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A Case Study in the Game *As We Descend*

Key Design Considerations for Implementing Controller Support in Fast-paced Deck-Building Games

Master's thesis in Computer science and engineering

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CHALMERS UNIVERSITY OF TECHNOLOGY
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Abstract

This study explores the critical design considerations for implementing controller support in fast-paced deck-building games. Through extensive prototyping, playtesting, interviews, and data analysis, several significant findings emerged. Players prioritize both efficiency and overall experience, highlighting the need for a balance between precision and comfort in controller design. Simplified control schemes, such as an auto-hover memory system and wrap-around selection, can enhance gameplay efficiency. Pre-existing player habits and preferences must be considered to facilitate quicker adaptation to new control schemes. Consistent input methods, supporting both D-pad and joystick inputs, prevent frustration and ensure a smoother gameplay experience. Additionally, visual support, such as enhanced visual cues, is crucial for controller users to navigate the game effectively. These insights provide a comprehensive guide for developers aiming to create intuitive, efficient, and enjoyable controller experiences in deck-building games. Further details and specific recommendations are discussed in the full study.

Keywords: Game design, Interaction design, Roguelike Deck-builder, Card game, Controller design, Xbox controller

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Yin Liang, Gothenburg, May, 2024

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1
Introduction

Deck-building games are a type of card game where the main process involves constructing a deck of cards. Generally, in deck-building games, cards are assembled during gameplay. The game typically employs a resource mechanism that allows players to purchase more cards and build their decks as the game progresses. Early examples of deck-building games include *Magic: The Gathering*(1993), *StarCraft: The Board Game* (2007), and *Dominion*(2008), which laid a solid foundation for the rise of video deck-building games.

With the flourishing development of computer games, deck-building games have experienced significant growth across various platforms in recent years. Following the precedent set by *Dream Quest* in 2014, and benefiting from the success of early access to *Slay the Spire* in 2017, Roguelike deck-building video games have become popular. Statistics data show that Roguelike deckbuilders beat all indie genres on Steam in terms of sales.[46]

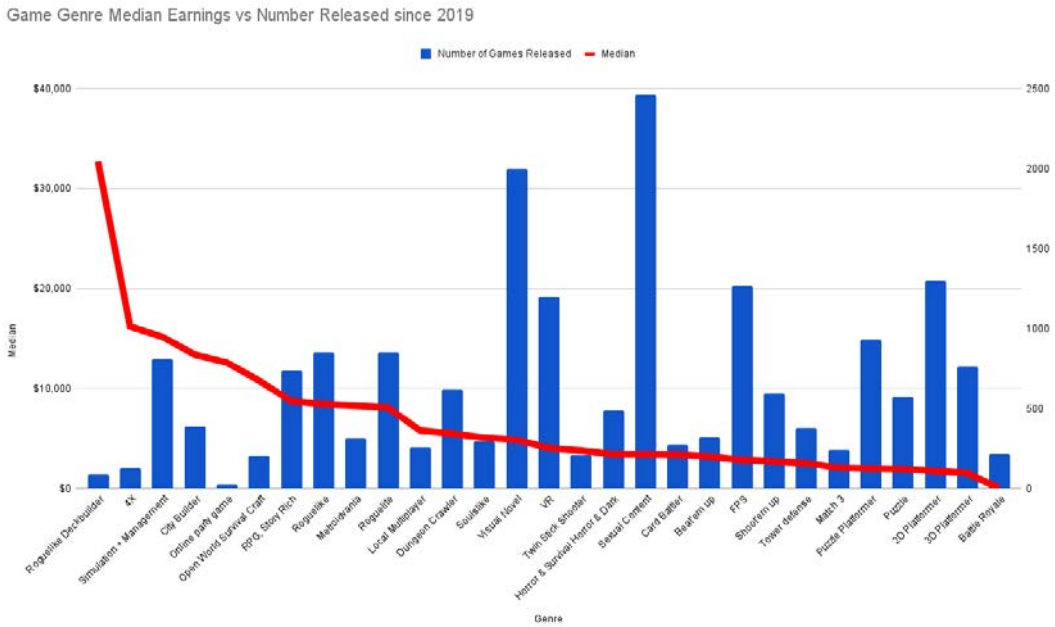

Figure 1.1: Game genre median earnings vs number released since 2019.[46]

These games evolved from desktop deck-building games and incorporated elements of both Roguelike and deck-building genres. They are often single-player games

that combine deck construction with procedurally generated scenarios and rewards. These games require players to construct decks while playing, usually needing to add randomly selected cards as rewards for completing objectives. Full descriptions of these game genres will be given in Section 3.

A game controller is an input device used to interact with video games and control the movements of characters or objects in the game. Unlike mouse and keyboard, these controllers often feature buttons, D-pads, joysticks, triggers, and other input mechanisms to provide a realistic and immersive gaming experience. However, the focus on mouse-centric gameplay in fast-paced video deck-building games, especially on PCs may inadvertently overlook a substantial segment of gaming enthusiasts who prefer controllers. While some deck-building games in recent years, such as *Alina of the Arena* (2022) and *Gwent: The Witcher Card Game* (2020, short as *Gwent*), have presented us with novel controller input designs, the widespread adoption of truly effective and engaging control systems remains relatively uncommon and needs a lot more work and attention.

A common issue with deckbuilders is that they tend not to be very playable for those using a controller. At the time of writing, when filtering "Roguelike Deckbuilder" on Steam, there are more than 800 games. However, when adding another filter for "Gamepad Preferred," only two games show up. Deck-building games with controller support need to put significant effort into controller design, as it can differ greatly from mouse gameplay. Unlike action games, deck-builders feature numerous UI elements that are challenging to access with a controller. However, this is not the only challenge.

In this thesis, I will embark on a journey to explore the complexities and inadequacies of controller input system designs in fast-paced deck-building games. This thesis is in collaboration with Box Dragon, an indie game studio founded in Gothenburg. This research centers around their upcoming Roguelike deck-building strategy card game, *As We Descend* (2024). Our collaborative effort seeks to pioneer a controller system for the game in the Xbox Series controller primarily about their combat scene.

Through this research, I aim to shed light on the current state of controller systems within this genre, building on earlier studies on deck-building games, and relevant controller design principles. I will explore several distinct controller designs, subjecting them to playtesting and analysis. Our goal is to address the existing gap in research and design, ultimately paving the way for a more inclusive gaming experience. I believe that this not only satisfies the specific needs of Box Dragon but also contributes to universally applicable controller design considerations for other fast-paced deck-building games. As the gaming landscape continues to evolve, my work endeavors to leave a lasting impact on *As We Descend* and the trajectory of future developments in the dynamic realm of deck-building games on controller design.

1.1 Research Focus

The game development was already at a relatively late stage when the thesis started, with most of the features already added. And all of the game design decisions so far were made by Box Dragon. Certain details and wishes from Box Dragon will be addressed throughout the paper as needed. The game is still under development, too. Unless otherwise noted, there are no significant input design changes between versions used in the thesis. Comparison between versions may occur if they are meaningful.

Box Dragon is primarily interested in supporting Steam Deck and Xbox controller for their game because they think that these two have the biggest audience among all Steam players on Windows. The layout and the controls are pretty much the same for the Steam Deck and Xbox controller. The Steam Deck features a touch screen. The inclusion of a touchscreen, capable of fully simulating a mouse, could potentially disrupt the established rules of controller design and usage. However, it is important to clarify that the core emphasis of this research remains on examining the controls and buttons of game controllers. The touch screen, while an interesting addition to the landscape of gaming input, falls outside the primary scope of this study. Considering that, the Xbox controller will be the main priority of this paper. More background will be introduced in later chapters.

The game *As We Descend* is pursuing a fast-paced game feel throughout the game, meaning that the controller input should support such a game feel as well. So the study and the design considerations will additionally lean on a fast-paced game experience. The research will contribute to the controller system entirely, meaning that game design-wise, implementation of coding will all be done by the author. The details between Deck-building games and Roguelike deckbuilders will be given in Chapter 3.

There is no official definition of what a fast-paced game should look like, but player feedback offers valuable insights. For instance, one player describes a fast-paced game as one where they are "*sweating and don't have time to deal with the outside world,*" while another humorously notes that any game feels fast-paced *"if you are playing it whilst traveling at very high relativistic speeds.*" Some even give an extreme example "*Techno music + guns + blood.*" These comments suggest that the overall feel of the game is critical. The game needs to create a sense of urgency, making players feel that their actions are crucial and must be completed quickly. This includes fluid movement, mechanics, and gunplay, where applicable. [36]

Fast-paced games require players to react quickly to succeed. Plot progression should be swift and not drawn out, ensuring there are no dull moments. In the context of a fast-paced Roguelike deckbuilder regarding controls, it is crucial to provide players with smooth controls and the freedom to perform actions efficiently. The control should avoid any points that slow down the pace, allowing players to maintain continuous, rapid engagement with the game.

However, three things need to be excluded here since they are considered out of the scope of the study. One of them is the vibration features built into the Xbox controller, they are widely used for tactile feedback. However, the topic of tactile feedback will be excluded from this study due to its complexity with hardware knowledge of the controller and the scope of the study. The focus here is primarily on the mapping design of controller buttons within the game and how they serve the gameplay. Tactile feedback, while beneficial for enhancing user experience, is often more associated with providing a response to in-game events, which may not align with the objectives of a fast-paced gameplay experience. Secondly, the controller input icons designed for in-game visuals won't be included in the research, either. The UI/UX design is another study field requiring other people's help. Last but not least, many games now support remapping of controller input or mouse input for accessibility, which can be a very interesting topic to talk about, but out of the scope of the current study. However, the accessibility of controller input design and ergonomics will be included since they are essential considerations need to be taken into account for designing buttons and inputs.

The primary focus of this study is to develop a controller system that optimally complements the game's features and provides a fast-paced gameplay experience. So these three things aren't the focus and will not be touched, though they can be very good future study directions.

1.2 Research Question

What are the key design considerations for implementing controller support in fast-paced deck-building games?

1.3 Goals and Challenges

The study aims to design an Xbox controller input system for Box Dragon's Roguelike deck-building game *As We Descend*. However, a key challenge lies in creating a controller input system that is not only functional but can be insightful to the research question. After applying different methods and gathering data from testers, the goal is to draw key design considerations for fast-paced deck-building games for controller input and provide players with an enjoyable play experience at the same time.

One particular challenge arises from the controller looping system within the game. Unlike other Roguelike deck-building games, *As We Descend* takes place within a three-dimensional (3D) world, posing unique challenges for its input system. Managing the input process becomes inherently complex with multiple layers of user interface (UI) and interaction within the 3D environment. Additionally, the game presents sequential steps for input, further complicating the user experience. In traditional two-dimensional (2D) interfaces, navigation is typically straightforward,

with clear distinctions between directions such as left, right, up, and down. However, in a 3D environment, spatial orientation becomes more ambiguous. For instance, the concept of "going upper right" may not directly correlate to moving right or up, leading to potential confusion for players. More detailed information can be found in Section 2.3 and Figure 1.2.

Figure 1.2: The tilted battlefield in *As We Descend*.

On the other hand, player study which is essential to the research result analysis can be quite a challenge. Addressing existing player habits and preferences indeed adds complexity to the study, as these behaviors may not always align with desired outcomes. Players often exhibit various habits and preferences that can influence their gameplay decisions, sometimes in unexpected ways. Some players may engage in certain actions without clear reasons, while others may express intentions they ultimately do not follow through on. For instance, in a multiplayer online game, a player might repeatedly enter a certain area of the game map without a clear objective or benefit. This behavior could be due to curiosity, habit, or even experimentation with game mechanics. Similarly, players might express their intention to cooperate with teammates during a match, yet when faced with critical moments, they act independently, deviating from the initially stated plan. Moreover, certain game mechanics or features may prompt players to perform actions that seem illogical or unnecessary. For example, a player might repeatedly check a specific area for hidden items, even if the chances of finding something are low. This behavior could stem from a desire for completionism, a habit developed from previous gaming experiences, or simply the anticipation of a rare find.

It is also worth mentioning that the purpose of the paper is research, of course, stakeholders have certain requirements that will be considered but not completely followed. The paper is about recording the research process and attempting to deliver an answer to the research question. Different deck-building games may have unique gameplay elements that are far from the study. I will emphasize investigating the relevant part. The research will solely focus on the combat scene due to the scope of the study and the universality of the result. Details about the combat scene definition, screenshots, and borderlines will be provided later in Section 2.2.

2
As We Descend

As We Descend (2024) is a deck-building Roguelike strategy game. The game sets the scene in a future world where humanity is cursed, to get rid of the dark core of the world, actions such as fighting the hazards, gathering resources, and exploring the city, etc. need to be taken. Players need to survive the battles and gain resources to defend the city.

2.1 Gameplay

The game loop consists of several stages, each contributing to the overall gameplay experience. Initially, players are greeted with information and messages from the city, setting the stage for their journey. See Figure 2.1, players will get the first piece of information at the start of the game. They are given 4 cards, including 3 *Envoy* to explore the city and talk to citizens about the story and guidelines. Within the city, players have the opportunity to play cards, gather information, and engage in activities that will later influence combat encounters.

Before engaging in combat, after they have gathered enough information, players have access to a card called *Expedition Force* to trigger the combat event. However, before this, players must undergo deploy stage. During this stage, they select their preferred exploration route outside the city based on the type of rewards available. Additionally, players have the freedom to choose the units they wish to bring into battle, tailoring their approach to suit their playstyle. Once combat commences, players must strategically play cards, defeat enemies, and emerge victorious from the battle. Successful completion of combat rewards players with valuable loot.

Figure 2.1: First message from the city.

Figure 2.2: Players need to use cards to interact with the city.

They then return to the city to reap the benefits of their endeavors.

Figure 2.3: Game loop in *As We Descend*.

Figure 2.4: Path choosing for the combat, different rewards are shown.

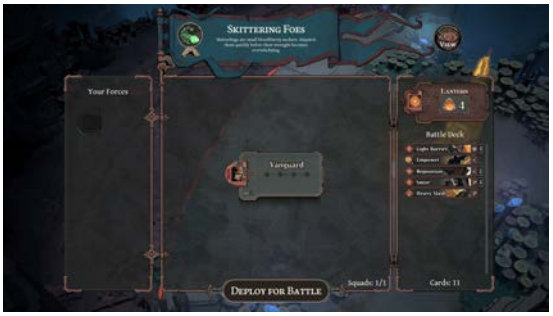

Figure 2.5: Deploy the units for the combat.

Back in the city, players have the option to trade their acquired rewards with interested citizens for items that contribute to the city's prosperity. Furthermore, they can continue to explore the city and embark on further combat encounters, perpetuating the engaging game loop.

2.2 Terminology

Figure 2.6: Terminology visuals and layouts in the combat scene.

The combat scene is shown below, this is the core gameplay, and where the research focuses on as well. Pre-faces presented in previous sections will be excluded from

the study, nor the settings page. However, the *Deck Pile* and the *Discard Pile* will be included in the study which can be triggered in the left-bottom corner and right-bottom corner in the combat scene.

Name		Term	Icon
Character	Units	Anllies. Players start from choosing 1-4 of them when deploy. Each of these units has its own unique deck of cards. They are usually presented as a squad.	
	Hazards	Enemies. What players fight againist. Hazards can sometimes give players affliction cards(debuffs).	
	Lantern	Lantern is the last line of defense. It has its own deck of cards supporting the units.	
Intent		Units/Hazards's intention at the end of each turn. Can be move, shield or attack etc.	
Command		Command is the "action points" used to play cards. Does not carry over between rounds.	
Favor		Favor is used to play enpowered combat actions, can only be generated ouside of the combat.	
End Round		Advance to next round, all unspent command will be lost and will discard the hand.	
Guard Zone		Units in the Guard Zone protects units behind them from regular attacks. Certain units can only auto-attack in Guard Zone.	
Support Zone		Units in the Support Zone hide behind denfenders from regular attacks. Some units can do ranged attack in Support Zone.	
Redraw		Can be spent to discard a draw and draw a new one. Redraw persists between rounds.	
Redraw Zone		Toss a card in it and draw a new one. Redraw cost one Redraw Point. Each battle Start with 2.	
Deck		A place that gathers all the cards that play possess.	
Discard Pile		This is the pile cards go to after play has played them, at the end of the turn, all unplayed cards will also be sent to this pile.	

Figure 2.7: Terminology explanations in the combat scene.

Figure 2.6 and Figure 2.7 provide an overview of the most commonly used terms encountered in combat. It is important to note that while the explanations provided may not always be applicable due to exceptions in card games, they serve as general rules. Understanding these terms is crucial for comprehending the entirety of the game. Moreover, this foundational knowledge is sufficient for grasping the controller inputs, which is the primary focus at this stage.

2.3 Current Input

The two main activities players do in combat are play cards and read UI information. Since the goal and the wish from Box Dragon is that the controller input should not lose player anything from the mouse input, it is very worth looking at the current mouse and keyboard input. Stages after the combat such as the reward page, unit picking page, and other scenes won't be included because they are not relevant to the actual combat.

2.3.1 Combat Scene

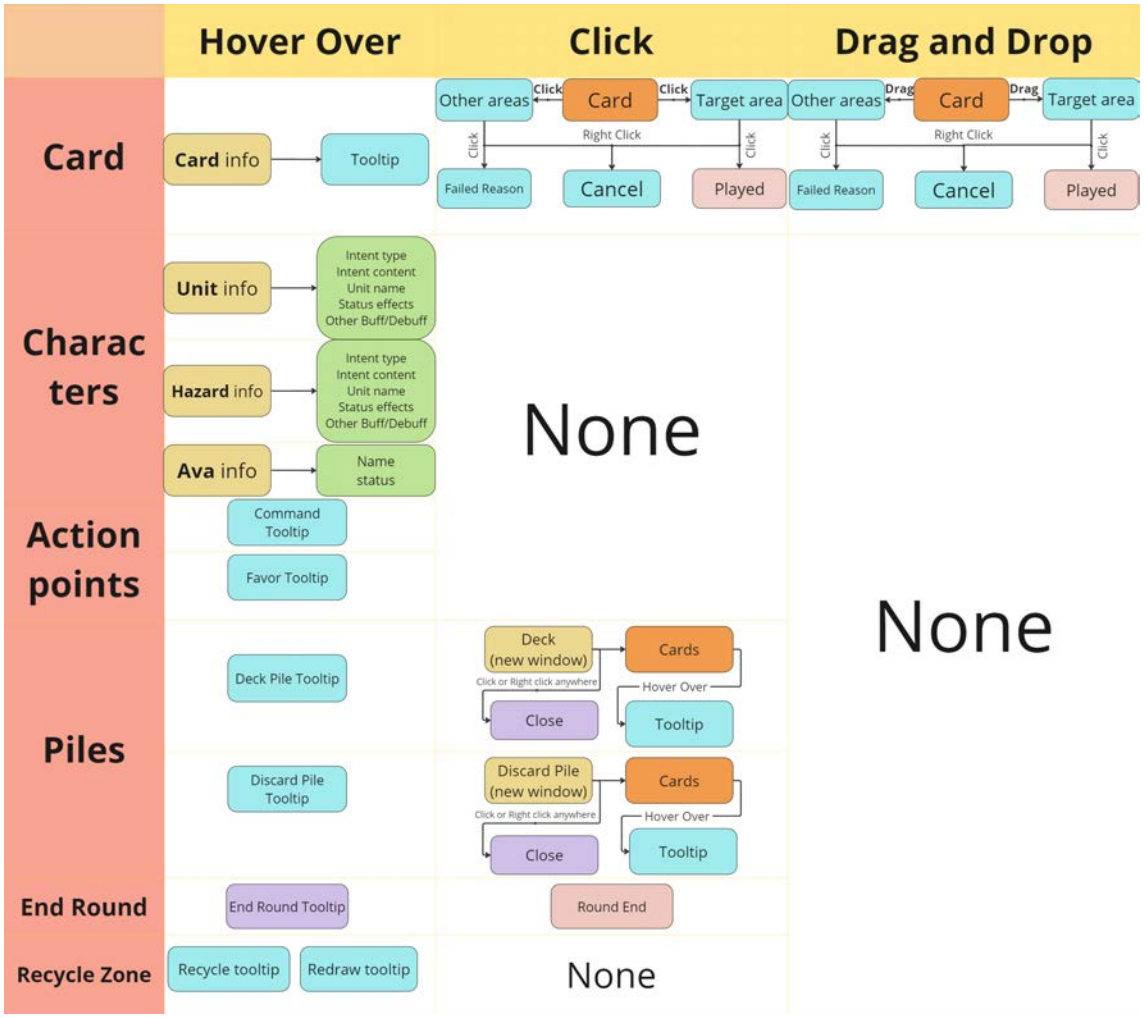

Figure 2.8: Mouse behaviors in combat scene.

There are a lot of UI for players's information to read. The game doesn't have any tutorials and doesn't plan to have tutorials in the future either. Box Dragon wants the player to be slightly confused rather than over-explained and wishes the player to learn by playing a few rounds of the game. They believe that a tutorial will frustrate players on the pace of the game if it is mandatory. They think players can learn the game simply by playing it more. So a lot of information is hidden in the game. For example, the Intent(see Figure 2.6, 2.7) is one of the most important features players need to learn. If a player is not familiar with the game, they will have to read it, as it explains many of the mechanics. That is one of the challenges to solve, as we have discussed in Section 1.3, the complexity of the game is one of the factors that we must navigate in designing a controller scheme. Box Dragon wants the game to be fast-paced, how to coordinate all the UI and buttons would be a tall order as well.

Players can almost get the information just by moving the mouse around and hovering over the UI in the combat scene. If a card has some keywords or special effects,

a more detailed UI will appear on the side of the card when hovering over it. Same for the characters(units, monsters, Lantern). So before players do any actions, they should clearly know what would happen if they actually do any more actions in the game. This is the designed early learning process, too.

Once players feel they have a sense of the game, we encounter the next phase of play. The only hidden input control is the card usage. Players can either drag or drop onto the target or click the card to play them. They may find it helpful to draw on their experience with similar games to grasp the gameplay dynamics, although the game doesn't explicitly indicate this. However, the mouse input is straightforward and simple, and offers limited controls. Therefore, players can provide input, and the game will respond accordingly, eliminating the need for a tutorial in this regard. When the card is being moved, there's a supporting highlight around the targets that the card is being selected. And also for the recycle system (see Figure 2.7). Players can drop cards to replace the card they don't want that is clearly written, which can be done by either drag and drop or click.

Figure 2.9: Aiming in the combat scene.

Based on the different styles of playing card games, specifically drag and drop versus click, Box Dragon has decided to support both methods in their game. This decision stems from the recognition that some players may become frustrated if they are unable to play the game in their preferred manner. Despite the similar behavior between the two methods, there are distinct differences in logic.

After selecting a card, players have the option to play it to the target. However, the card will not be played automatically after selection; players must confirm their choice by aiming. This double-confirmation process ensures that players genuinely intend to place the card. Aiming occurs immediately after the card is selected, and players will always have the option to place it on all available targets or in the redraw zone.

In-game, normal targets are distinguished by a more highlighted outline, providing

players with a clearer indication of where to place the card. Conversely, the redraw zone will not be highlighted automatically unless players move their cursor over it, at which point other normal highlight areas will disappear. While seemingly minor, this detail informs future design considerations for the controller, suggesting that the redraw zone should be easily accessible but distinct from other options.

If players click somewhere outside of the target, a rejection will occur both visually on the card and on the screen. Additionally, prompts such as "click a target" will appear, accompanied by a card shake effect, reinforcing the feedback loop for player actions.

2.3.2 Deck and Discard Pile

During combat, players have the opportunity to access their deck and discard piles to review which cards they have yet to draw and which they have already drawn. Although the discard pile and deck serve distinct gameplay functions, they share similar mechanics in terms of input and user interface (UI). Players can interact with both the deck and discard pile by clicking on them and a new window will pop up, allowing them to view the contents of each pile.

Figure 2.10: Deck view in combat scene.

Upon accessing either the deck or discard pile, players can hover over individual cards to obtain detailed information about their properties and effects. This feature enables players to make informed decisions based on their available cards and strategize accordingly during combat scenarios. As these mechanics are integral to the gameplay experience, they will be included in the study to assess their usability and effectiveness in supporting player interactions.

3

Literature Review

In this section, I will introduce some foundational aspects of deck-building games and Roguelike deck-building games, encompassing their historical evolution, gameplay mechanics, and rule structures. A critical exploration of the current landscape of input support across deck-building games will be provided. Transitioning to a detailed discussion of the game, this chapter will illuminate its gameplay dynamics, and existing mouse-based player controls. While familiarity with the Xbox controller may be widespread, this section will offer insights into its functionality, catering to readers who may benefit from a deeper understanding. Moreover, an analysis of past deck-building games will be presented. This serves as a foundational framework for the subsequent design of a new controller system tailored to *As We Descend*.

3.1 Deck-building Games

A deck-building game is a card game or board game where the construction of a deck of cards is the main element of gameplay. Deck builders see players expand their starting hand of base cards which is good for everyone by steadily unlocking and purchasing new cards, performing actions, and using abilities to achieve the ultimate goal, whether it's scoring the most points or defeating an opponent are usually the same. [23]

Figure 3.1: The starting setup for a typical game of *Dominion* (2008)

In most deck-building games, each player starts with a small deck of low-value cards. Each turn, they draw some cards from their deck and use them, which may produce

various game effects, and may purchase more cards from the central market to build their deck. The effects of cards often include providing in-game currency, and allowing players to purchase cards; other effects may include increasing the number of game actions a player can take in their turn, removing unnecessary cards from a player's deck, or attacking other players. As players purchase more cards with more valuable abilities, their decks gradually become more powerful. When a player runs out of cards to draw, they shuffle the discard pile (usually including newly acquired cards) to create a new deck to draw. By choosing which cards to buy and how to play them when drawn, players can build decks on the fly in an effort to gain valuable victory points in the most efficient way at the end of the game.[25]

3.1.1 Roguelike Deck-building Games

A Roguelike deck-building game is a hybrid genre of video games that combines the nature of deck-building card games with procedural-generated randomness from Roguelike games.

The Roguelike genre is one of the oldest genres in game history. It is a sub-genre of role-playing video games. Many games over the years have borrowed elements from the game *Rogue* (1980), resulting in the creation of the Roguelike genre of games. But although Roguelike has become a bit of a catch-all term, a 2008 development conference created the "Berlin Interpretation[16]" and defined Roguelikes as having nine specific design tenets. These elements have since been the most important when defining the genre, and each of them will followed by the look they are in Roguelike Deck-builders:

1. Random environment generation: Instead of having a randomly generated world, Roguelike deck-builders alter the world into a map, and encounters in these Roguelike deck-building games are often randomized, following Roguelike spawning rules to form fair but distinct paths through the game.

