies and climates. The game presents the player with five different territories or States: Ambarino, a rugged mountainous region roughly based in Colorado, with a rigorous snowy climate; New Hannover, with hills and grassland, inspired by states such as Nebraska and Wyoming; Lemoyne, a humid flatland region full of swamps and plantation, similar to Louisiana, even having a city based on New Orleans; West Elizabeth, with valleys, forests and plains and inspired on California; And, finally, New Austin, a desert region full of canyons that is inspired on Texas and New Mexico.

This diversity is further reinforced by how authentic the climate within the game is. Like the fog in Lemoyne, due to the swamps, or the bursts of rain and even snow in New Hannover. This system, coupled with the fact that the main character can indeed “feel” hot or cold depending on location and weather, mirrors the unpredictable and harsh reality of the period, turning the environment into an active participant in the story.



Figure 26 Red Dead Redemption 2 (Rockstar Games, 2018), 1 - Ambarino state; 2 - New Hanover state; 3 - Lemoyne state



Figure 27 Red Dead Redemption 2 (Rockstar Games, 2018), 4 - West Elizabeth state; 5- New Austin state

The game's world also depicts this period's social and cultural norms with great precision. The world is populated by diverse political systems, from the way of the outlaw gangs to the rigid sociopolitical systems we can find in the cities, and to the very few remaining native tribes.

The game's economic structures also show the harshness of the passage of time, with some regions still employing an old agrarian economy, while big cities present a more modern economy.

Overall, the game captured the essence of that chaotic time in American history through the environment, its many towns, with their own distinct architecture and social norms, reflect the various ideologies and struggles of the people and of a society in transition, creating a complex storyworld for the player to inhabit, where morals are often questioned and put to the test. The visual identity of a modern city like Saint Denis and a small settlement in the middle of the swamp, like Lagras, formed mainly by former slaves, represents the cultural shift and struggles of that time. The clothing, the way of speaking, and the daily routines of the NPCs (non-Player Characters) contribute to this sense of a world changing.

### 3.2.2. Architecture

Just like its vast landscape, *Red Dead Redemption 2*'s architecture tells a story in itself, even though it doesn't follow the same linear, guided framework that we find in *The Last of Us Part II*. Its buildings, towns, and industrial sites are meticulously crafted to work as indices to the changing world. They are not merely backdrops for action, where players have shootouts and stage robberies, they are deliberate expressions of the game's central themes of the relentless industrialization of the United States, the decline of the wild frontier, the lawlessness of the times, and the socioeconomic conflicts that arise from such transition.

The game designers meticulously built a diverse number of settlements and cities, ranging from various sizes and population amounts. Lagras, in the state of Lemoyne, is a small settlement in the middle of the swamp composed of four wooden houses built by ex-slaves and their families. Its main food source and economic export are fish and alligators caught from the surrounding swamp. The people living here are ostracised and ridiculed for their simple way of living and their poor living conditions, and of course, for being former slaves. It's the smallest type of permanent settlement within the game and represents how ex-slaves struggled even after being freed, often having to build their communities in places undesired by others.



Figure 28 Red Dead Redemption 2 (Rockstar Games, 2018), Lagras

The second smallest permanent settlement is the village of Strawberry, located near the green forests of West Elizabeth, which not only has fertile grounds nearby, but plenty of water sources, making it a good place to live. The village is significantly bigger than Lagras, boasting around 10 family houses, a saloon, a general store, a police department, and even a hotel, which is advertised as a “retreat for city folk to enjoy the wilderness”. Furthermore, much like Lagras, its layout was obviously not planned, indicating that it was a settlement that grew organically and not a product of industrialization.



Figure 29 Red Dead Redemption 2 (Rockstar Games, 2018), Strawberry

Meanwhile, Annesburg, a small mining village, contrasts with the cozy setting of Strawberry. Although this village has a fairly good economy, it is always covered in a thick, dark fog from the coal mines, and its surrounding waters are covered with a layer of oily grime from the pollution. This creates a stark contrast with the village of Strawberry, since the living conditions in Annesburg are far from ideal, even if it has all the same commodities Strawberry has, like a saloon, general store, and police station.



Figure 30 Red Dead Redemption 2 (Rockstar Games, 2018), Annesburg

The first settlement the player encounters in the game is a small-sized town called Valentine, which, upon the player's arrival, is still under construction. Valentine is a product of industrialization, a town clearly designed for expansion, located between the entrance to the mountain range situated in the state of Amberino, and the new oil rig factories located in New Hannover, allowing it to boast not only as an industrial haven, but also as a tourist point. The town's layout is simple, divided by blocks, with large roads that allow for carriages to navigate easily.

An example of what is expected from the town of Valentine to grow into can be found at the entrance of the state of Lemoyne, in the Medium-sized town of Rhodes, which not only shares the touristic characteristics of Valentine, but already has commodities such as a bank and a fully-fledged train station, together with a fairly big parlour. The biggest difference between the two towns is the origin of their industry, where Valentine not only has a cattle ranch, and a horse stable, it has potential to expand into a manufacturing town with its nearby oil rigs, while Rhodes stagnated due to its only industry being found within the large plantation around the town, which are owned by two rival, yet equally as corrupt families.



Figure 31 Red Dead Redemption 2 (Rockstar Games, 2018), Valentine



Figure 32 Red Dead Redemption 2 (Rockstar Games, 2018), Rhodes

Finally, the biggest settlements within the game are the two main cities, Blackwater and Saint Denis. Blackwater is a blooming city, still under construction, but that already boasts banks, a variety of stores, a port, and paved roads. Its layout was clearly planned for easy

transportation and transit. The city doesn't have any factories, still relying on the surrounding ranches and farms for its economy, plus the fact that it has a port in the city, making it the central trading hub of the southern part of the map.



Figure 33 Red Dead Redemption 2 (Rockstar Games, 2018), Blackwater

Saint Denis, on the other hand, is an already established city and, if we look at its older and poorer parts, we can conclude that it started organically and a bit chaotic, but eventually, with the industrialization, it started to be more carefully planned. Its layout is made for easy navigation and traffic, making it easy to supply the factories. It has a huge port and train station, plenty of commodities such as theatres, tailors, butchers, barbers, and boasts a large luxury block where all the city's rich people live. It's a city that shows the two extremes in socioeconomic classes, where the poor walk across the city to go to the factories, while the rich inhabit their huge mansions and spend their days enjoying all the commodities the city offers.



Figure 34 Red Dead Redemption 2 (Rockstar Games, 2018), Blackwater



Figure 35 Red Dead Redemption 2 (Rockstar Games, 2018), Saint Denis' poor part

By looking at the images of these locations, we can see that they have a high probability of evoking emotions in any given observer. Although not all locations follow the 5 principles of legibility that Kevin Lynch defined, which are paths, edges, districts, nodes, and landmarks, they can all be seen in most of the locations that are a product of industrialization, like in Valentine, Blackwater,

The architecture we see throughout the game is not there to fill in the vast game world, but is a way to convey the themes of the narrative, creating a stark contrast between the rural and the urban. The small towns of the game's wild west, such as Valentine and Strawberry, are collections of wooden saloons, general stores, and simple houses, a style of architecture that embodies a dying way of life. The wear and tear on these buildings serves as a visual testimony to a way of life that is slowly being left behind. On the other end, the sprawling, meticulously designed cities like Saint Denis and Blackwater represent an inevitable future with its ornate buildings, cobblestone streets, and grand structures. By having the player move around between these two distinct architectural styles, the game uses the physical environment to show the conflict between Arthur's nomadic, lawless way of life and the growing modernization of society.

Furthermore, the game's architecture also works as a system of indexes. The buildings' realistic designs inform the players about what gameplay possibilities and challenges might be found there. For example, the heavily fortified bank of Saint Denis implies a lucrative but high-risk objective, while small shackles hidden in the woods, owned by illicit distillers and liquor smugglers, are indexes of small gains or potential secrets.

### 3.2.3. Indexes

Throughout the decentralised narrative of the game, the environment is littered with indexes for the players to discover. As defined in the environmental storytelling chapter, an index functions as a sign that points to something else, be it a past event or a future one. As established throughout this dissertation, these indexes are the primary medium through which the player assumes the role of an in-game historian/detective, piecing together the fragmented, multi-layered history of the game.

Red Dead Redemption 2 puts these narrative elements in its open world to have the players actively seek them out and interpret them, often finding fragments from different narratives in succession instead of finding all the fragments from one narrative, which is a stark contrast to the linearity of the previous case study, where these elements are strategically placed so the player can hardly miss them. As mentioned in the previous subchapter, this turns the act of exploration into something other than simple mechanical movement from A to B due to the fact that stepping away from the main path often rewards the player with new information on the world and leaves them curious for more.

Some of these indices may evolve into quests while others simply create chance encounters or give some new context to otherwise normal spaces. For example, in the fence (A store that buys ill-acquired goods) located in Saint Denis, there is a bookshelf with a semicircular mark on the floor in front of it, hinting at a secret door behind it. This door is part

of a totally optional and possible to miss quest, but even if the player doesn't do said quest, just by seeing the marks they will understand that the door is there, and will start to speculate what's behind it, be it a simple hidden storage room, or something more nefarious, like it's discovered through the quest.



Figure 36 Red Dead Redemption 2 (Rockstar Games, 2018), Secret door

Other such indexes that are related to quests exist, some of them just being part of it, such as a specific quest where Arthur, meaning the player, needs to go and collect money from Leopold Strauss' debtors. One such debtor, clearly drunk, guides Arthur to his home, and upon entering, it's obvious the type of life the debtor lives, with the house being dirty, and bottles of different kinds of liquors tossed around carelessly, while his son tries to make the house more presentable and live a good life. Other indexes, however, are direct consequences of previously completed quests, such as the crash site of a hot air balloon, which is now used as a makeshift camp for nomads and travellers. The said balloon was used by Arthur in a quest that aims to find where John Marston, Arthur's friend, is being held captive, but by the end of the quest, the balloon is targeted by a rival gang, and Arthur ends up crashing it.



