

# Crafting Coherence: Integrating Narrative Elements and Redesigning Heads-Up Display in a Digital Card Game.

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## Abstract

This thesis, conducted as part of a graduation project at GAMUCATEX, addresses the integration of narrative elements into the digital card game Tectonicus: on the Edge of War and explores the redesign of its Heads-Up Display (HUD). The primary aim is to enhance player experience by creating a more coherent and immersive game world. The research employs preliminary investigations, ideation, and testing. As part of this thesis, an interactive prototype was developed to assess proposed redesign solutions. The study reveals that indexical storytelling through in-game items emerges as an effective method for incorporating narrative elements into Tectonicus: on the Edge of War. Additionally, transitioning from non-diegetic to diegetic elements positively impacts immersion, though the extent of improvement is not deemed significant. Evaluation of the re-designed HUD layout provides insights into its successes and challenges, shedding light on areas that require further refinement.

**Keywords:** Digital collectable card games, DCCGs, Strategy games, Heads up display, User interface, Game environment, Game narrative, Indexical storytelling, Diegetic user interface

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# 1. Introduction

## 1.1 Company Outline

GAMUCATEX is a game development startup established in 2020 by its founder, Andreas Jørgensen. The company is based in Copenhagen, Denmark, and operates across two locations within the city: the University of Copenhagen hub situated in the Copenhagen/Amager region, as well as facilities at the Copenhagen School of Entrepreneurship. These locations serve as collaborative workspaces, facilitating innovative work and entrepreneurial activities for GAMUCATEX and other businesses and developers who share an interest in innovation and entrepreneurship (Lighthouse, 2022).

GAMUCATEX was founded with the primary aim of crafting a turn-based auto battler card game with a strong focus on historical themes. The overarching goal of this endeavor is to create a game that not only delivers strategic gameplay but also ignites players' interest in history, fostering an appreciation for the subject in an engaging and enjoyable manner.

Titled 'Tectonicus: on the Edge of War,' the current project is at the Minimum Viable Product (MVP) stage of production. It is being developed using the Unity game engine for a Personal Computer (PC) platform. This game is under development by a team of approximately 30 employees, with the team size subject to change as the company actively seeks additional funding. The development team operates across six distinct departments, including Business and User Studies, Game Design, Sound Design, Development, Art and Graphics, and History. An important objective of this project is to achieve historical accuracy, a goal significantly supported by the contributions and expertise of the history department, as they provide their knowledge and research.

At the helm of GAMUCATEX is its founder and lead designer, Andreas Jørgensen, who will take the role and be referred to as 'the client' in this thesis.

## 1.2 Market

### 1.2.1 Digital collectible card games

Tectonicus: on the Edge of War is a turn-based card game, as such it falls under the genre of collectible card games (CCG).

Collectible Card Games (CCGs) are characterized by customizable decks of collectible cards, each with unique abilities and rarity, promoting strategic gameplay, resource management, and a strong emphasis on trading, deck building, and competitive play. (*Trading Card Game Industry - From the T to the C to the G*, n.d.)

Pioneering the CCG genre was *Magic: The Gathering*. Created by Richard Garfield and first published in 1993, this game product popularized CCGs and set the standard for all future games in the genre. (Duffy, 2015)

Following the success of the physical table-top *Magic: The Gathering*, the genre made use of the digital format and reinvented the tabletop gaming into digital collectible card games (DCCG). The digital version offered players an opportunity to play against opponents online, as well as the option for solo play against artificial intelligence (AI). Notable titles in the DCCG genre are *Hearthstone* (Blizzard Entertainment; 2014), *Gwent: The Witcher Card Game* (CD Projekt RED; 2018), *Legends of Runeterra* (Riot Games; 2020), *Faeria* (Abrakam Entertainment; 2016).

While comparatively DCCGs are not at the top of the popularity chain when it comes to game genres (*What Is a Digital Collectible Card Game?*, 2022), the market for them is steadily growing and

expected to reach a little under 1.2 billion USD by 2028. (*Digital Collectible Card Games Market 2023 Analysis - Trends, Size, Share | Industry Report, 2023, n.d.*)

### 1.2.2 History games

GAMUCATEX's game operates in another niche of game genres – historical games. A big marketing point for Tectonicus: on the Edge of War is the heavy researched history information that goes into the game. The card visualization and descriptions follow a strict guideline to ensure the accurate depiction of the characters and events from a history perspective.

In this genre there are many examples, some games prefer to use only a historical setting and fictionalize the narrative of the game by inserting original characters and a linear lore, while others serve as an outlet for a simulation of a historical event. In the latter the player takes control of the narrative and shapes the outcome of a historical event. While these games allow for alternate history, they are often grounded in historical contexts and periods. ('Playing with the Past', 2019)

Several history-themed game titles have been pivotal for the genre and have left a lasting impact on the gaming industry. Here notable mentions are:

**Sid Meier's Civilization Series (1991-present):** The Civilization Series is a renowned franchise of turn-based strategy games created by Sid Meier. In these games, players take on the role of leaders guiding their civilizations from ancient times to the modern era and beyond. It has set the standard for historical strategy games, offering a wide range of historical settings, customizable civilizations, and complex decision-making, making it a beloved choice for history enthusiasts and strategy gamers alike. (Vrtačič, 2014)

**Age of Empires Series (1997-present):** Developed by Ensemble Studios, the series allows players to build and manage civilizations, develop economies, lead armies, and engage in real-time battles. It remains a cornerstone of historical real-time strategy gaming. (Madsen, 2020)

**Total War Series (2000-present):** Total War games combine turn-based strategy with real-time tactical battles, often set in historical eras. Titles like Rome: Total War and Shogun: Total War are eminent. (*Total War Series Has Sold 36 Million Copies, Creative Assembly Now Biggest Developer in UK, n.d.*)

## 1.3 Client Objectives

As the game remains in the development phase, an MVP build is currently hosted on itch.io, a platform designed for indie game developers to exhibit their creations. To achieve the desired level of success, the client underscores the importance of gathering user feedback and addressing a range of gameplay and visual challenges, with a primary focus on establishing a robust core gameplay foundation before advancing to the polishing stage.

Moreover, the client's vision extends to the game's main play area, with a particular emphasis on infusing a historical theme into a well-defined visual style to augment the game's branding. The **battlefield board**, as designated by the client, requires further iterations to enhance visual clarity. The client anticipates the incorporation of thematic elements aligning with the narrative context within the game's battlefield board. Additionally, there is an expectation for a Heads-up Display (HUD) redesign that seamlessly integrates with the environment, fostering an immersive gaming experience.

## 2. Practical analysis

### 2.1 Product analysis

"Tectonicus," currently developed by GAMUCATEX, is an auto battler digital card game that wants to offer players a unique historical and mythological gaming experience. The game's core concept revolves around allowing players to engage with real-life history and mythology in a strategic card-based battle format. What sets *Tectonicus* apart from other similar games is its strong emphasis on historical accuracy. Historians conduct extensive research to ensure that the game's content, including cards and battles, is rooted in real history. This not only provides players with an enjoyable gaming experience but also an educational one, as they can expect to learn while playing.

The fundamental game mechanics in *Tectonicus* center around card battles, where players strategically use their chosen decks to compete against opponents. Players have a limited number of moves before their opponent's turn, and the objective is to drain the opponent's morale while strategically deploying cards on the battlefield.

Customization plays a significant role in the game, allowing players to create personalized decks with various cards, each possessing unique traits and abilities. Traits categorize cards into specific subgroups based on their characteristics, while abilities grant unit-specific skills that enable cards to bend the game's rules in various ways.

Visually, the game currently features a hand-painted style that aims for realism without venturing into hyper-realism. Most of the game's elements are presented in two-dimensional (2D) graphics. However, there is room for improvement in the visual design, as the game lacks a distinct art style and exhibits style inconsistencies that the developers intend to address.

The game's narrative, while not yet fully implemented or conceptualized, is connected to its in-game locations. *Tectonicus*' main location described by the narrative designers is the **Library**, known as LAM (Library, Archive, and Museum). This setting draws inspiration from historic institutions like the Library of Alexandria. It houses artifacts, living historians, and knowledge from various historical periods. The **Library** is divided into districts, each focused on specific eras, and players can engage in debates and explore history through the pages of books.

#### 2.1.2 Current battlefield: board layout and UI elements

Analysis of the current in-game battlefield screen (See Figure 1) and its elements:



Figure 1 Screenshot from the main game screen (battlefield) of the current build of the game Tectonicus. It consists of the board where cards are placed and other UI elements. Taken from Tectonicus's itch.io page. Source: <https://GAMUCATEX.itch.io/tectonicus>

1. Card deck: Players draw their cards from here.
2. Morale: The morale in the game determines who the winner is. If the player's morale goes to zero or below before that of the enemy, then the player has lost the battle and therefore the game.
3. Priority coin: The priority coin shows whose cards on the board will be attacking first.
4. Action points: The action points represent how many actions the player has left at their disposal before the opponent has the turn. It is very common feature in turn-based strategy games.
5. End turn button: By clicking on the end turn button, the player decides that they have made all the moves they wish to make for that round and give the turn to the opponent.
6. Graveyard deck: Players can view which of their cards have been defeated by the enemy and are no longer in play.
7. Grid: The board of the game where players place their cards. Currently it is a seven by eight grid. The first row of the grid facing each player is where they can place their cards. After that placement, the cards move automatically ahead.
8. Flags: The flags represent which faction the player and opponent are playing with. In Figure one, both the player and opponent are playing with the Anglo-Saxon faction.

## 2.2 Target audience

GAMUCATEX's user studies team conducted extensive testing to better understand the potential user base. On-site testing and observations were performed during the Roskilde Festival in Denmark in September 2023, complemented by qualitative feedback gathered through interviews. (Jes Starzak et al., 2023) Additionally, older user tests took place at the Saxo-Institutet in Copenhagen, Denmark, in December 2022, involving qualitative feedback from 23 participants. (Skov, 2022) Quantitative feedback was collected via an online survey with 28 participants. The combined data from these sources informed the creation of a representative user persona, exemplifying the end-user for the product (See Figure 2)



## Nicklas

**Age:** 23  
**Occupation:** Student  
**Location:** Denmark  
**Income Range:** €5 - 10 000.

Nicklas is a 23 year old Danish bachelor student that enjoys playing strategical games on PC or Console.

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*"A good storyline and great characters means a lot when I have to choice a game."*

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<p><b>GAME GENRES</b></p> <ul style="list-style-type: none"> <li>Board games</li> <li>Multiplayer games</li> <li>Shooters games</li> <li>Strategy games</li> </ul>	<p><b>GAME PREFERENCES</b></p> <ul style="list-style-type: none"> <li>Hearthstone</li> <li>League of Legends</li> <li>Teamfight Tactics</li> </ul>	<p><b>DEVICES</b></p> <ul style="list-style-type: none"> <li>PC</li> <li>Console</li> </ul>
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<p><b>GAMING HABITS</b></p> <ul style="list-style-type: none"> <li>Mid-core gamer</li> <li>Games 1-3 days weekly</li> <li>Rarely purchases games</li> <li>Single- and multiplayer</li> </ul>	<p><b>ACTIVITIES</b></p> <ul style="list-style-type: none"> <li>Gaming with friends.</li> <li>Reads history or fantasy book occasionally.</li> </ul>	<p><b>INTERESTS</b></p> <ul style="list-style-type: none"> <li>History</li> <li>Fantasy</li> <li>Reading</li> </ul>
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Figure 2 User persona. Created by the user experience department at GAMUCATEX

These user studies are referenced again in the next subsection of this thesis as they contain important information regarding end user preferences.

## 2.3 Analyzing User Studies

Information from the forementioned user studies has been synthesized to extract relevant data about user preferences and reactions to the UI elements and visuals of the play area that will be referred as the battlefield in the game's context.

- UI/HUD elements

The following conclusions from the Roskilde Festival report:

Participants expressed confusion regarding the movement of cards on the board, citing a lack of visual cues and understanding that cards could only be placed on the first row. (See Figure 36 under Appendix 1) The observed behaviors of players attempting unauthorized card placements and manual card movements underscored challenges in conveying key mechanics.

Action points and morale, integral components of gameplay, were identified as sources of ambiguity, with participants struggling to comprehend their significance. (See Figure 37 under Appendix 1) Additionally, the priority coin often went unnoticed or misunderstood.

The graveyard deck, intended for displaying defeated cards, was criticized for lacking a clear purpose and confusing placement. Despite tutorial engagement, users encountered difficulties in understanding elements like the graveyard. (See Figure 38 under Appendix 1)

Participants also raised concerns about the clarity of the escape and back buttons, emphasizing the need for more straightforward design. (See Figure 39 under Appendix 1)

Out of the 49 participants that were asked to identify a point of dissatisfaction with the game, the most votes out of all the dislikes were 10 (29.4%) cited feelings of unintuitiveness, seven (20,6%) users expressed a dislike for the visuals, while two (5,9%) playtesters directly attributing their discontent to UI-related issues. (See Figure 40 under Appendix 1)

These findings collectively illuminate critical areas for UI refinement, aiming to enhance user comprehension and satisfaction within the gaming experience.

- Visuals/storytelling

The following conclusions from the Roskilde Festival report and the Saxo-Instituttet report:

The user tests conducted on the visual and storytelling elements of the game's environment revealed diverse sentiments among participants. In response to an open-ended question from the Roskilde Festival report about dislikes, 20.6% of players specifically pointed out visual aspects as an area of dissatisfaction.

This feedback resonates with an external playtesting report from the Saxo-Instituttet, where players similarly described the visuals as lacking dynamism, expressing sentiments such as "old," "boring," and "outdated." Some participants associated the historical theme with a serious and realistic visual style. Given that the environment of the game has not changed significantly since the Saxo-Instituttet playtesting report the findings from it are valid.

The game's commitment to historical accuracy was appreciated, with players recognizing it as a unique aspect. However, feedback indicated a desire for more immersive storytelling and visual feedback. While players valued the concept of historical accuracy, they expressed dissatisfaction

with how historical information was delivered, primarily through text. Notably, from the 13 players that answered, 10 did not feel that they learned anything related to history through gameplay (See Figure 41 under Appendix 1) nor did they feel a connection to the history theme of the game.

