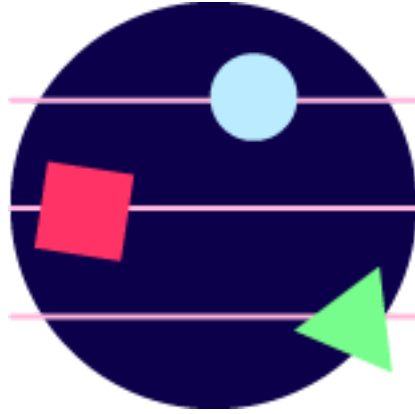




HARMONEUTICS

Creating a Framework for Ludonarrative Harmony

“Narrative beauty is independent of medium.”

Janet Murray

(pg. 273)

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1. Introduction

1.1 Ludonarrative Dissonance

Ludonarrative dissonance is a term coined by Clint Hocking to describe a contradiction or opposition between ludic (play or interaction) and narrative elements of a videogame. He uses Irrational Games' *Bioshock* (2007) as a foundation for defining this term. Hocking claims that the game presents the player with two contracts: "a ludic contract [...] seek power and you will progress" and "a narrative contract [...] help Atlas and you will progress". These contracts refer to the player's agency to decide whether to gain power, presented through the act of "doing what's best for me [...] without consideration for others", and their lack of agency to decide how to progress the narrative, by being forced to help the character, Atlas. Hocking claims that these contracts thematically oppose each other, resulting in the game "mocking us for having willingly suspended our disbelief in order to enjoy it" (Hocking, 2007).

1.2 Ludonarrative Harmony

Roth critiques dissonance by arguing that it "does not adequately describe the phenomenon" because Hocking uses it holistically instead of describing specific dissonant interactions. Roth's claim is supported by Hocking's acknowledgement that at the beginning of his playthrough, he experiences the opposite of dissonance, ludonarrative harmony (Roth, 2018).

While many definitions for ludonarrative harmony exist, Pynenberg's concise description effectively highlights the intricacies of the term: "a positive symbiotic relationship between the narrative and gameplay of an interactive narrative", where gameplay enhances narrative and vice versa. Pynenberg emphasises the impact of both ludonarrative elements on the overall experience. By understanding Hocking's response to dissonance in *Bioshock* as a loss of immersion and a disregard for the narrative, we can deduce that harmony must cause increased player immersion and more investment or involvement in the story, creating an internally consistent world that "feels right" (Pynenberg, 2012).

1.3 My Research

Despite abundant research focusing on identifying and analysing ludonarrative harmony, there is a significant gap in the literature regarding ways to create it. Considering the terms' impact on how players, critics, and game designers perceive interactive narrative, I believe it is crucial to understand what can be done to generate harmony and how to ensure that, as game designers, we can incorporate it into our projects.

To address this, I will develop a framework focused on designing interactive narratives for ludonarrative harmony, specifically through mechanics and interaction design. Using mechanics to enhance our storytelling, we can understand how to successfully connect ludic and narrative elements, leading to a better player experience. I will achieve this by iterating on other game development frameworks, gathering data on junior game designers' workflows and personal struggles with

ludonarrative design, and integrating a stronger focus on narrative storytelling through interaction.

By describing my target audience as junior designers, I can clarify that I am referring to game designers who may not have professional industry experience, experience outside of education or an extensive portfolio of works. I will create a digital educational resource (DER), a website targeting junior designers, to explain the framework, provide background information, provide examples of ludonarrative harmony, and provide design advice for the user. Using El Mhouti's DER model (et al, 2013), participants will then evaluate the effectiveness of the resource. By doing so, I aim to offer a foundational resource for designers that guides them in achieving ludonarrative harmony by exploring their interactive narrative ideas.

2. Literature Review

This section will explore existing frameworks associated with game design and ludonarrative mechanics, specifically Roth's (et al, 2018) ludonarrative hermeneutics and their development on Koenitz's (2010) interactive digital narratives, Hunike's (et al, 2004) Mechanics, Dynamics and Aesthetics (MDA) framework and Lauren Ash's ludonarrative model (2016), outlining their contents before critically analysing their benefits and limitations. This analysis will provide a deeper understanding of game design principles and approaches to creating ludonarrative harmony, informing my user research methods and the future design of the framework.

2.1 MDA Framework (Hunike et al, 2004):

The MDA framework analyses and breaks down interactive games into three components: *mechanics*, *dynamics*, and *aesthetics*, from which it gets its name. Hunike suggests that each component is "separate but causally linked" and can be used to view the game. From the designer's perspective, mechanics provide dynamic systems that lead to aesthetic experiences for the player. From the player's perspective, aesthetics set the tone for the experience from observable dynamics, which can be traced back to mechanics.

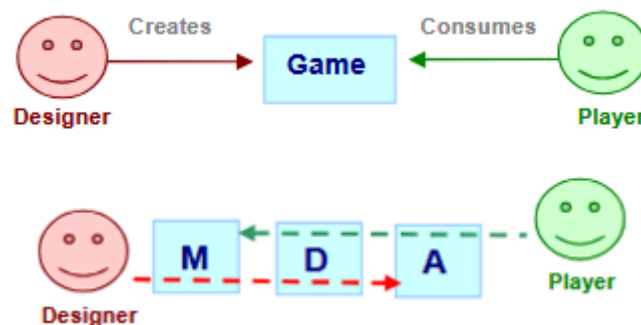


Figure 1 Dual perspective through the MDA lenses.

Hunike also provides a taxonomy of aesthetic terms that categorise what kinds of "fun" can be had by the games we design and what emotional response we want our players to have. Using the vocabulary, designers can define gameplay models, aiding them in tuning their mechanics and dynamics when user testing to align better their understanding of the game's "fun" with players.

The dual perspective approach to design proposed by Hunike actively encourages the developer to understand the player's perspective of the game. As discussed previously, it could be argued that Bioshock had not considered the aesthetic meanings its mechanics may lead to, like Hocking claims. Pushing designers to consider their game from the consumer perspective would allow for less dissonance between the designer's intended experience and the player's curated experience.

The proposal of a taxonomy for defining the desired kind of "fun" and emotional response the player should experience is a great starting point for designers to understand their games from their perspective. However, the taxonomy describes the experience holistically instead of specifying individual mechanics. Because my

framework focuses on enhancing narrative through interaction, applying vocabulary holistically will not aid the developer in tuning their specific interactions.

2.2 Ludonarrative Hermeneutics (Roth et al, 2018)

Koenitz defines IDNs as a combination of digital technology and narrative expression where the player has a non-trivial influence on progress, prospective content and narrative outcome. IDNs are not narratives but tools for creating them, turning potential stories into instantiated ones (Koenitz, 2010). An IDN is comprised of three sections (herein referred to as the SPP model): *system*, the digital artefact itself; *process*, how the user interacts with the system; and *product*, the instantiated narrative itself. Roth expands on the SPP model by adding a hermeneutic strip, describing how the players' interpretation of the systems and mechanics affects their understanding of the game's narrative, impacting their instantiated narrative.

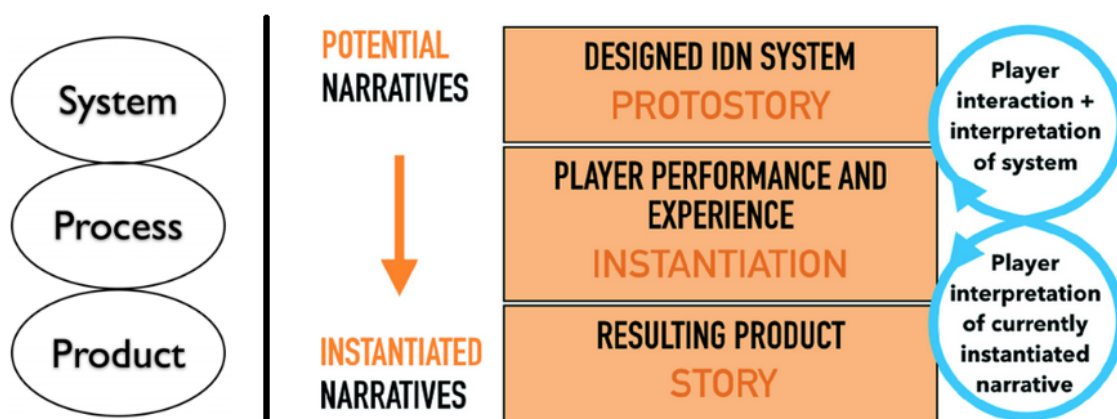


Figure 2 Koenitz's SPP model (left). Roth's updated SPP model (right).

Roth represents the player's "narrative meaning-making" cycle as two interconnected loops of the narrative interpretation process, distinguishing between what designers convey, imply, and intend from the experience and what the player performs, interprets, and expects. Suppose there is a difference between the player's interpretation and expectations from the narrative and what the designer has planned; the player may become unsatisfied, leading to perceived dissonance. This can be distilled down to a lack of consideration for player agency, similar to the root of Hocking's critiques.

Implementing the hermeneutic cycle emphasises the player's interpretation of interactions and their meanings to create a narrative. This is integral to creating ludonarrative harmony as it encourages designers to consider the implications of their mechanics for their narrative.

Roth makes it clear that it is crucial to consider the tension between the player's desires, having freedom to take actions, and the desires of the designer, refusing to relinquish control of what they perceive to be a satisfying narrative. By establishing the use of an IDN, Roth claims that the method inherently reduces the impact of this issue. However, for junior designers, it may not seem feasible to create an IDN to represent their narrative or effectively tell their story, and it shouldn't be a requirement

for a developer to change the fundamentals of their narrative to suit an IDN system. This is apparent through strictly linear games, such as *Thomas Was Alone* (Bithel, 2012), which received critical acclaim and was nominated for the 2012 BAFTA Games Award for Story without the use of branching narratives or other systems that may allow the player to shape their own instantiated narrative.

2.3 Designing For Ludonarrative Harmony (Ash, 2016)

Ash creates a process for game designers to use during development to achieve ludonarrative harmony. She uses a combination of approaches to develop her artifact: a player-directed approach to designing the level, allowing the player to experience emergent narrative (a narrative created through the interactions of the player and the game world) while exploring the area, and a designer-directed approach to focusing the players' interactions on their objectives.

Table 1 Ash's Ludonarrative Mechanic Analysis.

Ludonarrative Analysis and Supporting Systems				
Mechanic	Narrative	Context	Emotion	System(s)
Walking	Exploration	traversing an unknown environment	Mystery	First-Person Movement
Casting Light	Discovery	illuminate a dark and confining space	Ambiguity	Player Device Light System
Listening	Discovery	searching for a rune	Wonder	Geiger Counter System Rune Collection System
Listening	Challenge	navigating around obstacles to search	<i>Fiero</i>	Geiger Counter System
Extracting	Discovery	acquiring a rune (making an unknown object known)	Awe	Rune Collection System
Jumping	Overcoming Obstacles	cross chasms to escape confinement	<i>Fiero</i>	First Person Movement Checkpoint System
Jumping	Exploration	finding the way to acquire a rune	Fulfillment	First Person Movement
Inserting	Discovery	escaping a brutalist environment	Awe	Master Rune System

Ash details the intended impact of each 'ludonarrative loop' she created, exploring the mechanic's functionality and purpose in the experience, what system it contributes to, and the intended emotional response generated in the player (Table 1).

By breaking each mechanic into distinct categories, designers can plan what each mechanic aims to accomplish and use this information when implementing mechanics into their games. This layer of planning ensures that the player is kept in mind when developing, aligning the designer's intention with the player's expectations.

Ash's mechanic breakdown allows game designers to find meaning in each aspect of their mechanic design. This, paired with her player- and designer-directed approach to development, will enable us to push players into experiencing an emergent narrative without revoking complete control of how the narrative progresses/ concludes.

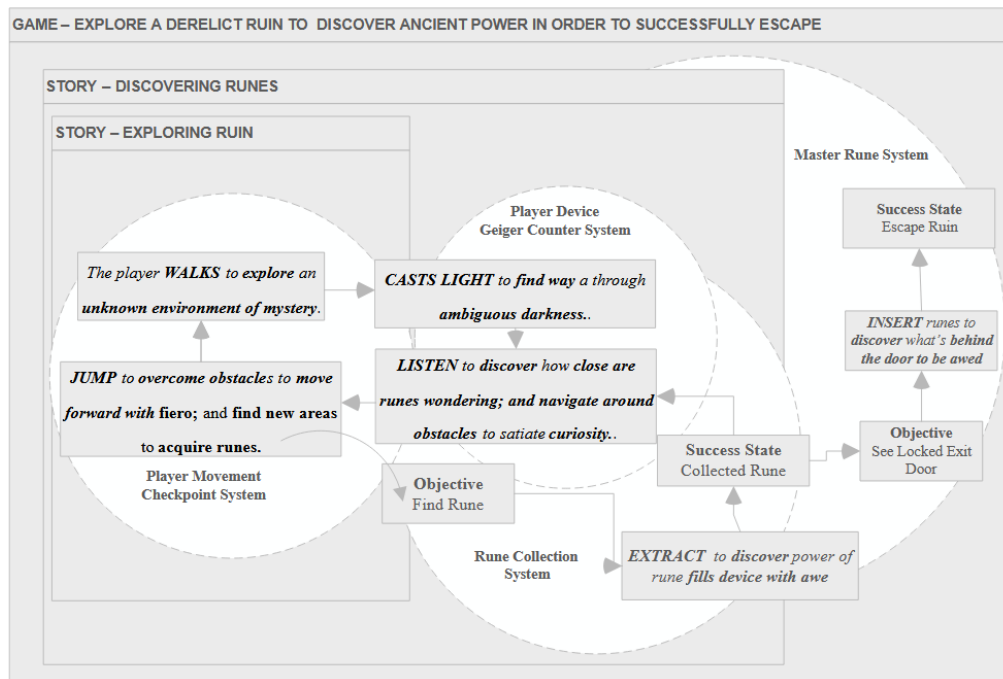


Figure 3 Ash's ludonarrative harmony model.

2.4 Critical Analysis

Ash acknowledges that she does not use an “explicit narrative” to convey her story (pg. 27), instead providing a basic backstory that contextualises her interactions and the game world (pg. 20). When considering her design approaches and her focus on emergent narrative, we can align her approach with Roth’s hermeneutic IDN. Many issues arise when viewing her model in this way. One problem is that her systems, consisting of basic mechanics and a level, do not facilitate player-driven narrative like Koenitz and Roth suggest they should. The player has no freedom to use the mechanics to create a unique approach to navigating the level, nor do they have a non-trivial impact on the narrative. Players can either engage in her ludonarrative loop and complete the game in the intended way or not engage in the game at all. Instead, she focuses on using the aesthetic qualities of the level design to facilitate creating and exploring narrative.

