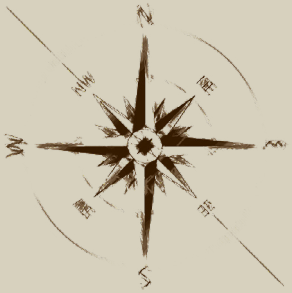

AGI
By Mohsin Ali

My life has changed completely.

- Future self

Figure 1. Digital treasure map of *Agi* (Mohsin Ali, 2016)

HOW CAN THE OCULUS RIFT ENRICH THE INTERACTIVE STORYTELLING EXPERIENCE?



By Mohsin Ali

A thesis submitted to the Victoria University of Wellington in fulfilment of the requirements of the degree of Master of Design Innovation in Media Design.

Victoria University of Wellington

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Abstract

The technology of today, such as the *Oculus Rift*, can provide immersion in ways that were unachievable in the past. The *Oculus Rift* is a virtual reality headset that allows the user to see the three-dimensional world without the use of a traditional monitor. Unlike television, computer and mobile screens, a virtual reality headset digitally transports the user into the environment. Functionality such as depth tracking and rotational head tracking provides immersion unlike anything experienced to date.

My interest is to investigate interactive storytelling in combination with the *Oculus Rift,* to determine if virtual reality headsets can enrich storytelling experiences. This will be achieved by developing an application where interactive storytelling is compatible with the *Oculus Rift,* and testing that application with participants. Finally, a conclusion will be drawn from the data collected by participants.

Alongside the written thesis, a digital application will be produced in *Unreal Engine 4* (Video game engine). The application will be an *Oculus Rift* driven experience, meaning that users can only experience it through an *Oculus Rift*. The application will have an interactive plot, which allows the user to influence the storyline. The design will be iterative and will be refined after each user testing session. The application hopes to strengthen the theories and concepts found in the written section of the thesis.

Figure 2. Digital sketch of scene two (Mohsin Ali, 2016)

Acknowledgements

I would like to thank my supervisor Walter Langelaar for the constant feedback and support this past year. Our discussions helped me greatly in finding a thesis topic that I would truly be interested in. This resulted in my thesis being an absolute joy to work on and kept me motivated throughout the past year.

I would also like to thank my classmates, Tuakana Metuarau, Nick Wellwood and Patrick Kauraka for accompanying me in this journey towards a post graduate degree. I wish you all the best for your final hand in.

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Lastly, to my family who have constantly supported me in my education and provided me with the tools to help me complete my thesis without difficulties. I thank you.

Figure 3. Digital sketch of ledge in scene two (Mohsin Ali, 2016)

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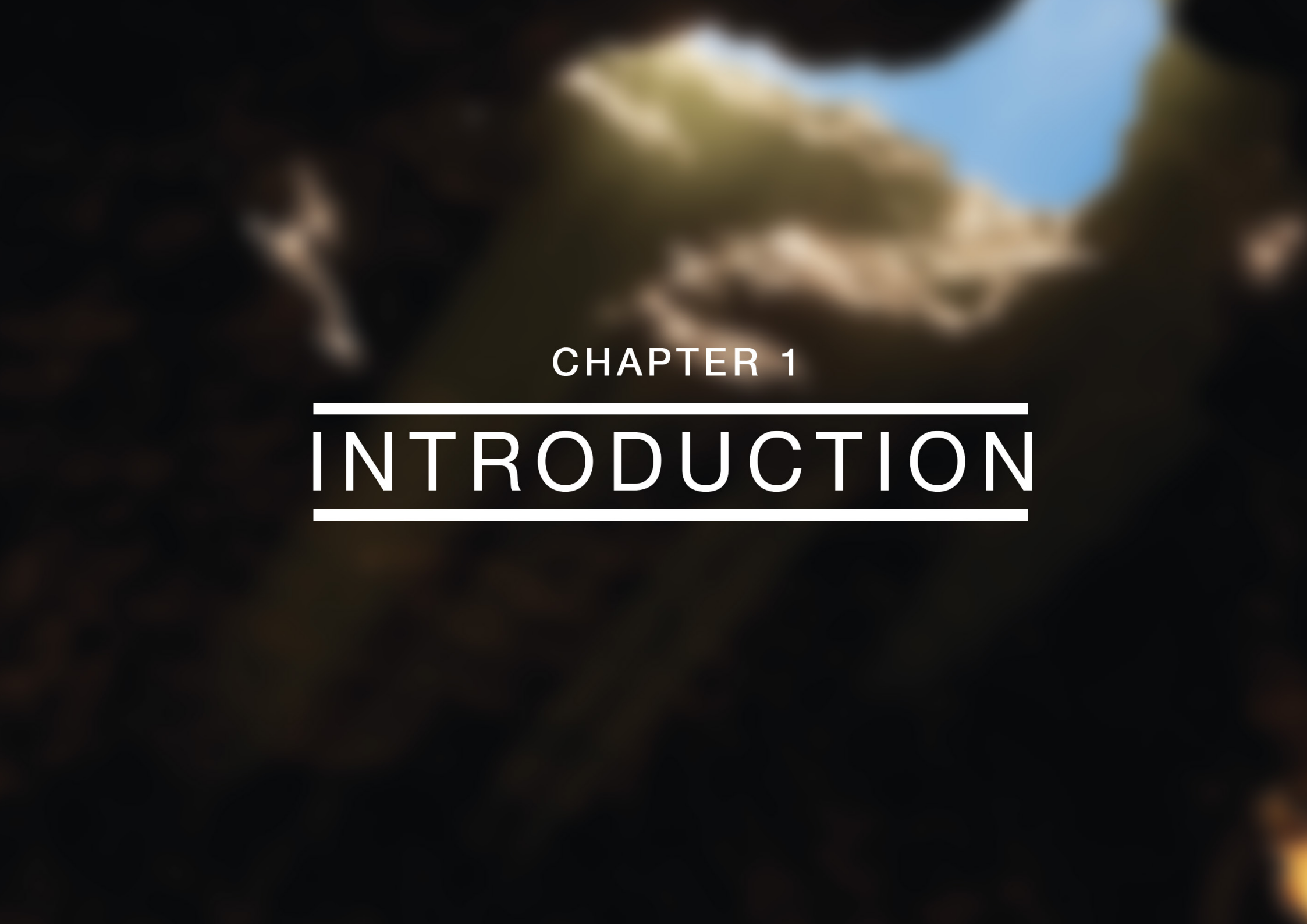
Important files on USB drive:

Firstly, the interactive application called *Agi*. This is the interactive storytelling project that I have been working on. To launch the application, navigate towards the folder called "*Agi*", then *WindowsNoEditor>Agi.exe*. The application was built to run with an *Oculus Rift,* however, can still be used with a keyboard and mouse. Using the application without an *Oculus Rift* will dramatically decrease the concepts applied to this project.

Next, demonstration videos will be available showcasing the application in action with an *Oculus Rift*.

Lastly, a compilation video of the reactions from the research event will be available to the reader to provide further relevancy in the user testing section of this thesis.

Figure 4. Render of scene 1 - “Awakening” (Mohsin Ali, 2016)



CHAPTER 1

INTRODUCTION

Introduction

Storytelling plays an important part in the development of understanding our world. As our world evolves with technology, the way we experience stories evolves too. 2016 marks the year that launches the first generation of virtual reality headsets. The major headsets include the *Oculus Rift*, *HTC Vive* and *Playstation VR*. Functionality between the headsets are almost identical. All the headsets have depth tracking, rotational head movement and have the option to purchase motion controllers. The differences in headsets are in preference of ergonomics, platform and available software. A virtual reality headset is a device that has the ability to view a three-dimensional world without the use of a monitor. Unlike a traditional monitor, the functionality of a virtual reality headset can allow full 360 degree interaction with a scene. Technology does not only change the way we experience stories, it also changes how we tell stories.

Computation can be utilised to bring interactivity into the narrative (Swartjes, I. (2007), pg. 1). This form of narrative is called interactive storytelling. It allows the user to interact and affect the storyline. This innovation has created new and different types of stories that are difficult or impossible to produce in another medium. (Lebowitz, Klug, (2012), pg.14). Interactive storytelling is not new. It is a young field, first imagined in the late 1980s and initially investigated within the 1990s. It did not however, become a hot topic till around 2010. (Crawford, C (2012), pg.10). It is in my interest to investigate interactive storytelling in combination with the *Oculus Rift,* to determine if virtual reality can enrich storytelling experiences. The *Oculus Rift* is the virtual reality headset that will be used in this project.

Figure 5. Digital concept sketch of potential asset (Mohsin Ali, 2016)

Aims and Objectives

To achieve this investigation, two aims have been produced alongside objectives on how to accomplish these aims:

Determine the amount of interactivity that interactive stories can have

- Define what is considered 'interactive' in interactive stories.
- Test what interactive elements are present in current interactive projects.
- Determine the influence of interactivity on the narrative structure.

Determine if virtual reality can enhance story experiences.

- Determine the design strategies used to harness the *Oculus Rifts* capabilities.
- Produce a platform where virtual reality coincides with the interactive narrative.
- Test my interactive application with participants.

Design Output

A digital application will be produced that combines the philosophical concepts and design strategies behind interactive storytelling and the *Oculus Rift*. The application will judge the success of the theories and design principles by testing the design with participants. The application will be called *Agi*.

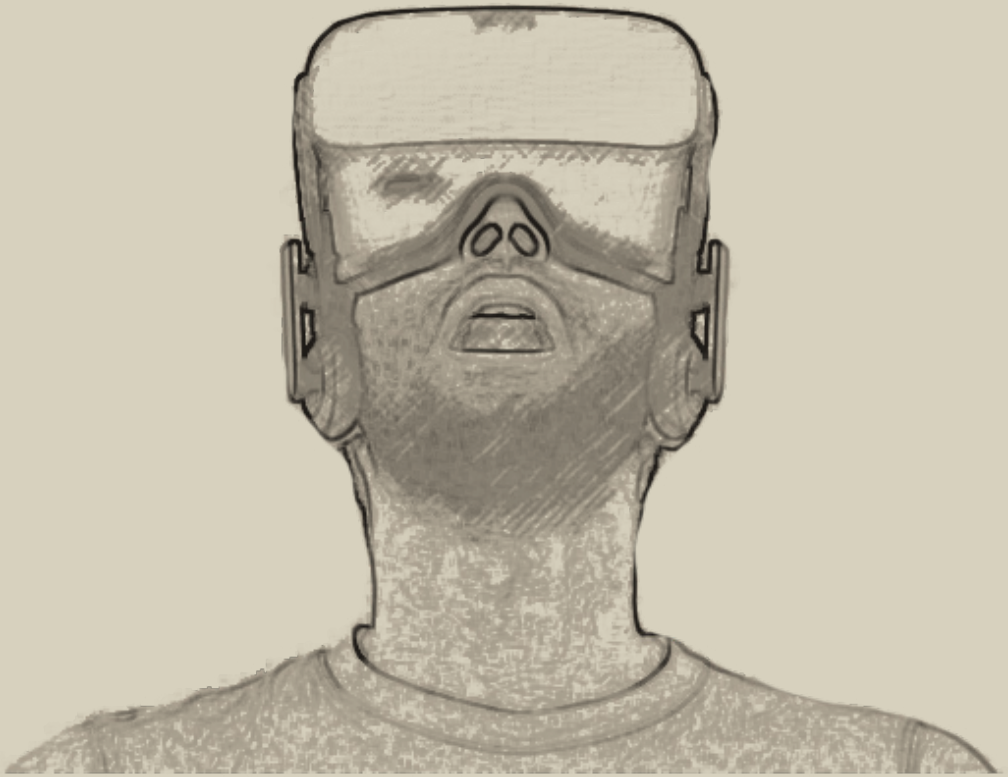
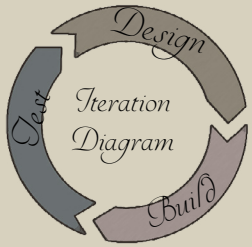


Figure 6. Image of participant wearing headset - Image re-designed by Mohsin Ali (Oculus, 2016)

Methodology Summary



To extract the information from participants, this research will utilise ethnography methods. Linking ethnographic methods to design has allowed designers to gain a deeper understanding of user work practices. (Schuler D., Namioka A., (1993), pg 151). The ethnographic methods used in this thesis are:

Observation (Carl Bereiter, pg 325).
Interviews (Turner III, D. W. (2010, pg. 1).
Questionnaires (Hymes, D, 2003, pg. 9).

The purpose of these methods are expanded and explained in the user testing section.

The application follows an iterative design process which includes designing, producing and testing. (Nielsen, J. (1993). The process is repeated until the design is optimal for user testing. Much of the iterative process takes place in the preliminary design phase, where the interaction, visual design and sound design are tested with a small sample size before opening the application to a larger group. This is because the focus of the research is to extract data about interactive storytelling and the *Oculus Rift,* rather than technical details.

Key Theorists and Precedents

Chris Crawford has been researching interactive storytelling since 1992 and has published numerous books on the topic. Chris Crawford's latest book, *Chris Crawford on Interactive Storytelling second edition* (2012), is a key reference to the research and will aid the objective of defining the interactive elements in interactive stories.

Game of Thrones: A Telltale Game series is a video game made by Telltale. Telltale have been successful, winning awards such as VGX Award for Game of the Year, VGX Award for Studio of the Year, BAFTA Game Awards for Story and many more. Telltale describe their games as offering a 'tailored story', which means that the story experience could differ completely from person to person. (para 2). Scoping relevant precedents is equally important as the literature, and will also assist the objective of defining interactivity in interactive stories.

A key part to any narrative is becoming immersed into the story space. This project will research the definition of immersion in traditional literature by **Ryan (2001),** and the definition of immersion that simulates a realistic subjective experience by **Reiners, Teras, Chang**, **Wood, Gregory, Gibson** and **Teras** (2014).

Aylett and Louchart (2008) discuss a theory called *Emergent Narrative* which is presented to answer the issues of interactivity over narrative structure. The issue stems the phrase 'interactive story'. A story is linear: it has a beginning, middle and end, however non-linearity is the core of interactivity. (Bruckman, (1990), pg.1). The issue dissolves down to the authors desire to execute narrative versus the freedom of user choice. The principles of *Emergent Narrative* will be in effect in *Agi* and applied to Game *of Thrones: A Telltale Game series* to judge if the theory solves the issue between authors intent versus user freedom.

Back to Dinosaur Island is an *Oculus Rift* driven game built to take advantage of the technology's capabilities. The studio behind the experience is Crytek, known for pushing the limits with hardware and technology. Crytek has won various awards such as Innovative Company of the Year 2014 and SIGGRAPH Award 2014 – Best Real-Time graphics. *Back to Dinosaur Island* will aid in determining design strategies to use the *Oculus Rift* to its full potential.

Scope of Research

Agi, the interactive application, will be produced by one person. Due to this, constraints have been placed on the project:

- Firstly, the duration of *Agi* will not exceed 10 minutes.
- Secondly the interactive system will accommodate the principles of interactive storytelling, however, it will not be complex enough to dynamically reform the story according to the users choices.
- Finally, three-dimensional character creation and animation will be limited.

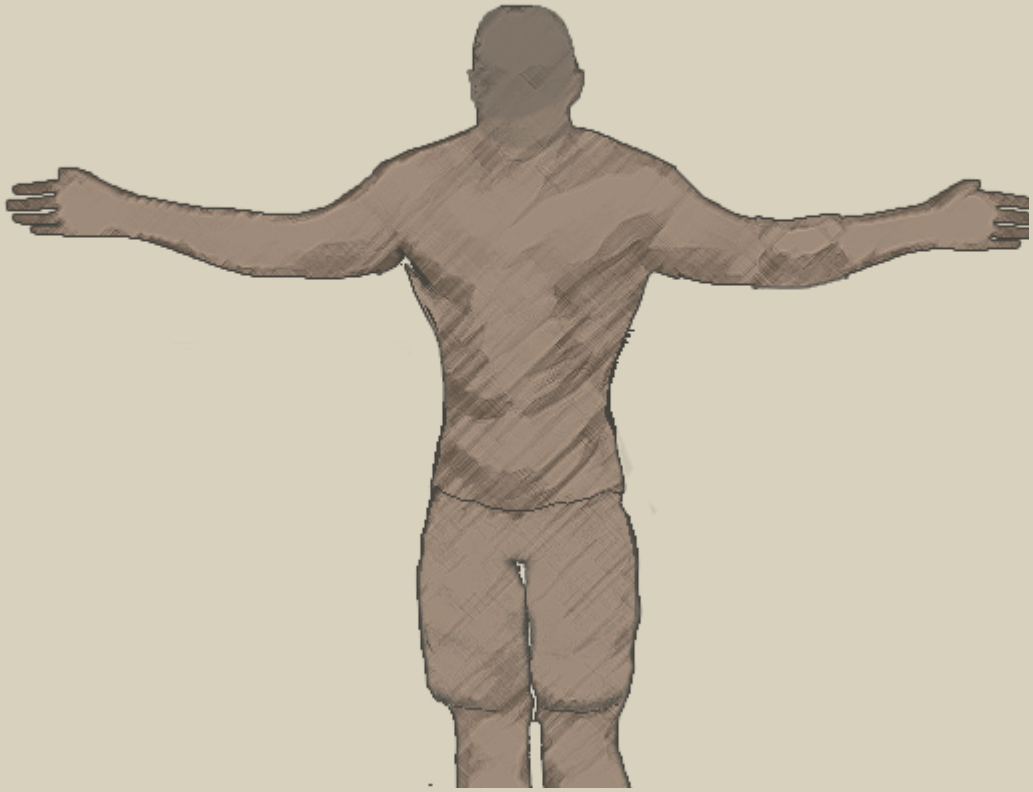


Figure 7. Digital concept sketch of character (Mohsin Ali, 2016)

The version of the *Oculus Rift* that will be tested with participants is the Development Kit 2 (DK2). The DK2 is outdated by two years and may not represent the final product which will available to consumers.

As a result of the limitations, design choices will be made to work around the feasible constraints. *Agi* may not fully represent the full potential of interactive storytelling and virtual reality headsets, however, the design of the application will still integrate the principles of interactive storytelling and design strategies from *Oculus Rift* precedents.

Thesis Structure

The thesis structure will begin by grounding the research aims and objectives within relevant literature to discover a mixture of theories that can be implemented into *Agi*. Next, the thesis will target relevant design precedents to break down the strategies already applied to successful interactive storytelling and *Oculus Rift* projects. The theories discovered in the review of literature will also be applied to applicable precedents to judge the success of the given theory.

Following the review of literature and projects, the notions discovered in these chapters will be applied to the preliminary stage of the design. The preliminary phase will focus on the strengths and weaknesses of the developed iterations, the construction of *Agi* and the justified design choices for the different components of the application.

Lastly, the developed application will be tested with participants to judge the success of theories and design strategies. In this section, the ethnography research methods will be explained and the results of the testing will be presented. Finally after examining the results, conclusions will be made in relevance to the aims of this project.