Furthermore, when asked an open-ended question about meaningfulness in games, a significant majority (71.4%) of the 12 participants that answered identified storyline/narrative elements as crucial for player connection. (See Figure 42 under Appendix 1) This suggests a clear preference for a more engaging and visually integrated historical narrative in the game.

### 3. Define

#### 3.1 Problem definition

Tectonicus: on the Edge of War faces challenges with an unintuitive HUD design, lackluster visuals hindering immersion, and an environment devoid of narrative depth. In addressing the visual problems of the battlefield, the interconnection between UI layout and environmental design needs to be recognized.

#### 3.2 Main research question

**How can the battlefield area, which includes the head up display layout and environment art, of a history-themed card game be redesigned for improved user experience, visual clarity, and narrative immersion for the target audience?**

#### 3.3 Sub questions

1. What is the role of the HUD in games? / What role does HUD play in relation to immersion in games?
2. What type of UI representations are there in games?
3. How is narrative included in game spaces?

#### 3.4 Research Methodology

<p><i>1. What is the role of the HUD in games? / What role does HUD play in relation to immersion in games?</i></p>	<p><b>Approach:</b> Desk research that consists of analyzing existing literature, blogs, and industry talks on the role of HUDs in games. Insights from game designers, UI/UX experts, and researchers will be looked at.</p> <p><b>Data type:</b> Qualitative; Existing data</p> <p><b>Data source:</b> Secondary data</p> <p><b>Data relevance:</b> This research aims to establish a foundational understanding of the significance of Heads-Up Display (HUD) elements in gaming. It will introduce key terminology and established conventions related to HUD design, providing a comprehensive framework for further exploration and analysis within the context of the history-themed card game.</p>
<p><i>2. What type of UI representations are there in games?</i></p>	<p><b>Approach:</b> Desk research; Review literature, industry talks, and books that discuss various UI representations in games. Explore examples, case studies, and expert opinions to gain a comprehensive understanding.</p> <p><b>Data type:</b> Qualitative; Existing data</p>

	<p><b>Data source:</b> Secondary data</p> <p><b>Data relevance:</b> Analyzing these representations will contribute to identifying effective UI elements that can be integrated into the game's environment to achieve optimal communication and engagement with players.</p>
3. How is narrative included in game spaces?	<p><b>Approach:</b> Research articles, books, and industry discussions that delve into how narrative is incorporated into game spaces.</p> <p><b>Data type:</b> Qualitative; Existing data</p> <p><b>Data source:</b> Secondary data</p> <p><b>Data relevance:</b> This exploration aids in addressing the main question by providing a foundation for evaluating the effectiveness of narrative elements in shaping player engagement and immersion.</p>

## 4. Research

### 4.1 What is the role of the HUD (heads up display) in games? What role does HUD play in relation to immersion in games?

In game development, HUD stands for "Heads-Up Display." It refers to the on-screen elements and graphical information that are overlaid on the game's main visuals to provide the player with important information and feedback during gameplay. This can include elements like health bars, mini-maps, score displays, ammo counters, and other essential details that help players understand the game's state and their character's status without the need for a separate menu or screen. (*Mastering Game HUD Design | Elements, Customization, and Optimization* - Polydin, 2023)

Immersion in games refers to the player's sense of being deeply engaged and absorbed in the virtual environment, feeling connected to the narrative, and experiencing a suspension of disbelief, commonly known to game developers as the state of *flow*. The HUD, in collaboration with the game design, plays a crucial role in either enhancing or impeding the immersive experience.

This thesis acknowledges that achieving immersion in games is a multifaceted endeavor that extends beyond the realm of UI. Various factors, including game design choices, art and sound direction, and UI/UX, play integral roles in crafting a cohesive game world that is deemed immersive by players (Fagerholt et al., 2009).

Some game designers, such as Zane Lyon of Riot Games, advocate for minimal UI visibility to enhance immersion. This perspective is illustrated by the "immersive" HUD mode in the game *God of War* (2018), which aims to minimize the HUD elements as much as possible (Polygon, 2020). However, contrasting viewpoints suggest that games with less action-oriented mechanics can benefit significantly from traditional HUD interfaces. Strategic games, which attract players fond of complex systems, often feature game mechanics that predominantly unfold within the interface (Naro, 2018).

## 4.2 Types of HUD designs

To understand the types of HUD designs in video games, it is vital to understand two other important components: Narrative and the fourth wall. Narrative refers to the story the game wishes to convey, while the concept of the "fourth wall" can be described as the imaginary boundary between the player and the game world. (See Figure 3) This boundary can be traversed in two ways: either by bringing external elements into the game world or by pushing elements from the game world out into the non-diegetic space. (Conway, 2010)

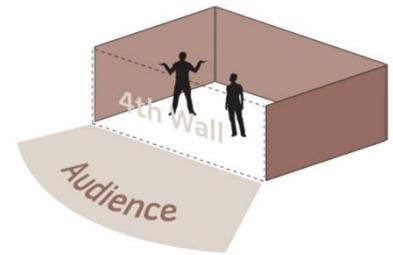


Figure 3 Fourth wall; Image source: <https://musicalholic21.wordpress.com/2023/01/25/trans-modern-drama-breaks-fourth-wall/>

The term "diegetic", borrowed from film, pertains to the concept of elements or entities within the narrative world or reality of the medium itself. In gaming, diegetic elements are what make up the shared reality of the player and the in-game characters, while non-diegetic elements are designed for the player's exclusive experience and guidance. In contrast, film strictly considers what characters within the movie's narrative can perceive. The difference is due to the interactive nature of video games. (Peacocke et al., 2018)

Every UI element in a game could be evaluated by considering whether it fits within the game's narrative and world. These are the two questions that would provide that context:

1. Is the UI component part of the game's narrative/story?
2. Does the UI component exist within the game world/space?

These two questions give rise to four categories of video game UI components: Non-diegetic, Diegetic, Spatial, and Meta. (Fagerholt et al., n.d.) (See Figure 4)

		Is the UI component <b>in the game world/space?</b>	
		No	Yes
Is the UI component <b>in the game narrative/story?</b>	No	Non-diegetic representation	Spatial representation
	Yes	Meta representation	Diegetic representation

Figure 4 Diagram of the four UI components. Adapted from Fagerholt, E., Lorentzon, M., & Björk, S. (n.d.). ERIK FAGERHOLT MAGNUS LORENTZON.

### Non-diegetic UI

*Is the UI component in the game world? - No*

*Is the UI component in the game story? – No*

A non-diegetic UI component in games is an element that exists outside of the game world and doesn't have an in-game explanation. (See Figure 5) A non-diegetic approach is considered conventional and familiar to the player because it usually consists of an in-game overlay HUD that if done correctly can even aid the player during the gameplay. Non-diegetic HUD components in games offer valuable advantages. Game designers have full control over their visual attributes, enabling the use of screen space efficiently. These elements remain consistently visible, regardless of in-game events. However, designers must be cautious not to overcrowd the screen, potentially obscuring essential in-game information. Careful design and placement are essential to maximize the benefits of non-diegetic UI components. (*Keys to Efficient User Interfaces – GD Keys, 2020*)



*Figure 5 Screenshot from the game Guilty Gear. The dashed lines show the non-diegetic HUD used in the game. The tension and health bars are never recognized by the game world or the characters in it.*

### **Diegetic UI**

*Is the UI component in the game world? - Yes*

*Is the UI component in the game story? – Yes*

Diegetic UI components are integrated into the narrative world, accessible and interactable by in-game characters.

The appeal of diegetic UI is that it creates a highly immersive world where almost all UI elements smoothly fit into the game's universe. However, this attractive feature brings several challenges, the most significant being its alignment with the game's story.



*Figure 6 Screenshot of gameplay from the game Death Space. The player's health status is cleverly indicated through visual cues on the avatar's suit.*

A well-known example of a diegetic interface is Dead Space [Visceral Games, Glen Schofield & Bret Robbins — USA 2008]. The game has many diegetic elements, one example is by projecting in-game graphics as holograms from the protagonist's suit (See Figure 6) and seamlessly integrating screen access without interrupting gameplay. (Galati, 2020)

Diegetic elements can also be included though sound cues.

### **Spatial UI**

*Is the UI component in the game world? - Yes*

*Is the UI component in the game story? – No*

Spatial UI elements represent components that exist within the visual context of the game environment but are inherently detached from the game world's narrative, as such as they remain unnoticed by in-game characters. (Lankoski, n.d.) This kind of UI can include icons above characters to indicate their mood, such as in the Sims.

Spatial UI can also be used to subtly guide players towards objectives without explicit instructions, fostering an immersive and intuitive gaming experience. For example, showing the player where their teammates are through the game's geometry. However, this type of UI can be overlooked by users depending on the type of game it is employed in. If players have free mobility within the game world, they can easily miss the spatial UI elements. Spatial elements work best in game segments where designers are certain the player will see them or that players are conditioned to constantly look for them, for example team based multiplayer games like Overwatch where players need to be aware where their teammates are. (*Keys to Efficient User Interfaces – GD Keys, 2020*)



Figure 7 Screenshot of the game Mario + Rabbids Kingdom Battle (2017). The preview is in a form of an arche showing the trajectory of where the character will be relocated.

Under spatial UI elements falls also **Previews**. As the name suggests, these are HUD elements that show the consequences of the actions a player might take. (See Figure 7) (*Game Maker's Toolkit, 2021*)

### Meta UI

*Is the UI component in the game world? - No*

*Is the UI component in the game story? – Yes*

Meta UI elements are similar to non-diegetic elements because they only exist in a 2D plane for the player, but they make sense in the game's narrative. Common Meta components used to deepen immersion can be blood splatter (See Figure 8) on the screen when the character is low on health, or any other overlay on the screen that communicates to the player that a predicament needs their attention. (*User Interface Elements in Video Games Part 1—Meta UI, n.d.*)



Figure 8 Screenshot from the game Modern Warfare showing blood splatter on the player's screen. Source: <https://www.razor.co.uk/insights/how-we-can-use-effective-ux-to-create-great-immersive-experiences>

Meta UI enable players to access essential information, manage game settings, and understand their progress without interrupting the in-game narrative. However, they can also cause screen overcrowding by needing extra details in order to fit thematically within the game's world.

The key to getting the right type of UI on the main action screen depends entirely on the needs of the game. Some games utilize all four categories of UI components because that way they best preserve functionality and relevant information.

### 4.3 How is narrative included in game spaces?

*"One of the clearest aspects that bridge stories and games is space." - (Fernández-Vara, 2011)*

The topic of storytelling in game spaces is very nuanced. This analytical investigation centers on the contributions of Clara Fernández-Vara, a game researcher, media scholar, game designer, and writer. Specifically, her article titled "*Game Spaces Speak Volumes: Indexical Storytelling*" serves as a focal point. Fernández-Vara's work extends the insights of media scholar Jenkins (2003) and Michael Nitsche, the author of "*Video Game Spaces: Image, Play, and Structure in 3D Worlds*," who introduces the concept of "*evocative narrative elements*". Nitsche explains that the purpose of these elements is to provide evocative means for the player to comprehend the virtual space and events within it. The

player, in turn, forms a narrative by figuring out the connections between these elements. (Nitsche, 2008)

Vera gives a term to an already familiar concept to game designers – Indexical Storytelling. This strategy, one of many, employs indices. The definition of indices is signs physically connected to the represented idea. Indexical storytelling in game design involves using indices to shape a story, emphasizing story-building over traditional storytelling. In this approach, players construct narratives based on provided elements, placing them at the narrative's core. Indexical storytelling aims to engage players in narrative gameplay.

### Indexical storytelling in practice – Case Study

This section delves into an analysis of a game employing indexical storytelling through its visual elements. The focus is on *Unpacking*, a 2021 release from the game development studio Witch Beam. *Unpacking* is a puzzle video game that tells a story through tasking players with arranging household objects. In *Unpacking*, the game reveals comprehensive details about the player's character through interactions with objects and navigable spaces. Each item and its placement within the environment contributes to unfolding the game's narrative. The recurrence of certain items across various locations signifies their importance in the character's life. Remarkably, *Unpacking* elicits a strong emotional response from players solely through the utilization of objects within the game space. (Couture, 2022)

The game achieved significant recognition, securing two IGDA Global Industry Game Awards in 2022, specifically for 2D Animation and 2D Environment Art (IGDA, n.d.). Additionally, it triumphed at the 18th British Academy Games Awards in 2022, securing a win in the Narrative category (BAFTA, n.d.)

## 5. Ideation

### 5.1 Brainstorming

*How can the battlefield area, which includes the head up display layout and environment art, of a history-themed card game be redesigned for improved user experience, visual clarity, and narrative immersion for the target audience?*

The ideation phase yielded several concepts, each exploring the potential impact of diverse configurations between the UI and the game space. (Refer to Appendix 2 visual representations of concepts 1,2,3,4, and 5.)

Concept number one, titled 'War Table,' proposed transforming the board from a non-diegetic to a diegetic element. In this iteration, the board becomes a part of a war table situated within the in-game space, incorporating historical narrative elements derived from a map showcasing locations of significant historical battles. (See Figure 9) Additional visual elements, such as figurines, contribute to the narrative by providing information about historically significant buildings and landmarks. (See Figure 10) In this concept, both the board and associated elements like cards, action points, and the

priority coin transition into diegetic elements. The positive reception of this idea by the art and design team led to the creation of a SWOT analysis (See Concept 1 under Appendix 2)



Figure 9 War Table concept; Source: Personal work



Figure 10 Concept for the figurines that showcase historic information. Source: Personal work

Concept number two considered the worldbuilding aspect of the Library developed by narrative designers. Here, the board takes on a diegetic form but within a more fantastical setting. The background implies that this section of the battle board is located in the Library, utilizing ample space for the environment. (See Figure 11) Favorable feedback from narrative designers prompted further exploration of the potential offered by the Library setting.