Another issue is that while her mechanics make sense in the context of each other, they do not facilitate or create a meaningful narrative, something that, from our definition, ludonarrative harmony aims to achieve. Ash’s use of backstory explains why the mechanics are present in the game, but doesn’t invite the user to interpret narrative information like an IDN should. While Ash focuses on using her framework to create an experience with ludonarrative harmony, she relies too heavily on assets and level design to facilitate this. This is something that Ash acknowledges, and while I agree with her statement that a “visual representation of those mechanics and environmental art are necessary components to maintain consistent ludonarrative harmony”, I feel as though her solution hinges on the presence of these elements instead of using them to compliment her “meaning-making cycle”. To reflect on this, I want to focus on generating harmony from the design of the mechanics rather than solely relying on aesthetic qualities to convey it.

In contrast, Ash's ludonarrative breakdown is a great starting point for understanding narrative intention through our interactions. As seen in Table 1, Ash allocates a narrative keyword to each mechanic, similarly to the MDA's taxonomy for aesthetic models, simply detailing why the player is performing the mechanic. On top of this, she assigns an emotional response to each interaction, describing the emotional response that encourages the continued use of the mechanic.

However, Trembaly (2016) and Sherlock (2022) recognise that through interaction, players can learn much about the character and game world they inhabit. By incorporating these facets into the mechanic's meaning and creating a more in-depth mechanic breakdown, we can design mechanics that provide players with much more to interpret than just an emotional response. My framework will expand on this to create more meaningful narrative interactions.

As discussed previously, the dual perspectives of the MDA framework help designers better understand how players will experience their game, pushing designers to view their work through different lenses. Koenitz's analysis of the tension between designer intention and player interpretation reflects this: the more focused we are on creating a specific experience without considering the player, the greater the dissonance.

Suppose designers can outline what a specific interaction can tell the player about the narrative. In that case, we can align the player's expectation of the narrative with our intention, reducing the tension usually created without being forced to develop an IDN. I will reiterate this focus through my framework. Using the more detailed mechanic breakdown, I will push designers to consider the narrative implications of their mechanics from the player's perspective and design around this principle.

Similarly, the MDA framework recommends that designers repeatedly test and tune their mechanics to align the player's experience with the designer's intended experience from a gameplay perspective. For my framework, I will switch the gameplay focus to a narrative one, aiming to align the player's narrative interpretation from experiencing or using a mechanic with the designer's intended interpretation.

One facet of interaction that none of the frameworks consider is how the player controls the interaction. Pynenberg (2012) uses the 'contextual' controls system of Quantic Dream's *Heavy Rain* (2010) to explore how even controls can create ludonarrative harmony. Walsh (2022) explains that games can use 'Representation' to align the emotional state between the player and a character. *Heavy Rain* utilises representation to tell the player how their character feels through the control scheme. In stressful situations, control prompts will be shaky and more complex, generating stress within the player. The contextual controls that Pynenberg refers to also allow the player to form a deeper immersion through interaction; opening doors requires the player to rotate their joystick, emulating the wrist movement of doing the same action in real life. We can generate more harmony by considering how controls immerse the player and thinking of creative ways to integrate them.

3. Initial User Research

This section will outline my approach to conducting designer research, justifying who I am researching and why. I will then explore the outcomes of my research and how it will aid the development of my framework before synthesising participant information into two user personas.

3.1 Method

Drawing on the MDA framework's developer and player perspectives and Ash's designer—and player-directed approach, I aimed to gain insight into how juniors begin their projects and investigate how well their workflows consider both sides. I also sought to understand their perceptions of their success in implementing narrative through interaction to gauge how useful they would find a framework or resource for improving their process.

By using short, semi-structured interviews, I could strike up a conversation with participants, build rapport, and ask about their ongoing projects before reusing information from this conversation to get answers with insight from their projects to my questions.

By focusing my research on junior developers, I can ensure that my framework properly facilitates my target audience and considers their wants and needs from the resource. Creating something for professional designers would seem redundant, as they will have their own approaches to design, be less receptive to being taught more basic concepts, and provide information that may seem complex if integrated into a tool for juniors.

I created an interview schedule (see Appendix A) outlining the basic flow of conversation I would lead the participants through during the interview. I tested the schedule by asking Google's Gemini artificial intelligence my questions, refining them based on my experience to create a more streamlined and connected conversation (Google, 2025). Before interviewing, I submitted information on ethics that aligned with the university's policies and got clearance to conduct my research.

3.2 Results

Table 2 Junior Designer Interview Results.

A	Narrative & Mechanics	They find it challenging to integrate their narrative ideas through their interactivity.	A checklist that displays what parts of a mechanic have been implemented and the meaning behind each mechanic.
B	Narrative first.	Finds it challenging to implement player interactions that represent their narrative ideas well enough.	A website with tutorials for aligning and guidance alongside examples.
C	Mechanics first.	Doesn't struggle as much when creating narratives through mechanics. They use cliché narrative techniques to facilitate gameplay.	Planning tool for narrative beats and story structure.
D	Mechanics then Narrative.	Focuses on allowing players to create their narratives by providing systems for interaction (Similar to Koenitz & Roth's IDNs).	A list of mechanic examples and the emotions they evoke within the player for designers to refer to.
E	Narrative first.	Struggles to implement mechanics, prefers to write stories for the player to experience.	Doesn't want a set of rules that are restrictive of the designer, more of a tool for aiding in planning.
F	Narrative & Mechanics.	Combining player interaction with the exploration of narrative.	Planning tool for narrative beats and interactions.
G	Narrative then Mechanics	A comprehensive narrative plan must be created before interactions are implemented. Recognises when games create a link between mechanics and storytelling.	A list of examples. A way to break down current progress & to-dos when designing interactions.

I interviewed seven participants and recorded over 97 minutes of audio. The table above summarises the qualitative data collected and its key outcomes.

3.3 Evaluation

Participants found it easier to begin by developing what they believe they are best at. Still, they recognised that sometimes, for example, they would need to implement mechanics before being able to tell their narrative. Many participants expressed that finding a balance between developing both ludic and narrative elements single-handedly is difficult.

Most designers aligned themselves with one of two sides when beginning a project: developing mechanics or developing narrative. This apparent split suggests that my framework should consider both approaches, breaking down how to establish ludonarrative harmony from both starting points.

Using the information gathered in my research, I created two personas, each aligning with one of the categories I established previously. By using these personas to influence the creation of my framework and resource, I can design my resource for use by many junior game developers.



Kai is a Computer Science student.

They love to prototype short games and often participate in game jams to explore their ideas.

Key Characteristics:

- Enjoys prototyping game ideas and experimenting with player interactions.
- Prefers to start with “how” a player will experience the game.
- Currently see’s narrative as secondary to gameplay.

Pain Points:

- Struggles to create narrative meaning in their games.
- His mechanics feel detached from the story he is trying to tell.
- Finds it difficult to create a cohesive narrative.

Goals:

- Design engaging, innovative player interactions.
- Wants to learn how to tell a story through gameplay.
- Aims to create mechanics that enhance the players narrative experience.

Figure 4 Kai, a user persona.

Kai represents the juniors who focus on creating interactions first and don’t consider how to attach a story to their gameplay experiences. Using Kai’s goals, I will develop an approach using mechanics to create narrative meaning through player interaction.



Emma is a 19-year-old Interactive Media student. She has always loved writing and will often write poetry, work on their novels and create short stories in their free time.

Key Characteristics:

- Has a strong understanding of key narrative writing principles.
- Prefers to start with “why” a player is experiencing the game.
- Sometimes views mechanics as a means to service storytelling.

Pain Points:

- Struggles to translate narrative ideas into engaging game mechanics.
- Feels as though her mechanics don’t do her narrative justice.
- Worries her gameplay may contradict the story she wants to tell.

Goals:

- Telling compelling interactive narratives.
- Wants to know how to design mechanics that facilitate her narrative ideas.
- Needs gameplay to effectively convey her intended experience.

Figure 5 Emma, a user persona.

Emma represents the juniors who first focus on creating a narrative and struggle to integrate interactivity. Using Emma’s goals, I will make an alternate approach for the framework to find and develop player interaction ideas from a narrative.

3.4 Project Shift

Initially, I wanted to create a framework to use as a tool in designing and developing my own game to prove its success in creating ludonarrative harmony, similar to Ash's approach. However, the need for a strong foundational resource became apparent through the interview process, as most participants expressed their struggles with creating ludonarrative harmony in their projects. This shifted my focus from building an interactive experience to developing the framework, making it more user-focused and accessible. Participant B (see Table 2) suggested creating a web resource, a great way to incorporate information and interactivity, so this is the direction I took.

4. Design and Development

This section will focus on creating the ludonarrative harmony framework, building upon prior analysis and user research. Following this, the website resource will be made, detailing the visual design, information architecture, and development process.

4.1 Framework Design

By expanding on Ash's mechanic breakdown (see Table 1) and focusing on integrating Roth's hermeneutics alongside the requirements put forward by my personas, I created a new mechanic breakdown from which I can make my framework. My breakdown emphasises using hermeneutics (interpretation) to align the designer's intended narrative experience with the player's understanding of it to create harmony. Two approaches can be taken, taking into consideration designers who begin either from mechanics or narratives. The framework is intentionally created not to force the designer to follow a specific method or change anything about their idea, but instead to provide a way of dissecting what they already have and improving its harmony.

4.1.1 Defining the Mechanic

The first step of the framework is to consider the designer's strengths. Following Kai and Emma's requirements, we use two starting points: 'Mechanic' or 'Narrative'. Through these starting points, we ask the designer to describe the interaction or use the key themes presented in their narrative to create one. From this initial idea, we can start designing the mechanic's narrative meaning.

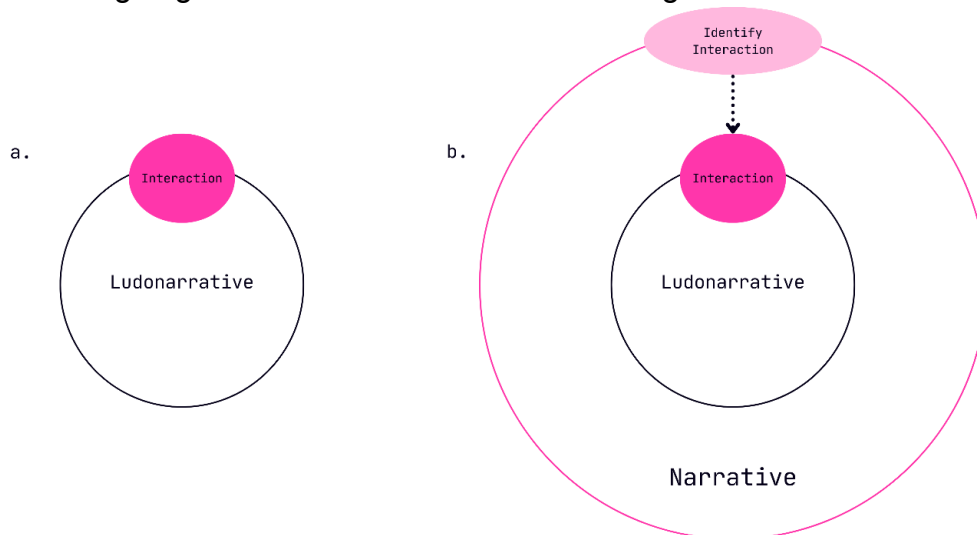


Figure 6 Defining the mechanic. (a. Mechanic first. b. Narrative first)

Designers who begin with an interaction idea follow the inward-out approach, creating an initial ludonarrative (narrative meaning inferred by the interaction) to generate an emergent narrative. Designers who begin with a narrative idea follow the outward-in approach, identifying themes from their narrative to create a method of interaction, then developing the mechanic's ludonarrative to support their story.

4.1.2 Developing Feedback

Feedback refers to the visual and auditory elements of an interaction. Despite ludonarrative harmony focusing on the relationship between player interactions and narrative, Ash expresses that an aesthetic representation is “required to maintain consistent ludonarrative harmony” throughout a game (pg. 27). Designers can use their understanding of the interaction and create aesthetics that represent it, reinforcing worldbuilding and creating a coherent aesthetic for the player to interpret.

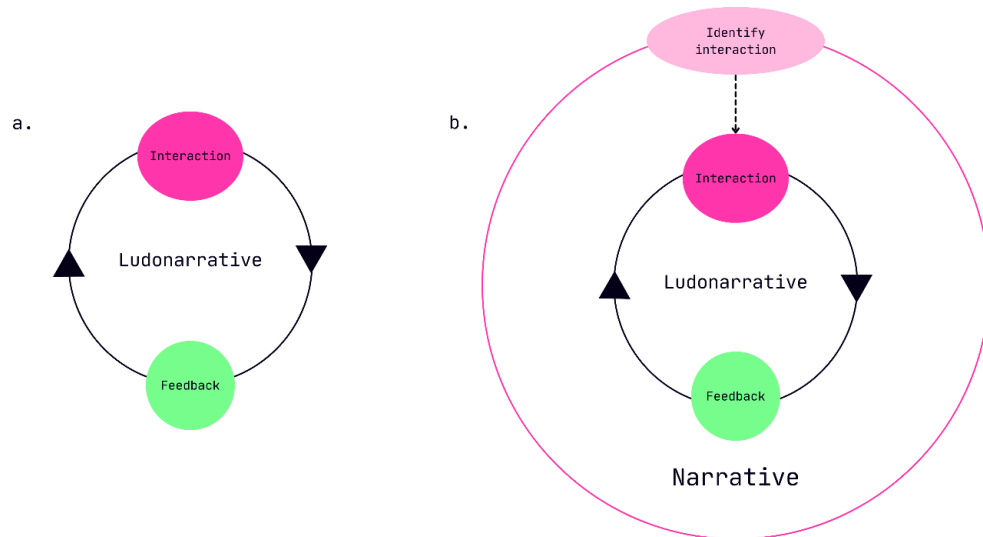


Figure 7 Creating aesthetics. (a. Mechanic first. b. Narrative first)

4.1.3 Creating Impact.

Designing the mechanic's impact is critical for creating ludonarrative harmony. Through 'impact', designers should aim to align the player's understanding with their intention without simply telling them so, allowing them to interpret narrative meaning through interaction. We can split a mechanic's impact into context, subtext, and connotation.

Context refers to how we want the player to perceive their character through the mechanic. Trembaly emphasises that gameplay actions relate to how the character behaves and the nature of their personality (Trembaly, 03:00, 2020). By designing with this in mind, we can align the player's and characters' intentions to avoid dissonance.

Subtext refers to what the mechanic can tell us about the game world. Sherlock suggests that when we play games, we suspend our disbelief to immerse ourselves. If designers ensure their mechanics are coherent and make sense within the game world, they can keep the player consistently immersed (Sherlock, 2022). Designers can use this to infer details about the game world to the player.

Connotation refers to the emotional response we want to generate within the player when interacting with the mechanic. Walsh proposes three ways to evoke an emotional response: simulation, representation, and abstraction. With our objective being ludonarrative harmony, the framework will focus on using representational emotions as they require interpretation, which is “a way to make emotion interactive” (Walsh, 2022). Using representation, we can provide experiences that players may

not have experienced through interactions. This emotionally aligns the player and the character, deepening immersion and creating harmony.

