

Instituto Superior Técnico

**Game Development Methodology  
(2020/2021)**  
**Design Document**

**Captivity**

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# 1. Introduction

In this document we present the main aspects of the game we are developing: *Captivity*.

*Captivity* is a 2D, co-op medieval adventure game for Windows PC with a bird's-eye view perspective.

The players control two human characters that move together through the levels of the game, by overcoming obstacles and fighting enemies. They will occasionally encounter imprisoned spirits, attaining powers from them once they are freed. One of the key aspects of the game will be the ability that the players will have to combine the powers of their characters.

The game ends with a final fight with the Wizard who was keeping the spirits imprisoned.

We will often use terms of the game to describe certain entities and situations. In the last section of the document we added an index with the meaning of these terms.

## 2. Game Experience Goals

In this section we describe what we want the players to feel and how we want them to interact with the game.

We will also define, below the goals, criteria for these goals to have been achieved.

- Goals on the players feelings:
  - The players feel challenged
    - The players try different combinations before figuring how to overcome an obstacle or fight the enemies.
  - The players enjoy the diverse design of the game
    - The players explore different rooms even after having found the solution
  - The players feel like they have the freedom to complete a level using different strategies
    - The players repeat a level to try another combination
  - The players feel empathy for the spirits they free and feel rewarded when they are granted the power to become an elemental
    - The players start experimenting with their new powers as soon as they are granted
  - The players feel that in order to survive they have to fight and defeat the enemies. They can't just run
    - The players don't try to avoid the enemies (for example by going into different rooms) and face them as they appear
- Goals on the way players interact with the game:
  - Players have to cooperate and find the right combination for overcoming obstacles
    - The players aren't able to overcome a level without cooperating
  - Players have to make quick decisions when fighting enemies: take cover and combine powers, fight, run or use the environment to their advantage
    - The players are able to survive and defeat the enemies, even when they appear when not expected

### Game's First Tweet

Captivity is a co-op adventure in a bird's-eye view perspective. Combine your powers, free spirits and kill a wizard to escape his Castle!

### 3. Competition and Related References

*Captivity* was primarily inspired in two games. In this section we will describe these games and what we think are their positive and negative aspects. We also describe what we used from these games and what we introduced in *Captivity* to address the negative aspects we describe.

- **Fireboy and Watergirl:** This is a 2D platformer game, which can be played by two players, each controlling a character, or by a single player, controlling both. The characters are a fire and a water entity, which the player(s) leads through simple mazes and element directed obstacles, in order to escape the room.

The game is fun for its simplicity: the characters have a likable design, they are easy to control and you don't have to think hard to overcome the obstacles.

We took from this game:

- The idea of having characters of different elements
- Levels in which you have to use the character's elements to overcome obstacles

However, after a few levels, the novelty of the scenarios runs out and the game becomes a bit monotonous.

We hope to make *Captivity* more challenging and diverse, by introducing:

- New elements and ways to combine the powers of each elemental
- Enemies which you can fight
- A more appealing point of view: a bird's eye view



- **Binding of Isaac:** In this roguelike game, you play a character in a bird's eye view perspective, that progresses through the levels by exploring rooms and defeating bosses. In some rooms you can also pick up items to make you more powerful and you can unlock different endings based on the routes that you take along the levels.

This game provides a much more challenging experience and constantly rewards the player for the choices they make and for being skilled while playing it.

We took from this game:

- The bird's eye view perspective and the movement of the camera
- The idea of having different rooms and enemies which you have to fight

However, because of the game's gory art-style and because of its repetitive nature, it caters to a very specific target audience, so only some people will find it captivating. Also, you'll have to play over and over again, to get all the playable characters and items.

We hope to make *Captivity* more exciting and appealing, by:

- Making diverse obstacles, that force the players to find the right combinations of elementals to use;
- Making the game less repetitive, by adding different scenarios and elements, which allows for different ways to solve the same level.
- Making the game cooperative, which increases the replayability and speeds up the pace of the game: two heads think better than one.



We now present three other games that share a common feature with *Captivity*, be it for its cooperative nature, a similar scenario or the exploration of the environment. The games are:

- It Takes Two
- Unravel Two
- Dead Cells



In *It Takes Two*, Cody and May, a married couple on the verge of divorce, find themselves trapped inside the bodies of two dolls resembling, with which their daughter had been playing with.