Figure 37 Red Dead Redemption 2 (Rockstar Games, 2018), Debtor's House (Top); Hot air balloon crash (bottom)

While not tied to quests, indexes also serve to enrich the gameworld and provide a greater depth to it. For example, the entry to Saint Denis from the industrial district. Here, the river's surface is filled with a noticeable layer of shiny oil, a clear visual cue that speaks volumes about the growing industrial society. This detail, though seemingly minor, functions as an index of the environmental pollution that industrialisation brought causes, it doesn't trigger any mission, nor does it give any reward. Instead, it provides the player with a quiet narrative element, making the factories, which are a symbol of prosperity and progress, silent culprits of destruction. While the characters within the game may be unaware of the long-term consequences of this pollution, the player, with their modern-day perspective, immediately grasps the gravity of the situation. This subtle element allows the game to reinforce its complex themes without explicit dialogue, inviting the player to connect the visual information with the broader concepts of the game by themselves.

Another example of an index that adds depth without being quest-related is a solitary grave found in an unremarkable hill situated in the south of Larned Sod, in New Hannover. The grave is nameless, devoid of flowers or any form of decoration save for a small wooden cross and a warped tree beside it. Every day, a man can be seen walking up the hill and sitting beside the grave for some time, leaving the player to speculate what happened. Was it the man's child that died and he buried there, his wife, or a friend? The game doesn't provide answers, leaving the player to construct their own stories and fill in the missing pieces of this tragic story. These small, non-essential details are what make *Red Dead Redemption 2*'s world from a simple backdrop into a living, breathing place with a history.



Figure 38 Red Dead Redemption 2 (Rockstar Games, 2018), Polluted water (Top); Random isolated grave (bottom)

The textual indices, such as letters, newspapers, and journal entries, also provide more depth to the world, allowing the player to take a more direct glimpse into the thoughts and feelings of the people who inhabit, or used to inhabit, these places, offering a counterpoint to the ambiguity visual indexes may have. Returning to a previous example, the quest where the player has to search a repossessed house is full of letters that demonstrate the slow decadence of the man who lived there, from refusing to change his ways after the Civil War ended and

slavery was abolished, to losing his wife, and having his son run away from him, and refusing any further contact.

Another, more bittersweet example, is the Quincy Harris Memorial Hall, a shelter for homeless veterans and their families. During the campaign, the player may hear a lady asking for donations when walking by the memorial hall. If the player approaches, he will have two options: steal the donations or donate 20 dollars. If the player ends up choosing the second, during the epilogue, if they revisit the place, now playing as John Marston, a plaque with Arthur's name can be found at the entrance of the building, making John shocked to see it.



Figure 39 Red Dead Redemption 2 (Rockstar Games, 2018), Quincy Harris memorial hall plaque

Beyond these static scenes and unchanging pieces of text, the game also uses indexes to lead the player to mini, hidden quests and, as asserted before, to some micronarratives. The most common form of these is the treasure map, which itself is just a paper with cryptic drawings and riddles, pointing to a series of locations that the player must find, each one acting as an index to the next, until the final treasure is found.

In conclusion, *Red Dead Redemption 2*'s use of indexes is a cornerstone of its world, moving beyond the simple role of a quest marker to a more subtle narrative function. The game's environment is not just a stage for the main plot but a living museum of small, untold stories waiting to be uncovered. This approach to environmental storytelling, with emphasis on player-driven discovery and interpretation, ensures that the world feels truly inhabited and authentic, rewarding curiosity with a deeper understanding of a world that appears to have existed long before the player's arrival.

### 3.2.4. Micronarratives

In an open-world game as vast as *Red Dead Redemption 2*, the main narrative is not always enough to create a world that feels lived in, so, as a supplement to its main storyline, the game populates its sprawling landscape with countless micronarratives. These are mostly isolated, self-contained stories that the player can stumble upon while exploring, often having no impact on the main quest. While these narrative fragments may not advance the central narrative, they are essential for imbuing the world with a sense of history, tragedy, hope, and humanity. They serve as a constant reminder that the world functioned before the player's arrival and continues to do so independently of them.

These micronarratives manifest in a variety of forms, from found objects to silent scenes that point to past events, and even in spontaneous interaction with NPCs. For example, if the player wanders through the town of Rhodes at night, he will hear a cry for help. Following the sound, the player will encounter a young man locked up in the basement of the local gunsmith, telling the player that he was kidnapped, and that the gunsmith is crazy, handcuffed him, and made him wear children's clothes. The player is then confronted with a choice: save the young man by entering the gun store and confronting the owner, which is risky since it is a place full of guns, and the owner is probably armed, or ignore him and go on with the game. If the player chooses to ignore him, the boy will eventually be killed by the gunsmith, but if they choose to save the boy, he will find out the reason why he was kidnapped is his similarity to the gunsmith's deceased son. This type of storytelling is a stark contrast to the heavy linearity of *The Last of Us Part II*, where the player only has to follow linear clues to find specific notes that explain or hint at the past events, while in this game, the player might wander around for hours before they find the next piece of evidence.



Figure 40 Red Dead Redemption 2 (Rockstar Games, 2018), Rhodes gunsmith micronarrative part I



Figure 41 Red Dead Redemption 2 (Rockstar Games, 2018), Rhodes gunsmith micronarrative part II

The environment is also littered with visual micronarratives that communicate stories entirely or partly without text. One such example is a quest given by a drunken old man that most players might not even approach, since he's just mumbling incoherently in a public park in the town of Rhodes. If the player engages with him, he will talk about how his house is being repossessed and ask the player to return a few items he left there: his revolver, his ledger, and a valuable pocket watch. Once the player arrives at his house, he finds a note from a judge about the house being repossessed. Upon entering, the player will find lots of hints about the man's life before having his home taken away from him. The house is littered with trash and empty whiskey bottles, painting a clear picture of why he lost everything, including his son, as it is revealed in a letter inside the house telling the man to stay away from him and his grandchild.

While exploring further, the player will find a hidden staircase leading to the basement, where it lays another piece of this micronarrative lies. The ledger the man wanted was, in fact, a list of slaves he, his father, and his grandfather caught, since their profession was catching runaway slaves for a nearby plantation, but he was fired after slavery was abolished at the end of the Civil War. This micronarrative is layered to evoke different emotional responses from the player throughout the quest, first feeling pity for the old man, seeing his history of falling to addiction through the visual indexes scattered throughout the house, and then feeling angered and disgusted after learning about his former job and the type of person he truly is.

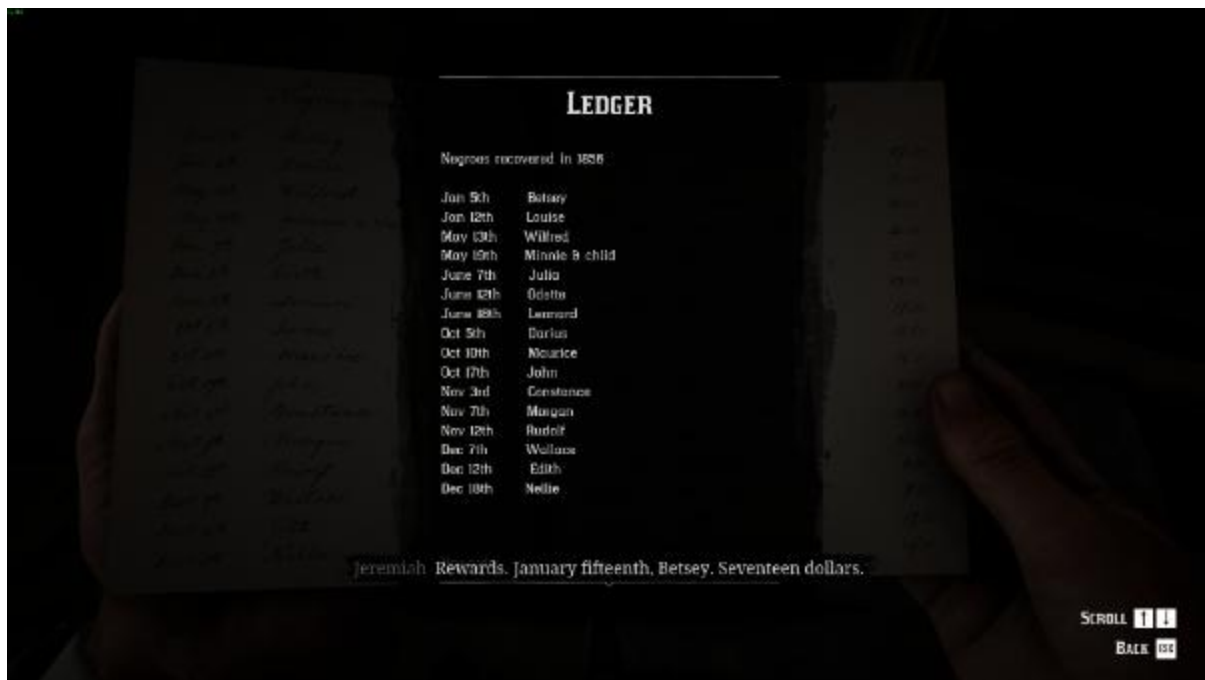


Figure 42 Red Dead Redemption 2 (Rockstar Games, 2018), List of slaves caught by the man and his family

In these micronarratives, the player is not given the full story, only bits and pieces, but the emotional impact is still immediate and profound as these small environmental stories are what create the sense of a world older than the player itself. They provide a continuous sense of discovery, ensuring that even a simple horse ride across the landscape can present a new story. For example, upon reaching Act 6 of the main narrative, the Van der Linde gang moves its hideout to a place called Beaver's Hollow. When roaming around camp, the player might find themselves encountering a naked man running away. If they follow him, they'll end up at the entrance of a small cave, where the man hides behind two wolves who don't immediately attack as long as the player doesn't approach them.