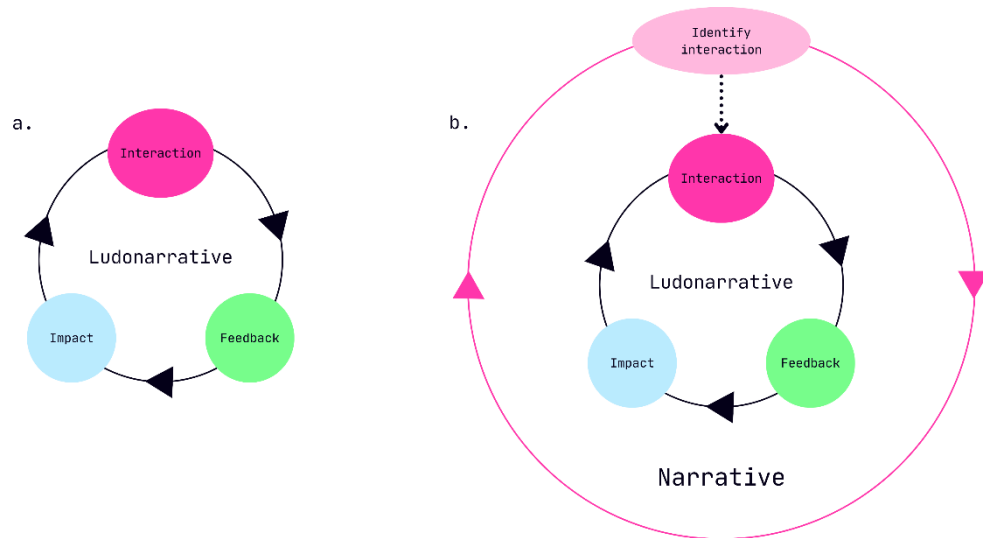


Figure 8 Creating Impact. (a. Mechanic First. b. Narrative First)

4.1.4 Refine

The final step of the framework asks users to refine the mechanic's ludonarrative loop to align the intended narrative better with the interpreted narrative, then begin designing other mechanics that support the narrative. Designers are prompted to think about connecting the mechanic they have made with future developments to create a gameplay loop.

Designers should also consider how the player will interact with this mechanic, considering any unique interaction methods or control schemes that could complement the mechanic and its narrative meaning.

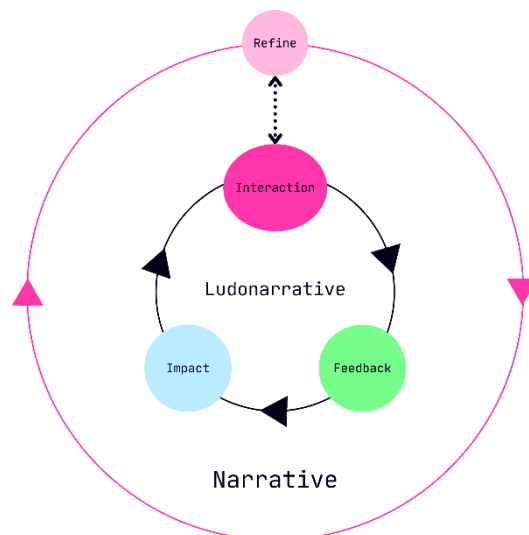


Figure 9 Refining the mechanic.

4.2 Requirements

Influenced by my prior research and the needs of my personas, I have created a table of functional and non-functional requirements for my web resource. I will refer to these throughout my development to highlight where I have designed with them in mind.

Table 3 Artifact Requirements.

F1	The website must adhere to W3C web standards.	NF1	Content wording must be easy to understand.
F2	The website must be accessible through a web address.	NF2	Content must be easy to digest visually.
F3	The website must be responsive.	NF3	Information must be structured in an easy-to-understand way.
F4	Styling must be consistent.	NF4	There must be examples of ludonarrative harmony from other games.
F5	Provides a resource for planning mechanics.	NF5	Interaction should feel fluid and smooth.
F6	The user must be able to navigate from page to page easily.		
F7	The user must be able to access definitions quickly without taking them away from current content.		
F8	The website must provide examples of ludonarrative harmony in other games.		

4.3 Resource Design

4.3.1 Visual Aesthetic

To adhere to my F1 and F4 requirements, I created a colour palette with a high contrast ratio for use across the website. The colours were chosen to complement the framework's focus on videogames and game design, with red, green, and blue used to differentiate each category of the framework's focus (Red for interaction, green for feedback, and blue for impact).

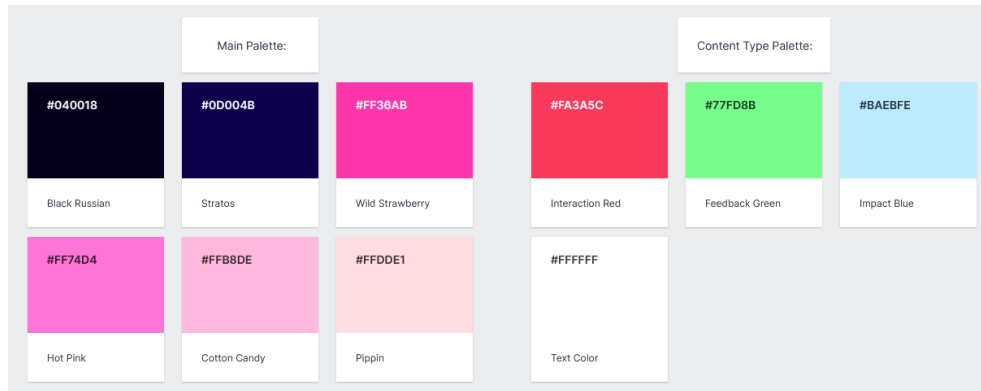


Figure 10 The website's colour palette.

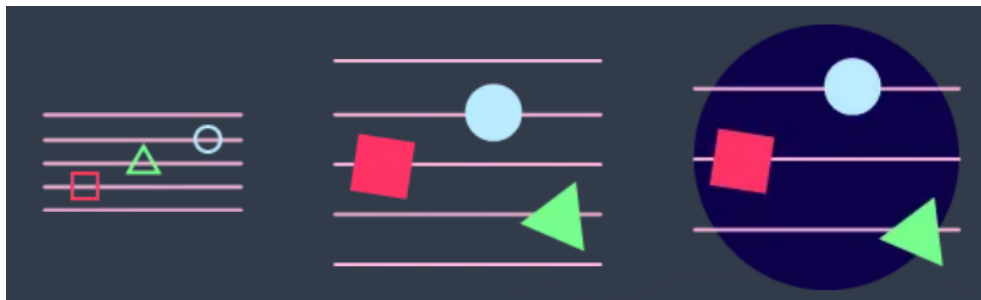


Figure 11 Logo Designs iterating from right to left.

I wanted to create a logo for the website that combined harmony and play. Drawing inspiration from music notation (for harmony) and the PlayStation's controller buttons (triangle, square, circle, and X), I developed the logo for the website, refining it to make it simpler and easier to understand (Figure 10). The notes in the logo represent one of my favourite chords! Using the same concept, I created a 'mascot' for the site, evoking a more casual and friendly feeling for the site (Figure 12).

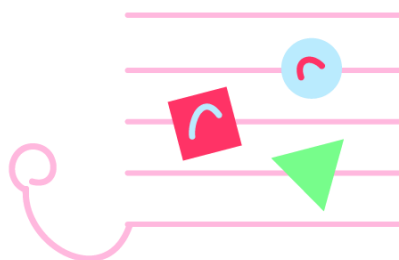


Figure 12 Harmony, the website's mascot.

4.3.2 Information Structure

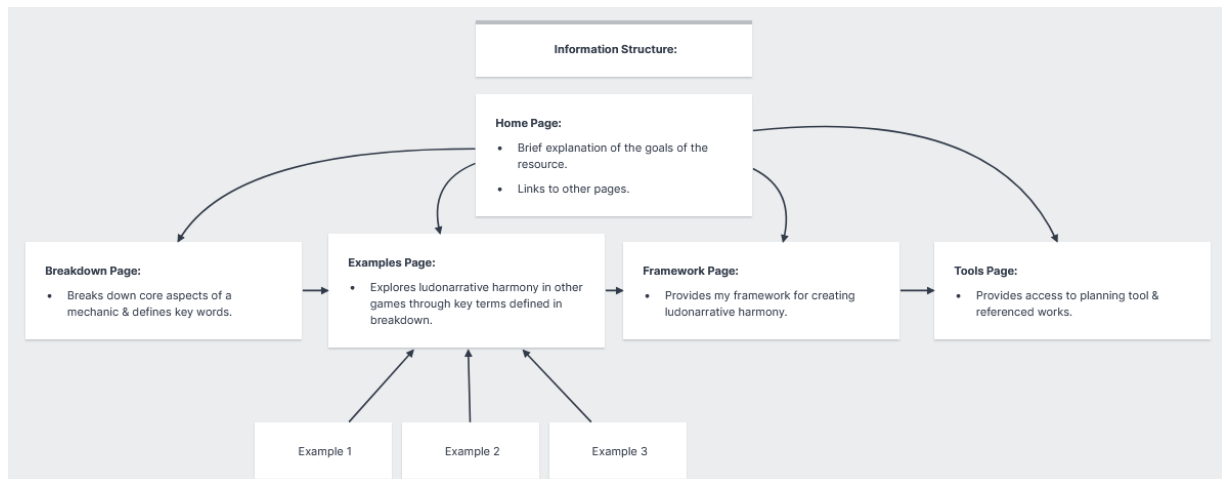


Figure 13 Information Structure.

To ensure that the information presented by my web resource is easy to understand, I created an information structure that provides a linear experience through the content. I provide essential definitions and contextual information before exploring them through examples and finally using the framework to develop the user's mechanics (See Figure 13). Pages should all be accessible from each other, but I will encourage the user to navigate the website in this order, meeting requirement NF3.

4.3.3 Flowcharts

To present the information in an easy-to-digest way (NF2 & NF3), I wanted to use a flowchart-style interaction method that allows the user to navigate through the information through interaction. This will primarily be used on the 'Breakdown' and 'Framework' pages, enabling me to collect related information in one 'branch' and prevent the user from being overwhelmed when they land on a page (see Appendix C).

Animations will indicate the direction in which the user is navigating through the flowchart, making navigation less visually confusing, more natural, and engaging.

4.4 Resource Development

4.4.1 Responsive Pages

To meet requirement F3, I used the web library Bootstrap (2025) to ensure that all of my pages are as responsive as possible. Bootstrap's custom classes, which can be applied to HTML elements, make it easy to design responsive web layouts and provide ways to scale and reorganise elements for different devices. I chose Bootstrap because it simplifies a lot of the CSS styling without revoking complete control, allowing me to customise my elements.

4.4.2 Animation Manager

As mentioned in section 4.3.3, animations will be used to create a more engaging user experience. To achieve this, I made a JS script that applies CSS animations to specific HTML elements, removing them when completed. This allows elements to be

dynamically animated when updating the DOM (Document Object Model) during runtime. A range of animations was created for use in various parts of the website; a list of them is available in Appendix E.

```
// Adds an animation
export function animateContent(element, animation, callback) {
  console.log("Adding", animation);
  element.classList.add(animation);

  // Get the duration of the animation:
  const animationDuration = parseFloat(getComputedStyle(element).animationDuration) * 1000;

  // Set a timeout to execute the callback after the animation duration:
  setTimeout(() => {
    console.log("Removing", animation);
    element.classList.remove(animation);
    if (callback) {
      callback();
    }
  }, animationDuration);
};
```

Figure 14 The 'animateContent' function.

4.4.3 Flowcharts

To create the 'flowchart' interaction, I made a JS script that programmatically loads information from a dictionary (a data structure that stores data in key-value pairs). The script provides users with navigation options based on their current position in the chart. The script dynamically updates the DOM (Document Object Model) to display content, ensuring it is styled correctly on all devices.

The 'flowchartNode' class creates objects that hold information about a flowchart node. These objects are used to create content for both the breakdown and framework pages.

```
export class flowchartNode {  
  constructor(header, text, options = {}, backID = null, colour = null) {  
    this.header = header;  
    this.text = text;  
    this.options = options;  
    this.backID = backID;  
    this.colour = colour;  
  }  
}
```

Figure 15 'flowchartNode' class constructor.

The 'renderNode' function loads a node object's contents onto the page, updates the DOM, and runs animations to represent the user's chart navigation to meet requirement NF5. When navigating the chart, an animation is played, fading out the content and moving it upwards or downwards, depending on whether the user is progressing forward or back in the branch. New content is transferred and faded from the opposite direction, allowing users to digest the change between their current location and destination (See Appendix D, Figure D2).

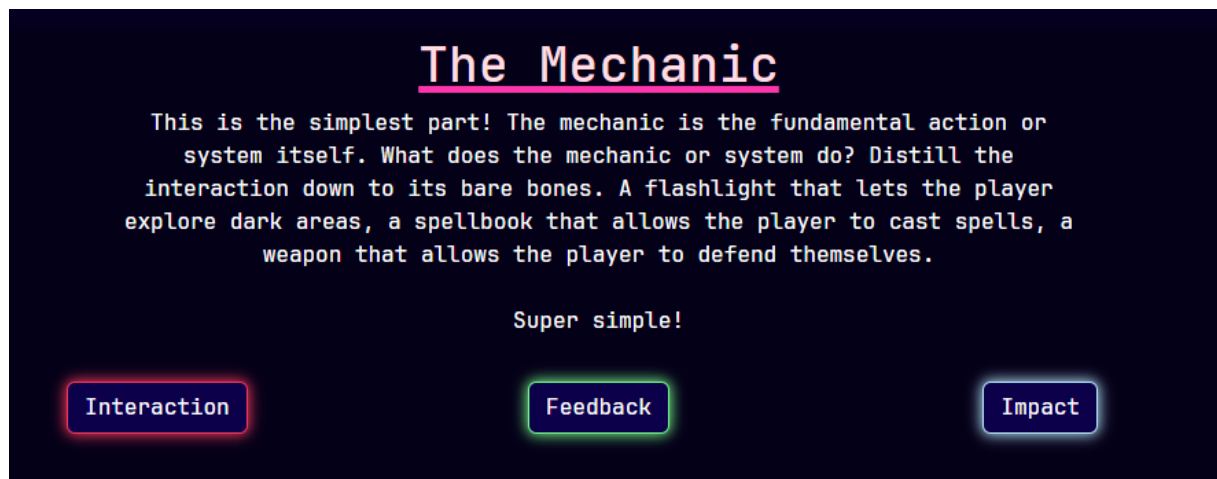


Figure 16 Flowchart View

4.4.4 Article View

To meet requirement NF3, an 'article view' was implemented that takes the flowchartNode content and displays it one after another. This allows the user to decide how to explore and engage with the web page's content, preventing users from being limited to learning in one specific way. It also allows users to quickly re-read content without navigating through the flowchart.