Throughout the game, they have to work together to overcome different obstacles posed by Dr. Hakim, a relationship-therapy book, and reunite with their daughter, who they think might reverse their condition.

In the end, the journey they take rekindles their relationship and they are brought back after they share a kiss.

Link: [It Takes Two](#)



*Unravel Two* is both a single-player and a multiplayer game which focuses on two Yarnys that must work together in order to solve puzzles and manipulate the world.

The game starts when a red Yarny washes ashore, with his yarn cut to a dead end, encounters a blue Yarny and the two connect their dead ends together. From this connection emerges a spark, which the Yarnys have to chase throughout the game.

The game ends with the Yarnys bringing the spark to the center of a lighthouse which makes the storm outside pass over.

Link: [Unravel Two](#)



In *Dead Cells*, the player controls the body of a deceased prisoner, through a mass of cells, to explore a series of dungeons and fight the creatures within it.

The game ends when the Prisoner reaches the castle's throne room and eventually kills the King, who's body explodes, destroying the Prisoner's host body and resetting the game.

Link: [Dead Cells](#)

## 4. Player Personas

In this section we introduce different Personas, based on our target audience: people who enjoy adventure games and a bit of puzzle solving. We use these Personas to have a more “player directed” development of the game.

### Persona 1

Name: Henry Oak.

Gender: Male.

Age: 25.

Background: Born and living in Portugal, started playing games very early due to father influence and personal interest.

Profession: Currently working in Customer Relationship Management in IT.

Favourite Games: Action, Shooters, Adventure (Valorant, Genshin Impact..).

Currently playing: League of Legends, Valorant, Genshin Impact.

Player type: Achiever.

Interests: Video Games, Biology, Technology, Sports.

Context of play: Plays whenever has free time.

Goals: Get more skilled over time.

Activities: Watches series, works out, practices sports.

Knowledge: Familiar with a lot of game genres, including having played “The Binding of Isaac”.

Right now trying to improve in an FPS game.

Skills: Great Adaptability.

Limitations: Is Impatient.

### Persona 2

Name: Angel Lahera.

Gender: Male.

Age: 24.

Background: Born in Spain but he is now finishing his studies in France. He always liked to play games when had some free time.

Profession: Veterinary.

Favourite games: MOBAs (Multiplayer Online Battle Arena) such as League of legends, Valorant.

Currently playing: League of Legends and Genshin Impact.

Player type: Teamplay.

Interests: Sports and multiplayer games.

Context of play: He plays for fun.

Goals: To know a little bit of every game genre and find one in particular which can challenge him.

Activities: He plays in a hockey team, which makes him love games to play with a teammate, and he also plays in a competitive team in League of Legends..

Knowledge: he is a guy of all trades and he has knowledge on different games.

Skills: Skilled at games and gets used to the controls and the mechanics fast.

Limitations: No outstanding limitations.

### **Persona 3**

Name: Vincent Vega.

Gender: Male.

Age: 17.

Background: Born in Lisbon and studies economics.

Profession: High School student.

Favourite Games: Action and strategy games.

Currently playing: Grand Theft Auto

Player type: Achiever, Daredevil.

Interests: Music and sports.

Context of play: Plays when he's at home and has nothing to do.

Goals: Plays to enjoy cool fight scenes and defeat complicated levels.

Activities: Listens to music and practices Judo.

Knowledge: Played Fireboy and Watergirl and plays a lot of Grand Theft Auto.

Skills: Fast reasoning and outside the box thinking.

Limitations: Not very patient.

### **Persona 4**

Name: Yulian Kuzmin

Gender: Male.

Age: 21

Background: born and living in Mira, Portugal

Profession: Computer Engineering Student in Coimbra

Favourite Games: Counter Strike and Rainbow Six Siege

Currently playing: Counter Strike

Player type: Achiever, Survivor

Interests: Technology and E-Sports

Context of play: Plays whenever has a little time to spare with his friends

Goals: To have fun and achieve higher ranks

Activities: Running on weekends with his cousin and does skimboard from time to time

Knowledge: Knows a lot about first-person shooters. Started playing Crossfire and then moved to Counter-Strike and Rainbow Six Siege. Also enjoys playing Dead by Daylight

Skills: Great aim and quick decisions

Limitations: Doesn't have much patience.

## 5. Play Scenarios

Angel and his girlfriend are waiting for a plane to visit his family in Madrid and have to stay there for 3 hours. At that moment he decided to play that new game that a friend of his talked about. As it is a game based on levels he thought that it was a good idea to give it a try as they can always stop whenever they have to.