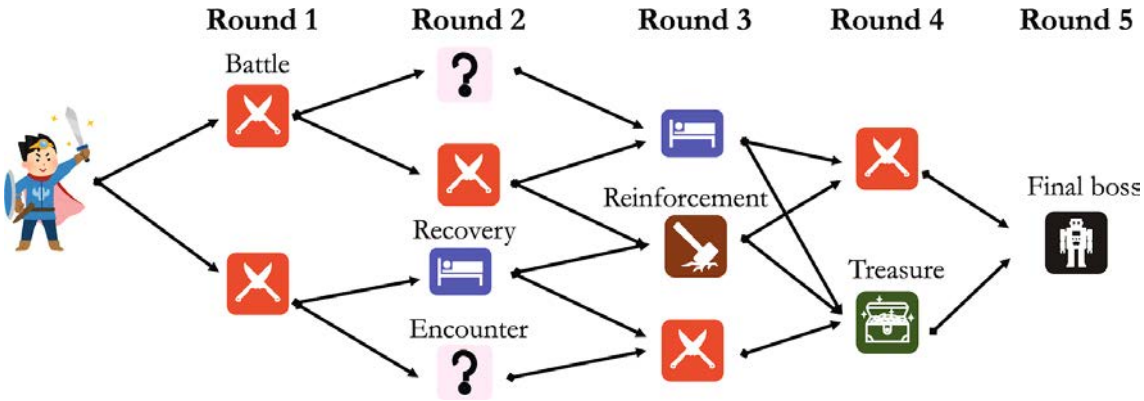

Figure 3.2: An example of game composition in Roguelike deck-building games.[26]

2. Permadeath: Permadeath is used by many games in the genre. If a player's character loses all health points, that character is dead and the player must start over with that character's original starting deck. Often, these games include a metagame

aspect, where players can unlock the potential for new cards with each playthrough, or receive a small bonus when starting a new playthrough. [21]

3. Grid-based and turn-based: Many games in Roguelike deck-building feature turn-based combat, similar to console role-playing games. When a player's turn comes, they draw a hand of cards and can play one or more cards, usually based on a limited number of "action costs" used in other trading card games. Card effects range from simple damage, defense, or healing to complex effects that may last for several turns, similar to other trading card games. Enemies typically engage in more direct combat, attacking, defending, or applying buffs and debuffs to themselves or the player.

4. Complexity: Most Roguelike deck-building games provide players with one or more playable characters, each with a deck of pre-built cards that can be used in the game.[37] As players progress through the game, they can add cards to this deck, usually by selecting one or more random bonus cards, sometimes through the in-game store. There may also be mechanisms for removing cards from the deck or updating cards already in the deck. Some games in this genre do allow players to edit decks directly, like trading card games, but still use randomization to determine how the cards play out in the game.

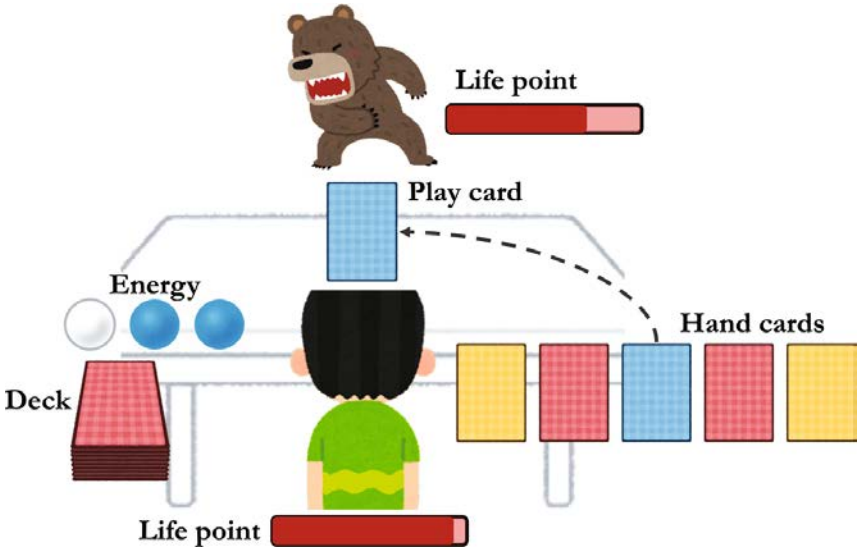

Figure 3.3: The battle event of the Roguelike deck-building games.[26]

Card games revolve around combat, and most Roguelike deck builders use the same verbs as many other games: attack, defend, unleash special abilities—that kind of thing. But instead of asking players to rely on hasty reactions or gratuitous free time to hone their progress, the genre asks players to slow down and take a moment to think. In this way, the genre resonates with the broader turn toward mechanical complexity in recent years. Gordon[11] also pointed out that most importantly, the hand is played tightly, encouraging strategic folding to create a deck that is fine-tuned for precision. This may seem illogical to a newbie, but it's helpful to think

about finding gear to build your deck in Roguelikes and role-playing games.

In deck-building games, players utilize a limited number of cards drawn from the top of a shuffled deck, where the sequence of card draws significantly influences gameplay dynamics. Even with a powerful deck, unfavorable card draw orders can lead to defeat, significantly impacting players' satisfaction and enjoyment. Thus, a card ordering algorithm is crucial to balance randomness, maintain an appropriate challenge level, and enhance the game's entertainment value. The card randomization should ensure unpredictability while avoiding excessive favoritism that could compromise the game's inherent difficulty.

There are also additional "low value" factors that are discussed in debates as to what games truly qualify as Roguelike and what titles should be in the subgenre "Roguelite" or "Roguelike-like," such as a player's ability to control only a single playable character; the requirement of the player to learn specific tactics to progress; and in-game monsters operating with mechanics that are similar to those of the player.

3.2 Mouse vs Controller

The debate about using a mouse or controller for PC gaming often stirs strong opinions due to differences in precision, comfort, competitive advantage, and personal preference among players. While the outcome may not come as a surprise to many, it's still worth exploring. Generally, the mouse tends to offer superior precision and control compared to controllers, which is why many game developers may prioritize mouse input or even neglect controller support altogether.

Steam, one of the leading PC gaming platforms, supports this trend in the year review in 2021, revealing that only 10% of Steam users rely on game controllers for playing games.[3] A quick examination of the Steam store reinforces this notion. When filtering for games with controller support tagged as deck building or Roguelike deck builders, only 197 games were found. However, upon removing Xbox controller support, the total number of results increased to 607. This discrepancy suggests that mouse input is often the primary choice for these types of games, likely because implementing controller support requires additional effort from developers.

Different game genres argue for different controller preferences. A study about the efficiency comparison between a mouse and a controller shows that the mouse is more accurate than the controller, and more efficient than the controller. But when it comes to being better suited, it depends on a lot of reasons. Bratu[7] pointed out that "*(the results) are not only influenced by quantitative aspects, but also by subjective factors like how each participant perceived performance, subjective workload, how entertaining playing with each interaction device was, and overall comfort.*" Similar ideas can be found somewhere else, too. King[19] pointed out that for competitive gaming, especially in FPS like *Fortnite* (2017) or *Apex Legends* (2019), nothing beats the precision of a mouse. But for comfort and versatility, controllers have their

place. Ultimately, it's about what works for you and what enhances your gaming experience.

While some may argue that simple clicks suffice for gameplay, having the option for a more relaxed controller experience, especially for games like *Slay the Spire* (2019), adds variety and accessibility to the gaming experience. After all, gaming is about having fun and enjoying the games you love, regardless of the input method chosen.

3.3 The Controller

The game controller market has seen significant growth in recent years due to the increasing popularity of gaming on various platforms including consoles, PCs, and mobile devices. The rising number of gamers, advancement in gaming technology, and increasing preference for multiplayer games are some of the key factors driving the market growth.[32] There are very many different options for controllers to pick from in the market, as we mentioned before, Steam Deck though is the target platform for Box Dragon but it is out of the research scope. Here, I will conduct a simple comparison of both controllers and delve into the specifics of how the Xbox controller operates. It's worth noting that the variety in controller styles largely stems from Nintendo's patent on the original design, rather than significant innovations in the field.

3.3.1 Steam Deck vs Xbox Series X/S

Steam Deck is a handheld gaming computer developed by Valve and released on February 25, 2022. The device uses Valve's Linux distribution SteamOS, which includes the Steam storefront of the same name. SteamOS uses Valve's Proton compatibility layer, allowing users to run Windows apps and games.

The main unit of the Deck is designed for handheld use. It includes a 7-inch (180 mm) touchscreen LCD with a resolution of 1280 × 800 pixels and a fixed refresh rate of 60 Hz; the game is configured to use vertical synchronization whenever possible.[15] The device's input set consists of two thumbsticks, a directional pad, ABXY buttons, two shoulder buttons on either side of the device, four additional buttons on the back of the device, and two trackpads below each thumbstick.[24] The thumb joysticks and trackpad use capacitive sensing, and the device also includes a gyroscope for more professional control in handheld mode. The device also includes tactile feedback.[29]

On the other hand, Xbox series controllers have been one of the biggest controller choices among PC game players for a long time. IGN has given an article about their ratings for controllers. The Xbox One is on top of the list. The article mentions that Xbox controllers combine high-quality design with enough flexibility for playing games on PC. Microsoft has created an ergonomic controller that's easy to hold onto thanks to added grip on the side, rear, and triggers. It has a familiar Xbox layout,

Figure 3.4: My Xbox Wireless Controller -Volt(2021), Series X

while the majority of its buttons are remappable, and the D-Pad is even more tactile than the Xbox One iteration.[20] In summary, Xbox does have its advantages. For various reasons, the Xbox Series X/S Controller became the core of this study. The author is using the Xbox Wireless Controller - Volt (2021) Series X. This one will be used for the development of the controller input system and the research of the thesis.

A controller is a device that imposes the player's will on the game and determines how they interact with the game.[27] When a player opens the game and before taking any action, the game and the player themselves are two separate systems - they operate independently. But once the player starts typing, interaction occurs. The two began to intersect. Input is the player's organ of expression in the game world and the only way for the player to talk to the game. [38]

3.3.2 Familiarity

First of all, the familiarity discussed here pertains to the relationship between gamers and the controls they have previously used. "*Unless you're a time traveler from the 1980's you most likely are not the first person ever in the world to develop a video game control scheme.*" Neal[27] from Cool Comic Creations believes that finding what has worked for games in your genre in the past and trying to replicate it is not only smart but also efficient. For example: fighting games mostly have directional button inputs on a 2D plane, racing games usually have you pressing R2 or its equivalent to simulate touching the accelerator pedal, A or X are usually the jump buttons, and confirm button and interaction in almost all games button. Many game types already incorporate standard control schemes, and many players are already very familiar with how they work.[27]

Apple developer documentation suggests some button usage for game controllers. What we can see from this is that surprisingly even though there are different platforms, some buttons are all the same.

Button	**Expected behavior in iOS and iPadOS**	**Expected behavior in macOS**	**Expected behavior in tvOS**
D-pad	Moves focus	Moves focus	Moves focus
A	Activates a control or selects an item	Activates a control or selects an item	Activates a control or selects an item
B	–	–	Returns to the previous screen. Exits to Apple TV Home Screen from an app's root-level screen.
X	Activates media playback. Pauses/resumes media playback.	Activates media playback. Pauses/resumes media playback.	Activates media playback. Pauses/resumes media playback.
Y	–	–	N/A
Left shoulder/trigger	Navigates left or moves focus	Navigates left or moves focus	Navigates left or moves focus
Right shoulder/trigger	Navigates right or moves focus	Navigates right or moves focus	Navigates right or moves focus
Left thumbstick	Navigates. Moves focus.	Navigates. Moves focus.	Navigates. Moves focus.
Right thumbstick	–	–	N/A

Table 3.1: Buttons suggestions for game controller for Apple [1]

There's another idea of standard conventions. It takes precedence over the physical accessibility of buttons. If you design an innovative mechanism, you may not have a standard convention. In this case, use a real-life mental model. These mental models should have spatial and physical similarity to the player's actions using the input device (triggered shot, upper button [up], lower button [down], etc.).[10]

3.3.3 Naturalness

The concept of naturalness is frequently discussed in academic sources, particularly concerning controller mapping. The movement and navigation systems should be intuitive, providing players with an immersive experience. Certain controls can simulate connections between in-game behaviors, enhancing the overall gameplay experience. Tamborini and Skalski[39] argue that more naturally mapped gaming controllers should allow players to quickly access mental models of real-world behavior. Since players focus less on the controls (to the extent that they perceive them

to be natural) and more on the game itself. Biocca[5] argues that human perceptual and motor systems are optimized for real-life interaction; therefore, adapting virtual controls to movements of the human body should bring about heightened levels of presence. A greater degree of mapping will lead to greater controller naturalness. [33]

It is believed that uncovering the dimensions of mapping and empirically testing them can help predict the effectiveness of interactive control devices such as those used to play electronic games as well as strengthen our understanding of how and why they work. [33] On the other hand, Controller naturalness improves the game experience by aiding the recall of mental models, increasing spatial presence; and increasing game enjoyment. These findings reinforce the intuitive assumption that the more realistically a controller mimics a video game, the more realistic the experience will feel, and the more enjoyable it will be. [18]

Then the idea of directional natural mapping can be quite beneficial to the study. Since in video games, our screen is a 2D space. The most basic manner in which controllers can be more naturally mapped is by producing correspondence between the directions used to interact via a control device and the results in the world or on a screen.Skalski et al.[33] have also pointed out that even though there may be a disconnect between the actions used to control and the specific actions that happen in response, as in the case of using a joystick to make a game character walk, simply having 'up' on the stick lead to 'forward' movement, 'left' lead to 'left,' etc. represents a basic form of natural mapping. Without these natural directions, confusion and frustration may result, since unnatural actions work counter to existing mental models for behavior. This explained further the challenge before, where the enemies and the characters are not "pure" left, or "pure" right. They are not perpendicular to the screen, so it can be a lot more challenging to implement the directional mapping for the study, see Figure 1.2.

Swink[38] shares similar thoughts, suggesting that the tactile variance in input devices can significantly influence a game's overall feel. He emphasizes the importance of natural mappings, which are intuitive relationships between potential actions and their impact on the system. Swink also discusses the significance of physical metaphors, which establish connections between an input device and the way it influences a system. According to him, joysticks should be designed to seamlessly translate into motion, with the joystick situated within a circular housing that constrains its movement. This setup enables users to push the lever toward the housing's edge, facilitating smooth, circular movements. The control box configuration also utilized more natural and intuitive mappings for the controls, e.g., the rotation switch was configured so that moving the switch to the right resulted in the craft being rotated to the right; a lever-style control could be moved to accelerate the craft. Graetz, one of the "Spacewar!" developers, stated that the new control mechanism "improved one's playing skills considerably, making the game even more fun". [12]

Blomberg[6] brings resemblance in semiotics in game studies that "*interaction is at its most transparent when the controller-action resembles the action represented in the video game.* " This coupling also requires video functional similarity between game actions, controllers, and out-of-game indicators. Blomberg has an example of this similarity-based relationship is how often the pressure-sensitive shoulder buttons on most contemporary console controllers are used. In first- and third-person shooters, the right trigger is usually mapped to firing a weapon. Since the button is pressure sensitive, it can mimic pressing the trigger of different types of guns, and in this regard, it does resemble (part of) a gun as a specific out-of-game reference object. A similar idea can be found, "*The extremely close mapping of a kinesic controller should call up mental models for real-life behavior and be perceived as fairly natural.*"[33] This relationship can be analyzed as iconic when it is mapped onto the firing of a weapon. This suggests that behaviors should try mimicking the real input. This doesn't necessarily mean that players will need to jump in real life to jump in the game, but try to provide an invisible connection or similarity to some extent between the symbols.

3.3.4 Accessibility

The active control principle recognizes that control schemes often require players to constantly touch, press, move, or shake to complete in-game actions. Players cannot take their hands off the controller or buttons if they want to succeed, and must remain alert at all times when using the controller. The passive control principle weakens the presence of the controller. Here, players think less about the hardware in their hands and more about the information or visuals happening in front of them on the screen. Limited features or controls may be required when the game is more focused on psychological strategy, information, or storytelling. This is very necessary for the game as it relies heavily on thinking and understanding the information displayed on the screen.[27] In short, it is very important to develop a control system that fits the game background, and the game feel is the core. The controller is there to serve the game itself, so everything designed and developed should serve the overall vision.

In order to do that, we can use Fitt's Law, which for our case we can formulate this way: "*the fewer the distance to the button and the bigger the button, the more accessible the button is.*" Combining Fitt's Law and knowledge of hand limitations, we can formulate the basic principle for control layout design: The most frequent actions should be in the most accessible places and match the primary control group of the player's hand. [10]

Figure 3.5: Three main "finger groups" that we need to keep in mind during controls design [10]

Primary control– thumb and index fingers. Flexible and precise, usable for primary actions (shoot, jump, etc.).
Secondary control– middle finger. Flexible but not so precise, usable for primary hold actions (aiming mode, [w] for walking, etc.).
Support– ring and pinkie fingers. Weak and not very flexible, can be used for secondary actions.

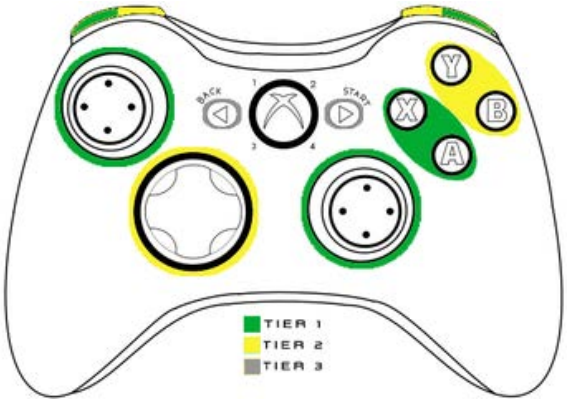

Figure 3.6: Accessibility tiers: gamepad. [10]

Tier 1	**Tier 2**	**Tier 3**
A/X buttons	B/Y	Start/Back
Sticks	D-PAD	
LT/RT	LB/RB	

Table 3.2: Accessibility tiers: gamepad table. [10]

Human attention is often limited when performing multiple simultaneous actions, even if these actions are physically possible. Dotsenko[10] divides attention into three levels:

- ***Primary actions*** *– require active decision-making, the main "Verbs"/basic mechanics that the player uses. It might include more than one basic input (aim & shoot, moving & jumping, etc.). Require constant attention from the player.*
- ***State change*** *– actions that switch control modes (hold button to aim, hold the button to run, etc.). Slightly increase the overall level of required attention. Very often, "hold" actions.*
- ***Contextual actions*** *– appear from time to time in the context of the primary "Verbs" (reload the weapon, interact, use a special ability, etc.). Require short-term periods of high attention from the player.*

According to his practice and observations, the maximum limit of simultaneous movements (each hand) is: One primary action, one state change, and one contextual action.

Therefore, the player can control (approximately) two main actions, two state changes, and two contextual actions simultaneously with both hands. We should also remember that one hand is always dominant, so movements that require more precision should be assigned to the dominant hand. Assign the main game actions (e.g. attack, movement) to the main hand. This means that players should use the hand that is most comfortable and precise when performing these actions, which is usually the player's dominant hand. Because human attention is limited avoid designing situations that require players to perform too many actions at the same time. This could mean tying commonly used contextual actions to the main action to reduce the cognitive load on the player during gameplay.

Another primary metric for any game control that defines player comfort is responsiveness. It provides the key to any good control - predictability. Therefore, game controls should be designed with this in mind to ensure that players can accurately perceive and respond to in-game events in a timely manner. Secondly, technical limitations are also a factor that must be considered, involving technical factors that may increase response times. Factors such as hardware delay and signal filtering may cause the game to respond slowly, thus affecting the player's gaming experience. [10]

3.4 Previous Games

Nine games have been carefully selected for this research, with seven offering controller support and two without such compatibility. These games encompass various styles of deck-building gameplay, with *Marvel Snap*(2022) being an exception due to its collectible card game nature. Despite the difference in genre, *Marvel Snap* still provides relevant elements for our research objectives. These games have been chosen for specific reasons, primarily due to their uniqueness within the deck-building

genre. Box Dragon has indicated that they consider *Wildfrost* (2023) and *Slay the Spire* (2019) as references for their game, making them essential to examine. Each selected game either shares a gameplay aspect similar to *As We Descend* or possesses a unique feature rarely seen in deck-building games. By considering a diverse yet relevant range of examples, I aim to lay a solid foundation for future designs.

The games that will be looked at are: *Slay the Spire*(2019), *Monster Train*(2020), *Alina of the Arena*(2022),*Gwent*(2020), *Wildfrost*(2023), *Astrea Six-sided Oracles*(2023), *Hellcard*(2024), *Hearthstone*(2014), *Marvel Snap*(2022). Only three essential games were chosen to be discussed in this chapter, the rest of the six games analysis can be found in Appendix B. The chosen ones are *Slay the Spire*(2019), *Alina of the Arena*(2022), *Wildfrost*(2023) since Box Dragon has been closely researched *Slay the Spire* and *Wildfrost* when designing *As We Descend*, *Astrea Six-sided Oracles* has offered a really important aspect of blocks division in terms of UI and cards which is applied in the design for testing.

	Slay the Spire 2019	Alina of the Arena 2022	Gwent 2020	Wildfrost 2023	Astrea Six-sided Oracles 2023	Monster Train 2020	Hellcard 2024	Hearthstone 2014	Marvel Snap 2022
Controller Support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Reason for picking	Popular Classic Reference game	Hex board	Popular Simple mechanics	Hub building Reference game	Not cards, but dice!	Popular Three vertical playfields	3D UI-richment	Popular Classic	CCG Fast-paced
Game style	PVE	PVE	PVP	PVE	PVE	PVP	PVE	PVP	PVP

Figure 3.7: All games with their chosen reason and style.

It's worth mentioning that *Magic: The Gathering* (1993) was not included in this study for several reasons. Despite being a foundational game in the deck-building genre and serving as the inspiration for many digital adaptations, it is primarily a physical board game. Additionally, the digital version released in 2023, *Magic: The Gathering Arena* (2023), does not support controllers and does not fall into the Roguelike genre. Furthermore, the transplantation of a board game into a digital format often results in significant differences in controls and gameplay feel. Given these considerations, *Magic: The Gathering*(1993) was excluded from the study because I only looked at video game implementations of these mechanics, as tabletop games were considered out of scope.

The examination of these games will involve multiple facets. For games with controller support, a detailed table will be provided, presenting essential information about each game alongside its corresponding controller input. This table will illuminate the factors considered during the analysis process. Additionally, thorough discussions on controller input and notable design elements of each game will be included to provide deeper insights into their mechanics and functionalities. The design of inputs, including controls for playing cards, ending rounds, and managing decks. Each game may implement these controls differently, based on what best suits its gameplay mechanics and design philosophy. By comparing these variations, a clearer concept of controller button design and its relationship to player familiarity

in deck-builder games can emerge.

Controller supported games	Play Card	More info Panel	End Round /Pass	Aiming	Cancel Aiming	Map	Draw Pile	Discard Pile	Deck	Setting	Double click selection for cancel
Slay the Spire 2019	A	On the side	Y	A + L/D	B or other buttons		LT	RT	None		Yes
Alina of the Arena 2022	A	Hold X	Looped	A + L/D	B or other buttons	LB / RB Loop	R + Loop	R + Loop	Looped	LB / RB Loop	No
Gwent 2020	A	RT	Y	A + L/D	B	None	Looped	Looped	None	History Menu	No
Wildfrost 2023	A	Y	None	A + L/D	B or other buttons	None	Looped	Looped	LB	No Acess	No
Astrea Six-sided Oracles 2023	A	X	Looped or LB+ RB	A + L/D	B	None	LB	RB	None		No
Monster Train 2020	A	On the side	X	A + L/D	B or other buttons	RB	Looped	Looped			Yes
Hellcard 2024	A	On the side	Y	A + L	B or other buttons	None	D-pad left	D-pad right	D-pad down		No

Figure 3.8: Table of all main controls of controller-supported games.

One crucial aspect to consider is the navigation system, which enables players to interact with various options on the screen, such as cards, characters, and UI elements. The methods used by games to partition looping areas can vary significantly and will be discussed individually.

The starting position of cards and how the game manages the placement of cards' subsequent targets after playing a card are unique considerations for controllers, especially in fast-paced games where efficiency is paramount. This aspect can sometimes lead to unnatural gameplay experiences, particularly when games restrict players from returning to their hand after playing a card.

Moreover, the behavior of remaining on the same card index or returning to the very first card after playing one varies among games. This discrepancy is unique to controller input, as there is no concept of "auto-hover" in mouse input. Such subtle design details can significantly impact the player experience, oscillating between feelings of comfort and frustration.

In some games, players can loop through options by holding the left stick on the controller, presenting its own set of challenges such as aiming difficulties and skipping issues. However, the tolerance for skipping issues can vary greatly among different games, as even small adjustments can drastically alter the game feel.

Comparing input between mouse and controller reveals information that may be overlooked during the transition. Understanding why certain information is omitted—whether intentionally or inadvertently—provides valuable insights into design choices. This analysis will inform the subsequent methods section and contribute to a deeper understanding of controller design in deck-building games.

Exploring how controller-supported games handle mouse input and transitions differently will offer valuable insights into the design challenges associated with implementing controller systems in deck-building games.

Controller Design	Selection Loop Mehod	Looping options default	Other buttons	Wrap around	Auto-hovered Card after playing	Can keep moving if keep pressing	Missing info
Slay the Spire 2019	Partially	Cards, Characters, Abilities, Bonuses, Money, Hp	X: Potion spot	Yes	Same index if there's any, otherwise the first one	No	Enegy UI explaination
Alina of the Arena 2022	Blocks	Cards End Roud	RB: Draw pile, Hand Limit, Exhaust Pile, Discard Pile, LB/RB: HP, Ability, Enemy order, Deck, Setting	Yes	Left	Yes	Enegy UI explaination
Gwent 2020	All	Cards, Characters, Draw Pile, Discard Pile, Enemy, Draw Pile, Enemy Discard Pile, Row Effect, Rows(If empty), Placed cards	None	No	On the Card placed	Yes	Combat points detail for each row
Wildfrost 2023	Partially	Cards(include characters) Draw Pile Discard Pile	RB: Redraw	No	On the target	Yes	Can't access to the menu bar
Astrea Six-sided Oracles 2023	All	Cards, Character name, Character status, Draw pool, Discard pile, Virtue, Cellarius, Dice pool, Sentinels, Map, Star Shards, End Round	LB: draw pool RB: discard pool LB+RB: End round	No	Left	Yes	Player health has a certain effect, can't read. Can't switch between Mouse and controller in game, so that info toally lost for controller
Monster Train 2020	Partially	Cards, Ember(action points), Draw Pile, Discard Pile, Consume Pile, End Turn, Floor Capacity, Enemies/Units	Y: Top UI bar X: End Turn R: Move between floors LB: game speed RB: Map	No	The left side of placed card	Yes	None
Hellcard 2024	Blocks	Cards	X: Switch blocks Y: End Round D pad-left: Draw Pile D pad-right: Discard Pile D pad-up: Almanac D pad-down: Deck	No	Right	No	None

Figure 3.9: Controls for all selected controller-supported games.

On the other hand, games without controller support will receive focused attention on mouse input and how they handle user interface interactions. This approach aims to offer a broader perspective on input systems, highlighting the intricacies of mouse designs and understanding the relationship between mouse and controller inputs. Given the study's focus on transitioning from mouse input to a controller system, analyzing these aspects is crucial.