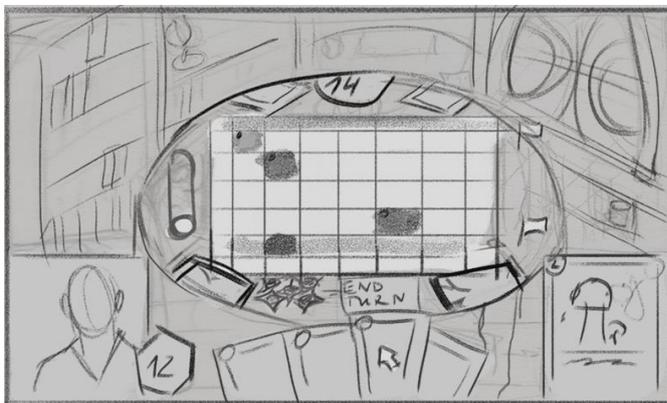


Figure 11 Concept "Library"; Source: Personal work

These two concepts garnered the most feedback and interest within the company. A refined and final concept is to be developed, aiming to combine the narrative of the library setting with a diegetic board. This approach seeks to address practical considerations for the user interface's game design requirements while also testing the impact of diegetic elements on player immersion within the game world.

### 5.2 Scope

**Deliverable:** The research aims to create an interactive prototype using Figma, a freely accessible interface design application. This prototype will integrate the proposed HUD layout and a 2D art environment aligned with the narrative design. Developed by the researcher, the prototype will reflect the researcher's expertise and cover aspects within their purview.

**Inclusion: Moodboards** will be created for both the UI and the environment art. The client has noted a lack of visual guidelines, therefore different *art styles* will be explored before picking an appropriate one. **UI art** is to be included. Additionally, *simple animations* will be incorporated into the interactive prototype, specifically focusing on enhancing the responsiveness and engagement of the UI buttons.

**Exclusions:** The prototype will not encompass the art and UI of the *cards*, which are under development by another UI artist within the company, with no definitive timeframe for completion. Additionally, the *gameplay of the cards on the board* will not be presented in the Figma prototype. The primary focus is to assess the impact of the suggested UI layout and environment art on immersion and interest in the game world, rather than evaluating game mechanics.

**Audio, intricate board animations, and visual effects are excluded due to this prototype being developed entirely by the researcher.**

**Constraints:** The UI design adheres to the existing design requirements in the game. Due to ongoing suggestions for new mechanics and tools, and a lack of a coherent vision for the end game, the prototype will concentrate on enhancing the current game board and HUD layout, as well as the art of the environment. Time constraints associated with the graduation project prohibit the redesign of any game mechanics.

**Assumption:** Players are presumed to be acquainted with the game Tectonicus: on the Edge of War and to have played it at least once. This assumes players are familiar with the game rules and the significance of each game element (e.g., understanding that morale determines the win/lose condition) before testing the prototype.

## 6. Development

Following the ideation phase that provided a conceptual framework for the prototype, a transition to a more structured approach is required. (See Figure12)

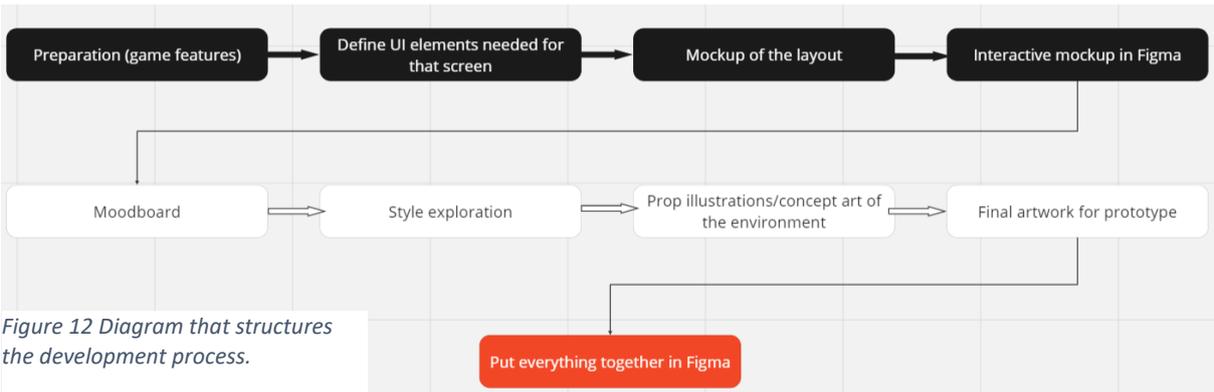


Figure 12 Diagram that structures the development process.

## 6.1 Refining concept for prototype

Recognizing the pivotal role of the user interface (UI) in gaming, Ubisoft UX director Nicolas Kraj emphasizes its paramount importance, particularly in card games (Kraj, 2020). In the realm of digital card games, the design of the UI is deeply rooted in the principles and elements inherited from traditional physical board games. This digital adaptation finds inspiration in the structural layouts inherent to physical board games, forming the foundation for the digital card game's UI. Derek Sakamoto, the senior UI designer for Hearthstone, underscores the substantial influence of the game's UI on overall game design (Hearthstone, n.d.). Consequently, the initial step towards enhancing the visual appeal of the game is to strategically refine the existing layout, acknowledging the profound impact of UI on both aesthetics and gameplay.

### 6.1.1 Layout re-design

Beginning with a central element of the game- the board. When reviewing the list of design requirements (See Table 1), it becomes evident that the existing game board, encompassing 56 squares, occupies a substantial portion of space. The dimensions of each square need to ensure the legibility of crucial card information, including health, attack power, and other stats. However, the challenge arises when the camera angle positions the board further away, resulting in diminished visibility of the embedded information, as observed in conceptual iterations from the brainstorming session. Through discussions, a consensus emerges regarding the camera's optimal position for practical board viewing, favoring a top-down perspective reminiscent of chess gameplay. This strategic alignment aims to preserve the accessibility of all information displayed on the board, addressing concerns related to visual clarity and gameplay dynamics.

Game design requirements
<ul style="list-style-type: none"><li>• Board is 7x8 squares</li><li>• Player can hold up to 10 cards in hand</li><li>• Player can put down cards only on the first row</li><li>• Morale determines who wins (0 morale = defeat)</li><li>• Player has 5 action points</li></ul>

*Table 1 Game design requirements of the current Tectonicus card game*

The current predicament revolves around optimizing a limited surface area to convey a wealth of crucial information. The key challenge lies in maintaining clarity and organization on the board without overwhelming it. A strategic approach involves identifying the essential UI elements and distinguishing them from those that could be optional or positioned outside the primary play zone. (See Figure 13)

Information player needs to progress in the game	Information player does NOT need to progress in the game
<ul style="list-style-type: none"> <li>• Clear view of the board</li> <li>• Clear view of the card stats on the board</li> <li>• Morale ( this is what determines if you win)</li> <li>• Deck to pull cards from</li> <li>• Cards in play (in hand)</li> <li>• Action points</li> <li>• End turn button</li> <li>• Priority coin</li> </ul>	<ul style="list-style-type: none"> <li>• Enemy card deck</li> <li>• Graveyard (Cards no longer in play)</li> <li>• Flags</li> </ul>
<p>These elements need to be in a more central position. They should be easy for the player to find and use.</p>	<p>These elements need to not take up valuable space. They can still be part of the HUD or present in other non-distracting ways, but they risk visual clutter.</p>

Figure 13 UI elements list

An examination of current HUD problems. (See Figure 14)



Figure 14 Current Tectonicus in-game UI screen

The primary focus of the analysis lies in identifying problematic information distribution on the main play screen, specifically the board. While first-person-shooter (FPS) games typically employ a peripheral framework, allocating the main screen for swift and dynamic action (Klisurov, n.d.), this layout convention is less common in strategy games. Examining the design of popular digital collectible card games (DCCGs) like Hearthstone and Legends of Runeterra, it becomes evident that the periphery typically accommodates non-gameplay elements or those contributing to world-building rather than core gameplay. In Hearthstone, Ubisoft's UX director Nicolas Kraj delineates distinct UI zones, such as the hero corner, showcasing player statistics like health, abilities, cards, and avatars. (See Figure 15)



Figure 15 Analysis of Hearthstone UI areas by Nicolas Kraj; Image source <https://gdkeys.com/the-card-games-ui-design-of-fairtravel-battle/>

Kraj explains the western progression model adopted by Hearthstone, aligning with the left-to-right reading model in Western countries. The left represents the past (history), the center embodies the present (the board and playable cards), and the right symbolizes the future (mana to play cards and buttons to progress the game). Notably, decks, often associated with the past, are placed on the player's left side. (Kraj, 2020)

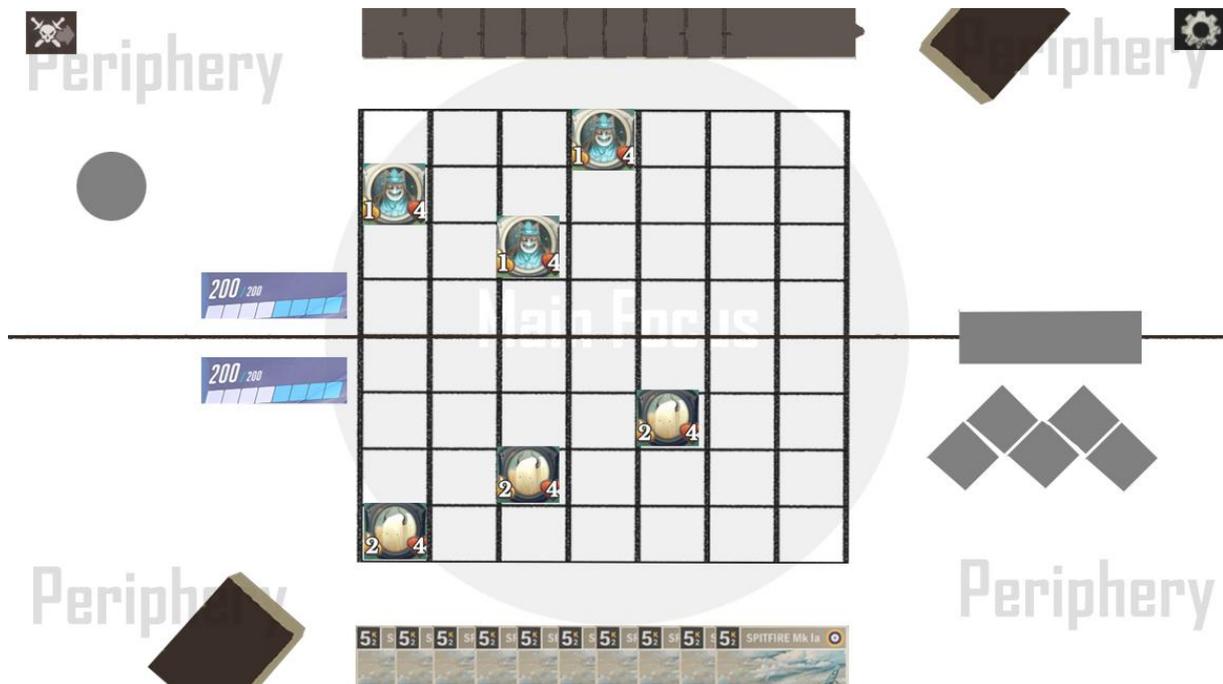


Figure 16 Mockup of the layout for the prototype; Personal Work

In the redesigned layout for Tectonicus: on the Edge of War (See Figure 16), efforts were made to bring essential UI information closer to the *main focus* area. However, due to the board's size, placement of morale in the hero corner was unfeasible. Testing several placements revealed limited space, allowing only the inclusion of cards in play. Consequently, morale finds its place on the left side near the board, ensuring easy tracking during gameplay, while the deck, representing the past, is

retained on the left to adhere to the western progression model. This is done with the target audience in mind.

Insights from user studies highlight the potential for visual improvement in the representation of action points to enhance functionality. In pursuit of this enhancement, the Gestalt Principles were applied. These principles, governing human perception, explain how people group similar elements, identify patterns, and simplify complex images during object perception. (*What Are the Gestalt Principles?*, 2024)

According to the Gestalt principle for perception, individuals do not process all details simultaneously. Instead, they first identify the most basic shapes, followed by color, and, finally, details (See Figure 17). The current presentation of action points emphasizes details, contributing to prolonged perception times. The numeric representation in the bottom right corner further impedes some players' swift recognition of their remaining action points during gameplay. In the redesigned layout, action points are visually conveyed through five distinct shapes, adhering to the proximity rule of Gestalt. This redesign aims to expedite players' visual recognition while treating action points as a cohesive entity on the screen. Placing them adjacent to the 'End turn' button follows the continuity principle of Gestalt, streamlining the player's interaction flow. (See Figure 18)

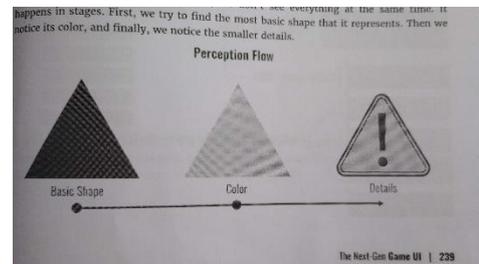


Figure 17 Perception Flow. Image source: *The next-gen game UI by Hristo Klisurov*



Figure 18 Action points icon re-design

Similarly, the morale icon is represented numerically, starting at 20. The turn-based strategy nature of *Tectonicus: on the Edge of War* emphasizes the importance of numerical information for player strategy and gameplay. Given this context and genre, numeric icons are better than bar representation in providing crucial information.

The 'History' tab is introduced as an optional icon in the top-left corner for players interested in tracking card interactions. It presents an alternative design approach to the traditional 'Graveyard' Deck.

### 6.1.2 Art

The narrative team provided a detailed description outlining the desired mood and atmosphere for the library narrative setting. The specified atmosphere for the library is envisioned as grounded in real architecture, evoking a slight sense of mysticism through shadows, and illuminated by soft, warm light. The style is described as Victorian, with a preference for avoiding excessive Gothic elements and ornateness. Additionally, elements from various cultures are expected to be present in the library's design. (See Figure 19) Notably, the narrative team highlighted the significance of an ink pot as a central item, symbolizing a crucial aspect of the library's narrative. The world-building of the game is still in the early stages, but sufficient information was given to guide the direction of the art for the prototype.



