Game Design Document

The Cave of Caerbannog

By
Team MIGI2

Taico Aerts, taerts, 4345797

Chiel Bruin, cbruin, 4368436

Bram Crielaard, bcrielaard, 4371755

Wytze Elhorst, welhorst, 4306228

Robin van der Wal, robinvanderwal, 4142918

Table of contents

1. Overview

1.1 Introduction

This document will give a description of what the game will be. This consists of explaining what inspired the concept of the game, the core gameplay mechanics, the story behind the game, and finally the assets.
The game is an asymmetrical virtual reality game about working as a team to either help a player reach their treasure, or prevent them from doing so.

1.2 Theme, Setting, Genre

Theme

The game is categorized as a *"Maze Exploration"* game.
The reasoning behind this classification will be explained in chapter 2.

Setting

The setting of the game is a *fantasy-esque cave*.
The reasoning behind this classification will be explained in chapter 3.

Genre

The game can be classified as *Action-Adventure*, *Puzzle*, and *Party*.
The reasoning behind this classification will be explained in chapter 2.

1.3 Core Gameplay Mechanics

1. Teamwork
2. Competitive gameplay
3. Asymmetrical gameplay
4. Incomplete information
5. Virtual Reality
6. Procedurally generated maps
7. Exploration

These will be expanded upon in chapter 2.

1.4 Targeted Platforms

The targeted platforms can be divided into two different groups. The platforms which should be able to run the game itself, and the platforms which should be able to run the website interface.

1.4.1 Game

The game should run on every PC with enough graphics power to handle the Oculus Rift. It should run on Windows 7 or newer.

1.4.2 Website Interface

The website interface should run on every browser supporting HTML5 and JavaScript, but will be guaranteed to run on the default browsers provided on iOS 9.3 or newer and Android 5.1.1 or newer.

1.5 Project Scope

The Project Scope will be explained in three different parts, namely the time scale of the project, the design team behind the project, and the hardware used in the project.

1.5.1 Time Scale

The time scale of this project is 10 weeks. The following milestones are defined

Week 5	- First playable spikes
Week 7	- Start of beta
Week 9	- Trailer release
Week 10	- Final release

1.5.2 Team

Taico Aerts

Lead Programmer, Lead Animator.

Responsible for

- Making sure the code is up to par.
- Making sure the animations are present in the final product

Chiel Bruin

Lead Manager of Communications, Lead Brand Manager/Marketing advisor.

Responsible for

- All communications that occur during the project.
- All marketing including, but not limited to, creating a trailer for the game.

Bram Crielaard

Lead Level Editor, Lead Audio Engineer.

Responsible for

- All level design and level generation.
- All sound design including, but not limited to, sound effects and background music.

Wytze Elhorst

Lead Artist.

Responsible for

- All art related to the game including, but not limited to, designing a logo.

Robin van der Wal

Lead Game Designer, Lead Playtester.

Responsible for

- Making sure the game runs and plays as expected.
- Making sure the game is fun to play.

1.5.3 Hardware

The following hardware is used for the game
- Personal Computer
- Projector
- XBox controller
- Oculus Rift
- Smartphones

1.6 Influences

There have been many influences for the "Cave of Caerbannog". The three main influences have been listed below.

1.6.1 Black Hat Oculus

Medium

  Video game

Explanation

  Black Hat Oculus provided the idea of making an asymmetrical maze exploration game. The idea of having different roles for different players in a maze is something the development team draws inspiration from.

1.6.2 Keep Talking and Nobody Explodes

Medium

  Video game

Explanation

  Keep Talking and Nobody Explodes is one of the best examples of an asymmetrical virtual reality game which keeps everyone involved. The short playtime and way of assigning different tasks to different players is something the "Cave of Caerbannog" draws inspiration from.

1.6.3 Monty Python and the Holy Grail

Medium

  Motion Picture

Explanation

  As multiple members of the development team are major fans of the Monty Python film "Monty Python and the Holy Grail" it was decided to name the game after one of the characters, namely the "Killer Rabbit of Caerbannog".
  The enemies in the game also draw inspiration from the movie, as they resemble the Killer Rabbit.

1.7 Project background

The project is done as part of the B.Sc Computer Science at TU Delft during the school year of 2015-2016. Specifically for the course TI2806 "Contextproject". The assignment is to create an engaging game with asymmetric gameplay, where one player has to wear an Oculus Rift and plays with a group of 'normal' players. The gameplay must enforce active gameplay from all users, so no user can be a passive pawn.