It's important to note that all games included in the research have been extensively played and tested by the author to get a closer look at their designs and controls of

the game. Examinations at the interface level are not enough since lots of controls were designed to work better for game design choices. This hands-on approach ensures a comprehensive understanding of each game's mechanics and facilitates the exploration of input design considerations. Through this meticulous process, I aim to establish a solid foundation for examining and comparing input systems in deck-building games. Additionally, it's worth mentioning that the purpose of playing these games isn't solely to fully grasp their mechanics, but rather to evaluate the game feel and examine their controller design. Therefore, the playtime won't be presented and doesn't significantly impact the analysis, as each game varies greatly due to the diverse elements beyond controls.

3.4.1 *Slay the Spire* (2019)

Slay the Spire(2019) is a game that combines Roguelike and deck building. The goal of the game is to explore the tower from bottom to top. Players start with the basics, allowing for some minor modifications at the start of a run by sacrificing cash or health for bonus cards and then gaining new abilities by killing enemies. The map is randomly generated each time and is a simple series of nodes along paths that sometimes intersect. Some nodes have combat, others have mysterious multiple-choice encounters, treasure, merchants, or campsites. [34] A boss will appear at the end of each floor. After winning the battle, the player can proceed to the next floor.

Few academic resources about controller support in *Slay the Spire* were found. However, some interesting comments about controls in *Slay the Spire* in general from Steam Community show up. One player suggests adding more keyboard bindings to allow players to play without a mouse. Specifically, they propose using right and left arrows to cycle through enemies, and keys like q, w, e, r, or the numpad for direct target selection. One also brought up a question about whether everything that can be done with a mouse and keyboard can be done with a controller. The player also expresses the importance of accessibility, especially for those who may experience wrist pains and the player wants confirmation on the game's controller support to address potential concerns before purchasing. [8] It underscores the importance of robust controller support in games like *Slay the Spire*, addressing accessibility concerns by offering customizable keyboard bindings and confirming controller compatibility, while also highlighting the expectation for controller functionality to match that of traditional mouse and keyboard setups.

Figure 3.10: The controls of controller in *Slay the Spire*.

The controller system of *Slay the Spire* is relatively traditional, Figure 3.10 shows all of the controls in the game. With Left Stick cycling around all the options, some quick buttons can target certain things. The UI system is perfectly transferred to the controller system just by simulating hovering over the selection of cards. The "holding looping" feature is also disabled in *Slay the Spire* so players can not keep holding the joystick to keep looping all the options. It's also notable that the End Turn is just press Y, I encountered a few times that accidentally triggered the End Turn. Then I didn't play any cards but just ended the turn. Some games later on can tell how other games treat this differently to prevent this from happening.

Figure 3.11: *Slay the Spire* navigation layers.

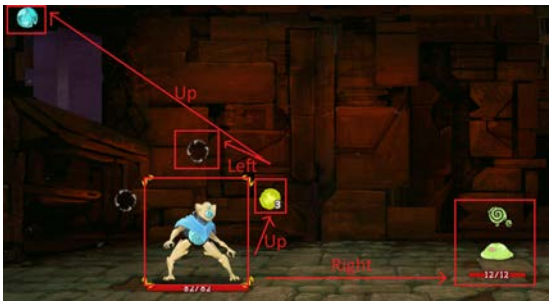

Figure 3.12: *Slay the Spire* navigation rules.

Figure 3.11 shows all the options players can loop from and also the layer axis details of how players can move. The combat scene was divided into 5 layers in total. Players can move horizontally in each layer but need to go vertically to be able to move to another layer. So that explains how the unexpected moves happen. As far as I'm concerned, the UI design could matter a lot when it comes to interpretations of the axis. It's a good sign to keep this in mind for later designs that the

positioning of the UI can be an essential element for the design of the looping system.

One point worth mentioning is that the way it treats the starting position of the card is strange. As shown in Figure 3.11, the screen is a 2D world. Players should be able to move from anywhere to the deck. However, in *Slay the Spire*, the hand cards are treated as a single entity and always start from the left no matter where players move from. It makes no sense that the player is currently cycling on the very right side of the screen but suddenly leads back to the very left card. For example, I am now looking at the enemy on the very right I hope to jump back to hand, it's reasonable to land on the very right card not the very left.

Moving around the character seems weird too; As shown in Figure 3.12 I initially thought it was moving right, but it turned out to be moving up. Similarly, I thought it would be moving up, but it is moving right. Moving left/right when selecting the lightning can loop through all three lightning bolts. This suggests that not much attention was paid to the implementation of the screen axis when dealing with small components. Additionally, the game loses the information of the action points UI with pure controller input, as this information is only available with mouse input.

The controller's behavior regarding activation was rather peculiar. It's noteworthy that I found it impossible to engage the game with the controller enabled after launching it. Instead, I discovered that the controller must be powered on prior to initiating the game for proper detection. Should this sequence be disrupted, the controller fails to function, necessitating a game restart—an inconvenience I found particularly frustrating. Such a requirement significantly disrupts the gaming experience, as it adds an extra step that could easily be mitigated. It's worth considering whether a more seamless integration of controller detection could be implemented to enhance user convenience and streamline gameplay.

3.4.2 *Alina of the Arena* (2022)

Alina of the Arena (2022) is a Roguelike deckbuilding tactics game that combines elements from *Slay the Spire* (2019) and *Into the Breach* (2018). Play as a gladiator to survive. With Roguelike deckbuilding and hex-based tactics, they are no longer bound by simple attack and defense. [30]

Some online commentators find the controller functionality to be generally good, albeit requiring some adjustment time.[4] I concur with this sentiment; they've implemented a highly innovative controller system. Notably, the game features a hexagonal board where characters and monsters maneuver. Players can target any valid entity within a card's zone, offering multiple targeting options and the potential for misses. Movement on the board follows unique rules; ascending is limited to the upper left tile while descending is restricted to the bottom left. There's no downward movement if the bottom left tile is unavailable, and maneuvering diagonally can be challenging. Viewing characters and the arena is facilitated by the Menu button,

with movement mechanics mirroring targeting rules.

Figure 3.13: Combat scene in *Alice of the Arena* (2022)

The UI is compartmentalized into distinct zones or blocks, a rarity in other games. Navigation within these blocks is achieved using the right stick, LB, RB, and Y buttons, with some blocks allowing looping through options. Exiting blocks is achieved by pressing B, returning to the default card selection. It's noteworthy that some blocks are accessible from multiple locations, offering flexibility in navigation methods.

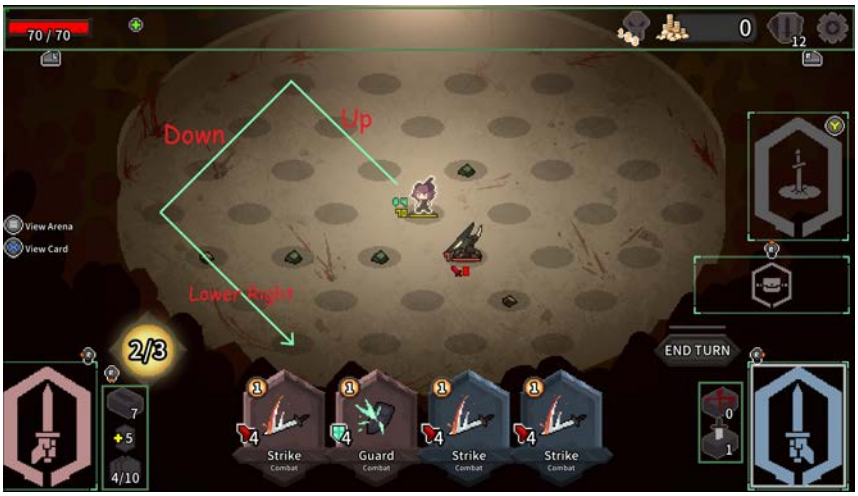

Figure 3.14: Navigation rules of the controller in *Alina of the Arena*(2022)

The controller UI interaction in *Alice of the Arena* introduces a slight deviation. Players must hold the X button to access detailed information and release it to cancel, unlike the mouse version where hovering reveals the info. This additional step poses a question about its necessity in the design. Regarding controls, certain aspects impede the game's pace. The default setup only permits cycling through all

cards and an end turn button, which, while efficient for experienced players, lacks specific options for quicker actions.

Moreover, the positioning of the end turn button, separate from the cards, requires additional navigation, suggesting a design improvement such as a charge bar to minimize accidental end turn presses during looping. Another potential slowdown is the "holding looping" feature, where extended button holds can inadvertently skip options. However, *Alice of the Arena* manages this well, likely employing a holding time detection mechanism to mitigate skipping issues while maintaining convenience.

Figure 3.15: *Alina of the Arena* Cards And Bottom UI.

The controller interface lacks access to the action points UI explanation, leading to potential confusion for newcomers. However, through gameplay animation, players can deduce its function. A notable design feature is the inclusion of a small holding bar on the end-round button when players have remaining action points, preventing accidental activation. Once actions are completed, a simple press triggers the end-round function. This implementation demonstrates intelligent input design, balancing user convenience and preventing inadvertent actions.

3.4.3 *Wildfrost* (2023)

"Wildfrost, a tactical Roguelike deckbuilder! Journey across a frozen tundra, collecting cards strong enough to banish the eternal winter..." [9] This is the message from their Steam page, In the world of *Wildfrost*, the sun is dead, evil forces have corrupted everything they touch, and everything is covered in ice and snow. After selecting one of three randomly generated adventurers, players begin traversing the map, choosing which nodes to visit to gain cards and buffs, in between turn-based battles against the tundra's fearsome denizens. Losing a battle will throw you back to your village, where you can inspect any permanent items you've unlocked before setting off for another run.

In *Wildfrost*, characters are cards, too. The player will start by placing their ally card in their hands into the fight. Battles take place on two lanes, each with space for three allies and three enemies. Most of the player's cards have instant effects, such as damaging enemies or freezing them, but a few are heroic units that can

be placed in lanes. Once you start the game, characters don't attack immediately, instead each turn has a countdown until they act, and enemies follow the same rules. Players can only play one card per turn, but can freely rearrange the order of their heroes - this is important because each friendly or enemy attack targets a specific point in the lane they are currently in. [45]

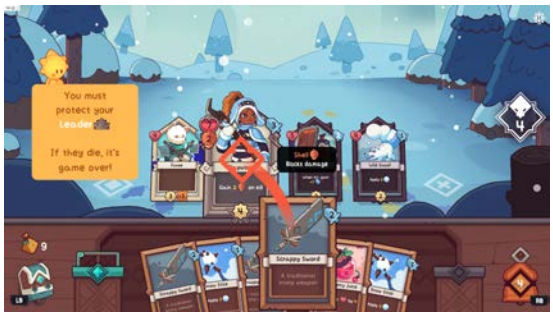

Figure 3.16: Players can attack their own character in *Wildfrost*.

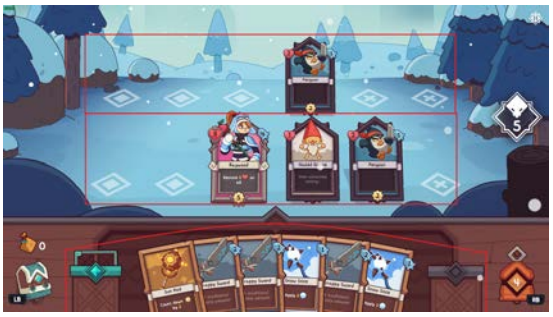

Figure 3.17: Navigation pattern behind *Wildfrost*.

It's the same input as placing cards. If the card place needs aiming, it will stay on the target card. It's interesting to see that *Wildfrost* allows players to apply any card to any character, which means that you can attack your own people or defend your enemies! But it will by default aim at the first enemies for attacks, and heal/buff will automatically be on the player's units first. Red aiming lines show that it's a debuff (to your enemies), while yellow aiming lines show it's a buff to your allies. Players will need to put in more effort if they want to aim for other characters. And since players can apply cards to any character, it means that almost every card needs aiming, see Figure 3.16.

In default settings, all cards, including the two decks on the side, can be looped. The interface consists of three layers, which are quite clear. Since the turn is automatic, there's no end turn button, meaning players must continually take action until they win or lose. Accessing more detailed UI information with the controller has two methods. One is to select the card for a simple version, displaying only special keywords on the character. Alternatively, pressing Y on the card allows inspection, presenting a new page and blacking out the combat scene. Here, players can view comprehensive details such as health, counter, attack, and character type. Both methods are applicable to any card. In mouse mode, it differs slightly; players can access all information by hovering over icons on the card, a feature challenging to replicate with the controller.

Additionally, right-click triggers different UI widgets and a new pop-up window for complete details. Occasionally, the simple version matches the detailed one if the card lacks extensive information. This approach ensures that the simplified version covers around 90% of the gameplay information needed, with an option for players to delve deeper if they become confused. By avoiding extensive information panels, players can avoid information overload and fatigue.

Figure 3.18: Hovering over different icons shows different UI information in *Wildfrost*.

However, the requirement to press Y for more detailed information is not explicitly mentioned, which can lead to confusion. This crucial detail is only introduced briefly during the tutorials and might be forgotten by players. It's possible that the developers opted not to include this information to avoid clutter, but it could contribute to player uncertainty. Interestingly, LB for deck and RB for redraw both feature controller signs, subtly indicating their functions. This design choice prompts further consideration. Additionally, it's worth noting that the redraw button can be cycled through when available, and it can also be quickly accessed by pressing RB or looping. However, for deck viewing, access is restricted to LB.

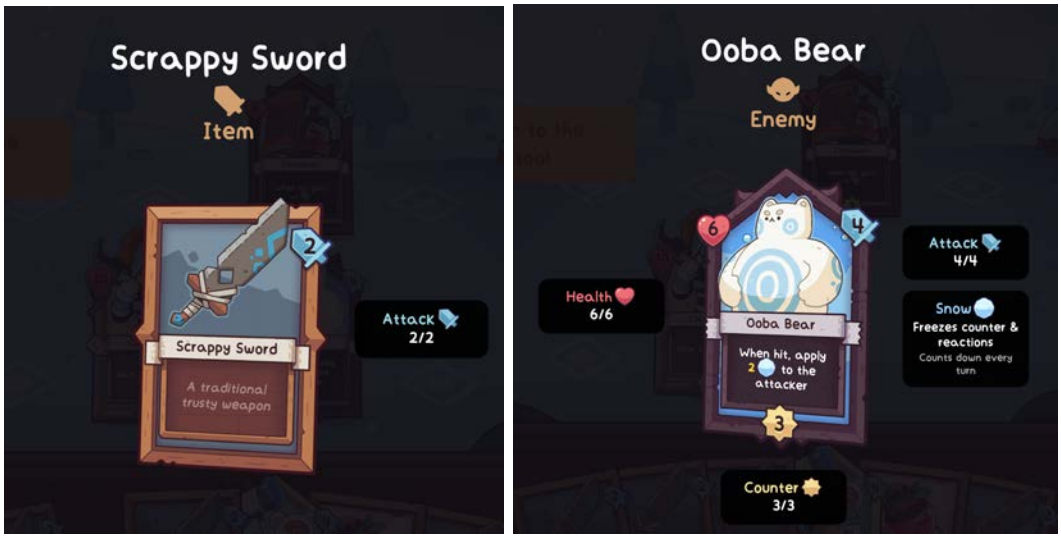

Figure 3.19: More information window for cards in *Wildfrost*.

On the contrary, there's no default explanation provided for the discard pile and draw pile in *Wildfrost*. This absence of information is noticeable both on the deck itself and after players access the deck. It appears that *Wildfrost* assumes players already grasp the significance of these piles. Interestingly, even for mouse input, there's no indication of what these piles represent, suggesting that this omission is a deliberate game design choice rather than an oversight in controller implementation. However, it would be beneficial to have some form of explanation available so that players can understand the purpose of each pile.

Figure 3.20: *Wildfrost* Deck view

Another noteworthy detail in Wildfrost that I particularly appreciate is how the cards inside the deck are initially arranged in random order when the player opens it. This creates a visual representation of disorganization, mirroring the experience of handling physical cards in Figure 3.20. However, as players interact with the cards and browse through them, they gradually return to their original orderly arrangement. This design choice effectively simulates the process of sorting and organizing cards, reminiscent of how a player deals with real cards.

4
Methodology

After gaining sufficient information and knowledge from the literature review, the next step is to design a controller system for the actual game. The methodology comprises paper prototyping and footage review to derive insights for design. The aim is to synthesize these methods to inform a comprehensive design approach based on previous work. Subsequently, the design will be presented later in this chapter. Methods that aren't used will also be discussed.

4.1 Paper Prototyping

Paper prototyping involves using low-fidelity methods, such as placing a deck of cards and simple character representations (e.g., dots) on a table to simulate a battle scene. Designers then sit down with players, inquire about their desired actions and expectations, and adjust elements based on their feedback.[41]

Paper prototyping aims to draw some ideas before the actual design starts. It's a nice way of knowing what people's first intentions are. Its quick iteration enables designers to rapidly build overviews, testing ideas without getting bogged down in details. This speed facilitates early-stage exploration and encourages honest feedback from participants who feel more comfortable critiquing rough sketches than fully polished prototypes. However, one major drawback is its lack of realism, as hand-drawn sketches cannot fully mimic interactive designs. This limitation may impact users' gut reactions, which may differ from their responses to a finished product. Furthermore, paper prototypes may be inappropriate in certain contexts, particularly when translating user constraints related to accessibility. [41]

A method called "Wizard of Oz" was also conducted here. The Wizard of Oz method is a moderated research method in which a user interacts with an interface that appears to be autonomous but is (fully or partially) controlled by a human. *The Wizard-of-Oz method lowers investment risk into complex, costly technologies (such as generative AI): it provides early insights into their desirability, utility, and usability before companies spend money building them.* [31]

	Role	Expeirence with controller in gaming 1-5	Expeirence with Deck-building games 1-5
Tester 1	Box Dragon Artist	3	2
Tester 2	Box Dragon Coder	1	3
Tester 3	Chalmers student	3	1
Tester 4	Chalmers Student	4	3
Tester 5	Chlamers student	5	4

Figure 4.1: Paper prototyping testers status.

4.1.1 Preparation

Five participants were involved in the testing process, with two representing Box Dragon, individuals highly familiar with the digital version. Among them, one was proficient with controllers while the other had limited controller experience. The remaining three participants hailed from Chalmers, all avid gamers with varying degrees of expertise in deck-builders.

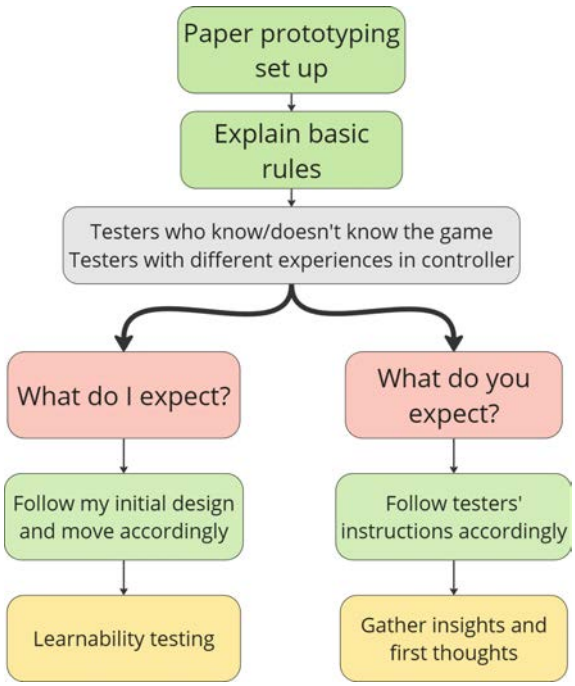

Figure 4.2: Paper prototyping method flow chart.

Specific testing methodologies were implemented to assess various aspects of player interaction. Initially, participants were prompted with an open-ended inquiry: "What do you want to do?" This allowed for a broad exploration of player intentions and preferences. Subsequently, the functionality of the Right Joystick was tested across different blocks, with testers demonstrating proficiency in navigating these elements. This highlighted potential opportunities for enhancing learnability during gameplay.

Encouragement was provided for testers to engage in diverse behaviors and explore unfamiliar actions, aiming to elicit comprehensive feedback.

Figure 4.3: Designed paper prototyping layout 1.

Figure 4.4: Designed paper prototyping layout 2.

The setups in Figure 4.3 and Figure 4.4 were from different testing sessions. One was organized for Box Dragon testers, and the other was conducted with Chalmers students. They weren't intentionally identical or nonidentical in layout or materials as the core of paper prototyping is quick and simple. However, the testers ended up caring about the spacing differences because that matters to their understanding of navigation. Despite this, both setups included all game components and maintained the overall layout for effective testing. A more detailed analysis of the results will be presented later in this section.

4.1.2 Feedback and Results

Tester one: grow up with Xbox.(What do they expect)

The expectation is to utilize the left stick for navigating through cards, starting from the left and progressing rightwards, requiring three right movements to reach the fourth card. Pressing A would execute the play action. For redraw, the preference shifted from using B to cancel, thus B should serve as the cancel button, while redraw should be assigned to another button. There was a moment of regret for initially assigning B to a different function, prompting the adjustment.

To streamline navigation, horizontal movement with the left stick would enable looping within a row, while vertical movement facilitates jumping between rows, regardless of layout variations. Efficiency notwithstanding, clear navigation remains a priority, even if it deviates from the most optimal approach.

End-round actions are anticipated to be cyclical, with a potential shortcut assigned to RB. D-pad left and right are earmarked for navigating the discard and draw piles respectively.

Tester two: Almost never used a controller to play games before. (What do I expect)

Starting with intent information, the focus is initially on the card. Attempting to move up by pressing the D-pad up yielded no result, prompting experimentation. Right joystick up successfully transitioned to the battlefield, with the selection fixed on the leftmost Lantern. The expectation was to traverse rows with left or right movements, with the top option in each row being the first. However, encountering an exception led to the belief that jumping to the same line with the same selection might be more intuitive.

Transitioning back to the hands was achieved by moving down on the Right joystick, and utilizing the left joystick to navigate through cards. The expectation was for moving to the very right to return to the very left, considering it a shorter path. Discovering that the right joystick changes interaction areas led to the expectation that the left joystick exclusively controls the hands, precluding movement elsewhere. Pressing A initiated gameplay and aiming mode, with the desire to use the left joystick for target selection, followed by confirmation with another A press. For non-aiming cards, a double A click for confirmation was expected, mirroring mouse behavior. The next card selection was anticipated to default to the middle of the hand, maintaining consistency irrespective of hand size.

Utilizing the right joystick to navigate left accessed the deck's tooltip, with A opening and B closing the tooltip page. Returning to the pile was expected to resume selection from the last position, rather than starting from the left each time.

Redrawing involved pressing A to enter aiming mode and X to redraw, or attempting to loop through options and check if redraw was available by moving down. End-round actions were mapped to RT or Y, with an expected confirmation indicator, given RT's trigger-like nature, or Y due to it being the remaining shortcut button. All tooltips were accessed using LT or LB, as rarely pressed buttons.

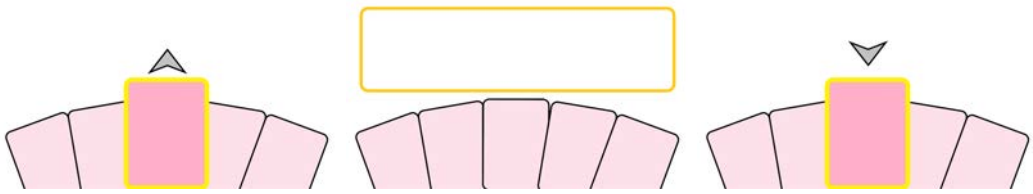

Figure 4.5: Card position memorize when switching views.

Tester three: Consistency and muscle memory, as few clicks as possible.(What do they expect)

B is for canceling aiming and returning to the hands, while the left stick and D-pad are for navigation. X is designated for redraws, and the top card is always highlighted. The D-pad allows for free movement between favorite and command zones.

Initially, they thought about using X, Y, and B to locate different zones but realized there were too many buttons. They then considered using Y to access the upper zones and the bumper to move between zones. The select button is for ending the round. The D-pad left is for accessing the discard pile, while A is for confirmation and B for canceling. LT/RT are used to navigate between the zones of the discard and deck pile, always starting from the left. They prefer not to be warped at all, with the top-left always being prioritized.

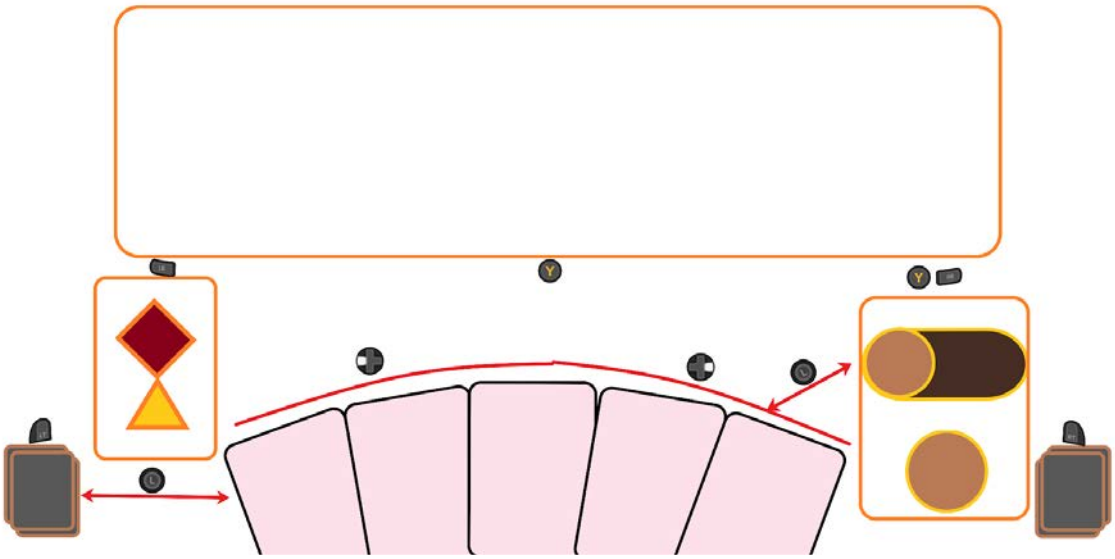

Figure 4.6: Controler input design according to Tester 3.

Tester four: Pretty experienced with Xbox controller.(What do I expect)

They quickly considered using the right joystick to navigate between different parts, but it wasn't the first option that came to mind. The default choice of going up with the left joystick seemed logical, but confusion arose about how to redraw a specific card. Claimed that a clear UI layout on the screen would be helpful. The system feels natural and okay to them. They assumed that the aiming system between enemies should be the same as when moving freely around the battle zones. They wanted more familiarity with the game to be able to know more about what good controls will look like.

