

THE ARK PROJECT



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Chris Andersen



7 October 2011



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7 October 2011



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ABSTRACT

The Ark Project is a computer-based 3D first-person virtual experience. The project experiments with new methods of narrative and investigates storytelling in relation to interaction and 3D virtual environments. The Ark Project builds on previous research into interactive narrative and methods of interaction through the use of object-based narrative elements and overlapping layers of themed space. New relationships between environment and narrative are explored through branching narratives and journey structures.

The narrative of The Ark Project operates via the method of “narrative archaeology”, through which users uncover the story through exploration and interaction. Centred on the scientific excavation and exploration of an ancient interstellar ark, the Ark story explores themes of the natural versus the controlled and the origins of life on earth through the investigation of the ark’s purpose and mysterious origins.

INTRODUCTION

The purpose of this document is to outline the theoretical underpinnings and creative process involved in the creation of The Ark Project, an investigation into interactive environmental narrative. According to Michael Nitsche (2008), the emergent state of the games industry poses the challenge of analyzing the expanding media while critical literature surrounding the topic is developed at a slower rate. The expansion of interactive 3D media and the paucity of literature presents vast opportunities for research that can help us gain new insight into the growing medium. This project features an environmental narrative model enhanced with the use of interactive narrative principles, creating new and unconventional forms of narrative. This exegesis presents the theoretical, methodological and technical processes undertaken in my research and consists of the following chapters:

CHAPTER ONE: *THE ARK PROJECT* NARRATIVE

This section provides a summary of the main narrative points within the project and provides the narrative context for the theories and techniques explained in the rest of the exegesis.

CHAPTER TWO: CRITICAL FRAMEWORK

This chapter outlines the main theoretical underpinnings influencing my work and illustrates the techniques used to implement environmental narrative through the use of evocative narrative elements¹ and interactive narrative principles within a game space. This section also provides examples of how these techniques are presented within the project.

CHAPTER THREE: METHODOLOGY

This chapter outlines the practical aspects of my work and helps illustrate aspects of the creative journey of the project. It also describes the project's production pipeline² and the techniques used in creating narrative spaces. In particular, this chapter covers the importance of pre-production³ and my focus on clear concepts, and the use of story maps as a planning tool for interactive environmental narrative.

¹ Evocative narrative elements "encourage players to project meaning onto objects and spaces in game worlds" (Nitsche, 2008, p. 44).

² A fixed process for producing assets and environments.

³ The first phase of a production pipeline in which planning and concept development takes place.

CHAPTER FOUR: TECHNICAL ASPECTS

This chapter covers important technical aspects of the project, outlining some of the challenges encountered and the methods employed to overcome them. It also describes the methods of presentation and physical interaction with the project, including the use of stereoscopic 3D⁴ presentation.

CHAPTER FIVE: CONCLUSION

⁴ A presentation technique creating the elusion of depth in an image using a separate image for each eye.

CHAPTER ONE: THE ARK PROJECT NARRATIVE

The Ark Project utilizes environmental narrative techniques that allow players to create their own interpretations of a narrative. Players explore themed sections of the environment largely at their own discretion, however the environment still projects an overall consistent narrative. This narrative evokes themes of exploration, the natural versus the controlled, and the origins of life on earth. The last of these was influenced by the scientific theory of "Directed Panspermia" (Crick & Orgel, 1973). This theory is also utilized in science fiction and concerns the idea that organisms may have been sent out to propagate throughout the universe deliberately by another species.

The Ark Project narrative involves the excavation site of an ancient interstellar ark. The environment featured in the narrative is a form of an "escape pod" issued from the ark itself, containing a vital cross section of the distant planet's ecosystem and indigenous life. The original ark met with tragedy on its journey and the escape pod became stranded beneath the surface of the earth for thousands of years. The player steps into the role of a diegetic⁵ character from the excavation team, sent into these remnants of the ark to investigate the disappearance of another preliminary excavation team. Through the users' exploration and interaction with the environment they may uncover the purpose and origin of the ark and its builders, as well as the nature of the research conducted by the first excavation team.

There are two main characters apart from the diegetic protagonist. The first is Adam, the discovery of whom is an alternate narrative outcome for the player's exploration in the ark. Adam is the last of the alien race who is preserved in stasis and protected and revered by Revenant, a malfunctioning maintenance robot for the ark. Revenant leaves traces of the ark's origin and builders through painted murals left throughout the environment and protects Adam by discouraging the player and preventing their progress. The player's chosen paths and goals within the environment may lead to different narrative outcomes in the form of multiple

⁵ Part of the internal world of the narrative.

CHAPTER TWO: CRITICAL FRAMEWORK

This project represents continued research into perfecting an environmental narrative model synthesized from original ideas and the theories of several key practitioners such as Joe Rohde and Michael Nitsche, which are discussed below. This model is further enhanced by recent research into interactive narrative principles, which allow players to gain a greater sense of interaction and ownership of the personal narratives encountered within the game space.

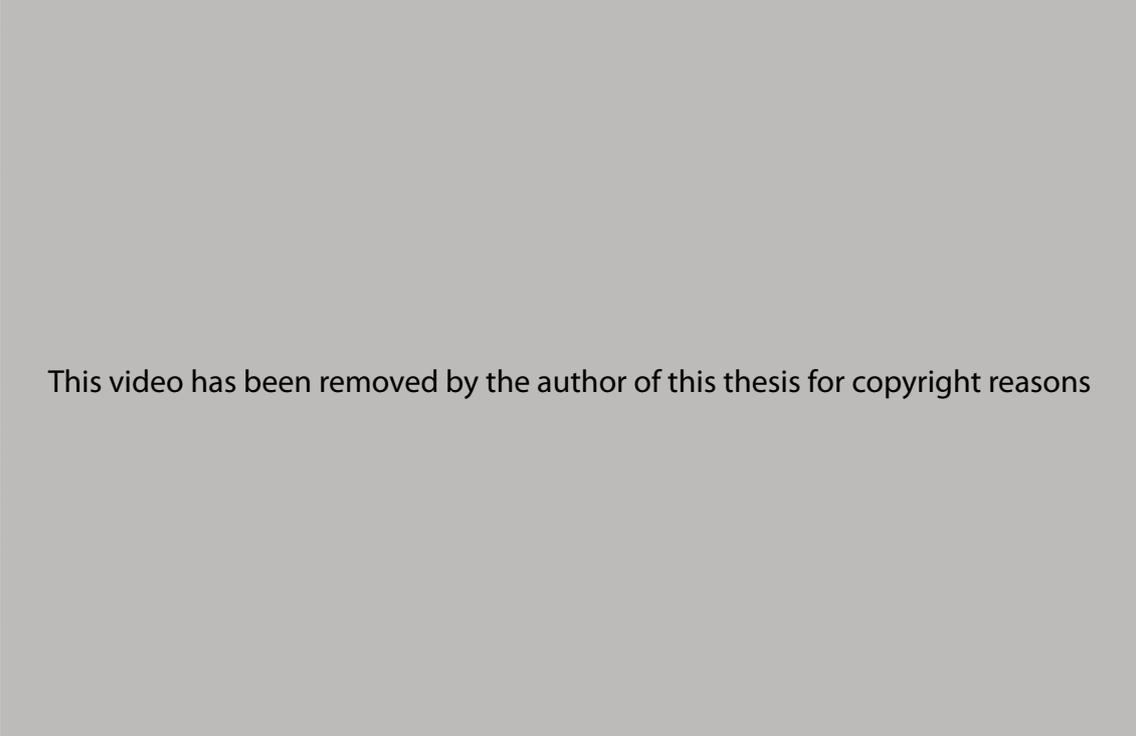
The theories presented in this section are accompanied by descriptions of their implementations within The Ark Project and examples of how each principle operates within the environment.

EVOCATIVE NARRATIVE ELEMENTS

Michael Nitsche, author of *Video game spaces: Image, play, and structure in 3D worlds* (Nitsche, 2008), introduces the concept of evocative narrative elements. These elements can be any object or situation presented in the game space that may aid and guide the player's experience and understanding of the 3D world. Nitsche believes that these evocative elements can be used to improve the player's process of building meaning and that each element is not a story in itself but a "suggestive marking". At the same time, these elements may be "clustered in certain ways and aimed to trigger reactions in players in order to help them create their own interpretations" (Nitsche, 2008, p. 44).

According to Nitsche (2008), the value of evocative narrative elements "is not realized on the level of the element itself but in the way players read and connect them" (p. 44). When the player creates these connections they are able to form narratives and link them to the game world. Evocative narrative elements help to infuse significance into, and project meaning onto, objects and spaces in 3D game worlds. They aim not to tell a linear story, but instead provide the means for the player to comprehend the virtual space and make their experience within the

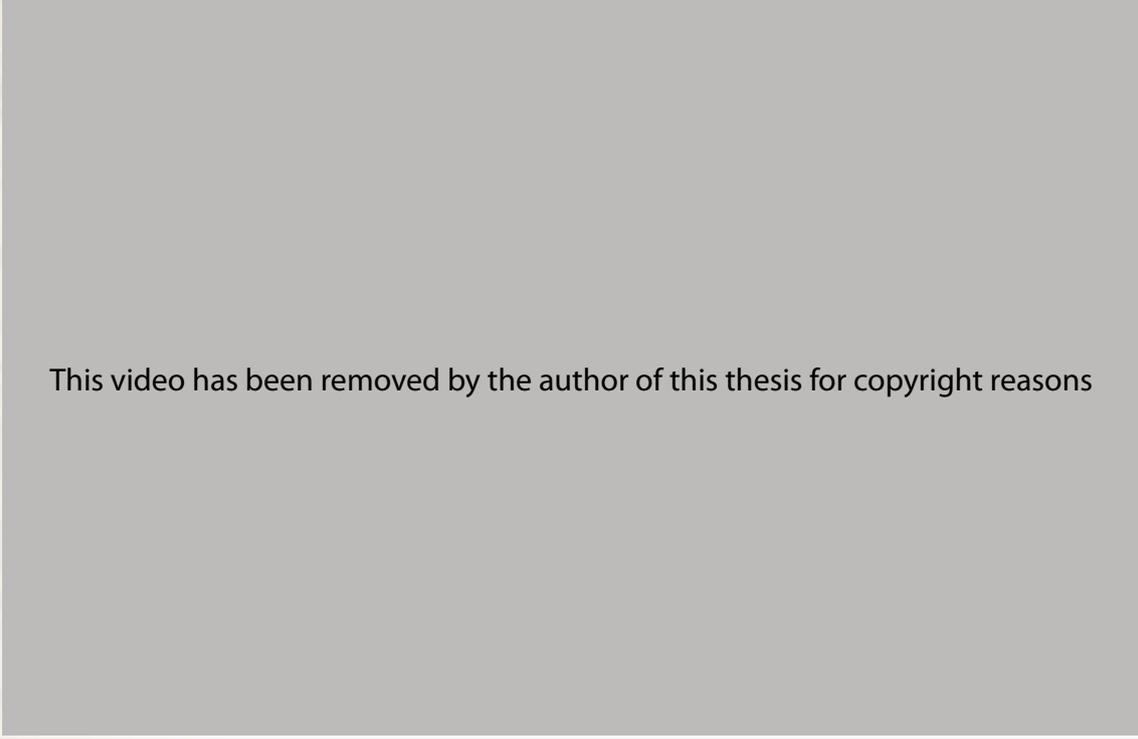
Examples of the use of evocative narrative elements to convey narrative can be found in two games published by Cyan Worlds. In both the highly acclaimed⁶ MYST (Cyan Worlds, 1993) and its sequel RIVEN (Cyan Worlds, 1997) users interact with the environment to solve puzzles and explore, revealing elements of the story as they progress. Pearce (1997) describes MYST as “a slow paced world in which was embedded a story. You had to search for the story in the form of various obscure and unusual clues” (pp. 326–327) (Figure 1). RIVEN offered a more realistic presentation and less abstract narrative clues but retained the system of evocative narrative elements as part of its storytelling method (Figure 2).