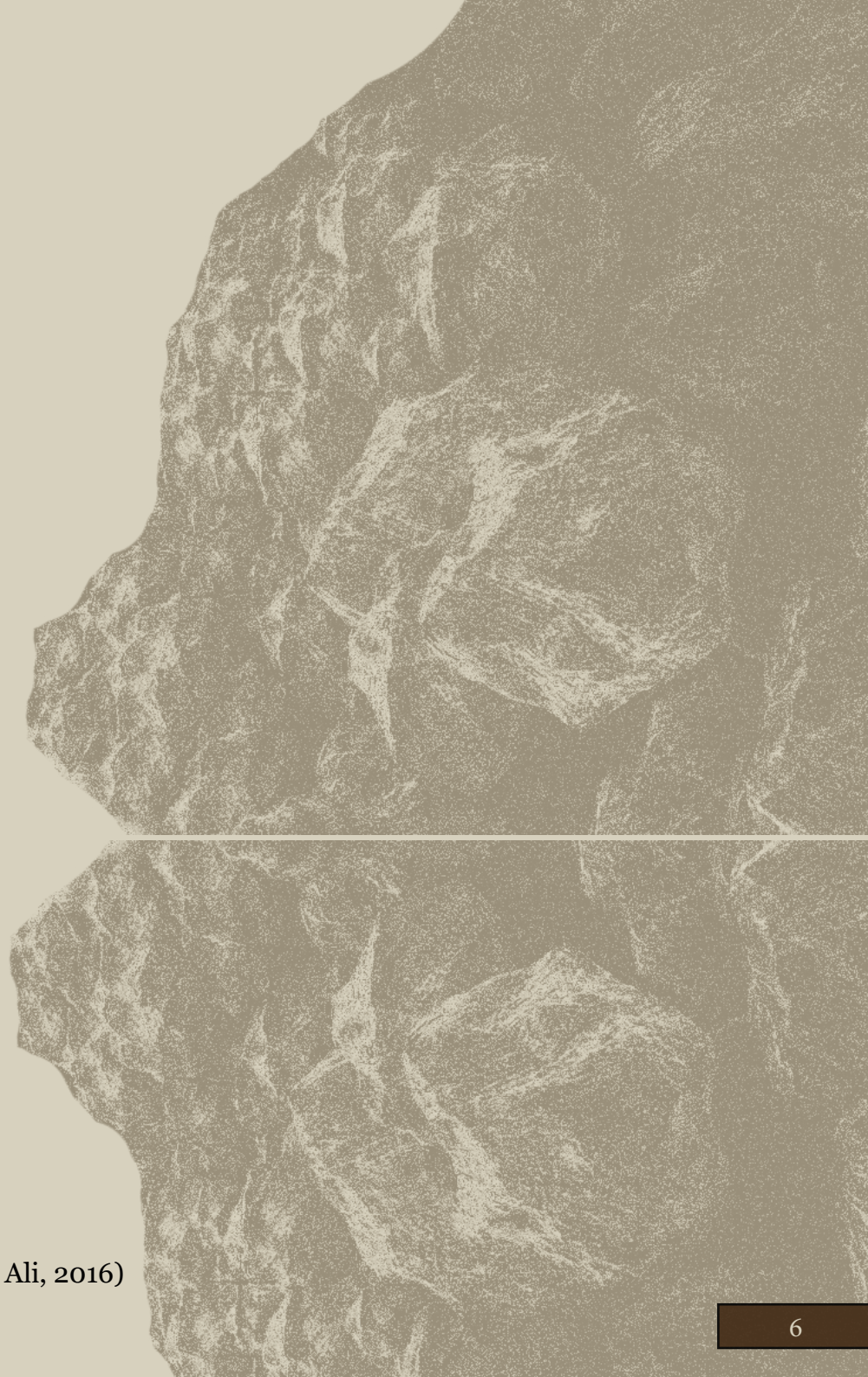
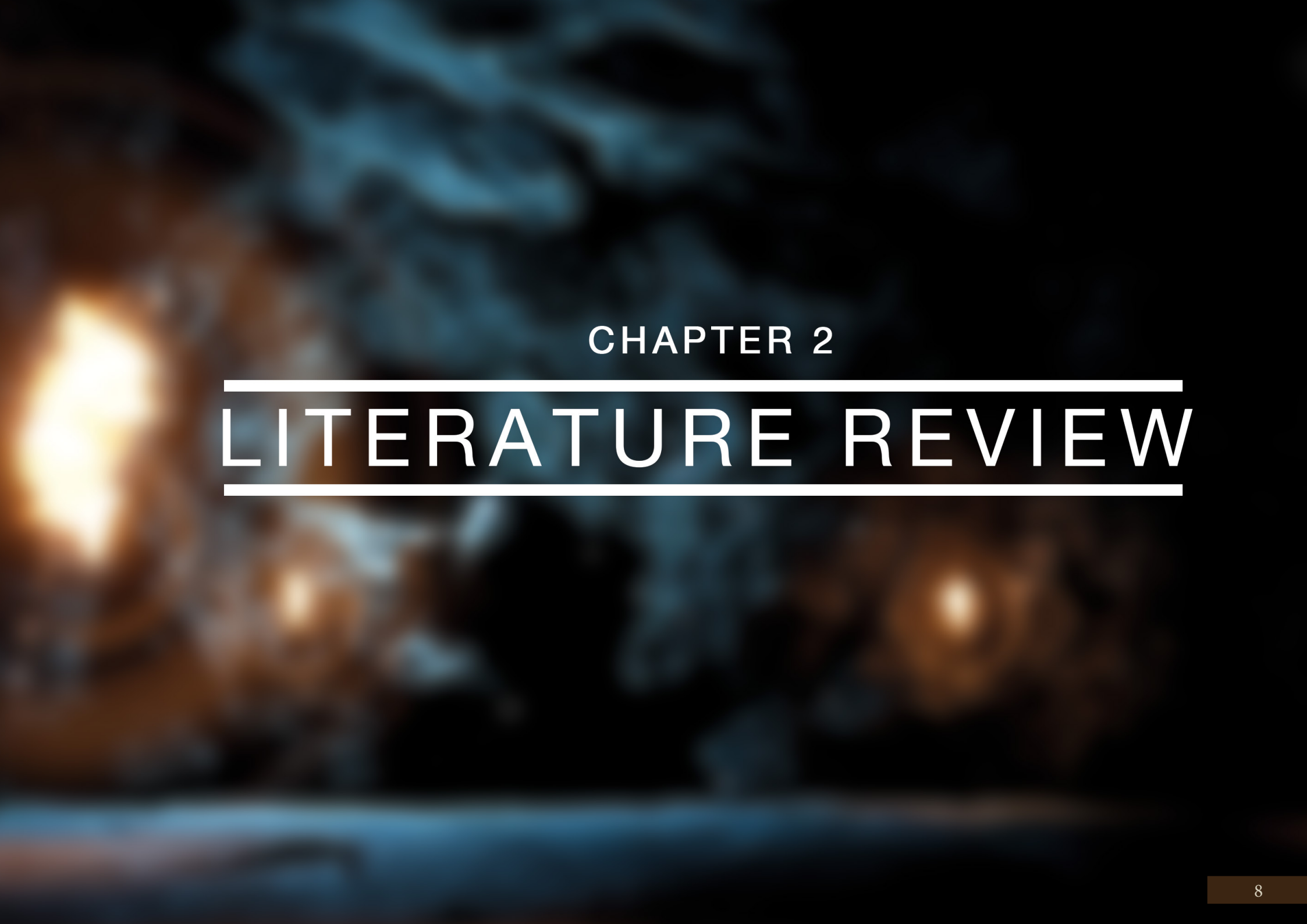


Figure 8. Digital concept sketch of rock formations (Mohsin Ali, 2016)

Figure 9. Render of scene - “Wraith” (Mohsin Ali, 2016)



CHAPTER 2

LITERATURE REVIEW

Literature Review

To most effectively explore interactive storytelling, a subset of literature has been selected in relevance to the following questions to further advance knowledge towards my aims and objectives:

1) **How should interactivity in stories be defined?**

2) **What conflicts occur when interactivity is introduced to the narrative?**

3) **Can immersive visualisation technology, such as virtual reality headsets, enhance the narrative experience?**

The review of the literature focusses on peer-reviewed journals, published books and academic research in the hope that these findings are based on a wider range of research. This is to gain different perspectives from members who have contributed to this field in the past.

How should interactivity in stories be defined?

Chris Crawford (2012) defines interactivity as an “action” that has to be “inter” (between or among) the agents. A one-sided action is not “inter”, it is “re”, which is a reaction. (pg.14) Chris Crawford emphasises the fact that a reaction is not the same as an interaction. He goes on to give an example with a movie: “A movie is not listening to what you are saying, nor is it thinking about anything. It is only speaking. It speaks well and powerfully-that’s good! But it is not interacting.” (Crawford C, (2012) pg.14).

A clear distinction is made between reaction and interaction, thus, what is considered interactive in stories? Adams (1999) describes interactivity in stories as to have freedom and power. It is entering the world and changing it with your presence. (pg.4). More specifically, Cavazza, Charles and Mead (2002) describe this user power in the form of character-based interactions. They explicitly looked at letting users affect, at any time, the predefined narrative. Users have the power to influence characters by offering advice, or change the environments by stealing objects if they so desire. The consequences of these interactions then influence character behaviour and alter the course of action. This leads to dramatic situations eventually progressing to different story endings. (pg. 17). Cavazza, Charles and Mead (2002) go on to give an example of this user interaction: “If the character Ross wants to ask out Rachel, then he must acquire information about her, gain her friendship, find a way to talk in private, and so forth”. (pg. 17). They give an example of the several possibilities at each stage. To gain information, the user could steal her diary, talk to one of her friends or phone her mother. (pg. 17). They comment on how this character based approach uses the same mechanisms to drive both story variability and interaction: “Plan-based roles for the various characters are dynamically combined to generate multiple variants of an initial storyline.” (Cavazza, Charles, Mead (2002), pg. 17).

Linssen (2012), Lebowitz, Klug (2012) and Mitchell, Fernandex-vara, Thue, David (2014) all mention similar descriptions of interactivity in storytelling. However, while Deisinger and Bullinger (2001) mention a similar description, they comment on a conflict that arises between freedom of user choice and author's desire to impose plot and characterisation on the user. (pg.23)

Discussion

The way that interactivity is described above by theorists is mostly through character-based interactions. Interestingly, interacting with characters is not the only method presented: stealing objects from the environment can also alter the course of action. This provides a meaningful addition to interactions, not directly with the action of stealing, but the fact that users can influence the plot without solely relying on character-based interactions. Considering the time restraint and scope of my design, producing multiple characters with their own three-dimensional models, animation and dialogue is not feasible. Environment based interactions can provide an adequete substitute.

What conflicts occur when interactivity is introduced to the narrative?

Bruckman (1990) states that "The traditional idea of a "story" is linear – it has a beginning, a middle, and an end." (pg.1) Bruckman then proceeds to say that there is a contradiction in the phrase "Interactive Story", because a story is "linear" but non-linearity is the essence of interactivity. (pg.1). Bruckman (1990) mentions that "Non-linear is not the same as unstructured. A work without any structure becomes a database – a laundry list of available information." (pg.1) Aylett and Louchart (2008) defined this contradiction between plot and interactivity as the '*Narrative Paradox*'. "How to reconcile the needs of the user who is now potentially a participant rather than a spectator with the idea of narrative coherence – that for an experience to count as a story it must have some kind of satisfying structure". (Aylett, Louchart, 2008, pg 1233). To combat this contradiction between narrative and interactivity, in 1999, Aylett presented the notion of Emergent Narrative as a solution to the "Narrative Paradox". (Aylett, Kriegel, Louchart, Swartjes, (2008), pg.273). Aylett, Kriegel, Louchart and Swartjes describe Emergent Narrative as a narrative concept for the virtual space that depends on the emergence for a dynamic shaping of stories rather than a pre-determined fixed plot. (pg.273). The Emergent Narrative concept focusses on storytelling from a process-based perspective, as opposed to concentrating on the structure of the story. A crucial part of Emergent Narrative systems is that the participants influence how the story plays out. (pg. 274). For this to happen, "interactions and narrative development must show a certain level of flexibility so as to accommodate each other." (Louchart et al. (2008), pg. 274). In an Emergent Narrative scenario, the narrative system provides a limited range of options to the participant. The choices that the participant makes progressively shape and reshape the range of actions available to the user. Future interactions are constrained by the narrative development through the users own story choices. (pg.274). Serious consideration must be made towards the design of the story. The structure should be designed in a way that enables narrative to surface from interactions between different characters, the user and their individual storyline. (Aylett, Louchart (2004), pg.2).

Discussion

The Emergent Narrative theory provides a different perspective on narrative development by concentrating on process-based systems rather than exclusively focusing on the structure of the story. The Emergent Narrative concept as described by the theorists above is a dynamic shaping of storylines which must have a certain level of flexibility in regard to interaction and narrative development. In designing my story, first I must consider how the character-based or environmental interactions for the user progress narrative. Secondly, I must create a system that structures the narrative in a way that gradually reshapes and constrains the range of options available to the user, which is dependent on the choices that the user makes. Finally, I must plan a feasible narrative system in accordance with the scope of my project.

emergent narrative

Can immersive visualisation technology such as virtual reality headsets, enhance the narrative experience?

In the previous sections of this literature review we have seen theorist discuss concepts and strategies in relation to interactive storytelling. Another key aim of this thesis however, is to combine narrative with virtual reality technologies to understand if virtual reality can enhance storytelling experiences.

A key part of any narrative is the viewer or participant's ability to get immersed in the story space. Ryan (2001) talks about a specific type of immersion, "one that presupposes an imaginative relationship to a textual world." (Ryan, (2001), pg. 14). Ryan (2001) then proceeds to give an example about text-based narratives: While reading, immersion is the experience through which the reader can relate to the fictional space and that space must construct a setting for a potential narrative action. (Ryan, (2001), pg. 15). Whether textual worlds are imaginative or serve as representations of the real world, they are mentally born by the reader as environments that exist in time and space. (pg.15). Ryan (2001) goes on to say that "These three dimensions correspond to what have long been recognised as the three basic components of narrative grammar: setting, plot, and characters." (pg.15). The same fundamentals of immersion still apply to virtual reality experiences as the purpose of virtual reality technology is to link the user to a simulated reality (pg.15).

In 2014, Reiners, Teras, Chang, Wood, Gregory, Gibson and Teras conducted research about the role of authenticity and emotion to aid learning in digital environments, specifically with health and safety operations in the Supply and Chain industry. The paper acknowledged the many different immersive definitions in emotion-focused literature, however it adopted the definition used by Dede (2009), which is "that immersion is the subjective impression that one is participating in a comprehensive, realistic experience."(pg. 66). They used an *Oculus Rift* (virtual head mount display) with students to simulate consequences of accidents in a work environment which may cause death or injury. They found that "all the participants claimed that the experience felt real" (Reiners et al, 2014, para 31). They also found through observation that the participants showed strong immersion through mimicking their physical movements to the virtual avatar. In some cases, participants lost their balance or had to stop because the experiment was too intensive. (para 30). This was not the case when they used a 2D monitor. The same scenario failed to have such an immersive effect. 70% of the participants investigated the environment with more care when using the *Oculus Rift* despite knowing that they were in a digital world.

Strategic summary

This literature review establishes a strategic set of principles that can be incorporated into the design experiment. The principles that arose from this review include:

Interactivity: In the earlier section of this review, we looked at how theorists defined interactivity and implemented interactivity into their narratives. Two main principles are recognised in this section about interactivity:

1) That there is a clear distinction made between reaction and interaction.
2) Narrative interactions are not restricted to character-based interactions. Environmental interactions can also be used to influence the story.

Emergent Narrative Theory: The Emergent Narrative concept arose to provide a solution for the contradiction between plot and interactivity. While the theory is based on larger complex interactions, I will reapply the strategies in this theory to structure my narrative, focusing more on environmental interaction rather than the character-based interactions. Character-to-user-based interactions can be incorporated in my project however, character-to-character interactions will require complicated Artificial Intelligence, which may not be feasible for the scope of my project. The key principles I recognised in this section are:

1) Interaction and narrative must complement each other.
2) The decisions that the user makes will advance the story.
3) Future decisions will be limited to the user's own story choices.

Figure 10. Sketch of title screen (Mohsin Ali, 2016)

Strategic Summary

Immersion: A key ingredient in any narrative is the ability for the user to be immersed in the story's universe. The success of my narrative hinges on how well the application immerses the participant into the narrative space. The *Oculus Rift* experiment exposed how their working environment influenced the participants physically. Some participants lost their balance and 70% explored the environment with extra care. If this is the case, then I can expect the *Oculus Rift* to heighten immersion which may lead to more engaging environment-based interactions.

The principles I recognised in section are:

1) The three components of the narrative are: setting, plot and characters.
2) It has been proven by Reiners et al, that the *Oculus Rift* increases immersion, therefore I should be expecting greater immersion in a story-driven application.
3) There is a good chance that environment-based interactions can be enhanced through the *Oculus Rift*.

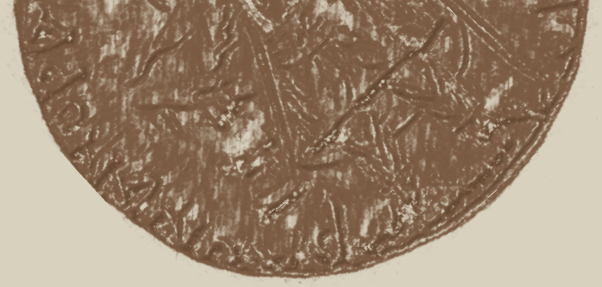
Figure 11. Digital sketch of a dragonfly (Mohsin Ali, 2016)

Figure 12. Render of scene - “Darkness” (Mohsin Ali, 2016)

CHAPTER 3

DESIGN PRECEDENTS

Design Precedents



The previous chapter uncovered concepts that theorists have undertaken in regard to issues raised in the early stages of this research. These include interactivity in the narrative, authorisation versus user freedom and the importance of immersion in the narrative. The *Emergent Narrative* theory will be applied to *Game of Thrones: A Telltale Game Series*, to judge the success of the theory.

This chapter will investigate design precedents in relevance to the following questions.

Interactive storytelling questions:

1) **What are the interactive narrative elements in this project?**
2) **What is the relationship between authorisation and user freedom?**

Oculus Rift questions

1) **How is this project utilising the *Oculus Rift* to increase immersion?**
2) **How does this project display immersion through digital media?**

The three design precedents will be split between two interactive story projects and one *Oculus Rift* project. Currently no interactive storytelling applications for *Oculus Rift* are available on the store. (March, 2016). *Lunadroid 237 – An Interactive Narrative* (Aaron Lemke, 2013) does not come under the definition of interactive storytelling. Interactive storytelling allows for the user to affect the narrative. *Lunadroid 237 – An Interactive Narrative* does have interactive elements such as freedom to explore the world, however the interaction does not manipulate the storyline. Due to this, I will select one successful *Oculus Rift* project based on critical acclaim and rating.

The projects discussed in this section, are projects that I have interacted with and completed.

Game of Thrones: A Telltale Game Series

Game of Thrones: A Telltale Game series is a video game made by the independent Telltale Games in California. Telltale describes their games as offering a 'tailored story', which means that the story experience could differ completely from person to person. (para 2). This is achieved by the story being dynamic, based on the choices that the player makes. The consquences from each choice may be felt instantly, in a later episode, or may surprise you unexpectedly. (para 2) The game is designed to allow anyone to play. The difficulty is made through being forced to make tough decisions with potentially dangerous consequences. The game is episodic which means that the complete story will be told over the course of a season. The first season consists of six episodes which are roughly two hours long but vary depending on the player. Telltale studios have been very successful, winning awards such as VGX Award for Game of the Year (Video Game Awards, 2012), VGX Award for Studio of the Year (Video Game Awards, 2012), BAFTA Game Awards for Story (BAFTA, 2013)

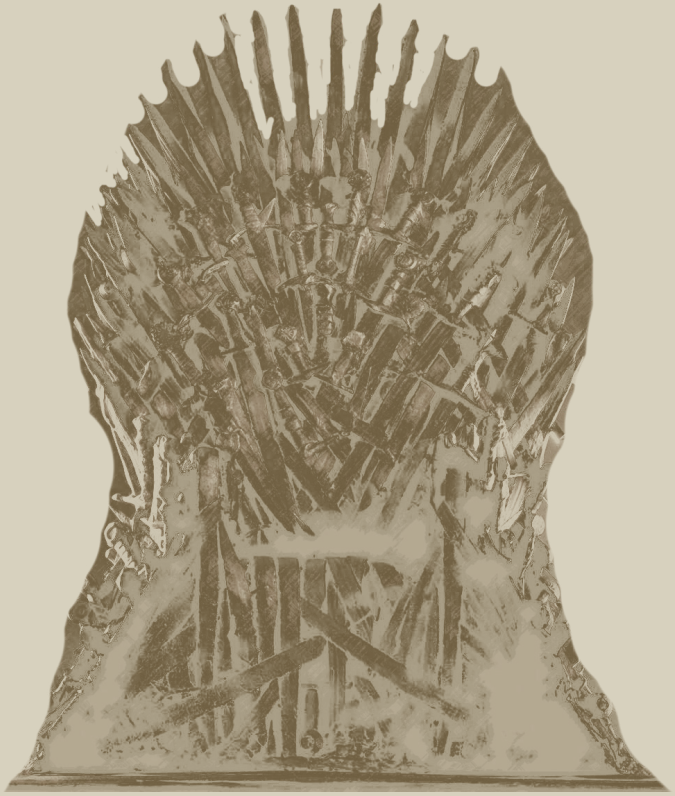


Figure 14. Iron throne, re-designed by Mohsin Ali (Meslow. S, 2014)

What are the interactive narrative elements in this project?

As mentioned earlier, the design of the game is fairly simple and does not require the user to be a gamer in order to interact with the system. The main interactive mechanic is being able to decide what the main characters are going to do. These decisions come in different forms, I have identified four main decision systems in the game.

Shallow decisions (Level one decisions)

Figure 14: Game of Thrones: A Telltale Game Series, Episode 1 (Source: Telltale, 2014)

Description of decision

Shallow decisions present four choices to choose from, each often scarcely influencing the plot. Shallow decisions do not have long term consequences and are used mainly to progress dialogue and conversations.

Authors intent vs user freedom

User freedom is limited to dialogue choices without heavy impact on narrative. While the decision may lack narrative implications, it is a mechanic to utilise for story control.

Figure 15: Episode 3 - Asher lets Daenerys know that Beskha knows the city well. (Source: Telltale, 2015)

Figure 16: Episode 3 - Besktha is not happy with Ashers choice and is noted at the top left. (Source: Telltale, 2015)

Relationship decisions (Level two decisions)

Description of decision

Relationship decisions offer four choices and have a slightly deeper impact on the story. The decision does not dramatically influence the storyline, however, it can have long-term implications. Generally, these are used between characters to establish relationships. Visually, the game represents the decision by letting the user know that the character remembers their choice.

Author intent vs user freedom

Relationship decisions reflect a closer balance of the author's desire to impose plot and user freedom. The variety in dialogue choices indicates the different branches the story can follow. Characters remember how the user treats them, therefore the decision can have immediate or a delayed impact on the story. Author control on story is still strong with user control slightly determining the fate of the story.