Figure 19 Art depicting different cultural items for the prototype; Personal work

Various styles were considered for the prototype, including graphic, stylized, and realistic. (See Figure 20) The art team expressed a preference for the realistic style, aligning with the game's serious themes and desired representation. The choice of a realistic art style was further motivated by the upcoming redesign of the cards by the art lead. The intention is to establish a

realistic environment and use a stylized look for the card illustrations. This combination aims to create an intriguing visual contrast by incorporating two distinct styles.



Figure 20 Style exploration for the prototype. Personal work

Inspired by traditional Chinese game tables, the prototype's table integrates the board into its design, while motifs and patterns reflect a Victorian aesthetic. (See Mood boards under Appendix 3) This approach grounds the world in reality while introducing novel elements intrinsic to the library's narrative. (See Figure 21) The diegetic board design, featured in the prototype, aims to address player confusion regarding card placement on the board through symbol indicators and distinct colors. (See Figure 22)



Figure 21 Environment art for the prototype. Featuring the table with the diegetic board and clickable items.

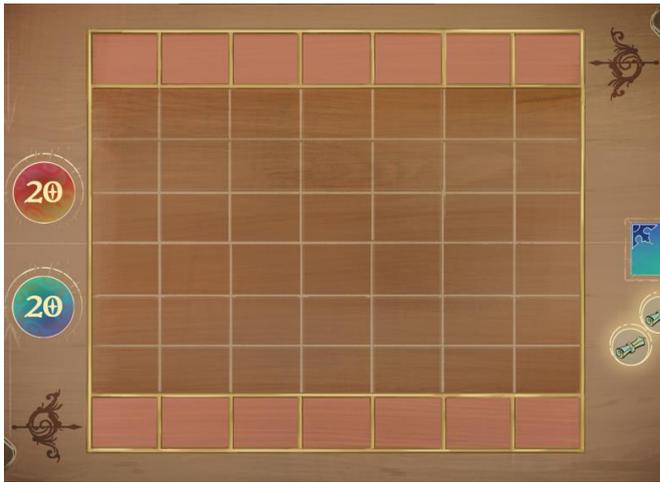


Figure 22 Board design for the prototype

### 6.1.3 UI design

In alignment with the library setting, the UI design draws inspiration from the aesthetics of old, ornated book covers, often characterized by intricate gold outlines. (See Mood boards under Appendix 3) Information screens within the UI emulate the appearance of smudged ink, reinforcing the thematic connection to writing and historical documentation. Notably, the icons representing action points take the form of scrolls, symbolizing the game's essence of challenging opponents with historical information. The glow surrounding these icons serves as a visual indicator of the remaining action points, gradually greying out as they are used by the player. (See UI artwork under Appendix 4)

The font used is described as “fantasy” and it was chosen for the prototype to tie in with the mystical feel the narrative team described.

### 6.1.4 Figma prototype

To provide a coherent guide for user interactions, an initial navigational structure diagram was developed. (See Figure 23)

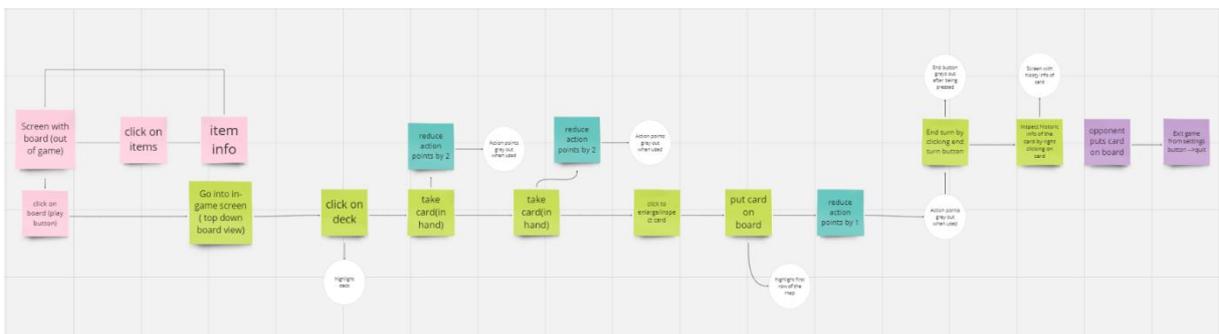


Figure 23 Diagram for the interactive prototype

The interactive prototype adheres to a linear progression, effectively illustrating the storytelling concept through items, the redesigned layout, and the environmental artwork representing the library. It simulates basic gameplay moves to showcase how the new UI would work, not to test any mechanics or game design decisions.

Given the preliminary nature of the game's pre-production phase and the existing ambiguity regarding its final visual design, the Figma platform was employed for the creation of this prototype.

This interactive model serves as a practical method for evaluating the proposed concept the company was interested in. The construction process in Figma involved the systematic connection of individual layers, ensuring a cohesive representation of each screen. (See Figure 24) Simultaneously, collaboration with Photoshop was maintained, necessitating the organization of elements into separate layers for subsequent reassembly, accommodating diverse interaction outcomes.

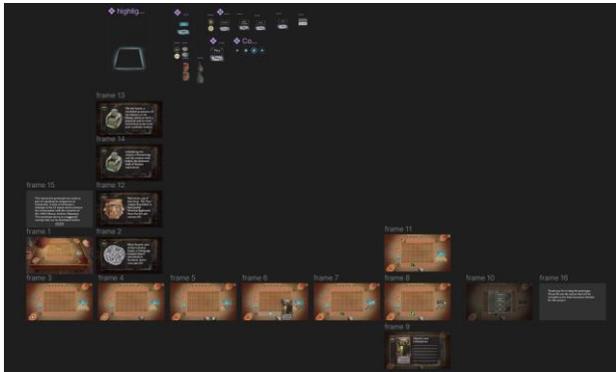


Figure 24 Figma prototype; Personal work

In pursuit of efficiency and consistency, base components were established for each UI element, facilitating basic responsive animations, and promoting reusability throughout the entire prototype.

## 7. Testing

### 7.1 Testing objectives

The post-production nature of the project necessitates testing with company members rather than the direct target audience. This approach is driven by the ongoing exploration of design decisions related to the game's requirements and narrative by the company. The prototype simulates gameplay to test visual improvements and not overall game satisfaction.

The testing goals for the interactive prototype developed in Figma are aligned with the identified challenges and overarching research question posed in the thesis. The primary objectives include evaluating the **feasibility** of the proposed concept, gauging improvements in **visual clarity** resulting from the new layout and assessing the alignment of the **environment** with client expectations. Furthermore, the testing aims to establish a foundation for future iterations in the ongoing postproduction phase of the project. Beyond these general goals, specific attention will be given to determining the impact of transitioning from a **non-diegetic to a diegetic board** on player immersion within the historical narrative of the game world. By addressing these objectives, the testing phase seeks to provide valuable insights into the effectiveness and potential refinements of the redesigned battlefield area in the history-themed card game Tectonicus.

### 7.2 Method

To conduct testing for the prototype, the chosen method is quality assurance testing, which involves gathering feedback from the project team. This method is selected to systematically evaluate the redesigned battlefield area in Tectonicus by comparing team satisfaction with the new prototype against the previous battlefield design. Primary data will be collected through the administration of a questionnaire designed to capture participants' honest opinions. The questionnaire will employ a combination of scaled responses and open-ended questions to provide a comprehensive understanding of the strengths and weaknesses of the prototype's layout and art. Additionally, participants will engage in discussions to articulate their perceptions of the prototype, facilitating a

more nuanced exploration of their experiences and preferences. This qualitative approach aims to offer insights into the effectiveness of the proposed changes and potential areas for refinement.

### 7.3 Results

The testing phase involved 17 participants from various departments, including the CEO Andreas Jørgensen. Each participant played the current build of the game before testing the prototype. The testing occurred via an online call, where participants discussed their thoughts on the prototype. The average testing time was approximately 4 minutes, followed by participants filling out a questionnaire. Participants engaged in discussions, sharing their initial impressions of the prototype. Some took the time to examine the art, and a few clicked on the play button without realizing that the items were clickable, leading to the need to navigate back. (See answers to the open-ended questions under Appendix 5)

#### Art of the Environment and Narrative Connection

In evaluating the environment and its narrative connection, responses indicated a diverse range of perspectives among participants. A majority of 52.9% responded with "Maybe," 35.3% with a definite "Yes," and 11.8% with "No" (See Figure 25).

Do you think that the environment in the prototype connects to the Library setting of the game?

17 responses

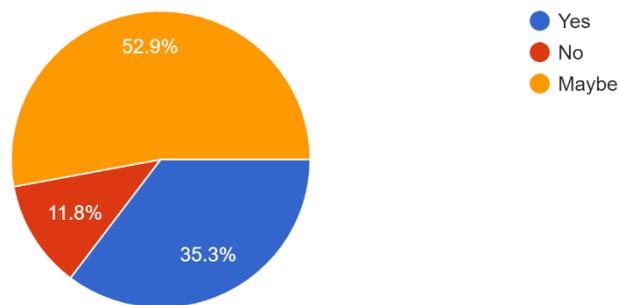


Figure 25

Upon delving into the rationale behind their responses, participants articulated associations between textures, lighting, and scattered items, interpreting these elements as indicative of a library atmosphere. However, a noteworthy subset considered the possibility of the setting representing not just a library but potentially various other locations. This nuanced interpretation was reflected in the predominant "Maybe" responses.

Further exploration into the emotional resonance of the environment revealed additional layers of interpretation. Notably, 4 participants drew parallels between the environment and a classic board game. Several mentioned a medieval setting such as a tavern instead of a library. Descriptive terms employed by various participants included descriptors like calm, cozy, comfortable, quiet, and contemplative. These varied perceptions contribute to a comprehensive understanding of the participants' engagement with the prototype's environment and its narrative implications.

#### Indexical Storytelling

The examination of participant responses revealed a notable consensus on the impact of clickable items, with 83.4% expressing that they enhance the overall immersion of the prototype. A significant

majority responded positively to the notion of leveraging items to convey elements of the game's narrative. (See Figure 26) However, participants emphasized the need for a more meaningful selection of assets, stressing the importance of cohesive connections among them.

Do you think that the different clickable items scattered around the environment help to immerse and flesh out the game world?

17 responses

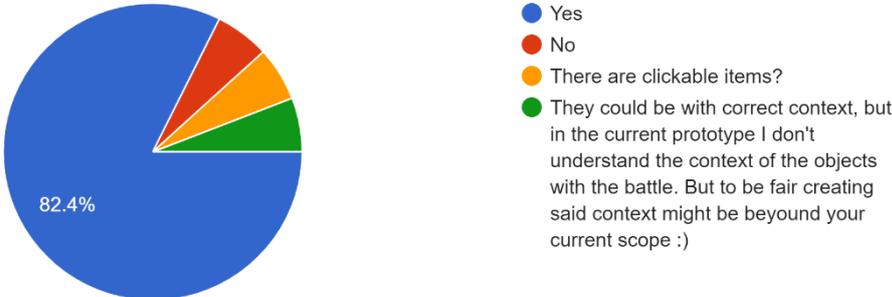


Figure 26

The concept of using indexes as a means to deepen players' understanding of the game world garnered substantial support, with 14 individuals favoring the idea and an additional 6 expressing strong support, while 3 maintained a neutral stance. (See Figure 27)

Do you enjoy learning more about the game world though indexes (items) or are they distracting from the gameplay?

17 responses

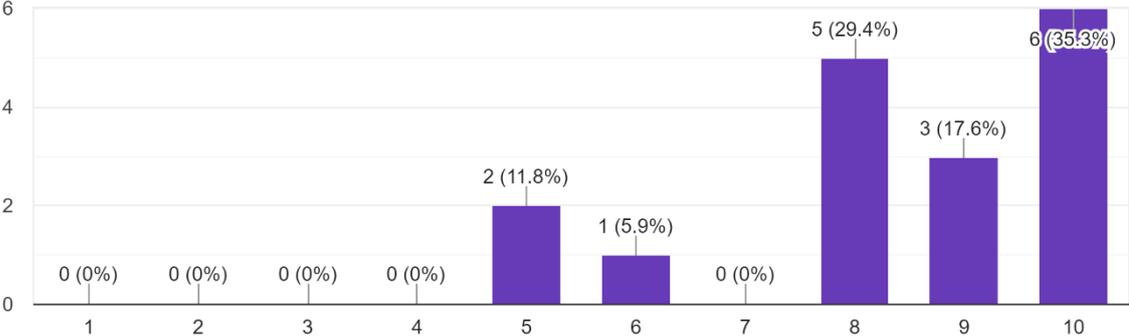


Figure 27

In addressing the prospect of players reading information, the open-ended question generated a predominant opinion affirming its validity as an option in the game. Nonetheless, participants underscored the necessity for careful implementation, suggesting the establishment of criteria or "rules" to determine which items merit a textual explanation. The prototype's presentation of reading information as an optional feature for interested players was perceived positively within the context of indexical storytelling.

**Top-Down Perspective of the Board**

In response to the inquiry regarding the top-down perspective of the board, 8 individuals expressed a definitive preference for this orientation as the optimal choice for achieving visual clarity. An additional 6 participants adopted a more nuanced stance, concluding with a "Maybe." (See Figure 28) Some respondents providing rationale noted that the efficacy of visual clarity was not solely contingent on perspective but also on considerations of coloring and textures applied to the board. These insights underscore the multifaceted nature of visual elements contributing to the perceptual clarity of the game board.

Do you think the top-down perspective of the board helps with the visual clarity?

17 responses



Figure 28

**Diegetic vs. Non-Diegetic Board**

When queried about their perspective on the transition from a non-diegetic board to a diegetic one, the responses were evenly distributed, with an equal proportion of participants advocating for the diegetic approach (29.4%) as well as the non-diegetic counterpart (29.4%). The remaining 41.2% expressed the viewpoint that both types of boards are equally good. (See Figure 29) Diverse perspectives on diegetic versus non-diegetic boards were offered. Some stated that the setting itself could be more visually interesting. Additionally, a subset of participants suggested a nuanced approach, proposing efforts to bridge the thematic elements of the library setting with its diegetic board, thereby seamlessly immersing players in a narrative transition to a battlefield area. These varied viewpoints contribute valuable insights into the nuanced preferences and considerations surrounding the game board's design paradigm.