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Figure 1. Cyan worlds. (2008, September 10). Myst – chapter 4 – mechanical – part 1 [Video file]. Retrieved from <http://www.youtube.com/watch?v=mvEa6fvn8Wo>

⁵ MYST became “the world’s best-selling computer game, a record it held until it was surpassed by The Sims in 2002” (Kohler, 2008).



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Figure 2. Cyan worlds. (2009, September 4). Riven the sequel to myst – idle movie [Video file]. Retrieved from <http://www.youtube.com/watch?v=vRruQ89YMLo>

Nitsche (2008) believes that within game worlds that present narrative in this manner, “any development of the fabula⁷ is within the responsibility of the user’s interaction that is itself informed by the evocative narrative elements” (p. 49). This fits well with my intended implementation of evocative narrative elements in the game world of The Ark Project, which presents arrangements of evocative elements specifically chosen and placed in relation to each other in order to help users form basic micro-narratives⁸ within the game. New narratives can then be discovered through further exploration by the user, who links the micro-narratives together to form a greater perspective of the narrative and overall themes.

One example of how this has been implemented in the project is shown in Figure 3, which displays books, papers, a laptop and ark artefacts in order to present a themed space. Within this themed space players may link these narrative elements together to form an understanding of what aspects of the ark the desk’s owner was investigating, and what stories these objects might tell.

⁵ A story or order of retelling events.

⁸ A small, localized narrative.

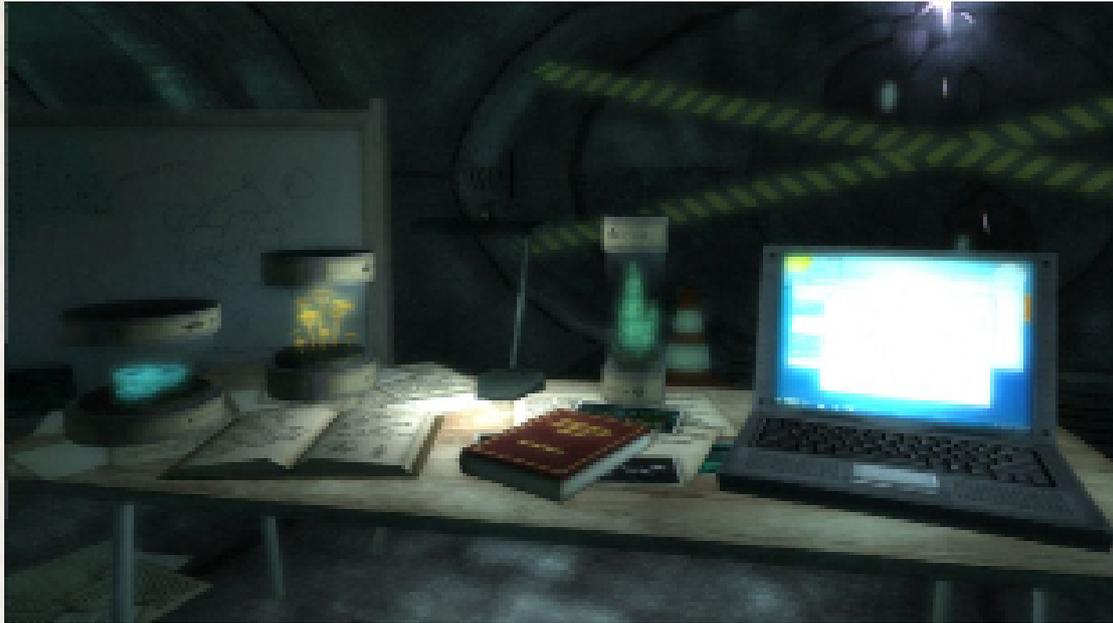


Figure 3. Andersen, C.G.I. (2011). Screenshot of workstation featuring evocative narrative elements. Auckland: Private collection of Christopher Graham Ivan Andersen.

Grant Tavinor (2009) supports this technique of narrative discovery through evocative narrative elements, stating that one of the most effective ways of drawing a user into a game narrative is when “they are made responsible, if not for the content of the narrative, then for the discovery of the content” (p. 124).

The use and placement of narrative content within the environment relates closely to Tim Edensor’s interpretation of the industrial ruin and how “Clutter produces an excess of meaning, a plenitude of fragmented stories, elisions, fantasies, inexplicable objects, and possible events which present a history that can begin and end anywhere” (Edensor 2005, p. 834). These objects and narrative traces invite the user to fill in the blanks. Edensor compares these traces to “notice boards under decay that suffer from partial erasure but retain certain words, only fragments of stories remain” (p. 846), and believes the inarticulacy this presents creates an opportunity to create new forms of narrative, unbound by form and convention.

Tavinor (2009) presents a method through which these narrative elements can be enhanced by integrating “untrustworthy sources of information” which may disrupt a player’s ability to interpret a coherent narrative, however this makes “their contribution to the narrative more robust by allowing them to resist the narrative that is being fed to them” (p. 125).

Joe Rohde, an Executive Designer and Vice President with Walt Disney Imagineering and head of design and development for Disney's Animal Kingdom at the Walt Disney World Resort describes a method of environmental narrative heavily focused on themed space which he calls "narrative placemaking". The core concept of narrative placemaking is that every detail of the space itself must reiterate the main ideas and themes that drive the narrative. Rohde believes "Narrative space is theatrical space. What matters is not the functional realities of the buildings and landscape, but their use to communicate ideas" (Rohde, 2007, p. 2). This focus on theme and the use of space to communicate ideas works well to provide an overall narrative space into which evocative narrative elements can be sewn.

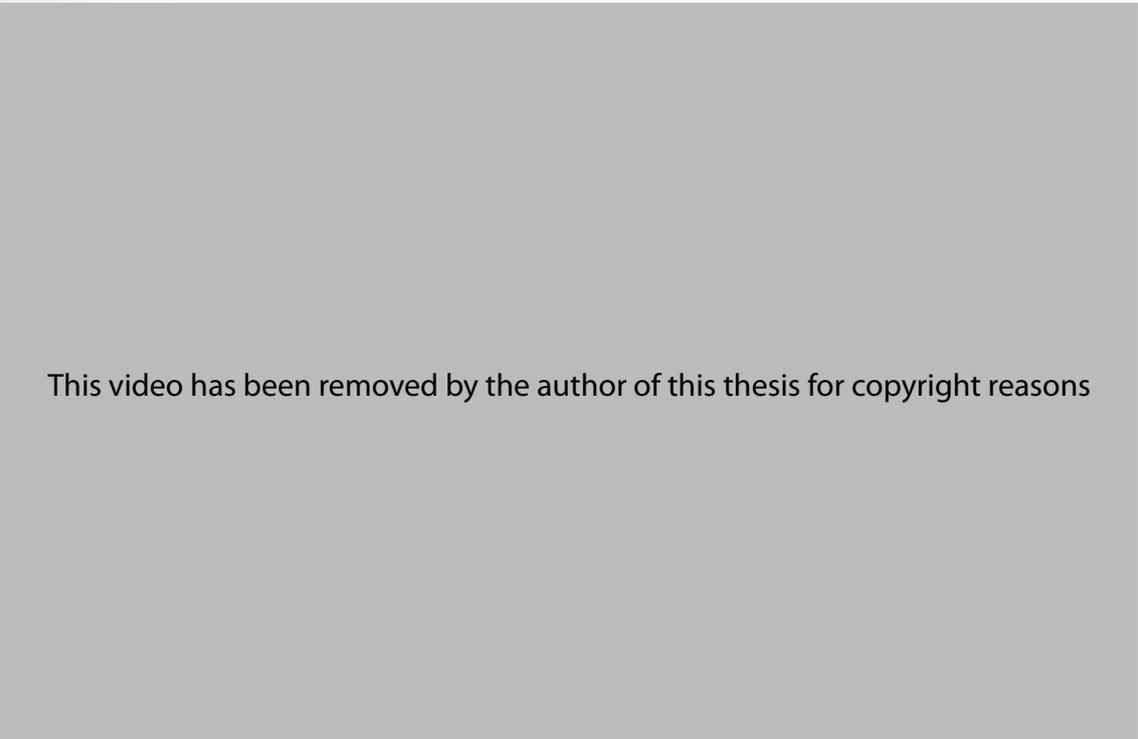
Due to the nature of spaces he designs and creates, Rohde offers effective solutions for eliminating linearity within narrative environments. He states:

In the layout of common circulation space, such as the public areas of any theme park, linear storytelling doesn't read. If the space is designed to allow free, self-directed flow, then the designer cannot know what linear sequence each person may follow. (Rohde, 2007, p. 3)

The solution he presents to this problem is to create "concentric layers of space" to work with the narrative themes. Each layer of space should contain its own impacts and narrative ideals. As a result any user of the space will be able to pass through these layers in different ways but will always be able to interpret a sequence of narrative.