Angel enjoys the fact that they have to cooperate to overcome the levels and has fun trying out the character's abilities. They felt nervous every time they needed to play together to combine their powers and defeat enemies. Also they were struggling on some levels because they didn't know how to go through it.

Henry Oak, happy about having a day off work, decides to spend the whole day playing Captivity with his brother, speedrunning the game. He is very excited to be finding cool ways of going through the levels and seeing how fast they can complete all of them as well as finding every single gem. They would feel a rush of adrenaline when trying to go through every room to find every gem and cross every obstacle as well as kill every single enemy, as it was a 100% speedrun. And when they got a good time or a personal record, they would burst out with joy every dead time they had between Chapters. When they couldn't achieve that, they would feel frustrated and sad, but would always try again.

That day, they improved their personal best, and celebrated by telling all their friends. Everyone was happy.

Vincent and his dad are playing the game together when his dad decides he has to go to the bathroom. Wanting to feel more challenged, Vincent continues the game alone, controlling both characters. Unfortunately, he encounters a horde of skeletons and dies, since he can't control both characters and shoot at the same time.

Vincent curses his luck. He feels embarrassed for having lost the game, both for him and his dad, but decides to first play the whole game with a partner, before venturing on a solo adventure.

Yulian was talking to his roommate about possible games to try out since he wants to try something new. Finally, on his way home, during his train trip, he and his friend decided to play Captivity. They didn't expect too much from the game, but as soon as they started playing, they couldn't stop doing it. They felt amazed by the fact that they needed to combine powers and cooperate to achieve to go through the levels. At the beginning they felt that it was difficult to combine powers and do it all right, but at the end, when improving, they got more coordination and they started to enjoy the game so much. They couldn't stop playing.