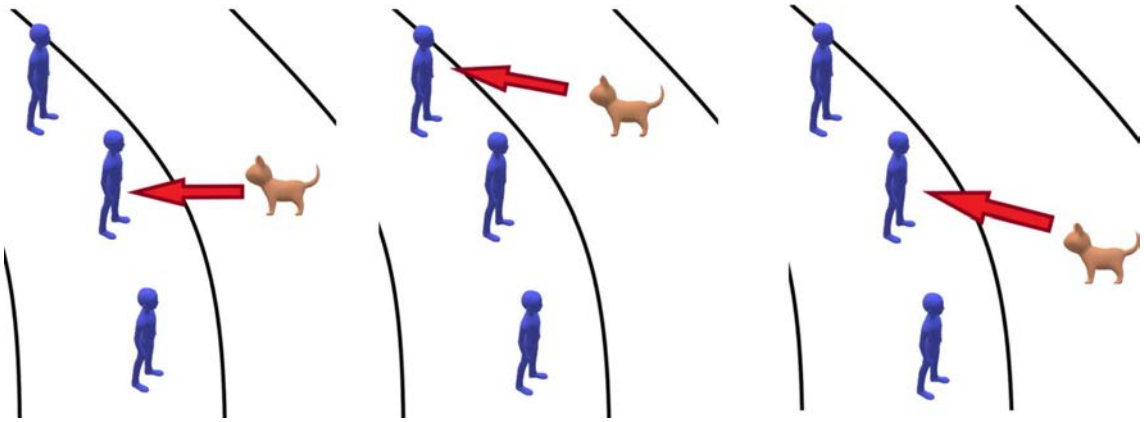

Figure 4.7: Controller input design according to Tester 4.

Tester five: Closeness, distances, and left top first.(What do they expect)

For confirmation, prioritize the top-left rule. If it's very clear to the left, then it should go left. Automatically select the leftmost card. Closeness is the most important thing; it depends on the distances of the UI that should be navigated first. Remember the last place when moving from the battlefield to the End Round/command.

4.1.3 Conclusion

Encouraging participants to explore unfamiliar actions was a key aspect of the testing process. However, challenges arose regarding the differentiation between UI widgets on the screen, revealing a notable limitation of paper prototyping: the lack of clear visual feedback. Widgets only appeared upon mouse hover or controller interaction, leaving players uninformed about important details like end-of-round information. The variation in layout across test sessions led to unexpected outcomes. While the initial session at Box Dragon aimed to understand participants' preferred movements and controls, subsequent sessions in different environments paid less attention to exact UI positioning. Nonetheless, testers stressed the importance of distances and relative positions between UI elements and cards, underlining the impact of UI placement on control preferences.

The study didn't explicitly address fast-paced gameplay, as the goal was to gauge participants' initial reactions. This approach aimed to streamline the understanding of players' instincts and potentially accelerate mastery of controls based on familiarity and initial reactions.

Participants from Box Dragon didn't extensively discuss their imagined controls for Favor, Command, Redraw, and End Round UI tooltips. Conversely, testers unfamiliar with the game expressed curiosity about these elements and attempted to access their explanations. This observation suggests that players familiar with the game may not require frequent UI explanations. Thus, the frequency of accessing

UI tooltips may decrease as players become more acquainted with the game.

Testers indicated satisfaction with either navigation approach, implying flexibility in control design. While this doesn't mandate support for both methods, it underscores that either approach could be effective. It suggests that testers exhibit a degree of tolerance towards input designs differing from their initial reactions, provided they are logical. Additionally, incorporating UI information indicating control design was deemed desirable by testers.

4.2 Footage Review

Tester	Run	Time spent in combat	Combat counts	**First thing to look at**	Second thing	Check Deck	Open Deck	Check Discard	Open Discard	Check Favor& Command	Check Recycle	Check End Round
Tester 1	25 minutes		6	Recycle Zone	Cards	never	never	2	never	4	1	1
Tester 2	20 minutes		5	Cards	Ava, Vanguard	1	never	never	never	2	3	2
Tester 3	1	68 minutes	6	Ava	Cards	never	never	1	never	never	1	1
	2	62 minutes	6	Card	Enemy	1	4	1	5	2	1	never
Tester 4	1	16 minutes	4	Ava	Cards	never	1	1	never	2	2	1
	2	80 minutes	13	Play straight	Play straight	Never	1	2	3	1	Never	1

Figure 4.8: Footage review for 4 testers in total with detailed behavior

Box Dragon has provided footage of players' playthroughs, primarily consisting of their first or second experiences with the game. This footage is valuable for understanding the target audience of paper prototyping: those unfamiliar with the game. In contrast, the purpose of reviewing gameplay footage is to gain insights into player behavior related to tooltip usage and UI interaction frequency. The review also uncovers nuanced patterns in player behavior. By analyzing these recordings, Table 4.8 is created to determine players' initial interactions and how frequently they interact with UI elements.

Originally, the footage was intended to generate a heatmap of mouse traces in the video, revealing areas where players spent the most time. These areas would likely be the easiest to access and should serve as default options. However, due to technical limitations and NDA issues, the quality of the video and the workload prevented this. Instead, I manually watched these videos and marked out the total combat durations. The concept of combat durations and battle length provides insight into how often players engage with UI tooltips. It's important to note that these observations are based on first and second playthroughs; more familiar players are likely to trigger tooltips less frequently.

Observations reveal that players predominantly focus on two main areas during gameplay: cards and the battleground. They trigger tooltips a few times at the beginning, with most of their time spent reading text on cards and characters. The same goes for the deck and the discard pile; players do not frequently check the deck

or discard pile, even though it's the first round of the game. They tend to make use of the deck and the discard pile after they are more familiar with the game, as it wasn't really helpful at the beginning of the game, suggesting potential variations in player behavior influenced by factors such as familiarity with previous deck-building games. These observations underscore the importance of analyzing player actions to understand their preferences and optimize controller design accordingly.

Specific actions and patterns observed during gameplay sessions provide valuable insights. The review also showed that players often hesitate when selecting units, resulting in them frequently toggling between units/hazards and cards. For example, players typically check the discard pile tooltip before accessing the deck, exhibiting a consistent approach to accessing game information. Moreover, players frequently trigger the End Round tooltip before making decisions, but that is likely due to the naturalness of the game since click is a type of hover as well. So as long as the player's mouse is on the End Round area, the tooltip will show. But it is very rare to see the End Round tooltip triggered deliberately in the middle of the combat. Another notable behavior is observed when players attempt to play Hyperbeam, a card that requires both Command and Favor points; they often encounter failure, and then check Favor's tooltip before retrying. This pattern suggests a strategic gameplay approach, where players adapt their actions based on available resources and conditions and the current state of the game. That is to say, they will intentionally read them when confusion arises, very rarely spontaneously.

4.3 Unused Methods

Throughout the methods presented above, there are some that might have been considered for use in player studies but were ultimately not included. Here, I will address three such methods and the reasons behind their exclusion.

Qualitative studies, such as interviews and footage reviews, have been conducted. On the other hand, there are potential benefits to using quantitative studies in player studies, such as asking players to complete a list of tasks in the game and calculating the time they need for each. However, such data collection requires a considerable number of samples, which can be difficult to obtain. Furthermore, while this type of data can be useful for representing a larger audience, it may not provide much insight into what players specifically want.

The mouse heatmap tracking technique was initially planned to be used for tracing the mouse position during the footage review. This would provide an idea of where players tend to place their mouse most often, which could indicate the most frequent interactions and inform button design. This technique is widely used in fields like animal study and web design, where they track players' mouse click times and positions to develop a marketing strategy. However, it was eventually not used due to the poor quality of the video, which made it difficult for most techniques to recognize the mouse's position. Additionally, due to workload privatization limitations

and the scope of the study, this method was not prioritized.

The eye-tracking technique could have been used to track players' eye movements and their first and most significant impressions. It shares the same ideation as the mouse heatmap, where it could be applied to track the most interacted and frequently interacted gameplay sections. Although such an equipment can be provided by the campus, it is quite challenging to set up with players since most of the interviews occur online. Borrowing and returning the equipment also requires considerable effort. Therefore, it was not used.

5
Execution and Process

After the work has been done on the methods, a complete version of the design is provided. A test version featuring Xbox controller support in combat has been crafted by myself with assistance from Box Dragon in Unreal Engine. After having the details about the design, the playtest is structured into three distinct phases: playthrough, survey, and interview, each serving a unique purpose.

5.1 Controller Design

Previous research from literature reviews, previous game studies, paper prototyping, and footage review have provided me with a wealth of knowledge about the considerations that need to be taken into account while designing the controller. Additionally, Box Dragon, as the biggest stakeholder, has suggested some aspects. I will consider these factors and draw my own conclusions about the design. The design presented here is my final implementation version. Specific thoughts not originating from me will be noted when mentioned.

The concept of a fast-paced game is grounded in the assumption that players already possess some knowledge of the game and seek to enjoy even quicker fight satisfaction without overly complicated controls and inputs. Therefore, the design for playtesting is tailored to accommodate players who are already familiar with the game. This implies that the design may not fully cater to first-time players, although their feedback could be invaluable for game design aspects, albeit not within the scope of this research. I break down the design part into a few aspects for better presentation as shown below.

5.1.1 Priority List

Figure 5.1: Priority list from *As We Descend* according to Box Dragon

The combat scene can be segmented into various components, encompassing all the interactions players can access. Many of these components can get reference designs from previous games. To achieve the desired fast-paced game feel, the foremost consideration is how players engage with and play their cards, along with determining which parts of the interface players can cycle through by default. Box Dragon has provided a prioritized list of elements players should comprehend in the game.

I divided the screen into distinct sections based on the aforementioned priorities. Given that card play constitutes the core mechanic and the most crucial activity in combat, I support making cards the sole option to cycle through by default. This approach, informed by testing previous games, aims to prevent accidental button presses and streamline card selection processes. Limiting looping to cards exclusively can enhance efficiency and prevent potential targeting issues.

The second priority pertains to conveying intent information, which players familiar with the game may trigger less frequently compared to those less acquainted with it. I aim to facilitate area and view switching using the same control, reducing the number of controls and simplifying memorization. Therefore, I decided to use a single press to trigger view switching.

Lastly, the third priority involves the tooltip for the End Round Button, Favor, and Command. These elements will not be implemented in the test version for several reasons. Firstly, time constraints and technical limitations give challenges, as Unreal Engine handles tooltip functionality internally when the mouse hovers over widgets. Additionally, since the focus of the test version is on players already familiar with the game seeking a fast experience, I assume playtesters are knowledgeable about these aspects. Moreover, the tooltip implementation ranks low in priority. Therefore, I do not include this feature initially and instead seek feedback from players with some experience in the game. This approach makes sure that players who already know the game well can still understand how to play without needing extra explanations. It also lets us see how players react when certain tooltips are not available.

5.1.2 Input Design

The input design involves selecting buttons, defining the auto-hover system, and determining the overall style. This front-end aspect directly engages players and reflects the design considerations. Button designs serve as the main form of communication between players and the game, representing the thought process behind player interactions.

Figure 5.2: The testing version of the controller design, main view.

5.1.2.1 Play Card

By default, players can only navigate around the hand cards, as explained earlier. The input system supports both the Axis and D-pad functionalities. This choice stems from requests made during paper prototyping sessions, where some players expressed interest in using the left thumbstick for movement, while others mentioned the potential usefulness of D-pad support. Additionally, according to Xbox's official website, the D-pad is designed as "*a raised plus sign-shaped toggle that resides between the left and right sticks*" [2]. Therefore, supporting both Axis and D-pad movements seems reasonable, especially for Xbox compatibility. The full excerpt of the Xbox button design can be found in Appendix A.

While cards can wrap around for navigation, players cannot continuously loop through cards by holding the left stick in one direction or repeatedly pressing the D-pad. This restriction is in place to prevent players from experiencing unexpected jumps, which could disrupt the game's pace and smoothness. When navigating around the cards, the selected card will be highlighted, and a tooltip will appear on the side, mirroring the behavior of a mouse. To enter targeting mode for the currently hovered card, players can press A. They can then use the Axis or D-pad to select their desired target within the targeting mode. Pressing A again will play the selected card on the chosen target, completing one card play. To exit targeting mode and return to hover mode, players can press B. As mentioned in the previous section, A and B are primarily used for confirmation and cancellation, also see Appendix A. Due to their familiarity and Xbox compatibility, I believe these buttons should not have alternative functions.

Figure 5.3: Playing cards with the controller in the testing version.

5.1.2.2 End Round

Both Box Dragon and I are keen on designing a separate button specifically for triggering the End Round function to minimize accidental activations. End Round action uses Y button, strategically chosen due to its distance from the frequently used A button, we aim to ensure the intentional triggering of this critical action in each round of the game. Holding the Y button will confirm the End Round action, while a simple click will only provide visual feedback without triggering any action, see Figure 5.4. This design choice is intended to reduce the likelihood of accidental activations, as players must hold the button to confirm their decision. The duration of holding is determined by the game itself, as it already supports hotkeys for this action when playing with a mouse. Although this may slightly slow down the pace of the game, we believe it is a worthwhile trade-off to prevent unintended End Round activations.

Figure 5.4: End Round button visual transformation when triggered. (Arrows are added from the original gameplay to visualize the rotation)

5.1.2.3 Redraw

In mouse controls, players redraw cards by dragging them into the redraw area. However, this method doesn't translate well to controller input. To address this,

I've incorporated the redraw option into the target list during targeting mode. Typically, players enter targeting mode by pressing A and can then redraw within this mode. Yet, cycling through options each time may not be efficient. Therefore, I've designated a special button for redraw: X. With A, B, and Y already assigned, X is the only available button among the four face buttons. Redrawing is crucial but less frequent, making X an ideal choice. This setup streamlines gameplay, as players can primarily focus on the four main face buttons for most actions, ensuring coherence and fast speed. Pressing A and X mirrors the two-step confirmation already present in mouse controls: selecting the card first and then the target.

Figure 5.5: Redraw in targeting mode.

In cases where players have run out of commands or possess unplayable but redrawable cards, a unique scenario arises. These cards lack viable targets, preventing players from entering targeting mode. To address this issue, I've implemented a special alternative: players can redraw these cards by simply hovering over them and pressing X once, bypassing the need to enter targeting mode. However, this functionality only applies to unplayable cards. While this approach may introduce some inconsistency in button press times and control feel, it represents the best solution available at this stage of development. It will be intriguing to observe players' reactions to this feature during testing.

Figure 5.6: Redraw when the card is not playable.

5.1.2.4 Deck/Discard Pile

The Deck and Discard Pile can be accessed by pressing LB or RB. I opted for the bumper buttons due to their alignment with the semiotics discussed in Section 3.3.3. Bumpers offer a tactile button click sensation and are positioned on both the left and

right sides of the controller, mirroring the layout of the shoulders. This arrangement facilitates quick, momentary inputs that feel intuitive and non-linear. Additionally, since the Deck and Discard Pile are situated in the bottom corners of the screen, associating them with the bumpers feels natural. However, it's important to note that in this testing version, looping through the cards inside the Deck and Discard Pile is not implemented due to time constraints and technical limitations. Players can only open and close these components.

5.1.2.5 Inspection Mode

As previously mentioned in section 5.1.2.1, in the game, cards will be the only option players can loop around by default. However, players should also be able to inspect units and hazards tooltips. To facilitate this, players can switch their view between looping over cards and looping over characters by pressing the left thumb button. Additionally, this button allows players to examine intent and character tooltips, but it should not be easily triggered to prevent accidental activation. Instead, it should be slightly harder to press but still within the main control area. This design ensures that players can switch views when needed without inadvertently exiting the hand interface. Therefore, the left thumb stick press is the final design for switching views.

Figure 5.7: Inspection mode switches between the characters and the cards by Left Thumb Stick click.

5.1.3 Navigation Method

Navigation method refers to how players move between units and hazards in the game, as discussed in the Goals and Challenges section. A significant challenge arises from the game being 3D while projected onto a 2D screen. With a potential maximum of 9(2*4 + 1) character units (including Lantern) and 17(4*4 + 1) possible positions for characters to stand, planning becomes intricate. Our aim is to maintain a fast-paced game by minimizing the number of options to loop through while ensuring players can easily interpret character Intent information. Balancing

the player's effort, especially as they become more familiar with the game, presents a challenge. Both Box Dragon and I aim to reduce "unnecessary surprises" for players while offering flexible controls that feel natural.

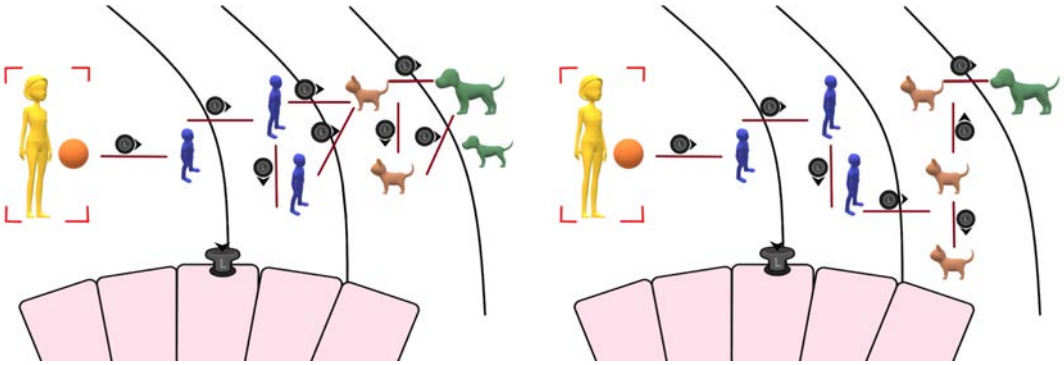

Figure 5.8: Simplification of two navigation methods visually.(Left: A, Right: B)

Given the game's 3D environment and non-orthogonal camera angles, there's potential for ambiguity in character positioning. A character may appear to be on the left of the target visually but left-bottom in 3D Space from where the character is standing, adding complexity to navigation comprehension. It's also evident that playtesters from paper prototyping have differing views on how navigation should be. Some express the value of coherence, where they can predict the next move, while others prefer a more straightforward method without any patterns they need to learn and free controls. Both of these methods can be valuable in the game, so testing different versions is core to the playtesting process. This is the only part that has variations for the playtest, while the rest remains a single design.

The two navigation methods works as follows:

Navigation Method A: This method aligns with the idea of predictable movement and involves navigating by rows, with the game divided into 5 rows. From left to right, these rows are: 1. Lantern, 2. Unit Support Zone, 3. Unit Guard Zone, 4. Hazard Guard Zone, and 5. Hazard Support Zone, see Figure 5.9. It can be a reserve sequence depending on the camera angle. Horizontal movements always change rows(will skip to next if the row is empty), meaning that when a player moves left or right, they transition to the adjacent row. Vertical movements within a row loop through the units or hazards within that row. For example, moving up or down within the Unit Support Zone will cycle through the units located in that zone. Wrap-around is allowed, meaning that if a player reaches the end of a row and continues moving in the same direction, they will loop back to the beginning of that row. This provides a predictable movement pattern that players can become accustomed to over time.

Figure 5.9: Navigation Method A: By Row

Navigation Method B: This method allows for free movement based on the positions of highlighted units/hazards and the input axis. It guides players to the "closest" candidate by considering relative proximity, allowing for movement in any direction. The method supports a range of angles of movement based on the relative position and distance between the candidates. Compared to Navigation Method A, this approach is more straightforward and offers greater flexibility in movement. The logic behind Method B utilizes principles of 2D linear algebra. The core functionality of pseudo-code can be found in Appendix C.

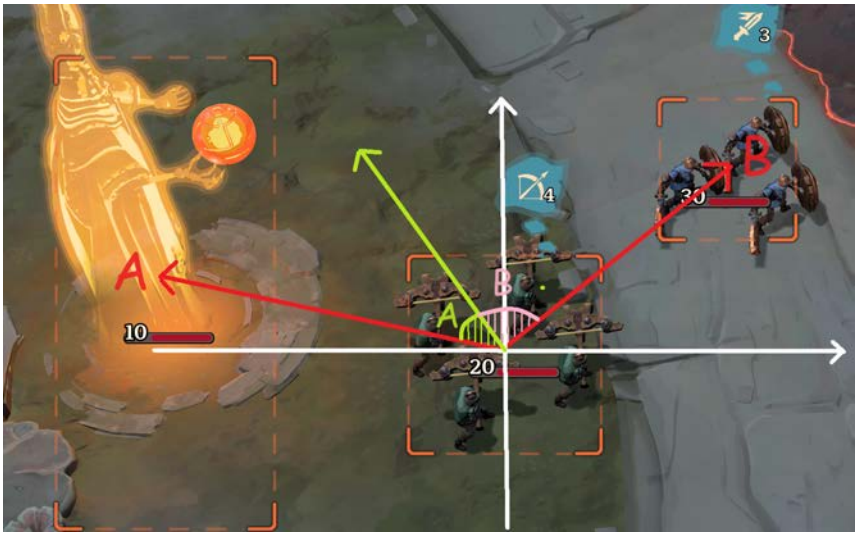

Figure 5.10: Navigation Method B: By Input

5.1.4 Other Designs

As previously mentioned in Research Focus 1.1, the research focus does not include the integration of UI elements. However, in the interest of ensuring clarity and structure during the testing phases, a decision was made to implement helper icons

within the game. While these icons deviate from our initial plan, they are designed to serve a specific purpose: to provide valuable guidance and context for playtesters by displaying controller control icons. Conversely, when a mouse click is registered, the UI returns to mouse mode and the support icons will disappear. In controller mode, the very left card is always the first to be hovered.

A significant difference between controller and mouse usage is that the controller always requires something to be selected. The controller-supported game typically provides players with an auto-first hover card before they have any actual input. In the current testing version, once the controller is detected, players will automatically get the very left card hovered. Any input (including axis and buttons) from the controller side can trigger the switch from mouse mode to controller mode. Additionally, implementing a memorizing system for other cases of auto-hover on the controller can enhance convenience and consistency. From observation of the footage reviews and paper prototyping, if players are about to apply damage to a hazard, they are likely to target the same hazard within one turn. Similarly, when playing a buff card for units, players tend to target previously selected units. This memorization system streamlines gameplay, enabling players to swiftly confirm and play all cards.

The game's controller version includes a memorizing system, a key design feature:
Inspection Mode: Within inspection mode, the game remembers the candidate the player has inspected when switching views between cards and characters. It focuses on the remembered candidate, reducing unnecessary effort as players toggle between views to check intent before playing a card.

Targeting Mode: When entering targeting mode, the game remembers the last candidate players targeted. This is particularly useful when players aim to repeatedly target the same enemy or unit with multiple cards, saving them effort and streamlining gameplay.

Card Index: The game remembers the position of played cards, ensuring that the next auto-hover card occupies the same position. This minimizes interruptions or distractions for players by keeping their focus on recent gameplay events. After a card is played, the game supports auto-hover on the same index as the played card. If the index exceeds the available cards, the auto-hover will shift to either the far left or far right. This approach maintains gameplay coherence and minimizes distractions caused by sudden shifts in focus.

In the absence of any UI components, playtesters might encounter confusion or ambiguity, hindering their ability to effectively engage with the game mechanics. By introducing the helper icons, I aim to mitigate such challenges, offering visual cues that aid in comprehension and navigation. It's important to emphasize that these icons are not intended to influence gameplay or alter the core mechanics under investigation. Instead, they function as supplementary tools, offering informational support without compromising the integrity of our research objectives.

A drop-down bar is implemented in the game along with some helper text. It will allow players to choose between Method A and Method B in the game, but mouse input is required for selection. This decision ensures that the controller design remains natural and consistent, maintaining the integrity of the game testing experience. Avoiding the addition of a dedicated button for method selection ensures the focus remains on the game itself rather than test-specific features, minimizing irrelevant feedback.

5.2 Process

This is the playtest ad that has been sent out to playtesters before they start:
As a playtester, you'll need to:

1. *Have played the game using the mouse for approximately 2 hours or more.*
2. *Have an Xbox controller (preferably Xbox X/S series, but other versions should work too).*
3. *Record your playthrough and voice commentary simultaneously (no camera required).*
4. *Complete a short survey (approximately 5 minutes).*
5. *Participate in a follow-up interview based on the survey and recorded playthrough (approximately 20 minutes).*

The playtest will follow this structure:

1. *You'll receive a special secret command in-game to trigger controller support and play the game using the mouse (yes!) outside of combat.*
2. *You'll then play the game inside combat using controllers. The combat begins when the "combat begins" text shows in the middle of the screen. The combat ends when you kill the last hazard or get killed.*
3. *You'll test two methods. Play the game with the given order on each navigation method for 3 cycles(3 battles).*
4. *Feel free to comment on anything that comes to mind—your thoughts don't have to be limited to controller-related aspects.*
5. *Afterward, complete the survey and upload your playthrough, the link will be provided in the survey. You'll be asked to provide your email in the survey as well, and I'll follow up to schedule an interview (no camera needed, but I'll record the screen for our discussion).*

The game underwent testing by 10 individuals, four from Box Dragon and six from the closed Beta. They all have sufficient experience playing games in general to be able to test the game. At the moment of testing, Box Dragon is currently running their closed Beta playtest. The six playtesters are my friends and classmates from my education at the University, the effect of this is aware and will be discussed in Discussion7. They all followed the instructions and made sure the test ran as I requested. An extra note is that two of the Beta testers only have a PS5 controller. But they made the game work with third-party software that makes the game think of their PS5 controller as an Xbox controller. The affection will be addressed in the

Result section and Discussion section.

These participants were divided into four groups to ensure diverse perspectives and mitigate biases. The rationale behind this division was to prevent favoritism towards a particular method based on the sequence of play. Thus, I ensured that each group had an equal amount of individuals starting with Method A and the others starting with Method B. It's a repeated measures design using counterbalancing to eliminate crossover effects. This approach aimed to counteract any potential bias resulting from participants favoring the method they played first or having a stronger impression of the most recent method experienced. Both methods were tested as the first one by five testers in total.

Moreover, it was essential not to exclusively involve individuals from Box Dragon, as they were already very familiar with the game. Including participants with fewer hours of gameplay may provide a broader range of perspectives, ensuring that opinions from both experienced and less experienced players were considered. By evenly distributing the eight participants across four different groups, I aimed to obtain diverse feedback representative of various player experiences.

5.2.1 Playthrough

During the playthrough phase, the goal is to capture players' genuine reactions to the controller as they experience it for the first time. Method think-aloud protocol is a method used to gather data in usability testing in product design and development, in psychology, and in a range of social sciences which was applied in this process. This method encourages players to share their thoughts openly, focusing on any aspect of the game that comes to mind. This approach not only gathers feedback on the controller but also creates a natural testing environment where players feel comfortable expressing their opinions.

The main focus of this phase is to observe player behavior and preferences regarding navigation methods from their previously required recorded playthroughs, evaluate the overall pace of gameplay, and identify which navigation method players prefer. To maintain a fast-paced gaming experience while allowing players to navigate the game comfortably and intuitively.

5.2.2 Survey

The survey conducted after the playthrough is designed to gain a comprehensive understanding of the players' overall feelings. While small comments can provide valuable details, they may not fully capture the player's final opinion. Therefore, it's important to conclude the survey by asking participants, "How do you like it overall?" Although some questions may have already been addressed during the playthrough, the responses obtained may vary and contribute to the final results by reflecting the players' overall impressions the most. Here are the prepared questions, each explained with its intention:

- **Rate your controller usage in general from 1-5 ***

This question aims to gauge participants' overall comfort and proficiency with using the controller, which may be a reference to how professional they will reflect on the design.