Figure 17 - 18: Episode 5 - The user must choose who stays behind, both are main characters in the storyline (Source: Telltale, 2015)

Critical decisions (Level three decisions)

Description of decision

Critical decisions have major implications on the storyline, unlike the previous types of decisions. The decision can determine the fates of characters in the story and drastically change the user's storyline. On average you will find five critical decisions per episode and these are highlighted at the end of each episode.

Author intent vs user freedom

Despite the choices presenting critical impact on the story, author control is still strong over user freedom. The author controls the different branches that the storyline will progress in and the user only has control over which branch is chosen.

Figure 19: Episode 5 - User statistics (Source: Telltale, 2015)

Figure 20: Episode 3 - Investigation of area (Source: Telltale, 2015)

Investigations (Environmental decisions)

Description of decision

Investigations are similar to environmental interactions that were identified previously in the literature review. The interactions here are non-character-based and are generally interactions with the environment or objects. The implementation here is different to what was set out in the literature review. In most cases, the interaction is typically used to add extra lore to the story rather than advance the storyline, as theorised in the literature review.

Author intent vs user freedom

User freedom is complemented with additional control over characters by controlling movement. Author control over story is high in this regard as only one option advances the narrative; the other options flesh out the story.

Discussion

Game of Thrones: A Telltale Game Series offers many interactive systems that each influence the narrative in a different manner. Each system paces the storyline in unique ways, critical decisions for example intensify the narrative while investigations slow down the pace. A recurring theme throughout each decision system is the domination of author control over user freedom. While the user does have the ability to impact the narrative, user freedom is very restricted. Full user freedom will have to take into account every decision possible; even the decisions that do not make sense in that scenario. The author's desire to impose plot at that point will be near impossible. In this project, the author enforces setting, characters and plot. The user only has limited freedom in deciding how to interact with the characters and environment.

Emergent Narrative

Applying the *Emergent Narrative* theory to *Game of Thrones: A Telltale Game Series* reveals the flaws of the philosophy. *Game of Thrones: A Telltale Game Series* fulfils the key principles of *Emergent Narrative* by complementing narrative with interactions, advancing the story with these interactions and limiting the choices available to the user depending on what critical decisions the user has chosen. The key principles of emergent narrative are clearly present in this project, however they do not solve the issue of author versus user. To balance user freedom with author control, a decision-based narrative has to be complemented with the ability to truly explore the narrative world. A decision-based system alone will not be practical to account for every single action possible to the user.

The Witcher 3: A Wild Hunt

The Witcher 3: A Wild Hunt is a video game made by the studio CD Projekt RED from Poland in 2015. *The Witcher 3: A Wild Hunt* is very successful, winning awards such as Game of the Year from The Game Awards 2015 (The Game Awards, 2015), Outstanding Achievement in Story from 19th Annual D.I.C.E Awards (Academy of Interactive Arts and Sciences, 2016) and collectively over 200 awards from gaming outlets.

The Witcher 3: A Wild Hunt has a similar decision-based system embedded within its narrative as *Game of Thrones: A Telltale Game Series*. The user picks a decision and the story will advance accordingly, however the biggest difference is that *The Witcher 3: A Wild Hunt* has multiple ways to interact with the world. One example is the ability to freely roam the narrative space. The user can choose where and how to explore the world with the narrative adjusting to the user's free roaming decisions. An example of this is listed below.

Figure 21: The Witcher 3: Wild Hunt title screen (Source: CD Projekt RED, 2015)

Figure 22: Wolf medalion (Source: CD Projekt RED, 2015)

Figure 23: The Witcher 3: Wild Hunt screenshot (Source: CD Projekt RED, 2015)

Similar to *Game of Thrones: A Telltale Game Series,* the user can choose a decision which will impact the narrative. In this instance, the user declines to help Keira.

Figure 24. The Witcher 3: Wild Hunt screenshot (Source: CD Projekt RED, 2015)

After declining, the user decides to trail Keira and help her. The narrative adjusts to the decision and is noted by Keira, replying with “How about that, you changed your mind”. In this instance the user could have easily decided to exit the cave, continue exploring the area or do something irrational such as putting out the flames on nearby torches. With the ability to free roam, the user has the freedom to decide what to do without being restricted by choices.

Due to the scope of my project, creating true user freedom will require a sophisticated system with multiple interactions to dynamically adjust to everything the user decides to do. Instead, I will follow the structure of *Game of Thrones: A Telltale Game Series*, having strong user control over narrative and utilising many of the decision mechanics identified previously.

Back to Dinosaur Island

Back to Dinosaur Island is an *Oculus Rift* driven game built to take advantage of the technology's capabilities. The studio behind the experience is Crytek, known for pushing the limits with hardware and technology. Crytek has won various awards such as Innovative Company of the Year 2014 and SIGGRAPH Award 2014 – Best Real-Time graphics. (Crytek, *Corporate Overview – Awards*, 2016) Some of their successful titles include the Far Cry series and the Crysis series.

Figure 25. Back to Dinosaur Island (Source: Crytek, 2015)

Back to Dinosaur Island is a short experience with no interactivity other than being able to observe the area by looking around. The main encounter is against a Tyrannonsaurus Rex which investigates the vicinity of the user. The T-Rex approaches the user in close proximity, roaring, sniffing and lunging at the user. The encounter is amplified with the *Oculus Rift* as it immerses the user into the world, creating a virtual representation of being face-to-face with a dinosaur.

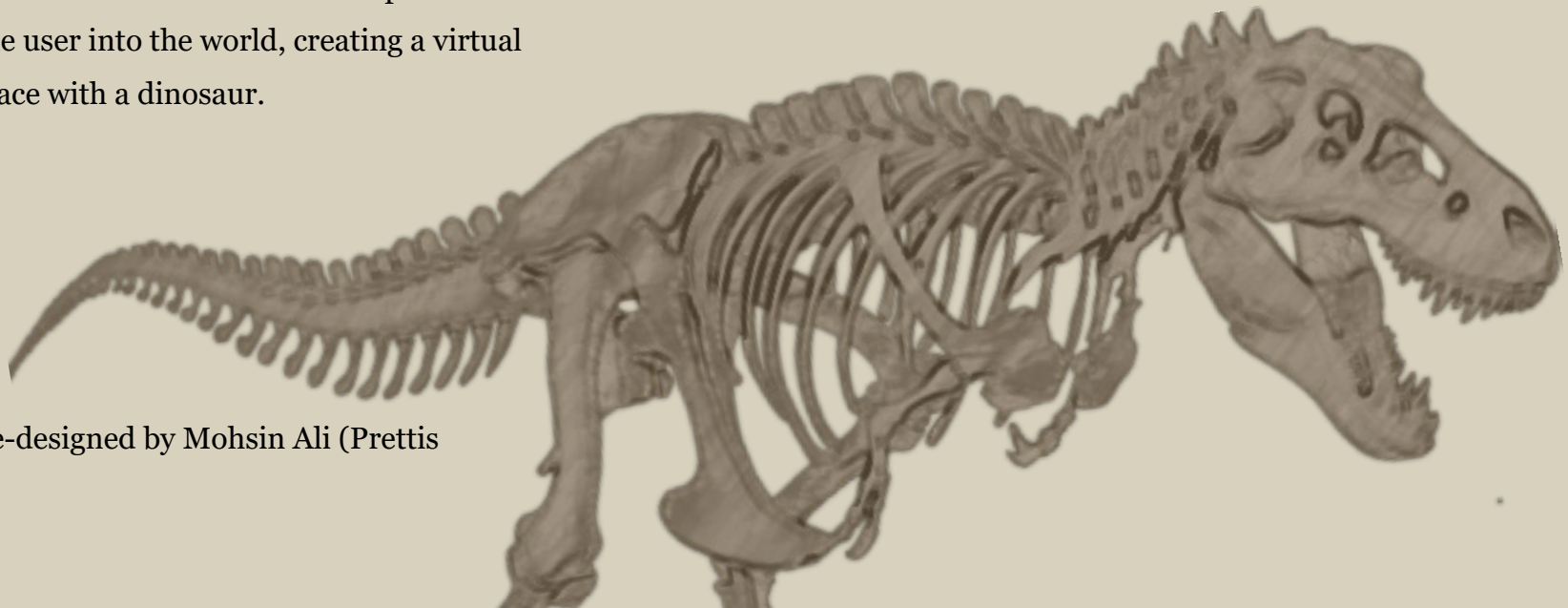


Figure 26. T-Rex, re-designed by Mohsin Ali (Prettis Bre, 2014)

How is this project utilising the Oculus Rift to increase immersion?

There is an immense difference in viewing *Back to Dinosaur Island* with an *Oculus Rift* than a standard monitor. This will be the case with all *Oculus Rift* applications as the technology offers different capabilities than a normal viewing screen. Firstly, there is an illusion of depth in the image: objects closer to the viewer in the digital space pop out greater than objects further in the distance. The effect is similar to three-dimensional movies, however, the effect is greatly intensified. Secondly, the headset has motion tracking technology which means that the application will track the user's head movement. This removes the level of abstraction between the user and digital application, as many digital applications require a controller or mouse to operate. Head rotation is how people observe their surroundings and it feels natural on the *Oculus Rift*. This also has added benefits on usability issues.

Back to Dinosaur Island takes advantage of the Virtual Reality headset by utilising the added capabilities of the *Oculus Rift*. The use of scale and depth is illustrated in this application: the user is placed in a low position which brings out the vast size of the creature. The dinosaur first sights the user from afar and then quickly proceeds to investigate the area. This is an intimidating display of scale and depth. The dinosaur transitions from being a background object to intruding the user's personal space.

Figure 27. Back to Dinosaur Island Walkthrough (Source: Dlive22891, 2015)

Figure 28. Back to Dinosaur Island Walkthrough (Source: Dlive22891, 2015)

How is the project displaying immersion through digital media?

While the dinosaur is the main attraction of the experience, finer details are hidden away in this application, which overall add to the immersion. The sound design includes a vibrant forest ambient track and dinosaur sound effects. The weight of the dinosaur is felt through the sound and vibration is portrayed visually within the scene. The roaring is loud and intimidating with added visual effects such as breathing particles escaping from the mouth. The background reacts accordingly with the dinosaur: branches and leaves rustle with movement when the dinosaur moves or roars. Additional assets such as smaller dinosaurs, birds and insects appear in the application creating the illusion of a lively forest. Three-dimensional sound effects are used with the insect buzzing around the user, which demonstrate the motion tracking capabilities of the *Oculus Rift*.

Back to Dinosaur Island is a great demonstration of the potential of the *Oculus Rift's* capabilities. It utilises the hardware in simple but effective ways that present clear design opportunities for designing an Oculus Rift application. The main weakness of the application is the lack of replay value and lack of interactivity. The application remains identical throughout the experience and the dinosaur does not react differently to the user. While *Back to Dinosaur Island* lacks interactivity, it does demonstrate the use of depth and scale, three-dimensional sound design and small visual details that increase immersion.

Figure 29. Back to Dinosaur Island Walkthrough (Source: Dlive22891, 2015)

Figure 30. Back to Dinosaur Island Walkthrough (Source: Dlive22891, 2015)

Discussion

In the literature review it was discovered that narrative based interactions can extend to environmental decisions. In reviewing design precedents, specific information on how decisions change the storyline was found. Four types of narrative choices were discussed, shallow, relationship, critical and investigations. In *Game of Thrones: A Telltale Game Series*, environmental decisions come in the form of investigations, however, these do not have a crucial impact on the the story. The goal of the narrative system is to push environmental decisions to have critical implications towards the story.

Secondly, we investigated the concept of authorisation versus user freedom. The proposal of *Emergent Narrative* was the solution to this issue. After applying the principles of the *Emergent Narrative* theory to *Game of Thrones: A Telltale Game Series*, it is found that *Emergent Narrative* does not solve the issue of authorisation versus user freedom with pure decision-based narratives.

The Witcher 3: Wild Hunt displayed balance of user freedom and authorisation by supplementing a free-roaming mechanic which would adjust narrative alongside the decision-based system. If authorisation is dominant over user freedom, it does not mean that the experience is deteriorated. Sander (2008) states that linear stories in interactive storytelling systems are looked upon as a flaws, but what if the direction happens to match up with what the user was going to do initially? The experience would not be different to a non-linear interactive story. (pg.3). *Agi* will adopt linear interactive storytelling into the plot which means that author control over the narrative will be high.

Lastly, it was discovered that the *Oculus Rift* automatically heightens immersion due to it's technological capabilities. In the review of *Back to Dinosaur Island*, it was identified how the project takes advantage of the technology's capabilities. While the project lacks in interactivity, it presents strategies for most effectively designing for the *Oculus Rift*. These include techniques for scale and depth, and motion tracking. *Back to Dinosaur Island* also presents exceptional sound design and visual effects which all add to the experience of viewing the project with an *Oculus Rift*.

Figure 31. Render of scene - “Tutorial” (Mohsin Ali, 2016)

CHAPTER 4

DESIGN PROCESS

Design process

This thesis now shows the design process of *Agi*, the interactive application. The application will be constructed in *Unreal Engine 4*. The theories and design strategies discovered in the previous chapters have been incorporated into this process. The design process has been structured by the following components:

Planning of setting, character and plot.

- Creation of setting and characters
- Interactive decisions
- Screenplays

Design of interactive system.

- Iterations of the interactive system
- Unique *Oculus Rift* scenes
- Iterations of visual and sound components

Condition of *Agi* before user testing.

- Constraints of the application from scope of the research

Planning of setting, character and plot

Setting

According to Ryan (2001), the success of narrative immersion is comprised of setting, character and plot. (pg.15). These three keywords drive the creation of the narrative universe. Before character and plot, the setting was planned for. The setting is simple. Simplicity is the key element as the scope must be suitable for a lone worker.

I have decided to use a cave environment as the setting. A cave is an ideal setting for the scope of this project as the applied environmental decisions feel appropriate and not forced.

Characters

There are four interactive characters in the storyline. Interactive characters are characters that the user can communicate with and influence the conversation with their choices. It was decided that the characters in the story would communicate over a radio. The reason for this decision is that a radio reduced the work in modelling and animating characters.

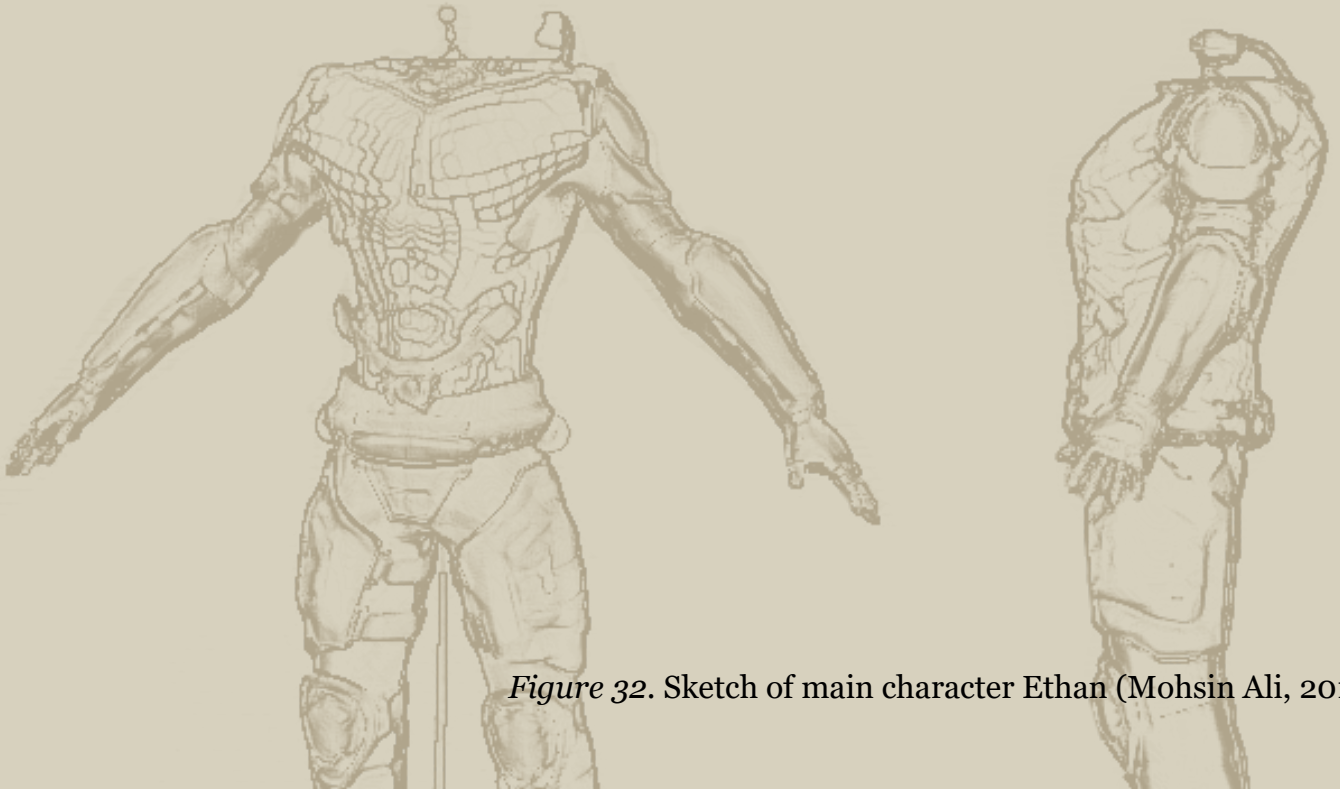


Figure 32. Sketch of main character Ethan (Mohsin Ali, 2016)

Characters

Ethan:

Ethan is the vessel for the user to control the story. The user will role play as Ethan and have the ability to choose his decisions. Tamati Kawha is the voice actor for Ethan.

Naomi:

Naomi plays an important role in response to user decisions. Due to many of the choices being environmental, Naomi criticises the user's choice to add further drama to the situation. Emma Carpenter is the voice actress for Naomi.

Alethea:

Alethea was created in response to Emma, the voice actor for Naomi, not being available for additional voice recording. Alethea tutors the user about the basic controls of the application. Hannah Botha is the voice actress for Alethea.

Darkness (Optional):

Darkness plays the role of the optional antagonist in the storyline. Darkness is a spiritual being that communicates to Ethan through dialogue. This design choice is in retort to the technical scope of the project. While Darkness does not have a physical body, Darkness can influence the physical world around him. Tuakana Metuarau is the voice actor for Darkness.

Wraith (Optional):

The Wraith is a physical actor however does not speak in the application. Wraith is introduced to demonstrate three-dimensional depth.

Figure 33. Digital sketch of Wraith (Mohsin Ali, 2016)

Ethan development:

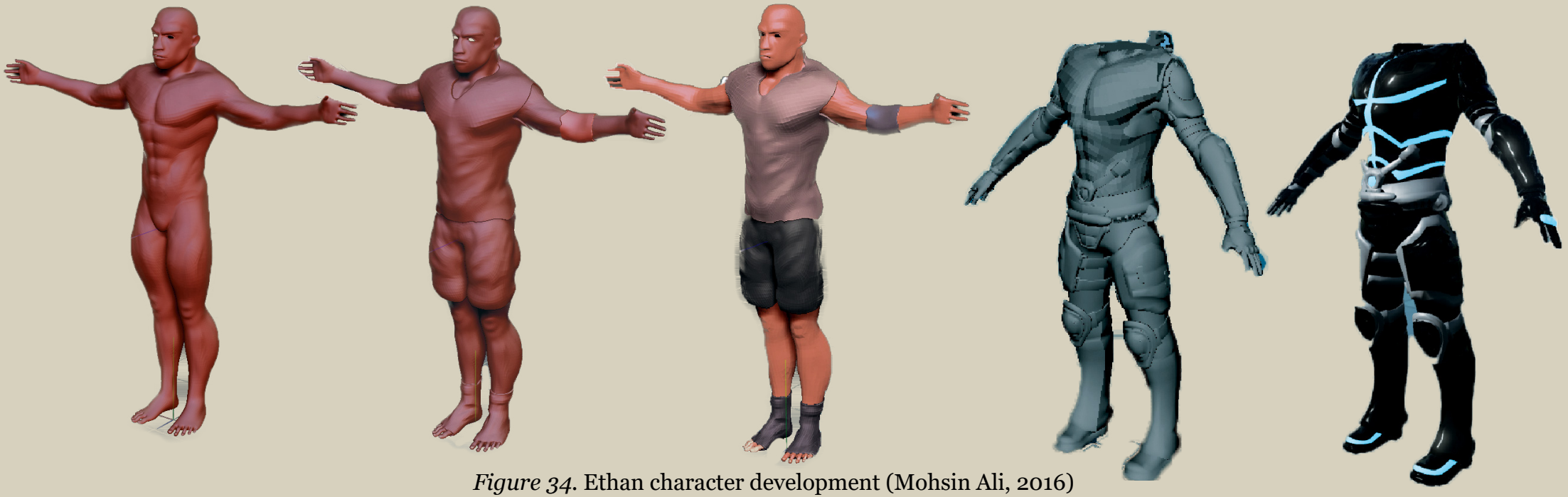


Figure 34. Ethan character development (Mohsin Ali, 2016)

Figure 35. Final character in scene (Mohsin Ali, 2016)

Wraith development:

Figure 36. Wraith development (Mohsin Ali, 2016)

Figure 37. Wraith in scene (Mohsin Ali, 2016)

Plot

The design of the plot has taken into consideration the parameters discovered in the literature review and project review. The interactive elements are characterised by levels, similar to *Game of Thrones: A Telltale series*.