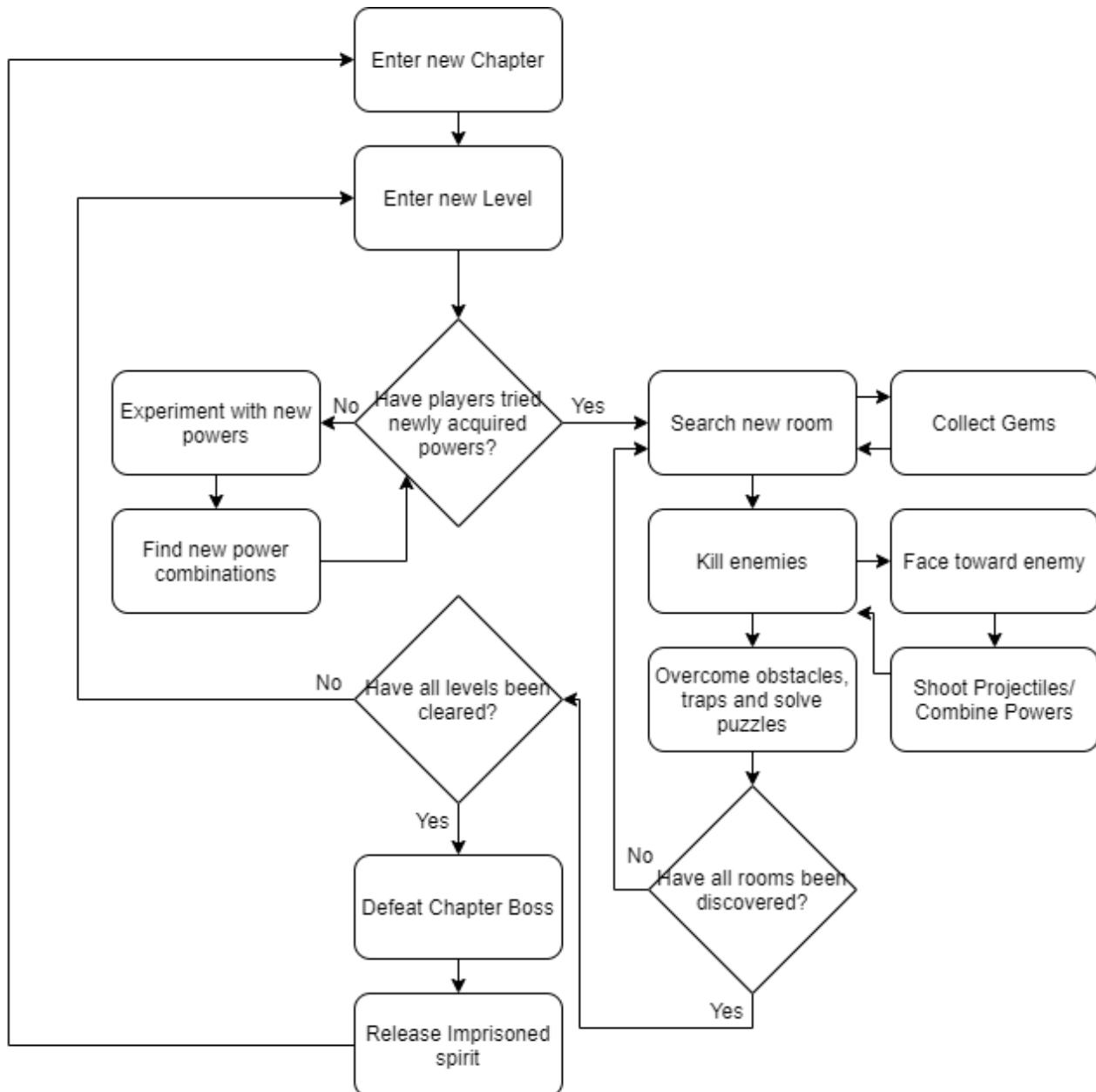
## 6. Core Gameplay Loops

After entering a new chapter and thus a new level, players will experiment with their newly acquired powers and kill enemies with them.

Whenever the players enter a new level, they will do several things as they progress through each room, so at one time, they may collect gems, kill enemies and cross over obstacles and avoid traps, all in the same room.

After clearing every room of every level, the players will have to face the Chapter's boss in order to free the spirit. After which, they are free to proceed to the next Chapter.

These core gameplay loops are demonstrated more clearly in this flowchart:



## 7. Controls and Presentation

### Presentation

Regarding the presentation, we worked on three aspects: the information made available to the user, the movement of the camera and the design of the environment.

#### Design and camera movement

We started by designing the level in an outside garden, where a player could move around with the camera following him. However, this solution didn't work when we introduced the second player, so we redesigned the level to be set inside a castle, with two cameras (with a split screen), each pointing to the room where the correspondent player is currently in.

The split screen also allowed us to have obstacles that require each character to be in a different room simultaneously.

#### Information

We thought of three aspects that require extra visual feedback: the health of the characters/enemies, which elemental the character is currently using and the fact that a character is charging the power to combine.

The health of the characters and enemies is made available through a health bar, on top of each of them. This was a unanimous decision from the workshop we held, in which we asked what health system the participants preferred.

To know which elemental the player is using, we change the color of the character to a color matching the standard color of the element: blue for water, green for earth, red for fire, white for air and electric blue for electricity (although we only implemented the first two). We also decided to have the color of the health bar matching the color of its character.

And finally, to let the players know that their characters are charging for a combination, we set their health bar to a golden color whenever the characters charge.

## Controls

For the controls, our main concern was to let both players use the same keyboard without being uncomfortable. To reduce the required number of keys, we set up an order by which the elementals appear (water, earth, fire, air and electricity) so the players navigate between them using the swap element keys.

The standard key controls are going to be as follows:

### Player 1:

1. Movement (White Background)
  - a. Up → W
  - b. Left → A
  - c. Down → S
  - d. Right → D
2. Abilities
  - a. Simple projectile → Space
  - b. Combination/Fusion → V
3. Swapping elements
  - a. Left → Q
  - b. Right → E

### Player 2:

1. Movement (White Background)
  - a. Up → Up Arrow Key
  - b. Left → Left Arrow Key
  - c. Down → Down Arrow Key
  - d. Right → Right Arrow Key
2. Abilities
  - a. Simple projectile → .
  - b. Combining/Fusion → -
3. Swapping elements
  - a. Left → K
  - b. Right → L