Upon approaching and killing the wolves, not only will the player lose honour, a system inside the game that determines one's moral compass, which will change the way other NPCs interact with the main character. This hints at the player that what they did is considered a bad action, which is further reinforced by the way the feral man runs to the wolves' bodies, crying. Upon going further into the cavern the player will find a diary written by the feral man detailing his backstory, telling the player that he used to be a normal boy who lived in that region, but after his father tried to teach him how to hunt he felt disgusted by it and ran away to live in the wild, eventually finding to orphan wolf cubs and raising them by himself.



Figure 43 [https://reddead.fandom.com/wiki/Feral\\_Man?file=Rdr2\\_feral\\_man.png](https://reddead.fandom.com/wiki/Feral_Man?file=Rdr2_feral_man.png), Feral man inside the cave

These micronarratives end up having a cumulative effect on the player's perception of the world, creating a profound sense of a world that is a dynamic entity with its own past and present, transforming the act of exploration from a mere mechanical movement from A to B into a continuous process of discovery, making it so as the player uncovers more of these fragmented stories, a richer, more nuanced mental image of the world emerges within them.

In this context, the environment is not just a series of deliberate indexes, but a rich and complex map showcasing a past era, inviting the player to become a part of it, shape it, and become part of its many stories. The primary narrative, while obviously present, is frequently affected and sometimes even overshadowed by the countless micronarratives and fragments of history waiting to be discovered across the landscape. Ultimately, these narrative elements are not forced upon the player but are discovered through exploration, transforming the act of discovery into a core part of the storytelling experience.

### 3.3. Outer Wilds



Figure 44 [https://store.steampowered.com/app/753640/Outer\\_Wilds/](https://store.steampowered.com/app/753640/Outer_Wilds/) , Outer Wilds logo

Following the examination of a linear, authored narrative in *The Last of Us Part II* and a decentralised, historical world in *Red Dead Redemption 2*, this final case study shifts to a game that utilises environmental narrative as its core. *Outer Wilds* (2019, Mobius Digital) operates on the basis that the environment is not a vehicle for its narrative, but the narrative itself. In this science fiction world, the player is stripped of traditional quest logs and markers, not having any form of overt guidance. Instead, the player is tasked with uncovering the secrets of an ancient civilization through direct observation and interpretation of the environment. The entire solar system is a single, interconnected puzzle, where every planet, ruin, and subtle environmental cue serves as a crucial piece of the great mystery behind the disappearance of the ancient civilization.

This section will analyse how the game tells its story almost entirely through the environment, transforming its mechanics into a primary storytelling device. It will explore the concepts of architecture, analysing how they gave such an alien storyworld a sense of familiarity, micronarratives that give the player a glimpse of relationships between NPCs, both from his species and from the ancient civilization, and how indexes are used uniquely, as every one of them is a fragment of a larger, non-linear narrative that the player must piece together. The game's cosmology and evocative spaces will also be analysed, demonstrating how the environment itself evokes a sense of awe and wonder, acting as the silent narrator.

### 3.3.1 Storyworld

The storyworld of *Outer Wilds* is the best example among the three case studies of a universe where the environment is the narrative itself, defined by its genre and cosmology. Unlike the narrative frameworks of the previous case studies, where rules and systems primarily support the plot to varying degrees of player freedom, *Outer Wilds* makes the very act of understanding these rules one of the core objectives. The game's environment is a central component of its identity as a science fiction world, a genre that, as discussed in the theoretical chapters, is defined by the exploration of technological advances, future or alien societies, and cosmic mysteries. The game's primary objective, discover what happened to the long-dead Nomai civilization and the secrets of the time loop.

The fantastical yet internally consistent physics and advanced technology of the Nomai serve as the foundation upon which the entire narrative is built, making the world something that doesn't merely house a story, but one that is the story. The game avoids traditional genre and gaming tropes by not having any kind of combat, and only having the player manage two resources, health and oxygen, which can both be refilled at various locations without any cost, instead focusing on pure intellectual discovery and exploration.

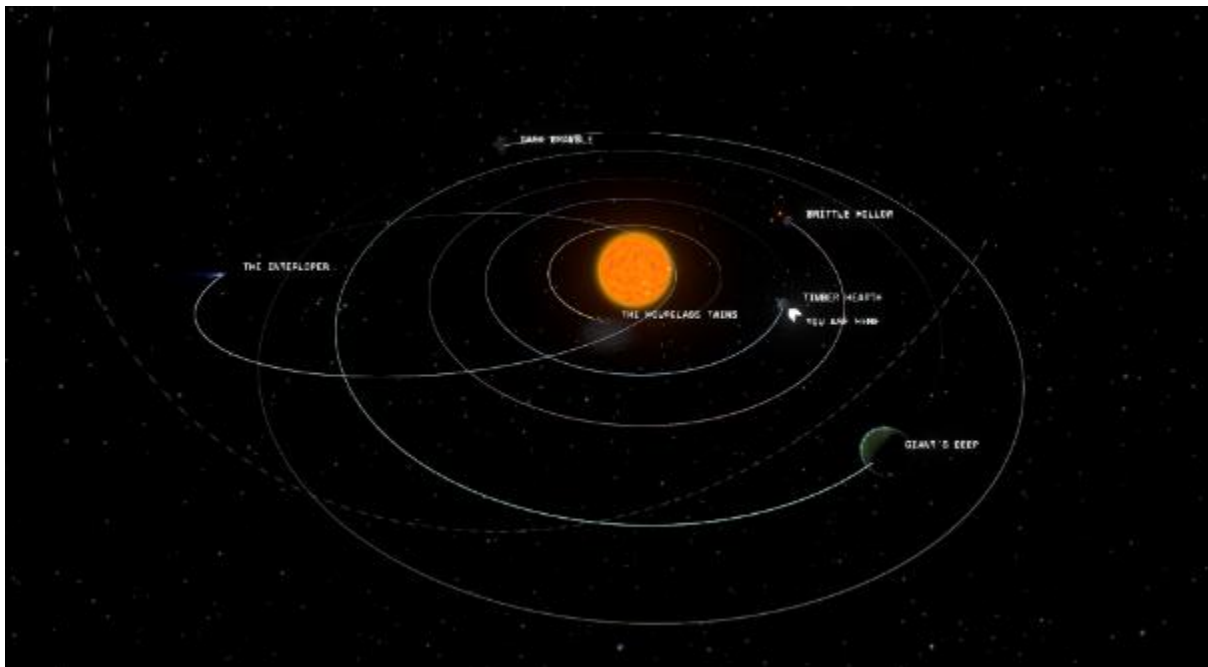


Figure 45 *Outer Wilds* (Mobius Digital, 2018), Game map

The game's world-building is particularly notable for its use of physical elements and cosmology. As discussed in the theoretical chapter, the cosmological systems of a storyworld define its place within the broader universe and its relationship with astronomical phenomena. This includes the nature of its primary star, possible natural satellites, neighbouring planets, stars, and constellations. Cosmology can also encompass the world's creation myths or the presence of divine or cosmic forces that influence its existence. *Outer Wilds* took this to an extreme by creating a small-scale but highly dynamic solar system as seen in Figure 45. Each planet and celestial body within it is distinct, making the entire solar system feel like a meticulously crafted puzzle.

Starting from the planet, or in this specific case, planets, that are closer to the sun, the Hourglass Twins are a binary planet system composed of the Ember Twin and the Ash Twin linked by a colossal column of sand that is implied to constantly flow from one to another, although the player only sees it go one way due to the time loop. This creates a dynamic environment that reveals and conceals information at the same time over the course of a time loop, and the player is forced to race against the ever-rising sand in the Ember Twin to explore ancient ruins before they are buried, or to wait for the sand to drain from the Ash Twin and reveal new pathways.

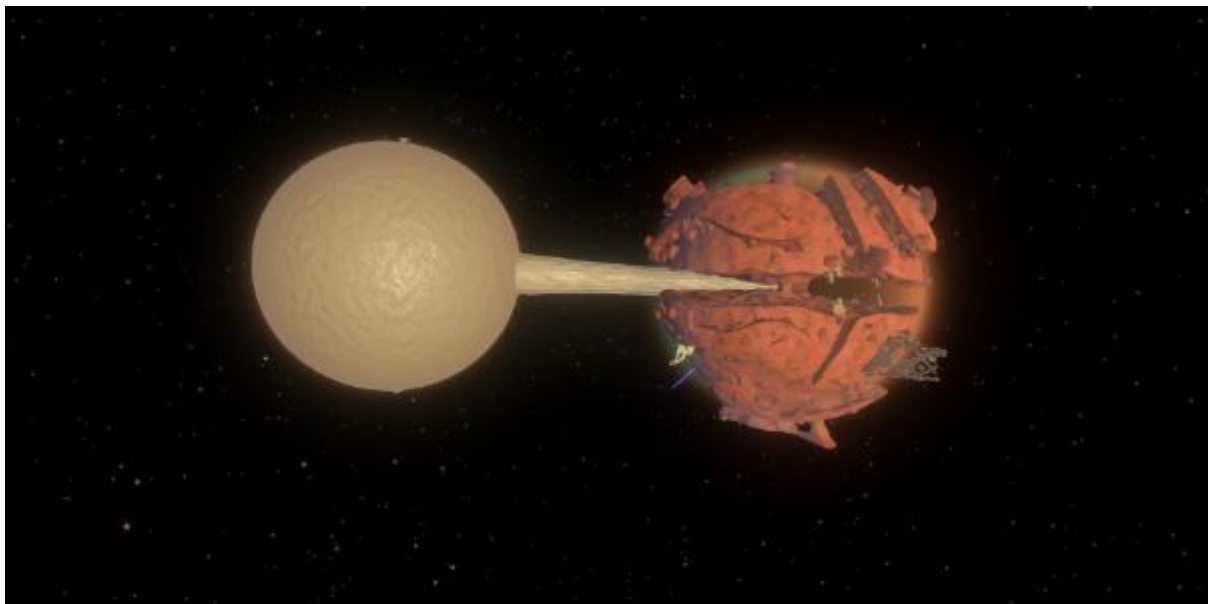


Figure 46 *Outer Wilds* (Mobius Digital, 2018), Hourglass Twins

Then there's the main character's home planet, Timber Hearth, which serves as a safe starting point. The defining factor of the planet is that it contains every single mechanic the player will need to master to complete the game, serving as a tutorial hub. Right at the beginning, the player can find a miniature of the spaceship he will fly and use it to learn its controls. This hub

allows the game designers to introduce every concept needed to explore the solar system in a low-stakes environment, providing foundational knowledge to solve the puzzles on the other planets. The planet also has a moon that orbits it, which serves as the starting point of the player's journey.