Level one decisions

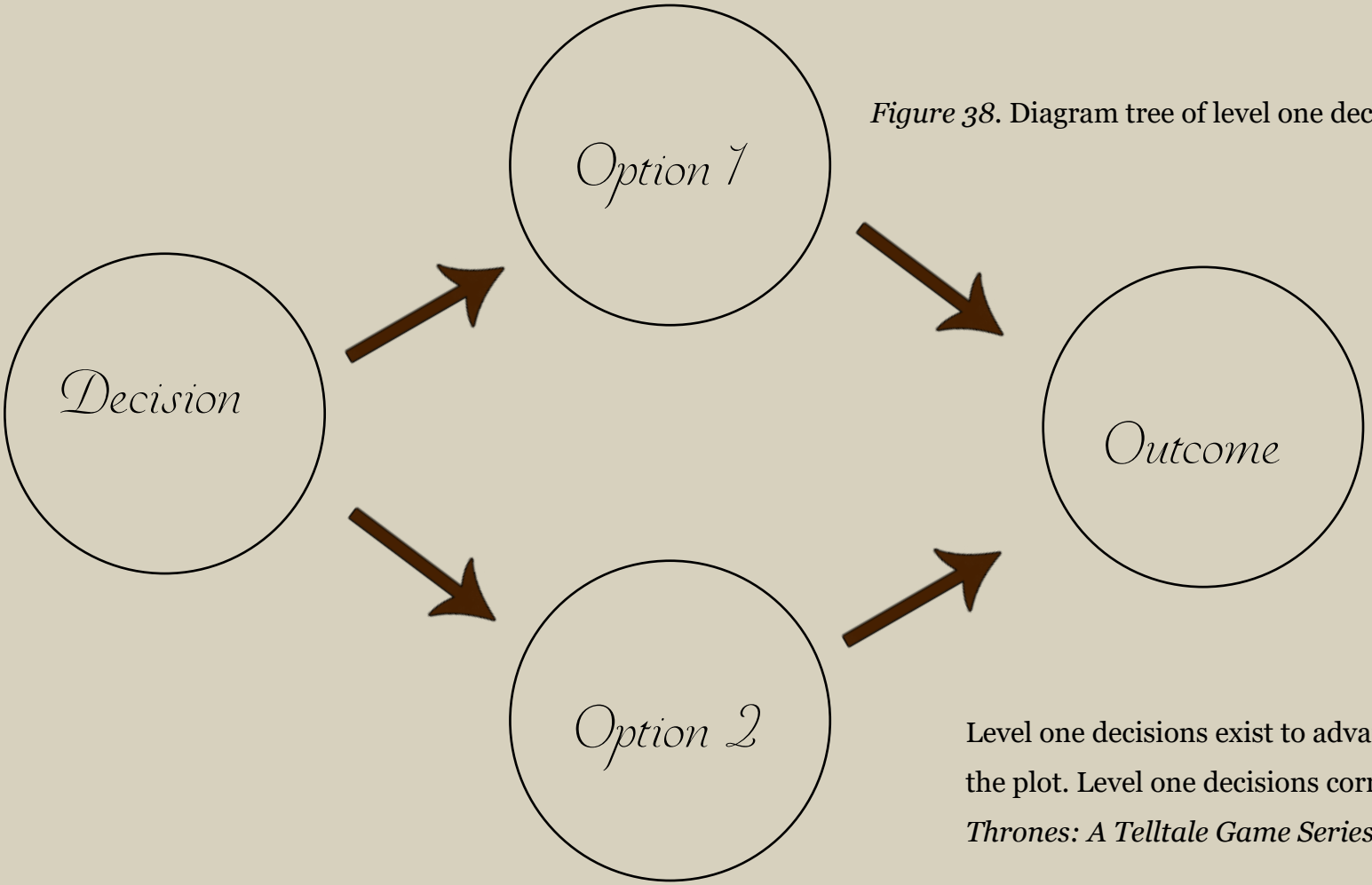
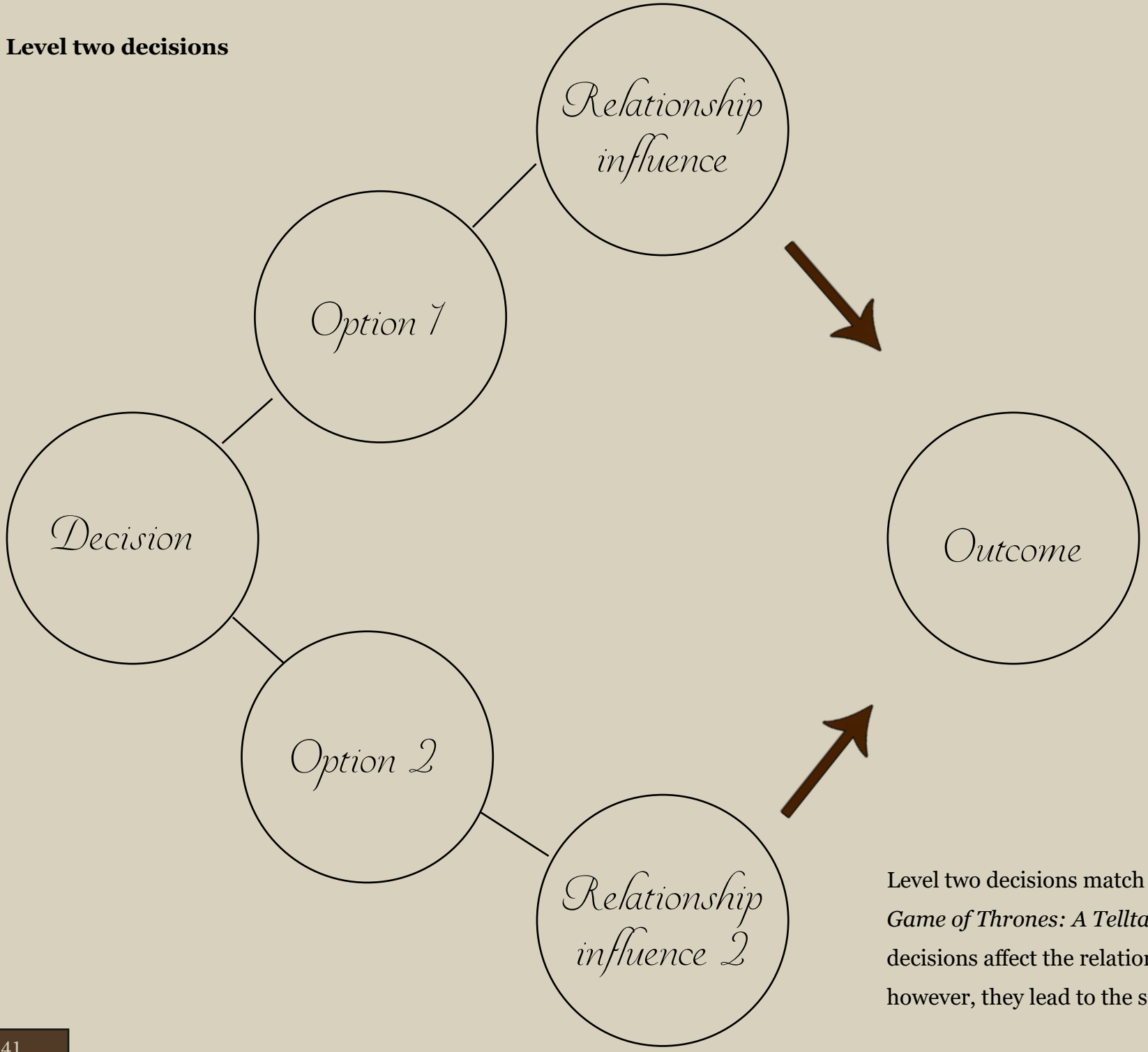


Figure 38. Diagram tree of level one decision implications (Mohsin Ali, 2016)

Level one decisions exist to advance the storyline without influence over the plot. Level one decisions correspond to shallow decisions in *Game of Thrones: A Telltale Game Series*

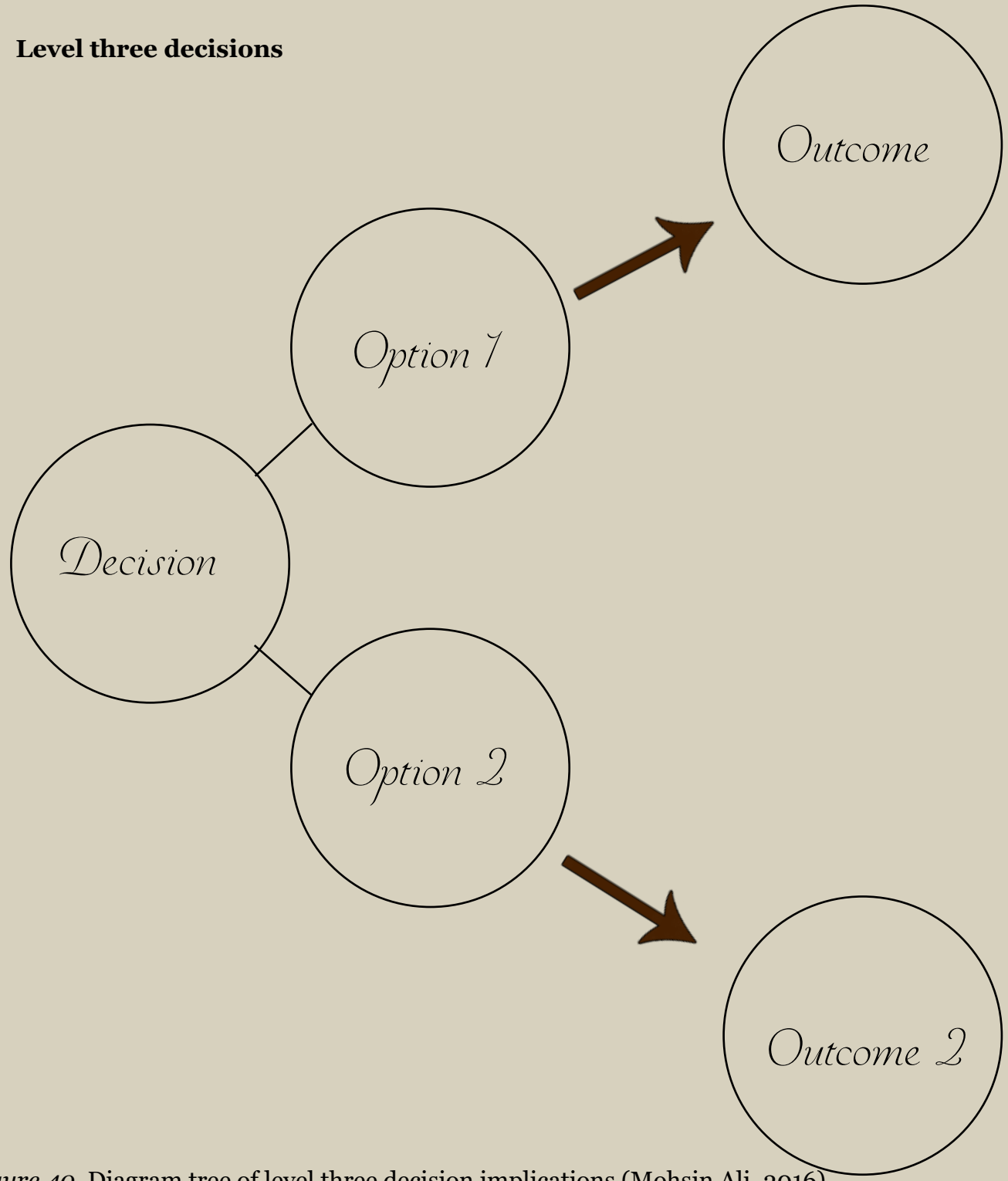
Level two decisions



Level two decisions match the relationship decisions in *Game of Thrones: A Telltale Game Series*. Level two decisions affect the relationship status between characters however, they lead to the same outcome.

Figure 39. Diagram tree of level two decision implications (Mohsin Ali, 2016)

Level three decisions



Level three decisions resemble critical decisions in *Game of Thrones: A Telltale Game Series*. Level three decisions have a major impact on the narrative with separate outcomes.

Figure 40. Diagram tree of level three decision implications (Mohsin Ali, 2016)

How the *Emergent Narrative* theory will be applied to this project

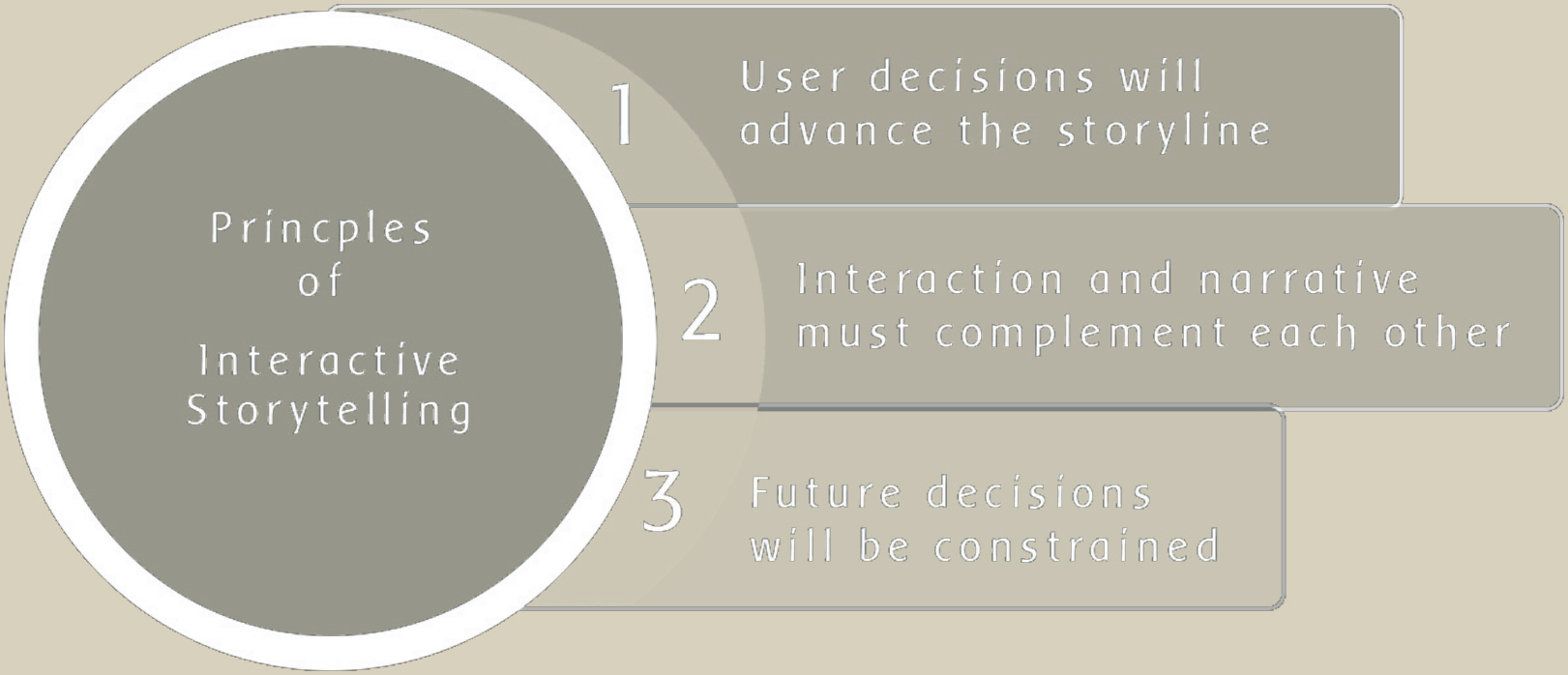


Figure 41. Table on principles of Emergent Narrative theory (Mohsin Ali, 2016)

The *Emergent Narrative* theory has been applied to the narrative, despite not convincingly solving the issue between author control and user freedom. Author control of the plot is dominant over user freedom.

Storyline

The premise of the story is simple, Ethan has fallen into an unstable cave and must find a way out before it is too late. Many environmental obstacles prevent Ethan from escaping. It is Ethan's decision if he listens to his support crew over the radio or if he trusts his own instincts. The user decides what Ethan does which has impacts on the relationship between characters and the branching storyline. The plot induces emotion to engage users, to ensure they pay attention and interact with the story. (Gobel, S., Malkewitz., Ido, I. (2006), pg.220).

Screenplays

The next step in the process is the formation of screenplays. Screenplays produce in-depth information about the scene and interactivity. They also help the voice actors to understand their character's situation and apply the correct emotional performance. A total of ten screenplays have been created for this project. Below is one screenplay for the scene Awakening. The screenplay details the setting of each scene, the characters and impacts of each decision.

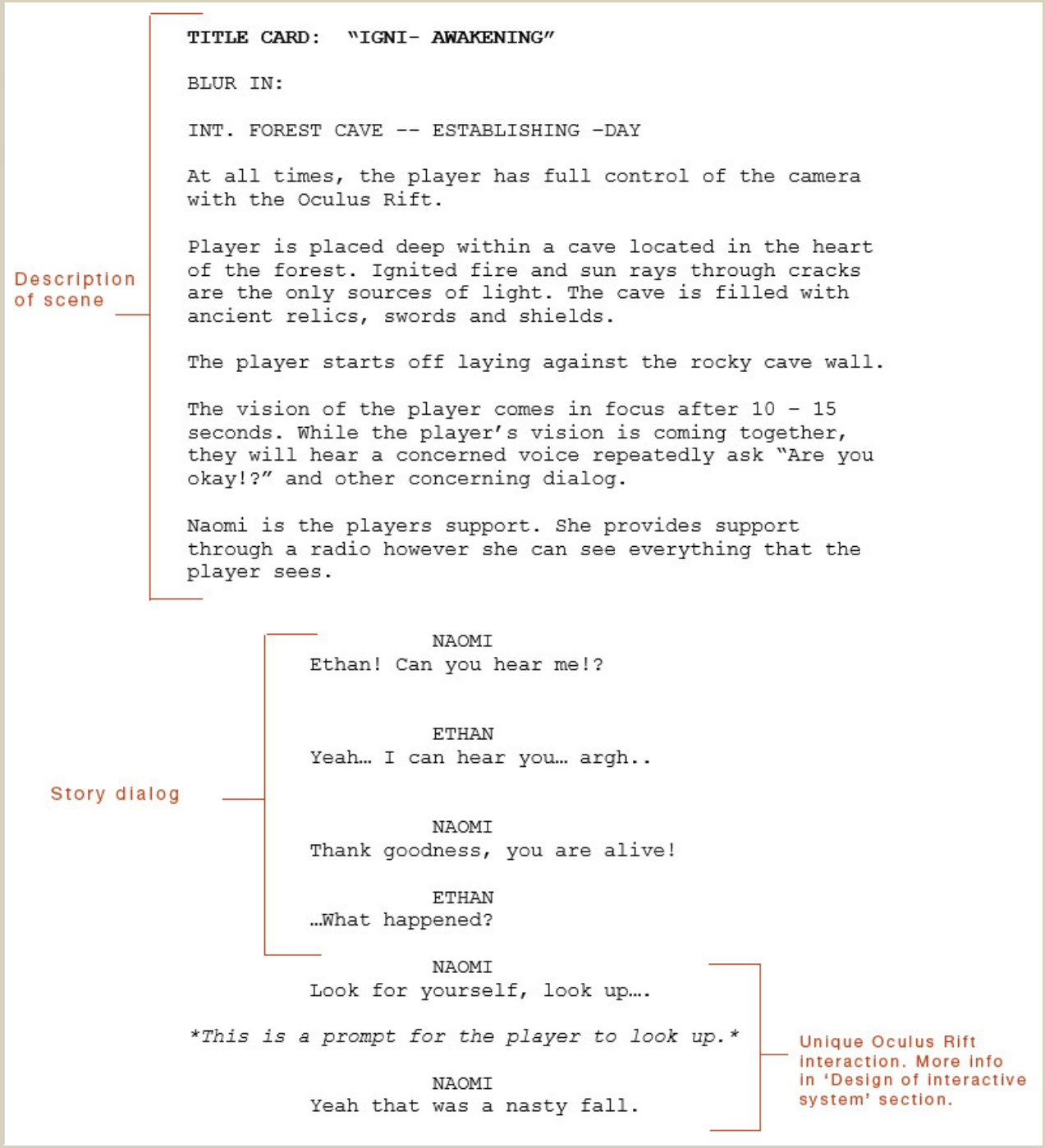


Figure 42. Screenplay for "Awakening" (Mohsin Ali, 2016)