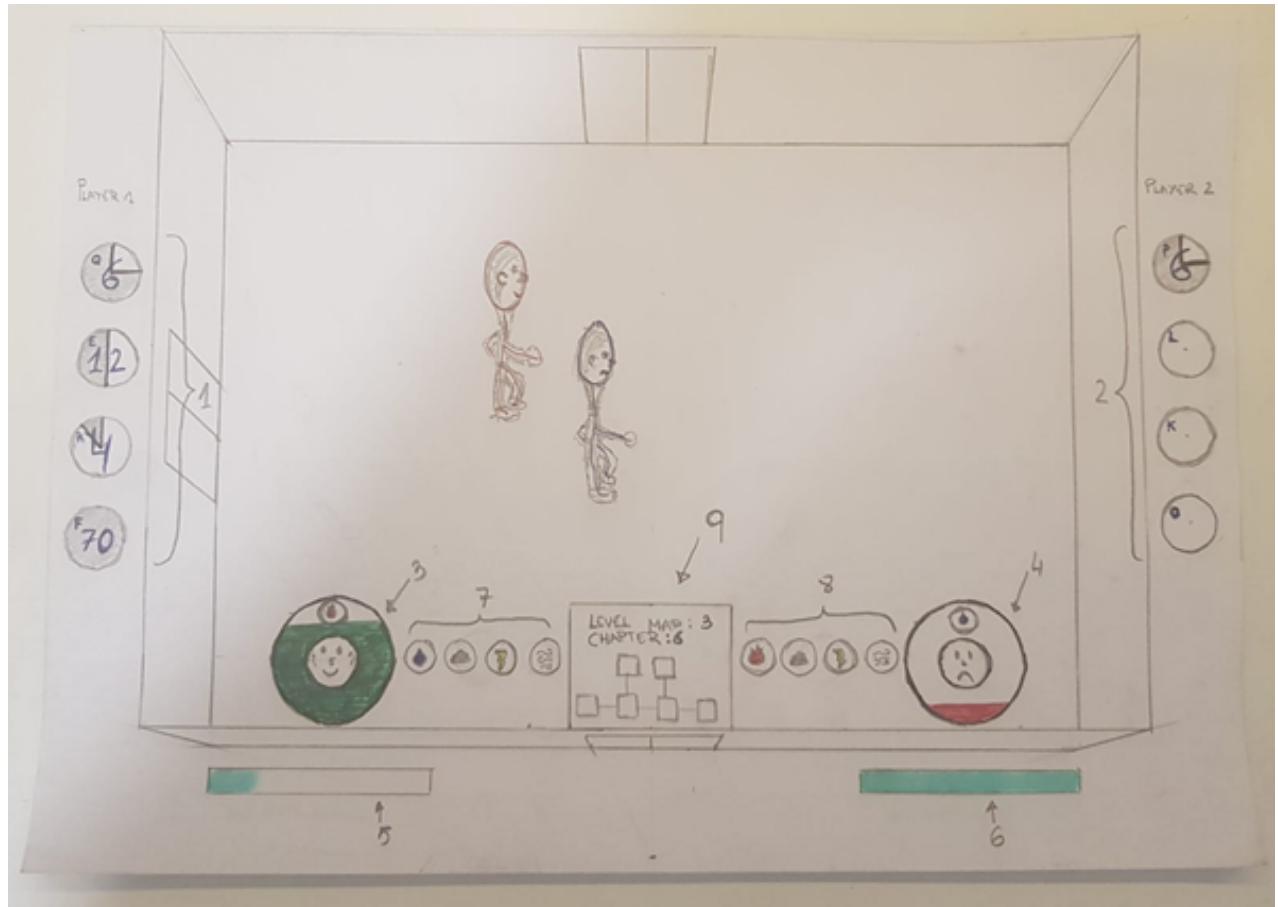
### Miscellaneous:

- a. Pause Menu → p

## Game Interface

Again, we had a ton of ideas for the user Interface and how everything in the game would be presented to the player.

We ended up thinking of this kind of interface:



1,2 - Powers: These will be the powers of each character's selected element. They will have a small cooldown when used. The cooldown duration is different for each power.

3,4 - Health Bars: The characters will have health bars, they will be able to take several hits of damage. When full, the health bar indicator is green, when mid-level it will be yellow, and when low, it will be red.

5,6 - Ultimate Bar: These will be the selectable elements for each character. Once selected, that element will be displayed above the character portrait, inline with the health bar.

7,8 - Elements: These are the meters for the wildcard powers, light and dark. When they get filled up (through different actions like combining powers or killing enemies), a more powerful ability can be unleashed. This is still a work in progress.

9 - Game Map: in the normal state you will be able to see in which room you are and others close it. If you press the map key (M), it will enlarge to cover the screen and the game will pause. You will be able to see all rooms where you've been through.