A notable example of saturating a game environment with the core narrative themes is the first-person shooter⁹ BioShock (2K Games, 2007). In BioShock the inclusion of themed space is so successful that almost all of its in-game environments can be interpreted to gain a sense of the deeper underlying narratives. These themed spaces are reinforced with simple or sometimes generalized evocative elements in the form of personal items, texts and audio diaries (Figure 4). Linde (2007) explains:

Evidence of comings and goings, parties, and life in general is found in every nook and cranny throughout the game. Messages written in blood are found on the walls and floors... With BioShock, it's not so much about telling a story as it is letting the player experience it.



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Figure 4. 2K Games. (2011, May 30). The art of bioshock: part 1: the environments [Video file]. Retrieved from <http://www.youtube.com/watch?v=Aa7XYKNhtJ0>

⁹ A video game genre presented in a first-person perspective, focusing on weapon-based combat.

In relation to free-flow navigation and narrative, the Swiss Family Robinson Treehouse at the Disneyland theme park in Anaheim, California, provides a good example of consistent narrative in non-linear space.¹⁰ The other areas of the park display strong narratives in individual units, such as certain rides or areas, and also as a unified whole. However, the Treehouse features a unified overall theme and layers of overlapping thematic space as well as the use of simple evocative narrative elements (Figures 5 and 6). Pearce (1997) describes the Treehouse and its use of narrative: "Each room is made from a combination of natural ingredients and the leftover wreckage of a ship run aground . . . These rooms and scenes tell a clear story about the lifestyle of the family" (p. 330).

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Figure 5. Swiss Family Robinson Treehouse [Photograph]. (n.d). Retrieved August 29, 2010, from <http://www.wdinfo/guides/magickingdom/adv-swissfamily.htm>

¹⁰ A space in which free, self-directed navigation may take place.

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Figure 6. Swiss Family Robinson Treehouse [Photograph]. (n.d). Retrieved August 29, 2010, from <http://www.wdinfo/guides/magickingdom/adv-swissfamily.htm>

These techniques of creating layered themed spaces to enhance the environmental narrative and effectiveness of evocative narrative elements have been incorporated into the design and layout of The Ark Project. The overall themes of “narrative archaeology”,¹¹ the origins of life, and the purpose of the ark were considered when creating the environmental layout, assigning specific areas of overlapping themed spaces through which players can roam freely and piece together a narrative. Each of these areas in turn is layered with linked micro-narratives generated by the evocative narrative elements specific to each area.

An example of this technique is seen in Figure 7, which shows an area designed to reflect the theme of the ark’s purpose of preserving life as well as mankind’s intervention in this purpose. Several stasis tanks fill the room, each preserving a specific organic specimen of alien life. Within this environment mankind’s influence is revealed as the player begins to investigate the alien technology, which can be understood through the presence of notes, workbenches, equipment and disabled stasis tanks and specimen tubes. This themed room links to and overlaps with other areas and themes concerning the ark’s purpose and the preservation of the alien life within. (Figure 8)

¹¹ The process of uncovering narrative using methods comparable to those in the field of archaeology.



Figure 7. Andersen, C.G.I. (2011). Screenshot of ark stasis environment. Auckland: Private collection of Christopher Graham Ivan Andersen.

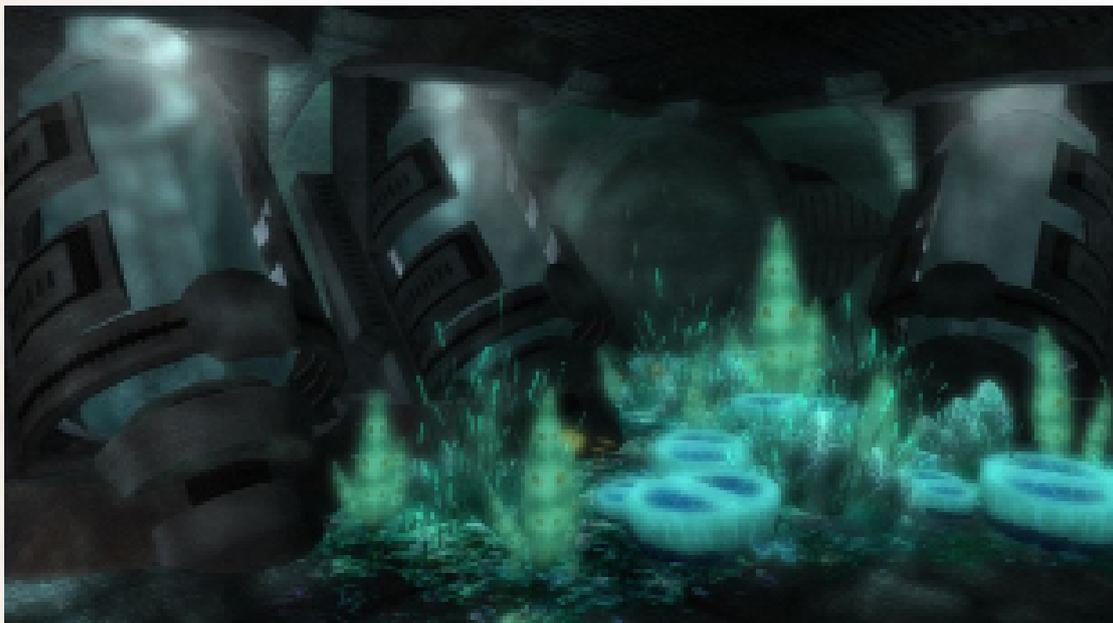


Figure 8. Andersen, C.G.I. (2011). Screenshot of ark stasis environment. Auckland: Private collection of Christopher Graham Ivan Andersen.

The use of layered themed space is discussed and supported by Tavinor, who believes that curiosity or the desire to know about one's world is a powerful force in driving players towards the completion of an environmental-style narrative. He states that this narrative style and self-directed flow "allows the player to discover facts about the game world, and to reconstruct the narrative on that basis. Because the information sources need searching out, any particular playing can have a more or less complete telling of the game narrative" (Tavinor, 2009, p. 124).

Edensor discusses movement within a narrative environment such as a ruin, and states that “without guided pathways or social physical barriers, large ruins become labyrinthine, permitting the making of a multitude of paths. Similarly, there are no temporal restrictions which determine how long one should loiter in one spot” (Edensor, 2005, p. 838).

INTERACTIVE NARRATIVE PRINCIPLES

The Ark Project involves research into interactive narrative principles. These principles can be used to enhance the existing environmental narrative model, established through previous tests and research.

In Chris Crawford on interactive storytelling (Crawford, 2005), the author, who is the founder of the annual Game Developers Conference,¹² provides many varied techniques as possible methods for developing interactive storytelling. One of the most basic and commonly used is the branching narrative tree (Figure 9). Crawford describes branching narratives thus: “Each decision is a choice between just two options and leads to a new situation with a new binary choice” (p. 124). More than two choices could be included at each point, but this leads to a greater and more complicated workload for the designer. A branching narrative using fewer nodes will reduce the workload but narrative interactivity declines sharply as a result.

¹² An annual gathering of professional video game developers.

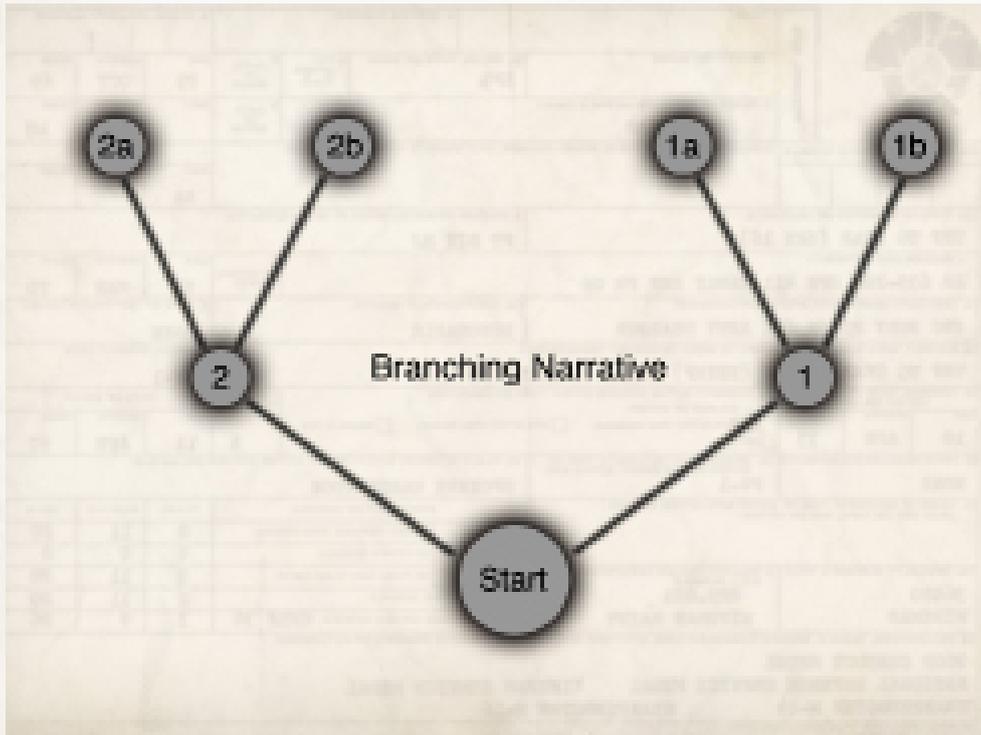


Figure 9. Andersen, C.G.I. (2011). Branching narrative diagram. Auckland: Private collection of Christopher Graham Ivan Andersen.

The trade-off between workload and interactivity can be achieved through the use of what Crawford (2005) calls “foldback schemes”. These involve branching narratives that contain decision nodes that fold back on themselves leading to the same narrative outcome (Figure 10). More than a few foldbacks in a branching structure can lead to a dishonest interactive narrative containing insignificant decisions for the player, yet Crawford supports foldback schemes in situations “when internal variables alter as a result of the difference in pathways” (p. 127). In this way, different contextual narratives can be conceived from a foldback node in a branching tree through the specific influences of narrative elements contained in the previous nodes.