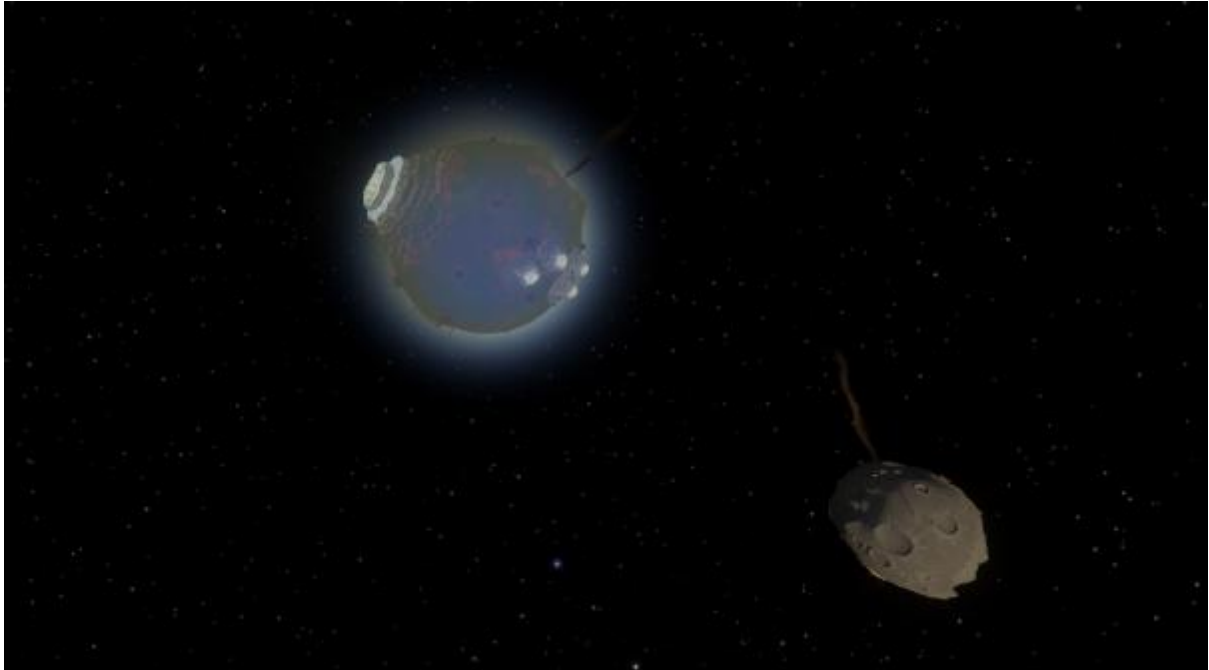


Figure 47 Outer Wilds (Mobius Digital, 2018), Timber Hearth and its moon, Attlerock

Following this is Brittle Hollow, a planet with a surface slowly crumbling into the void, created by a black hole that acts as its core, which forces the player to navigate its falling architecture and unstable landscape. As entire sections of the planet break apart and are sucked into the black hole, they expose new hidden parts that the player couldn't previously access.

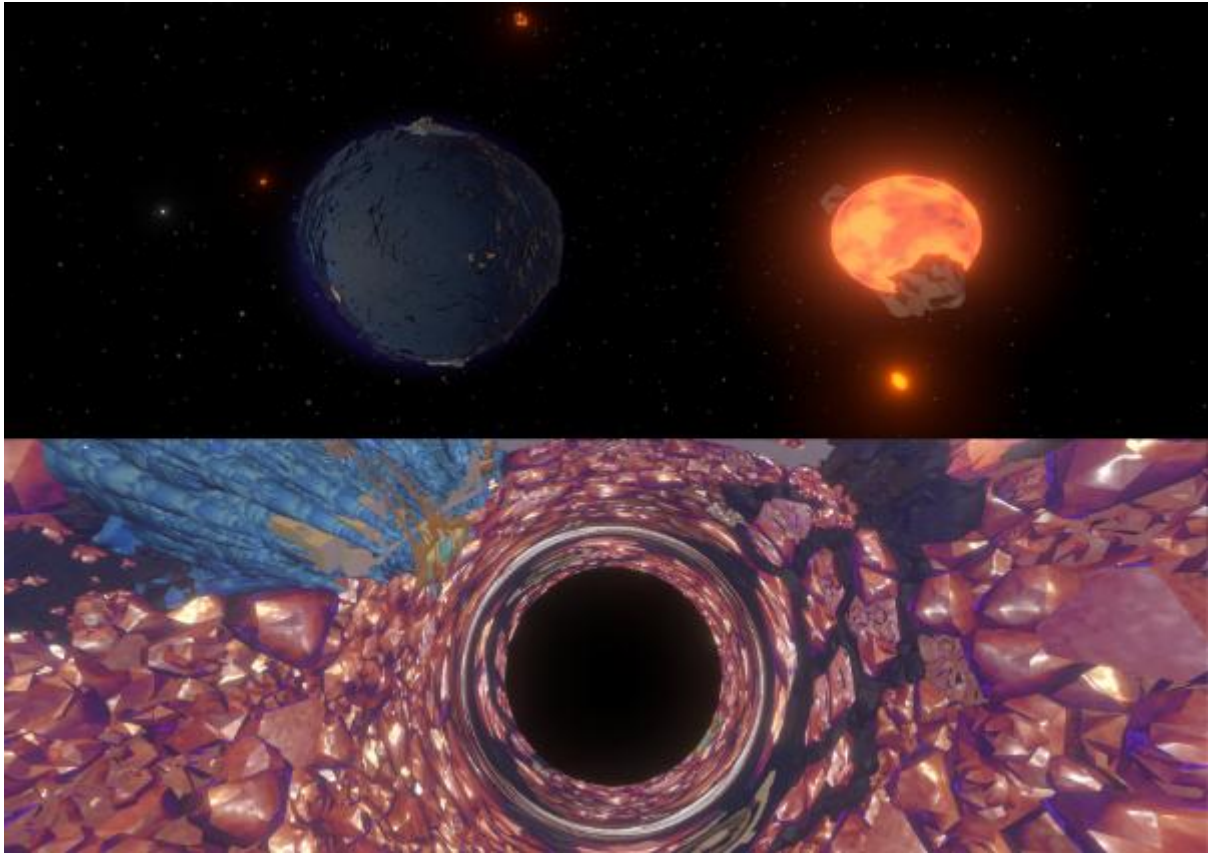


Figure 48 Outer Wilds (Mobius Digital, 2018), Timber Hearth and its moon, Attlerock

Giant's Deep, a planet defined by being composed mostly of turbulent waters, is a hazardous environment for the player, who must make use of the planet's powerful cyclones to both launch upwards and into the depths of the planet's waters, forcing the player to master the cyclones' behaviour.