Diegetic- a UI element that exists in the game world and story Non diegetic - A UI element that does not exist in the game world or story Do you p...in the current playable Tectonicus game on itch io?

17 responses

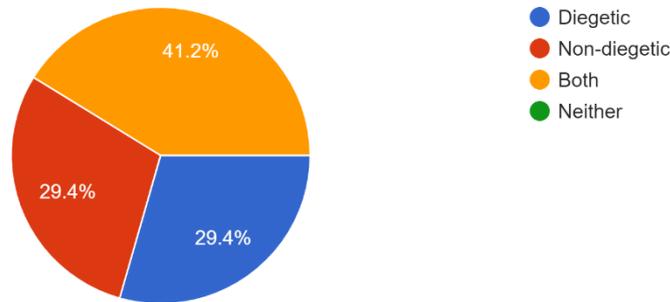


Figure 29

### Board Details and Player Understanding

Previous studies showed that players make unauthorized moves on the board and try to place cards in areas of the board where they can't, so the participants in the prototype testing were specifically queried regarding their perceptions of the prototype's board. With the integration of additional details into the board's design, participants were asked if they believed it would aid players in understanding where to appropriately place cards. 82.4% said "Yes". One person diverged with a 'No' but added that the current board design in the game also doesn't provide players with clear instructions for where on the board cards can be placed, but that they don't see that as an issue as players would eventually understand where they can and can't place cards though trial and error. (See Figure 30)

Do you think the board presented in the prototype clearly shows where the player can place cards?

17 responses

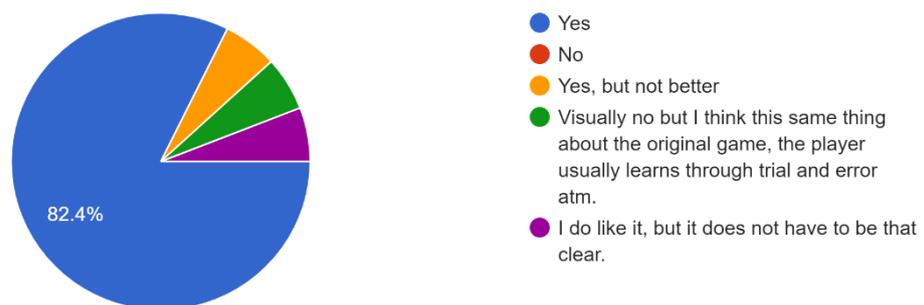


Figure 30

### Redesigned UI Icons

When queried about the redesigned UI icons, 12 participants affirmed their clear recognition and understanding, while 5 participants expressed difficulty. The predominant concern centered on the scrolls, cited as suboptimal in representing action points. (See Figure 29)

Are the UI elements in the prototype easily recognizable? (Example: the morale is on the left, the icons with the scrolls are the action points, etc.)

17 responses

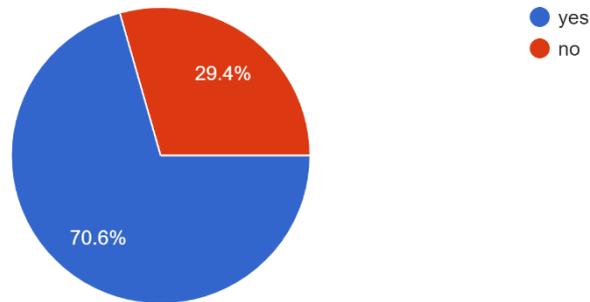


Figure 31

### Action Points Display

The choice to depict action points using separate icons received unfavorable feedback, with 7 participants opting for the traditional numeric display, while only 4 individuals believed that separate tokens effectively conveyed the quantity of action points. Six participants considered both display methods to be adequate. (See Figure 32)

Do you prefer the action points indicated in a numerical way (like in the current playable game on itch.io) or through several icons like in the prototype?

17 responses

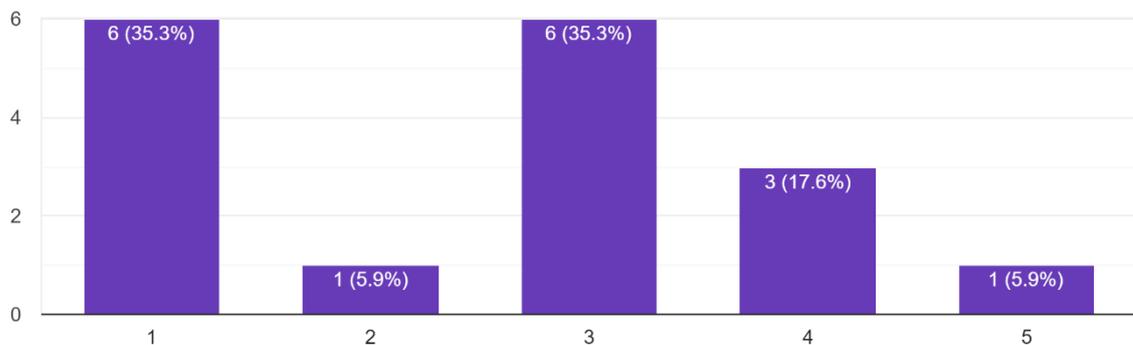


Figure 32

### Art Style and Tone

The art style of the prototype garnered positive feedback from 13 participants, while 2 expressed a preference for an alternative style, and 2 remained neutral in their response. (See Figure 33)

Do you like the art style of the prototype?

17 responses

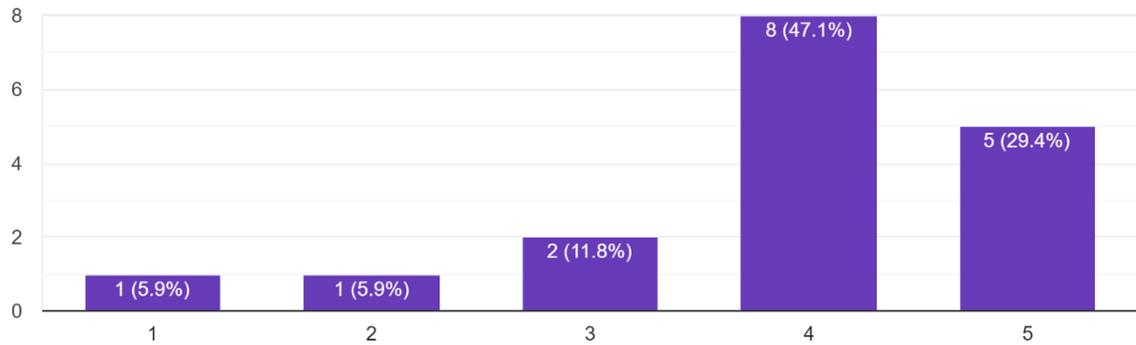


Figure 33

The next question was more specific, it concerned the alignment of the game tone with the art style. Responses exhibited a range of opinions, with 4 participants leaning towards the perspective that "The art style doesn't represent the tone of the game," while 8 individuals believed that it does align with the tone. Additionally, 5 participants maintained a neutral stance on this matter. (See Figure 34)

Do you think the art style represents the tone of the game?

17 responses

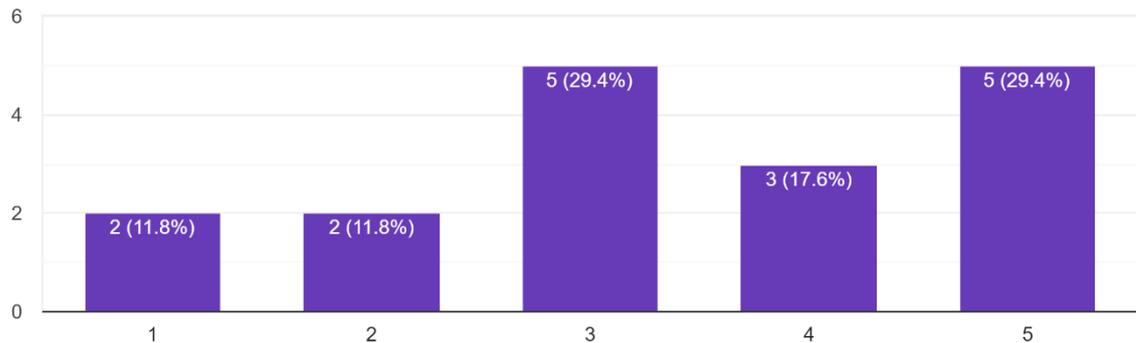


Figure 34

### UI Art style

The style of the UI was well received with majority (70.6%) voting on the positive side of the scale. (See Figure 35)

Do you like the style of the UI in the prototype?

17 responses

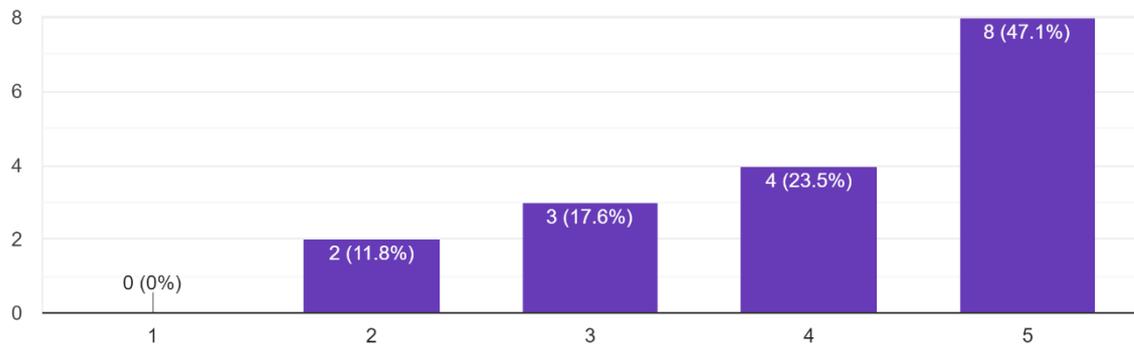


Figure 35

### Overall Comments

The last section on the questionnaire was there to give participants a chance to comment their overall thoughts. Useful feedback was given about further improvements to the UI and readability. Several comments were left to express that the work that went into the art for the prototype stood out to them.

## 8. Conclusion

The development of an interactive prototype aimed to present a redesigned UI layout and environment into the history-themed card game Tectonicus. The testing phase yielded valuable insights into the efficacy of indexical storytelling as a potential method for enhancing narrative depth, addressing a recognized deficiency in the current game. However, the assessment of a diegetic board's impact on immersion revealed mixed participant opinions, suggesting a nuanced consideration for its appropriateness in the context of Tectonicus.

Reflecting on the primary research question—how to redesign the battlefield area for improved user experience, visual clarity, and narrative immersion—the findings indicate a modest improvement in visual clarity, particularly in the HUD's action points, which require further refinement. While the top-down perspective positively influenced viewing opponent cards, concerns were raised about cramped card placement on the board, which is an uncovered problem regarding the game design decisions for the scale of the board.

Despite challenges in achieving visual clarity, the prototype received positive feedback for its artistry, highlighting its potential to contribute positively to the user experience. However, a misalignment with the client's envisioned endgame aesthetic suggests an ongoing exploration to solidify Tectonicus's visual identity.

While the interactive prototype encountered mixed reception regarding its alignment with the game's overall vision, the success of the indexical storytelling concept emerged as a notable achievement. This method demonstrated feasibility and immersive potential, providing a foundation for further development in Tectonicus. Although certain aspects' success, such as indexical storytelling, others, like the portrait setting and atmosphere, revealed areas for improvement. The results underscore the

necessity of comprehensive discussions within the team to establish a unified vision, tone, and atmosphere for Tectonicus's future development.

## 9. Recommendations

Based on the research conducted for this thesis, it is evident that in the context of DCCGs, an examination of successful designs underscores the integral importance of harmonizing user interface (UI) design with game rules. The connection between these elements is critical, as the UI layout in DCCGs goes beyond mere informatory functions to become an active component of gameplay. Consequently, it is imperative to evaluate the spatial allocation of the game board, currently configured as 7x8 squares. A comprehensive assessment should determine if this much space is worth being taken up by the board when players can only place cards on one row. Optimal dimensions should not only accommodate strategic gameplay but also ensure the visibility of card-based information on the board.

Regarding the art style, it is advisable to establish an art guide that aligns with the company's capabilities and available resources. This approach ensures a consistent and achievable artistic vision for the game. The art lead should examine the benefits and drawbacks associated with the utilization of 3D graphics, given the company's aspirations to integrate animations into the game. In parallel, as the game's narrative evolves, there should be a well-defined scope that everyone is aligned with. The prototype's creation, based on a narrative description, highlights the necessity of a coherent vision that resonates with the overarching goals for the game.

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## Appendices

### Appendix 1

Results from the play tests done by the user studies department at GAMUCATEX:

#### Quotes and comments from participants

##### Movement on board

Participant 2 said: *"Ehhh.... Yes, I had to understand how I should, what is it called?... How long I could move forward, actually. That is what I was doubtful about. How to go, one step everytime. That is what I was confused about."* Participant 18 said: *"I never knew how much I had cast before. I didn't know that because it just seems like I could play everything on my hand and then it was a bit of a drag. It doesn't feel like no one has to wait to play at a certain time."* Participant 37 did not understand the lanes and the characters and that they get placed towards each other automatically. Participant 91 found it hard to understand the movement forward.