2. Core mechanics

The Cave of Caerbannog has some core mechanics that give the game its unique gameplay.
As mentioned in the overview, we have seven core mechanics. All of these will be expanded upon in this chapter. More details about the gameplay can be found in chapter 3.

2.1 Teamwork

The players are split into two teams. The only way for either of these teams to win is to work together. If they don't, it's impossible to win. This will be enforced by tasks that require simultaneous input from two different players.

2.2 Competitive gameplay

In the game there are two competing teams. One team wants to find the treasure and the other team tries to prevent the first team from finding it.

2.3 Asymmetrical gameplay

The knight has entirely different gameplay elements than the other players in the game. Between the two other groups are some shared mechanics, but there will also be ones that differ. This strong asymmetry is created by placing the knight in a virtual cave, where the other players play the game on a mobile device with a simple top down view of the "rooms" in the cave.

2.4 Incomplete information

Due to the asymmetric gameplay and different roles for each group of players, there is no single player in the game that has all information he or she needs to win. The knight for example, can't see the boobytraps placed in the cavern and is not able to defend itself from enemies. The elves can (and should) help him by navigating around those traps and distracting the enemies. This mechanic also enforces the need for communication and teamwork, as you have a disadvantage when you don't work together.

2.5 Virtual Reality

The knight has a special role in the game as he is the only player that actually is in the cave. He will be using virtual reality, provided by an Oculus Rift, to become completely immersed in the cavern.

2.6 Exploration

The cavern is similar to a dungeon or maze, where the knight needs to find the end. This forces the players to explore the cave and find its secrets. Every room will raise another challenge to the players that needs to be resolved for the next room to become accessible. Sometimes the knight even needs to explore more cave just to be able to proceed to another section. The knight must for example find keys that will open doors to other parts of the cave.

2.7 Procedurally generated maps

To enable the players to keep exploring in the game there must be endlessly many adventures in the cave. The way this is solved is by using procedurally generated maps. Because of this feature every playthrough will be different.

3. Story and Gameplay

The story and gameplay are the attributes of the game that matter the most to the players of a game. The players are playing the game for fun. In order to keep playing the game, they have to be invested. This investment can come from different parts of a game, but it does need to come from somewhere. In the case of the Cave of Caerbannog the story and gameplay elements try to to entice the players to keep playing the game. In this section, the story and gameplay elements that players will experience are discussed.

3.1 Story Summary

Long ago in a distant past, a knight of Camelot was given the mission to retrieve an ancient dwarven treasure in order to save the kingdom from an economic crisis. This dwarven treasure promises immense wealth, although the treasure is known to be guarded by the last surviving dwarves of Caerbannog. On the way to the cave the knight of Camelot met a few elves in the woods who joined the knight in this courageous quest.

  The story starts when the knight arrives at the dreaded Cave of Caerbannog. The reputation of the cave surely wasn't exaggerated, as horrible beasts and traps await the companionship of the knight and elves. The treasure is well hidden in a maze of caves and ruins, which seem to exist to stop any intruders. To exacerbate the situation, the dwarves have taken notice of the intruders and will do anything to stop them.

  Will the knight of Camelot and the elves find the treasure and see the light of day again? Or will the dwarves manage to hold on to their ancient riches?

3.2 Story Exposition

In this section, the story will be explained more thoroughly. In section 4.2.1 the background of the Cave of Caerbannog will be discussed. This is followed by a description of each individual actor or group in the story in section 4.2.2. Next, in section 4.2.3 the gameplay area, which is the Cave of Caerbannog, will be described. And finally, in section 4.2.4 the main quest is told.

3.2.1 The world of Camelot

The Cave of Caerbannog takes place in a Medieval fantasy England. There is one well known kingdom in this land, namely Camelot. Camelot shares its name with the capitol and is inhabited primarily by humans. Barring the existence of woods, mountains and caves, there is not much known about the geography of this world. The journey from the capitol to the Cave of Caerbannog takes a few weeks by horse. Between the capitol and the Cave of Caerbannog lies an immense forest. In the forest live a few clans of elves, which the kingdom sometimes trade with. In the cave itself there live a few dwarves that remain to guard the cave.