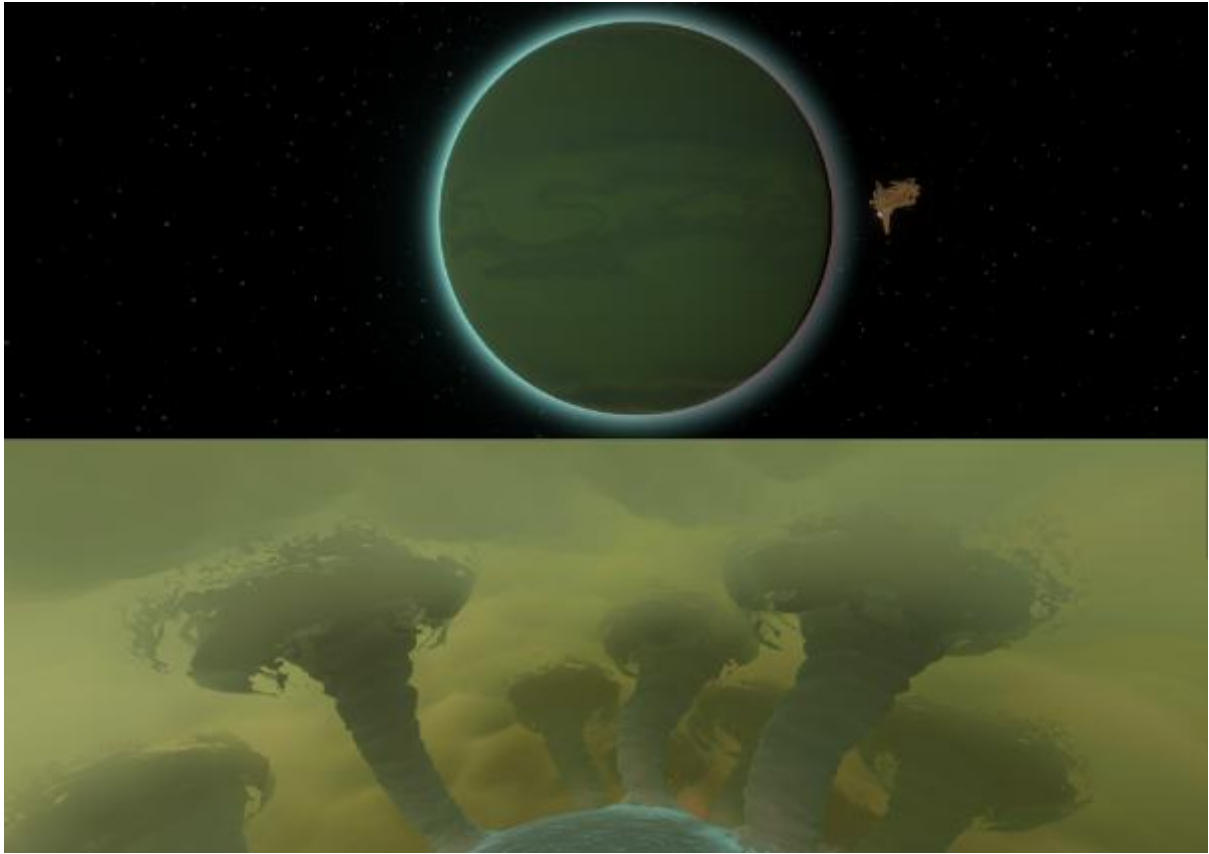


Figure 49 Outer Wilds (Mobius Digital, 2018), Giant's Deep and its cyclones

Lastly, at the edge of the solar system, there is Dark Bramble, a terrifying, non-Euclidean maze of fog and gigantic, anglerfish, which hunt the player based on sound, creating an environment where most of the spatial rules the player has known are broken to create a sense of disorientation and fear, in stark contrast with the dangerous, yet predictable elements on other planets.

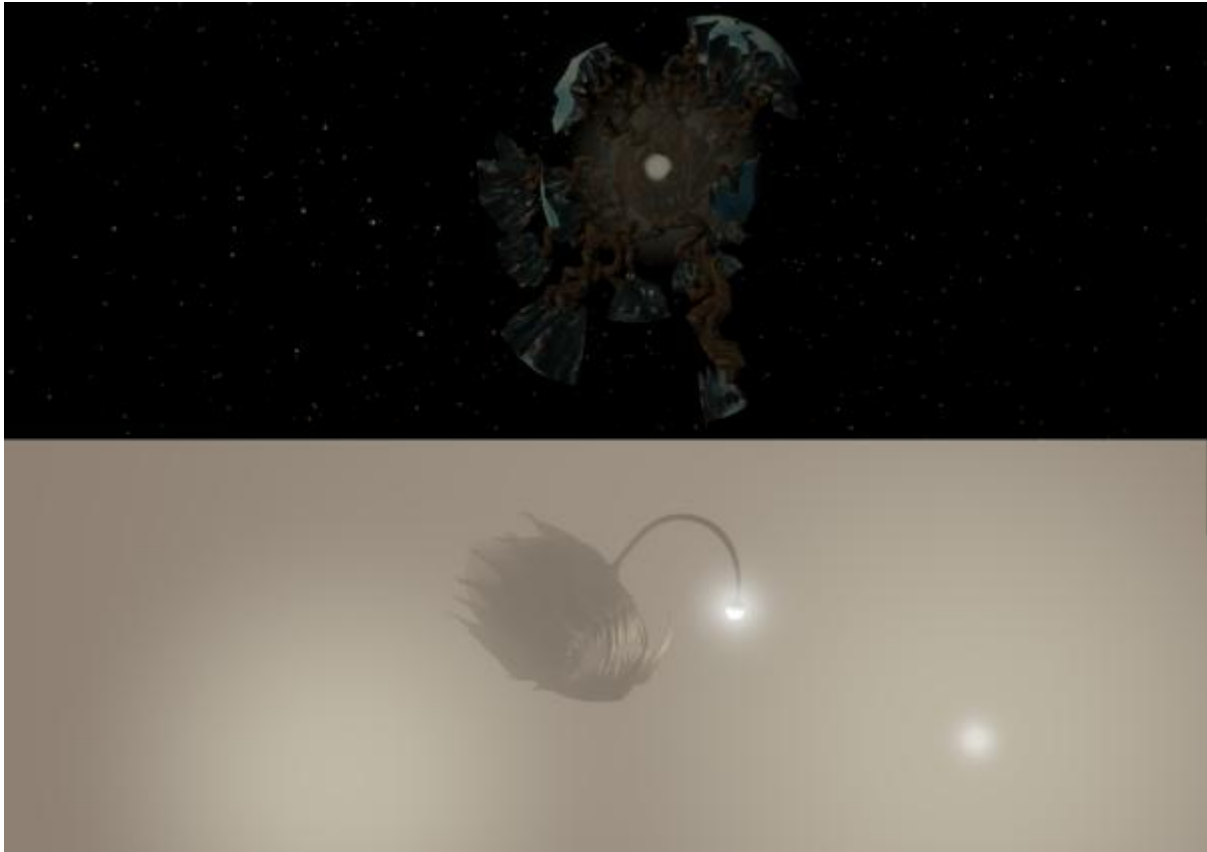


Figure 50 Outer Wilds (Mobius Digital, 2018), Dark Bramble, its non-Euclidean maze of fog, and an anglerfish

All these cosmological elements are not just part of the setting; they are key pieces of the narrative that the player must learn and understand to find the clues and solve the larger mystery. The game's design makes the player a true archaeologist, which is something that other games elude to, but in this case it's a literal thing as the game forces the player to uncover the secrets of the Long gone Nomai civilization and understand the rules and systems they discovered, often having to do things such as waiting for a planet's orbit to perfectly align with another for a specific event to occur. This direct interaction with the world's cosmology makes the player's understanding of the world a tangible skill, with every piece of new knowledge having a direct impact on their ability to explore and discover more information.

Finally, the rules and systems of the game are also essential parts of the story. The narrative and time loop are the most important rules of this universe, and it's a masterful example of a game mechanic that is also a storytelling device, as the loop provides the player with a persistent framework for exploration, since information, once discovered, persists across each 22 minute cycle, allowing the player to gradually accumulate knowledge and piece together the narrative, and ensuring that every moment that could be perceived as a failure turns into a learning experience, creating a tight-knit relationship between the storyworld and the player.

One of the game's narrative designers and writer, Kelsey Beachum, discussed during a Game Developers Conference titled "Independent Games Summit: Sparking Curiosity-Driven Exploration Through Narrative in 'Outer Wilds'", how this design philosophy is rooted in the idea of "knowledge as the sole gameplay reward" (Beachum, 2021, 4:53). As previously mentioned, the game deliberately lacks traditional incentives like experience points, skill trees, or a mission log, instead rewarding the player's curiosity directly with new information that allows them to progress. Beachum described the game's narrative structure as "maximally non-linear" (Beachum, 2021, 8:03), meaning players can discover information in any order they choose, especially since the systems aren't gatekeeping them from going anywhere without upgrades and such, which transform the game into a cosmic archaeological playground. To facilitate this, the game gives the player a few tools, such as the Nomai translator, which allows the player to physically interact with the textual fragments left by the ancient civilization, and the ship's log, which acts as a simple, objective record of every piece of knowledge the player has already crossed paths with. These tools ensure the player isn't being handheld through the story, leaving them to make the crucial connections themselves by only giving them the most basic clues.

The game also adheres to the "show, don't tell" principle by using major environmental events, like the previously mentioned cyclones on Giant's Deep, to "pull" the player into the narrative by enticing their curiosity, rather than "pushing" information at them through a linear script and forced interaction (Beachum, 2021). This symbiotic relationship between the time loop, the game's core systems, and the underlying design philosophies ensures that the player's intellectual journey is the primary driving force of the narrative. By making the very act of learning a new piece of knowledge a core mechanic, *Outer Wilds* creates a unique and unforgettable storytelling experience where the player is not a passive observer but an active participant in uncovering this universe's final moments.



Figure 51 Independent Games Summit: Sparking Curiosity-Driven Exploration Through Narrative in 'Outer Wilds' (Kelsey Beachum, 2021), Gameplay Loop Example 1

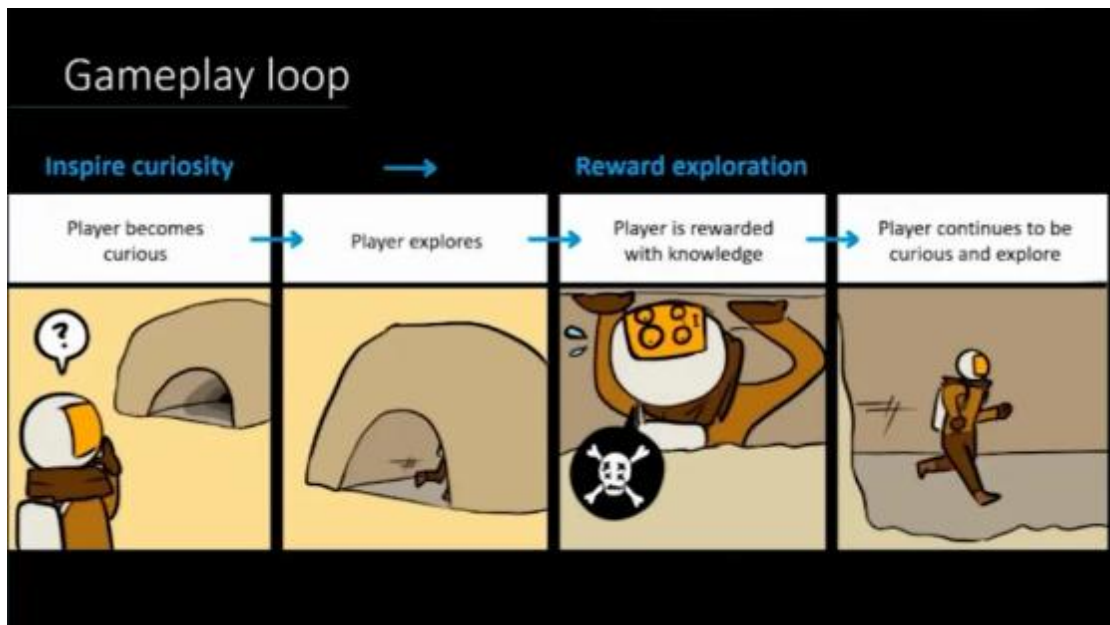


Figure 52 Independent Games Summit: Sparking Curiosity-Driven Exploration Through Narrative in 'Outer Wilds' (Kelsey Beachum, 2021), Gameplay Loop Example 2

### 3.3.2 Architecture

As mentioned in the previous subchapter, in *Outer Wilds*, architecture is a core element of the game's storytelling, being the primary narrator to the Nomai lost civilization's history, culture, and scientific endeavours. The Nomai ruins spread across the different planets function as an archaeological record, telling a story not through dialogue or cutscenes, but through their design, decay, and function, making the player's journey through these structures an act of intellectual discovery, where every building and every piece of Nomai technology serves as a crucial index to a larger, fragmented narrative.