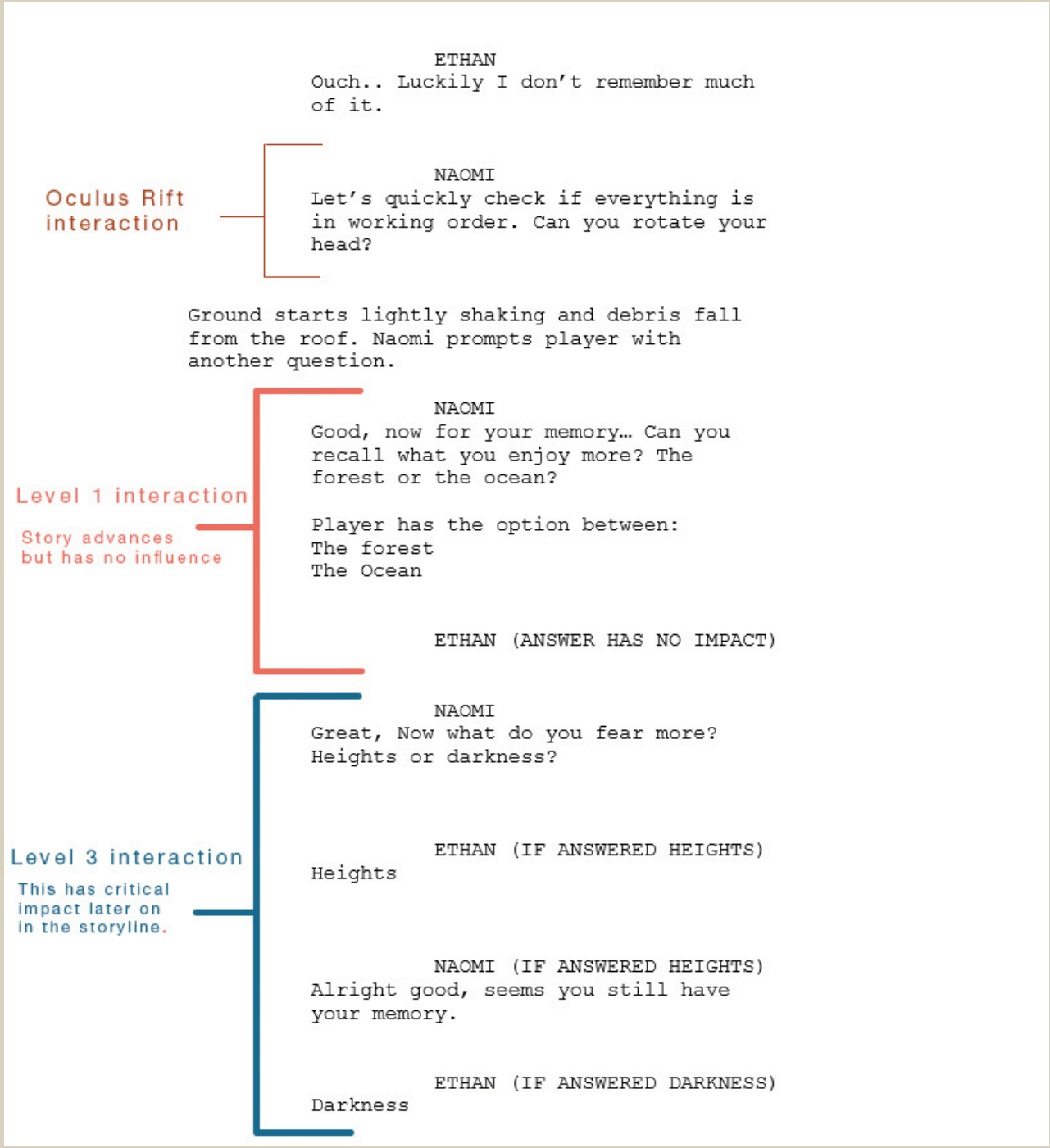
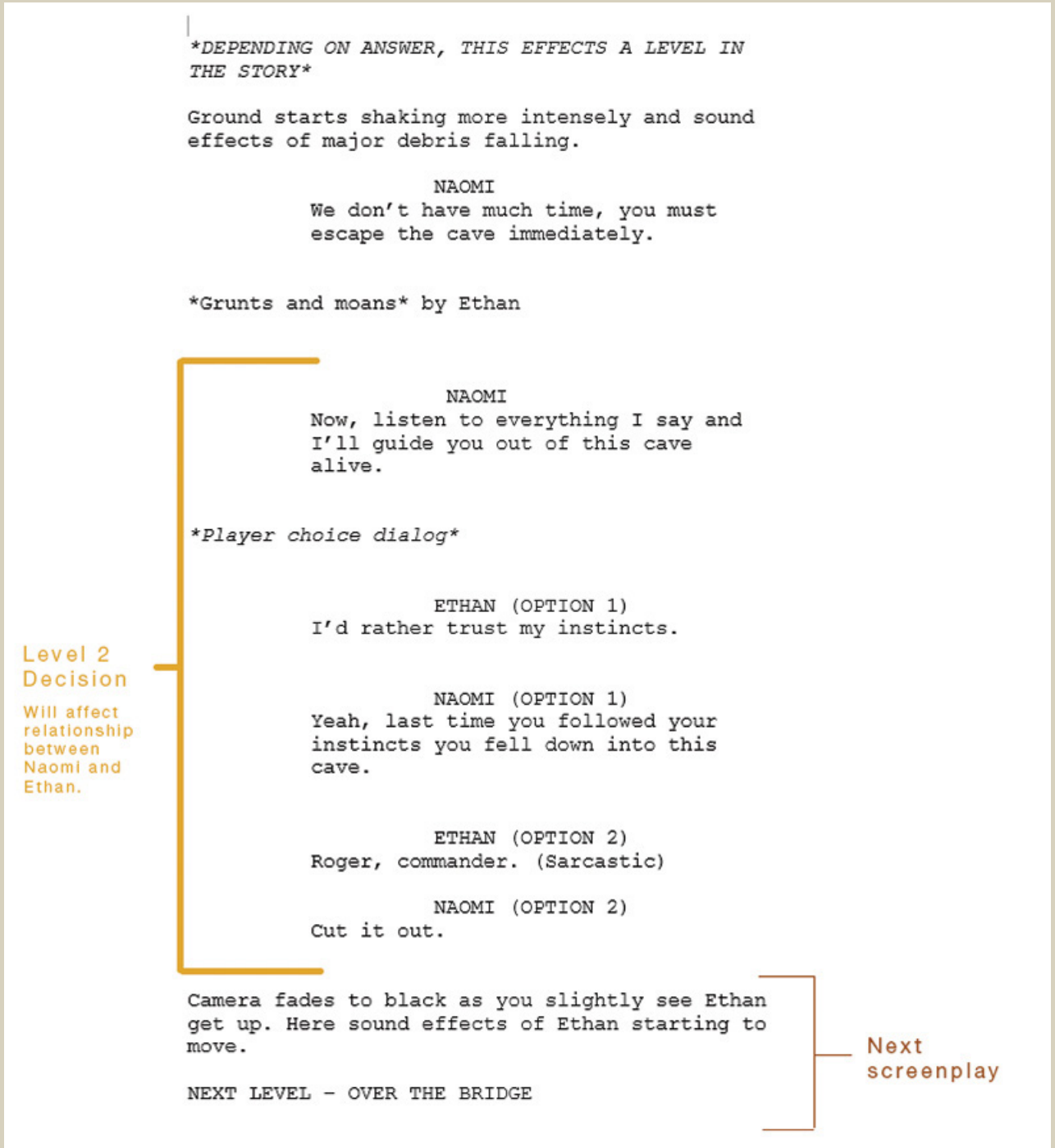


Figure 43. Screenplay for "Awakening" and level of decision choice (Mohsin Ali, 2016)



DEPENDING ON ANSWER, THIS EFFECTS A LEVEL IN THE STORY

Ground starts shaking more intensely and sound effects of major debris falling.

NAOMI
We don't have much time, you must escape the cave immediately.

Grunts and moans by Ethan

NAOMI
Now, listen to everything I say and I'll guide you out of this cave alive.

Player choice dialog

ETHAN (OPTION 1)
I'd rather trust my instincts.

NAOMI (OPTION 1)
Yeah, last time you followed your instincts you fell down into this cave.

ETHAN (OPTION 2)
Roger, commander. (Sarcastic)

NAOMI (OPTION 2)
Cut it out.

Level 2 Decision

Will affect relationship between Naomi and Ethan.

Camera fades to black as you slightly see Ethan get up. Here sound effects of Ethan starting to move.

NEXT LEVEL - OVER THE BRIDGE

Next screenplay

Figure 44. Screenplay for "Awakening" (Mohsin Ali, 2016)

Design of interactive system

The design of the system is a vital part to ensure a pleasurable user experience. The objectives of the interactive system are:

1• The application must be simple and easy to use.

2• The *Oculus Rift* has to enhance the application and incorporate innovative design strategies to stand apart from other *Oculus Rift* applications.

3• The visual and audio design must supplement interactions and strengthen immersion.

The success of the story, characters and the entirety of the application hinges on the design and production of the interactive system. The application is produced in *Unreal Engine 4*.

Gameplay

Petri Lankoski and Staffan Bjork (2007) define gameplay as "the structures of player interaction with the game system and with the other players in the game". (pg. 416). This paper will adopt this meaning of gameplay; in even simpler terms, gameplay in this paper refers to how the user interacts with the system.

Hardware

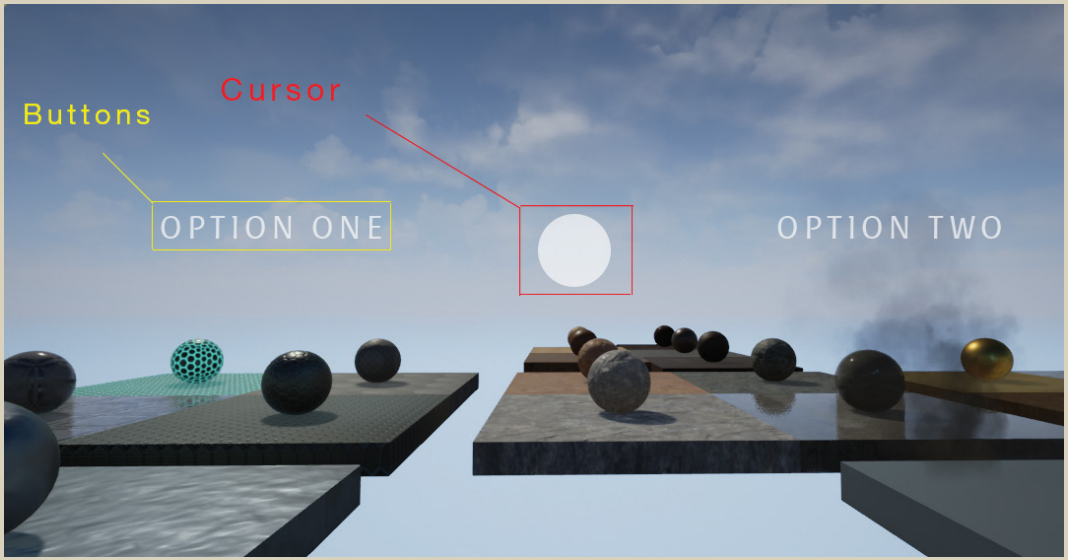
Many of the top rated *Oculus Rift* projects, such as I *expect you to die* (2015)*, Vox Machinae Demo (2014), Titans of Space [Classic] (2013),* require a mouse, keyboard or controller in addition to the *Oculus Rift* to interact with the game system. The more hardware components available, the more complicated the gameplay system will be. I decided to strip out any unnecessary components to simplify the system. The decision was made to only use the *Oculus Rift*.

Not many options existed for designing an interaction for the *Oculus Rift* as the headset does not offer much functionality. The main functionality for a virtual reality headset is to look around. There is no difference in looking around in real life versus looking around with a virtual reality headset. This may improve usability as looking is a natural motion. It was decided that a 'looking' mechanic may be ideal for user interaction.

Objective one - Ease of use: Looking mechanic

The user interaction was developed through multiple iterations. Each iteration is subjected to user testing to discover usability issues. Iterative design allows designers to take advantage of any insights that appear from user testing. (Nielsen, J. (1993), pg.32). The iterations below were exposed to a small sample size. The strengths and weaknesses are detailed below. Technical details are ironed out in the preliminary phase in the hope that the research event focuses on collecting data about interactive storytelling and the *Oculus Rift*.

Iteration 1



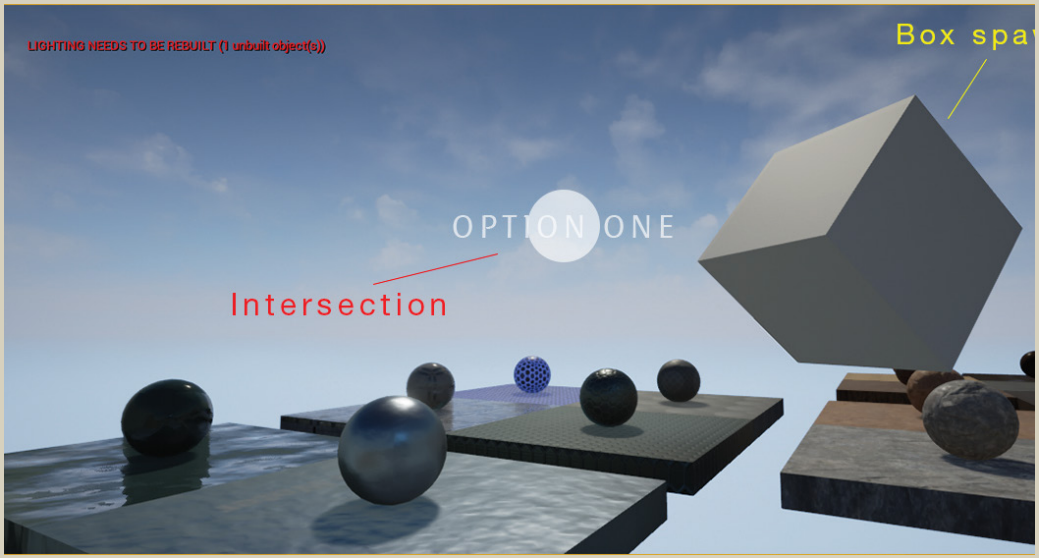


Figure 45 & 46. Testing interaction in Unreal Engine 4 (Mohsin Ali, 2016)

All iterations are developed inside *Unreal Engine 4*, the scene above is a demonstration of the interface inside a prebuilt scene. This interface is built around the looking gesture. The user will have this view on the *Oculus Rift*. The interface works by intersecting the cursor with the desired option. In this case, the cursor overlapped with option one, which resulted in a spawned box. The weaknesses in this first iteration are that there is no user feedback and the selection is instant. Instant selection is a weakness because the user could accidentally select an option by looking around. User feedback is key to realising that the options are to be interacted with.

Iteration 2

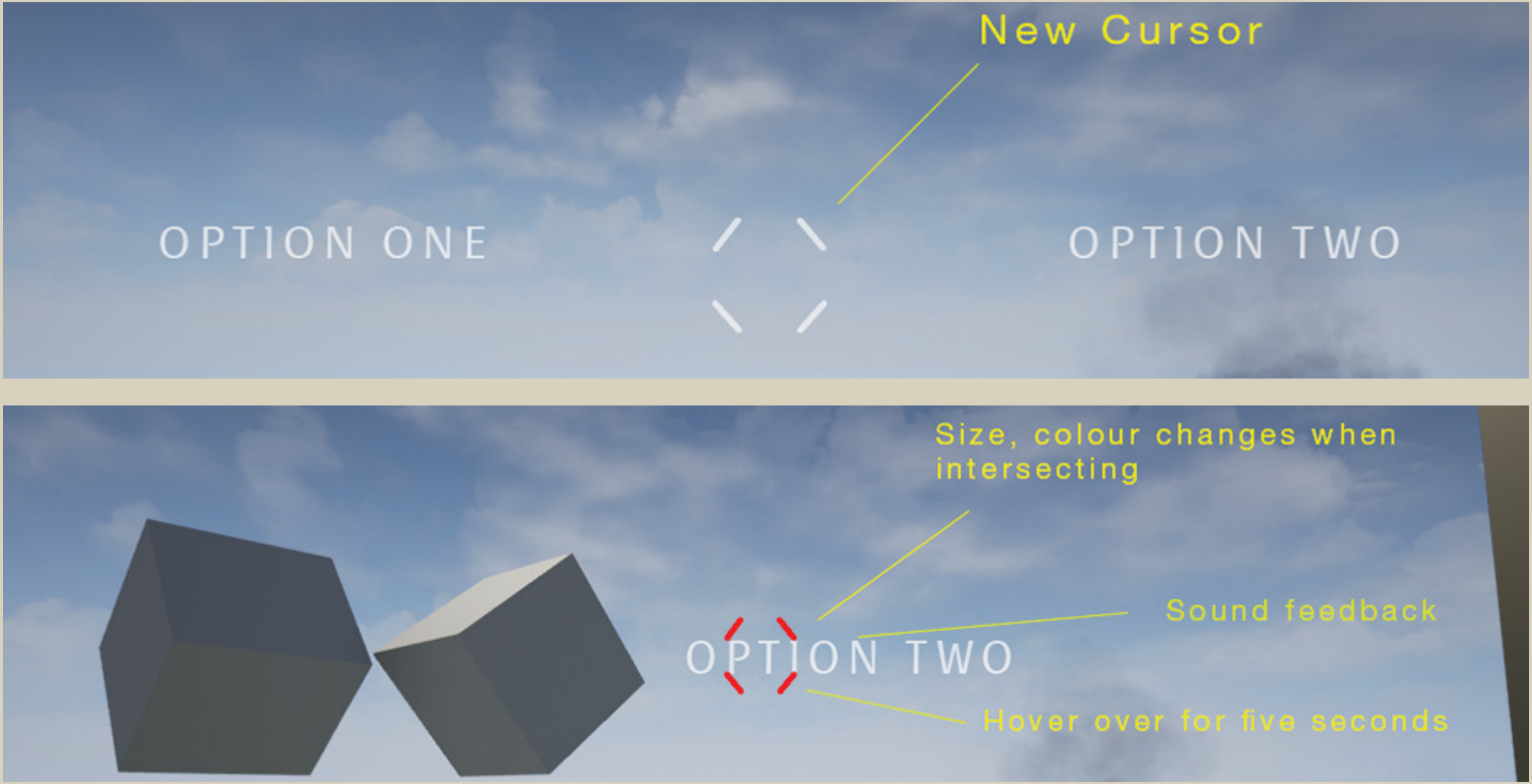


Figure 47 & 48. Testing interaction in Unreal Engine 4 (Mohsin Ali, 2016)

The second iteration improves upon the weaknesses found in iteration one. The new cursor dynamically changes its size and colour when intersecting with an option. The intersection is also accompanied by audio feedback. This gives the user indications that the options are to be interacted with. The instant selection has been replaced with a five-second hover, this means the user will need to look at the option for five seconds before it is selected.

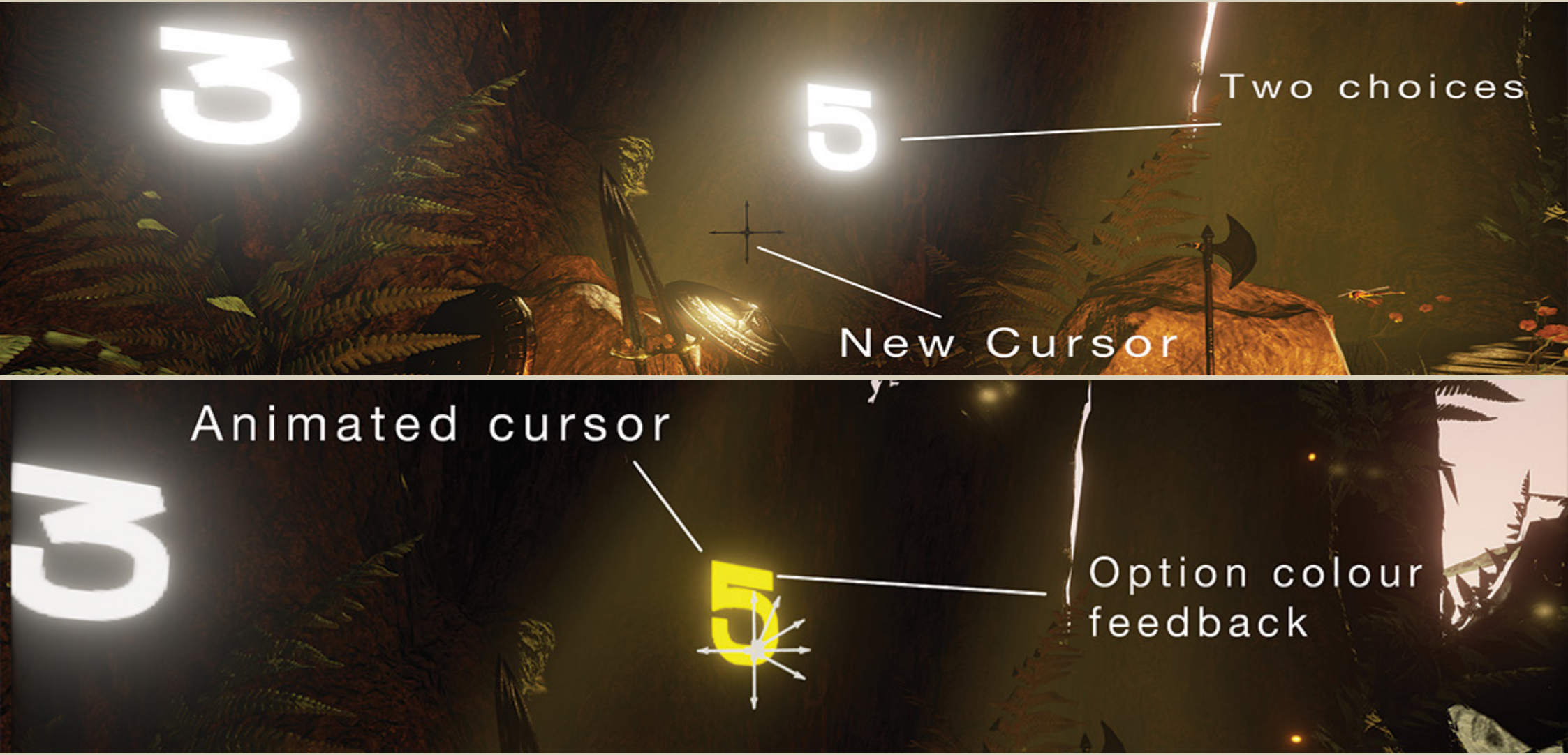


Figure 49 & 50. Testing interaction in tutorial level (Mohsin Ali, 2016)

The scene above is the tutorial scene of *Agi*, constructed by me. The final iteration polishes the strengths found in iteration two. The cursor has an animation to accompany the hover time. This way the user can see how long they have to hover over the option. The hover time has been brought down to three seconds and the option now gives colour feedback once hovered. The scene shown here asks the user to answer how many swords they can see. This simple question should be all that is required to teach the user about the looking interaction.