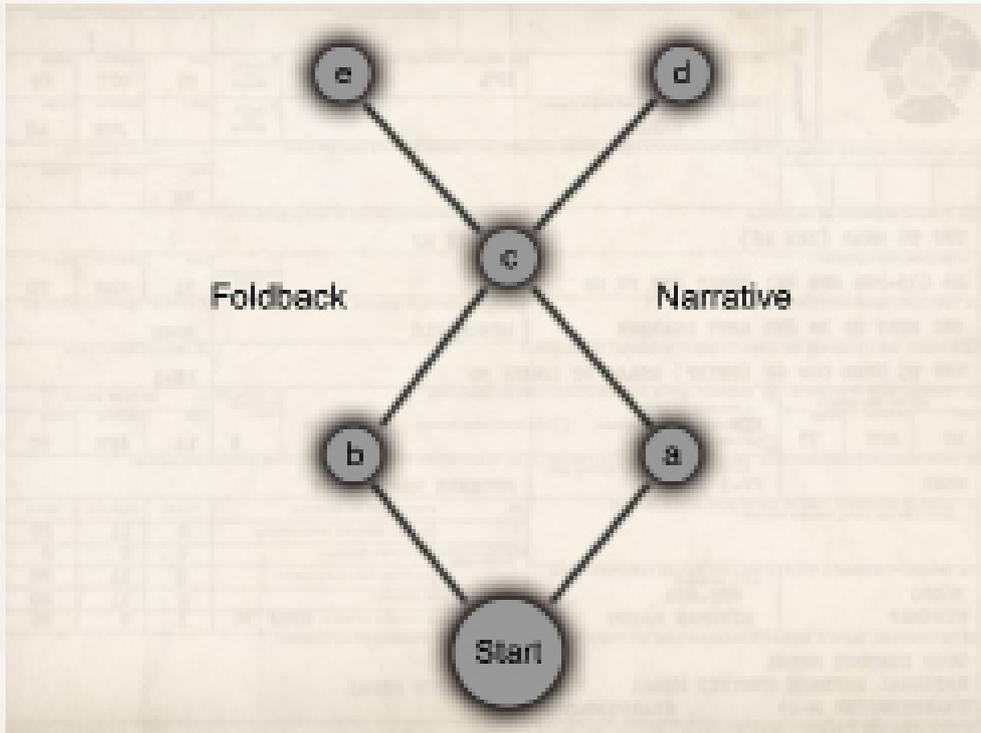


Figure 10. Andersen, C.G.I. (2011). Foldback narrative diagram. Auckland: Private collection of Christopher Graham Ivan Andersen.

Crawford believes the narrative system of branches and foldbacks can be enhanced further through modifying a branching structure by feeding upper branchpoints in the narrative back into the lower nodes to create a form of narrative network. He states, "If you then set up appropriately differentiating contexts, you can have your players move through the network of dramatic possibilities, revisiting each point with a different context each time" (Crawford, 2005, p. 129).

Crawford also presents the idea of having a "journey structure" overlayed on an environmental base¹³ as a method of attaining an interactive narrative model. He presents a hypothetical "Huckleberry Finn" game to explain this method, in which "the player travels down the river, he's free to wander around the stages placed along its banks. Each stage can offer an interesting puzzle or spectacle, but the only way to advance the plot is to move farther down the river" (Crawford, 2005, p. 141). This technique allows the player freedom to make decisions within the environment, while guiding them through an overall narrative.

¹³ A model in which an environmental context provides a basis for narrative.

It is important to note that Crawford states that the methods presented above are not completely effective and prefers the implementation of complex text-based techniques and the use of AI Drama managers.¹⁴ However, in the time since these ideas were published in 2005, the game industry has progressed to produce examples of successful interactive narratives.

A prime example of an interactive narrative game featuring a branching narrative, foldback techniques and journey structures is Heavy Rain (Quantic Dream, 2010) (Figure 11). Wei and Calvert (2011) state that “Heavy Rain effectively brings the game community’s attention back to the once-heated discussion of interactive narrative, particularly onto how to tell a coherent story with considerable intervention by players” It is often referred to as an “interactive drama”¹⁵ and presents a narrative from the perspective of four main characters between which the player switches throughout the game. The choices of players as well as their performance during certain in-game events lead to different narrative outcomes and multiple endings, including the potential death of any of the characters at any point in the game’s plot (Figure 12). This is achieved through a series of branching narratives and foldback techniques guided by an overall journey structure.

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Figure 11. Quantic Dream. (2009, May 22). Heavy rain hd gameplay – 720p [Video file]. Retrieved from <http://www.youtube.com/watch?v=bnck2oXdxMo>

¹⁴ An artificial intelligence system that interprets a player’s activities and triggers specific events in order to provide dramatic response.

¹⁵ An interactive narrative game presented in a cinematic style, giving a feeling similar to that of an interactive movie.

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Figure 12. Wei, H. & Calvert, T. (2011, September 01). The interactive structure of Heavy Rain at the local level – the “Mad Jack” chapter. [Diagram]. From *conventions and innovations: Narrative structure and technique in heavy rain*. Retrieved from <http://www.idmaa.org/journal/2011/09/01/conventions-and-innovations/>

Another notable example of the use of interactive narrative in games is *Fallout 3* (Bethesda Game Studios, 2008). *Fallout 3* features a prominent journey structure in which players are given the freedom to explore the game world and complete quests, most of which are related to, but not dependent on, the main narrative.

This technique is a prominent feature in popular role-playing games such as *The Elder Scrolls IV: Oblivion* (Bethesda Game Studios, 2007) and *Fable 3* (Lionhead Studios, 2010). Tavinor (2009) explains that these games involve

small local narratives strung together into an arc that is unique for a particular player ... Though they may share elements of the game fiction with other players, the sequence and combination of their activities is unique to their character, and this constitutes the story arc of their character. (p. 123)

Joel Burgess (2010) highlights the environments in *Fallout 3* that contain networks of evocative narrative elements to assist in conveying the narratives of quest-related environments. This is illustrated in the video below (Figure 13) which Burgess explains thus: “the CB radio looping the same message tells the story . . . the story is snapshotted through the skeleton models, the children’s toys, the shells and all the remaining clutter”.

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Figure 13. Bethesda Game Studios. (2010, April 26). GDC example video: Fallout 3 radio tower [Video file]. Retrieved from <http://vimeo.com/10220498>

Although these areas are still in development, this project's research investigation contains elements of branching narrative networks and journey structures, coupled with the previously mentioned environmental narrative models. The environment of The Ark Project features a branching narrative network that reflects the player's paths through the environment (Figure 14).

As the player travels through the game space and chooses certain paths, they interpret evocative narrative elements to form micro-narratives and an understanding of overlapping narrative themes. These paths also allow foldbacks in which the player can revisit, or loop back to certain areas and reinterpret their narrative with the contextual references gained on their branching route.

This narrative network is also re-enforced by the overall narrative and journey structure, which moves the player deeper into the ark environment with the ultimate goal of discovering the fate of the excavation team.

Players open or close certain paths through the use of a game mechanic which requires players to open doors or activate certain ark systems through the use of a limited number of "hardware keys". These keys are scattered throughout the environment and help encourage the player to further explore the game space. The number of hardware keys in the environment is limited in order to further

influence the individual narratives experienced by the player – certain doors require more than one key to open. Depending on which path players open or close, their paths through the environment lead to individual narrative interpretations.

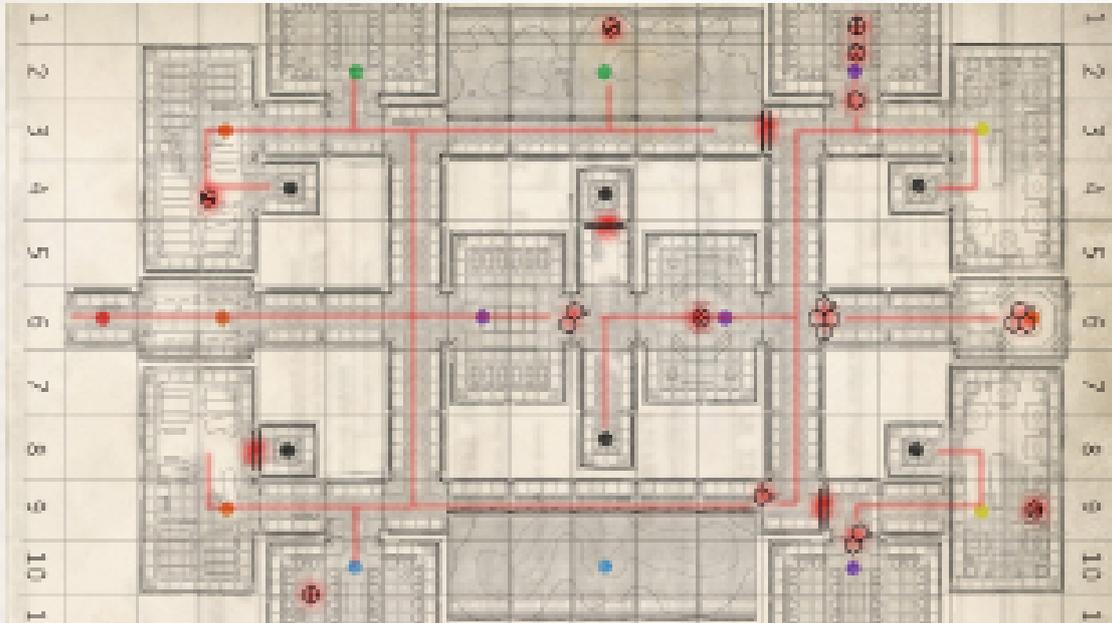


Figure 14. Andersen, C.G.I. (2011). Map of player paths through environment. Auckland: Private collection of Christopher Graham Ivan Andersen.

Tavinor (2009) states that with differing player paths, “The game might be replayed, leading to another quite different cluster of trajectories.¹⁶ In terms of the theory of interactive fiction ... different worlds might be fictionalised from the same fictive prop” (p. 118). The use of free-roaming navigation with the inclusion of specific scripted¹⁷ paths is also recommended by Tavinor as a means of helping control the narrative. He explains:

Close control over fictive events aids the ability to sustain narratives that are carefully paced, and develop in a set order ... Narratives rely on close scripting to have their sustained and meaningful effects: this is to say that the determinateness of the props in narrative fictions lends a particular artistic focus. This means that the definiteness that often seems antithetical¹⁸ to open gameplay is utterly necessary for the depiction of sustained narratives. (Tavinor, 2009, p. 119)

¹⁶ In the context of narrative arcs.

¹⁷ In the context of narrative scripts or screenplays.

¹⁸ In direct opposition or contrast.

CHAPTER THREE: METHODOLOGY

PIPELINE AND PROCESS

The production pipeline for The Ark Project was finalized at an earlier stage of development and has remained largely unchanged. After the original conception of the project was conceived all assets and environmental designs followed that pipeline. The pipeline features a strong focus on the pre-production and planning phase which allows me to attain a firm grasp of the visual styles and themes of the props, characters and environments to be included in the project before production began.