The Nomai architecture is a direct reflection of their society and advanced technological prowess, unlike the crumbling human-made ruins of other games that usually reflect either abandonment or struggle for survival, the Nomai's structures show a civilization that was highly adaptable, that valued curiosity, collaboration, and science. Their buildings are diverse, normally adapting slightly to the environment of the planet they were built in, but present some common characteristics, such as the use of smooth, clean lines, elegant arches, and the use of circular and spiralling forms, which is not simply a stylistic choice but a representation of their interconnected, community-based society. They also seamlessly integrate their technology into the building, with the use of the gravity crystals, which manipulate gravity, allowing one to walk on any surface, even when it's upside down, creating pathways that wouldn't otherwise exist, and also using them to create one-way elevators.



Figure 53 *Outer Wilds* (Mobius Digital, 2018), Gravity crystals pathway

The presence of multiple observatories and laboratories, together with their designs, also demonstrates how science-obsessed this civilization was, their large, open spaces and intricate geometric patterns acting as evocative spaces that communicate a profound sense of awe and intellectual pursuit, reinforcing the Nomai's primary goal and serving as a constant reminder of the overarching mystery that the player is trying to solve.

The use of specific architectural elements also tells the player a great deal about Nomai culture. Even though they seem to be physically tall, their homes are often small and interconnected, suggesting that, despite their size, they lived in close quarters, reinforcing the idea of community already mentioned.



Figure 54 Outer Wilds (Mobius Digital, 2018), Nomai hanging city

The physical state of the Nomai architecture across the solar system also tells the tragic story of their journey. The Nomai clans that inhabited the solar system where the game takes place had a sudden but immediate demise, which is reflected by the architectural decay, similar on every planet, indicating exactly that sudden disappearance. The slight differences in the architectural decay often come from the planet's specific characteristics, for example, on the Hourglass twins, the buildings are more worn out due to the constant flux of sand.

Beyond its aesthetic and historical functions, Nomai architecture also serves as a central puzzle mechanic in the game, each building being part of a maze of clues, pathways, and hidden mechanisms that the player must learn how to use and navigate. Things such as the aforementioned gravity crystals force the player to find new ways to move through a space, turning a simple hallway into a multi-dimensional puzzle. This element transforms the level design from a static backdrop into a dynamic, interactive challenge.

This intertwining of architecture and puzzle design is consistent throughout the entire solar system, for example, in Giant's Deep, the player must use the powerful cyclones to launch their ship downwards into the core of the planet, but when exploring the island, the player must seek certain platforms that use gravity crystals to keep objects in place, otherwise their ship will be sent into outer space. Similarly, the Ash Twin Project, a kind of central hub for the game's narrative and its puzzles, is a building that forces the player to use their understanding of time and the unique properties of the Hourglass Twins to access it.

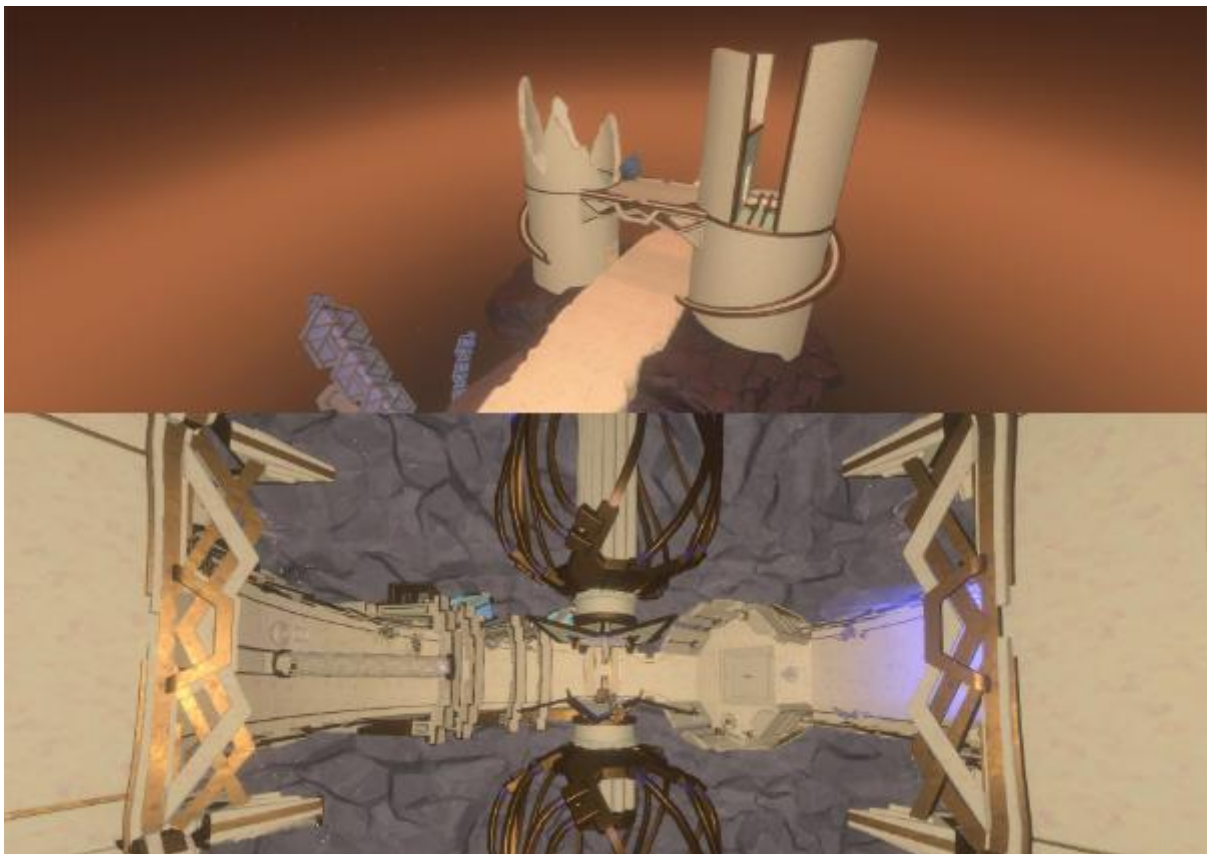


Figure 55 Outer Wilds (Mobius Digital, 2018), Ash Twin Project and its tower

### 3.3.3 Indexes

Building upon the concept of micronarratives and architecture, the game's environment can be understood as a complex system of indexes, which, as established previously, are the primary way by which the player participates in the storyworld. This narrative structure is not delivered linearly, but exists as a static, yet fragmented object from the very beginning, making the player's progression their own intellectual mapping and reconstruction of that story, a process akin to an archaeologist piecing together records of ancient events.

As mentioned previously, *Outer Wilds* doesn't provide the player with any reward systems such as new gear, experience points, or new abilities, making knowledge the only reward, a design choice that shifts the player's motivation from getting simple rewards to a pure drive to satisfy their curiosity.

The Nomai ruins are filled with indexes that provide clues about the civilization's history, way of life, technology, and eventual fate. A powerful example is the state of the Interloper, a frozen comet that wanders the solar system. The frozen, chaotic scene of a group of Nomai attempting to flee the comet after their investigations found that its core was full of a deathly matter provides a visceral index of their sudden demise. The preserved positions of their bodies and ships, and the scattered tools, tell a wordless story of their final, panicked moments.