Figure 36

## 4.1.8 Usability

### Was there anything they found confusing?

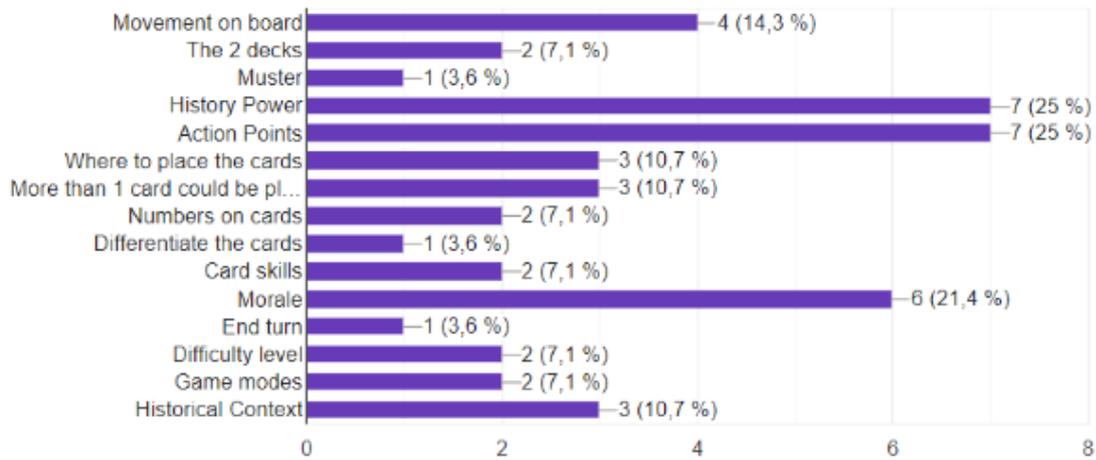
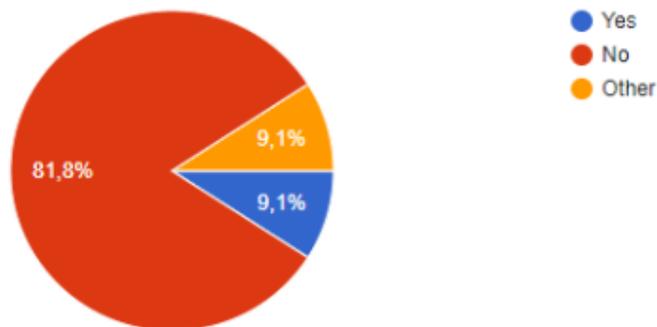


Figure 37

### Was the tutorial easy to understand?



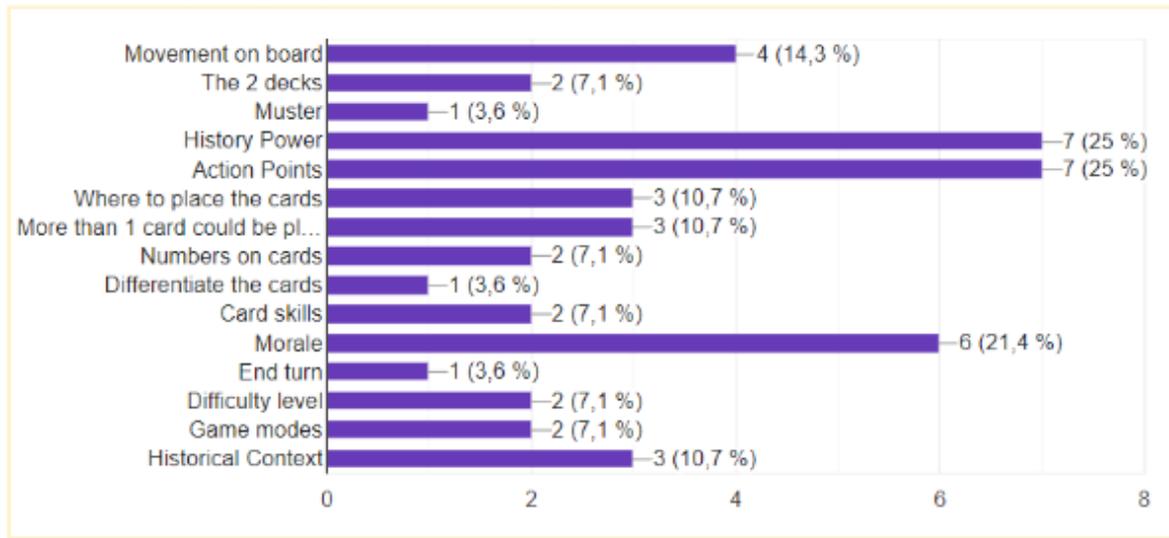
#### Result:

11 participants answered or were observed and 7 of them gave us their feedback. But most comments were actually not about the tutorial, but tooltips inside the game. These participants played the tutorial and yet it was not enough for understanding elements e.g. *Graveyard*.

Figure 38

### 1.1.1 Usability

#### Was there anything they found confusing?



28 participants out of the 40 interviewed were asked “Was there anything they found confusing?”. There are many different kinds of answers, but some that have similarities. 7 participants did not understand *History Power*, 7 of them did not understand *Action Points*. *Morale* was also not clear for 6 participants etc. Participant 14 wanted to click on the “Esc”/Escape button to leave the page with the historical battle information. Based on the online survey one participant said: “Need more clear Back & Close window buttons”.

Figure 39

#### What did they dislike about the game?

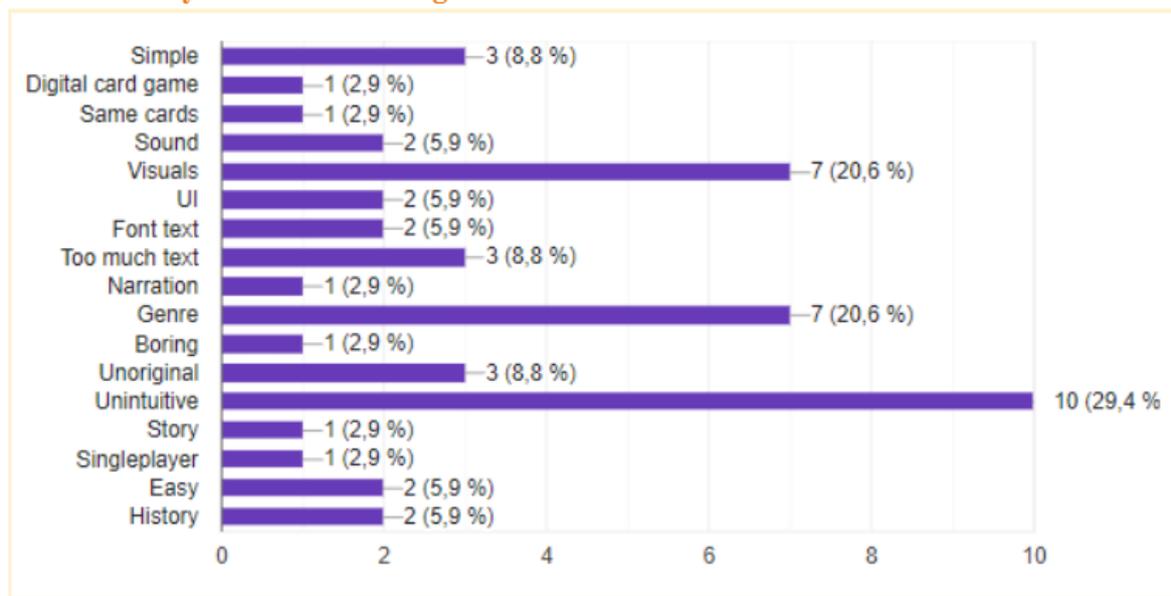
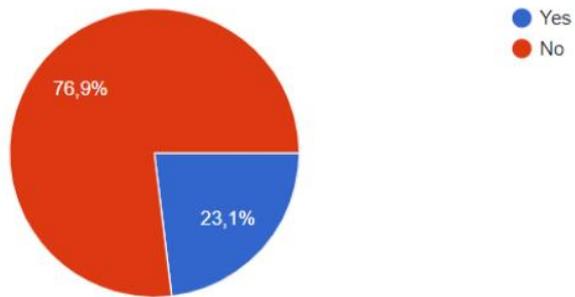


Figure 40

### Did they feel like they learned something about history playing the game?



#### Result:

13 participants were either asked directly or observed that can give an indication. 10 said “No” and 3 said “Yes”.

Figure 41

### Which aspects provide meaningfulness?

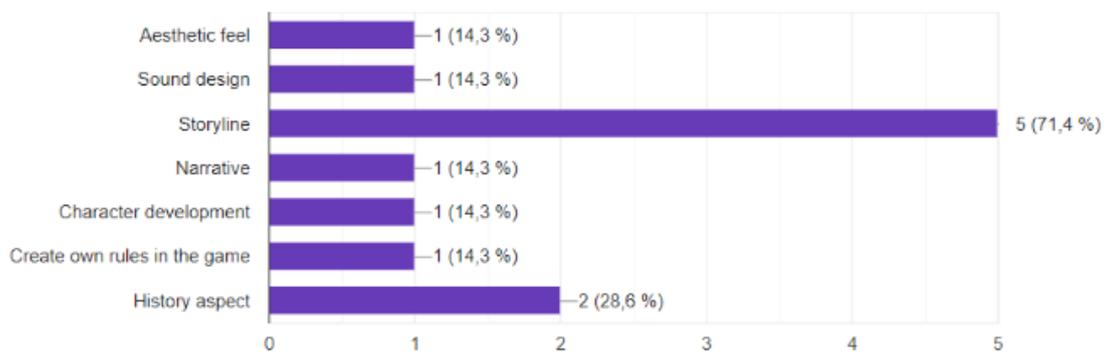


Figure 42

## Appendix 2

Brainstorm concepts (These concepts can be view on [this Miro board](#))

### Concept 1:



Table without board on top



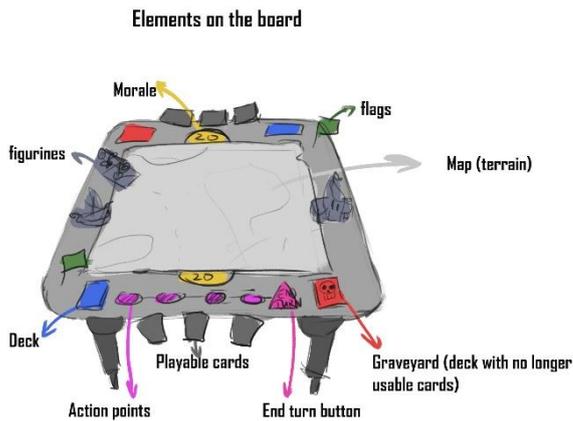
Table with board on top. Filled in squares are cards put on the grid.



Highlighted area to show players where they can put their cards



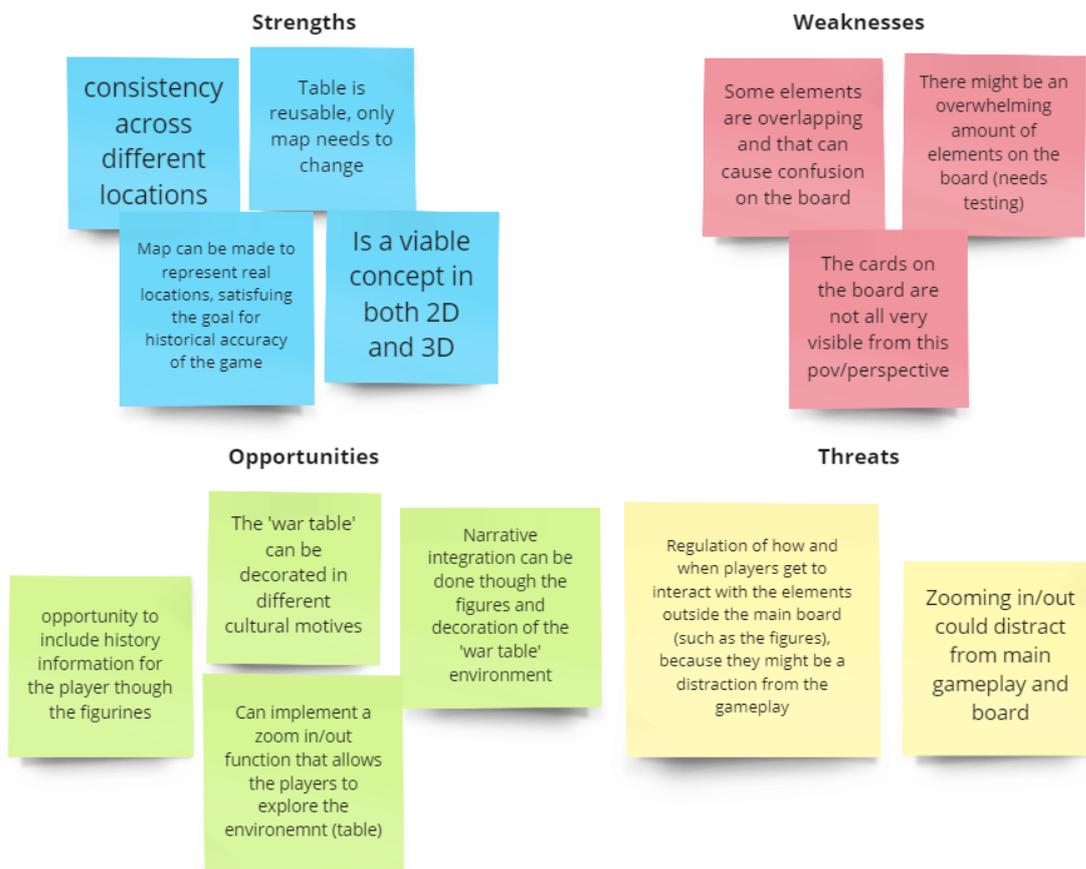
By clicking on one of the figurines on the board players can get more info about it. This could satisfy the historical and storytelling aspect of the game.



- Elements that change for different locations:**
- Map - Can be changed to represent a historically accurate terrain for different locations that battles were held. Can also be made-up for general play (no real-life location)
  - Figurines - Can be changed to represent real or mythological buildings, artifacts, etc.
  - ✦ Board decoration(not depicted) - Can be changed to represent different cultures

- Interactive elements in the the environment:**
- Clicking on the figurines could give you players more information on what they are.
  - Players could zoom in/out to view the map.