The Breakdown

On this page we will dissect and categorize what makes up a ludonarratively harmonious mechanic!

We will break things down layer by layer in order to make things as easy to put together as possible. These are the fundamental concepts that will allow you to design some *awesome* mechanics!

The Mechanic

This is the simplest part! The mechanic is the fundamental action or system itself. What does the mechanic or system do? Distill the interaction down to its bare bones. A flashlight that lets the player explore dark areas, a spellbook that allows the player to cast spells, a weapon that allows the player to defend themselves.

Super simple!

Interaction

Interaction refers to the way that the player interacts with or controls the game's mechanics or how the game's systems react to them. This could be through interesting or unconventional control schemes, cool NPC interactions or complex relationship systems.

A mechanic can fall into one of two kinds of interactions:

Figure 17 Article view.

The 'Framework' page's article view features a hyperlink that automatically scrolls down the page when the user clicks it. This lets the user quickly access framework content to create ludonarrative harmony from a story.

4.4.5 Examples Page

As shown in my initial designs (see Appendix B) and to meet requirement F8, including an examples page allows users to see how other games have achieved ludonarrative harmony, using terms from the 'Breakdown' page to explain how.

Examples are stored in dictionaries within an array. They hold information about the game and its mechanic, a GIF and sound clip, and descriptions of the context, subtext, and connotation. Accessibility information, such as alt text, is provided (see Figure 18).

```
export const mechanicData = [
  { // Bastion:
    "gameName": "Bastion",
    "gameLink": "https://www.supergiantgames.com/games/bastion/",
    "mechName": "Real Time Narration",
    "mechType": "<button class = 'tippy interactTip'>System</button>, <but",
    "mechDesc": "Real time narration for the players actions! You can read",
    "context": "Rucks is not only the narrator, but also a character the p",
    "subtext": "Not only does Rucks' inform the player of their character",
    "connotation": "Because Rucks' narration is the only voice the player",
    "gif": "../exampleFiles/bastion.gif",
    "gifAlt": "The Kid finds his 'lifelong friend'.",
    "audioFile": "../exampleFiles/bastion.mp3"
  },
]
```

Figure 18 Example Information.

Whenever the user loads onto the examples page, a mechanic is randomly loaded into the DOM from the array. This prevents the user from being overwhelmed by a long page of examples and adds interactivity to the learning process, as the user can refresh the page (or use the "new mechanic" button) to access another example (See Appendix D, Figure D3).

4.4.8 Tools Page

The 'Tools' page (see Appendix D, Figure D5) features access to a ludonarrative harmony planning tool, meeting requirement F5. This tool allows users to follow the framework and keep track of their designed mechanics in one place (see figure). The page also provides some core papers that influenced the framework's design, providing a more in-depth look at ludonarrative harmony.

A	B	C	D	E	F	G	H
Ludonarrative Harmony M...	Tr The Mechanic	Tr Mechanic Description	Tr Interaction Type	Tr Visual Feedback	Tr Audio Feedback	Tr Context	Tr Subtext
Sand Surfing	The player uses a 'sandboard' to navigate a desert environment, surfing on the sand dunes.	Player Controlled	The surfboard used to navigate the dunes is made from scrap metal, despite this it seems competently put together and the character's interactions with it are natural. When used, sand sprays from behind the player and leaves a trail in the terrain. Speed lines appear dependant on how fast the player is going.	The sound of sand being displaced and wind whipping is prominent, a subtle sound of metal being sanded away can be heard.	The character surfs around the dunes to find scrap as implied by their surfboard. They are proficient at 'sandboarding' implying they're well practiced. This as, in harmony with the environment, means that it's their job to collect scrap and re-purpose or sell it.	Through the use of the 'sandboard' and the characters proficiency with it, we can infer that there are no better forms of transportation available to them or the civilisation they are a part of. Could this infer some sort of catastrophe that set the world into post-apocalypse, or maybe the game world was always like this?	Sandboarding' should exhilarating! The player feel fast and free to e using this method of i pushing them to conti doing so. This should feeling should be refl, the character's respor sandboarding.

Figure 19 Ludonarrative Harmony Planning Tool.

4.4.6 Tippy

To meet requirement F7, I included another web library, Tippy.js (Atomiks, 2025). Tippy allows for the easy implementation and customisation of tooltips. I used Tippy to create short definitions for key terms that would appear when a user hovers or taps a word they may have forgotten the meaning of. This removes the need for the user to navigate back to a previous page to re-read and understand content. Keywords with tool tips visually stand out in content, allowing users to know they are interactive easily (see Figure 20).

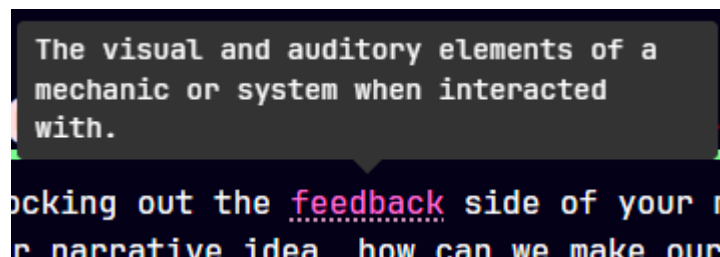


Figure 20 A Tippy popup.

Tippy tooltips only initialise their content when the page is initially loaded. This raised an issue: when the DOM content is updated, any new tooltips have empty content. To solve this issue, I created a custom script that runs and re-initialises Tippy tooltips whenever the DOM is changed.

```
// Dynamically finds tippy buttons and adds tooltips when DOM has been updated:
export function tippyUpdate() {
  const tippyButtons = document.querySelectorAll(".tippy");
  tippyButtons.forEach(button => {
    // Accessing the tippy content location.
    let contentToSet = button.getAttribute('data-tippy-content') || '';

    // Iterate through the content definitions and check if the button class matches any keys in the dict.
    for (const selector in tipContent) {
      if (button.matches(selector)) {
        contentToSet = tipContent[selector];
        break;
      }
    }

    tippy(button, { content: contentToSet });
  });
}
```

Figure 21 The 'tippyUpdate()' function.

4.4.7 Navigation & Footer

The navigation panel is accessible when the user clicks or taps the header. This gives them access to each page, highlighting the one they are currently on. The footer prompts the user to navigate the website linearly, as discussed in section 4.3.2. It also houses an interaction button that changes from page to page. The button allows the user to switch between the flowchart and article view on pages with flowcharts. A new example is loaded on the examples page when the button is pressed (see Appendix D).

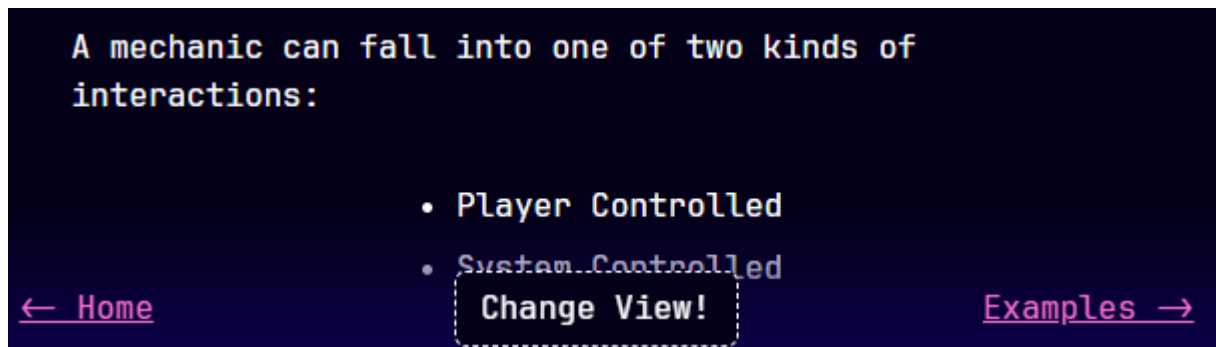


Figure 22 Footer with 'Change View' button.

4.5 Accessibility

4.5.1 W3C Accessibility Testing

To ensure the resource met requirement F1, I tested each page using the Wave evaluation tool. This tool allowed me to analyse how successfully each page aligned with the W3C web accessibility standards. My colour palette choices, including alt text and responsive design, meant that all pages on my website had no accessibility errors. (See Appendix F).

4.5.1 Web Hosting

To meet my F2 requirement of hosting the website, I purchased the domain “harmonautics.com” (a portmanteau of harmony and hermeneutics) and hosted the site on it using Netlify (2025). Having the website live will make it much easier to conduct user testing and evaluation. This also actualises the resource, allowing prospective users to use the framework.

5. Evaluation and Conclusion:

In this section, I will evaluate the success of my framework and web resource, using user research to gather a broad opinion of the work. Based on the results, I will discuss what improvements could be made to the framework and resource.

5.1 User Evaluation

To evaluate the success of my website as a learning tool, I created a questionnaire following El Mhouti's *digital educational resource* (DER) evaluation model (et al, 2013). I chose this model as there seems to be a lack of models created to evaluate the success of game-design related DERs. El Mhouti's model outlines four sections: academic quality, pedagogical, didactic, and technical quality. They then dissect these sections into criteria ranked on a scale of one to five. By adapting El Mhouti's model and changing some of the phrasing of the questions for accessibility and relevance to better fit the nature of my resource, I can better understand how learners perceive the DER.

To begin the evaluation, I sat with participants and watched them engage with the website. I would support them if they approached me with issues accessing or understanding information. After engaging with the website, I provided the participants with a questionnaire, asking them to answer the questions below on a scale from one to five, asking how much they agree or disagree with the statements.

Table 3 DER Evaluation Results.

Questions	Score / 5
1. Is the content straightforward to understand?	4.2 / 5
2. Does the resource present clear overviews and summaries?	4.5 / 5
3. Is the resource structured?	4.5 / 5
4. Is the structure well suited to learning?	4.3 / 5
5. Are the objectives to be achieved by the resource clearly stated?	4.6 / 5
6. Does the resource include stimuli likely to promote learning?	4.2 / 5
7. Is the learner actively mentally engaged?	4.6 / 5
8. Do you think the content is helpful for junior game designers?	4.4 / 5
9. Does the resource consider both junior and experienced game designers?	3.7 / 5
10. Is navigating the website easy?	4.3 / 5
11. Does the use of the website resource make learning easier?	4.5 / 5

12. Is the information presented useful to the learner?	4.5 / 5
13. Is the framework usable for beginner game designers?	4.6 / 5
14. Is there anything about the resource that the learner would want to improve?	N/A (Qualitative Data)

5.1.1 Quantitative Data Analysis

Fourteen participants, all game designers, took part in the evaluation. As seen in Table 3, most sections scored highly, indicating that the web resource was successful in its content and presentation. When using El Mhouti's model, out of a possible 65 points, the resource scored 52.4, just putting it into the top category of an "excellent educational resource" (pg. 31, 2013). Overall, the quality of the content and the information structure was rated highly, with participants agreeing that the resource is helpful to the user.

The lowest scoring result was for question 9, which was anticipated as the resource was targeted at junior designers rather than professional or experienced ones. This may also be due to the high volume of junior designers participating in the evaluation. On reflection, interviewing a wider range of designers about their approaches would have influenced the framework's content and structure, broadening the target audience to designers of any skill level.

Another of the lower results was for question 6, surrounding stimuli encouraging learning. While designing the website, I realised there weren't many visual stimuli to accompany the text or explain any concepts, especially in the breakdown section. Including specific images to aid descriptions and provide examples may help the user better understand the content, leading to a better work experience.

Despite being able to evaluate the resource's success, assessing the framework's success is limited, as it is unreasonable to ask designers to create games to prove its effectiveness. However, through participant feedback, many expressed their interest in returning to the site to continue designing for ludonarrative harmony for their projects.

5.1.2 Qualitative Data Analysis

Almost all participants found the website's content helpful and applicable to their design process, as reflected by the results in Table 3. Participants particularly enjoyed using tooltips to quickly access definitions and key terms without leaving the page they were on. Participants expressed that the framework's content was accurate, engaging and applicable to their design processes. My analysis of question 6 was confirmed by a participant who communicated that adding visual and auditory feedback would make the content more engaging and help convey the information by association.

One identified themselves as an "absolute beginner" and conveyed interest in explaining why ludonarrative harmony is an essential concept for game design as a preface for the rest of the content. A page specifically detailing this information would improve the experience for those who may have no experience with game design and want to learn about specific concepts at the beginning of their journey.

Another participant suggested reordering the content to focus the user's initial attention on the framework page, using the breakdown page as a glossary of terms. This would require restructuring content and creating a layout to ensure the user can understand the framework's terms, but could lead to a better overall user experience.

Many participants stated that the website was easy to use, proclaiming that the logical flow of content and the simplicity of the design created a "great user experience". Some participants reported enjoying the website's design but feeling overwhelmed when interacting with the content and pages, expressing that the amount of information was intimidating. They mentioned that paragraphs could feel dense and would be improved by breaking them into more manageable chunks for readability. Users who evaluated using mobile devices were pleased with the website's responsiveness, but they reported some instances where the page footer covered content.

Some participants reported being confused by the hyperlink in the article view on the framework page (see section 4.4.4). They identified that the hyperlink was styled too similarly to words with tooltips, making the user lose their place. However, this informs me that users engaged with the site's 'article view' functionality, indicating they may prefer it over the flowchart-style navigation.

The 'Examples' page confused participants, and there were many misunderstandings about how the page worked. Participants sometimes experienced the 'new mechanic' button not taking them to a new page or bringing up a different mechanic. I programmed the webpage to display a random mechanic from an array instead of creating multiple pages. However, this leads to the same mechanic sometimes being shown numerous times consecutively, confusing how the page works. Participants also wanted more examples to look at, to broaden their understanding of ludonarrative harmony. I can correct this by using session storage to track which mechanic is currently displayed, prevent it from appearing consecutively, and add more mechanics to the array.

5.2 Conclusion

This dissertation addresses a notable gap within game design literature: the lack of a practical framework for the proactive creation of ludonarrative harmony. To address this, I have developed a framework that focuses on creating ludonarrative harmony targeting junior game designers, specifically through adding narrative meaning to mechanics. The framework was developed by analysing existing game design models, such as Hunicke's (et al, 2004) MDA framework, Roth's (2018) developments on Koenitz's IDNs (2010), and Ash's model for ludonarrative harmony (2016). On top of this, user research was conducted to gain insight into how helpful a framework would be for junior designers, as they do not have as much experience in creating interactive narratives.

One significant conclusion from conducting semi-structured interviews was that a foundational resource was lacking to aid junior designers in successfully creating interactive narratives. This shifted the project's original direction from making a videogame through using the framework to creating an educational resource to teach the framework to junior designers. *Harmonautics.com*, a website designed to introduce the framework, provides designers with a step-by-step guide on integrating player interaction and narrative meaning to successfully create ludonarrative harmony alongside examples and tools to help them in their work.