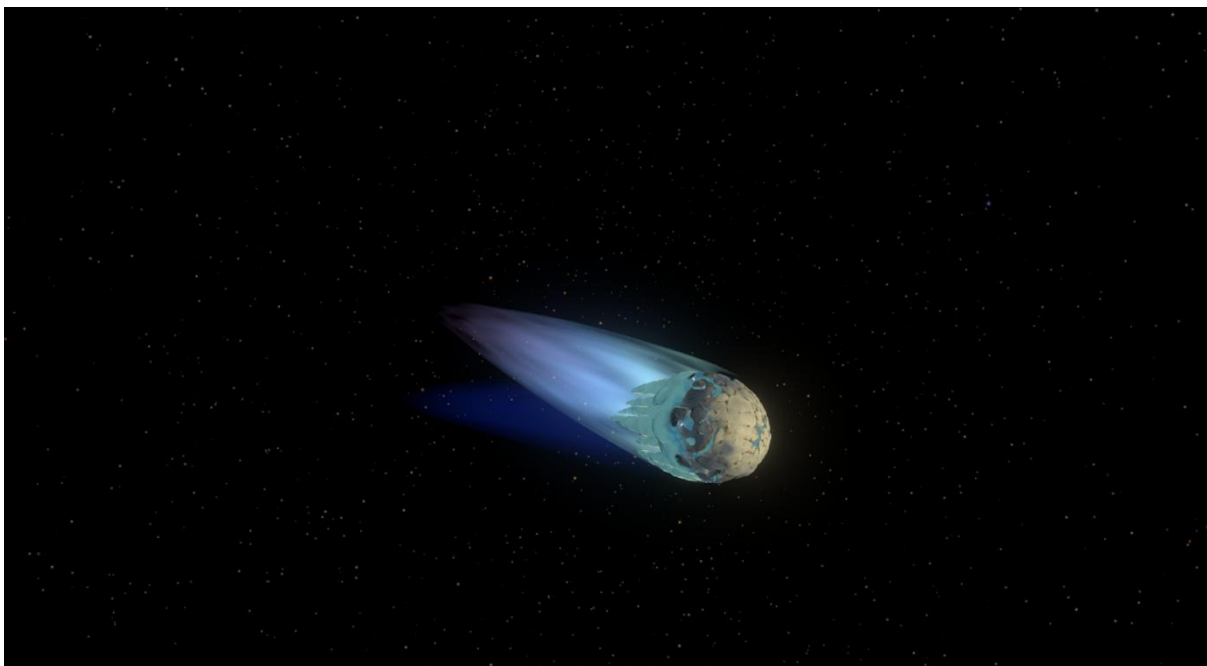


Figure 56 Outer Wilds (Mobius Digital, 2018), The Interloper

Another such example is the Hanging City in Bristle Hollow, constantly falling into the black hole at its core, serving as an index of a world in a state of terminal decay, the collapsing bridges, disconnected pathways, and crumbling buildings communicating both the Nomai's ambitious but flawed architectural choices and the geological inevitability of that world's fate. Beyond these large-scale examples, smaller details also function as indexes, such as the scattered books in the laboratories, indicating their desperate search for the eye of the universe.

Indices are also not just for storytelling, but also for guiding the player through the map, especially since the game has no traditional quest markers or objectives, instead, clues found in one location serve as direct pointers to another. Using the Ash Twin Project, the Nomai text describes a specific experiment with a subtle clue that points the player to the next planet, requiring the player to interpret the knowledge rather than simply follow a prompt or marker.

One of the few tools available to the player, the signalscope, acts as an index seeker, allowing the player to follow distinct signals from Nomai Ruins, distress beacons, music from other travellers, and a distinct sound that the quantum moon fragments that are scattered through the solar system emit, each acting as an index that draws them to a new area of interest.

Outer Wilds, therefore, relies solely on the principle that the player who discovers something on their own is far more invested than a player who is told what to do. This results in a powerful sense of intellectual victory with every new path found, as the player feels a genuine sense of accomplishment for having pieced together the fragments of knowledge to solve the puzzle of where to go next.

### 3.3.4 Micronarratives

The primary form of micronarrative in *Outer Wilds* is the scattered Nomai text, which is usually inscribed on walls, scrolls, or statues. Contrasting to the micronarratives from the previous case studies, *Outer Wilds*' micronarratives are always tied into the main narrative due to the design process that Kelsey Beachum explained, where they created the narrative in arcs contained within each other (Beachum, 2021, 37:40), often being conversations that have a mix of clues for the main story, while also showing glimpses of the relationships between the Nomai.

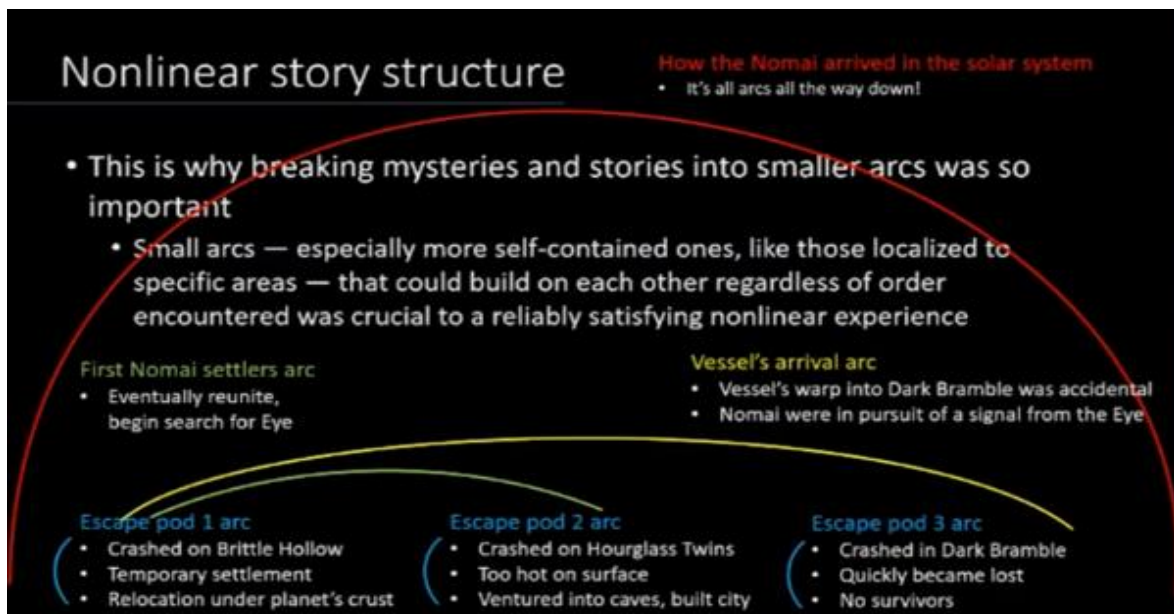


Figure 57 Independent Games Summit: Sparking Curiosity-Driven Exploration Through Narrative in 'Outer Wilds' (Kelsey Beachum, 2021), Narrative design methodology

The game cleverly presents these dialogues out of sequence, forcing the player to act as an archivist, piecing together fragments from across the solar system to form a coherent conversation, for example, the debate between two Nomai, Pye and Poke, about the safety of the Sun Station and the morality of its purpose, is a micronarrative that is not confined in a single planet.

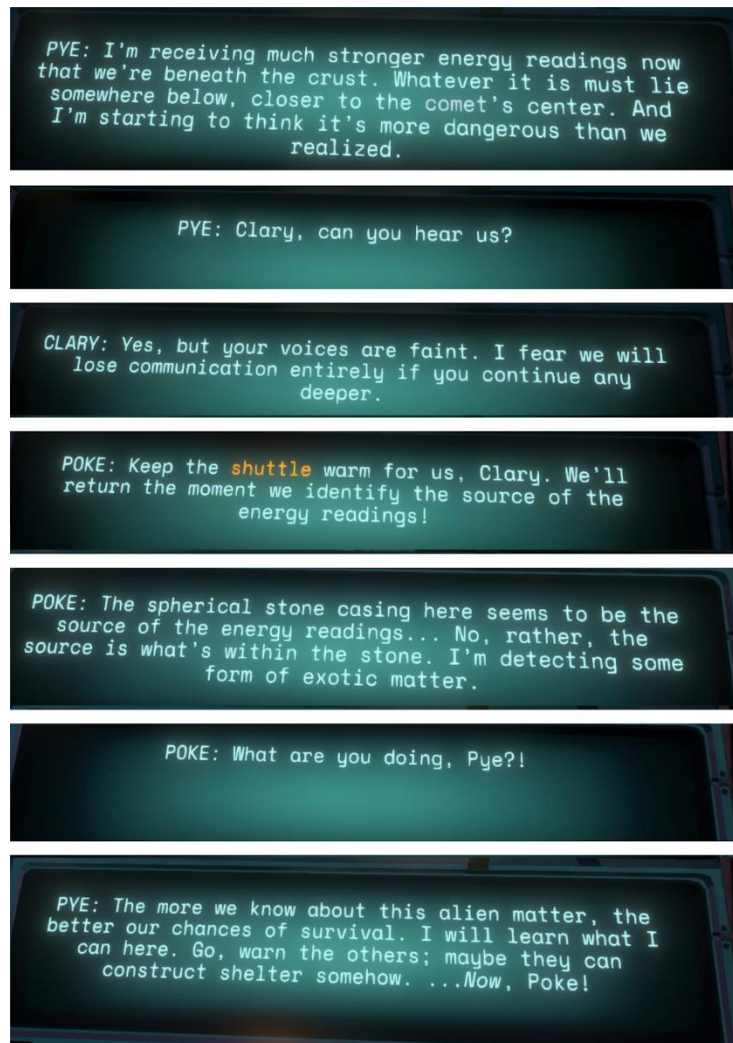


Figure 58 Outer Wilds (Mobius Digital, 2018), Conversation between Pye and Poke

This non-linear presentation transforms the player into a galactic historian, and following the debate between Pye and Poke is a prime example of this, since the player finds their initial conversations on the dangers of the Sun Station on Timber Hearth, such as shown in the previous image, then must go to the Sun Station itself for a later, more desperate message. This forces the player to actively reconstruct a conversation that unfolded across centuries. Similarly, other conversations offer glimpses into more mundane aspects of their lives.

Beyond the written word, the game also uses silent visual micronarratives to convey emotion and character, usually utilising objects scattered throughout the environment to point to past events. For instance, in the Hanging City, located in Bristle Hollow, multiple Nomai skeletons can be found inside their homes, some were eating, others sleeping, some were sitting on a bench near bookshelves, indicating that they were reading. All of these points to

their tragic, Pompeian demise, where they were simply living their normal day-to-day lives when catastrophe struck.