The pre-production aspect of the pipeline was kept open throughout the development of the project to allow the inclusion of new ideas and narrative influences, which in turn created a form of feedback between narrative development and visual style. This feedback has been crucial for the continued development of the project and the recent enhancement of narrative method through interactive narrative theory. During pre-production all designs for evocative narrative elements – props, plant life, etc. – and environment layout were finalized before their production began.

Figure 15 shows earlier concept developments from a period in the project where the environment did not yet have strong narrative undercurrents. The feeding back between narrative development and visual development led to the evolution of the ark and its current visual style.

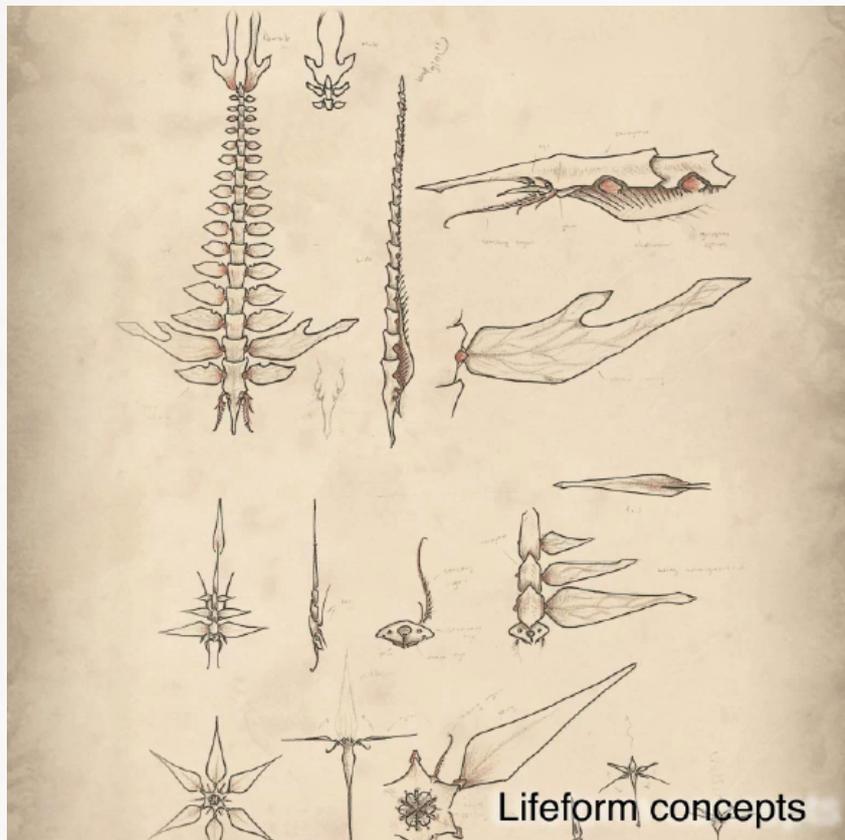


Figure 15. Andersen, C.G.I. (2011). Early pre-production concepts. Auckland: Private collection of Christopher Graham Ivan Andersen.

Figure 16 shows some of the finalized concept developments approved for production.

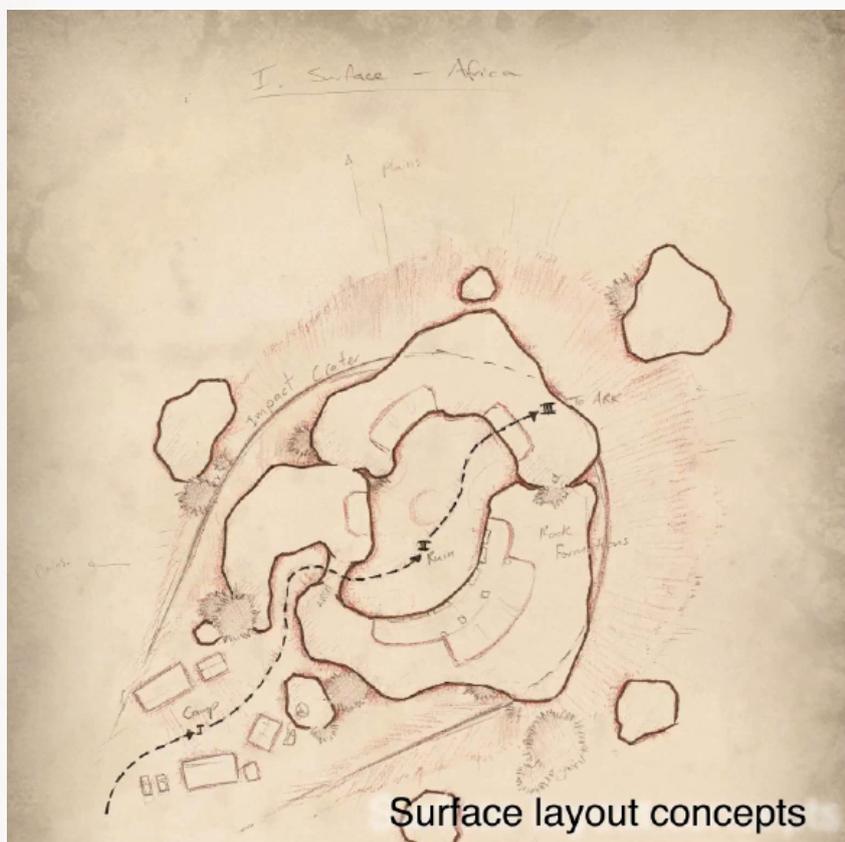


Figure 16. Andersen, C.G.I. (2011). Ark concept designs. Auckland: Private collection of Christopher Graham Ivan Andersen.

Once the main pre-production process was completed the pipeline moved into the mock-up¹⁹ and testing phase. During this phase the environment sections, objects or narrative props conceived in the pre-production phase were modelled in their basic form using the 3D program Autodesk Maya. This allows for testing of scale as well as possible layouts for environment sections and props (Figure 17).

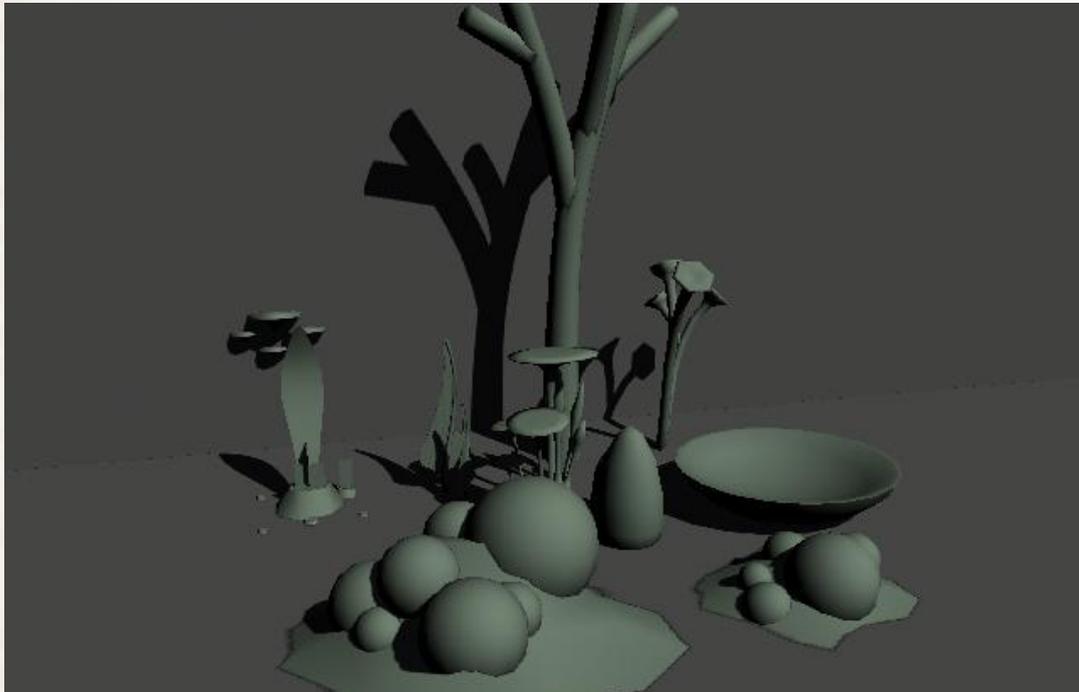


Figure 17. Andersen, C.G.I. (2011). Screenshot of 3D prop mock-ups. Auckland: Private collection of Christopher Graham Ivan Andersen.

Modelling and testing also formed an important part of how the environment itself came together. This phase allowed for the extended design and adjustment of prefabricated segments of the environment such as the hallway shown in Figure 18. Each prefabricated section must align and fit perfectly with the next in order to eliminate inconsistencies and obstructions.

These elements and the 3D props were combined to create larger scale environmental mock-ups in Maya. These allow for the creation of various test layouts, which help establish a feel for the environment and test for narrative and environmental flow. This process proved very useful as a simple version of a narrative prop can be tested within a mock-up environment to assess its effectiveness before it is fully invested into the production process.

¹⁹ A model or replica used for experimental purposes.

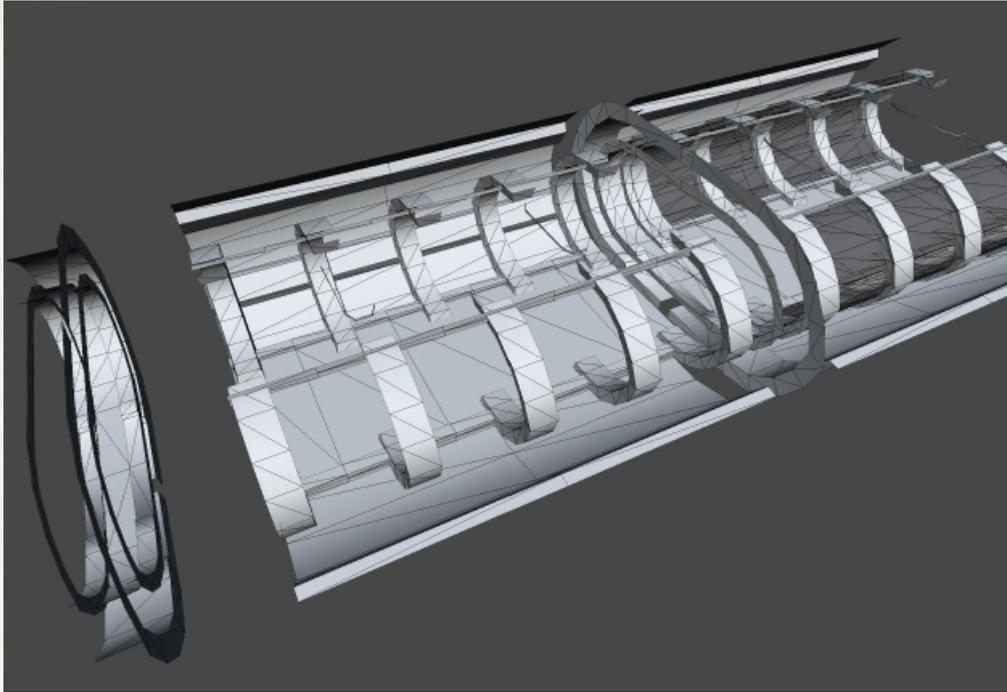


Figure 18. Andersen, C.G.I. (2011). Screenshot of hallway prefab mock-ups. Auckland: Private collection of Christopher Graham Ivan Andersen.