Junior designers were used to evaluate the resource using El Mhouthi's (et al, 2013) DER (digital educational resource) evaluation model. The results indicate that the resource was of excellent quality, with many participants expressing their desire to return to the resource when designing their projects in the future.

While this study offers an initial step towards a structured approach to designing for ludonarrative harmony, it has limitations. The framework's practicality cannot be truly analysed until it is used to design and develop a project. Additionally, the scope of the user research was limited to junior designers—iterating upon the framework using insight from a broader range of skill levels would be the next step in improving the content. Furthermore, evaluating the long-term impact of the framework on design practices and its results warrants further investigation. To enhance the resource, I would implement the feedback received through the user evaluation, focusing on improving the overall user experience, flow of content, visual stimuli, and number of examples.

In conclusion, this dissertation proposes a foundational framework for creating ludonarrative harmony in video game design. The 'harmonautics' resource empowers junior designers to enhance their process and produce harmonious, interactive narratives, enriching the player experience by fostering a successful connection between how a game is played and the story it tells.

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Code Libraries & Web Hosting

Bootstrap 5.3.6	Each HTML page.	2018 MIT licence.	https://getbootstrap.com/
Tippy 6.3.7	Home, Breakdown, Examples & Framework pages.	2025 MIT licence.	https://atomiks.github.io/tippyjs/
Netlify	Used to host the website.	N/A	https://www.netlify.com/
WAVE Evaluation Tool	Used to test each page's accessibility.	N/A	https://wave.webaim.org/

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tional_Response. Accessed 12 May 2025.

Appendices

Appendix A: Interview Schedule

BUILDING RAPPORT

1. What are you working on at the moment?
 - a. **OR** What games have you been playing at the moment?

QUESTIONS:

2. What inspires you to begin creating an interactive project? Is it a cool mechanic idea? Or do you begin with an idea for a story you want to tell?
3. Is **X** the area you begin developing first or do you focus on other areas to begin with?
 - a. *Feature or experience focused?*
4. How easy do you find it to develop **X**?
5. Do you think about how to attach narrative meaning to **X or the user interaction**?
 - a. Do you find it challenging to do so?
6. In **YOUR PROJECT / RECENT GAME YOU PLAYED**, can you identify any examples of where you have attached/ experienced narrative meaning in mechanics?
 - a. *Eg. In Unpacking, the gameplay and narrative are one in the same as we experience the narrative through looking at what we move house with.*
7. Do you think that a framework or some guidelines would help you better understand how to link narrative to user interaction or mechanics?
8. What do you think that framework or those guidelines would look like to you?
9. **END** Thank you for your time!

Appendix B: Initial Webpage Designs

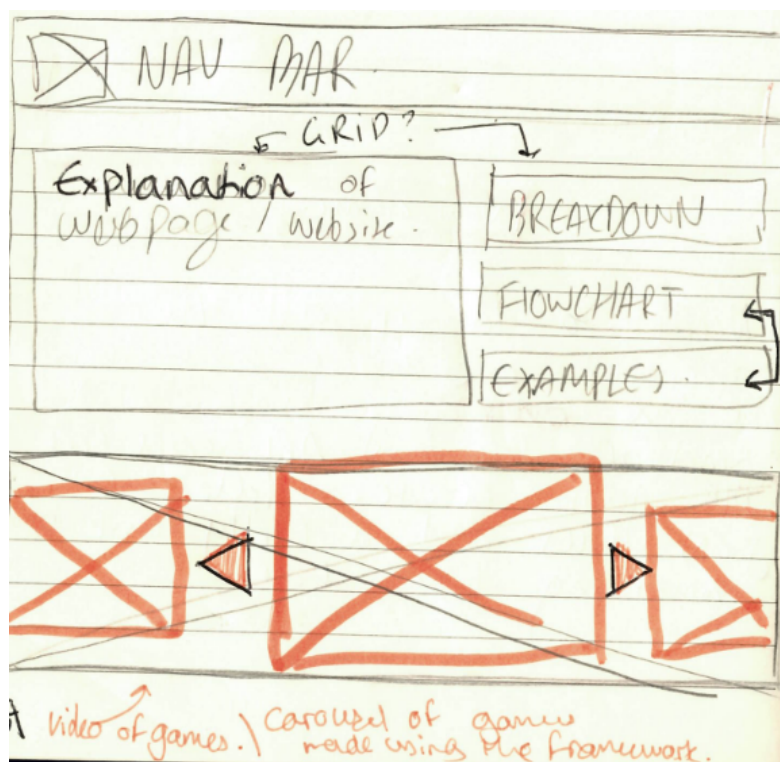


Figure B1 Initial design for the Home Page.

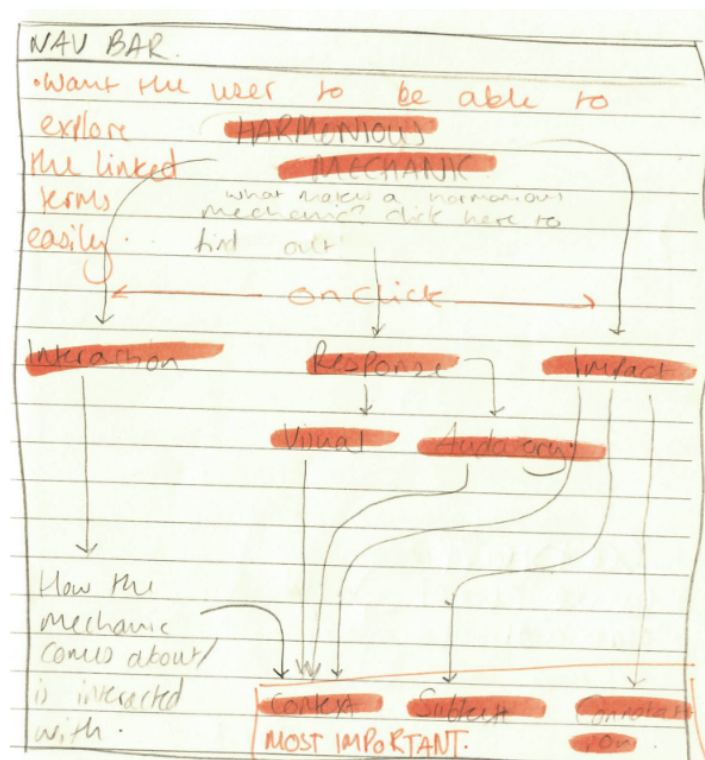


Figure B2 Initial concept for the flowchart-style navigation system.

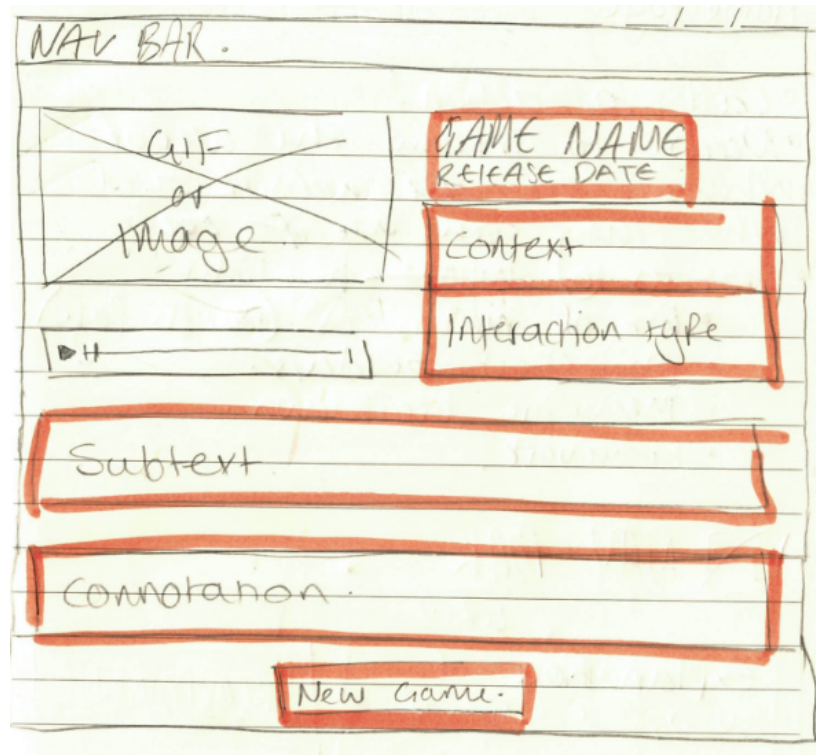


Figure B3 Initial concept for the examples page.

Appendix C: Flowchart Structure

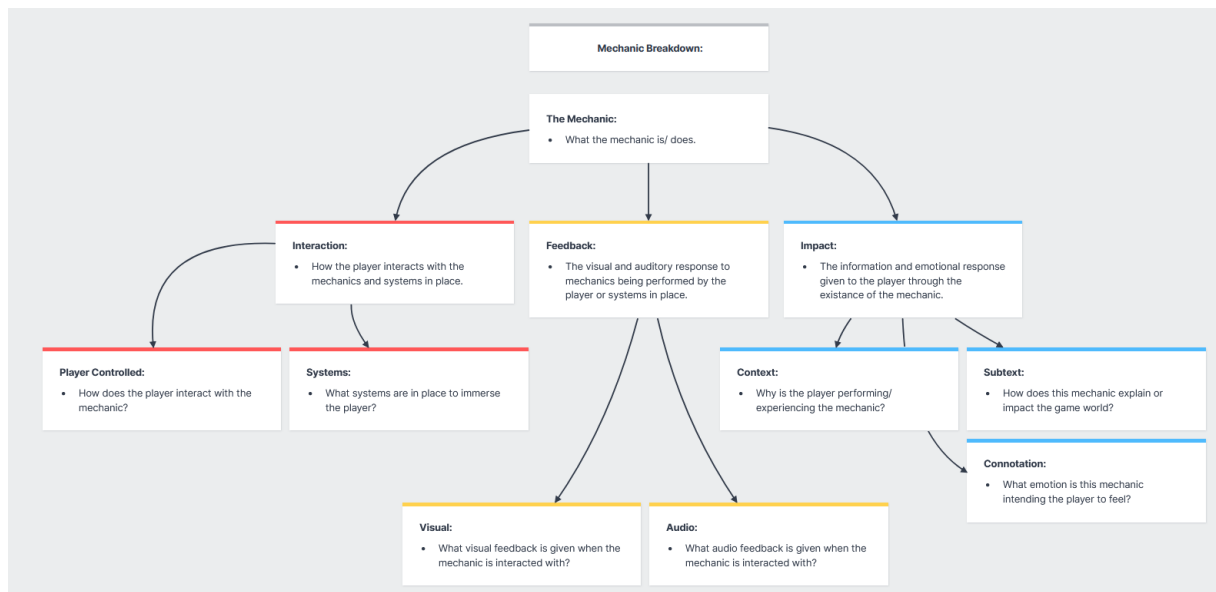


Figure C1 The flowchart structure for the 'Breakdown' page.

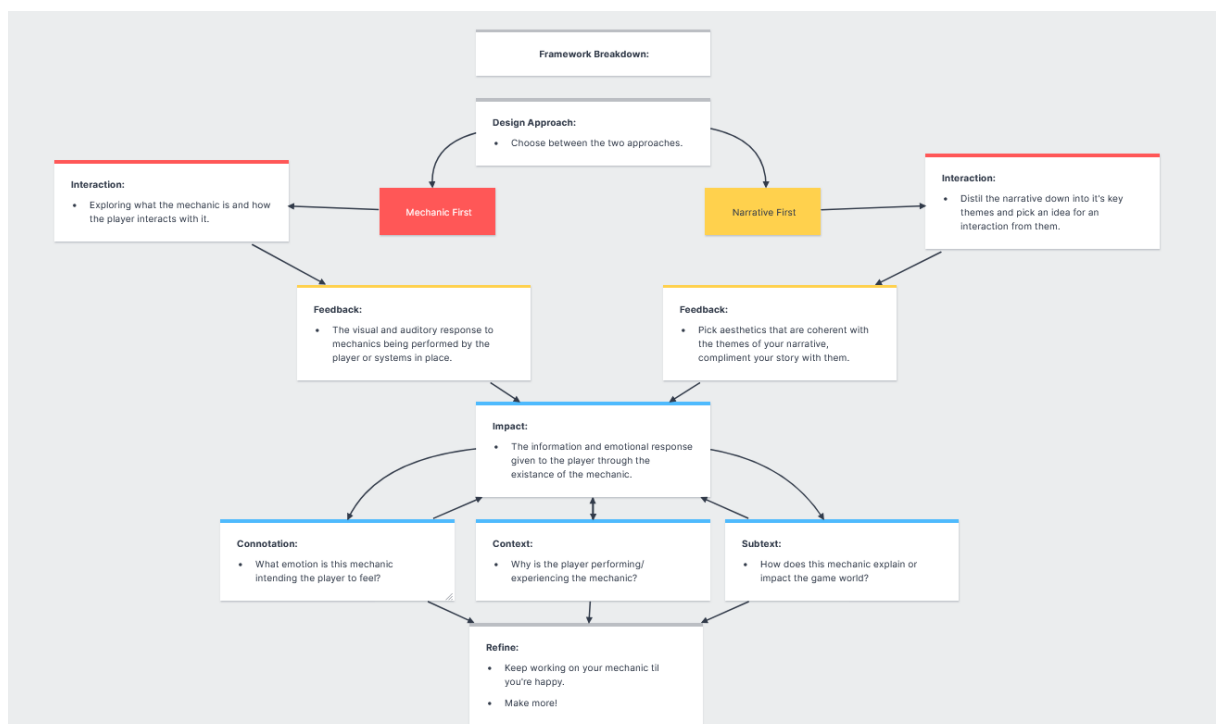


Figure C2 The flowchart structure for the 'Framework' page.

Appendix D: Final Webpage Implementation

Through using Bootstrap and responsive design techniques, my website is accessible to both desktop and mobile users.

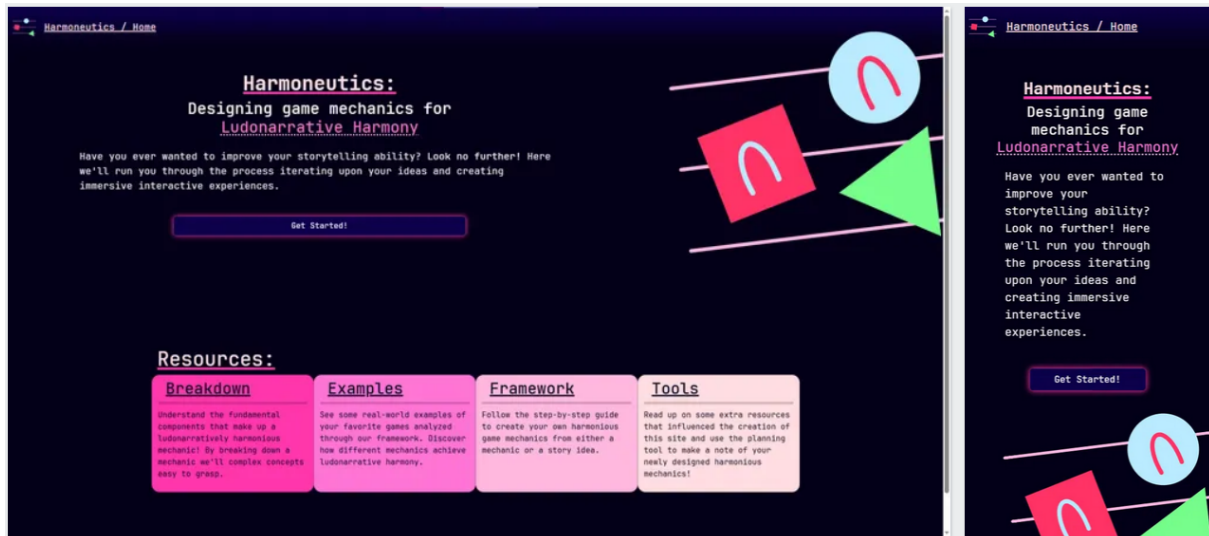


Figure D1 Home page.