- **Did you notice any difference between the two different navigation methods?***

I want to ascertain if players are aware of any distinctions between the navigation methods. I typically avoid asking testers if they understand the differences because the crucial aspect is the game's feel; players don't necessarily need to comprehend the logic behind it. As long as there's a noticeable difference to compare, they will likely have a preference, and that preference is what I'm truly interested in here. It could be quite significant.

- **If yes, which navigation method do you prefer and why? If no, you do not need to answer this one.**

This question allows participants to express their preference if they are aware of the differences between the methods. Otherwise, it's not meaningful to ask.

- **Which input (controller, mouse) is more efficient for you and why?***

This question aims to remind players of their specific preferences regarding which method they find more efficient. Although I tend not to ask which method they prefer, as preference can stem from various reasons, efficiency can significantly impact the game pace. This is a core question to explore further during the interview.

- **Do you find anything in the controller input that is very different from the mouse input?***

This question explores any notable distinctions participants perceive between using the controller and the mouse. While the aim is to ensure that actions on the controller mirror those with the mouse, inherent differences between the input methods exist. However, if some unavoidable changes are very noticeable, they can be appreciated or not. Therefore, it's another way of asking the same question, but I can gain more information from it. It's interesting to uncover participants' perspectives on these differences.

- **Any other thoughts or suggestions?***

This open-ended question provides participants with an opportunity to share any additional insights or suggestions they may have during the follow-up interview.

5.2.3 Interview

In the final segment of the playtest, participants will engage in an interview session to provide qualitative insights into their gameplay experience, allowing for a more thorough exploration of player opinions, preferences, and specific challenges encountered. After completing the playtesting and survey, I'll review both to generate questions that combine insights from both sources for the interview.

The interview aims to delve deeper into players' underlying thoughts and opinions. Players often offer insights without fully understanding their reasons, and the fram-

ing of questions significantly influences responses. I prefer asking instructive questions to prompt participants to generate ideas or guide them through their thought processes. This approach helps reveal their genuine thoughts. The full interview transcript can be found in Appendix D.

6
Results

Overall, feedback on the controller input was largely positive, with many testers expressing surprise at how well it followed their commands and praising its smooth functionality. One player expressed, "*Works really well! I was surprised by how well it followed my commands*" while another stated, "*In general, it feels really good, smooth, and the buttons made sense to me! I really liked it.*" Some testers appreciated the quick pace facilitated by the controller, while others noted a slight learning curve in getting used to certain actions, such as choosing troops in rows or selecting enemy crit points. Suggestions for improvement included slowing down card transitions for smoother visuals, improving clarity on selected units, and refining certain interactions, such as accessing details on units or implementing a held button for discarding to prevent accidental actions. Despite minor issues, many testers found the controller input intuitive and comfortable, offering a pleasant alternative to mouse input, particularly in terms of ergonomics.

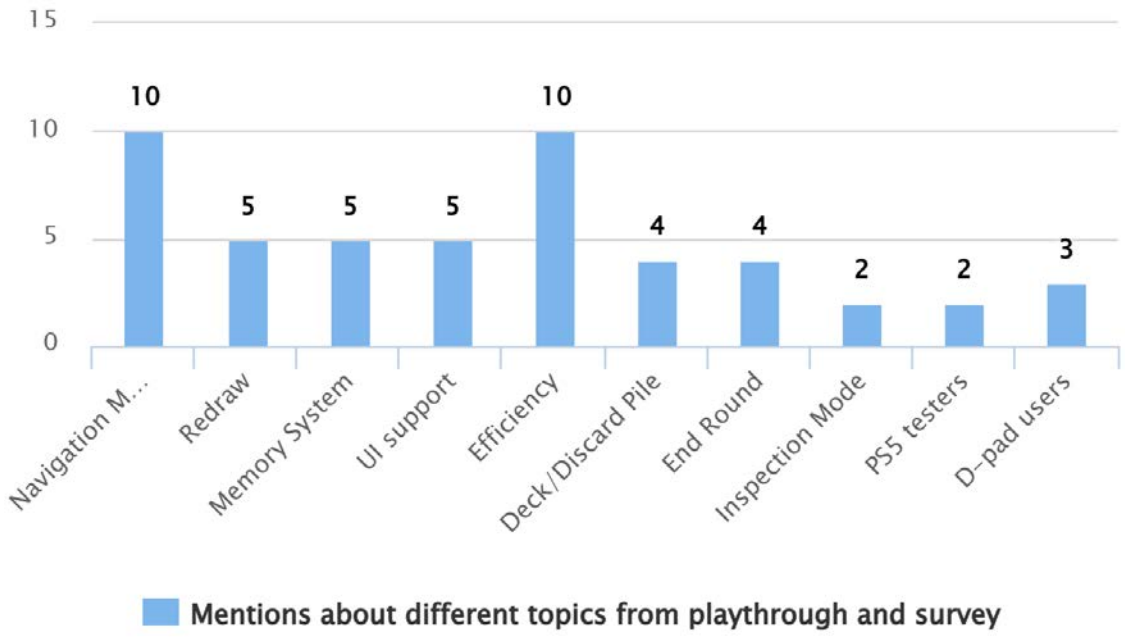

Figure 6.1: Mentioned topics in playthroughs and interviews

Different topics from the playtest and interviews were brought up. Chart 6.1 shows the topics mentioned by players spontaneously, and the interviews helped me to un-

derstand their views better. These topics will be presented separately as follows and discussed in Chapter 7. The absence of comments from individuals about specific topics, or the lack of mention of certain topics altogether, can be considered positive. It suggests that these aspects feel natural to the players, which is a good sign.

6.1 Navigation Method

	Source	Expirence with controller usage (1-5)	Played Sequence	Found the logic	Preferred
Tester 1	Box Dragon	4	3A + 3B	None	B
Tester 2	Box Dragon	5	3B + 3A	None	A
Tester 3	Box Dragon	4	3A + 3B	None	B
Tester 4	Box Dragon	5	3B + 3A	A	B
Tester 5	Beta	4	3A + 3B	None	A
Tester 6	Beta	4	3B + 3A	Both	A
Tester 7	Beta	4	3B + 3A	A	B
Tester 8	Beta	4	3A + 3B	None	A
Tester 9	Beta	4	3A + 3B	A	B
Tester 10	Beta	5	3B + 3A	None	B

Figure 6.2: Navigation method playtesting results.

The majority of testers (60%) expressed a preference for Method B for navigation. They found that it followed their intentions better and provided more freedom of movement. Testers appreciated the intuitive nature of Method B, particularly when selecting units based on row divisions rather than relative positions on the screen. Here are the few points that were brought up by the playtesters in Method B:

1. **Free Movement and intuitive targeting**: Method B offers a more open and flexible approach to movement, allowing players to navigate the game environment with greater freedom. It provides a wider range of movements, enhancing player control. Method B's targeting system, based on the direction of joystick movements, is seen as intuitive by some players. They find it natural to aim towards the desired target, relying on instinctive thumb movements.

2. **Efficiency and Speed**: Players appreciate the speed and efficiency of Method B, especially when executing actions quickly. The ability to skip intermediate steps and directly target enemies saves time during gameplay.

3. **Potential for Improvement**: Despite initial challenges in getting used to Method B's controls, players acknowledge its potential for efficiency and smooth gameplay once being accurate. The effectiveness of Method B depends on proper implementation within the game. Players note that accurate targeting

is essential for Method B to work seamlessly without confusion or frustration.

4. **Trade-off Between Speed and Predictability**: While Method B offers speed, it may sacrifice the predictability and precision found in Method A. Some players prioritize speed in their gameplay experience, willing to adapt to Method B's less structured approach.

On the other hand, 40% of testers favored Method A for navigation. They appreciated its structured approach and consistent patterns. Testers felt that Method A provided more organization and clarity, particularly in scenarios with multiple units. However, some testers encountered challenges with Method A, such as confusion over directional movements or inconsistencies in movement responsiveness due to some bugs and technical issues. Here are a few points about Method A from playtesting:

1. **Logical Structure**: Players appreciate the structured approach of Method A, where movements are based on a consistent pattern. It offers predictability and familiarity, which some find intuitive.

2. **Organization with More Units**: Method A is seen as more organized, especially when dealing with multiple units. The division of units by rows aligns with how some players naturally categorize units in their minds.

3. **Consistency and Precision**: Despite initial confusion for some, once understood, Method A offers consistent and precise movements. It allows for strategic planning and execution, particularly in complex battles with numerous units. Players perceive Method A as a safer option due to its predictability. It ensures that the intended action is executed reliably, which is crucial for strategic decision-making in intense gameplay situations. The placement of characters also follows a grid-like structure where the game is divided by rows and columns for some testers. Method A aligns well with the game's mechanics, offering precision targeting and efficient gameplay.

4. **Preference for Known Patterns**: Players who prefer Method A often cite familiarity with similar control schemes from other games. They find comfort in recognizing and mastering the established pattern of movements.

Overall, while both methods had their strengths and weaknesses. The navigation methods were primarily noticed and evaluated during interactions with enemy units, particularly when testers needed to access detailed information about them. testers pointed out that the effectiveness of the navigation methods became more noticeable in scenarios with multiple hit points, such as boss fights, where patterns and organization were more apparent. This suggests that the navigation methods were primarily used when reading details about enemy units, rather than when playing cards or performing other actions. Additionally, testers emphasized that the complexity of the encounter, especially the number of hit points, influenced their

perception of the navigation methods, with more hit points making patterns and organization more obvious.

6.2 Redraw

As we discussed in section 5.1.2.3, redraw has been designed into two different phases where there's one universal case for all playable cards and the other special case for unplayable cards. The redraw mechanic emerged as a controversial topic among players, with contrasting views shaping the discourse. On one hand, several players praised elements of the mechanic, particularly the inclusion of a two-step confirmation process. One player remarked positively, stating, "*The confirmation step before redraws prevents accidental discards, enhancing player control.*" Additionally, some players appreciated the visual cues provided for redrawable cards, finding them helpful in decision-making. However, amidst these positive sentiments, there were voices of dissent. Certain players found the redraw process unmanageable and disruptive to the gameplay flow. One player expressed frustration, stating, "*I find it frustrating that I have to go through multiple steps just to redraw a card. It feels unnecessary and slows down the pace of the game.*" These differing perspectives underscore the complexity of the redraw mechanic and highlight opportunities for refinement to address player concerns while preserving its positive aspects.

6.3 Memory System

The memory system on played characters sparked considerable discussion among the players, with five participants mentioning it during their playthrough or in the survey about their experiences and preferences. Some players appreciated the system, noting that it added an element of challenge and encouraged them to be more mindful of their actions. One player remarked, "*I like it; it made me make some errors sometimes. It's a matter of habit.*"

However, others expressed uncertainty about why they preferred the system but acknowledged its benefits. One player mentioned, "*I couldn't say exactly why I prefer it like this, but I think it's better than the selection being reset all the time.*" This uncertainty highlights a common theme among players—while they may not fully understand why they prefer the system, they recognize its positive impact on gameplay. Additionally, players discussed the intuitive nature of selecting targets, particularly when applying buffs or abilities. Some players found it more intuitive for the selection to start with the character closest to their avatar, typically in the support zone. Another player noted, "*I always wanted it to start in a support zone. If it's the origin, then it always starts with this one.*" This suggests that players value consistency and predictability in target selection, as it simplifies decision-making and reduces the need for excessive cognitive load during gameplay.

Overall, the discussions surrounding the memory system on played characters highlighted a range of perspectives, from appreciation for its challenge-inducing effects to preferences for intuitive target selection mechanics. Despite varying opinions, players generally agreed that a consistent and predictable system contributes to a smoother and more enjoyable gameplay experience.

6.4 Visual Support

The issue of UI support for more obvious visual cues garnered attention from players, with several expressing concerns about the clarity of target selection, particularly when using a controller. One tester from Box Dragon attributed their confusion to the UI presentations, stating, "*When you play with the mouse, you're sure which unit you are dropping into the shield and stuff like that. But with the controller, how we highlight is not clear enough.*" This sentiment was echoed by others who suggested that the current highlighting system, which relies on subtle color changes, could be improved to provide clearer indications of selected targets. This is something on the game design side, not from the controller testing version, therefore it is out of the scope of the study. But it was more obvious when using the controller since players don't have a cursor with them on the screen.

Players proposed various solutions to enhance visual feedback, such as incorporating additional shapes or effects to differentiate selected targets. One player suggested, "*If I want to do an action from the lantern to a unit, the unit I select will appear in a square around it. And the square will turn from red color into yellow.*" This approach aims to mitigate confusion, especially for new players, by providing more distinct visual cues for selected targets. Additionally, concerns were raised about the similarity of colors and shapes used for highlighting, with one player suggesting the adoption of different colors or shapes to improve clarity.

Overall, players emphasized the importance of intuitive and clear visual cues in target selection, particularly for controller users. Suggestions for enhancing UI support ranged from color and shape changes to the incorporation of additional visual effects, all aimed at improving the player experience and reducing instances of confusion or error during gameplay.

6.5 Controller vs Mouse Efficiency

All testers essentially expressed their view in the survey about their preference regarding efficiency between the mouse and controller. Out of the ten responses, five participants favored the mouse as the more efficient input method, citing reasons such as greater control, precision, and familiarity with playing card games using a mouse. Meanwhile, three participants leaned towards the controller, highlighting its speed, smoothness, and comfort during gameplay. Two participants expressed

mixed opinions, acknowledging the strengths of both input methods depending on the situation.

Participants favoring the mouse cited its superiority in control, precision, and familiarity with playing card games. They emphasized feeling more confident in their ability to navigate the game environment with ease and accuracy. For them, the mouse interface provided a seamless and intuitive way to interact with the game's mechanics, allowing for efficient decision-making and task execution. Additionally, the customization options and adaptability of the mouse interface were noted as key factors contributing to their preference for this input method.

Those preferring the controller highlighted its speed, smoothness, and comfort during gameplay. They found that using a controller offered a fluid and responsive gaming experience, particularly when selecting cards or navigating through menus. The ergonomic design and tactile feedback of the controller in other games also contributed to their overall comfort and enjoyment, allowing for a relaxed gaming experience. Additionally, the convenience of being able to lean back and play without the need for precise control or constant hovering over elements was appreciated.

Participants with mixed opinions acknowledged the strengths of both the mouse and controller depending on the situation. They recognized that each input method had its advantages and disadvantages and appreciated the flexibility of being able to switch between them based on their preferences and gaming needs. While they acknowledged the precision and familiarity of the mouse interface, they also recognized the speed and comfort offered by the controller. This balanced perspective allowed them to adapt their gameplay style accordingly, optimizing their efficiency and enjoyment based on the demands of the game.

6.6 Deck/Discard Pile

Four participants expressed thoughts regarding the deck mechanics, focusing on its accessibility and functionality. They appreciated the convenience of being able to access the discard pile and draw pile with a single trigger, finding it instinctive and versatile. The ability to switch between piles without returning to combat was noted as a time-saving feature. However, they noted issues with placing cards on top of the pile and expressed a desire to scroll through the cards in the pile using the left stick or D-pad. Some suggested having a separate UI window for the discard pile to enhance visual clarity. Although not all testers initially used the feature, some started utilizing it more after discovering specific cards and wanting to see more information about them.

6.7 End Round

Four participants shared their experiences and opinions regarding the mechanic of

holding a button to end the round, generally expressing positive sentiments tempered by concerns about accidental triggers and the impact on game flow. While some participants found the feature engaging and appreciated the added layer of control it provided, others felt it disrupted the flow of gameplay, leading to moments of confusion and frustration. Despite this, there was a consensus that the longer press requirement served a purpose in preventing accidental actions and promoting intentional decision-making, particularly in crucial moments of gameplay. As one player commented in the interview D.4 "*It was an important fight before the boss healed, I was so panicked when I accidentally hit Y because it was an important button. But thankfully it didn't get registered. So I really like that you need to hold to end the round.*" One participant highlighted the importance of balancing the duration of the hold, suggesting that while a longer press may prevent accidental triggers, it shouldn't overly restrict the pace of the game. Overall, while the majority of participants welcomed the confirmation mechanism, there was a recognition of the need to refine its implementation to ensure a smoother and more intuitive player experience.

6.8 Inspection Mode

The inspection mode button design introduced in section 5.1.2.5 was generally considered useful, especially for checking details about enemies and player characters, such as attack range and special effects like auto-attacks. Testers found it particularly beneficial for understanding game mechanics and making strategic decisions, especially for beginners who may need more information to grasp the game's intricacies. Despite occasional reports of the game bug where the button fails to trigger, testers overall appreciated the clarity and depth of information provided by the inspection mode.

6.9 Left Thumb Stick and D-pad support

Out of the 7 participants, many preferred the left thumbstick for its familiarity and comfort. They found it easier to use, especially in the heat of battle.

However, 3 participants favored the directional pad (D-pad) for its precision and structured inputs. They highlighted the structured nature of the D-pad, which offers distinct directional inputs, making it feel more logical and providing greater control over movement. These participants found the D-pad to be more accurate and efficient, especially in situations with multiple options or units to navigate through. They initially used the left thumb stick but eventually switched to the D-pad as they found it to be more precise and responsive, particularly in scenarios where accuracy and speed were crucial.

6.10 Other aspects

A few participants also shared their thoughts on various other aspects of the game. Despite some initial confusion caused by the different button icons on the PS5

controller, one PS5 tester generally adapted quickly to the controls. It didn't significantly impact gameplay once they became accustomed to them.

In terms of Inspection Mode, 2 testers mentioned this and found it useful for checking details about enemies and player characters. However, one tester encountered minor difficulties in recalling specific icons or details, which being suggested that potentially be improved for better clarity.

Moving to card animations, one participant expressed a desire for smoother transitions between card selection states. They felt that the abrupt appearance of cards could disrupt the flow of gameplay, suggesting that implementing more gradual transitions could enhance the overall experience. These insights into various aspects of the game provide valuable feedback for potential refinements to improve player immersion and usability.

7
Discussion

7.1 Playtesting Review

The playtesting process encompasses both the development of the test version and the actual conduct of playtesting. The detailed process is outlined in the Execution and Process chapter. The playtesting review is intended to provide insights into the testing version and to reflect on the overall research process. It offers reflections on my satisfaction dimension and considers what could have been done differently for smoother execution.

7.1.1 Test Version Review

With regard to the development, the project met the majority of its goals and fulfilled personal goals. Considering the time limit and the resources available, I believe I've given my best effort. This being my first development experience in Unreal, I'm satisfied with what has been delivered to the players based on their feedback. The test has yielded valuable results for the research, although some parts could be improved.

As the result showed in 6.8, I unexpectedly found that the tutorial for the controller scheme could pose a significant challenge. While this research isn't primarily focused on teaching players about UI design, icons, or controls, it's crucial that testers don't encounter confusion that impedes their progression to the actual design part. This issue can be quite problematic but also avoidable. If I could have done things differently, I would have paid more attention to the UI interface, delivery, and learnability of controls to prevent potential comprehension issues that might block testers from effectively testing the game. This could significantly impact the results, ensuring more useful feedback rather than statements like, "Oh, I didn't know you could do that, so I didn't."

A notable incident was when one player didn't realize they could press the left thumbstick to switch views until I mentioned it in the interview. Several testers discovered this function while switching methods during testing, as the information was displayed beneath the method-switching UI, see Figure 5.2. However, some testers mistook this information for part of the testing alert and didn't pay attention to it. Incorporating tutorial animations could alleviate such issues.

I would also advise future investigators interested in the subtleties of controller design to prioritize making the game bug-free. I noticed that since I asked players if

they noticed any differences between Method A and Method B, they were particularly attentive to any evidence of distinction. Unexpected differences arising from game crashes or bugs can mistakenly be perceived as intentional design choices. For instance, some testers noted that in Method A, they could use the left thumbstick to view the playfield, while in Method B, they couldn't. They assumed this was intentional, but it was actually a bug. Such "noise" in the game can affect players' opinions on specific aspects. Therefore, efforts should be made to minimize such occurrences and provide a cleaner testing environment. While unavoidable issues may arise from the game's side, minimizing these factors in the test version can enhance its quality.

7.1.2 Limitations from the Game

The lack of UI support was a recurring issue highlighted by testers, who felt that the UI support wasn't adequate. Specifically, they pointed out that the selection of units and enemies wasn't obvious enough due to the similarity in color, making it difficult to discern which one was selected. While it was noted that more obvious UI could address this, even some testers from Box Dragon expressed that clarity was lacking in the game itself, emphasizing that it's not a problem on my end, but rather an issue with Box Dragon. While the mouse input worked fine, for controllers, better visual support is necessary as the cursor icon is absent. The game requires improved UI to clearly indicate the player's selection.

The feedback underscores the crucial role of UI clarity in enhancing player experience, particularly for controller users. Designing clear visual indicators and intuitive interfaces is essential to minimize player errors and confusion. This entails careful consideration of color contrast, shape differentiation, and animation to ensure that selected targets or actions are distinctly highlighted. Implementing distinct visual cues for different actions can enhance navigation efficiency and overall usability.

7.1.3 Playtest Conduction Review

I also want to address the challenge of assembling a completely neutral panel of testers. All the testers are either my friends or people I know from Box Dragon. It's acknowledged that since testers are personally acquainted with the developer, there may be a tendency to offer feedback that's more pleasing rather than entirely honest. This is an inherent limitation of playtesting, as access is typically restricted to acquaintances. However, it's worth noting that one tester, who is a friend of mine, tried to think up a better way for the thesis, not just from their own perspective. I found this quite interesting, but it's not entirely avoidable given the circumstances so these factors should be and had been taken into account while reviewing the results.

During testing, participants tended to immediately interact with the LB and RB buttons upon seeing them on the screen, even if they primarily used a mouse. This inclination to explore new features or push boundaries is natural and should be em-

braced.

The game typically begins with a limited number of units and enemies. If a tester finds themselves struggling or if the game crashes, they must restart and retry from the beginning. Worth mentioning that since the game has not yet been released, so there's a lot of flux in game design and code from day to day. This limited opportunity for progression may slow testers' ability to distinguish logical differences or provide comprehensive feedback. I found it smart to drop the players into action without too many rules or concerns, as players sometimes forget to use the controller to test the game. While they're engaged in the game, they're unlikely to remember complicated steps or instructions. Some testers also preferred not to read the instructions and played the game with the wrong method initially, but corrected themselves after a short while.

The naturalness of playtesting is beneficial, but it can also pose challenges in achieving consistent results. It is known that players might try to break the game or engage in unexpected behaviors even before playtesting begins. The idea is to drop them into action and hope for the most natural results. This approach doesn't affect the outcome of the testing, but it requires more effort to determine what is actually useful for the study, as the focus is solely on relevant topics. Players have different encounters with the game and varying levels of experience with card games in general. Some players experienced the boss, while others didn't. One playtester intentionally skipped the boss fight because they felt they performed poorly using the mouse. Some testers experienced frequent crashes, limiting their ability to test beyond the early stages. These factors ultimately affect the results. Embracing the inherent diversity among individuals and being aware of these differences is necessary for conducting effective playtesting.

7.2 Player Preference

It's essential to recognize that player preference encompasses various elements beyond efficiency alone. Some testers may prefer one method over another due to technical issues or lack of experience with one of the methods.

7.2.1 Controller vs Mouse Efficiency Preference

Regarding the preference between mouse and controller, the majority of testers expressed satisfaction with the controller controls, despite their initial reservations or biases against controller-based gameplay for card games. People can sometimes be stubborn about their preferences. Quite a few testers explained that it wasn't that the controller wasn't good enough, but rather, they were simply too accustomed to using a mouse and preferred it. Conversely, some testers found it easy to adapt to the controller, perhaps because they had been using controllers for other games recently, or because their mouse had an uncomfortable DPI, making the controller

a more appealing option.

However, this doesn't decline the value of the study. On the contrary, it sheds light on the essential difference between controllers and mouse — they are two distinct input modes. Throughout the study, the goal was to offer an equally efficient experience as the mouse. However, it became evident that they are intrinsically different, and the experience will never be identical. Some players will still prefer the mouse, especially for card games, where mouse usage is irreplaceable for them. Nevertheless, this underscores the research value of exploring controller designs, which are rarely considered for card games in Roguelike deckbuilders.

From the study, we can draw insights into what to avoid and what to incorporate when offering the option to play with a controller in such games. The aim is to provide the most efficient design for controllers on their own terms, without direct comparison to the mouse.

7.2.2 Navigation Method Preference

One tester preferred Method B over Method A due to its lower frequency of crashes. This preference underscores the importance of considering irrelevant factors to the study that can impact gameplay. While some testers perceived the mouse as more efficient due to its ease of movement, others favored the controller for its comfort and accessibility, such as being able to play while leaning back on a couch.

Challenges arose in separating feedback on controls from feedback on gameplay, as they are inherently intertwined. Testers sometimes expressed frustration with the game itself, which could influence their perception of the controls. For example, using a mouse outside of combat could lead testers to forget to utilize a back controller efficiently, or the increased familiarity with the mouse might make switching back to it feel like more effort. Some testers expressed a preference for the controller simply because they had been using it frequently and were accustomed to its feel.

Ultimately, it's not solely about persuading people to love a design, but rather offering the best design possible. While most testers preferred the familiarity and comfort of mouse and keyboard controls, they still found the controller experience to be viable and efficient. Personal preference played a significant role in their choice, with some testers stating that they would continue to use the mouse and keyboard due to habit, but acknowledging the quality of the controller experience provided in this game.

7.3 Navigation Method

In assessing the navigation methods for the game, it's evident from the playtesting feedback that both Method A and Method B possess distinct advantages and drawbacks.

Method B's strengths lie in its intuitive and straightforward approach. Players found it natural to aim towards desired targets, enhancing their sense of control and immersion. Despite initial challenges in mastering Method B's controls, testers acknowledged its efficiency and smooth gameplay once they became accustomed to it. However, a challenge for Method B is its need for precision; if executed precisely, it can offer a seamless experience.

Method A is favored for its structured and organized navigation. Players appreciated its logical structure and consistency, which provided predictability and familiarity, particularly in scenarios involving multiple units. Method A's division of units by rows aligned well with how some players naturally categorize units in their minds, enhancing their ability to strategize and execute actions with precision.

Some testers found Method A less adaptable in fast-paced situations and preferred the flexibility offered by Method B. Additionally, the method's reliance on established patterns and structures may limit its applicability in scenarios requiring unconventional or dynamic movements, interactions with enemy units, and boss fights. Testers noted that the complexity of encounters, especially the number of hit points, influenced their perception of the navigation methods, with Method A's organization and predictability becoming more apparent in such scenarios.

Testers tend to notice the difference when there are more units and enemies in the playing field, meaning that if there aren't too many in the game, the two methods theoretically work similarly. When there are more units, Method A and B can both be effective, depending on the player's preferences. Players generally have a high tolerance for surprises and express their willingness to learn, so as long as the pattern and logic make sense to them, it should be acceptable. Few testers also expressed that even though they had a preference between A and B, the difference wasn't significant; both were seen as good, and they could appreciate the benefits of both.