Once the testing of basic 3D props and environments was complete the process of finalizing the model and creating textures could begin. Final details were added to props and environment prefabs,²⁰ after which the process of UV mapping began. During this process the “skin” of the 3D model was unwrapped and converted into a 2D image, much like the process of flattening a cardboard box. This 2D image was then split into separate layers, each having its own information used by 3D programs to assign colour or image, bump mapping, and specular²¹ (Figure 19). These layers were painted or composited in Adobe Photoshop before being exported as .tga²² image files.

²⁰ Prefabricated objects or environment sections.

²¹ A term for the amount of glare or reflectivity on an objects surface.

²² Truevision TGA, or TARGA, is a raster graphics file format.

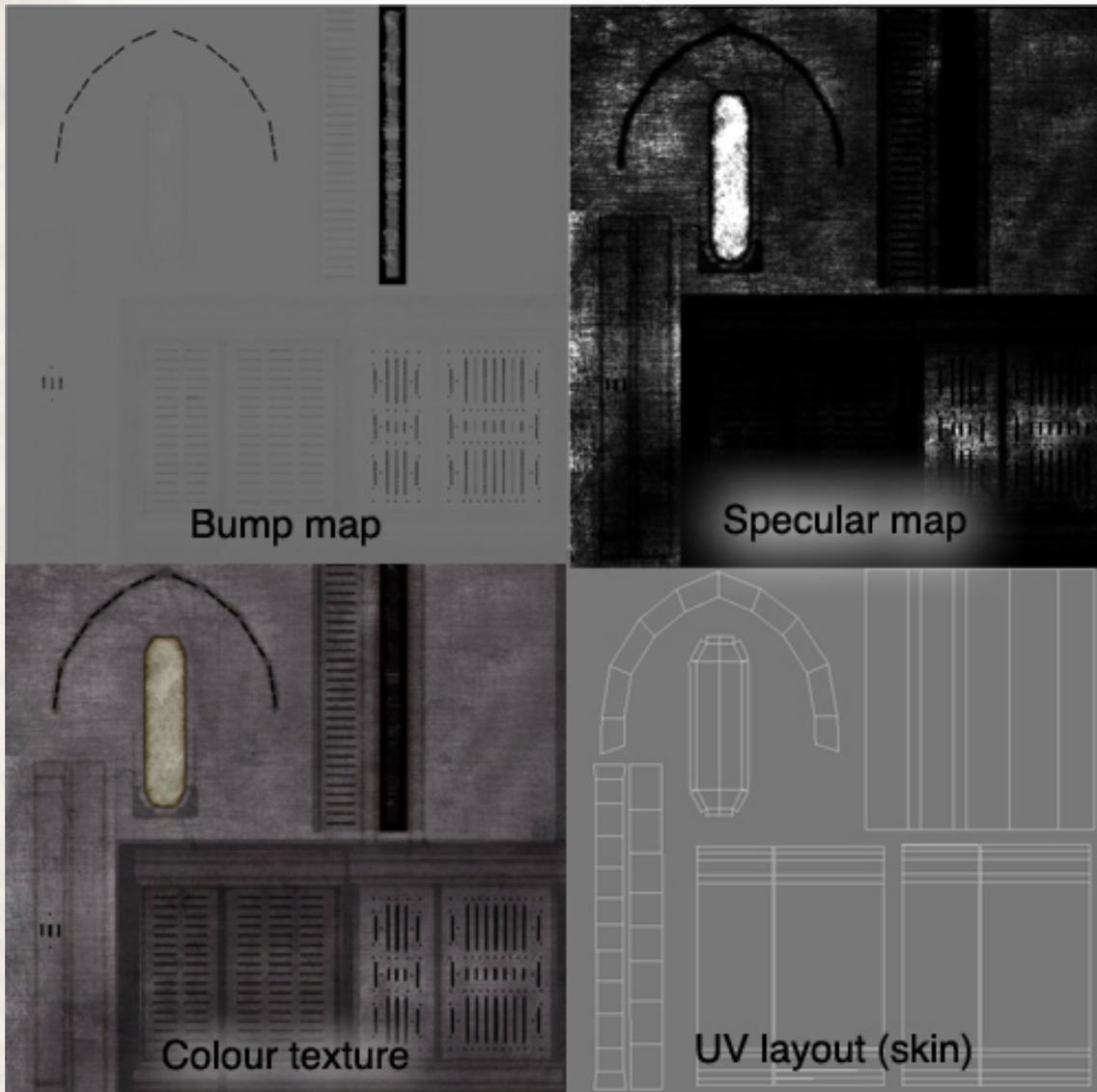


Figure 19. Andersen, C.G.I. (2011). Texture map samples. Auckland: Private collection of Christopher Graham Ivan Andersen.

Once the process of texturing was complete the final models and texture files were imported into Unity 3D,²³ a simple but powerful game authoring tool (Figure 20). The Unity engine supports several different scripting languages and features simple drag-and-drop commands for the assignment of properties and attributes as well as the placement of assets within scenes. Unity is capable of high-end graphical presentation while putting a limited amount of stress on most computers. It also features the ability to publish games to PC and Mac, as well as to Wii, Xbox 360, PS3 and iPhone.

²³ <http://unity3d.com>

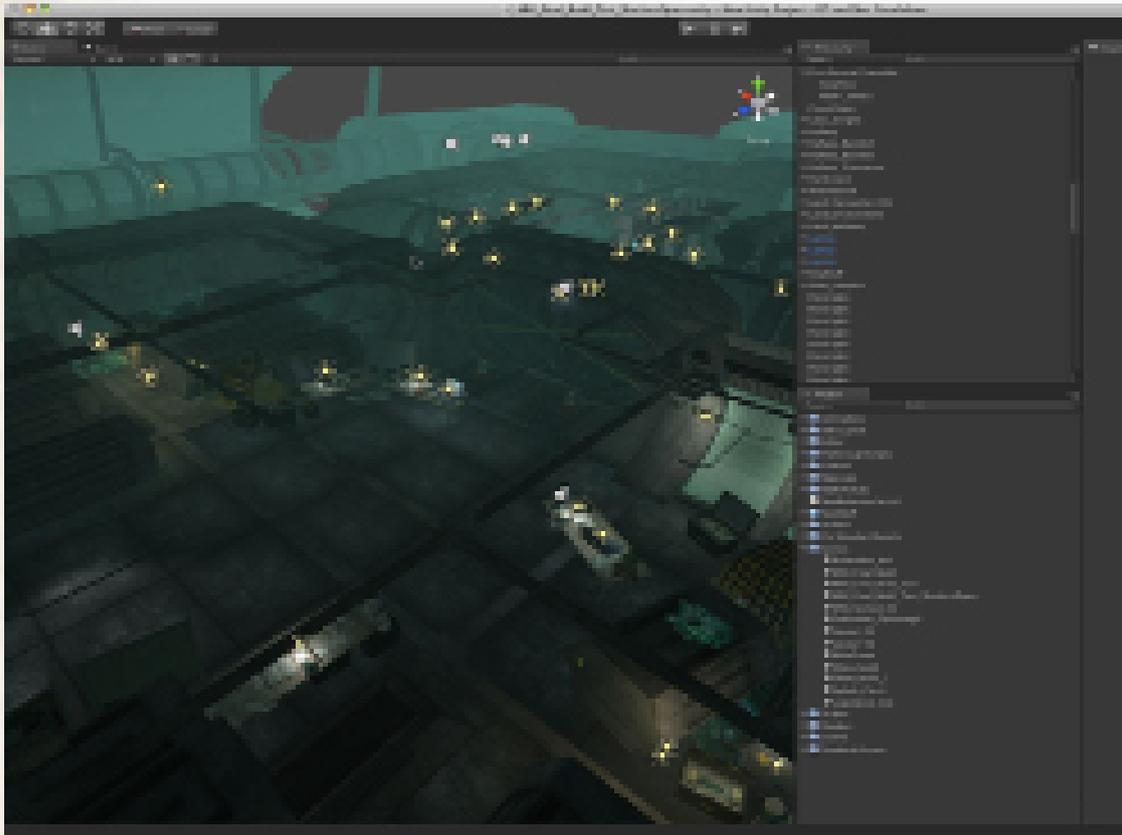


Figure 20. Unity 3D editor. From Unity 3D (version 3.3.0f4) [Computer software]. Retrieved October 5, 2011. Copyright 2010 by Unity Technologies ApS.

With all the models, textures and environment sections imported into Unity, each model then had to have a shader²⁴ and appropriate texture assigned to it, as well as any physical properties, e.g. physics colliders. Once this was complete the objects were arranged into prefabs and stored in Unity so they may be easily replicated and dragged into the game space to create new scenes and environments.

With prefabs in place, the final process of piecing the environments together could begin. This started with the placement of the main environment sections, e.g. hallways, into the final layout. This framework can then be filled in with important narrative evocative elements, followed by background props and elements, particle effects, soundscapes,²⁵ and scripted events²⁶ such as animations. Figures 21 and 22 show screenshots of some of the finalized environment sections.

²⁴ Software programs used to define the look of a material's surface.

²⁵ The sounds heard in a particular location, considered as a whole.

²⁶ May be interpreted in both the narrative and computer coded script contexts.