Figure D2 Breakdown Page.

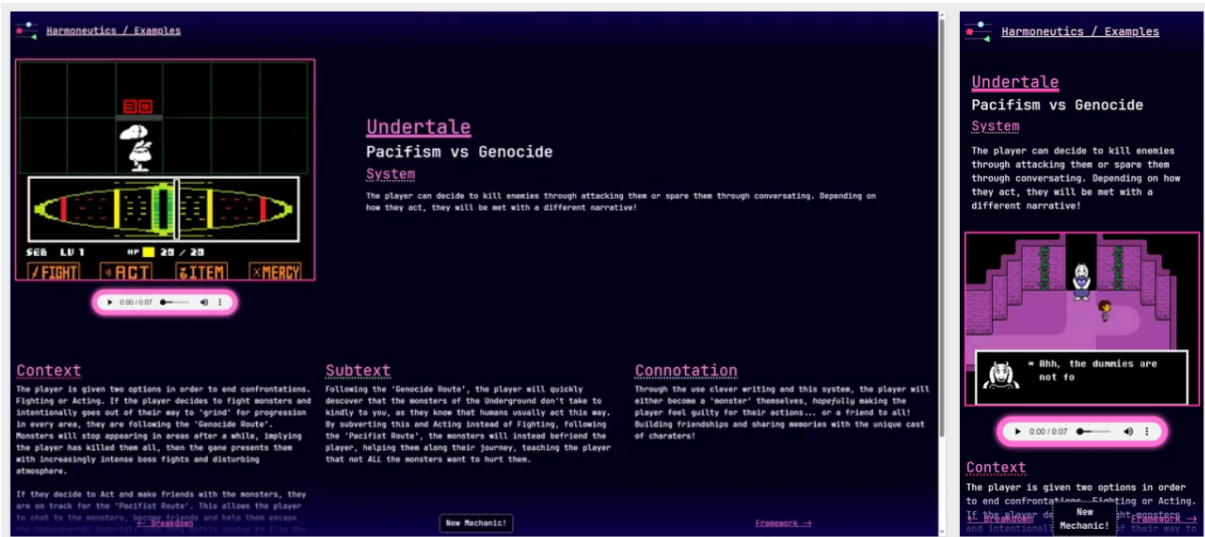


Figure D3 Examples Page.

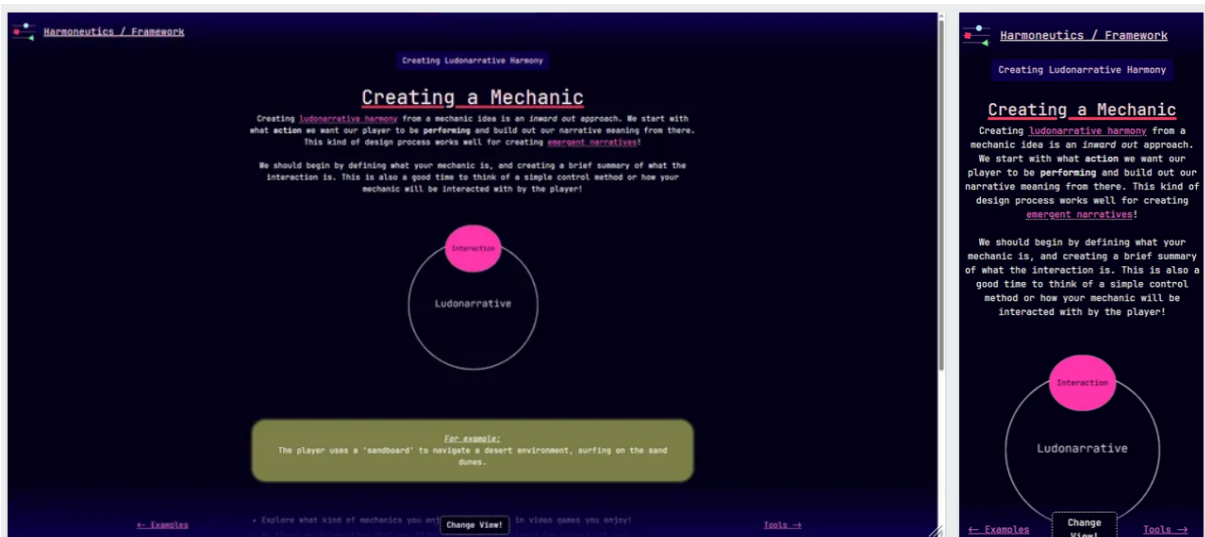


Figure E4 Framework Page.

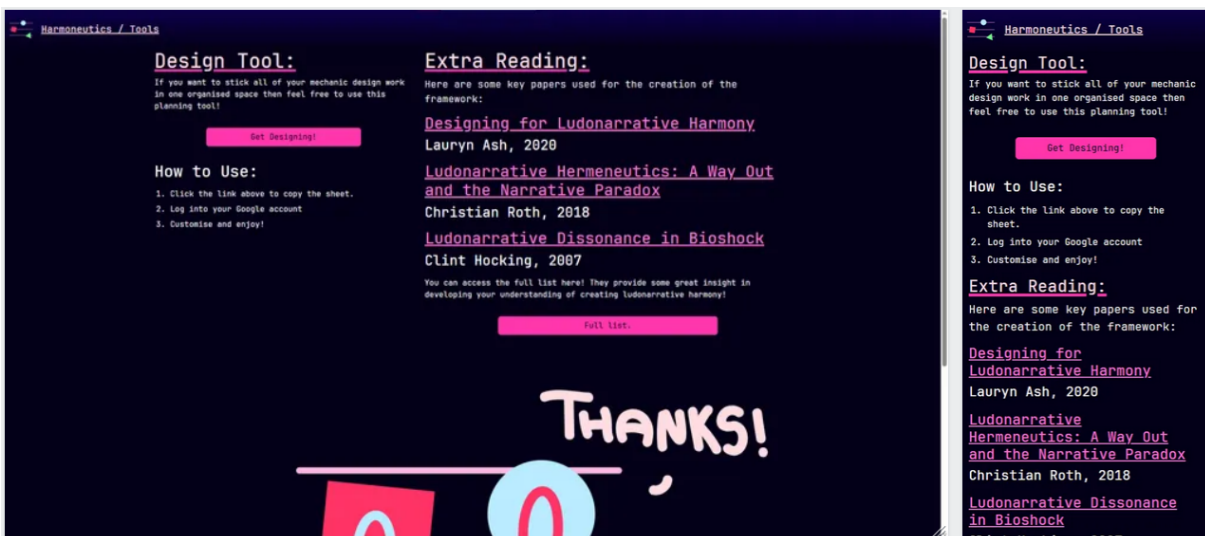


Figure D5 Tools Page.



Figure D6 Navigation examples.

Appendix E: CSS Animations

```
.fadeIn {
  animation-name: fadeIn;
  animation-duration: var(--transitionSpeed);
  animation-fill-mode: forwards;
}

.fadeOut {
  animation-name: fadeOut;
  animation-duration: var(--transitionSpeed);
  animation-fill-mode: forwards;
}

.moveDown {
  animation-name: moveDown;
  animation-duration: var(--transitionSpeed);

  animation-fill-mode: forwards;
}

.fadeToBottom {
  animation:
    var(--transitionSpeed) forwards fadeOut,
    var(--transitionSpeed) forwards moveDown;
}

.topFadeToCenter {
  animation:
    var(--transitionSpeed) forwards fadeIn,
    var(--transitionSpeed) forwards moveDownFromTop;
}

.bottomFadeToCenter {
  animation:
    var(--transitionSpeed) forwards fadeIn,
    var(--transitionSpeed) forwards moveUpFromBottom;
}

.fadeToTop {
  animation:
    var(--transitionSpeed) forwards fadeOut,
    var(--transitionSpeed) forwards moveUp;
}
```

Figure E1 CSS animations.

Appendix F: Web Evaluation Tool Results



Figure 23 Home page evaluation.

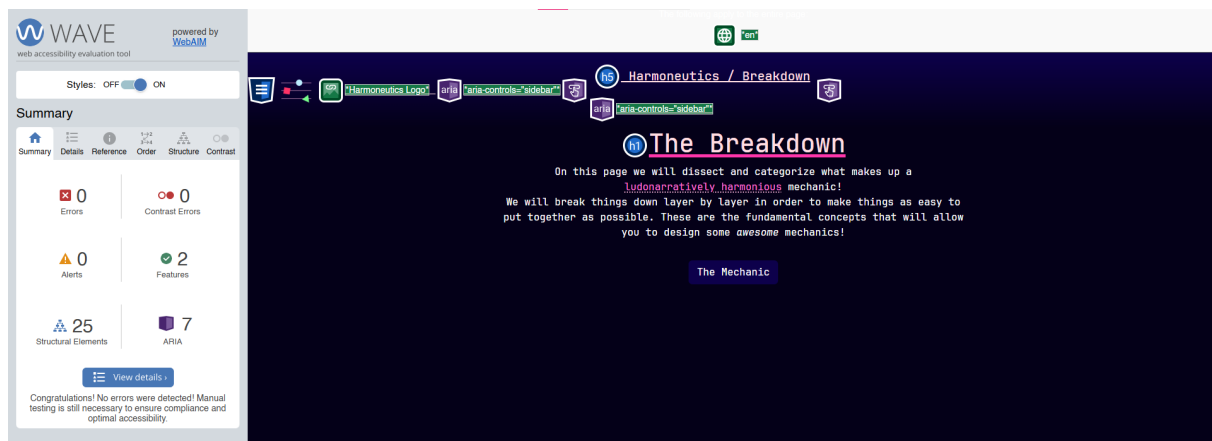


Figure 24 Breakdown page Evaluation.

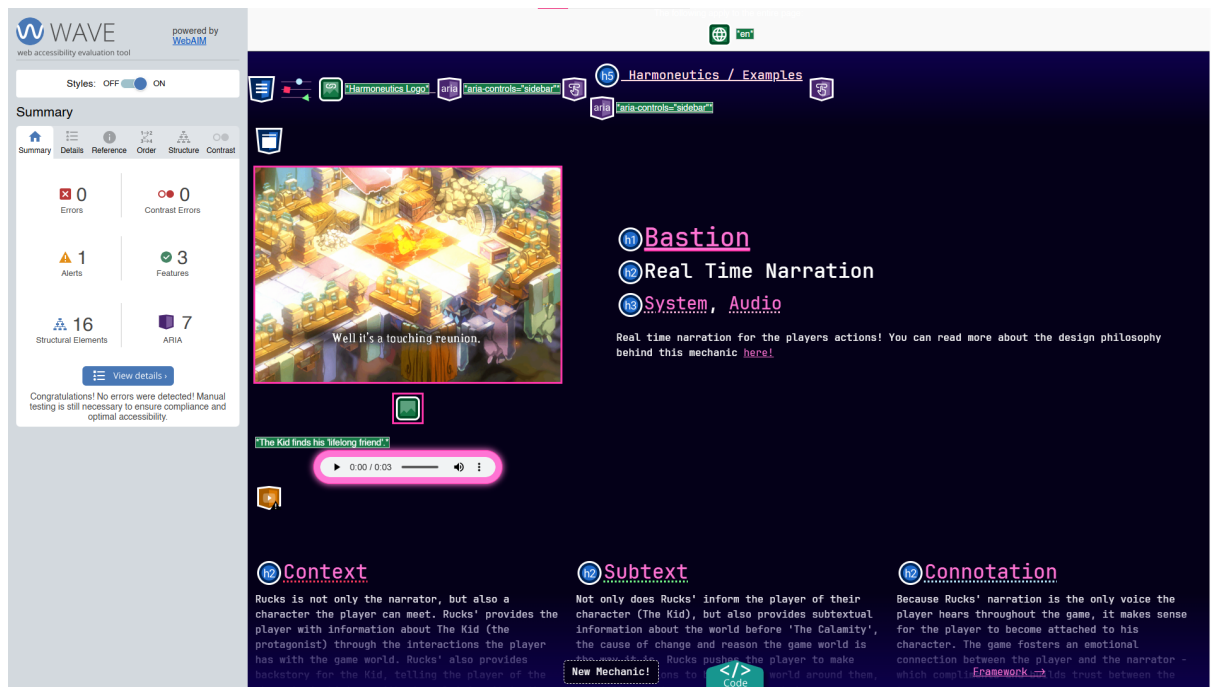


Figure 25 Examples page Evaluation.

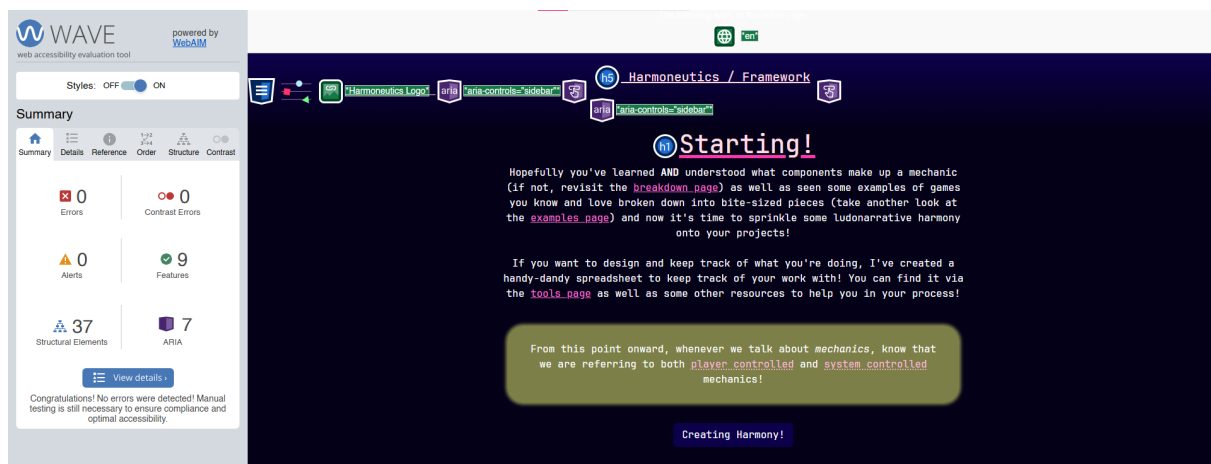


Figure 26 Framework page evaluation.