Objective two: Unique *Oculus Rift* interactions

Looking checkpoints

The looking mechanic inspired another similar interaction with the *Oculus Rift*. *Unreal Engine 4* has the capability to track the head movement of the *Oculus Rift*, which means the system knows where the user is looking at any given time. (*Oculus Rift Blueprint, Input>Head Mounted Display, 2015*). Having story characters comment on where the user is looking, or having the user directed to certain place, could add an extra layer of immersion. There are a few instances in the story where this interaction has been woven in.

In this instance, Naomi tells the user to look up, to see the hole that Ethan fell from. The story will not progress until the user has looked up at the hole. No visual signs are avaliable to guide the user as this may break the immediate immersive state, however if participants fail to move past these interactions, adjustments will be made.

Figure 51. Looking up at the hole in the cave (Mohsin Ali, 2016)

Unique *Oculus Rift* interactions: Scale and depth

Another *Oculus Rift* feature implemented into the project is the use of scale and depth. *Back to Dinosaur Island* utilised scale and depth with an animated creature. This project will have two main animated creatures to create that illusion of scale and depth.

Dragonfly scene

Figure 52. Dragonfly render in tutorial level (Mohsin Ali, 2016)

Dragonflies have been placed into the introduction scene and buzz around the user. There are four dragonflies in total in the introduction scene and all have predetermined paths to patrol. This gives the introduction scene more life and illustrates the depth properties early in the application.

Wraith scene (Optional)

Figure 53. Wraith render (Mohsin Ali, 2016)

Wraith is a ghostly hooded character created to spark mild horror. The purpose of Wraith is to take advantage of the *Oculus Rift's* depth and scale properties, similar to T-Rex in *Back to Dinosaur Island*. Wraith does not communicate with the user verbally, however it has a physical body. Wraith is optional which means that the user may not encounter it.

Figure 54. Render of heights (Mohsin Ali, 2016)

The last unique *Oculus Rift* feature implemented into the application is the use of vertigo. The scene will not contain extreme vertigo and will have three checkpoints. The three checkpoints are designed to see if the user feels comfortable progressing further in height. If the user does not feel comfortable, there is an option to discontinue the scene.

Objective three: Visual and audio design

The visuals were designed to be appealing and interesting to look at. It was proven by Reiners et al (2014) that the *Oculus Rift* heightens immersion and he observed that users investigated the environment with extra care while using the *Oculus Rift* (pg. 30). With the user more aware of the environment, further attention was taken into the visual design. A glitch or an unnatural positioned asset may disrupt the immersive state of the user which can impact the overall experience.

The audio is equally as important as the visual design. An unusual sound may have the same impact as a visual glitch or unnatural asset. The audio supplements the visual design and together heighten immersion. Below is one example of the effectiveness of complementing audio with visuals and paying attention to the finer details.

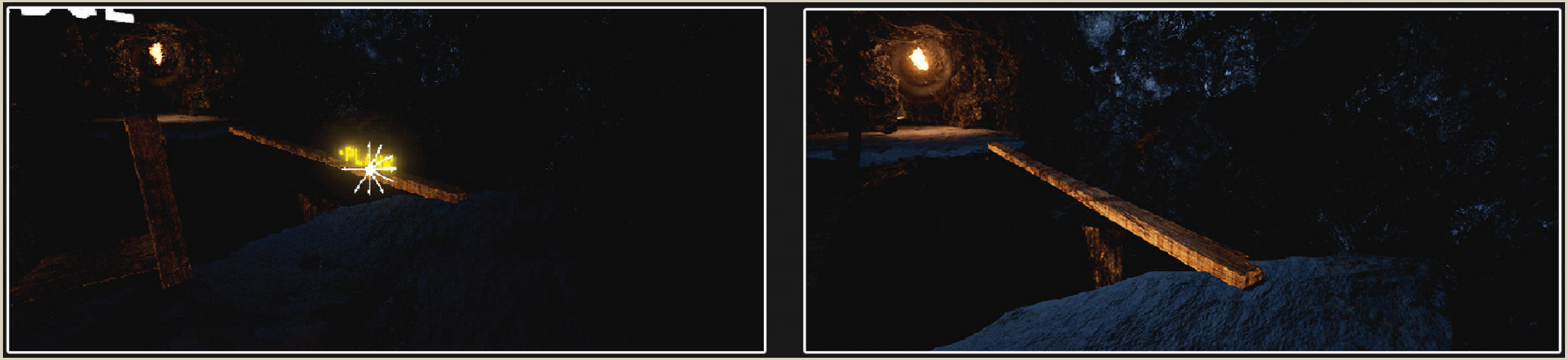


Figure 55. Over the bridge scene - plank (Mohsin Ali, 2016)

Over the Bridge is a scene that requires the user to choose a path to cross to the other side. One of those options is to walk across the plank.

The area constantly has short bursts of shaking, this is supplemented with a rocky rumbling sound effect. Naomi warns Ethan not to take the plank but the user can decide not to listen. After the user chooses the plank, Ethan approaches the edge and comments on the decision to take the plank.

Figure 56. Over the bridge scene - plank (Mohsin Ali, 2016)

As Ethan begins walking, the sound of footsteps colliding with wood complement the bobbing of the camera. An eerie wooden creaking sound starts to build up as Ethan reaches the middle. Suddenly, a loud snap, followed by a sharp dip ensues, however the plank is still wedged between the gap.

Figure 57. Over the bridge scene - plank (Mohsin Ali, 2016)

Ethan gasps, takes a few seconds to regain his composure and begins walking the rest of the distance. As Ethan reaches the end of the plank, Naomi lets Ethan know how dangerous his decision was. The plank walk could have been a simple walk across with minimal sound effects, however, the little detail, such as wood creaking and a sharp dip could keep the user engaged and cautious throughout the whole segment. The emphasis on smaller details is scattered throughout the application.

Visual design: Environments

The visual design used an iterative approach. Below are the different environments in *Agi*.

Awakening

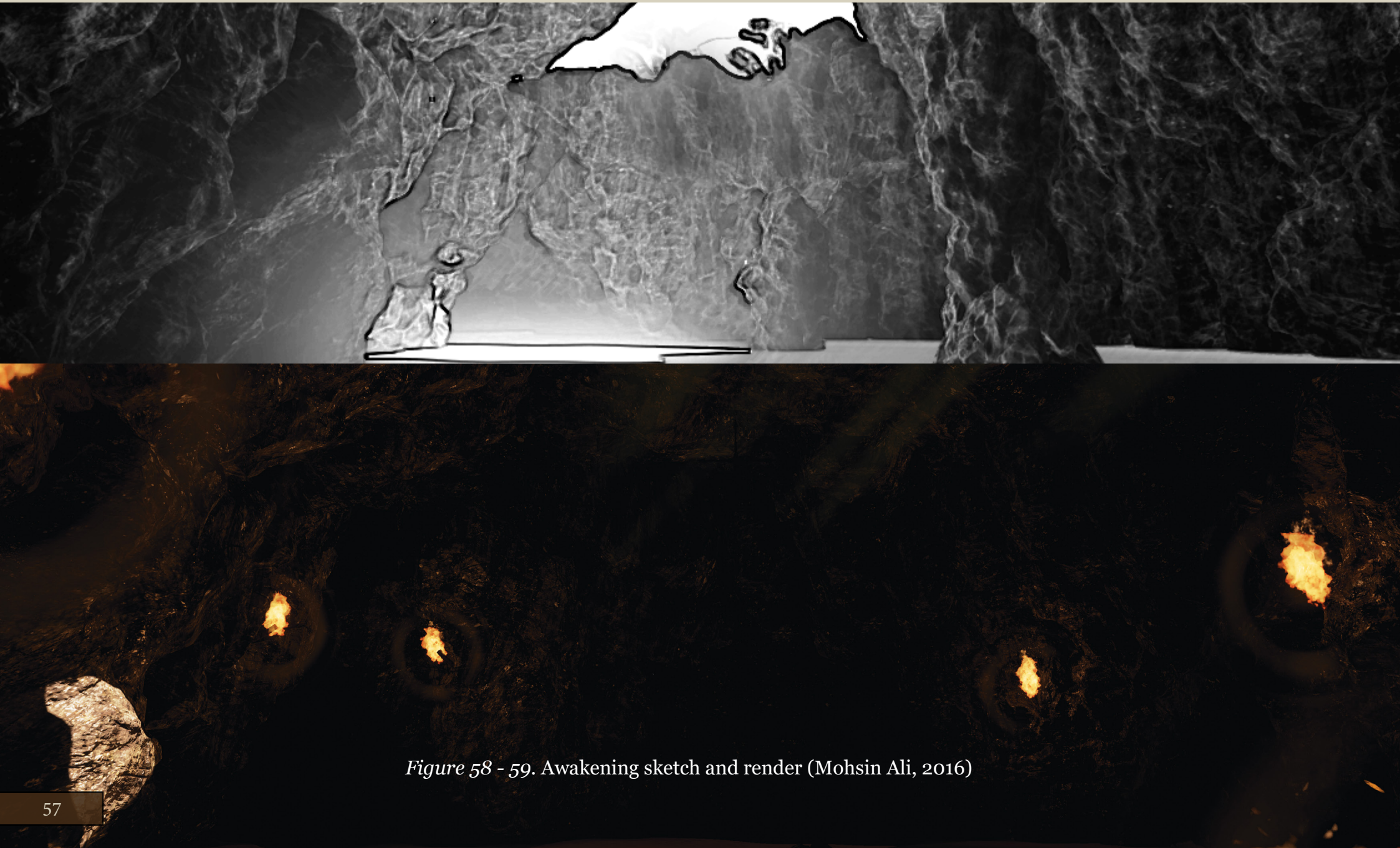
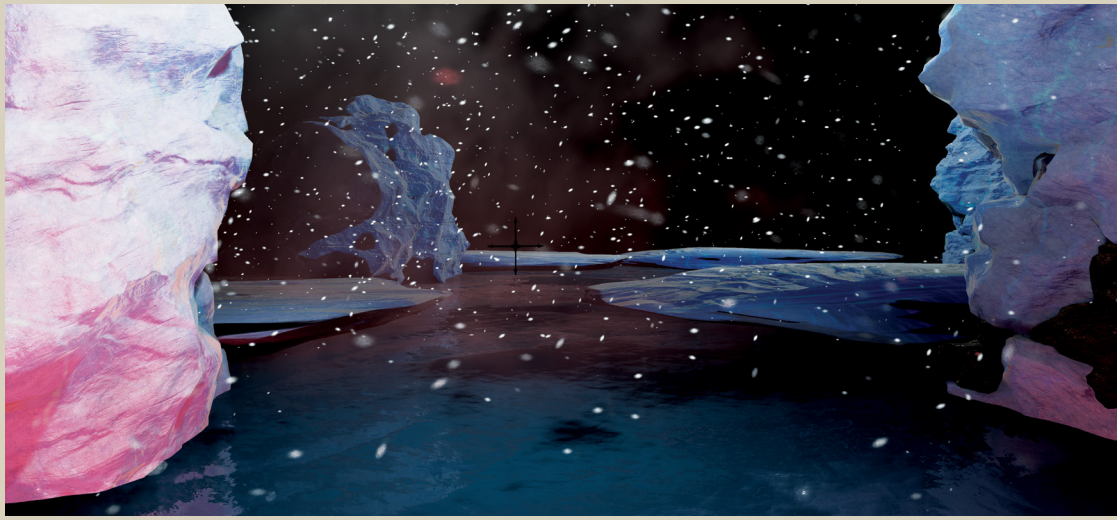


Figure 58 - 59. Awakening sketch and render (Mohsin Ali, 2016)

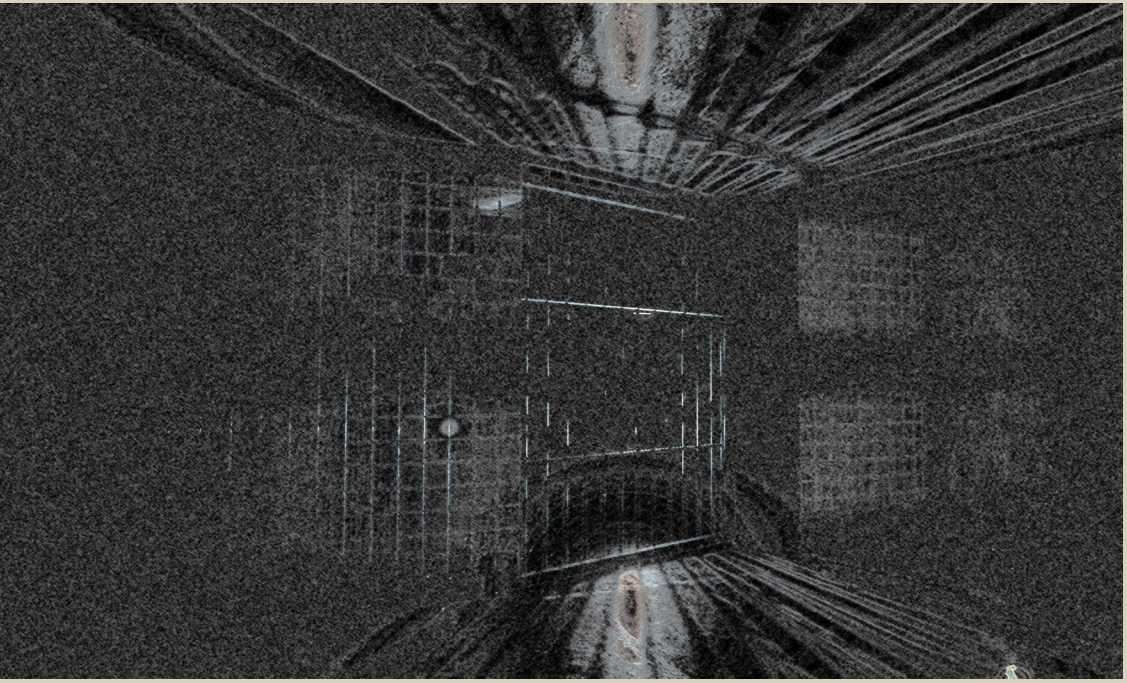
Figure 60- 61. Tutorial sketch and render (Mohsin Ali, 2016)

Figure 62 - 64. Development of Heights (Mohsin Ali, 2016)



Darkness

Figure 65 - 67. Development of Darkness (Mohsin Ali, 2016)



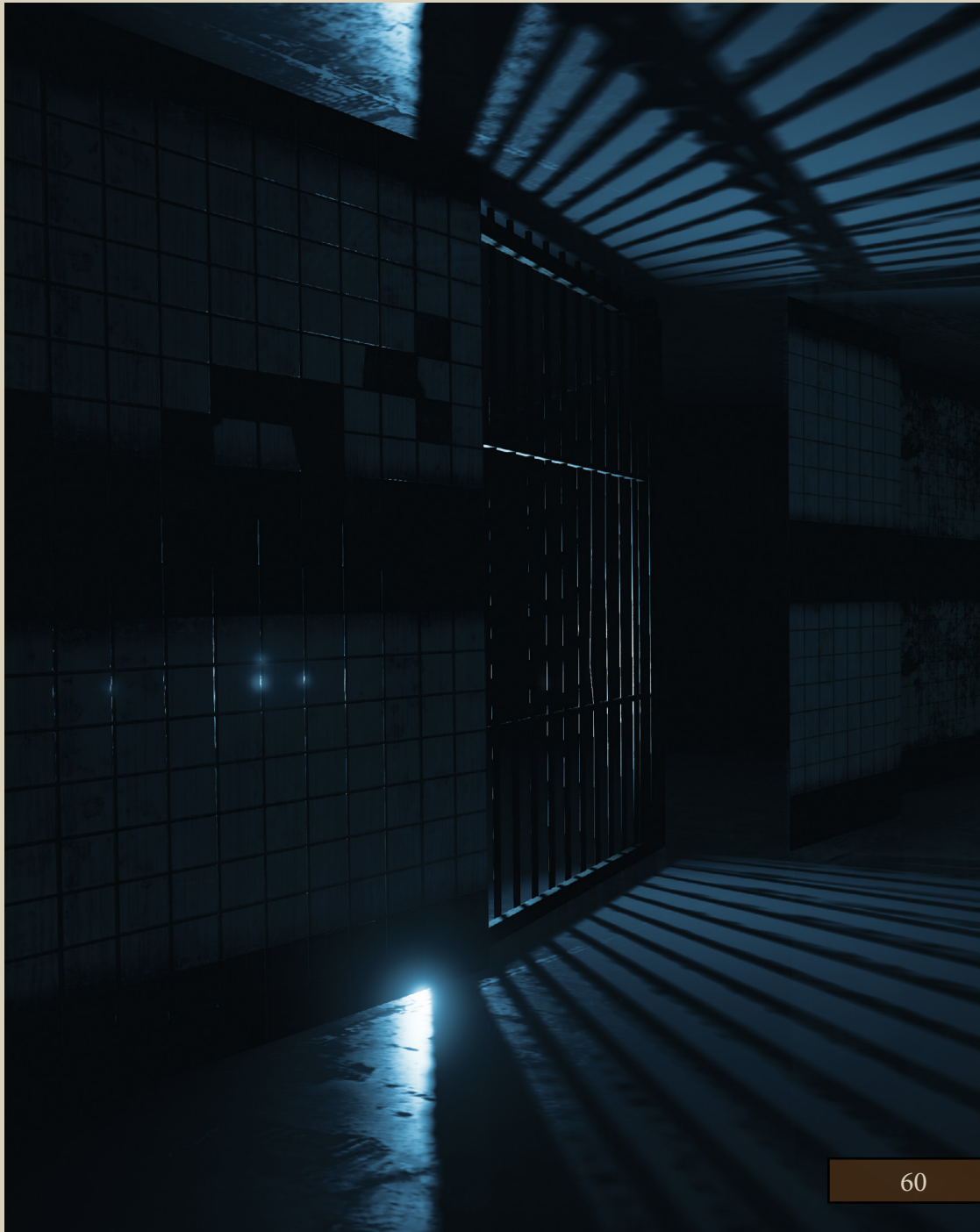
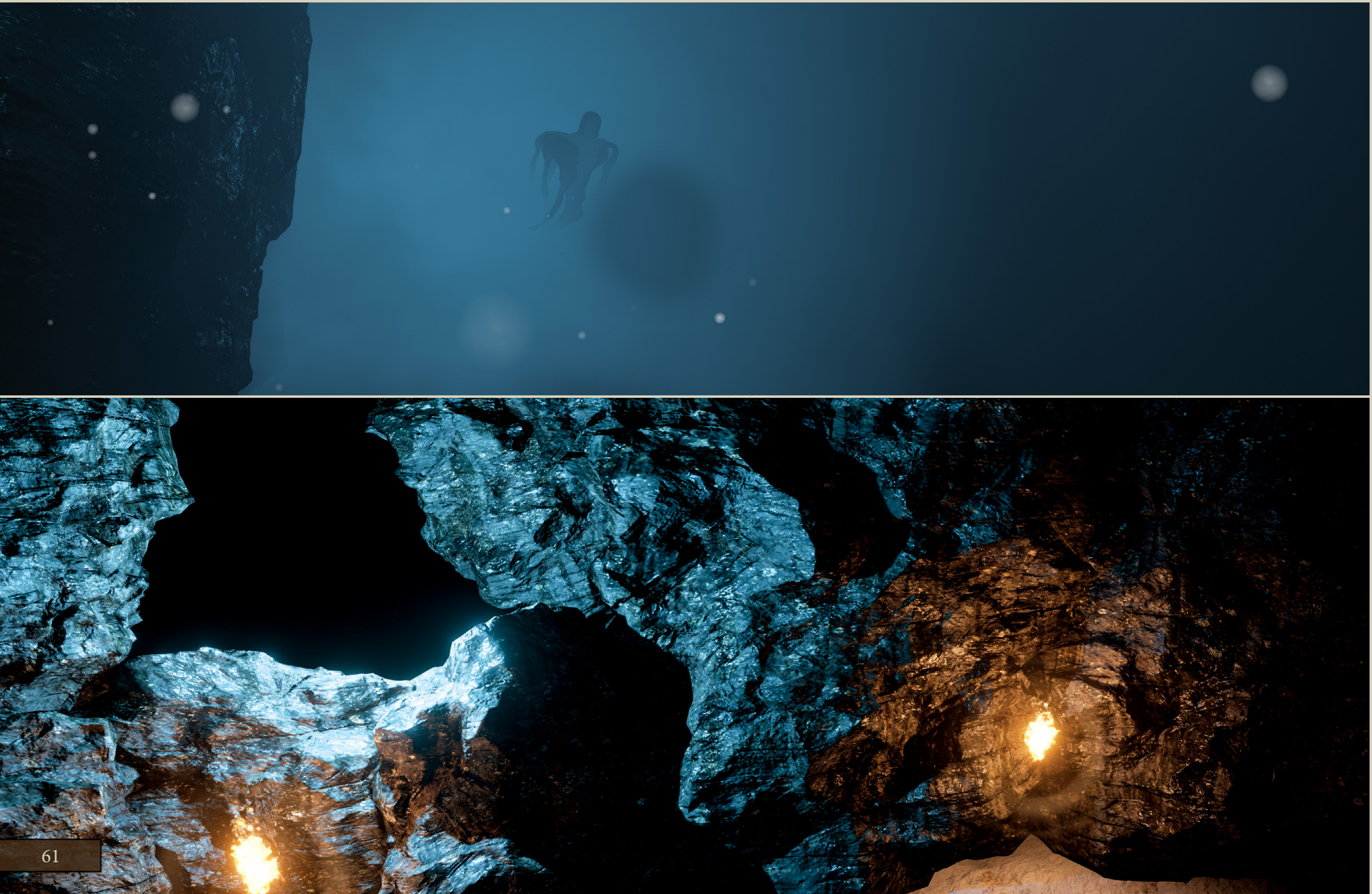


Figure 68 - 69. Development of Darkness (Mohsin Ali, 2016)



State of application before user testing

The system has been rigorously tested for glitches, during which a few errors were found but are now fixed. The application runs between eight and twelve minutes long, this is dependent on the choices the participant makes. The application is optimised to run at 60 frames per second which creates a smooth experience.