In terms of game design implications, the feedback suggests the importance of balancing structure and flexibility in navigation systems. While Method B excelled in providing freedom and speed, Method A offered reliability and precision. Game designers may consider implementing a hybrid approach that combines the strengths of both methods or providing customization options for players to choose their preferred navigation style based on their gameplay preferences.

Overall, the playtesting feedback underscores the significance of navigation methods in shaping the player experience and highlights the need for iterative design processes to refine and optimize these systems based on player feedback and preferences.

Ultimately, the decision may hinge on what is deemed most suitable. While my own preference is stated above, I believe supporting both and making Method A the default option would be ideal. Method A's patterned approach, despite being less efficient for some, offers precision and entails lower development costs. Thus,

players who prefer a different approach would always have the option to change. This strategy aligns with similar implementations seen in games like Slay the Spire, where players have the option to toggle animations for a faster pace. After presenting the result with Box Dragon, they reflected that there could be a design blend between the two main advantages of Method A and Method B, so it can be predictable, precise, and straightforward at the same time. But the final decision rests with Box Dragon on this topic. Furthermore, it would be an interesting subject for future study to explore which method should be the default option and why. This research focuses on key design considerations rather than determining the best version.

7.4 Controller Inputs Design

Providing intuitive and efficient control schemes is essential for a seamless gameplay experience. Offering options for both the Left Thumb Stick and D-pad navigation caters to diverse player preferences and accessibility needs. Consistency in input methods across different actions ensures player comfort and familiarity. Designers should strive to strike a balance between preventing accidental triggers and maintaining the flow of gameplay, adjusting hold times based on player feedback to optimize usability. However, it's notable that one tester used the D-pad on a PS5 controller. Since the D-pad position on the PS5 controller and Xbox controller is reversed, it may be due to the accessibility feature introduced before in Section 3.3.4, and Figure 3.6 clearly shows that the primary area is usually in that region.

Figure 7.1: Xbox controller face(left) and PS5 controller face(right).

Mechanics such as redrawing and End Round actions should be designed with player flow in mind, balancing clarity and speed of gameplay. Longer press actions should prevent accidental triggers without disrupting gameplay flow excessively. Smooth transitions and animations contribute to the overall immersion and intuitiveness of interactions, enhancing the player experience. Designers should aim to create transitions between different game states, ensuring that actions feel natural and responsive.

Another limitation of the game lies in the Redraw mechanic. While designing Redraws, I encountered certain cards that could be drawable but not playable. Initially, I thought it might be beneficial to incorporate Redraw as part of the targeting options. In mouse mode, players could enter the targeting mode first and then redraw. However, the design didn't account for the scenario where an unplayable card couldn't enter the targeting mode. This necessitated special case handling. Reflecting on this, I wonder if I could have approached it differently to ensure consistency in the game's handling of redraws. Despite receiving compliments on the two-step confirmation feature, I am uncertain whether a universal design of holding to redraw could achieve the same outcome. This experience highlights the importance of recognizing that controller schemes can stand on their own and should not be strictly bound to mouse-based designs.

Implementing auto targets, such as the memory system for played characters, helps reduce cognitive load and streamline decision-making for players. Simple and intuitive memory systems operate seamlessly in the background, enhancing gameplay without drawing excessive attention. Designers should prioritize simplicity and effectiveness in memory aids, ensuring that they enhance rather than detract from the overall player experience.

Designing inclusively involves considering the diverse needs and preferences of players, including those with varying levels of experience and physical abilities. Customizable options for control schemes, input methods, and UI elements improve accessibility and accommodate a wider range of players. Regular player testing and feedback collection are essential for identifying potential barriers to accessibility and iteratively improving the player experience. By prioritizing accessibility, designers can create more inclusive and engaging experiences for all players.

Prioritizing player satisfaction and enjoyment involves incorporating player feedback into iterative design processes to continuously refine and optimize the game experience. By actively listening to player input and responding to their needs, designers can create more immersive and rewarding experiences that resonate with players on a deeper level. Engaging players through intuitive interfaces, seamless interactions, and accessible design ensures a positive and fulfilling gaming experience for all.

7.5 Others

It's interesting to note that Box Dragon testers generally provided more positive reviews than Beta testers. In my opinion, I assumed before the test that since Box Dragon team members already knew a lot about games, they would have more insights to share. However, it turned out that Beta players had more thoughts on certain aspects. This could be attributed to their freshness with the game, as they were eager to explore all its features and functionalities. Beta testers seemed more inclined to spend time testing and pushing boundaries, even trying to break the game at times. On the other hand, Box Dragon testers appeared to be more focused on

the fast-paced feeling of gameplay, prioritizing efficiency and winning. They seemed curious about the design but not necessarily about critiquing its quality, perhaps because they were already familiar with the game's development process. Additionally, some known issues had already been addressed, leading Box Dragon testers to overlook certain aspects. Beta testers, on the other hand, were more excited about finding bugs and reporting them. This dynamic suggests that there could be fascinating topics for future studies in the psychological field related to player behavior.

8

Conclusion

Throughout this study, several significant findings emerged. The research question of this thesis was: **"What Are the Key Design Considerations for Implementing Controller Support in Fast-paced Deck-Building Games?"** Presented below are the key design considerations that I believe were identified through this work. The order does not represent any hierarchy or priority.

Conclusions	
Bug free testing: provide a bug-free testing version to maximize the result value.	**Player Priorities:** - Experienced players focus on efficiency. - Beginners prioritize the overall feel and safety of actions. - Balance between efficiency and experience is essential in controller design.
Player Habits: - Pre-existing habits influence player preferences. - Considering player habits in design is important. - Familiar control elements facilitate quicker adaptation.	**Controller-Specific Design:** - Innovative designs tailored for controllers can enhance efficiency and gameplay. - Simplified control schemes increase efficiency. - Example: Auto-hover memory system for auto-selecting used targets.
Consistency of Input: - Consistent input methods prevent frustration. - Supporting both D-pad and joystick inputs is beneficial.	**Specific Design Suggestions:** - End Round button with a brief hold for accuracy. - Divide the main game view into blocks, allowing card looping by default. - Wrap-around selection for core gameplay elements. - Prioritize frequently used buttons for easy access.
Button Design: - Main gameplay actions should be mapped to the most accessible buttons. - Common buttons should align with player expectations (e.g., confirm and cancel actions). - Mapping icons to screen positions and controller buttons (e.g., deck and discard pile mapped to LB and RB).	**Visual Support:** - Enhanced visual indications for controller users to compensate for the lack of mouse cursor feedback. - Improved navigation and overall user experience through visual cues.

Figure 8.1: Conclusions summary points table with short descriptions.

One of the most critical aspects is the importance of developing a bug-free version of testing. Minimizing noise in playtest data is essential to ensure accurate and reliable feedback from players, allowing developers to make informed decisions based on precise data.

The research revealed another notable difference in priorities between experienced players and beginners. While seasoned players tend to focus on efficiency, new players prioritize the overall feel and safety of their actions, even if it means sacrificing some efficiency. This insight highlights the necessity of balancing both efficiency and the overall experience when designing controller support. Players seek comfort, a seamless overall experience, and accessibility, which are often more important than the pinpoint precision offered by a mouse.

One crucial takeaway is the potential of innovative design tailored specifically for controllers, rather than merely mimicking mouse behavior. Often, a distinct and

smarter design can enhance efficiency and gameplay experience more effectively. Simplifying control schemes by reducing the number of steps and effort required for actions generally increases efficiency, which players appreciate. Implementing an auto-hover memory system, for instance, can save players' time by allowing them to auto-select used targets, thereby improving overall efficiency. But this is subject to the case to the case's target system, and may not be applied to other Roguelike deckbuilders.

Pre-existing habits also play a significant role in player preferences. Many players come to a game with established preferences, making it challenging to find entirely neutral participants for studies. This underscores the importance of considering player habits and preferences when designing control schemes. Players have a high tolerance and willingness to learn new control schemes, yet they also appreciate familiar elements that facilitate quicker adaptation. Therefore, offering intuitive and familiar control options can significantly enhance player experience.

Consistency of input is a key consideration, especially when dealing with special game mechanics like redrawing cards. Maintaining consistent input methods helps prevent player frustration and ensures a smoother gameplay experience. Supporting both D-pad and joystick inputs is beneficial, as each offers unique advantages and caters to different player preferences. By accommodating both input methods, developers can appeal to a broader audience and enhance the overall controller experience.

More specifically, having the End Round button that requires a brief hold, rather than a simple tap, can improve accuracy without compromising speed. Additionally, dividing the main game view into blocks and allowing card looping by default can save time. Supporting wrap-around selection for cards, as the core gameplay element, is essential, while less prioritized blocks can be triggered by less-used buttons.

For button design, the most frequently used buttons should be the easiest to access on the controller, emphasizing the main gameplay actions. While innovative design can be welcomed, familiarity still plays a significant role. Common buttons should align with player expectations, such as using familiar buttons for confirm and cancel actions. Mapping icons to the corresponding positions on the screen and controller can enhance the player's experience. For example, if the deck and discard pile are on the left and right sides of the screen, they could be mapped to the left and right shoulder buttons (LB and RB) respectively.

Lastly, visual support is crucial for controller users, who lack the direct feedback provided by a mouse cursor. Enhanced visual indications can improve the overall user experience, helping players navigate the game more effectively. By incorporating these design considerations, game developers may create a more intuitive, efficient, and enjoyable controller experience for players of fast-paced Roguelike deck-building games.

8.1 Future Work

One interesting topic for future study could involve providing an actual controller design for the game. This research could then focus more on the detailed design of specific buttons and how they work best for this particular game. Since Box Dragon believes that there might be a way to combine both Method A and Method B, I believe this thesis could serve as a stepping stone for this topic, ultimately providing the desired design.

Another compelling topic could be examining the visual appeal of the buttons themselves and how to design a good controller button UI to ensure that players understand the controls effectively. This would address the learnability of the control scheme, an aspect that was somewhat blocked during the testing phase of this research. I believe this is a handy field for the controller design of other Roguelike deckbuilders.

Additionally, the accessibility of controller remapping, which was excluded from this study, could be a very in-depth follow-up study for these types of games. Remapping support is an important feature that many controller games now include. Questions such as how often players use remapping and how much they rely on the current default design could be explored. These questions could also be combined well with the first future study point, which aims to provide a final controller scheme for the game.

Lastly, whether these findings could be generalized to other genres of games beyond Roguelike deckbuilders is another area for future research. The current answer is "maybe to some extent," but how this could be achieved is a question left to be explored in future studies, for which this research could serve as a good starting point.

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A

Appendix - Xbox Controller Input

This is an excerpt from Microsoft's Xbox Controller official website, regarding the intention of each controller button are designed. Each button in the game serves a specific function, and these functionalities can vary from game to game. The introduction is designed to give non-controller players an understanding of how the controller operates within the game. In the future, common behaviors and interpretations of video games, in general, will be explored in more detail.

Figure A.1: The face of the controller.[2]

Figure A.2: The back of the controller. [2]

1 Left thumbstick	**9** 3.5-mm port	**2** Left bumper	**12** Left trigger
2 Left bumper	**10** Expansion port	**7** Right bumper	**13** USB-C power port
3 View button	**11** Right thumbstick	**11** Right trigger	**14** Pair button
4 Xbox button	**X** X button		
5 Share button	**Y** Y button		
6 Menu button	**A** A button		
7Right bumper	**B** B button		
8 Directional pad (D-pad)			

Table A.1: Table of Xbox buttons. [2]

Left thumbstick (1) and right thumbstick (11): These are small sticks, raised above the controller surface. The left stick resides on the upper left of the front face of the controller, and the right stick resides on the lower right of the front face. The

sticks are used to interact with games, apps, and the Xbox console. These move directionally and they can also function as clickable buttons when you press down on them.

Left bumper (2) and right bumper (7): These oblong-shaped controls reside on the top of the controller to the left and right of the USB-C charging port. They are used to interact with games, apps, and the Xbox console. They are often used to let you jump between sections of the interface but have varied functionality depending on the game.

View button (3): This button resides just to the lower left of the **Xbox** button . The functions of this button vary depending on the app or game.

Xbox button (4): This button resides at the top on the face of the controller. It has multiple functions:

- When the controller is turned off, pressing this button turns on the controller. It will also turn on the console if the console is not already on.
- When the controller is turned on:
  - Pressing this button once will open the guide on the Xbox console. On a Windows device during gameplay, this button will open Game Bar.
  - Pressing and holding this button will open the **What do you want to do?** screen. From there, you can turn off the console or controller, restart the console, or turn on Narrator or Magnifier.
  - Pressing and holding this button for about 6 seconds turns off the controller.

Share button (5): This button resides in the center of the controller's face directly below the **Xbox** button. Press this button to capture game clips and screenshots then share them with friends.

Menu button (6): This button resides just to the lower right of the **Xbox** button . Use this button to access game and app menu options like **Settings** or **Help**, along with commands within the user interface such as Enter on a keyboard.

Directional pad (D-pad) (8): This is a raised plus sign-shaped toggle that resides between the left and right sticks. Used to interact with games, apps, and the Xbox console. It moves the focus up, down, right, and left in the interface.

3.5mm port (9): This is a recessed port next to the expansion port on the bottom-side edge of the controller. Used to connect compatible 3.5-mm audio devices.

Expansion port (10): This is a recessed port that resides on the bottom-side edge of the controller. It's used to connect other accessories such as an Xbox One Stereo Headset Adapter.

A, **B**, **X**, **and Y buttons**: These buttons reside on the right side of the controller.

The **Y** button sits in the top position, with **B** on the right, **A** on the bottom, and **X** on the left. Used to interact with games, apps, and the console interface.

Left bumper (2) and right bumper (7): These oblong-shaped controls reside on the top of the controller to the left and right of the USB charging port. These controls are used to interact with games, apps, and the Xbox console. They are often used to let you jump between sections of the interface but have varied functionality depending on the game.

Right trigger (11) and left trigger (12): Positioned just below the bumpers on the front-top edge of the controller. These are pressable controls that are most commonly used during gameplay. They often vibrate to provide feedback during the games, though you can turn off vibration in the controller settings.

USB-C power port (13): The USB-C power port is used for charging your Xbox Series X|S Wireless Controller. This port resides on the top edge of the controller above the **Xbox** button .

Note Third-party battery packs may not be compatible with this model of controller.

Pair button (14): This small, slightly raised button resides near the USB-C port on the top edge of the controller. It is used to wirelessly connect the controller to Xbox and pair Bluetooth on a PC.

B

Appendix - Previous Game Analysis

B.1 *Monster Train* (2020)

Monster Train (2020) offers a refreshing take on the Roguelike deck-building genre, providing players with diverse and dynamic gameplay mechanics. Unlike *Slay the Spire*, where players control a single character, *Monster Train* allows players to command multiple creatures across three floors of a moving train. Each creature has unique abilities, leading to strategic depth and synergy between cards and units. The game's colorful and quirky art style adds to its charm, creating a fun and engaging atmosphere. With its emphasis on tactical positioning and thoughtful decision-making, *Monster Train* offers a challenging yet rewarding experience for players. Its replayability is further enhanced by the variety of card combinations and modifiers available, ensuring that each run feels fresh and exciting. Overall, *Monster Train* distinguishes itself as a must-play title in the genre, offering a unique and captivating gameplay experience that sets it apart from its predecessors.[35]

Before the game supported controller input, there was a growing demand from players on the internet for controller support in *Monster Train*. Several Steam users expressed their eagerness to play the game from more comfortable settings, such as their beds or couches, highlighting the convenience and relaxation that controller support would bring. Despite the absence of native controller support, some users resorted to emulating mouse and keyboard inputs using third-party software like DS4Windows. However, many found this workaround uncomfortable and called for dedicated controller support from the developers to enhance gameplay comfort and accessibility. Requests varied from basic hotkey mappings to displaying PS4 controller prompts alongside Xbox ones. Despite the workaround solutions, users remained hopeful for official controller support and expressed trust in the developers' promises to deliver an improved gaming experience.[44]

Monster Train has divided the battlefield into 4 layers. Players use the Right Joystick to move between each layer. By default, it will focus on the card. Left stick for looping all the options. Players can loop through all the options by using the left joystick. And there's only one layer at a time that can be focused, players can freely move with a left joystick to view all the units on the current layer. And one very smart but unique thing in Monster Train is that the players try to move down

to the cards. They programmed that whenever players want to go back to the field, it will stay on the options they have selected before.

Figure B.1: *Monster Train* memorizes the last examined card and unit for players.

Several Steam users provided feedback on the controller support in *Monster Train*. One user shared their positive experience of playing the game with an Xbox (360) controller, finding it fantastic and requiring minimal mouse interaction. Another user commented on the functionality of controller support, mentioning the inability to rebind controls or change prompts from Xbox style. They noted that using older or retro controllers on PC could pose challenges, particularly with movement controls, but found that mapping certain functions to alternative buttons allowed them to play without issues. Another user expressed appreciation for the feedback received and confirmed that they purchased the game based on it. They found the controller support to be satisfactory overall, despite occasional jankiness, and highlighted the improved comfort of playing with a controller compared to a mouse and keyboard setup.[17]

It only applies when players try to go back to the cards. Not when they try to go back to the floor. Different units are on different floors, players can right R to move around the floor while still aiming.

Figure B.2: *Monster Train* allows players to switch floor while aiming.

B.2 *Gwent* (2020)

Gwent is an online PVP turn-based card game. Players play one card each round from a hand of 10 cards, chosen from a pool of 25 cards. The goal is to win two out of three rounds by playing cards to gain points on the board called "power." Each card has a certain power, and the player's score is the total score of all cards. Players

Figure B.4: Looking at the opponent's card does nothing in *Gwent*

win a round by scoring more points than their opponents. Each card may have a variety of special abilities, such as the ability to damage other units when deployed, increase the point value of other units, spawn other units when given conditions are met, trigger effects when destroyed, and lock another card Ability. The round ends when both players advance to the next round, or when both players run out of cards. The first person to win two out of three wins the game.

The general sentiment surrounding controllers in *Gwent* is negative, primarily due to issues with inaccurate targeting and the uncontrollable "holding looping" feature. This feature often leads to skipped options, significantly increasing the amount of attention and effort players need to devote to the game. Sensitivity levels exacerbate the problem, especially when attempting to loop through options diagonally. Additionally, *Gwent* by default allows players to cycle through opponents' cards, decks, and discard piles but none of them are interactable, see Figure B.4, adding unnecessary inefficiency.

There's a need for more information panels triggered by right-click (mouse) or Right Trigger (controller), but Box Dragon aims to avoid this in their game. They prioritize maintaining player focus during battles, believing that additional windows or widgets may distract players and lead to information overload. Maintaining concentration within the game's core scenes is paramount for optimal gameplay experience.

Initially, I noticed a lack of information accessible through controller inputs, particularly regarding combat points. While in mouse mode, simply hovering over provides this information, but it's not as straightforward with controllers. Players should be able to access point details for each line, not just the total count. Interestingly, I stumbled upon triggering this by accident using RS, which isn't documented any-

Figure B.5: *Gwent* menu overlay bug.

where. This crucial control detail remains elusive unless players know beforehand or experiment with random inputs, making it challenging to discover. Additionally, clicking the board provides visual feedback, which isn't replicated with controllers. While these features may not significantly impact gameplay, they're worth noting as they could influence decisions during gameplay.

Figure B.3: *Gwent* total point information

In *Gwent*, numerous UI bugs plague the controller system. Unlike the mouse version, where players can only hover over one place at a time, the controller mode allows different buttons to be triggered simultaneously. Consequently, multiple layers can pop up successively without needing to be disabled, leading to common occurrences of UI elements overlaying each other, see Figure B.5. This issue is definitely disappointing to encounter frequently in the game, as it not only reduces the smoothness of the gameplay feel but also disrupts the pace of the game.

B.3 *Astrea Six-sided Oracles* (2023)

Astrea Six-sided Oracles (2023) is a DICE-deck-building Roguelike that flips the script on deck builders by using dice instead of cards and a unique dual "damage" system: Purification vs Corruption. Build a dice pool strong enough to purify Astrea's out-of-control corruption and save the Star System.[22]

The game's structure is nearly identical to deck-building pioneer *Slay the Spire*, but by trading cards for dice, it makes real-time combat a completely different experience. Each of the six playable

characters has their own completely different gimmick and set of dice that can be selected as rewards for progressing on the branching campaign map.

Dice fall roughly into three categories: safe (all 6 sides can be positive if the impact is small), balanced (3-4 sides are good, but there is some risk), and risky (2-3 sides are positive, but There may also be risks) very powerful). Finding the right balance is the key to survival. Early enemies can be weakened with safe dice, each dealing one or two damage, but later enemies become stronger as the fight drags on. [40] The game did some tricks on the value of each dice effect so they can be randomized from rolling the dice each time. So that gives the game a detailed UI widget for the dice, not to inspect the more detailed effect the dice does, but to inspect the value each side has. Players can learn the information of the die itself by just hovering over the surface of the dice.

Figure B.6: Controls setting's page for *Astrea Six-sided Oracles* in game.

First of all, even though the settings are not considered in the study, it's still worth mentioning how ridiculous the controller and mouse control settings are designed. Usually, controller-supported games allow players to switch between mouse and controller in-game, but this game does not, as shown in Figure B.6. So if someone wants to play with a controller, they have to go to the settings in the main menu before the game starts, as the default input is the mouse. Whatever input players use on the settings page, the changes are determined by the input used on the apply button. Therefore, if a controller user sets the control to mouse by hitting the apply button, it won't work.

This adds a lot more difficulty for playtesting as well. Since comparing the two input systems is necessary, I have to test both the mouse and controller on the same me-

chanics and features. However, this game doesn't allow players to switch controllers in-game. Consequently, a lot of information is lost for players who want to use a controller because they will never have access to the mouse hover-over information.

Figure B.7: *Astrea Six Sided Oracles* all options for looping

Figure B.7 shows the options players can cycle through by controller in the game. All the ones with red outlines are accessible. Allowing all the options to be able to loop isn't quite an enjoyable experience since there are too many, and that greatly reduces the pace of playing. A more efficient looping system can enhance the experience a lot. However, there are a few quick button designs where the player can reach without looping. But the confusing part is that there's no icon on the interface indicating that, only when they are on the selection of the option that control information is accessible. So the player has to loop over there to be able to see, which slows down the playing speed and adds extra work for players again. While two things are lost from the mouse input, one is the status information on the characters, in the mouse controls. Players have access to those round icons underneath the characters by hovering the mouse there. Since players can't even change to mouse input in-game, that information is totally lost for controller users.

And the health bar of the character is not accessible either, since that is tied to the gameplay and that information can be very important to the game mechanics. Losing it can cause big issues for players. And since mouse input is totally burned in-game, that information is lost in combat permanently.

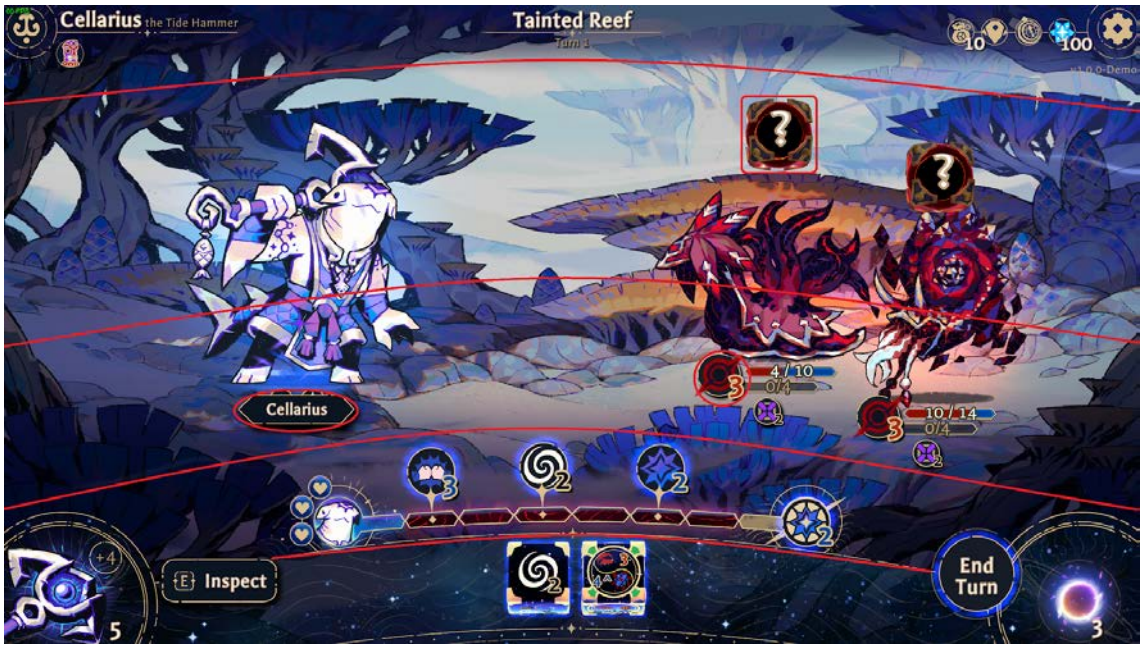

Figure B.8: *Astrea Six-Sided Oracles* navigation layers.

The game is divided into different layers for the looping system. So inside each layer, navigation can happen smoothly by going left or right, but if one wants to switch to another layer, sometimes inefficiency can occur. Let's say we want to start from the die on the first enemy in the middle to Cellarius the Tide Hammer; I would go left first, and probably go up again. But the actual way is to go up to the Dice pool (the first one on the right top corner) and then to the left. Similarly, going from the same position to Cellarius the character, would involve going down first, then to the left. So it is always the vertical layer change first if there's one, then the horizontal move to the target. Notably, Draw Pool, Discard Pile, and End Turn can be accessed from both the Virtue layer and Dice layer, so they can be accessed more easily.

While playing this game, I had another bad experience with the UI layout. Oftentimes, things get overlapped with each other. They could have designed a better layout system. A lot of important UI elements were covered, which greatly reduces readability. Again, the mouse will never trigger this, especially because of the controller. Players can trigger multiple things at the same time. So it's insignificant considering the UI layout problems.

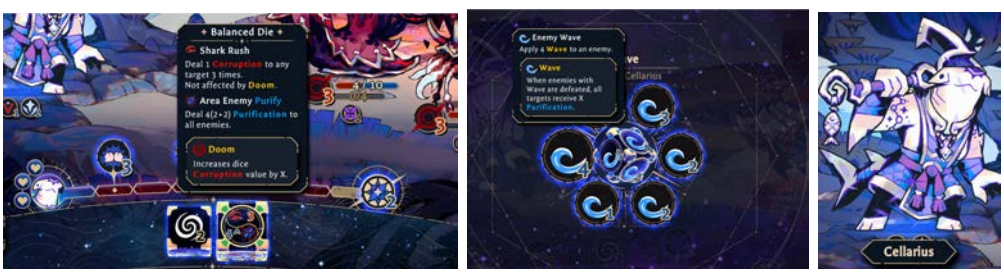

Figure B.9: Different type of UI overlay issues in *Astrea Six-Sided Oracles*

B.4 *Hearthstone* (2014)

Hearthstone is a free-to-play online digital collectible card game, it builds upon the existing lore of the Warcraft series by using the same elements, characters, and relics. The game is a 1vs1 turn-based game. Under normal circumstances, the player will draw a card during his turn, and based on the cards in his hand, he will decide whether to summon followers, equip weapons, or cast spells to respond to the battle. When it is the player's turn, the player can choose to play cards, use hero skills, order followers to attack, or when his hero has attack power, he can also let the hero attack himself; of course, he can also do everything. If you don't do it, the round ends. However, in order to play a card or use a hero power, you must spend a certain number of mana crystals equal to the number in the upper left corner of the card.