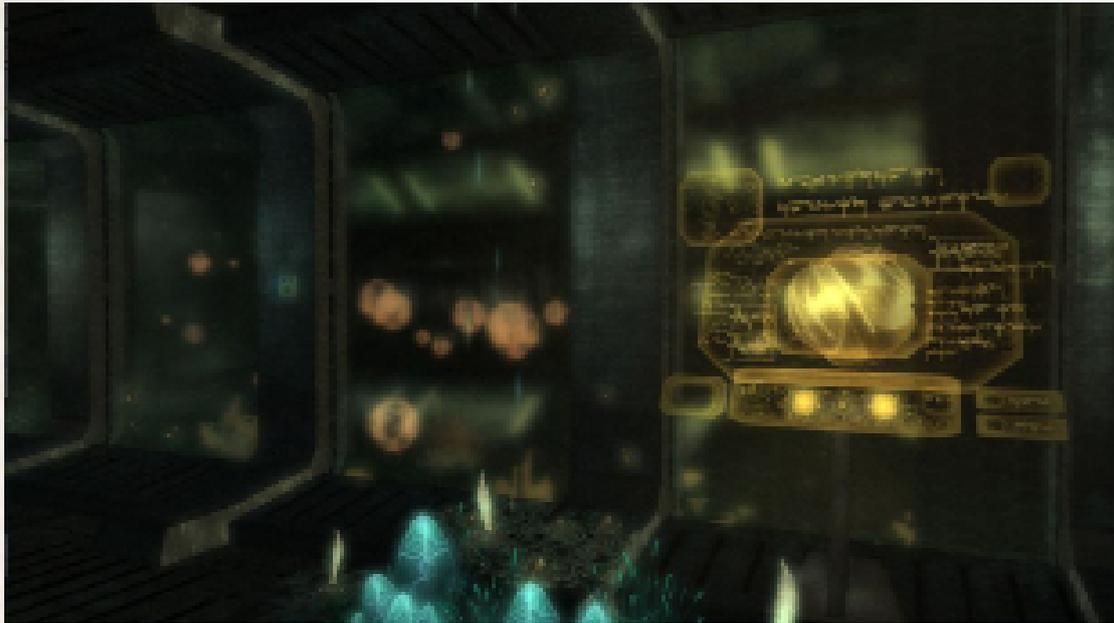


Figure 21. Andersen, C.G.I. (2011). Preview screenshot of ark environment. Auckland: Private collection of Christopher Graham Ivan Andersen.

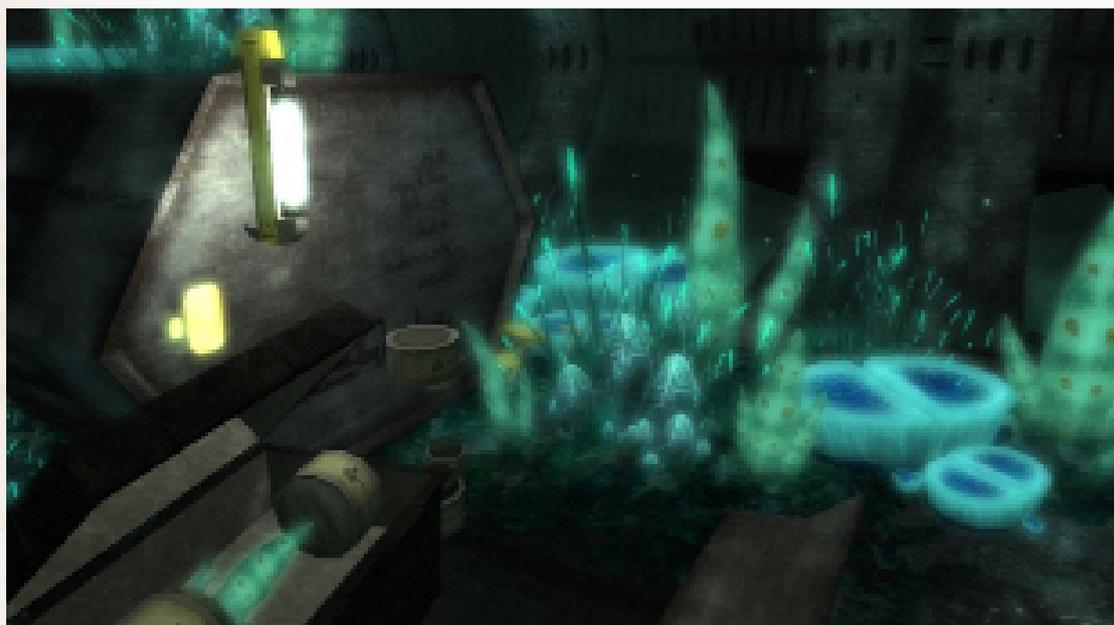


Figure 22. Andersen, C.G.I. (2011). Preview screenshot of ark environment. Auckland: Private collection of Christopher Graham Ivan Andersen.

Michael Nitsche (2008) describes the concept of cognitive maps as “complex mental interpretations of a real or fictional environment, and its components that live in the fictional plane” (p. 161). Each player’s cognitive map is completely unique and is a reflection of their individual subjective perspectives and experiences. Cognitive maps help tie spaces together in meaningful ways and assemble the positions of events and the player in relation to these events. Essentially, story maps are cognitive maps that are influenced by the evocative elements experienced by the player in the game environment. Nitsche explains:

A story map is the result of this reading of the game space in combination with the directed evocative narrative elements encountered along the way. The game space, the events it includes, and the position of the player in relation to them are dramatized and contextualized. (Nitsche 2008, p. 227)

The designer must place the evocative elements to support a player’s creation of a story map in a way that will allow them to create meaningful interpretations. Nitsche (2008) adds: “in contrast to the cognitive map generated primarily for orientation, a story map aims not at an accurate understanding of Euclidean²⁷ space but of spatialized²⁸ drama and its setting” (pp. 229–230).

As an augmentation to the pre-production phase of my production pipeline I recently decided to adopt Nitsche’s concept of the story map and create a visualized version to be used as a detailed and effective narrative planning tool for the design of The Ark Project’s environments. The result is a detailed layout of these environments that is layered with different meanings relevant to narrative, layout, pathways and interactions. The implementation of this technique vastly improved the design of the narrative environments and allowed for the effective planning of journey structures and individual “interactive” player paths through the environment.

²⁷ System of geometry based on the work of Euclid and corresponding to the geometry of ordinary experience.

²⁸ Placement in 3D space.

Figures 23 and 24 display samples of the visual story maps used to plan out the ark's environments.

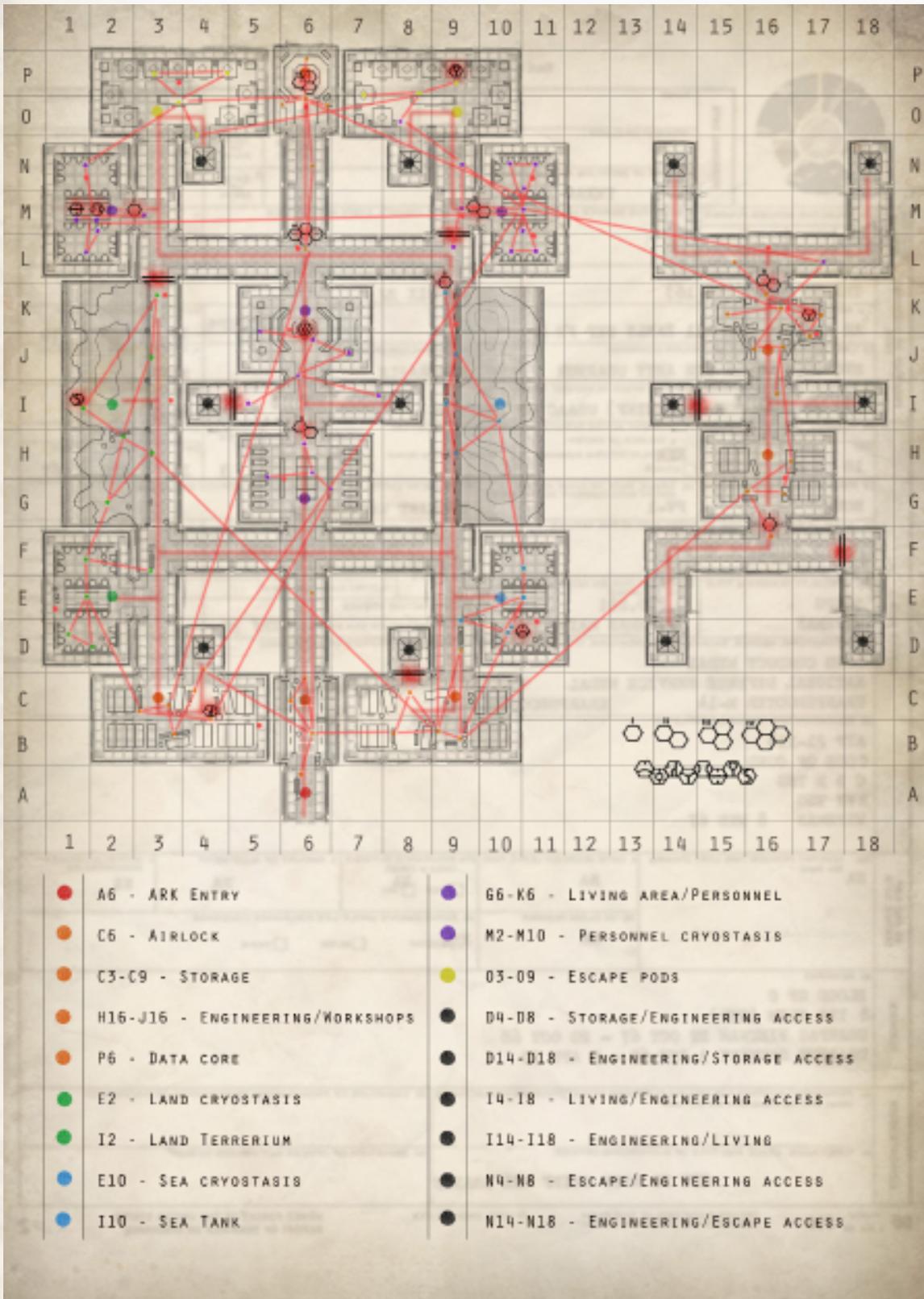


Figure 23. Andersen, C.G.I. (2011). Storymap layout image. Auckland: Private collection of Christopher Graham Ivan Andersen.