The story at this stage is incomplete and ends suddenly on a cliffhanger. While a detailed script for a conclusion to the story exists, I stated that the application will run roughly around ten minutes and anything much greater is out of scope for a lone worker. As a result of the sudden ending, a decision was made to split the application into episodes similar to *Game of Thrones: A Telltale game series*. Perhaps after the completion of this thesis, if the application draws attention, the second episode can be made.

A bit of content was cut from the application before testing. This include voice-overs, character models, animations and the last screenplay. The constraint of time did not allow the polish needed to work these assets into the system. Despite the cut content, the experience still sets out to test the design strategies and theories about interactive storytelling.

Figure 70. Heights render (Mohsin Ali, 2016)

CHAPTER 5

USER RESULTS

User results

This section of the thesis now provides the data gathered from user testing. Firstly, we will look at the research methods and materials involved in the collection of data from participants. Next, the results from the research event will be displayed and examined. Lastly, a section will be dedicated towards the changes and improvements to the final design.

To provide further relevancy, a compilation video is attached to this thesis that provides the user reactions from this testing session.

Research methods and materials

Observation

Using observation, much knowledge can be gained from observing the design in action. (Carl Bereiter, pg 325). The interactivity was assessed by recording the participant's interaction with the application via note taking.

Specifically, the key things observed for were:

1. The participants ability to navigate the interactive system
2. Physical reactions and verbal reactions
3. Most popular pathway through the story
4. Reaction to *Oculus Rift* unique interactions
5. Signs of discomfort

Interviews

Interviews deliver comprehensive information relating to participant experiences and perspectives. Interviews alongside other forms of data collection can provide a well-rounded collection of information for analysis (Turner III, D. W. (2010, pg. 1).

The interviews are brief as the application runtime can take over ten minutes. Here are the questions that were asked during the interview.

1. On a scale of 1 – 5, how difficult was the application to use? (5 being very hard)
2. How did it feel to view this story through an Oculus Rift?
3. Did you like or dislike being able to make decisions in the story and why?
4. Would you consider to experience more stories like this in the future?
5. Did you have any technical problems with the application?
6. Additional feedback?

Materials

To successfully run the application a computer, *Oculus Rift* and headphones are needed. The process to set up the application and place the headset on the user took no longer than two minutes. The duration of the research event spanned five hours long and participants were welcome anytime in those five hours. Food and drinks were available to those waiting to test the application.

Research event

Introducing questionnaires

The research event was a success and an overwhelming amount of people participated. During the start of the event, interviews were going as planned, however, a large surge of participants arrived at the same time, which forced me to abandon the interviews and present them in the form of questionnaires. The questionnaires produced very detailed answers, more so than the little information I gathered from the interviews. Many ethnographers do use questionnaires after participation and observation to ensure their validity. (Hymes, D, 2003, pg. 9). The interviews' responses were all slightly similar however the questionnaires provided new insights on interactive storytelling and improvements to the system. The questionnaires could have worked better because the participants had more time to reflect on their experience and were not in direct contact with me, the interviewer.

Data results

Difficulty of interactive system

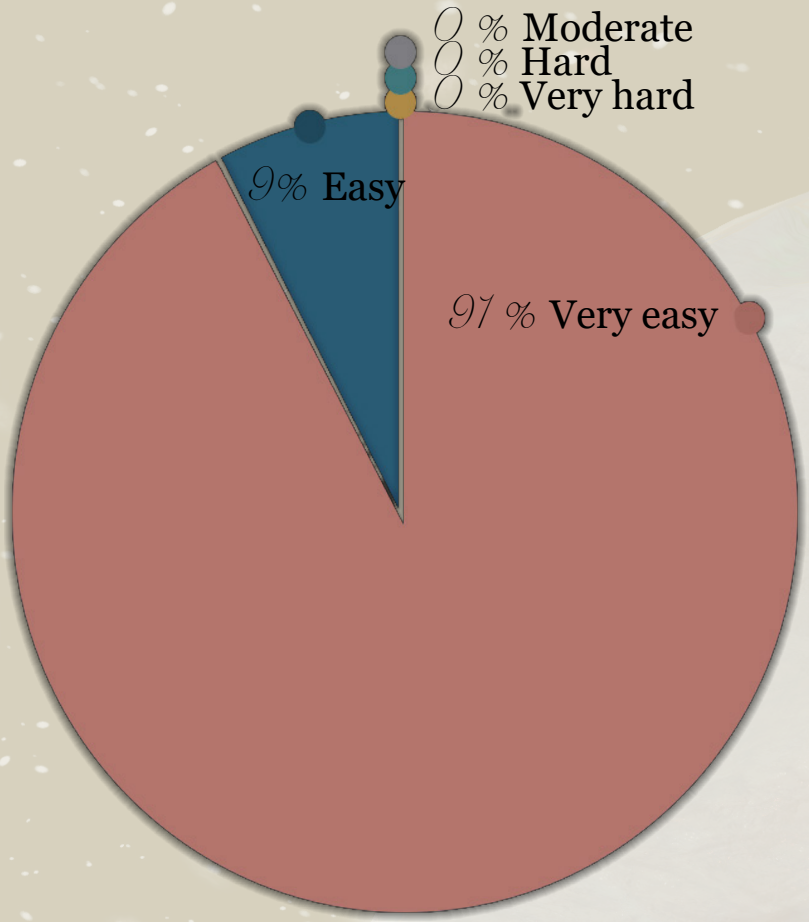


Figure 71. Pie chart of difficulty of interactive system (Mohsin Ali, 2016)

Through observation, I was able to determine that no participant had any difficulties interacting with the system. I did not assist any participant during the duration of the testing. The majority of the participants did not stumble at the tutorial section and this could be due to the interaction being very simple. This is also reflected through the scores given in questionnaires and interviews. Participants judged the difficulty of the interaction on a scale between one and five, five being very hard. 91% gave the score of one and 9% gave the score of two. 83% of the participants were aged between 18 – 27 and 17% were aged between 40 – 50. I theorise that the reason why the system is successful is because the interaction is simply looking at the desired decision. There is no difference between looking in real life versus looking with a virtual reality headset.

How did participants react to the ability to influencing the story?

A few key observations were found of participants making decisions. Firstly, a trend found amongst all the participants was the extra care when making a decision. This was identified through slight hesitation or a large pause before selecting a decision. 86% of the participants verbally commented after the selection of their decision. Here are a few comments recorded: “Oh, I’ve changed my mind”, this comment was in response to making a bad decision. “She better not set me up”, in response to taking a decision influenced by Naomi. The questionnaires gave detailed answers on why people enjoyed or disliked making decisions. 100% of the participants were in favour for decision making in the story. Here are a few comments why:

“I liked having the choice because it made it feel interactive and that I was a part of the action rather than simply an observer. It felt like a high-stakes situation and knowing I could influence the story made it more exciting.”

“Liked. It made it feel like it was your story, you are the character, you choose the outcome.”

“Yes, have your own experience other than watching the same thing as everyone else.”

Many of the comments made were all slightly similar to those listed above. There were a few critiques on improvements to the decisions:

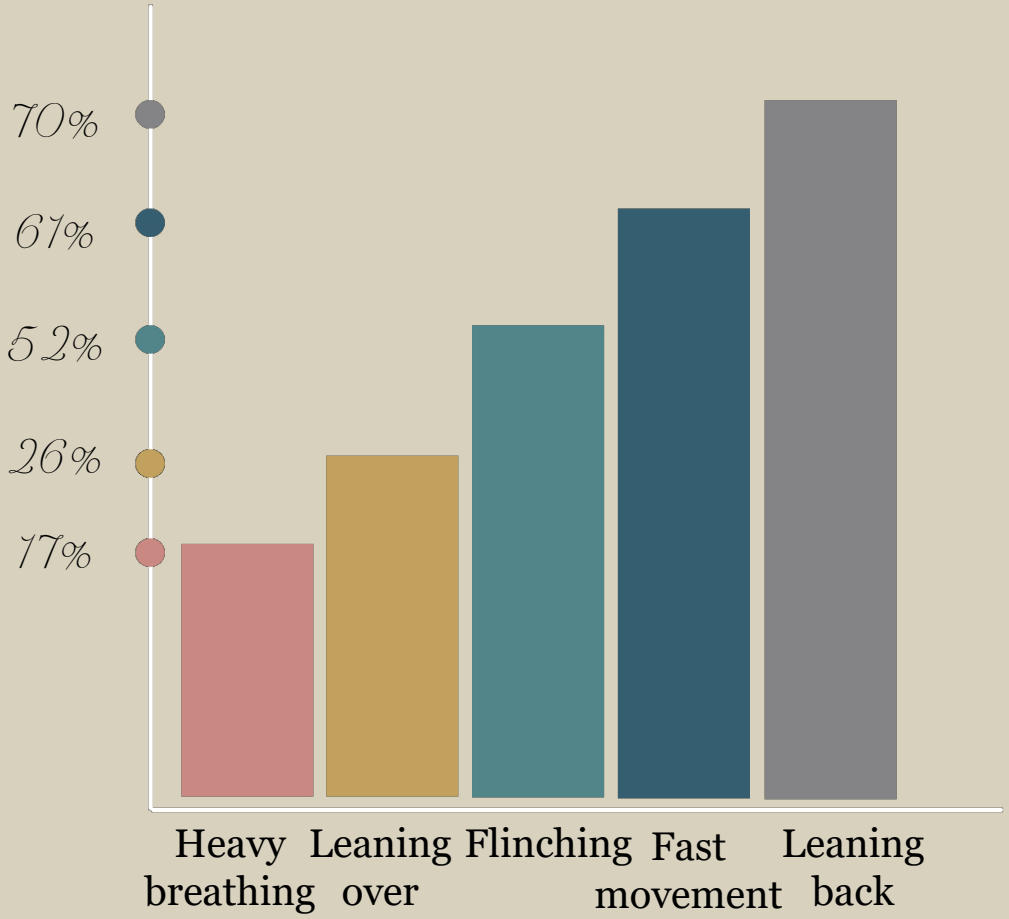
“I liked it but wanted some more control over the characters decisions. Eg: make quick decisions while walking a chosen path.”

“Like, opens up the possibilities of the story, multiple endings keeps replayability. Some feelings of linearity with player choices feeling limited.”

“Great approach to interactivity. If it is developed to a point where everything you say effects a plot point that would be amazing.”

These comments question the topic about user freedom versus author control. The ratio between user freedom and author intent in this application heavily favours the author. As mentioned in the preliminary phase, creating a balance between user freedom and authorisation will require a complex system which is out of scope for a lone worker. An interesting comment was made about being able to make quick decisions while progressing through another decision. This will give the illusion of additional freedom however the end result will remain the same.

Did the *Oculus Rift* enhance the experience?



User comments:

"Far more immersive than any other medium I can think of."

"Awesome. The environment was really detailed and interesting to look at. Forgot I was sitting in a computer chair."

"It felt very realistic, I felt like I was really there and felt genuine fear and excitement during the scary parts!"

Figure 72. Bar graph of difficulty of interactive system (Mohsin Ali, 2016)

40% of the participants said the word "immersive" while describing their experience with the *Oculus Rift*. It was clear through observation that participants were deeply immersed in the environment with an *Oculus Rift*. 83% displayed heavy physical movement while exploring the setting and 86% verbally expressed excitement.

The unique *Oculus Rift* integrations were nearly all successful. The Wraith demonstrated the effectiveness of scale and depth with the *Oculus Rift*. 78% of the participants heavily reacted physically and verbally to the Wraith. The most common physical sign was leaning back on the chair. Interestingly, the build up towards the Wraith also generated reactions with participants including fast twitch movements, exploration in all directions and in some cases, heavy breathing.

Unique *Oculus Rift* interaction: Dragonfly

The dragonfly did not generate the same amount of attention with only 26% of participants reacting to it. Many of the other 74% did not notice the dragonfly. This was because they were looking away from the dragonfly and exploring the environment. The participants that reacted to the dragonfly showed fast jerking movements similar to seeing a real flying insect.

Unique *Oculus Rift* interaction: Looking checkpoints

The looking checkpoint mechanic worked near flawlessly with 96% of the participants not having trouble progressing through. The 4% that did have trouble did not look directly at the point of reference. To fix this, the area of reference can be scaled larger.

Unique *Oculus Rift* interaction: Vertigo

Through observation, the scene used to test vertigo did not generate nearly as much reaction as the Wraith. Only 22% of the participants reacted with heavy physical and verbal actions such as profanity and leaning over the chair. The other 78% showed signs of subtle activity such as transitioning from a slouch position to an upright position. The reason why this scene did not produce many reactions could be because the vertigo is not extreme. Purposely, the point of reference is the ocean, if this was swapped with a city, for example, the effect could have been much greater. I did not want to make the participants feel too uncomfortable and that is why the vertigo is neutral.

Unique *Oculus Rift* interaction: Wraith

By far the most popular attraction in the application is the inclusion of the Wraith. The Wraith was the scene that participants expressed interest about the most. I received verbal comments and questionnaire feedback about the three-dimensional depth. The comments include:

"It would be good to have more objects come towards you."

"Integrating the 'Wraith' concept more throughout the story."

Hardware issues

22% experienced blurry or fuzzy vision during the application. This could be hardware issues or not having the correct lens for the specific person. The version of the *Oculus Rift* used in this project is the development kit 2. The final version set to release in late March 2016 may fix these issues with fuzzy vision.

The following comment elaborates on an issue regarding distractions with the *Oculus Rift*.

"Perhaps an option to repeat instructions given to you. As the experience is very immersive, sometimes you can get distracted."

This comment is brought up twice within the questionnaires and is a fair issue. The suggestion to repeat dialogue is a good solution to fix this, however unfortunately cannot be fulfilled. The way the system is designed in its current state cannot accomodate the feature of repeating dialogue.

The data collected from the research event has helped improve upon the existing application. The improvements regarding author intent versus user freedom are acknowledged but cannot be upgraded due to scope. The idea of making quick decisions while being in an existing decision does not improve upon the issue of user freedom, it merely gives the impression of added freedom. To improve the balance of user freedom, an overhaul of the existing system will be needed. The system needs to provide many options that all lead to different possibilities. Alongside an upgraded system, this will require updated and extra screenplays, additional voice-overs, further three-dimensional assets and more importantly, time.

The developed design section will address the improvements and additions of the final iteration of the application.

Developed Design

The final iteration of *Agi* has been improved by the feedback gained in the user testing phase. The story, decision choices and interactive system remain the same. Due to time, these components cannot be updated for this thesis. The components that have been upgraded are much to do with the environment. These include:

New environmental characters
New environmental events
Scene changes
Optimisation to 75 frames per second

Frost Dragon:

I would like to begin by saying that the dragon is not my model, it was available online for free use by user 3dhaupt at tf3dm.com. While 3dhaupt did animate and texture the dragon, I have redone the animation and texturing to suit the needs for this project.

The Frost Dragon was included into this project to serve the same purpose as “Wraith” and be another actor for three-dimensional depth. The dragon appears two times in *Agi*, first in the tutorial scene and lastly in the scene “Heights”. The reason why another actor was introduced for three-dimensional depth is because using the same model in multiple sections throughout the application could deteriorate its three-dimensional depth impact with the users.

Figure 73. Frost Dragon in Unreal Engine 4 (Mohsin Ali, 2016)

Ghost face:

Ghost face serves as both a background object and interactive actor in the application. Ghost face appears in many of the scenes in *Agi*. In a couple of the scenes, Ghost face is purposely hidden and those who find him are rewarded with an interactive gesture. Ghost face also is used for three-dimensional depth in the scene “Darkness”.

Figure 73. Ghost face in Darkness scene (Mohsin Ali, 2016)

Swarm of dragonflies:

The swarm of dragonflies are used to illustrate three-dimensional depth in a different way than the other three-dimensional actors in this project. Instead of one large object closing in to the user, many small objects swarm around the user.

Figure 74. Dragonflies swarm render (Mohsin Ali, 2016)

Environmental events:

The scene “Over the bridge” now has an extra event, where the bridge collapses while the user walks across the ledge. The reason for this addition is because originally the ledge decision felt static.

Heights changed:

In response to the lack of reactions produced in “Heights”, the ending has been changed. The ending requires the user to make a fast but crucial decision, where the user must decide to jump off the platform or to get devoured by the Frost Dragon. The dragon was added to provide three-dimensional depth, which originally “Heights” did not have.

Darkness changed:

The ending now has the addition of “Ghost face”, the role of this actor is to torment the user into giving up.

Figure 75. Heights - jump decision (Mohsin Ali, 2016)

Optimisation:

After talking to a few virtual reality experts, I found that 75 frames per second (FPS) is the optimal frame rate for a virtual reality application. To achieve 75 FPS, a lot of post processing effects were either turned down or removed entirely. While these post processing effects had implications to the story, it is more important that the user has a smooth experience.

No wrong choice:

There are no wrong decisions in the application, every decision leads to another event. Originally, if the user made the wrong decision, the application would end. This choice was made so that the user can experience the content to its fullest.