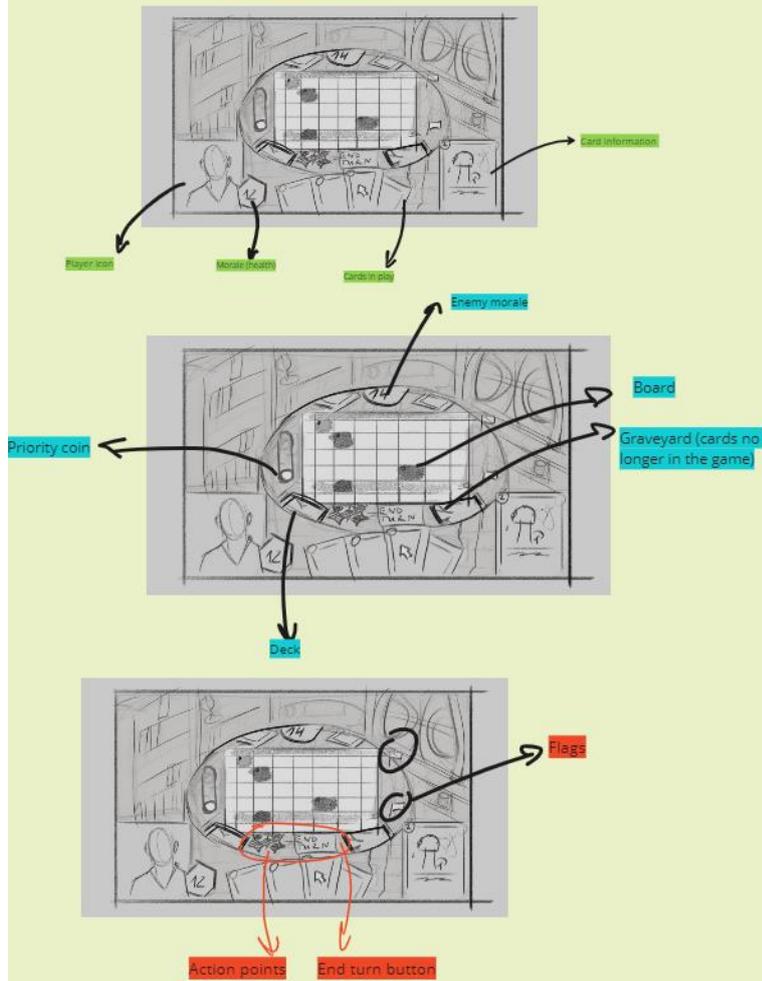
## Concept 1: War Table - SWOT



## Concept 2:

### Concept 2 - Library

Where relevant to the drawings, these are just ideas to explain the concepts. None of the elements have historical accuracy.



**Player icon** - Not currently an in-game feature. Designers should desire if it would be an interesting and double customization feature. Player icon is a HUD element that is not necessary for our game and unnecessary UI elements could disturb the visual clarity or leave less space for more important UI elements.

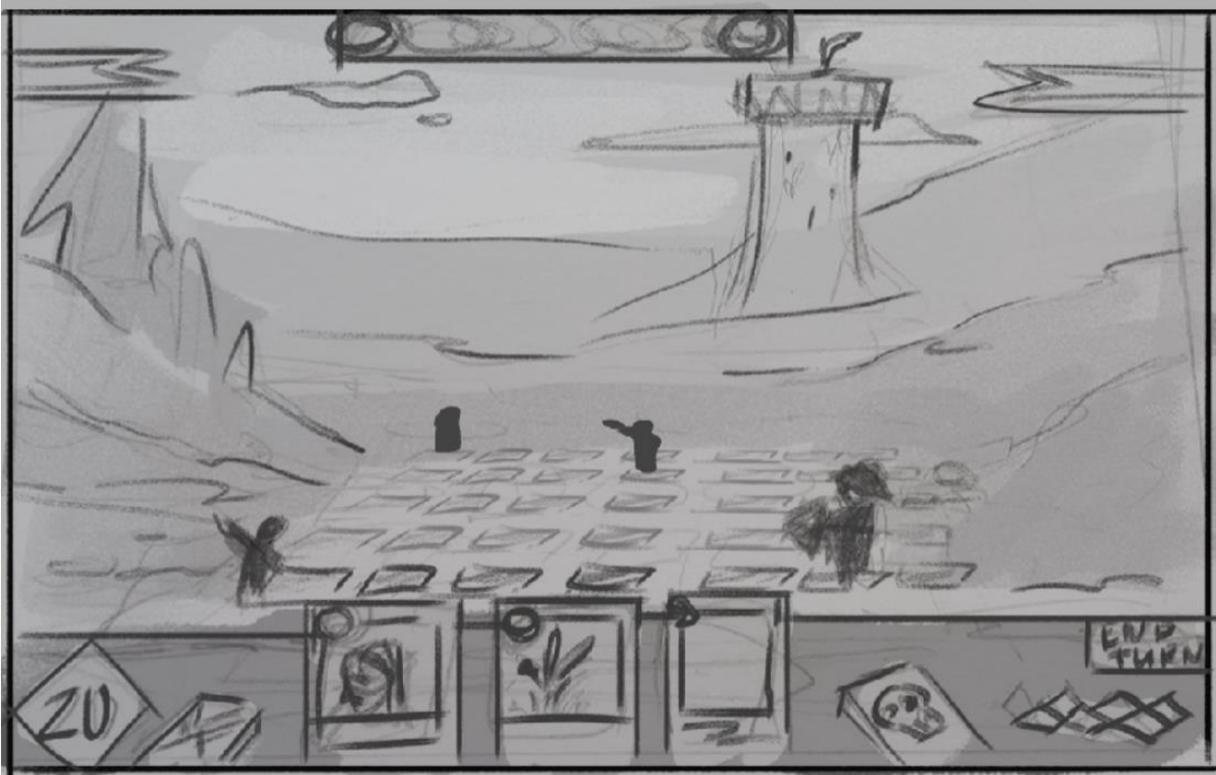
**Morale** - Morale is right next to the player icon

**Card information** - After clicking on a card, it will appear bigger on the left side of the screen. Players can then read more about it.

### Concept 3:



Concept 4:



Concept 5:



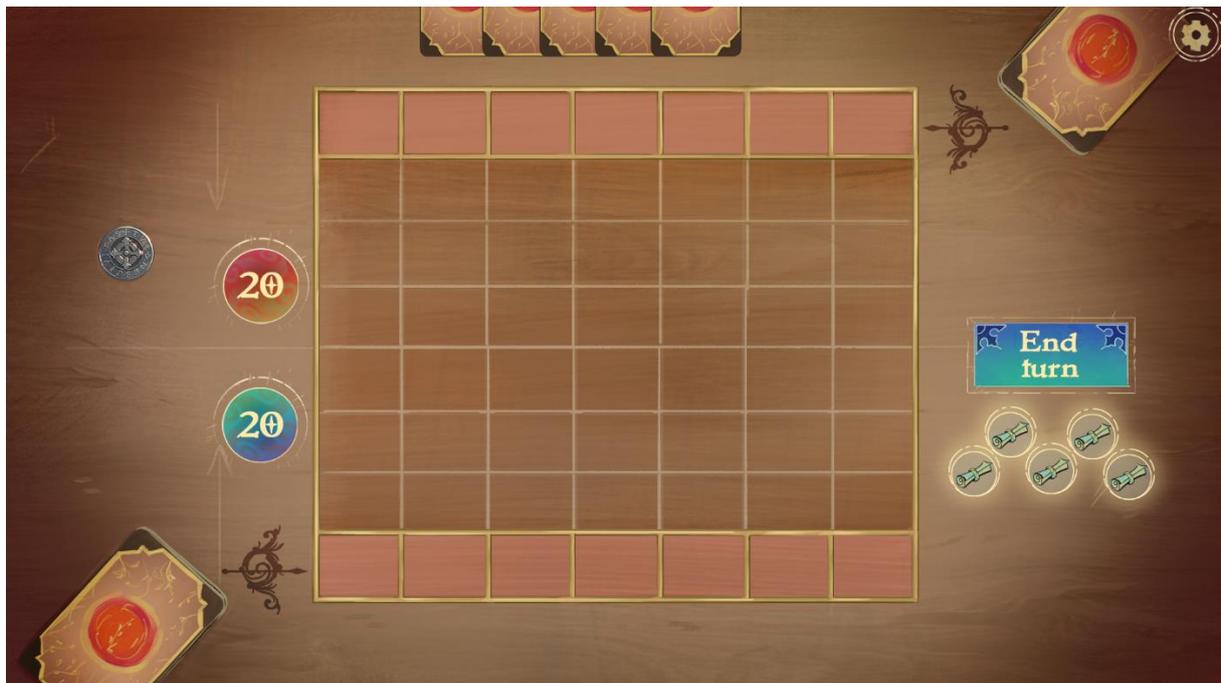
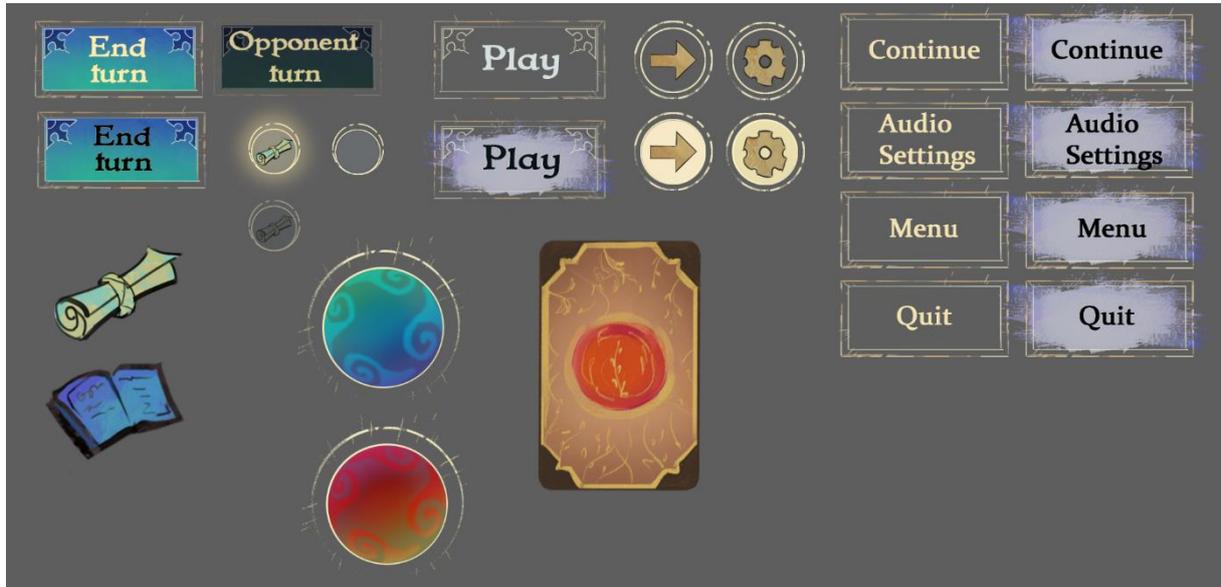




*Figure 45 Pattern used as inspiration for the board motives; Picture taken from the book "The Complete Pattern Directory."*

## Appendix 4

### Environment and UI artwork for the prototype





## Historic card information:

.....

.....

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.....

.....

.....

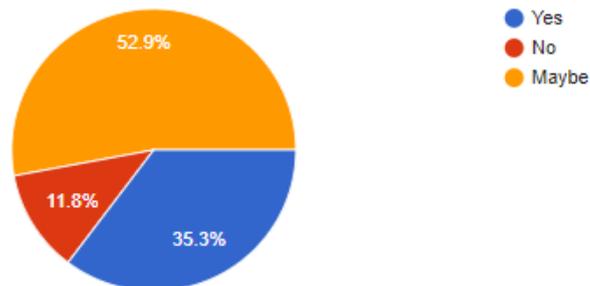
## Appendix 5

### Prototype testing open-ended questions results:

Do you think that the environment in the prototype connects to the Library setting of the game?

 Copy

17 responses



Can you explain what about the environment connects/doesn't connect with the Library setting of the game?

17 responses

This gives the feeling of that you're playing Mahjong?

doesn't connect: book on top of the battle area, a table on top of a table, some of the items does not make sense to random be there, like a broach.

I'd say that the only thing linking it remotely to the library is the presence of those books and the setting of the table with the ink and a cup of beverage, indicating someone was working.

the surrounding objects connect well

Inkwell, artefacts, wooden textures and ornaments, "old" books, soft warm lighting

It is really nice and it looks good, but I don't associate it with a library, I could see it be a rich person table. When I think systematic clean layout, maybe dusty, old.

looks just like a table in a nondescript room

Look at the next answer

Can you explain what about the environment connects/doesn't connect with the Library setting of the game?

17 responses

My first thought was not a library when I saw this picture, however the table and objects could be a part of a library corner. That is why I chose "Maybe". But if you can include something in the image to easier indicate that it is inside a library, then it will be perfect.

The books, ink and quill, cards, all these connects the environment to a library, the only thing that is not in place in my opinion is the money purse on the bottom right corner

The cards already being on the table seems weird as the player is tasked to collect and "own" their set of cards.

The random objects (books, trinkets, coins and so on) strewn about adds to the library feel. This could be strengthened by adding even more objects, as I feel libraries are quite messy, especially in the current setting.

The details on the wooden playing board adds to the distinguished feel of a library.

Someone mentioned the board in the middle, when clicked, would zoom into a battlefield. This is a great idea! Mixing the card nature of the players actions and the reality of the battles.

Can you explain what about the environment connects/doesn't connect with the Library setting of the game?

17 responses

Someone mentioned the board in the middle, when clicked, would zoom into a battlefield. This is a great idea! Mixing the card nature of the players actions and the reality of the battles.

A lot of objects that could be in a historical Library, including the board itself.

The textures and objects within the environment remind me of a library

It more shows the setting of the player (player close surroundings) I think the library setting can be shown in the intro, and not necessarily here.

I liked how you included items that you can click on that connect to both the vikings and to the library, like the coin and the ink jar. Having those items like the ink jar really helps the player connect to the library setting

I feel like it fits in with more of an archeological vibe, but it's polished like an old library, maybe adding items like ledgers of books that have been lent out would help this?

The cup, and the music box (?) stand out.

Can you describe a certain feeling that the environment gives you? Does it help you create your own story about where in the game world you are and what role you're playing?

17 responses

I'm neutral on this.

reminds me of a boardgame arena game and less of a Steam game.

This does give a feeling of a card battle game. The lighting seems pretty good. But I feel that it doesn't quite give the effect that one would want from this game, which is some sort of a war like scenario.

it gives me board gaming feelings

Cozy, positively mysterious, sparking curiosity, contemplative. It does foster my imagination to create my own story around me in the game world and better project myself into the game world.