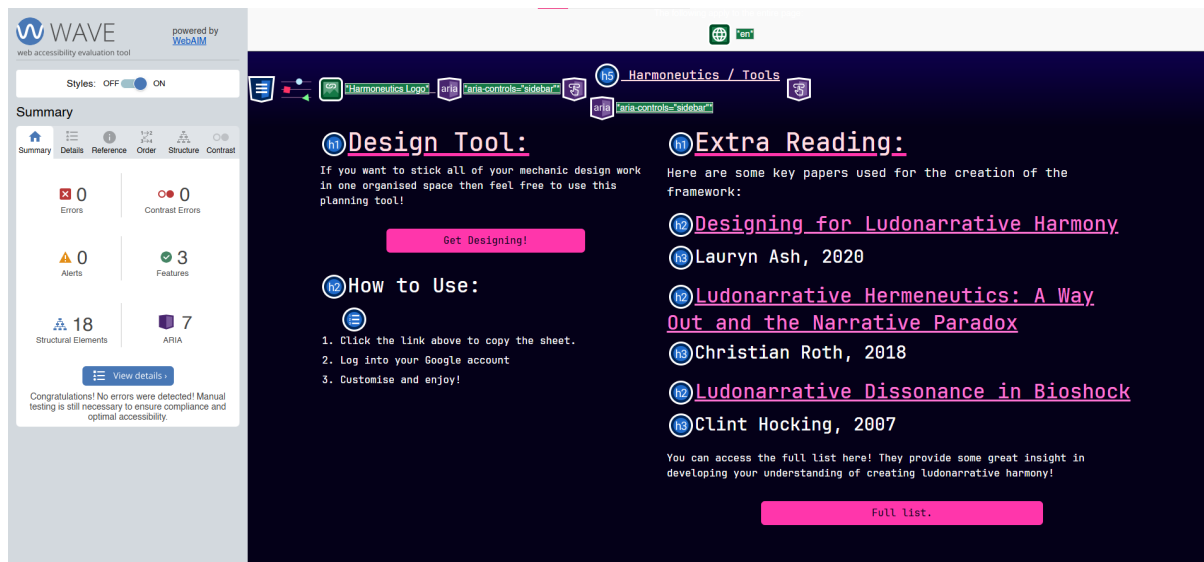


Figure 27 Tools page evaluation.

Appendix G: Ethics Information.



School of Arts and Creative Technologies

User Evaluation Participant Consent Form

Thank you for your interest in this project. For this research project, we are interested in your evaluation of the "harmoneutics.com" digital learning resource that allows developers to apply and understand narrative impact in their mechanics in order to create a more immersive interactive experience.

Please read the following statements carefully:

I have read the information sheet about this project.
I agree to take part in this project.
I understand my right to withdraw and/or have my data destroyed from this project at any time.
I understand that my participation in this project will be treated anonymously .
I am over the age of 18.

Researcher Name: Sebastian Gray

Researcher Signature: SJ Gray



School of Arts and Creative Technologies

Interview Participant Consent Form

Thank you for your interest in this project. For this research project, we are interested in creating a framework that allows developers to apply and understand narrative impact in their mechanics in order to create a more immersive interactive experience.

Please read the following statements carefully and tick the appropriate box:

	YES	NO
I have read the information sheet about this project		
I agree to take part in this project		
I consent to the interview being audio recorded		
I understand my right to withdraw and/or have my data destroyed from this project at any time		
I understand that my participation in this project will be treated anonymously		
I am over the age of 18		

Participant Name:

Participant Signature:

Date:

___/___/___

Researcher Name:

Researcher Signature:

Date:

___/___/___

If you wish to be informed about the outcomes from this project, please provide your email address:



School of Arts and Creative Technologies

RESEARCH ETHICS CHECKLIST FOR TAUGHT STUDENTS

FOR PROJECTS USING DEPARTMENT LEVEL ETHICS PRE-APPROVAL

This checklist is to be used **ONLY** for research work by ACT students who wish to use the Department Level Ethics Pre-Approval to accommodate the ethical risks of their proposed research work.

Students must ensure that their proposed research work can be accommodated by the restrictions in this Checklist. If not, you will be unable to conduct the work without further Ethical scrutiny by the ACT Ethics Committee as the work is considered to have higher ethical risks. To apply for additional Ethics approval, you must submit the Research Ethics Clearance Form for review by the ACT Ethics Committee. However, please note that some modules DO NOT permit students to submit individual Ethics applications.

All students who use the Department Level Ethics Pre-Approval for their work must complete this checklist and include the following as Appendices to their assessment reports:

- This completed Checklist;
- Example Participant Information Sheets and Participant Informed Consent Forms, if appropriate;

Please note that if this Ethics Checklist is associated with an assessment that has an **anonymous submission** (i.e. if you are using your Exam Number, Y123456 for submission) you **MUST** redact your name and any other information that would identify you as an individual from the appendices before submission.

Please note that your assessment markers will compare the submitted assessment work to this Ethics Checklist, Information Sheets and Consent Forms to ensure compliance.

You are also required to conduct this research work in compliance with the General Data Protection Regulation (GDPR). Information on how to ensure compliance is available on the ACT Ethics VLE site.

Before completing this Research Ethics Checklist for Taught Students, please consult the ACT Ethics VLE Site for guidance and further information.

SECTION 1: STUDENT AND PROJECT DETAILS

Box 1A: Student Details ALL students must complete this box	
Student Name OR Exam Number for Anonymous Submission	Sebastian Gray
Degree Title	Interactive Media
Stage (e.g. 2 nd year Undergraduate)	3rd Year Undergraduate
Role in Project (e.g. Team Leader)	Project Lead

Box 1B: Project Details ALL students must complete this box	
Module Title and Module Code	TFT00090H-S1-2-A
Project Supervisor Name and Email Address	Sanjit Samaddar sanjit.samaddar@york.ac.uk

Box 1C: Project Details	
ALL students must complete this box	
Project Title	Ludonarrative Harmony: A framework for the successful balance of ludic and narrative immersion.
Project Submission Date	19/05/2025

Please complete Section 2: Research Ethics Concerns

SECTION 2: RESEARCH ETHICS CONCERNS

Box 2A: Checklist of Research Ethics Questions		YES	NO
ALL students must complete this box			
1	Will the project involve conducting work that would typically require NHS Ethics approval? That is, will you be working with any of the following as participants, if recruited specifically due to their involvement with the NHS: - Patients and Users of the NHS, - Relatives or carers of patients and users of the NHS, - NHS staff? OR will you be using or accessing NHS premises or facilities as part of the work?		x
2	Will the project involve conducting work that would typically require His Majesty's Prison & Probation Service Ethics approval? That is, will you be conducting research with staff and/or offenders in prison establishments, National Probation Service (NPS)/Community Rehabilitation Companies (CRC) regions or within His Majesty's Prison and Probation Service (HMPPS) Headquarters? OR will you be conducting research on HMPPS premises?		x

Box 2A: Checklist of Research Ethics Questions		YES	NO
ALL students must complete this box			
3	Will you be working with vulnerable participants (e.g. those under 18, people with learning disabilities, people with mental impairment due to health or lifestyle, people who are terminally ill or recently bereaved etc.)? Note that if you are unsure whether someone you would like to work with could be considered vulnerable under the circumstances, you are required to discuss your concerns with the module leader, your supervisor and/or Ethics Chair. It is generally expected that any student working with vulnerable groups would submit the longer Research Ethics Clearance form.		X
4	Will you be identifying any of the participants in your outputs?		X
5	Will you be discussing sensitive or potentially upsetting or distressing topics with participants?		X
6	Is it reasonably foreseeable that the work could involve causing physical or emotional distress to participants or researchers?		X
7	Is it reasonably foreseeable that the participants could disclose or discuss participation in illegal activities (e.g. drug use)?		X
8	Is it reasonably foreseeable that the participants could disclose confidential or sensitive information (e.g. financial data, sensitive organisational data)?		X
9	Will you be deliberately misleading the participants in any way?		X
10	Will you be filming or making recordings of people without their knowledge and consent (e.g. covert filming of people in non-public places)?		X
11	Will you be researching or discussing issues relating to terrorism or political extremism as part of your work?		X

Box 2A: Checklist of Research Ethics Questions		YES	NO
ALL students must complete this box			
12	Will you be collecting online data that has been generated by human participants (e.g. social media data) from closed, restricted forums (i.e. from closed communities or those that require approved membership to view, e.g. restricted Facebook groups)?		x
13	Will you be identifying anyone from online data that has been generated by human participants (e.g. social media data) from either open or closed forums (i.e. by including information that could make the individual identifiable, such as direct quotes or usernames)?		x
14	Could the work involve potentially damaging property and/or the natural environment?		x
15	Will the work involve animals?		x
16	Is it reasonably foreseeable that the work could result in any anticipated university/institutional risk (e.g. adverse publicity or financial loss)?		x
17	Will you be compensating participants with financial inducements OTHER THAN reasonable incentives (e.g. chocolate, cake) for the inconvenience?		x
18	Will you be paying participant expenses?		x
19	Will you be conducting any of the work for this project OUTSIDE of the UK?		x

If you have answered “YES” to ANY of the questions in Box 2A: Checklist of Research Ethics Questions:

The Department Level Ethics Pre-Approval together with this Research Ethics Checklist for Taught Students MAY be insufficient to accommodate the ethical risks of your proposed work.

Some lower-risk ethical issues can be accommodated without further Ethical scrutiny provided that you agree to follow a process that is considered appropriate. These situations and processes are described on the ACT Ethics VLE site.

IF there is a suitable procedure to manage this ethics issue, please complete Box 2B to provide further details of how you intend to manage the ethical issues associated

with your proposed work in consultation with either the module convenor or your assessment supervisor.

Box 2B: Further Details

Complete this box if you answered “Yes” to any question in Box 2A AND there is an identified procedure to manage the ethical risks in this situation.

Provide details of the nature of the ethical risks that you identified by answering YES to questions in Box 2A and describe the process that you will follow to minimise the risks.

Please note that if you answered YES to Question 17 and/or 18:

Will you be paying your participants? If research participants are to receive any payments, reimbursement of expenses, or any other incentives or benefits for taking part in your research, please give details, indicating what and how much they will receive and the basis on which this was decided.

Payment must follow the [University's policy](#). Please note that the policy includes maximum limits and researchers should note that they may pay less than these, as appropriate.

Alternatively, the associated risks of your proposed work may be sufficiently low risk that an appropriate approach can be agreed with the ACT Ethics chair without requiring submission of the ACT Research Ethics Clearance form. Your supervisor/module convenor may contact the ACT Ethics on your behalf to identify an agreed process on a case-by-case basis. If your supervisor has discussed your proposed work with the ACT Ethics Chair via email, please complete Box 2C: Case-By-Case Agreed Process.

Box 2C: Case-By-Case Agreed Process Students must complete this box IF they have answered “YES” to any questions in Box 2A AND there is no identified procedure to manage the ethical risks of the proposed work. Note, that most students will need to submit a ACT Research Ethics Clearance form and this case-by-case process approach is ONLY suitable for work that can be considered low risk.		YES	NO
1	Has your project supervisor or module convenor discussed the proposed work and associated ethical risks with the ACT Ethics Chair via email?		
2	Was your project supervisor or module convenor able to agree a process to manage the low risks associated with your proposed work?		
IF YES to BOTH questions please provide further details of the anticipated risks of the proposed work and the process that was agreed with the ACT Ethics chair. Please include dates of the email correspondence AND the name and email address of supervisor/module convenor involved.			

If the associated risks of your proposed work cannot be accommodated through an identified procedure or through a case-by-case agreed process then, provided the module convenor permits it, you will need to submit an application to the ACT Ethics Committee for review using the Research Ethics Clearance Form. But, please note that some modules do NOT permit students to submit individual applications to the Ethics Committee.

Please complete Section 3: Data Protection

SECTION 3: DATA PROTECTION

In order to comply with the General Data Protection Regulation (GDPR) you MUST adhere to the data usage and storage principles described in Box 3A: Checklist of Data Protection Questions.

Box 3A: Checklist of Data Protection Questions		YES	NO
ALL students must complete this box			
1	Will you guarantee that you will inform all people whose personal and/or special category data that you are using: • What data you will be collecting and why; • How you will be storing the data; • The legal basis under which you are storing the data; • When/if/how the data will be destroyed? Please note that using a GDPR Compliant Project Information Sheet will ensure you meet these requirements.	x	
2	Will you guarantee that IF you use a portable device to collect electronic data you will transfer that data to your University Google Drive account or University Filestore as soon as possible after the interview AND delete it from your personal device?	x	
3	Will you guarantee that the data will ONLY be accessible to the project team AND that IF the project team extends beyond the University of York that you have consulted the University's IP and Legal team to ensure appropriate data protection safeguards are in place?	x	
4	Will you guarantee that you will ONLY use Google Forms OR Qualtrics to host online surveys that collect personal and/or special category data?	x	
5	Will you guarantee that you are collecting the MINIMUM amount of data necessary for the intended project?	x	
6	Will you guarantee that IF you are storing or accessing data from OUTSIDE the European Economic Area (EEA) you will access the data through your University of York Google Account connected to the University of York Virtual Private Network (VPN)?	x	

Box 3A: Checklist of Data Protection Questions		YES	NO
ALL students must complete this box			
7	Will you guarantee to destroy all physical AND electronic data EITHER after your module marks have been ratified by the Board of Examiners OR 10 years after last requested access?	x	
8	IF storing electronic data for 10 years after last requested access, will you guarantee to EITHER use a University Google Drive account OR an approved data repository service to store the data?	x	
9	Have you screened your project against the Data Protection Impact Assessment (DPIA) screening questions AND if required conducted a DPIA and submitted a copy to the Data Protection Officer for review?	x	
10	If capturing audio, will you use an encrypted device for recording (e.g. an Apple iOS device or encrypted voice recorder)?	x	
11	Where data is held on an encrypted portable device (e.g. laptop, tablet) will you back it up to a University approved service as soon as possible and perform periodic checks to ensure data is being backed up appropriately?	x	
12	Will you ensure confidential information is encrypted before it is transmitted/shared digitally?	x	
13	Please detail what other protections will be used for digital data (e.g. access/edit permissions, procedural safeguards re downloads/making copies, remote access via VDS/VPN, 2 factor authentication)?		
	Give answer here: •		
14	Confirm you have reviewed the user commitments under the Policy for the safe use of University information on devices . Detail anything in the user commitments that will pose a challenge in carrying out your proposed research.	x	

Box 3A: Checklist of Data Protection Questions		YES	NO
ALL students must complete this box			
	Give answer to the second element of question 14 here:		
15	Will you ensure that personal data or confidential data held on paper are stored in a lockable filing cabinet or container, and/or a locked room in secure premises?	x	
16	How will devices be physically protected (e.g. in transit, when not in use or left unattended)?		
	Give answer here: • Password protected devices. • Data will be stored in password protected Google accounts.		
17	Will you ensure the device(s), accounts, or storage area(s) used to store data are not accessible to any unauthorised parties?	x	

Box 3B: Checklist of Data Retention Questions		YES	NO
ALL applicants must complete this box			
1	How long will you keep personal data after the project, in what form and for what reason? https://www.york.ac.uk/library/info-for/researchers/data/sharing/	x	
	Give answer here: As soon as the project is complete, relevant data will be destroyed.		