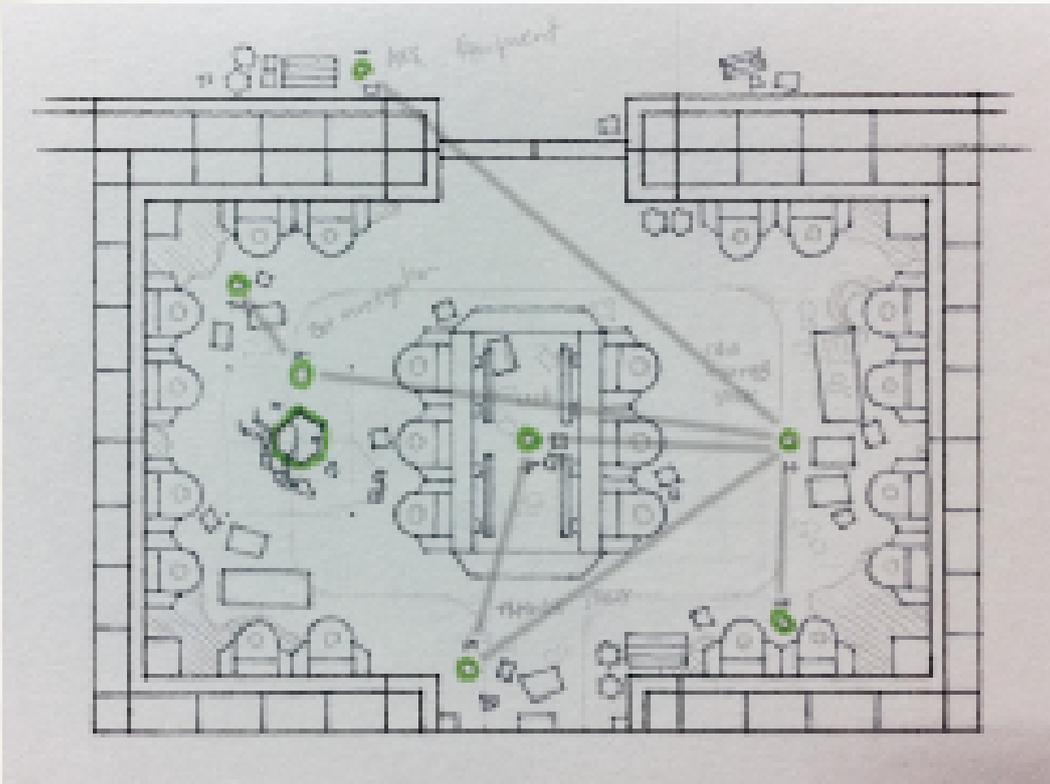


Figure 24. Andersen, C.G.I. (2011). Storymap detail image. Auckland: Private collection of Christopher Graham Ivan Andersen.

CHAPTER FOUR: TECHNICAL ASPECTS

The process of creating a successful environmental narrative in a 3D game space is complex and time-consuming. It also involves many technical aspects and challenges. The most prominent of these challenges encountered while developing the project involved the Unity 3D game development tool, specifically its difficulty rendering²⁹ the high number of assets within the environment. The first-person camera within Unity automatically renders all assets directly in front of the camera, even if most of them remain hidden by others in the foreground.

During early tests of the narrative environment this problem manifested itself through very low frame rates due to certain areas of the environment containing many assets in the path of the camera (Figure 25). Recently a solution has been developed through re-assessing the overall level design and layout, and breaking the large environment into easily manageable sections. The resulting sections contain far fewer assets and smaller scene sizes, while preserving the narrative impacts of the environment and allowing the player to move between sections unhindered. Each of these sections contain “crossover” areas disguised as airlock-style hallway segments which the player may pass through in order to be transported to the next corresponding section of the environment (Figure 26).

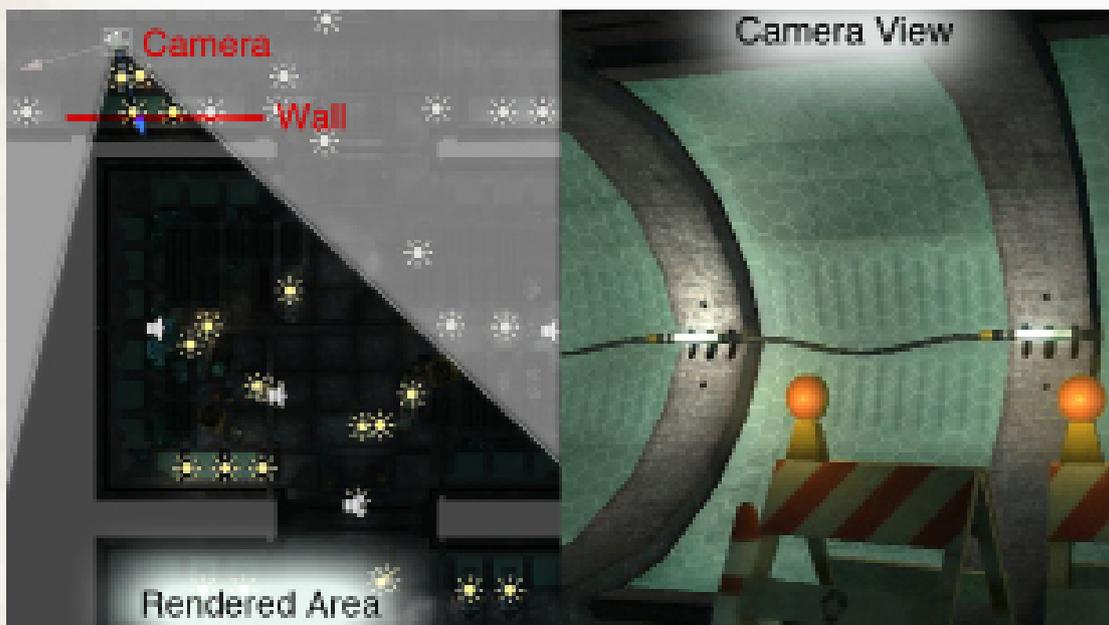


Figure 25. Andersen, C.G.I. (2011). Unity camera rendering example. Auckland: Private collection of Christopher Graham Ivan Andersen.

²⁹ The process of generating an image from a 3D model.

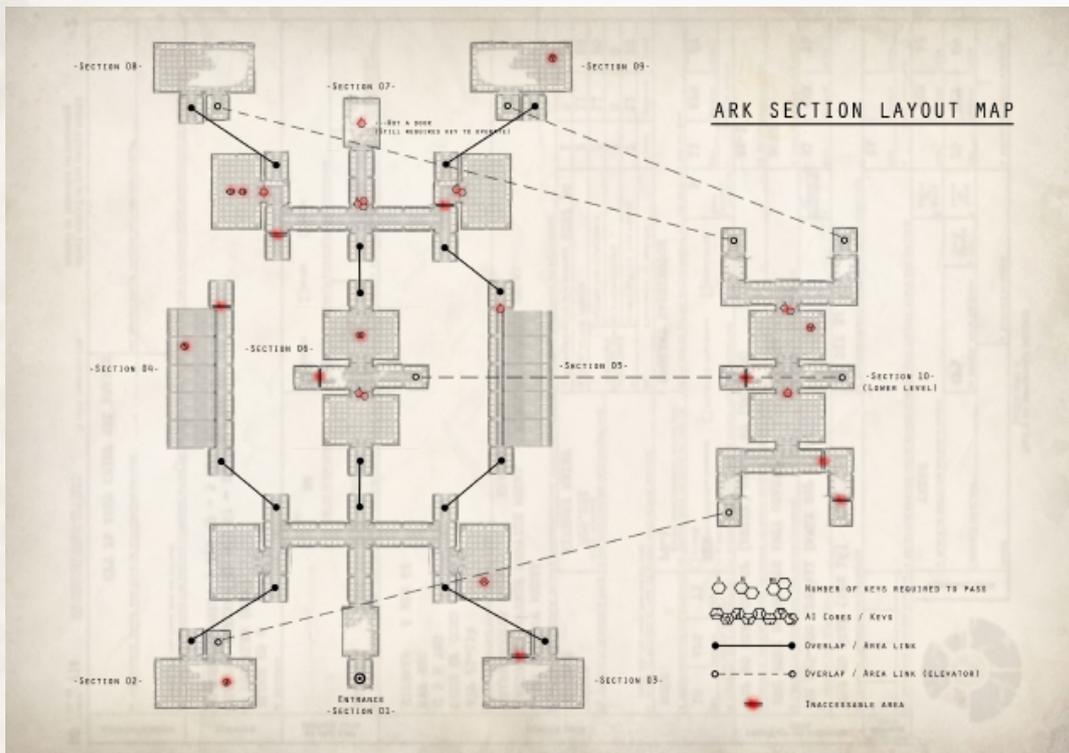


Figure 26. Andersen, C.G.I. (2011). Map of sectioned environment layout. Auckland: Private collection of Christopher Graham Ivan Andersen.

The second main technical challenge involves the use of environmental alterations³⁰ and the activating of specific user paths through the environment. These aspects of the project are currently still under development and solutions are being developed involving coding in the Unity 3D game development tool. A system of scripts³¹ has already been implemented to manage the use of keys and doors and is currently being tested, however the implementation of environmental alterations and the player's effects on the game space and how this will be achieved within Unity are still being developed. This however will also likely involve a system of scripts.

The final technical challenge currently affecting the project involves the exhibition of the project and methods through which players may physically interact with it. Concerning methods of control,³² previous versions of the environment are compatible with PC and Mac, as also support the Xbox 360 controller for windows. The Xbox controller as well as the keyboard and mouse controls implemented on the computers have proven difficult to adjust to for certain players who are not experienced gamers.³³

³⁰ In the context of alterations to the environment triggered by the player which in turn effect the narrative.

³¹ In the context of computer generated code.

³² In the contexts of a players physical control of interaction with the environment.

³³ A person who plays a game or games.

Recently research has been carried out into the possibility of creating a more intuitive control system implementing the Wiimote motion controller for Nintendo Wii. This research is still being undertaken and the use of a motion control system in the final presentation will depend on feasibility and time constraints.

Concerning physical presentation, the final incarnation of the project is intended for presentation in stereoscopic 3D. The use of a 3D projector³⁴ has been arranged for the final exhibition piece courtesy of Dr Roy Davies and Colab,³⁵ and this will aid in encouraging interaction with the project. It will also present it in an engaging way which supports immersion and possibly shared story spaces for players as they gather to view and interact.

³⁴ An image projector capable of presenting 3D images and film.

³⁵ <http://www.colab.org.nz>

CHAPTER FIVE: CONCLUSION

Creating a successful balance of narrative principles enabling an interactive environmental narrative is a difficult task. A large amount of work has been invested in this project and although it is still in the final stages of development it has proved successful so far. Early tests with the environmental narrative model allowed users to explore the environment and successfully interpret the narrative, as well as to create their own versions of the narrative.

Current work involves finalizing the implementation of the interactive narrative principles within the environment. Once complete, this should allow users to interpret and create their own narratives while interacting with and influencing the environment, giving the player a sense of ownership over the stories they create in the game space.

The interactive environmental narrative developed in The Ark Project has potential for development through further explorations into the conveying of specific ideas or themes to the player.

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