Figure B.10: A visual guide to the main elements of *Hearthstone*'s battlefield interface. [14]

The article "*Hearthstone* on Phones is Costing Blizzard Millions of Dollars" [13] discusses the financial impact of *Hearthstone*'s expansion to mobile platforms, highlighting significant losses for Blizzard despite substantial revenue generation. The introduction of controller support adds another layer to this complex scenario. With a large player base on mobile, Blizzard's decision to prioritize mobile platforms over PCs becomes more understandable.

In *Hearthstone*, mouse control is designed to be user-friendly and intuitive. Players can easily play cards by either dragging and dropping them onto the board or simply clicking on them. One interesting aspect is the tooltip feature, which allows players

to hover over a card to view its details. However, the tooltip only appears after a brief delay, preventing it from cluttering the screen with unnecessary information. This design choice enhances the overall neatness and helps players maintain focus during gameplay.

Moreover, playing a card requires a two-step confirmation process, adding an extra layer of control and preventing accidental plays. Players must first select the card and then confirm their target, ensuring precision in their actions. Additionally, the ability to cancel actions provides further flexibility and control over gameplay decisions.

However, one limitation of the mouse control is the lack of access to detailed deck information. While players can see the remaining cards in both their own and their opponent's decks, they cannot access the deck page to view card lists or make strategic adjustments. Despite this limitation, players can still track the cards that have been played throughout the match, as they are displayed on the side of the board along with tooltips for reference.

B.5 *Marvel Snap* 2022

Marvel Snap(2022) is not a deck-building game though it's worth looking into. In the previous section, collectible card games and deck-building games have been introduced. Deck-building games are similar to collectible card games (CCGs) in that each player has their own deck. However, unlike CCGs, the cards are not sold in randomized packs, and the majority of the deck is built during the game, instead of before the game. Deck-building games make the experience of crafting a deck the explicit focus of playing the game. It is not that players build a deck in order to play the game, it is that they play the game in order to build a deck.
[25] Though they have some distinctions between each other, Marvel Snap is still worth looking into. It equips the majority of elements that the study covers, like UI, card placing, etc.

Marvel Snap doesn't support controllers. So mouse and keyboard input is the only way to play the game. At the beginning of each round, players simultaneously place one or more cards face down in one of three locations. Locations for each game are randomly assigned, and each location has unique effects. [28]At the end of each round, the card is revealed and the card's special ability is triggered. Whoever has the most power in a certain position wins that position. The goal of the game is to win two of the three locations. The game usually lasts six rounds, with each round providing more and more "power" to play more powerful cards. [47]

Players can only drag and drop to play cards, which is not what Box Dragon wants. As explained before, they want to support both drag and drop and click to fit both styles of players. But clicking on the card in *Marvel Snap* is another feature, which opens up a new page and shows the information. There are sometimes special effects on the card, but most of the time players only need the points on the right top

corner. Players will need to open up each card and read the information about the specialty. If they don't, the card can still be opened, but show some flavor texts to players, which can be classic lines of that character.

The three locations can be opened up, too, even though they don't show much of a difference in smaller versions. Maybe the dev team is concerned about the consistency of the UI. And same goes for the action points, they are new widgets, too after clicking. It's interesting to see that there's almost no extra information to hover over since they also support tablets and phones as their supporting platforms. A YouTube video from Alec Tryan talks about some thoughts they have about how *Marvel Snap* is mobile-focused. Alec pointed out that *Gwent*, *Hearthstone*, and *Legends of Runtera* are a few examples of recent card games that have used existing IPS to not only attract players but also help them infer mechanics before looking at any card descriptions. [43]

Figure B.11: *Marvel Snap*'s main gameplay view.

Every game lasts around 2-3 minutes with longer games lasting around 4 minutes total, this means that players can always get a game more frequently in Snap, and the short length of each match guarantees a quick play cycle. The same idea came from Zack Zwiezen[47], it was considered "*fast and aggressive*". Zack suggested that matches are only six rounds and usually last less than six minutes, depending on the player's speed. You don't take turns either. Instead, you play a few cards, and then once both players are ready, the game flips all the cards over and chaos ensues. [47] Also, turns have been changed compared to traditional CCG games where cards are revealed at the end of the turn at the same time. The order is random, and spontaneous turns speed up games by reducing the typical card game dead time while also adding strategic considerations with entire cards being built around the system.

B.6 *Hellcard*(2024)

Hellcard (2024) is a cooperative Roguelike deck-building game that can be played in both multiplayer and single-player modes. The game is set in the same world as the papercraft pop-up *Book of Demons* (2016), making it a spin-off sequel. It continues the main storyline and also features completely different core mechanics. The main mode is three- or two-person cooperative multiplayer. Players hold their ground in the middle of the map and play cards that affect the map itself, allies, and enemies. This is another unique feature in addition to cooperative multiplayer-space-oriented card mechanics. Cards can be played around the map, creating area effects or moving enemies. At this point, there are three base classes, each with unique cards and a number of different "builds" that players can target while running through dungeons. This combined with randomized enemies and encounters results in high and persistent replayability. Between battles, players can rest in campsites, use found artifacts, and explore cleared floors for story events and loot. Even the story events themselves are planned as a multiplayer co-op experience. [42]

Figure B.12: *Hellcard* navigation system layers

The controller mapping design of *Hellcard* is centered around the concept of blocks, a similar approach seen in *Alina of the Arena* (2022). These blocks divide the game into three main parts: UI, cards, and characters.

By default, players are limited to looping around the hand cards. However, pressing X allows them to switch between different blocks, while the left stick is utilized for navigating through these blocks. An interesting feature is that the game remembers

the selected option for each block, maintaining consistency upon returning from other blocks. This streamlined approach contributes to a fast-paced gaming experience without burdening players with unnecessary steps.

However, it's worth noting that the game differentiates between the D-pad and the left stick in terms of functionality. While the D-pad is commonly used for navigation in other games, in this case, it is assigned to functions related to the deck, draw pile, and discard pile. Additionally, within block 1, most options have shortcuts that eliminate the need for looping, highlighting the importance of quick access to interactive elements. Features like the HP bar and mana (action points) are static and do not require frequent access, emphasizing efficiency in accessing dynamic elements.

C

Appendix - Method B Logic

```
max_direct_distance = max(distance_A_direct, distance_B_direct,
    distance_C_direct)
max_angle_to_input = max(angle_to_input_A, angle_to_input_B,
    angle_to_input_C)

normalized_distance_A_direct = distance_A_direct /
    max_direct_distance
normalized_distance_B_direct = distance_B_direct /
    max_direct_distance
normalized_distance_C_direct = distance_C_direct /
    max_direct_distance

normalized_angle_to_input_A = angle_to_input_A / max_angle_to_input
normalized_angle_to_input_B  = angle_to_input_B /
    max_angle_to_input
normalized_angle_to_input_C  = angle_to_input_C /
    max_angle_to_input


weight_direct = 0.5
weight_angle = 0.5


combined_distance_A = weight_direct * normalized_distance_A_direct
    + weight_angle * normalized_angle_to_input_A
combined_distance_B = weight_direct * normalized_distance_B_direct
    + weight_angle * normalized_angle_to_input_B
combined_distance_C = weight_direct * normalized_distance_C_direct
    + weight_angle * normalized_angle_to_input_C

min_combined_distance = min(combined_distance_A,combined_distance_B
    ,combined_distance_C)
#Then we get the closest candidate by getting the closest distance.
```

Listing C.1: Pseudo code of logic in Navigation Method B.

D

Appendix - Interview Transcript

D.1 Tester One from Box Dragon: 3A + 3B, Sensed little difference, Preferred B

Me: Are you mostly using Left thumb thick or D-pad for navigation?
The left one, yes.
Me: On the last round of Method A, you start the first round with the mouse, can you explain the intention here?
It was just that I used it for the city view, and then I forgot to use the controller.
Me: I've noticed that before the testing last round, you were supposed to test Method B but you intentionally changed to Method A and tried to move around. Can you explain what were you thinking or what were you trying to figure out?
So first I didn't realize or feel any change between A and B, so I wanted to try it like intentionally trying certain movements so I could test the difference if I felt the difference. So that was why.
Me: Did you find anything?
I am not sure why but I like B more, it just felt like it followed my intention better. But I can not say why because it felt like logically it worked the same way. But yeah. . . I am not sure why.
Me: Also for the weak points later, you switched between the two methods. Is it the same reason?
Yeah, it was the same reason.
Me: When did you learn that the two methods are different?
It was when I did the intentional switching. But it was like very small differences it was not very obvious to me at least.
Me: What other differences between the two methods you've found except for what've already discussed?
Not that I realized.
Me: I will explain how it works if I haven't yet.
Please do. (After explanation) Okay, that makes sense, that's probably why I like B.
Me: Do You still like B after the explanation?
Yeah, I think so, cuz I like that you can use all directions.
Me: Any other thoughts on the button design and other aspects?
When you are going to trade a card for a redraw, discard it you know, press X. If you can play it, you have to first click on A and X. But if you can't play it, you can

just click on X. It didn't bother me that much but I think maybe players would like to always expected to work the same way. So you either have to click your cards you can't play and then click X or you just always click on X.
Me: (Explained the reason I did it) Anything else?
I think it works really well. I usually don't think card game works well with controllers but I think this one felt good. As I wrote in the survey, the auto help is like when I only have one target and it's targeted automatically. It felt really good to play quickly.

D.2 Tester Two from Box Dragon: 3B + 3A, No difference found, preferred A

Me: Are you mostly using Left thumb thick or D-pad for navigation?
Left thumb stick.
Me: I think you have noticed that when you switch views it will remember the last thing you've looked at, and you seemed very surprised. Do you like it or not?
No, I like it, it made me do some errors sometimes. I think it's a matter of habit, it's fine it's just that sometimes I put the shield on the wrong person.
Me: Yes, I was about to ask you about it. So there was one time you tried to apply two repositions on two units but you applied them both on the same unit so nothing changed. Do you think there's something that should be changed? Or do you play too fast? Or?
Yeah, I think I play too fast but I think it's also a UI problem, it's not a control problem. It's just that when you play with the mouse, you're sure which unit you are dropping into the shield and stuff like that. So it really doesn't matter the color of the highlight. Where as with the controller, you are relying on what is highlighted, and I think how we highlight is not clear enough. I think it's sort of orange-yellow, and it became more yellow or something like that. It's not really clear. So I don't think it's a controller problem, it's just that it didn't feel apparent, like very fast what I was selecting. So I am like nah it's fine then I am like oh shit I am using the wrong person. So i am used to dropping on the units so I know in my head I am like I am gonna shoot this unit, so once I select the card I am like well I am already on the right thing because I used to think when I play on the barriers I am already on the right thing you know? But I think it's a more UI thing.
Me: I've seen you tried to go left when there's nothing left on the current target. Is it because the card allows you to do so and you would expect it the same way in the targeting mode?
Yeah..that could be cool. Is it like I was looking a buff or I was looking at playing a card or?
Me: You switch the view from card to units and you see the tooltips and you try to go left on the very left candidate, I would assume you want to jump to the very right candidate because the card allows you to do so.
Yeah yeah, I think so.
Me: You mentioned in the survey that the controller is faster because

you don't need to drag cards, is there something else that makes you feel that way too?
I think reading the intent is faster also, so you don't have to go to the actual unit. So it's always a DPI thing like moving the mouse I have pretty low DPI on my mouse by default and I am used to playing like that but it's also an effort to scroll around the whole screen.

The whole thing feels faster and it's just one quick press, even switching between the target is a quick press. Recycling is also one press. So yeah I feel I don't spend my time traveling the screen over the mouse it's just that something I don't like in general. So it's really good!
Me: I will explain how it works for you, which way do you prefer?
(Explained) I feel like the one with switching rows and it's up and down is better. I think that was B, maybe(It was A actually, but this interviewee tried B first.) Because I feel like in my head I always divide units by row, not by visual is this guy behind this, or is it on top-left or whatever? Like I already divided by row so. It's faster to change rows I am guessing.
Me: Any other thoughts in general?
No in general as I said I felt it was pretty fluent and it was fast. And I actually enjoyed playing with controllers.

D.3 Tester Three from Box Dragon: 3A + 3B, No difference found, Preferred B

Me: Are you mostly using the Left thumb stick or D-pad?
Left Stick.
Me: I like that you first thought the targeting was towards the front row bcs You noticed that the light barrier directly targeted Vanguard instead of Ava. and then the second round you noticed it was actually remembering the last played character, do you like this feature?
I couldn't say exactly why I prefer it like this, I think it's better like this than the selection being reset all the time. To be honest there must be a reason for it being better but I can't tell you. Because I could say like oh yeah you play a card and you want to play another card on the same unit but maybe it's not the case, it really differs from one time to another. Maybe it's because of the navigation, knowing where your cards were previously maybe mentally you're associating it to that previous unit, and then when you want to navigate to another unit or something like that you know where it comes from already. I mean but it's not right because it's the same if the position reset. Let's say the position will be reset, depending on the fight you would have, and the unit you would have, it means that the reset position will be different from one fight to another because you would have a different number of units on that fight. If you know it's the last unit, it will always be the last unit compared to the moment it will be random based on the fight you are having. I do feel game-wise it's better to have it on the previous position.
Me: I explained that it did make people make mistakes in previous tests.

One playtester had this issue that they applied two repositions on the same unit so nothing happened for them. So it's possible.
Especially for the reposition, and it's only working for the reposition. Yeah you played too fast maybe but like you would like to create a reason , technical stuff to remember you moved that unit previously so you need to choose another unit that hasn't been moved yet. I do think that keeping the rules simple. It simplifies everything and you don't have to think about it too much after.
Me: First I noticed that you found that you can trigger the discard pile and deck without going back to combat, you seems like it right? Can you explain why?
It's just because you can immediately access your discard pile or draw pile with one trigger, and then they are obviously being set on the left side and the right side which is quite instinctive. Also, you can switch from the discard pile to the draw pile without having to to go back to the combat, which means that you have one step less to do to reach the destination you want. So it's versatile that I like though I mentioned also like you have some issues that you can still put your cards on top.
Me: (Explained that it was a "bug" in-game with the mouse, too)
Ok. But I do also like that you can still be able to see your cards in your hands in the deckpile and discard pile without having to go back to the combat. But hmmm idk if it's very interesting to do that, it seems more complicated. You can just go back to the combat to see your hands.
Me: I heard your comment about the redraw's difference. Yes, you're right the redraw thing won't show up in hover mode unless going into targeting mode for playable cards. It's only for the cards that are unplayable but still can be redrawn which you can redraw without going into the targeting mode. You seemed unsure if you liked it or not when you found it but after 6 battles how do you feel about it?
Okay so after 6 battles it didn't matter that much I think? Most of the time you will play the cards you want to play, and there were very few situations where you would think first about "I need to discard a card to get the card I want before actually playing cards".
Me: So you mean you will always run out of command first then think about redrawing?
Let's say I have 4 barriers and one attack, and I would use my first attack and I will start like recycling. But actually... it doesn't work like that, wait...I am thinking. Just to resume, it didn't bother me in the end, I significant the mechanics you have to click or select first the card and then recycle it, I do still believe that on the paper it's not ideal though it didn't seems to bother me when I was playing. I feel like maybe at that moment I was very picky, but it's still working either way.

I play a lot of card games, but I am not doing speed runs and stuff like that, so I don't know how a player who likes it faster would react. But on my hand, it didn't bother me. Theoretically I am always thinking the less click the better, as soon as I notice the difference between the number of input I need to do I will be more like "I don't know if it's good."
Me: You commented about holding the press thing for the End round.

And you said it might frustrate players who want to play even faster? I can see where you are coming from but how about your own experience in general after 6 battles?
So after the 6 battle, I didn't comment on it in the video. I wasn't frustrated about it but a lot of time, I was like, why my turn is not over, oh yes I need to press it longer. It actually happened, what I mentioned really happened. I do like the idea of pressing longer and a rotating icon. I think it's kinda juicy, the problem is that it did slow down the flow of the game. And like multiple times I was wondering why I am not passing the turn.
Me: I can explain why it was designed like that, you can use key E on the keyboard to trigger End Round. It was the exact same length you need to press on the keyboard as on the controller. The idea is that when you are using the mouse it is very obvious you are clicking the end round button. But when you are on the controller or keyboard you might accidentally press it. So the longer press is to avoid that kind of situation.
It's definitely something I didn't notice because when I am playing card games I never use the shortcuts on the keyboard. Basically playing from the far with one hand on my mouse and just moving left and right and that's all I do. Very lazy type of player, because I don't have to think too much. Just have your one hand and mouse and playing a game like "Cuperpunk" requiring you both hands on keyboards and mouse. It's definitely a different feeling.
Me: But imagine you have the controller and lay your back on the couch in front of the TV being far away from the screen.
I would still be frustrated with the time. But maybe because I am used to using the mouse and have to press a little longer. Maybe after more than six battles, I will be used to it. But after the 6 battles, I had issues with pressing it longer.
Me: You didn't notice the left thumb stick press for switching view until you switched the navigation method.
Oh don't worry on that end it was me being lazy again not ready everything you sent me. And not ready with everything in the description. That's the stuff could happen with a lot of other people also haha!
Me: But still, after you found it you never triggered it again. Can you share some thoughts on it?
No, because I already know most of it. So there were some icons I didn't remember exactly. But I remember most of it. So yeah it's just the attack rang I didn't remember. Other than that , really not issues with other effects.
Me: You answered in the survey that you like the controller usage in this case, could you elaborate on why?
So yeah I am not used to playing card games on the controller. Actually never really tried before. So I guess you could count that as my first experience and I guess my fear for not actually doing it maybe because from my mind I do think mouse is more straightforward. But like the controller here is still very fast and for my speed I would say, or the way I play games I guess it's still good and enjoyable. It was simple also which is not over-complicated, and that's very important point I think.
Me: You shared some thoughts about "Paying attention to the number of inputs needed for each action and the repetitivity of it." Can you explain

more?
So yeah that's exactly like the recycle thing, and on one part you have to do one click to recycle the card, and on the other hand you have to do two clicks. Again, theoretically, you don't want to have a big difference between a drag and drop with a mouse and many inputs with a controller. It;'s just my thinking as a lazy player.
Me: I will explain the difference between A and B, and do you have any preference for that?
I think navigation-wise wise the idea of using left and right to navigate through the rows, and up and down to navigate through the same units of the same row is ideal. But I didn't really understand the difference between A, and B.
Me: Explained more with patterns and figures showing on the side.
Okay, then I guess the freely one is the ideal one on the paper. The thing I don't like about method A is if you have selected a unit on the bottom then you go right, I would expect the bottom one too on the next row, not the top one. At the end of the day, I guess there will be people liking two method both so you will want to keep two methods.
Me: It was not obvious at the first stage since people tend to show evidence they don't know the difference between A and B at all.
I do think it would be very noticeable if you go into detail of the enemy(tooltip), and to check like what their details are and stuff like that. is Those two methods only when you read the details of the units or when you play cards also.
Me: When you play cards also.
Okay, then I didn't see any difference between them.
Me: Any other thoughts?
Not really.

D.4 Tester Four from Box Dragon: 3B + 3A, Found the pattern behind A but answered no difference found, Preferred B

Me: Are you mostly using Left thumb stick or D-pad?
Left Thumb Stick. The D-pad works for me for the first match and after that it stops working for me.
Me: Okay but you mentioned in the video that you would expect that to work, what do you expect it to work for?
Yeah I would expect it to wrap sound the cards, you know like scroll through the cards and be like oh 1, 2, 3, 4 for which card I wanted to use.
Me: The deck and the discard pile is simply just not implemented, it was confusing for you because in the game we can still hover over both areas of cards. But in what way you would expect it to be?
Yeah, for both LB and RB you put them up so I can see them on screen.

So yeah I would expect it to be able to scroll through the cards in the pile. I would expect with either the left stick or the D-pad to fo up and down if it's like multiple cards I need to scroll down to see them all. I expect the left stick and the D-pad to

see them all. And I would not expect not to be able to scroll through my cards in hand while looking at the two piles.
Me: You mentioned that It's hard to see which weak point you are hovering over. Yeah, I noticed that it was also on the mouse, so it's a general game thing.
Me: What solution could you suggest for the controller?
I think the only thing was that it was harder to see, it's because on the mouse you have this little thing like a line following you and you see it shift a little easier. But otherwise, it was not a big difference between the two. So I don't think it's specific on the controller or mouse, it's more specific on us, the game in general. Maybe when you have something selected, you take another color under the selected stuff. Some more indicate that.
Me: You mentioned both in the video and the survey that you thought it was very hard and strange at first to target weak points in Method A. But you also said you get used to it and it feels better afterward. Do you prefer this method or would you expect something else?
Oh, good question. I think I would expect something else but the other else would make it more frustrating in the end because this one has a common pattern that you can use. Because I get confused first as I didn't see the pattern. And I was like it goes into a loop. But I was trying to go up to go up and it didn't work.And I had to do left to go in the loop. You know it's like in the mouse, you know you can go left to go left and go up to go up.So that was what I expected, but I think if we had that instead, it will actually make a little bit messier. It will be harder to choose the point in the end because it wouldn't have a common pattern to it.
Me: That was actually how method B works, you will be able to move freely to wherever you want to move to.
Yeah, I think I only did the boss fight in method A.
Me: It was surprise me for me because you already found the patterns in Method A but you still didn't see the difference between A and B from what I can see in the survey.
I didn't try the boss fight in method B.
Me: So would you think it's the boss fight that helps you determine the pattern behind Method A?
Yes, because that's when you have multiple hit points. Outside of boss fights, you usually only have two points. You can't really see the patterns with only two points because it is just up and down. You don't really see a pattern between two hit points than 5 points.
Me: So the more options out there, the more obvious it is for you?
Exactly.
Me: You have actually found the logic behind method A, can you explain how exactly you think it works?
It was one direction on the stick, If you start from the leg, and you go left you will go to the next leg, it will go a left-loop circle. Yeah, I only noticed it was a loop.
Me: I explained more and showed the difference between the patterns. Which would you prefer?
It is definitely more helpful when there are more people in the battles because I

didn't see any differences in the battle on my end. I think I would prefer method B then, that's kind of how I expected it to be.
Me: It was a moment when you accidentally pressed Y and you'll have to hold it to trigger and it didn't happen. Do you like it? Yes, I like it! It was an important fight before the boss healed, I was so panicked when I accidentally hit Y because it was an important button. But thankfully it didn't get registered. So I really like that you need to hold to end the round.
Me: Any other thoughts?
I like it in general, especially when it comes to card selections. So yeah it was good.

D.5 Tester Five from Beta: 3A + 3B, no difference found, preferred A

Me: Are you mostly using the D-pad or left thumb stick?
You have to use the left thumbstick. I don't think you can use the D-pad to switch between the cards.
Me: You can. Have you never tried?
There were some problems with the controller in the beginning so I don't know, it didn't work.
Me: OK. It was not your problem. It was that you were supposed to click the screen because you were focusing on the method of the selection part. You need to use the mouse to click the screen. Any key you registered on the game will be recognized. If you press A, you will select the UI instead of the cards. So that's why it doesn't work.
For the first few tones I kept escaping each action because I couldn't do anything attack or shield or anything.
Me: Then you said something about when you switched cards, it was too rapid and you suggested slowing them down a bit, so it looks smoother. Do you mean by too rapid?
So the card pops up all of a sudden if you move around them. There's no transition from for example from hand and into this screen like it's not the transition. It wasn't very smooth.
Normally there's an animation, right? Let's say there's a card on the table and if you hover over it, it will slowly go from the table to the screen. So maybe some animation in between that adds some transition. Because now it's just like suddenly something pops up. It feels too quick.
Me: So what do you suggest on the controller part that can help for this or it's just the animation on the more visual part?
I don't think there's anything wrong with the controlling. I think it's doing its job, but just visually it makes it not smooth.
Me: Do you trigger the discard pile and deck a lot when you use the mouse?
Oh, discard pile, right? No.
Me: But I found that you trigger them a lot in the controller mode. And you found that the card overlay from below the deck is in the discard

pile. You first thought it was very strange.
No, I was just testing like to see how it looks. It's not because I triggered it accidentally or anything it was just like intentionally. At first, I thought it was strange, but then I felt like maybe it was on purpose, but it just doesn't visually look as good. My suggestion was, for example, to create a separate user window for the discarded pile, for example, and when that is triggered, you can't do any in-combat actions.
Me: (Explained the reason behind) So if you have a window as suggested, how do you think the controller should work inside? What do you expect the controls to be?
Yeah, for example with the discard pile, there's a separate UI for it and if you use the D-pad or the thumb stick it will switch between the cards so you can see the description of the card.
Me: Okay, and you mentioned something about the color and the arrow, which is confusing for you. Which part it's confusing exactly and what do you mean by arrows?
if I want to do an action from the lantern to a unit, the unit I select will appear in a square around it. And the square will turn from red color into yellow. Arrow. I mean the line pointing from, for example, the lantern towards the unit. Let's say 2 units on the battlefield, it might be a bit confusing because you don't know what the selected target is. If it's the first time, you have no idea if red means selected or yellow means selected. So that might be confusing to new players especially with controllers because with the mouse you get the cursor icon, so you know better. I think that's the benefit of using a mouse to play this kind of game but with a controller. You'd need better navigation for it because you are just moving your thumb stick and sometimes can be confusing if you don't know which target are you selecting.
Me: So what do you suggest?
Maybe some more visual feedback instead of just colors. Like UI support.
Let's say if this thing is not selected, there's a square round about it, but if it's selected, it becomes a circle or a more obvious scene, or where you can just make some changes to the square to make it a bit obvious. Also a bit like looking different.
Me: Okay, I see. You said in the survey that you think the mouse is more efficient because you're so used to playing card games with the mouse. You only use the controller for action games. Is this the only reason that you think the mouse is more efficient?
Yeah, I mean, with card games, mouse controls are more straightforward because you just hover your mouse over a certain card. You know OK, this is a card I'm selecting but with the controller when using thumbsticks, if you push the thumbstick too hard. It's hard to tell which card you will be landing on, right? So it's less straightforward. and not as efficient as mouse controls. You need much better like a navigation for it. So there will probably be lots more work. Put into the UI and get a good experience with controllers.
Me: But then do you mean that whatever controller like, whatever card games you're playing, you will always think the mouse is better?
Yeah, I mean, I'm just so used to doing it so it's a matter of habit, not a matter of the design or anything. When I play action games, I often prefer to play with a

controller over the mouse. it's not because of poorly designed. Yeah, just habit.
Me: You said you didn't notice any difference between the 2 navigation methods in a survey. (Explained) Which way do you prefer?
Actually, it depends on a single or more units. I feel like Method A would be more organized with more units. Um, as you mentioned, it's especially when you are making decisions. don't know which unit you want to do the action you can just, you know. you can just push and hold your stick and think about it and see how it looks when a couple of the actions are done on like certain unit. But with Method B you have less organised. Um, you have to know exactly. Okay, so what do you want to do? Yeah, but I mean of course, like in both cases, you have to know what you want to do, but I just feel like Method A is more organized. Especially with more units, but if there's just 1 or 2 it doesn't make any difference, I don't know how many units you can have like in the later games.
Me: 17, 4 units on each row and plus the lantern is 17. Theoretically.
Yes, so definitely A is easier to get a certain unit. I would say A is better.
Me: Okay, any other results?
It was pretty good in general. The controller is doing its job. It is just some UI view seems to need to be fixed to get an even better experience.