A room at a Rich person, or maybe a type of tarven.

feels like im playing a boardgame in some medieval setting

It could be in any world. it could be a tavern, it could be an office, a wizards office. I recoment you to have books around as the majority of elements to give a clear understanding that this is a library or a schollars

Can you describe a certain feeling that the environment gives you? Does it help you create your own story about where in the game world you are and what role you're playing?

17 responses

It made me feel calm due to the soothing and brown earthy colors. It also made me feel nostalgic since brown furnitures used to be popular 30-40 years ago and now all furnitures are white, sterile and not as "cozy" compared to 80's/90's brown tables. It does not help me know which historical period I am supposed to be in.

It feels old and ancient, which is good for the game.

Having read the general idea of the narrative so far, it seems that the prototype here fits the theme really well. Could do with more open space.

As their are multiple characters and multiple factions, there could be different boards. One for the vikings and one for the franks... fx. Could also be located in different areas.

It gives the feeling of a comfortable, quiet, contemplative, full of History environment, which helps the narrative.

It gives me the feeling that the game will be strategic, that the game is a card games that involves managing recourses.

Can you describe a certain feeling that the environment gives you? Does it help you create your own story about where in the game world you are and what role you're playing?

17 responses

It gives the feeling of a comfortable, quiet, contemplative, full of history environment, which helps the narrative.

It gives me the feeling that the game will be strategic, that the game is a card games that involves managing recourses.

Without proper intro no, and I think its really hard to show that in one image.

Having things that you can click on made me excited and curious to learn more, both about the items themselves and about the environment in general. It really captured my imagination and made me feel like I was inside the world of the game (for instance, clicking on things to learn more about them made me feel like I was inside the library, rummaging through the objects that they had lying about and picking up different items to inspect them)

It gives me a very polished/distinguished feeling, like the area that I'm in is definitely set in an older time and we are in a nice environment (not poor) due to the detail work on and guilding on the table and other objects.

It does help. The feeling I got was cosy and safe.

What do you think about having to read the information about the items? Does it help you learn something about the world of the game or are there better ways to present information in your opinion?

17 responses

I'm neutral on this.

There are better ways, but this is a nice addition and a welcomed one.

Info given via a text is informative, but often looked over, unless the game forces you to read it in some way.

I think it's nice, though the breaking of the text could use some improvement - like not having really short lines

I would make the descriptions more 'intense' and short to increase the probability that more players read it to the end and focus on exciting facts rather than dates and dry facts, otherwise the whole concept is great for both learning about the game world and simply learning something new. It's important to help the player understand clearly which objects relate to the fictional game world and which are related to real world history.

As I wrote in the quistion "Do you think that the different clickable..." if giving the relevant context, I think yes

What do you think about having to read the information about the items? Does it help you learn something about the world of the game or are there better ways to present information in your opinion?

17 responses

it works in a singleplayer setting, might not work in PVP battle

I liked that element. It shows me that if I click on things I can find interesting information

Being able to click on an artifact and read shortly about each of them makes it easier for me to remember what I have learned. Because it breaks it up in small pieces instead of a lot of "text stuffing".

For me personally, I usually like games with minimum HUD and more interactable world's items

It helps the ones who want to learn/read to learn. A person who would be indifferent to this information can skip it.

If this is for an educational purpose, key elements of the history being told, there need to be a few objects that the player are "forced to read"

This is a better way to do this than in a codex that needs 3 or 4 clicks to access. It reinforces the idea of being surrounded by objects with a History behind them instead of decorative objects.

What do you think about having to read the information about the items? Does it help you learn something about the world of the game or are there better ways to present information in your opinion?

17 responses

I think it is a good option for the player to have, something else to do outside of combat, could even be an achievement to find and click them all. I believe Cinematic based storytelling is my favourite, sometimes with voiceover.

Perfectly fine to describe them like this.

I enjoyed getting to read the information about the items. It was a fun and helpful way of learning more about the world of the game

I think it's an interesting way to tell you more about who the Inkster is or whoever owns the board. For the concept of playing battles, I think it poses an interesting idea of objects that could be earned from achievements during gameplay so that the player can add more items around their board by going above and beyond when playing.  
Things more specific to the library like the pot with faces might be better suited for a background that you can interact with that focuses more generally on the history of the library.

Yes, it gives me an understanding. But I would have liked it, if the text was not so big, and had a frame around it.

Can you explain your answer to the previous question about the diegetic vs non diegetic board?

17 responses

I would prefer a top down perspective for more clear visual information communicated to the Player

Rather not now.

I'm happy as long as I can see the data. Immersive display would seem fascinating, but both are fine in my perspective.

I like both because it is nice to have some historical background but it is good to have another setting

I find the diegetic board more immersive, evoking in the player more emotional attachment to the game.

So the board in the (non-diegetic version) was not supposed to be a board persa, but anyway. The ND version works better IMO to telling a story about a historical battle. the diegitic version tells a story about a board game. Which is fine, but I prefer to be able to "immerse" myself in the historical battle narrative rather than the board game narrative.

I like the non-diegetic angle more

Can you explain your answer to the previous question about the diegetic vs non diegetic board?

17 responses

I find it more immersive and it will not feel very repetitive. The one we have now I assume that it changes in each battle.

Looking at a board on a table is kind off boring. Then I might aswell just play an offline and tangible board or card game while looking at my own dinning table at home. The background with trees, houses and ships in the non-diegetic makes it easier for me to imagine living in the Viking Age time period.

Diegetic feels that I, as a player, am more connected to the game world.

It looks nicer :)

I still love the idea of having it taking place in a battle field. Maybe take inspiration from Heroes of Might and Magic with their commanders at the sides? This could inherit the information needed.

In this case, there's a possibility that the mixed approach works better. The player is supposed to be transported in some sense to the battle, and it's a plus to be able to show that instead of telling. If the original table presented here could morph into a mix of board game and battlefield, it can communicate better that idea. But we might end up with just the idea of the game being played on a real board.

I like the idea of having both, I think this extreme in environmental shift will keep the game exciting so the

Can you explain your answer to the previous question about the diegetic vs non diegetic board?

17 responses

original table presented here could morph into a mix of board game and battlefield, it can communicate better that idea. But we might end up with just the idea of the game being played on a real board.

I like the idea of having both, I think this extreme in environmental shift will keep the game exciting so the game doesn't feel too linear but it is very important that we keep the UI of the game consistent, it would be really annoying as a player to have to learn new UI... maybe.

If we keep the perspective view then it should be a mix of non diegetic and diegetic. For example the Morale buttons we lose their visibility when the follow the perspective. If its top down view we can use all the assets and element in Diegetic way.

I feel like the diegetic board helps immerse the player in the game's narrative

I think having the environment of the board and everything make sense in a realistic setting like the diegetic board is nice but I also like the suspension of disbelief that comes with the non-diegetic version since it provides some more creative options - that is, if I'm understanding correctly.

The diegetic board one feels more cramped. I miss some space to breathe, that I get from the non-diegetic board.

## They are not recognizable

Can you tell me what wasn't recognizable/ what was confusing about the UI elements/layout?

15 responses

already mentioned

It was depicted in a fairly decent manner.

If I were a new player I probably wouldn't understand the link between scrolls and action points without being properly introduced to this element. Lacking graveyard deck.

I would have answered Yes and no, before. Moral point yes. The scrolls does not tell me it is action point if you haven't pointed it out. But to be fair it is quite difficult which is why most games tells you what the signifier for the resources are anyway :)

not sure

the arrows are very low in opacity, they are noisy without any purpose. same for the 'tribal' icon next to the sides of the board. i know what they are because i know the purpose of the game but as a new player i have no idea. the 20 will be nice to have text like health. The scrolls are not recognisable.

The Action Points was confusing to me, but it might be a biased since I am used to the "0/5" indication of

## They are not recognizable

Can you tell me what wasn't recognizable/ what was confusing about the UI elements/layout?

15 responses

The Action Points was confusing to me, but it might be a biased since I am used to the "0/5" indication of Actions Points.

It was clear and well made

The scrolls seems odd for player actions.

Especially the action points, I didn't associate the scroll with that.

Some text labels could help for clarity :P but overall the player usually has a hard time intuitively learning our UI. On the plus side they do display confident in understanding the UI by the end of the first play through.

None, everything is clear.

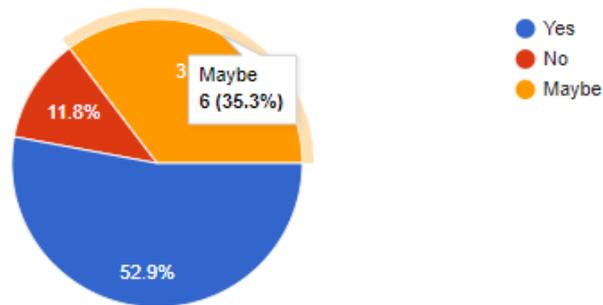
It all seemed pretty recognizable and straightforward

I think the only confusing part was that there wasn't a tutorial to say how many 'scrolls' you use by drawing

Do you think the redesign of the UI layout (including the board) has improved visual clarity compared to the current layout of the game?

 Copy

17 responses



Can you support your answer with a few sentences?

17 responses

I find the previous visual design more visually enjoyable but I would prefer a top down perspective.

no.

I feel that both are showing the necessary things required. Your board just feels more finessed and has more room for additional implementations and changes.

I kinda think it was clear before as well

Now each element looks natural in this environment and seems to be "in place", making the UI layout feel cleaner

The HUD Elements makes the visual clarity much more clear.

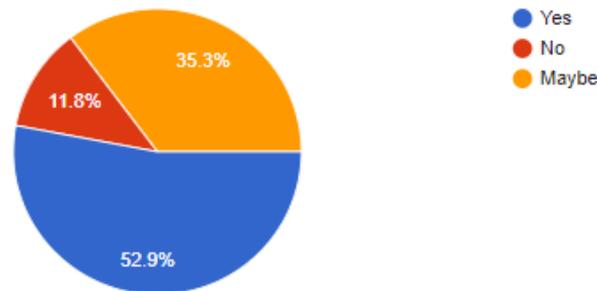
just like it in general

It feels empty and it does not really give a combat atmosphere.

Do you think the redesign of the UI layout (including the board) has improved visual clarity compared to the current layout of the game?

 Copy

17 responses



Can you support your answer with a few sentences?

17 responses

There are fewer details and more soothing colors, which makes each element more clear and I experienced less cognitive overload due to the more simple design.

I think combining the new UI/board with the old "Battlefield" we have is better. The player starts in a library and then when they click on the board to "PLAY" the game takes them to the battlefield scene, which is gonna be more immersive. Its not an easy transaction

As i understand it, taking it into a functional prototype, the clarity will be better since there won't be any clipping between cards because they can no longer be ontop of one and another.

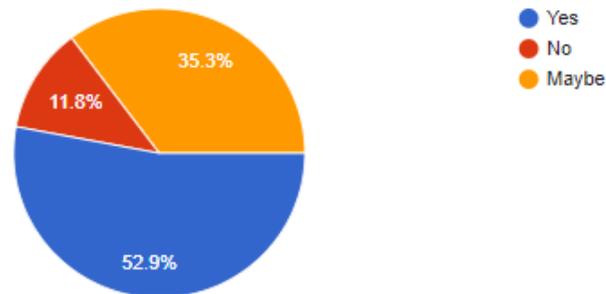
I'm too used to the original design to be able to discern that. The advantage of the original one is having words to describe the action points and morale, but the disadvantage of being very similar looking, which this design does better.

I love the colours used to make points of interest stand out and clearly display interactive elements of the game. A side note, perhaps it may be hard for the player to understand that the deck is interactable from the prototype, we need a consistent element that says to the players, "this is interactable" like a glowing outline or constant colour used or something :P

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Just that you put it top down view makes everything clearer.

I feel like looking at the board straight down rather than at an angle helps my brain make better sense of what's going on

Like the pictures below, I think it's much clearer how many 'moves' or action points the player has left. I would say this is the main improvement. But the addition of the scratches in the table to show the direction that the cards are moving helps a lot without being out of place!

I do, however, think it is better than before.

Overall thoughts on the prototype; additional feedback:

9 responses

The board and the lighting settings are very good. The books kinda throw it off. It seems like it could be a good thing to keep the book there before the battle starts and maybe have the smaller table morph to the desired battle background when the decks are selected and the battle starts, and also removing the books in the process, hence a bit immersive.

This creates amazing atmosphere! We will need to think of when exactly we want this sort of environment around the battle board instead of the historical battle ground environment, and also the transitions between the library environment and the historical environment, but this UI layout and environment is something I would very much want to use in suitable modes / moments of the game.

I like the idea of having the game board! I love that you made in on Figma (like a lot!). The items idea is great. I would recoment to work more on the enviroment of the battle itself and the UI , maybe put elements like books or smth 'bleeding' from the L and R side of the screen . Overall the initial idea feels great!

I personally like the art style. But I do not think it fits enough to the tone.  
I think the battle part of the game can remain as it is.  
But your idea of glowing or blinking objects should diffidently be more included more in the tutorial and your main menu idea should be part of the library scene of the game. I really hope we include your main menu somehow inside the game.

Overall thoughts on the prototype; additional feedback:

9 responses

I can of course still vouch for the critique i gave eralier.

If the action points were lined up in the prototype, I think that would improve readability. And my instinct would be to move them to a corner and leave the end turn button alone in that zone of the table. Overall, I think it's well organized and thought out, with a beautiful presentation.

Mentioning the action points counter, I didn't not know what this was but I am sure the player will understand once they started playing/drawing cards.

Really great work! I know that it takes lot of time, and designing and drawing all the assets. Thank you again for this work. Really like the "pulsating point" and that can be used further in our game and in tutorial for example. The overall design is great( sorry for lack of adjectives ). :D Love that you put assets on the board and around in the environment. Yes the book is on the board, but those are small adjustments that can be fixed easily .

For the overall visual design i think its good that you did it your way and presented us a game in one other visual style. As Danish say Mange Tak!

I really enjoyed getting to click on the items in the background to learn more about them!