  In the world of Camelot there is magic. Humans are unable to make use of this magic, however as stated earlier there are also two other races, the elves and the dwarves. These races are able to dip into the magic of matter. Not much is known about this magic,

but the magic can move objects, destroy objects and have basic interactions with objects. The magic of matter can be used against the knight or aid him in time of need. Unfortunately, because the knight is human, the knight can't control the magic, only his partners and adversaries can.

3.2.2 The actors of Caerbannog

First, the Oculus Rift player, also known as the knight of Camelot. The knight is a proud member of the round table and under the command of King Drump, who is a descendant of King Arthur. King Drump sent the knight on a quest to find riches to save the kingdom. The Knight has many friends and family in the kingdom, so it is in the knight's greatest interest to succeed in his mission to save them. The knight is equipped with plate armor and has strong arms which the knight can use to lift keys and boxes. The knight unfortunately forgot his sword, so he can only run from danger.

Next are the elves, who are played by the mobile users that help the Rift user. The elves are a proud but scarce race. They reside mainly deep in the woods of Camelot. They are friendly to humans, which they may talk and trade with, but the elves do try to keep their distance. The elves love to party among themselves and are proficient with magic, which they primarily use to entertain themselves.

The last race is the dwarves, also played by mobile users. They want to stop the Rift user. The dwarves are scattered throughout the mountains of Camelot. Most of them abandoned the Cave of Caerbannog due to the hazardous environment, but a few decided to remain in order to guard the treasure that remains. Dwarves mostly live underground and like to feast and brawl a few times per week. Dwarves are great smiths and they truly understand the richness that the mountains of Camelot hold. They delve deep to retrieve valuable ores and melt them into useful objects or decorations for their halls. The dwarves are ill-tempered to the other races, and will try to avoid all contact as much as possible. They see intrusion of their domain as an act of war.

The dwarves and elves have a bad history. The elves love the golden ornaments, the precious gems and metal weaponry that the dwarves produce. But they absolutely hate the infighting that dwarves frequently participate in. The elves can't stand the manners of the dwarves and think that the dwarves are ill fit to be in possession of such riches. The dwarves on the other hand hate the elves, both for elves' pretentious attitude and for the way the elves always act superior to all other races. The hatred is rooted deeply in both races and several wars for land and valuables have been fought over the years.

Finally there is one more participant in the Cave of Caerbannog, called the wildlife by some, but horrific monsters by others. There is regular cave creatures in Camelot like bats and insects, but the true inhabitants of the cave are the Caerbannog killer rabbits, named after the first innocent sod that dared to pet one. The rabbits have lived here before the dwarves built their cities. They are suspected to be the prime reason most of the dwarves no longer live in the cave, though the dwarves learned how to use the rabbits' ferocity against their enemies. The knight knows of their existence but has never seen one before, they will be the greatest challenge.

3.2.3 The cavern

The cavern is an old dwarven city which has been abandoned. The dwarves built many traps before they left so that their heritage wouldn't be destroyed by thieves or the greed of man. The cavern is maintained by a small pack of dwarves that after all this time still guard the place. Due to the age of the place, parts of the cave are known to collapse. When this happens the dwarves dig the tunnels anew. The new tunnels are always different in configuration to confuse surviving intruders and make old maps useless.

The cavern was always inhabited by the Caerbannog rabbits. They lived mostly in isolation, till the dwarves came along. When the dwarves built cities and grew bored they started hunting the rabbits and eating them during the feasts. This forced the rabbits to evolve and overthrow the dwarven cities. After most of the dwarves fled, the remaining dwarves no longer bothered the rabbits and they lived in peace.

The cavern was first discovered by humans when a group of them stumbled upon the cave after a trading mission with elves. The group was led by knight Caerbannog, a member of the round table in service of the previous king Arthur. The group found few ruins and halls deeper inside the cave. The group stumbled upon the most innocent looking white rabbit they had ever seen. Knight Caerbannog, animal lover as he was, extended his hand to pet the rabbit. This was the last action ever done by Caerbannog and the rest of the group fled. Only four people made it out, one of them carried the bloodied and cracked helmet of Caerbannog, the only piece of the knight they managed to save. The helmet is still on display in museum in Camelot and the cave itself was named the Cave of Caerbannog to remember the valiant knight who discovered it.

3.2.4 The glorious quest for treasure

The kingdom was ruled justly and peacefully by king Arthur for many years. He eventually had a son named Drump, which took over the crown when King Arthur passed away. King Drump had more difficulty keeping the nation stabilized as the other nations tried taking his land. King Drump came up with a solution, he just had to build a wall to keep intruders out! Just like they did in the far east. The wall required immense funds, and even though King Drump managed to build his own riches with only a small loan of one million ducats, the treasury was empty by the time King Drump was done with the wall. This resulted in an economic crisis the like of which Camelot had never seen.