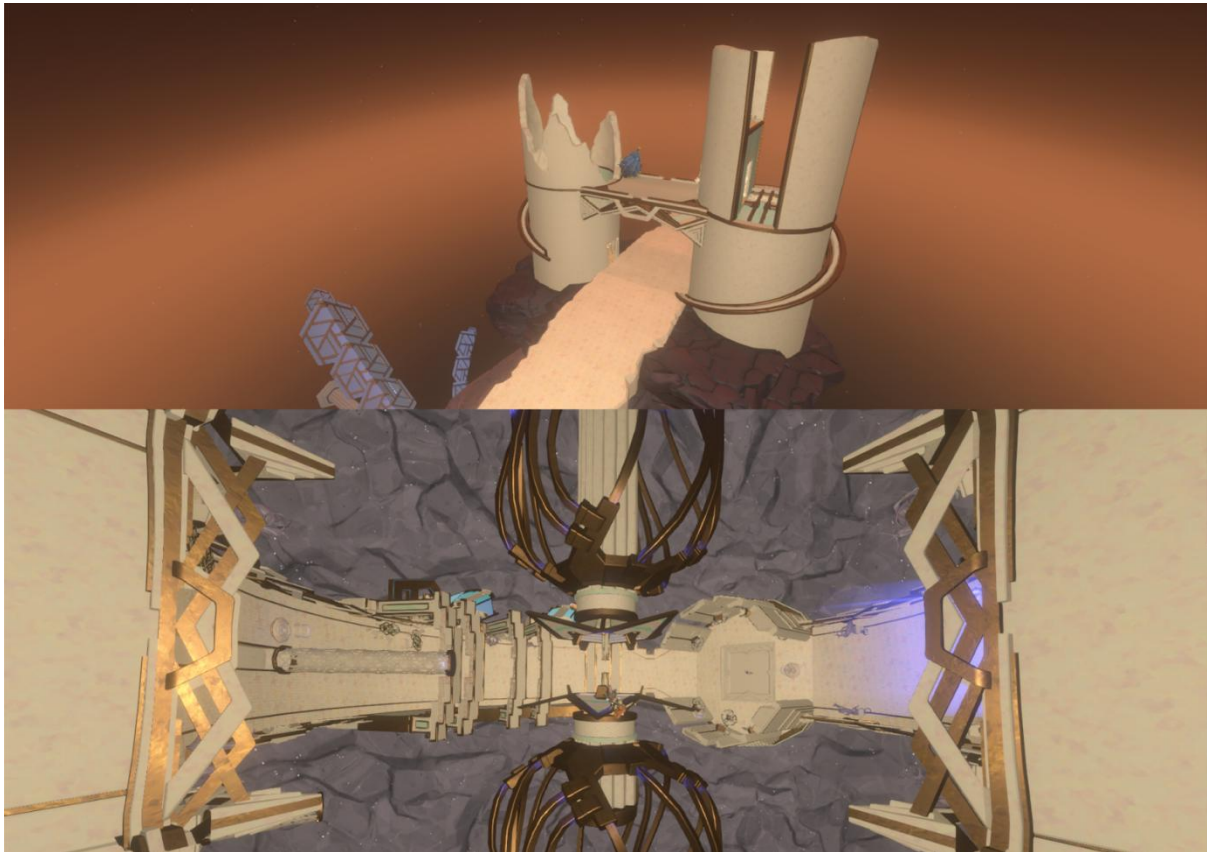


Figure 59 Outer Wilds (Mobius Digital, 2018), Nomai Skeletons in Bristle Hollow

The most important point to make about these elements in Outer Wilds is that, contrary to the other case studies, they aren't isolated, and every textual or visual fragment points to small parts of the story, creating a massive, interconnected narrative web. The player's journey, therefore, turns into a process of cross-referencing these cues. A clue about a specific thing may only make sense after finding another piece of text on a different planet. This design choice fundamentally links the concept of micronarratives to the main plot, making them the same, but presenting them separately for the player. This way, the player can find and understand the micronarratives at their own pace, turning the act of exploration into an intellectual journey.

# Conclusion

This dissertation aimed to provide an analysis of a growing field of study within video game studies: the capacity to generate a digital space that feels authentic, persistent, and permeated with history beyond the player's immediate experience. The central problem of this dissertation was to investigate how environmental storytelling (ES) is used in narrative-driven videogames to create the illusion of a world that existed, exists, and will exist beyond the player's presence. Through the examination of practical design applications, this study gives a structured compendium of techniques, theoretically demonstrating the power of environmental storytelling.

The dissertation starts by establishing a theoretical foundation, in Chapter 1, which defines the concept of storyworld as the diegetic universe governed by its own internal consistency - physical, societal, and systemic. This storyworld was confirmed as a necessary basis, since, without its coherence, the subtle clues of environmental storytelling would fail to register as narrative elements.

Building upon this foundation, Chapter 2 addressed the central problem of the dissertation: to create a thorough theoretical framework of environmental techniques. The study categorised environmental storytelling into three interconnected pillars that all fall under the umbrella of what was defined as an index: Architecture and Level Layout, Items and Item descriptions, and Micronarratives. This compendium acts as the main analytical tool of the dissertation, demonstrating that the perception of an inhabited world arises from the combination of these techniques, not just their individual application. The subsequent case studies in Chapter 3 validated this framework, showcasing how influential titles leverage these pillars strategically to align their narrative with the environment independently of design choices, such as how linear the game is or its genres.

The analysis of the architecture and level layout pillar returned significant findings. It revealed a struggle between the need for player agency and the necessity of narrative progression. Through the research and the case studies, the dissertation asserted that these elements should be carefully balanced with the game's objective in mind.

The practical solution to reconciling players' agency with narrative structure seems to lie in applying established architectural and urban planning principles to the virtual space. Balancing these two elements is key to a better player experience and to creating better environments where players can interpret their own surroundings without putting narrative integrity in jeopardy. Furthermore, using the five elements identified by Kevin Lynch can dramatically improve player experience by creating clear themes and functions for each part of the game world. Paths can be designed to work similarly to Michael Nitsche's concept of

tracks, establishing primary movement vectors that guide the player to the final objective. Edges are necessary to limit the player movement, when required for narrative control, and can be adjusted according to how much player agency the designers want the player to have, as seen in the case studies, with *The Last Of Us Part II* having much clearly defined edges than *Outer Wilds*; Districts can have a thematic approach to the player's perception, making them expect certain things from a specific part of the game, while also ensuring that said Theme doesn't stray too far from the overall coherence of the storyworld. To help players guide themselves, the designers may use easily recognizable landmarks that can be seen from different parts of the map.

This combination of techniques confirms that virtual architecture can be an effective narrative agent. By embedding spatial, temporal, and functional information directly into the layout, using methods such as Lynch's, designers can guide the player's gaze and movement without resorting to intrusive on-screen markers, transforming the player into an archaeological interpreter, with the act of spatial navigation becoming an act of narrative discovery.

The items and item description pillar acts as the primary method for the player to understand the storyworld's historical events. This analysis shows that the most effective item systems do not simply halt the player's momentum but instead provide enough in-world visual presence (the item as a prop in the environment) and compelling text that creates curiosity within the player (the description) to justify the interruption. By presenting these found objects as tangible historical elements, accompanied by cryptic text, the design compels the players to interpret and contextualize the fragment. The act of reading and connecting an item's lore to the macro-narrative of the environment transforms the player into an active investigator, rewarding them with emotional resonance.

Beyond the macro-level guidance provided by the other two pillars, the dissertation highlighted the narrative power contained within micronarratives. This technique is utilised within a localised, evocative scene and tells a small story, often detached from the main narrative, and told through object placement and scattered texts.

The research demonstrated that these fragments of implied history compel the player to investigate and theorize about the events that led to that scene, actively making them come to their own conclusion about what happened since nothing is explicitly stated. This investigation from the player's part is critical because when a narrative detail is discovered and authored by the player's imagination, the resulting emotional weight is significantly greater than if the detail were delivered passively through dialogue and cutscenes.

The framework provided by this dissertation, based on these three pillars, was then put to test by analyzing three distinct single-player videogames, each with their own structure, representing linear, open-world, and spatially complex narrative approaches, confirming that

even though each technique needs a slight adaptation depending on the underlying structural design of the games, it still functions with the same basis.

Table 1 - Deployment of Environmental storytelling pillars across the narrative structures

Game Structure	Pillar 1: Architecture & Layout	Pillar 2: Items & Descriptions	Pillar 3: Micronarratives
Linear (The Last of Us Part II)	Optimized for narrative momentum (controlling pacing and plot reveals)	Used for contextualizing certain elements of the narrative, rewarding brief pauses in specific areas	Medium density; used for emotional setup preceding major events
Open world (Red Dead Redemption 2)	Optimized for orientation and thematic reinforcement (managing the scale and vastness of the world)	Used as historical anchors; sparse but vital for turning empty spaces into evocative ones with a deep past	High density: used for localized events to incentivize exploration and create emotional resonance in the player
Spatially complex (Outer Wilds)	Optimized for gating and progression (architecture as access to puzzle elements via nodes and edges)	Used as progression keys, linking lore directly to mechanical rewards	Low density: integrated in environmental puzzles, often used to add context to a specific place, or to demonstrate the relationship between characters

The central practical conclusion is that design investment should be strategically used; in open-world, or spatially complex games, the priority should be on architectural coherence and item density; in linear games, it is on strategic placement of micronarratives to control emotional climaxes. The concepts of Lynch’s five elements and Nitsche’s spatial models are consistent, independently of the structure chosen for the game, as they can be applied in all types of environments.

While these qualitative case studies theoretically demonstrated the utility and efficiency of the framework, this research is limited by its reliance on the interpretation of design intent and on my analysis of player experience. To fully quantify the practical aspects of the physiological impact of environmental storytelling, future research should integrate quantitative methodologies, such as heart rate variability or eye-tracking, to measure the direct affective response players have to these techniques, something that goes beyond the scope of this dissertation, since the primary objective was to create a theoretical framework for environmental storytelling.

Furthermore, since the dissertation's findings are based on single-player experiences, there is also a necessity to further investigate how environmental storytelling can function within procedural generation systems, where the history of the environment is created dynamically, and within multiplayer spaces, where the perception players have of the world is constantly challenged by the real-time presence and changes brought by other players.

In conclusion, the efficiency of the video game medium as a narrative art form also depends on its ability to create a space that transcends mere visuality and can become something that feels independent from the player's presence. This dissertation has shown that environmental storytelling can play an essential role in that transformation, ultimately helping to change the player's perception of the world from a mere backdrop into something that feels inhabited and alive.

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