D.6 Tester Six from Beta: 3B + 3A, Found both methods' logic and preferred A

Me: Are you mostly using a D-pad or the left thumb stick?
I think I was basically exclusively using the left thumb stick.
Me: Okay, but do you recall that during the paper prototyping, you suggested that you would want to use the D-pad to move around?
I feel like when I actually think about it, the D-pad almost feels better because it's more structured. If you actually can move left and right or move up and down, it feels more logical to use. But yeah, idk, just kinda reverted to the stick I think. It's nice to have the option at least.
Me: You mentioned it could be slightly clearer who is selected, could you elaborate more on what makes you think it's not clear enough? Can you suggest some improvements?
In the beginning, there were few cards you could use on any of the characters basically. When I only had the Lantern and one other unit, so I had two options. At first, I didn't know which one was the one I selected for. You have the information pin but when the square is the same but different color, it's kinda difficult to tell which one is the currently active one. But of course, you play a bit more than you know which is which.
Me: What do you suggest to improve then? Is it on the controller side or more on the visual side?
I feel like it's more on the visual side. I don't know if you could add some effect on the one that is selected a bit more. The selected one has the yellow border and the unselected one has the orange border so I feel like if you could add something more to the yellow one, something additional can kinda heal that.

Me: Do you open up the Deck/Discard Pile a lot in the mouse mode?
In the beginning, I didn't because I didn't really think about it. But when I actually got a card that I wanted to see more information about, or what if I even had the card in the Deck, then I did start opening it more and more. But I actually found that you can not move the card in the Deck so maybe that's why I keep opening up and see if it might work at some point.
Me: (Explained the design and why it didn't work) But it sounds to you that you want to be able to move around the cards, right?
Yes of course, if I am going to use the controller I would like to be able to do everything but it's understandable if there are technical limitations in that way.
Me: You commented in the video that you thought only unplayable cards could be redrawn. But that's not sure. Did you figure it out eventually?
No, I don't think I ever did, when I play with the mouse, I basically only redraw the cards you get from the enemies. When I played with the controller, I noticed the pop-up thing, Press X to redraw. I think it only showed when I highlighted a card I couldn't play.
Me: Are you sure? I can screenshot the gameplay footage you sent me, you can redraw every single card.
Oh wait, so you actually need to select the card and then you can redraw it right? Oh okay okay, I thought it was when it's highlighted then you can redraw it. But then it makes sense. Is that because of the card that you can't play, or is it highlighting the cards immediately because you can't select them?
Me: Exactly, if the card is unplayable, then you can not go into the targeting mode. That's why you can only do the redraw when you hover over it. But if a card is playable, you need to select it first because I would assume players want to play it first then the two steps can make sure they really want to do it.
Okay sure, that makes total sense!
Me: Do you understand how the two methods work? Can you explain what you already noticed?
From my understanding, I can't remember which is which, but one is them is: Left and right between the different zones, right? And up and down between units within the zone. And then the second one you could just move more freely. You just pull the stick to the character.
Me: Yes, that's exactly how it works! You said you feel like A is better because A is more predictable and thus easier to build muscle memory for. Can you explain why more predictable is better?
If I have a specific setup of units, it's easier just to select and move. I was slightly confused about Method A because the angle of the play area, and the zones are not perfectly aligned right? So that was a bit confusing in that sense. So I felt like both of them were fine, fluent, and reasonable. But I think Method A is more structured, If you want to move from the Lantern to the unit in the Guard zone, you know you need to move twice between them.
Me: So you think Method A is more efficient?
Maybe not more efficient, just trying to train myself. It's more consistent I feel. But I think Method B is probably more efficient and it's simpler so I need to move to

this one so I can just kinda jump straight to it. So it's probably more efficient and nice in the long run. I can see benefits from both modes. I am happily using both so yeah.

Me: And you thought Method B is kinda random and also it's too wide the allowed angle in the video?

Yeah sometimes I want to move the characters in the same zone, I kinda pull the stick towards the character but nothing happened. So I had to do it twice before it actually moved. That was kinda the main thing I think. Then it was once when I tried to move to a character that looked to me was perfectly on the side then I pulled the stick down it would move to the unit to the left. It was kinda too forgiving in that sense. At that point, it felt a bit inconsistent maybe. But if you could get the consistency it could be really efficient and nice to use as well. So maybe Method B has the most potential I guess.

Me: So if Method B is precise enough, will you still prefer Method A?

I think I would prefer Method B. I feel like you could give some animation or indication about where you're moving to. Maybe it's just annoying in the end, I don't know. At this moment I like more about Method A but as I said I think Method B has more potential.

Me: At last, you say you think the mouse is more efficient because you think it is less restrictive and you do not need to follow the predicted path. Can you explain why the predicted path is restrictive? Can you give me your final preference list?

When I use the mouse to play a card, I can instantly choose which unit I want to play the card on. You kinda have to pre-select a unit and you have to move from that one. It's kinda difficult. If you have a card that can be played on any unit or any character, it's kinda impossible to predict that I guess for the controller users they can not have the exact same efficiency I guess. So you kinda have to have the starting place for the targets. That's kinda the main part.

Me: (Explained the memory system on the enemies in the targeting mode) Do you still it's less efficient than the mouse in that case?

I feel like for that kinda thing, for the attack cards, maybe it's just as efficient or maybe more efficient. If you get the correct one to be selected then it's more press of a button thing. In that case, it's probably better because you don't need to aim with the mouse. The drawback of the controller is mostly if you have a lot of units at the same time.

Me: (Explained the memory system on the units in the targeting mode)

I guess it's kind of impossible to always guess the right one, I think that system sounds very good and I didn't really notice it which is probably a good sign I guess because then it just kinda works.

Me: Any other thoughts?

No, not really. Overall I think it felt very good and it felt very natural. Like I feel like I didn't really need to learn anything new to start using the controller. It's just kinda easy to get into it.

D.7 Tester Seven: 3B+3A, Found the pattern behind A, preferred B

Me: Are you mostly using the Directional pad or the left joystick?
The directions pad. It felt more correct, I guess. I think it's easier to press the right directional pad than the joystick. Since it has 4 sets of directions that you can press. If you use the joystick, then you do not know if you gonna go up, left, right, or down. It will be a little in the wrong direction.
Me: How does it feel using a PS5 controller, does it bother you?
I don't think it's very different. I know that they look a bit different. The icons are different. And you know that the Xbox control's D-pad is at the position of PS5's left stick. That part is different. Maybe that has something to do with me preferring the D-pad, I don't know.
Me: It was a bug that you can not switch views using the left thumb stick. I am very sorry about that, it is supposed to work all the time in both modes. But I do want to ask you is that do you feel like it's an important feature to you.
I think it is. Because when I wanted to check the details about the enemy or details about my player character. And like which zone I was in and which zone I had to be in. As you know the auto-attack, when you are in the guarding zone, it's nice to know that the flying enemies only take 50% of the damage when they are flying. So those details are very important to be able to see.
Me: Do you think there's a possibility for you to check the details less if you get more familiar with the game?
Probably. yes. Then you know everything about the character. Sometimes new enemies appear, and it's important to be able to check their details. But definitely, it's something you get more familiar with as you play. But for beginners, I believe it's quite important.
Me: You said you were trying to use the left D-pad to move from the top enemy to the down enemy, can you explain why you would expect that way?
It has to do with which direction you press to move between the zones and move between the character enemies in the zone. I am not sure how I think it should work. Because the issue is the playing field is tilted when you press on the left button, it doesn't go left, but also it doesn't go down, and it doesn't go left, it goes somewhere in between. I was a bit unsure if should it be the down button or the left button I pressed to move between the characters. I guess it's something you have to get used to and it's gonna be OK. But I had some issues like getting used to which one to press and I pressed the wrong button.
Me: Okay, but I wanted to know more about the part where you said to yourself that you want to move from the top enemy to the down enemy but you want to press the left button?
Honestly, I don't know what I was thinking. It felt really stupid when you say it. In some way, I think the zones were up and down, and so the enemy should be left and right. It could be argued that the zones are left and right. I think it's just something you have to get used to. When you get used to it, you sort of like tilt the

playfield in your head towards the correct way, and feel more natural. Did I make that comment in the early stage?
Me: Yes in the early part.
Maybe I managed to get used to it later. I was just not getting used to it in the beginning.
Me: Okay. That would be a really good opening for my next question. It looks to me that you already figured out the difference between A and B, can you explain both?
I don't remember which is which, they felt very similar. I think the only difference was in one of the methods, you use left and right to navigate between the zones and up and down to navigate between the enemies. And the other method is the other way.
Me: (Explained how different methods work) Maybe you were on the D-pad so you didn't see the part on method B, because Method B allows you to do free moves but the D-pad is still 4 directions.
Okay, that's really interesting! Maybe I should've used the left joystick.
Me: It's absolutely fine! Do you understand the difference now? Which method would you prefer?
Yes, I understand how they work now. So I can't say what I actually prefer but when I hear how you say it sounds like Method B is more intuitive since it gives more range of movements, or if you want to play with Method A, you can just use the D-pad instead.
Me: Which Method do you think is more efficient?
I think Method B. You can just move to the enemy based on how you tilt the stick instead of having to go to the next zone and go down. If you use Method B you can just skip the steps in between and go directly to the enemy. I think that would be more time-saving.
Me: (Explained the mindset behind Method A and how could method A be faster based on previous feedback)
I can totally understand the view as well. I think pressing the button on the D-pad goes faster, so you can just very quickly press like left, down, down. But using the stick requires less input.
Me: It's interesting to see that you appreciated the way how the end round lets you hold a bit so don't accidentally trigger it. But then the next round you did accidentally trigger it and want that even longer? Can you talk a bit more about the thoughts behind this?
I think I'm used to having to hold the button for a longer to proceed to the next round in other similar turn-based games. I don't know any games at the moment but I do know some games. And some people might get frustrated since you need to hold for such a long time. But my fingers are so clumsy. Sometimes I pressed one button and then like I accidentally pressed Y(triangle on PS5) I would want it a longer time. For me it's like, I know I am done with the round, I don't mind holding it a little longer just to not have those accidental triggers during the gameplay. Maybe not super much longer, maybe 1.5 than this now. For me, that's more important than saving half a second of time each round.
Me: You said that the mouse is more efficient for you since it's easier to

move around. And you'd prefer mouse on card-based games, could you elaborate a bit more? Is it like, no matter how good are the controls you would still prefer the mouse to play?
Maybe not no matter how good the controls are. But I used to play a lot of Genshin Impact, and they introduced this card-based game. Their controls using a controller were so incredibly not good according to me. That frustrated me every time, and that made me feel biased towards using the mouse or using fingers on the screen, like mobile support games like Hearthstone. It feels like you have more freedom, and you can press wherever you want to.

For this game, I actually felt like the controller controls were really good because you could quickly get to most things without having to do like 5 different things and hold down several buttons. Or I don't need to memorize weird button combinations just to find more information. I really liked that you could press the thumb stick to see more information about the enemies. It was always available, I thought it was really good. And for most things are just one or two clicks away. So for this game, I don't think I would mind playing on a controller. But I think I would still choose the mouse and keyboard because I am just more comfortable with it. It's personal preference. I am more used to it, so it feels more correct to me.

When I started playing this game with a mouse and keyboard, like the first round before the controller testing. I got used to the keyboard and mouse. Especially since I had to switch from controller to keyboard and mouse. It would be easier to use mouse and keyboard the entire time. If I start with the controller and play it on everything, then I don't have to switch to it.

Me: Any other thoughts?
I hope I could help you in some way, it was good!

D.8 Tester Eight from Beta, 3A+3B, found no difference but prefer A

Me: Are you mostly using the D-pad or Left Stick?
The left.
Me: You didn't realize you could see the enemies by pressing down the Left thumb Stick at all.
Yeah, not until you told me. I associated it with the method testing text so I didn't really notice.
Me: Have you seen the little left thumb stick icon in the middle of the screen?
Yes, I did. I was like, I can use the left joystick, great!
Me: Ok..... You said in the survey that you think the controller was quite effective because you already had a target for cards so you didn't need to move the mouse over. Anything else that makes you feel that

way?
It just feels quite fast-paced to use it. When you know you are going for stuff to the right, you know you can just like tap it 4 times. Like, go 4 times quickly to the right. You don't need to look at the mouse and see how far you need to move it exactly. You know if you click 4 times you will be there. Then I am very confident that I will do it right, so I will just do tap tap tap tap and click. And then I'm done, instead of having to look at it. Instead of having to see if I've done it with the right call with my mouse. I quite like that.
I also like that it automatically toggles the right enemy usually, the same enemy and the same unit you targeted last time. That felt pretty good. I knew that would happen so I could just play through it.
Me: You mentioned that you quite enjoyed the quick pace of the controller and it might be because of the game animations. Could you explain more and give some certain cases?
I guess I am talking about the pulling of a card on top of a game board. That whole thing, pulling it to the right enemy or the right ally. I guess it's really quick. It just feels faster when you do it with the controller. It just felt like it chose it faster, without pulling it out and pulling it up and releasing it. You just click, click, click then you are done. I didn't notice the animation that much when I was using the controller than the mouse. When I use the mouse it feels like it is slowing it down.
Me: You wrote in the survey that you found in Method A whichever way you moved the joystick you switched between the enemies. Could you elaborate on it a bit more? What do you mean by switching between enemies?
So the thing that I noticed was when I had an attack, I could pick on an enemy, and there were multiple enemies, or I had two next to each other on the same line in this case. I just noticed cause I was messing around with the buttons, I noticed that even if you're on the top enemy, you press upwards you just go to the bottom enemy as well. I just noticed that on A, I don't know if that's the same case on B. Cause I think it's usually what you want is that when you only have two options, any input can be registered to move.
Me: Do you know how Method B works?
Not really.
Me: (Explained the logic behind both) Which one do you prefer theoretically?
The B one is just very open, there's not really specific logic behind each. It's just that try to do it as freely as possible. I think it might be that I was using the controller at that moment, I think A is better. I like the predictability, I want as much control as possible. If I always know exactly where I am gonna end up I can do it more myself. I will probably reason reason about it that way. I want to know where I am gonna land and I want to know how I can move from there. So as long as I know that, I have the most amount of control I can get. I want it to be efficient, so I can just be planned.
Me: Which Method is easier for you to understand?
A is probably easier to understand, the concept of A is simpler and feels more familiar I would say. I feel like you would recognize this from some other games, as

soon as you know the pattern, you gonna know.
Me: Anything else?
Not really.

D.9 Tester Nine from Beta: 3A + 3B, PS5 controller, Figured out A but preferred B

Me: How does it feel to use a PS5 controller as an Xbox controller?
It does not fundamentally change anything. The button icons are different, but it happens surprisingly frequently in other games that have only Xbox labels. I am relatively used to it by now and usually, when you play you get used to the position of the buttons. Once you get used to it, it does not really affect the gameplay.
Me: But the Y on PS5 is the triangle, X on PS5 is the square. Does this bother you a lot during the gameplay?
It is indeed the confusing part. But once I started trying the game, I started to press the buttons and once I knew what they were, I was used to it. No, it didn't bother me much. It has little to no effect. If you open up the game, usually you have some settings you want to change, but it's usually more minor than that.
Have stability issues.
Me: Are you mostly using the D-buttons/pad or the left stick?
Exclusively the stick. I didn't use the D-pad.
Me: You seemed frustrated about not being able to discard the card. You commented in the survey that the discard should probably be a held button to prevent unintentional discards and to allow the player to discard before targeting. Could you describe more in detail how you think it should work and why?
In Method A I had some problems by the way I played it, it seemed like I could only discard cards that I couldn't play. I didn't figure that out until a certain point, It was not very intuitive. I think that if you translate the gameplay literally, usually you would drag the card to play it. And you would drag the card to discard it. But I don't think dragging can benefit the controller, it will probably make the game more confusing. But then we need a targeting system which you have, but I feel like for discarding, you should probably just need a button press or hold.
I think for all the cards, you can just have an option where you can just hold X and it has a little ring to show your progress, similar to how your End Round button works. I felt personally, the less steps to an action, makes it more efficient. So if you need to target, and then press a button that's two actions. Two steps to do one thing.
Me: So that's your principle of "what's more efficient" for you, right?
I think the reason why I answered the survey is that the mouse is more efficient because you only need one button and the mouse, that's it. All of the actions are just to drag to throw away, or press to play which requires usually one or two steps. Where on the controller, you need to use the D-pad or joystick to select the card, then you need to go to targeting mode, then you need to move around, then you need to press to play again. Or with the discard you also need several steps.

Me: Will you prefer the mouse no matter how good the controls are on the controller? Or is it the fact that the controller will always need more steps so it will never be more efficient for you?
I don't think efficiency is the only thing that matters for playing such a game. If I had to play with a mouse and keyboard, my job requires a lot of mouse and keyboard, I think a lot of people will get tired wrists. It would be nice to just sit down and play it on a switch for example, with a controller setup. Then you can just lie down and play it, I will probably do that. Or I wouldn't mind playing it on the PlayStation either. And even in some games, where there was a lot of clicking required, like in this game you only use the mouse to click interactions over a couple of hours. You could maybe get tired. I feel like the controller adds quite a lot. It's also very helpful for disabilities, so you can remap the controls.
And I just think controllers are a little less precise, they are very comfortable.
Me: Okay, good to know. But is there any design on the controller that makes you think could be better purely on the efficiency side?
The dragging can be quite slow. It can be fast for people who are used to it, maybe. When you press a button, the card is instantly ready. The targeting snaps to the target you want to target. I had some issues in Method A where the enemy's positions makes the snapping quite difficult. The snapping is very intuitive so when you wanna change targets, you can just use the joystick to snap instantly then you can be faster with the controller. It wouldn't be more efficient since it would require more steps but it could be faster.
Me: It looks like you found the logic behind Method A. Maybe you have found that the expectation you have is exactly for Method B. Can you then explain to me why you like Method B more?
I like Method B mostly because I crashed three times in Method A, but as soon as I stopped using Method A and the controller, I didn't have any more crashes. I had one crash at the very end of Method B. I am not quite sure what the difference was. It felt like there was a double confirmation on Method B which counters my point about efficiency and fewer steps. But it got pretty intuitive when you clicked on it. I don't think that's the difference either. I don't the difference but Method B felt much smother, one of them instead I had to sit and analyze how that played.
Me: (Explained the logic behind) Do you still prefer B? Can you explain why?
With the triangle-shaped enemies, 3 on the left and one on the right in the middle. I was trying to pick the bottom enemy, so I will try and aim towards the enemy. The enemies are towards the top right angle. So I would use the joystick to aim towards the angle. And that would sometimes be up, sometimes be left interpreted as in the game. When I try to go from the middle enemy to the back, it would go to the top enemy in the back, or it would be interpreted as both left input and top input. So I would end up on the bottom enemy, so it wouldn't select every other enemy than I wanted to attack.
But it's a very intuitive thing when you target, you just aim your thumb in that direction and it's more when you encounter something that feels off and you notice things. If everything is working well you don't notice it at all.
I think the enemy's location was also more fit with a grid, I think Method A would

also be more intuitive and it would still have the benefit of being straightforward so it is also a meta-perspective in terms of how enemies are. I can definitely see the benefits of Method A, the more enemies there are, the more intuitive it might be. If there's a lot you would need precision, I think A has more precision.
Me: Playing cards is actually two steps in the game as well. Do you think that was not efficient enough either?
Ideally what I would go for would be an undo button, but that's like a fundamental change. But you could have very snappy very quick interactions, if you make a mistake you can undo the last step. Not a serious step, right? It would require a lot of computing power and might be pretty difficult to design around. If that's a change, that probably should be in both the mouse and controller. It's very common in those strategic games, undoing one step might not undo enough, but it wouldn't undo an entire turn. Maybe it's better to just hold it to confirm. The targeting is fine, it's more that you need to target the card for discarding, target a card that doesn't have a target. Usually, you would just play those cards if you placed them.

D.10 Tester ten from Beta: 3B + 3A, Thought they figured out the difference but actually not, preferred B but see benefits from both

Me: Are you mostly using the D-pad or the left stick?
In the beginning, I use the joystick, but there's more position later on. I actually thought it was the last battles, I started to use the D-pad because I thought that was more accurate. It didn't overshoot. More control basically so I would say start with the joystick then go to D-pad.
Me: You said in some cases you would use a D-pad to get more control, can you elaborate a bit more on it?
I feel like especially in Menus, or your game, you had a bunch of units, that are much faster to press the D-pad two times than to do one down down down on the joystick. It's faster and I felt like there's more control on how many times I pressed the button than with a joystick.
Me: You commented in the video that you thought it would default the target to the one closest to you but you changed your mind in Method B you said maybe it would be more intuitive to default on the top one and you also commented in the survey about it. What do you mean by closest? And can you explain more thoughts behind this?
Ok, when I talk about the closest one, I feel like when I apply a shield, it shows the target in the Guard zone. But I felt it was more intuitive when you press to apply something. It starts with the character or the units. That's closest to your avatar, so it starts selecting from the support zone. So that was more intuitive in my head.
Me: What is the avatar and character you are referring to in the game?
So I am talking about the yellow thing.
Me: So you mean the Lantern? But the Lantern can be part of the targets too sometimes, do you mean in those cases you want the target to default on the Lantern themselves or still the closest to the Lantern?

That's a very good point. I can't say that I applied much to the lantern at all. So I just thought that you know this is my player I can do something with it. I still think it should be the support row that should be the first target. I thought that was more intuitive in my sense, I thought the Lantern was me or something. Why I don't want to start with the Lantern is because I felt like applying something to Lantern happens less often. I also felt like it was a unit in that sense. Often we apply cards to units right.

Me: (Explained the memory system for the units and hazards) What's your opinion on this?

Okay, that's why it feels a bit inconsistent I guess, because I didn't realize it reapplied to the units. In my opinion, I always wanted it to be a default starting position. I always wanted to start in a support zone. And now the question is, which unit is in the support zone? I think I want the top one in the support zone. I think I am just looking for a default unit in the support zone, so if there's just one single unit then that would be the top one. But if you have two units in the support zone, I still wanted it to be the top one. Not the bottom one. If it's the origin, then it always starts with this one. And then you move however you want, that's how I see it.

Me: Is there a specific reason that you want it on top instead of bottom? If it's always on the bottom one then it's still the same one every time starts with.

I can't describe it. In my head, it makes more sense on the top one but I can not tell why. Maybe if I play a bit more then I can try to figure it out but for now, I can't say why I want it. But you're right, the bottom one also technically works. Just a base location

Me: You had some issues that you thought one unit was in the front but at the moment you applied the card it was at the front but then it moved back.

Yes, so that's why I think I want a default starting position. I thought it was gonna select another unit, I was too fast basically. I took like moveability card or something. And then it selected the front one while my brain was expecting it to select the support zone. Maybe it's just a thought on my end, I can't remember exactly what it was just a bit annoying.

Me: You mentioned the difference between the mouse and the controller on the End Round button that End Round on the controller requires you to hold a bit more. And I think you've tried to mess around it on the controller. Do you like it or not?

I really liked that you need to confirm it for a little bit. Cause sometimes I was just doing a nervous ticking where you do not want to. I like that you need to press half a second or something.

Me: You commented on something about how you didn't know which one you were targeting because the color wasn't clear enough. What would you suggest to change?

I remember it was yellow or orange, sometimes when you are not properly looking at a unit, you need to quickly figure out which one is which. I remember these colors blend me out a bit. Sometimes I have to spend a second figuring out which one am I targeting now. It didn't register in my head actually. I don't know which color you

use, maybe red, or green to be more distinct. But maybe that's not good for people who are colorblind. I just thought those were quite similar, they were not distinct enough in my head at least. Color change or shape change. Because the shapes are also similar, right? Because I remember the boss is exposed to its weak points. They all have arrows pointing to them. And that really messed me up, because I thought I had already selected this one, but then I realized other weak points also have these arrows that pointed towards them. So maybe a shape change or another way to indicate a unit or an enemy is selected.

Me: You said that you need to select the card first and then play, and you thought it's a good safety feature. Can you explain it a bit more to me? There's no confirmation about redrawing. You said?

If you select a card for redraw, you don't have a hold thing for the end-round button. You just need to press it once. I think you can accidentally press the X button unless you confirm it. So you press A and then X, so it's very less likely to happen that you accidentally redraw a very good card. I really like that feature.

Me: Both mouse and controller had their strengths. When there are a lot of things on screen, it can be easier to use the mouse because you do not need to cycle through a bunch of units. On the other hand, the navigation can be much faster on the controller. So it all depends on the scenario. But if I need to pick one I would choose the controller. Why controller in the end then?

The mouse is very good because you have lots of units. Then for the controller, you need to cycle through all of the units instead of getting the correct one one step. I still like the way you targeted stuff using the controller. Since everything worked in combat on the controller, maybe I have played a lot of games with the controller lately so I thought it was more intuitive in that sense as well, to pick up the controller and just use it. I like the mouse as well, right now I just sat my mind on the controller.

Me: It looks like you already figured out the logic behind Method A. Can you explain to me how you think both methods work?

Maybe I am wrong now, I thought Method A was targeting the Guard zone first, and Method B was targeting the support zone, first. Now I started to doubt that was the actual difference between them. I don't know what's the difference.

Me: It was about something else. And you said you prefer Method B, but do you still have a preference now?

No, I can't say I have a preference.

Me: (Explained the logic for both methods) If you understand how they work which do you prefer?

I recognize Method B is quite popular in a lot of games. *Dead Cells*(2018) comes to mind to me. I think Method B is very good when it's accurate. It can't actually track which one you meant, in some games, I notice that kind of system and it's always flawless. I always know which one I am gonna go to. I don't actually know how the targeting works and I don't really know which unit you are meant to go to. I think Method A is the safer option, it's predictable every time. Method B is faster, but it needs to be implemented correctly. Since I didn't notice anything I guess Method B was implemented correctly. I just felt like one offers speed the

other offers predictability.

Me: Any other thoughts?

I thought it was just a fun game experience to be honest. I've never played Rogue deck-builders, but the game is very intuitive in general. The first match I started to use the control was basically flawless. It was not disconnected on how it works basically. It's just how I expected to work.