Box 3B: Checklist of Data Retention Questions		YES	NO
ALL applicants must complete this box			
2	When will the research data be destroyed, by whom, and how? https://www.york.ac.uk/library/info-for/researchers/data/sharing/#tab-2	x	
	Give answer here: Sebastian Gray (sg2136@york.ac.uk). They will delete the data from the relevant Google accounts and ensure that nobody else has access to the information.		
3	Will any personal or special category data (i.e. data that is not truly and irrevocably anonymised) be deposited in an archive or external repository? https://www.york.ac.uk/library/info-for/researchers/data/sharing/#tab-4 Move on to Question 5 if you have answered 'no'		x
4	Where personal data are to be transferred to an archive or repository, please confirm that your Information Sheet will: (i) cover the archiving and reuse of any personal data and participant agreement to this, (ii) explain to participants the benefits of any data sharing, (iii) indicate where possible whether research data will be deposited in a named, recognised repository (e.g. Archaeology Data Service, UK Data Service, York's institutional repository, etc.)		
5	Where you have special category personal data or criminal data, will it be destroyed in line with an agreed retention policy (set by the University, the data provider, or approved by this ethics committee)? You may enter 'N/A' if you are not collecting this type of data	N/A	

Before submission of your assessment work, you must complete Section 4: Student Agreement. This completed Checklist must be included as an Appendix to your

assessment report, together with examples of your Project Information Sheets and Informed Consent Forms.

SECTION 4: STUDENT AGREEMENT

Box 4A: Student Agreement ALL students must complete this box.		YES	NO	N/A
1	I confirm that the work conducted for the above project has met all the statements as expressed in this Research Ethics Checklist.	x		
2	I confirm that the work conducted for the above project was guided by the University's ethical rules and regulations.	x		
3	I have included example Project Information Sheets and Informed Consent Forms as Appendices to my report, if applicable.	x		
4	I confirm that I have adhered to the ACT requirements for storing personal and special category data compliant with the General Data Protection Regulation (GDPR). Note that GDPR compliance guidance can be found on the ACT Ethics VLE site.	x		
5	I confirm that, if applicable, all payments made to personnel in relation to this project have complied with financial regulations.			x
Student Name (or Exam Number for Anonymous Submission) Date		Sebastian Gray 24/02/2025		

Box 4B: Supervisor Agreement		YES	NO
1	I have reviewed this Research Ethics Checklist.	x	

Box 4B: Supervisor Agreement		YES	NO
2	I have reviewed the Project Information Sheets and Informed Consent Forms, as applicable.	x	
Supervisor Name		Sanjit Samaddar	
Signed		SSamaddar	
Date		25/02/2025	



School of Arts and Creative Technologies

Participant Information Sheet – User Evaluation

Project background

The University of York would like to invite you to take part in the following project:
Ludonarrative Harmony: Creating a framework for perfect balance between ludic and narrative immersion.

Before agreeing to take part, please read this information sheet carefully and let us know if anything is unclear or you would like further information.

What is the purpose of the project?

This project is being conducted by Sebastian Gray (sg2136@york.ac.uk) whom is a 3rd year undergraduate student on the BSc in Interactive Media at the University of York. This research is being undertaken for the assessment of the Individual Project, which is being supervised by Sanjit Samaddar (sanjit.samaddar@york.ac.uk).

The work is being conducted according to restrictions that have been subject to approval by the ACT Ethics committee. The Chair of the ACT Ethics committee can be contacted on ACT-ethics@york.ac.uk.

For this research project, we are interested in creating a framework that allows developers to apply and understand narrative impact in their mechanics in order to create a more immersive interactive experience.

Your participation in this project will involve evaluating the effectiveness of the created framework and digital learning resource. This information will be gathered via questionnaire.

Please note that to comply with the approved Ethics requirements of this work, we do not intend to discuss sensitive topics with you that could be potentially upsetting or distressing. If you have any concerns about the topics that may be covered in the research study, please raise these concerns with the researcher.

Your participation in this project is voluntary. If you wish, we will provide you with access to the edited film and/or the report that we submit after our marks have been confirmed. If you would like to receive access to these, you can indicate as such on the consent form.

Why have I been invited to take part?

You have been invited to take part because I am interested in the perspectives of young, independent game developers.

Do I have to take part?

No, participation is optional. If you do decide to take part, you will be given a copy of this information sheet for your records and will be asked to complete a participant consent form. If you change your mind at any point during the research activity, you will be able to withdraw your participation without having to provide a reason. To withdraw your participation you need to send Sebastian Gray (sg2136@york.ac.uk) an email requesting withdrawal from the research, then all relevant information to you will be deleted.

Will I be identified in any outputs?

No. Your participation in this research activity will be treated anonymously and you will not be identified in any outputs.

Privacy Notice

This section explains how personal data will be used by the project at the University of York.

For this project, the University of York is the [Data Controller](#). We are registered with the Information Commissioner's Office. [Our registration number](#) is Z4855807.

What is our legal basis for processing your data?

Privacy law (the UK General Data Protection Regulation (GDPR) and Data Protection Act 2018) requires us to have a legal reason to process your personal data. Our reason is we need it to perform a public task.¹

This is because the University has a [public function](#), which includes carrying out research projects.² We need to use personal data in order to carry out this research project.

Information about your health, ethnicity, sexual identity and other sensitive information is called [“special category” data](#). We have to have an additional legal reason to use this data, because it is sensitive. Our reason is that it is needed for

¹This refers to [UK GDPR Article 6 \(1\) \(e\)](#): processing is necessary for the performance of a task carried out in the public interest or in the exercise of official authority vested in the controller

² [Our charter and statutes](#) states: 4.f. To provide instruction in such branches of learning as the University may think fit and to make provision for research and for the advancement and dissemination of knowledge in such manner as the University may determine.

research purposes.³ All research projects at the University follow our [research ethics policies](#).

How do we use your data?

Data from our interview will impact the way the framework is developed as well as gaining an understanding of how much impact the framework will have on game developers of different skill levels or focuses.

Who do we share your data with?

Data may be shared with the project supervisor Sanjit Samaddar (sanjit.samaddar@york.ac.uk) when discussing in supervision meetings.

As well as this, we use computer software or systems to hold and manage data. Other companies only provide the software, system or storage. They are not allowed to use your data for their own reasons.

We have agreements in place when we share data. These agreements meet legal requirements to ensure your data is protected.

How do we keep your data secure?

The University is serious about keeping your data secure and protecting your rights to privacy. We don't ask you for data we don't need, and only give access to people who need to know. We think about security when planning projects, to make sure they work well. Our IT security team checks regularly to make sure we're taking the right steps. For more details see [our security webpages](#).

³This refers to [UK GDPR Article 9 \(2\) \(j\)](#): processing is necessary for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes in accordance with Article 89(1) based on Union or Member State law which shall be proportionate to the aim pursued, respect the essence of the right to data protection and provide for suitable and specific measures to safeguard the fundamental rights and the interests of the data subject.

How do we transfer your data safely internationally?

If your data is stored or processed outside the UK, we follow legal requirements to make sure that the same level of privacy rules still apply.

How long will we keep your data?

The University has rules in place for [how long research data can be kept](#) when the research project is finished. Your information will be kept until marks are ratified and after this time an anonymised version will be kept. As this will be fully anonymous, it will not be possible to identify you in any way from this data.

What rights do you have in relation to your data?

[You have rights over your data](#). This sheet explains how you can stop participating in the study, and what will happen to your data if you do. This information is in the section 'Do I have to take part?'.

If you want to get a copy of your data, or talk to us about any other rights, please contact us using the details below.

Questions or concerns

If you have any questions or concerns about how your data is being processed, please contact the primary researcher Sebastian Gray (sg2136@york.ac.uk) or the project supervisor Sanjit Samaddar (sanjit.samaddar@york.ac.uk).

If you have further questions, the University's Data Protection Officer can be contacted at dataprotection@york.ac.uk or by writing to: **Data Protection Officer, University of York, Heslington, York, YO10 5DD.**

Right to complain

If you are unhappy with how the University has handled your personal data, please contact our Data Protection Officer using the details above, so that we can try to put things right.

If you are unhappy with our response, you have a right to [complain to the Information Commissioner's Office](#). You can also contact the Information Commissioner's Office by post to **Information Commissioner's Office, Wycliffe House, Water Lane, Wilmslow, Cheshire, SK9 5AF** or by phone on 0303 123 1113.

Participant Information Sheet –Anonymous Interviews

Project background

The University of York would like to invite you to take part in the following project: Ludonarrative Harmony: Creating a framework for perfect balance between ludic and narrative immersion.

Before agreeing to take part, please read this information sheet carefully and let us know if anything is unclear or you would like further information.

What is the purpose of the project?

This project is being conducted by Sebastian Gray (sg2136@york.ac.uk) whom is a 3rd year undergraduate student on the BSc in Interactive Media at the University of York. This research is being undertaken for the assessment of the Individual Project, which is being supervised by Sanjit Samaddar (sanjit.samaddar@york.ac.uk).

The work is being conducted according to restrictions that have been subject to approval by the ACT Ethics committee. The Chair of the ACT Ethics committee can be contacted on ACT-ethics@york.ac.uk.

For this research project, we are interested in creating a framework that allows developers to apply and understand narrative impact in their mechanics in order to create a more immersive interactive experience.

Your participation in this project will involve an informal interview where we will discuss and come to understand your perspective and experience with game design, specifically how you combine ludic and narrative elements. The interview will take up to 30 minutes and conversation will be captured through an audio recording device. Written notes may also be taken.

OR

Your participation in this project will involve evaluating the effectiveness of the created framework and digital learning resource. This information will be gathered via questionnaire.

Please note that to comply with the approved Ethics requirements of this work, we do not intend to discuss sensitive topics with you that could be potentially upsetting or distressing. If you have any concerns about the topics that may be covered in the research study, please raise these concerns with the researcher.

Your participation in this project is voluntary. If you wish, we will provide you with access to the edited film and/or the report that we submit after our marks have been confirmed. If you would like to receive access to these, you can indicate as such on the consent form.

Why have I been invited to take part?

You have been invited to take part because I am interested in the perspectives of young, independent game developers.

Do I have to take part?

No, participation is optional. If you do decide to take part, you will be given a copy of this information sheet for your records and will be asked to complete a participant consent form. If you change your mind at any point during the research activity, you will be able to withdraw your participation without having to provide a reason. To withdraw your participation you need to send Sebastian Gray (sg2136@york.ac.uk) an email requesting withdrawal from the research, then all relevant information to you will be deleted.

Will I be identified in any outputs?

No. Your participation in this research activity will be treated anonymously and you will not be identified in any outputs.

Privacy Notice

This section explains how personal data will be used by the project at the University of York.

For this project, the University of York is the [Data Controller](#). We are registered with the Information Commissioner's Office. [Our registration number](#) is Z4855807.

What is our legal basis for processing your data?

Privacy law (the UK General Data Protection Regulation (GDPR) and Data Protection Act 2018) requires us to have a legal reason to process your personal data. Our reason is we need it to perform a public task.⁴

⁴This refers to [UK GDPR Article 6 \(1\) \(e\)](#): processing is necessary for the performance of a task carried out in the public interest or in the exercise of official authority vested in the controller

This is because the University has a [public function](#), which includes carrying out research projects.⁵ We need to use personal data in order to carry out this research project.

Information about your health, ethnicity, sexual identity and other sensitive information is called [“special category” data](#). We have to have an additional legal reason to use this data, because it is sensitive. Our reason is that it is needed for research purposes.⁶ All research projects at the University follow our [research ethics policies](#).

How do we use your data?

Data from our interview will impact the way the framework is developed as well as gaining an understanding of how much impact the framework will have on game developers of different skill levels or focuses.

Who do we share your data with?

Data may be shared with the project supervisor Sanjit Samaddar (sanjit.samaddar@york.ac.uk) when discussing in supervision meetings.

As well as this, we use computer software or systems to hold and manage data. Other companies only provide the software, system or storage. They are not allowed to use your data for their own reasons.

We have agreements in place when we share data. These agreements meet legal requirements to ensure your data is protected.

How do we keep your data secure?

The University is serious about keeping your data secure and protecting your rights to privacy. We don't ask you for data we don't need, and only give access to people who need to know. We think about security when planning projects, to make sure they work well. Our IT security team checks regularly to make sure we're taking the right steps. For more details see [our security webpages](#).

⁵ [Our charter and statutes](#) states: 4.f. To provide instruction in such branches of learning as the University may think fit and to make provision for research and for the advancement and dissemination of knowledge in such manner as the University may determine.

⁶This refers to [UK GDPR Article 9 \(2\) \(j\)](#): processing is necessary for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes in accordance with Article 89(1) based on Union or Member State law which shall be proportionate to the aim pursued, respect the essence of the right to data protection and provide for suitable and specific measures to safeguard the fundamental rights and the interests of the data subject.

How do we transfer your data safely internationally?

If your data is stored or processed outside the UK, we follow legal requirements to make sure that the same level of privacy rules still apply.

How long will we keep your data?

The University has rules in place for [how long research data can be kept](#) when the research project is finished. Your information will be kept until marks are ratified and after this time an anonymised version will be kept. As this will be fully anonymous, it will not be possible to identify you in any way from this data.

What rights do you have in relation to your data?

[You have rights over your data](#). This sheet explains how you can stop participating in the study, and what will happen to your data if you do. This information is in the section 'Do I have to take part?'.

If you want to get a copy of your data, or talk to us about any other rights, please contact us using the details below.

Questions or concerns

If you have any questions or concerns about how your data is being processed, please contact the primary researcher Sebastian Gray (sg2136@york.ac.uk) or the project supervisor Sanjit Samaddar (sanjit.samaddar@york.ac.uk).

If you have further questions, the University's Data Protection Officer can be contacted at dataprotection@york.ac.uk or by writing to: **Data Protection Officer, University of York, Heslington, York, YO10 5DD.**

Right to complain

If you are unhappy with how the University has handled your personal data, please contact our Data Protection Officer using the details above, so that we can try to put things right.

If you are unhappy with our response, you have a right to [complain to the Information Commissioner's Office](#). You can also contact the Information Commissioner's Office by post to **Information Commissioner's Office, Wycliffe House, Water Lane, Wilmslow, Cheshire, SK9 5AF** or by phone on **0303 123 1113**.