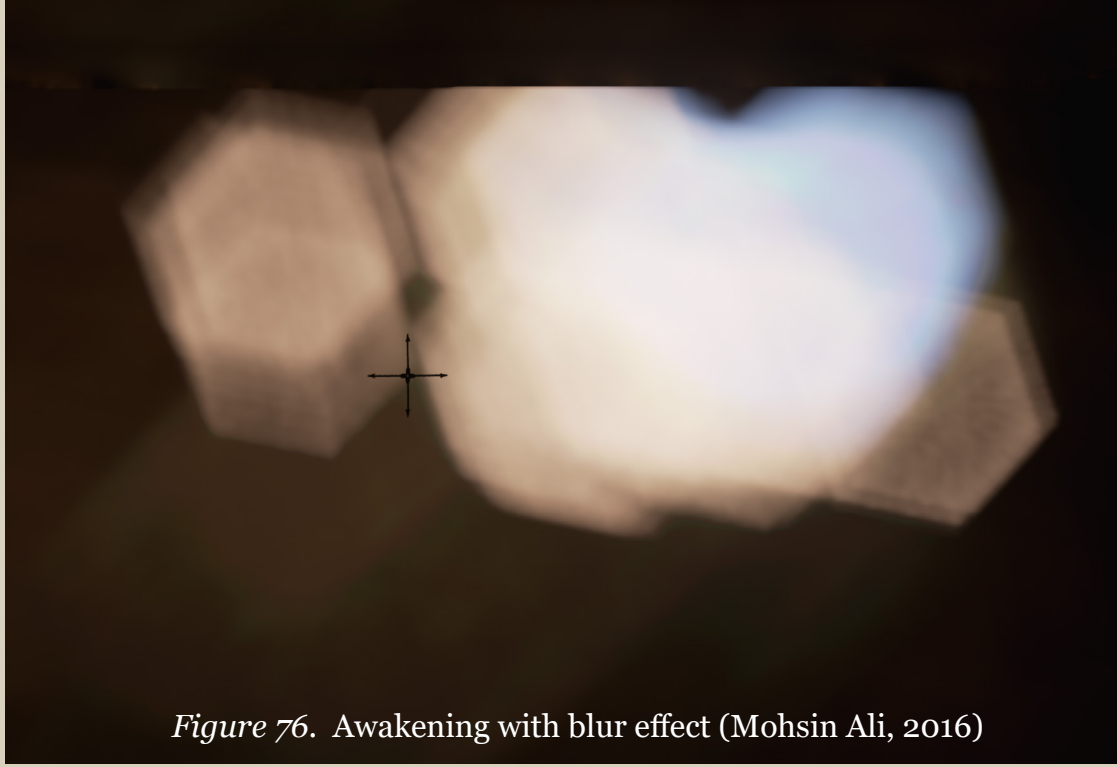
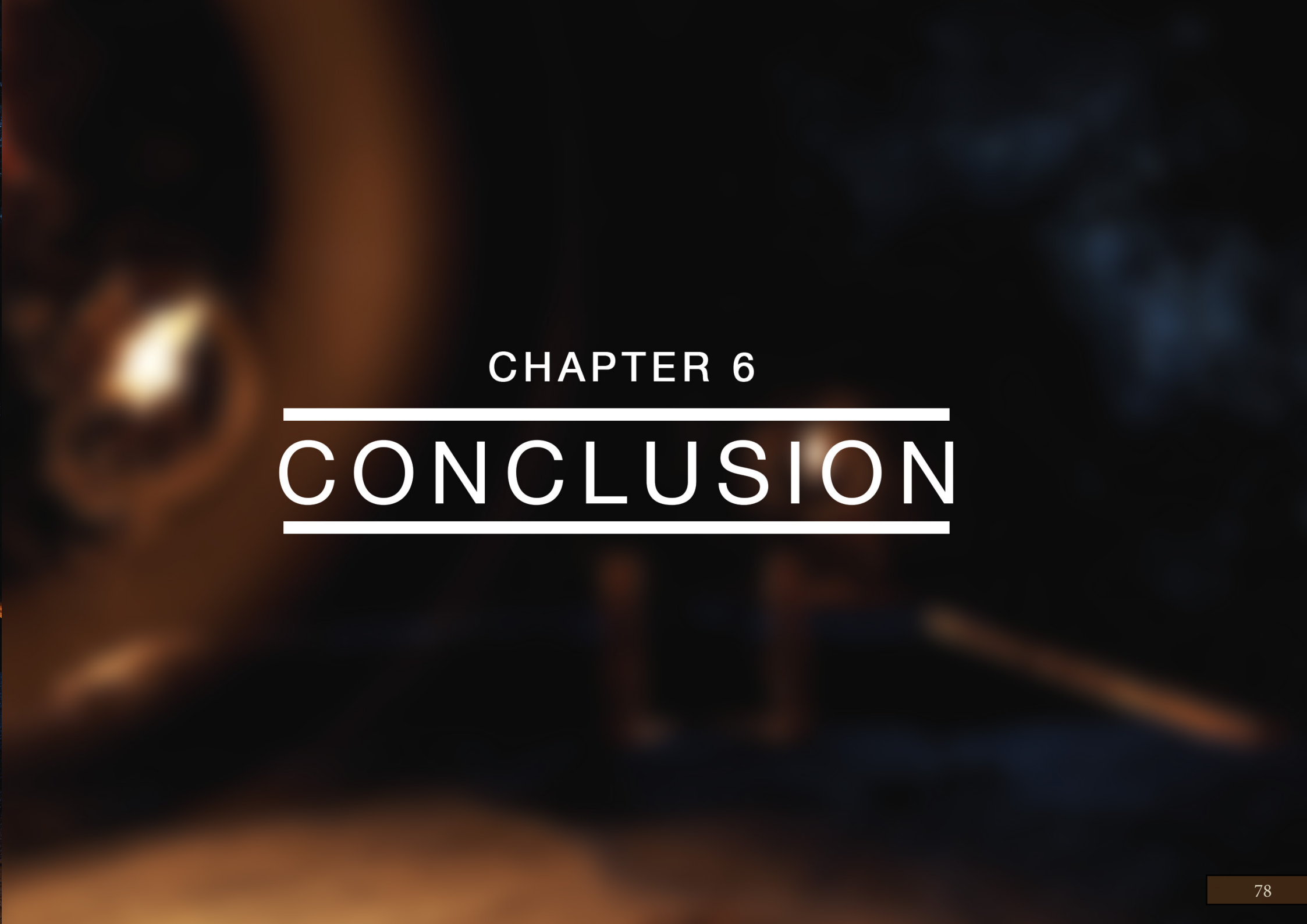


Figure 76. Awakening with blur effect (Mohsin Ali, 2016)

Figure 77. Awakening without effect (Mohsin Ali, 2016)

Figure 78. Over the Bridge render (Mohsin Ali, 2016)



CHAPTER 6

CONCLUSION

Conclusion

The goal of this research is to find if the *Oculus Rift* can enrich the interactive storytelling experience. There are already applications of interactive storytelling on the computer, video game consoles and portable devices, however according to the *Oculus Rift* download site (March 2016), there currently are no interactive storytelling applications listed. This is likely due to the *Oculus Rift* not yet being available publicly. The *Oculus Rift* is included in this research to see if the technology can enhance the interactive storytelling experience. Through design it was possible to create a system that harnesses the capabilities of the *Oculus Rift* and combines it with the successful principles of interactive storytelling. The interactive storytelling application is called *Agi*.

The strengths of the design include ease of use, an interactive story with multiple endings and successful integration of the *Oculus Rift* to enhance the story experience. The weaknesses of the application have a great deal to do with the dominance of author control over user freedom. While this may seem like a weakness, it did not affect the experiences of the participants. The majority of the participants did not comment on this issue. Linear interactive storytelling presents advantages such as authorial control, minor authorial complexity and a manageable authorial scope while conserving an immersive state for the users. (Sander, F, (2008), pg. 105).

Cutting the story into episodes due to scope is another weakness for the application. The length of the first episode is between eight and twelve minutes long which may not be enough time to get invested into story and characters.

Despite the weaknesses, *Agi* produced successful results. I have concluded that the *Oculus Rift* or any virtual reality headset is the next evolution of storytelling. While the key elements of narrative grammar such as setting, characters and plot are present in *Agi,* the experience of being transported inside the narrative environment is a feat unachievable by today's standard of storytelling. The ability to view the space in 360 degrees and judge three dimensional depth increases the immersive state remarkably. *Agi* is designed to take advantage of depth and 360 degree movement by integrating the features into the story. While it is a digital illusion, participants display various physical reactions. These include leaning back, flinching, bracing the chair, fast head movement, leaning over and heavy breathing. Many of the physical reactions are also accompanied by verbal reactions. With this level of three-dimensional ability, stories can be designed in ways that make the viewer feel an active participant within the narrative space. The participant's ability to get immersed into the story space is a critical part of any plot. (Ryan, (2001), pg. 14). With virtual reality headsets, immersion is the state of being inside the narrative universe.

I conclude that not only does the *Oculus Rift* enhance the story experience, the *Oculus Rift* is also the relevant technological platform for interactive storytelling. While many great technologies allow us to interact with the system, such as controllers or mouse and keyboard, they require the user to learn how to operate the hardware in order to interact with the application. With the *Oculus Rift*, this is not the case. The *Oculus Rift* is purely based on looking, which is a natural motion that many living creatures on the planet have evolved to do. If the design takes advantage of this capability, the result is near flawless usability. The evidence is presented in this research where 100% of the participants did not struggle with the interactive system. 17% of the participants are aged between 40 and 50 years old which shows that the interactivity is not limited to the younger audience. Interactive storytelling does not require the multiple complex interactions that video games necessitate. The core of interactive storytelling is presenting the user with a decision at a point in the narrative that influences how the story advances. (Lissen, J, 2012, pg. 3). Combining the core principle of interactive storytelling with a simple interaction provided by the *Oculus Rift*, creates a system that can appeal to audiences from the film and video game territory.

The limitations of the findings came down to hardware issues and scope. 22% of the participants experienced blurry vision with the *Oculus Rift*. The version of the *Oculus Rift* used in *Agi* is the development kit 2 which is outdated by two years, the final release of the *Oculus Rift* is set to hit markets on the 28th of March 2016 and may fix the issues with fuzziness.

The scope limited the research to an extent. *Agi* required many components to function such as screenplays, voice actors, design of environment, three-dimensional assets, animation, interaction design, development of system and sound design. With the exception of the voice-overs, all the work for the other components are done by one person. The scope had to adjust for this limitation and thus, design decisions were made to work around choices made based upon scope. A clear example is the addition of a radio in substitute for three-dimensional characters. The radio allows for character interaction without modelling and animating three-dimensional models. Having an animated model may have increased the participant's ability to be emotionally invested to the characters and story. Scope also restricted the duration of the episode and the complexity of the system. Despite scope limitations, the core aims of the research are applied and explored in *Agi*.

If scope was not an issue for *Agi*, the application would provide a greater experience to participants yet may yield similar results. The components at their current state successfully explore the aims of the research. Improving the components would simply enhance the experience.

Beyond the scope of *Agi*, there is a great opportunity to advance the research to all mediums of storytelling. With the recent emergence of 360-degree video, videos can be experienced in new and innovative ways. 360-degree video overcomes the passive limitations set by traditional video and gives control to the user by allowing the user to interactively explore a moving image with the ability to change the viewing direction. (Kwiatek, (2012), pg. 2). Integrating 360 video control with an *Oculus Rift* is a matching fit considering the *Oculus Rift's* ability to view scenes in 360 degrees. This new video format can expand into movies, television series, documentaries, music videos and even interactive storytelling. Would interactive stories benefit from real actors as oppose to digital characters? With the evolution of virtual reality headsets to mobile devices and new developing technology in support of virtual reality such as 360 videos, many questions still remain on the exciting possibilities that virtual reality headsets can have on current forms of entertainment and how interactive storytelling can evolve alongside new technologies.

Bibliography

Aaron Lemke. (2013). *Lunadroid 237 – An Interactive Narrative*. Austin: Texas. Retrieved from: https://unellodesign.itch.io/lunadroid-237-a-vr-short-film

Abramson, A. (1955). *Electronic Motion Pictures: A History of the Television Camera*. Univ of California Press.

Adams, E. (1999). *Three problems for interactive storytellers*. Designer's Notebook Column, Gamasutra, 144.

Aylett, R., & Louchart, S. (2008). If I were you – Double appraisal in affective agents. *In:Proc, of 7th Int. Conf. on Autonomous Agents and Multiagent Systems*. 1233-1236

Academy of Interactive Arts and Sciences. (2016). *2016 Awards - The Witcher 3: Wild Hunt*. Retrieved 21st April 2016 from: http://www.interactive.org/games/video_game_details.asp?idAward=2016&idGame=1432

BAFTA (2013), *BAFTA Awards Search – The Walking Dead*. Retrieved 20th April 2016 from: http://awards.bafta.org/keyword-search?keywords=The%20Walking%20Dead

Bereiter, C. (2002). Design Research for Sustained Information. *Cognitive Studies, 9(3),* 321-327. http://doi.org/10.11225/jcss.9.321

Bruckman A. (1990*). The Combinatorics of StoryTelling: Mystery train interactive*.The MIT Media Laboratory.

Crawford, C. (2012) *Chris Crawford on Interactive Storytelling*. New Riders.

Cavazza, M. O., Charles, F., & Mead, S. J. (2002). *Character-based interactive storytelling*. IEEE Intelligent systems.

CD Projekt RED. (2015). *The Witcher 3: Wild Hunt*. Kraków: Poland. Retrieved from: http://thewitcher.com/en/witcher3

Crytek. (2015). *Back to Dinosaur Island*. Frankfurt am Main: Germany. Retrieved from: http://www.crytek.com/news/crytek--s-back-to-dinosaur-island-available-for-free-today

Crytek. (2016). *Corporate Overview - Awards*. Retrieved 20th April 2016, from: http://www.crytek.com/press/corporate/overview

David, P. A. (1985). Clio and the Economics of QWERTY. *The American economic review*, *75*(2), 332-337.

Dlive22891. (2015, November, 19). THIS. IS. AWESOME | Back To Dinosaur Island (Oculus Rift) [Video file]. Retrieved from: https://www.youtube.com/watch?v=7Na1mVq415k

Gobel, S., Malkewitz., & Ido, I. (2006). Believable Agents and Intelligent Story Adaptation for Interactive Storytelling. *Technologies for Interactive Digital Storytelling and Entertainment: Third International Conference,* 4326, 1 – 12. doi:10.1007/11944577

Hymes, D. (2003). *Ethnography, linguistics, narrative inequality: Toward an understanding of voice*. Taylor & Francis.

B. Frohlich, J, Deisinger, & H.-J, Bullinger. (2001). Immersive Projection Technology and Virtual Environments 2001: Proceedings of the Eurographics Workshop. *Eurographics*. Stuttgard, Germany: Springer Science & Business Media. doi: 10. 1007/978-3-37091-6221-7

Koenitz, H., Sezen, T. I., Ferri, G., Haahr, M., Sezen, D., & Çatak, G. (Eds.). (2013). Interactive Storytelling: 6th International Conference, ICIDS 2013, *Information Systems and Applications, incl. Internet/Web, and HCI,* 8230, Istanbul, Turkey: Springer. doi: 10. 1007/978-3-319-02756-2

Kwiatek, K. (2012). An Exploration of 360 Film and Immersive Environments for Educational Purposes. (Paper, University of Plymouth, United Kingdom). Retrieved from:http://www.kwiatek.krakow.pl/charles360/images/JiED_manuscript_Karol_Kwiatek_3_final.pdf

Lankoski, P., & Björk, S. (2007) Gameplay design patterns for believable non-player characters. In *Situated Play: Proceedings of the 2007 Digital Games Research Association Conference*, 416-423

Lebowitz, J., & Klug, C. (2012). Interactive Storytelling for Video Games: Proven Writing Techniques for Role Playing Games, Online Games, First Person Shooters, and more. Oxford: Elsevier Inc.

Louchart, S., & Aylett, R. (2004). The emergent narrative theoretical investigation. In *the 2004 Conference on Narrative and Interactive Learning Environments,* 21-28

Louchart, S., Swartjes, I., Kriegel, M., & Aylett, R. (2008). Purposeful authoring for emergent narrative. In *Interactive Storytelling,* 273-284. Springer Berlin Heidelberg. doi: 10. 1007/978-3-540-89454-4_35

Linssen, J. (2012). *Discussion of Interactive Storytelling Techniques for Use in a Serious Game* (Master thesis, University of Twente, Enshede, Netherlands). Retrieved from: http://doc.utwente.nl/80054/

Meslow. (2014). Iron throne. Image retrieved from: http://theweek.com/articles/446107/6-cheap-ways-iron-throne

Mitchell, A. Fernandez-Vara, C. Thue, & David. (2014). Interactive Storytelling: 7th International Conference on Interactive Digital Storytelling. *Information Systems and Applications, incl. Internet/Web, and HCI,* 8832, Singapore: Springer. doi: 10. 1007/978-3-319-12337-0

Nielsen, J. (1993). Iterative user-interface design. *Computer*, *26*(11), 32-41.

Oculus. (2016). Image of participant wearing headset. Retrieved from: https://www.oculus.com/en-us/rift/

Oculus VR. *Oculus Rift Pre-Orders Now Open, First Shipments March 28*. Retrieved January 20 2016, from https://www.oculus.com/en-us/blog/oculus-rift-pre-orders-now-open-first-shipments-march-28/

Reiners T, Teras H, Chang V, Wood LC, Gregory S, Gibson D, & Teras M. (2014). Authentic, immersive, and emotional experience in virtual learning environments: The fear of dying as an important learning experience in a simulation. In *Transformative, Innovative and Engaging: Proceedings of the 23rd Annual Teaching Learning Forum* (1-14). Perth, Australia: University of Western Australia. Retrieved from http://e-publications.une.edu.au/1959.11/15177

Ryan, M. L. (2001). Narrative as virtual reality. *Londres: Parallax*.

Sander, F. (2008). *Linear Interactive Storytelling* (Master's Thesis, Stuttgart Media University. Stuttgart, Germany) Retrieved from: http://www.kreativrauschen.com/projects/linear-interactive-storytelling/linear-interactive-storytelling.pdf

Schuler, D., & Namioka, A. (Eds.). (1993). *Participatory design: Principles and practices*. CRC Press.

Swartjes, I. (2007). Using narrative cases to author interactive story content. In *Entertainment Computing–ICEC 2007,* 4740, 205-210. Springer Berlin Heidelberg. doi: 10. 1007/978-3-540-74873-1_24

Telltale Games. (2014-2015). *Game of Thrones: A Telltale Game Series*. Marin County: California Retrieved from: https://www.telltalegames.com/gameofthrones/

Telltale Games. (2015). Title screen of Game of Thrones. Retrieved from: https://www.telltalegames.com/gameofthrones/

The Game Awards (2015), *Game of the Year*. Retrieved 21st April 2016: http://thegameawards.com/nominees/

Turner III, D. W. (2010). Qualitative interview design: A practical guide for novice investigators. *The qualitative report*, *15*(3), 754.

Video Game Awards (2012), *Every VGA winner from years past*. Retrieved 20th April 2016 from: http://www.spike.com/articles/6a0a62/vgx-2013-every-vga-winner-from-years-past

Credits application

Game engine used: Unreal Engine 4

Voice actors:

Tamati Kawha as Ethan

Emma Carpenter as Naomi

Tuakana Metuarau as Darkness

Hannah Botha as Alethea

Soundtracks used:

Ross Buden - Adventure Western Music - The Wild West

(Copyright and Royalty Free)

Ross Bugden - Epic Chase Music Run

(Copyright and Royalty Free)

Kevin MacLeod - Chase Pulse - Horror - Royalty Free

Kevin MacLeod - Chase Pulse Faster - Horror - Royalty Free

Kevin MacLeod - Anxiety - Horror - Royalty Free

Dragon model – 3dhaupt at tf3dm.com

Sound effects used:

freesound.org

j1987 - cinderblock

shepards - ocean and fog horn

rucisko - ocean waves

marec - tremor

cgeffex - ricohet wood 3

tomlija - wooden plank snap

bahaish - rope cracking

jorickhoofd - pushing some gravel off a small hill

jorickhoofd - gravel climbing

dheming - woodcreak03

lolamadeus - gravel impacts and falls

phil25 - wood step

monotraum - steps on wooden floor

mentalsanityoff - 01-21 footsteps sneakers on gravel and leaves

rucisko - gravel steps

allanz10d - rocks falling no reverb edition - 16bit

pycckua2000320003 - on drums 1

huluvu4 - platzender kopf

soundcollectah - dry branches cracking

dragonphoenix - tribal bass

hiriak - urban tribal drums

kyster - woodpecker and other birds on spring morning

soundlikewilem - fresh breeze

vkproduktion - forest birds loop 02

jaegrover - creative insect dragonfly caught in net wing movement

martineerok - cuckoo and crow noisy
vocalpercussion - vocal percussion ugh agh
mysticool - rocks1
soundcollectah -rcok fall01
cosmicembers - snapping chain
jorickhoofd - breaking wood
spookymodem - falling rock
streety - sword4
fresco - falling shoe boxes 4
the biznics - lighter flick
arithni - heavy thud
jasonelrod - sizzling
icarferre - objectfalling 4
black snow - sword slice 22
miastod2wiehow - thud thud
klankbeeld - horror ambience
genelythgow - metal objects banging
mixedupmoviestuff - knife stab
nebyoolae - backyard gate
goodvibes420 - gasp01
headphaze - horror ambience atmos 10
gowlermusic - radio static
kickhat - horror piano note
littlerobotsoundfactory - gate open 00
themoviemacher - shadow maker cellar
rutgermuller - metallic noise
robinhood76 - dog howll 1
robinhood76 dog howl 4
soundmary - lift running
castleofsamples - fork light start and run
keykrusher - microwave beep
stormpetrel - whistling antaractic blizzard
spookymodem- falling rock
kangaroovindaloo - medium wind
rsilweira88 - stone on water04
delphidebrain - jazzthedoghowl bark
ylearhiso - sudet uvovat wolves howling small pack frost snapping
kodack - beep beep
apolloarello - mr dog 01
freqman - whoosh07
matty - large spaceship pass
benboncan - rockfall in mine
robinhood76 - cinema swoosh2
cybekinecticfilms - strangeteleport sound
dj chronos - monster drone
timbre - dramatic metal clang improved
vartion - tesla monster low growl
klankbeeld - heart beat scare

jacobalcook - creature roar 1

aetherspire - monster roar 2

aldenroth - blowing air

freeman213sg - blowing

quadraslayer - monster roar slow