King Drump had only one option left: find more treasure! He knew of many myths that foretold rich treasures, but only one of them could make Camelot great again: the treasure of the Cave of Caerbannog. He ordered his most trusted knight to go.

This knight journed on horse to the cave alone, as the knight did not want anyone else to get hurt. The knight met some elves in the woods while camping. The knight told them of the quest and its importance to the human kingdom. The elves knew about the treasure and would love to have a piece of it and, most importantly, humiliate the dwarves. Together, the knight and elves entered the cave and faced the dangers.

During the cave exploring they will face off against the Caerbannog rabbits and the dwarves protecting the ultimate treasure. Who will win will depends on the wits and reactions of both the elves and the dwarves. Will Camelot return to its former glory or will the dwarves have the last laugh?

3.3 Gameplay

The game is an asymmetrical multiplayer virtual reality game. In the game there are 3 parties. The first party is the Oculus Rift user, the knight of Camelot. The second party consists of the helper mobile users, they represent the elves. The third party consists of the antagonist mobile users, the dwarves. These parties make two teams. The knight and the elves form the treasure hunting team and the dwarves are the treasure defending team.

The main objective of the game is to secure the treasure of the Cave of Caerbannog. The treasure hunting team wins by getting to the treasure without dieing and the treasure defending team wins by preventing eliminating the hunting. The treasure hunting team loses if the knight of Camelot dies or the team runs out of time to get to the treasure.

The knight of Camelot begins the quest in the starting area. After leaving the starting area the knight has to make it to the treasure. The way to the treasure is randomized and split up in different rooms. Each room presents a certain kind of challenge before the knight can proceed to the next room. The challenge can be increased by the dwarves to make it harder for the knight to get to the treasure. The knight is aided by the elves on his way to the treasure to help the knight survive the challenges. Teamwork in both teams is essential in order to win the game

3.4 Overview of features

Below is an overview of all the features we would like our game to have, split up into **basic features** and **advanced features**. We regard the basic features as requirements, and the advanced features as "preferable to be included".

3.4.1. Basic features

- **General**
  - The game is played by two teams, the elves and the dwarves, and one player with an Oculus Rift, the knight of Camelot.
  - When the program is started, it will detect if the Oculus Rift is connected, and show a message to the user if it is not.
  - When the program is started and the Oculus Rift is connected:
    - The knight of Camelot is initially put in a virtual room in which they can select multiple actions, like starting the game, changing settings and starting a tutorial.
    - The beamer will initially display QR codes for the elves and dwarves to join the game on their mobile devices.
  - The game has a time limit. When the time runs out, the dwarves win the game.
- **The virtual environment**
  - The virtual environment consists of multiple rooms.
  - The virtual environment has at least a starting room and a treasure room.
  - Every room in the virtual environment will initially be reachable from the starting room. In other words, all rooms will be connected.
  - The virtual environment contains items and obstacles. These include (at least) bombs, keys, doors, gates and landmines.
  - The virtual environment is presented in different ways to the different players.

- ■ The knight of Camelot sees the virtual environment in 3D on their Oculus Rift.
- ■ The elves only see already visited parts of the virtual environment in 2D, on their mobile devices.
- ■ The dwarves see the entire virtual environment in 2D on their mobile devices.
- ■ A large 2D overview of the map is projected on the floor with a beamer. This overview only shows already visited parts of the virtual environment. The elves and dwarves can both use this overview.
- **Items**
  - ○ Bombs
    - ■ Bombs can be picked up and can be put down again by the knight of Camelot (in the virtual environment).
    - ■ When a bomb is put down, it can't be picked up any more and it will explode after a certain amount of time.
  - ○ Keys
    - ■ Keys can be picked up by the knight of Camelot (in the virtual environment).
    - ■ Each key has a specific color, and can be used by the knight of Camelot to open doors of corresponding color.
- **Obstacles**
  - ○ Landmines
    - ■ A landmine will explode when the knight of Camelot or enemies get within a specific distance (in the virtual environment).
  - ○ Doors
    - ■ Each door has a specific color.
    - ■ A door can only be opened by the knight of Camelot, if they have a key of the corresponding color.
  - ○ Gates
    - ■ Gates block the knight of Camelot from reaching a specific location.
    - ■ Gates can be opened by the elves.
- **Enemies**
  - ○ Enemies can be spawned by the dwarves
  - ○ Enemies move towards to knight of Camelot and bait, generally prioritizing bait over the knight of Camelot.
  - ○ Enemies die when they are within the explosion range of a bomb or landmine.
- **The knight of Camelot**
  - ○ They see the virtual environment in 3D on their Oculus Rift, and are able to look around in it from a first person view.
  - ○ They are able to move through the virtual environment by using a controller.
  - ○ They are able to pick up items in the virtual environment, when they are standing close to them.
  - ○ They can open doors in the virtual environment, by using keys that have been picked up.
  - ○ They can place a bomb in the virtual environment, when they have picked one up.
  - ○ They win the game when they reach the treasure room in the virtual environment.
  - ○ They have a certain amount of "health", which is decreased by explosions that hit them, by contact with enemies and possibly other things. When the health hits zero, the knight of Camelot dies and the dwarves win.

- **The elves**
  - They can connect their mobile devices to the game by scanning a QR code.
  - They see the virtual environment in 2D, on their mobile devices and on the beamer. They can only see rooms that have already been visited by the knight of Camelot.
  - They are able to see specific items and obstacles in their view of the virtual environment. This list includes at least: keys, bombs, landmines, enemies and gates
  - They can interact with the virtual environment, by specifying actions on their mobile devices. Actions include (at least):
    - Placing/throwing bait in specific places, to distract the enemies and lure them away from the knight of Camelot.
    - Opening gates for the knight of Camelot.
- **The dwarves**
  - The dwarves win the game when either of the following occurs:
    - The knight of Camelot is killed in the virtual environment
    - The time limit runs out
  - They can connect their mobile devices to the game by scanning a QR code.
  - They see the entire virtual environment in 2D, on their mobile devices.
  - They can interact with the virtual environment, by specifying actions on their mobile devices. Actions include (at least):
    - The ability to place landmines
    - The ability to place bombs
    - The ability to spawn enemies
  - They must not be able to place obstructions in such a way that permanently makes it impossible for the knight of Camelot to reach the treasure room.

3.4.2. Advanced features

- The game includes more objects that the elves can interact with. Possible objects are:
  - Moving platforms, which can be moved and/or activated by the elves and sabotaged by the dwarves.
- The game includes more objects that the Oculus player can interact with in the virtual environment. Possible objects are:
  - Light switches which can be activated and deactivated. Light switches provide the elves with more vision over specific aspects of the game.
  - Boxes/rocks which can be moved and climbed to reach higher areas of the environment.
- Keys are color coded. A key of a specific color will only work on doors of that same color.
- The game should have a way to change the difficulty by changing the time limit and the amount of rooms a level has.
- The game has a soundtrack, which will play for the duration of the game.
- The game has ambient sounds.
- The level generation can be seeded, and users should be able to enter a seed before starting the game.
- An elf can only have one gate opened at a time. To open two gates at the same time, both elves need to work together.

4. Assets

In this section we will list all the assets we will need for our game, this includes the textures, sounds, animations and scripts.

- 2D
- Textures
  - Cave ground
  - Cave wall
  - Open door
  - Locked door
  - Final Exit
  - Moving platforms
  - Landmines (only for non-oculus rift players)

- 3D
- Entities
  - Oculus rift player character
  - Bombs
  - Keys
  - Switches
  - Killer bunnies
  - Boxes

- Sound
- Sound List (Ambient)
  - Cave background music
  - Cave music (low on time)
- Sound List (Player)
  - Character Sound List
    - Walking
    - Picking up items
    - Moving platforms
    - Putting down items
    - Getting damaged
    - Character death
  - Bunny Sound List
    - Bunny walking
    - Bunny death
    - Bunny attack
    - Bunny eating bait
  - Item Sound list
    - Bomb ticking
    - Bomb exploding
    - Key unlocking door

              - Boxes moving
              - Platforms moving

- Code

    - Character Scripts
        - Moving around
        - Picking up items
        - Using items
    - NPC Scripts
        - Chasing player when in sight
        - Chasing bait when in sight

- Animation

    - Environment Animations
        - Door opening
    - Character Animations
        - Player
            - Player walking
            - Player picking up items
            - Player using items
            - Player dying
        - NPC
            - Bunny hopping
            - Bunny dying
            - Bomb exploding

A. References

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