## 8. Progression

### User Journey

In an early stage, the players only master the movement and shooting, whose controls are easy to use. They get the notion that they can physically interact with the environment (as triggers for pressure plates, for example) but don't yet know the effects that their actions have. We will use the first chapter to make these more obvious, by having obstacles with easy solutions, that rely on actions they will have to perform in later levels, in a more challenging setting.

As the players unlock new elementals, they will start experimenting with their powers.

Players with a greater gameplay time will know which elementals they have and how to use their combinations to overcome each obstacle that they face. They will still struggle with changing between elementals, for not knowing exactly their order (see the controls section), and will often change in one direction only until they reach the desired elemental.

In a more advanced state, the players can easily interchange between the elementals and use them, not only for their combined powers and immunity to their element, but also for their distinctive features, like increased speed, health, damage, etc.

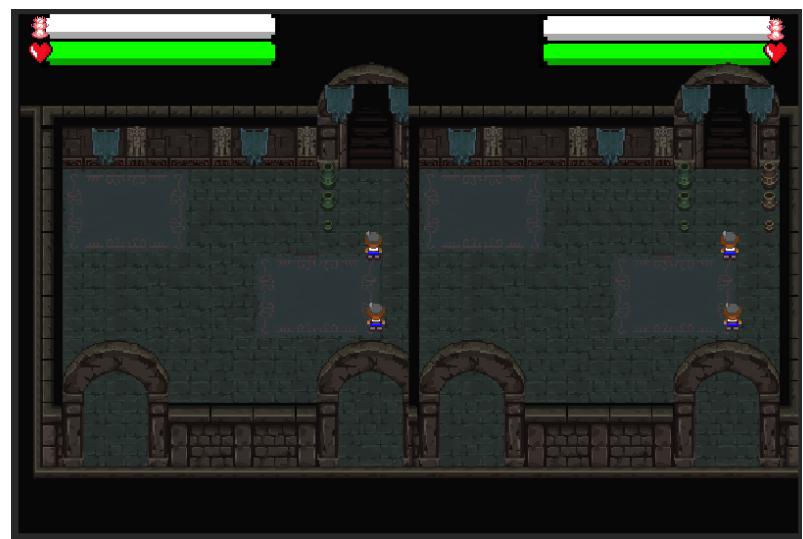
Player with a perfect mastery of the elementals, for example, would fight a horde of enemies by changing between the air elemental, which has an increased speed, and the fire elemental, which inflicts more damage.

While going through the game, we are going to be able to identify what we call the game progression and the player progression, which are going to be two sides of the same coin. The most important one is going to be the progression in the player, so it is going to be the main goal and progression focus. We will need to work on the progression of the game in order to achieve the progression in the player.

1. Progression in the game
  - a. Sequence of levels

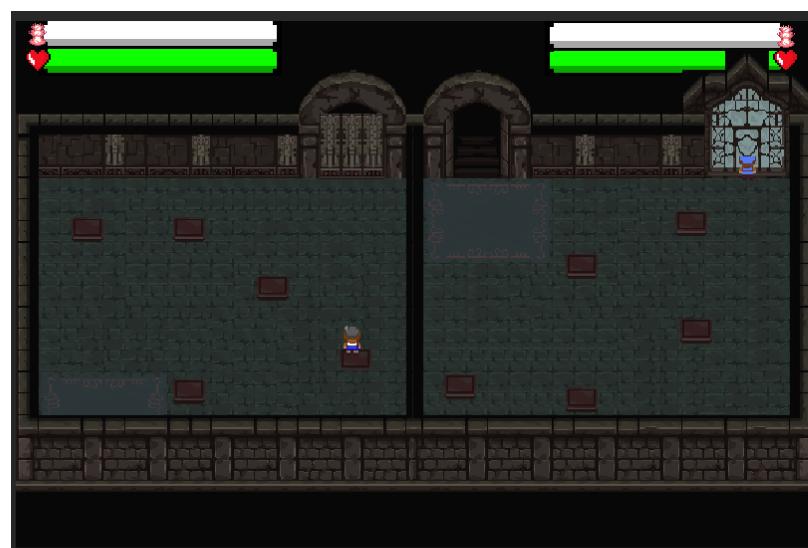
The navigation system for the game is pretty linear, where each chapter has some levels and in each level there are several rooms with some kind of door that gives access to them. In them you might find puzzles, traps, enemies, etc.

Now, it is going to be shown the sequence of a possible level.





There could also be hidden rooms that the player will have to find. In that level shown before, we could be able to go into a hidden room if we try to cross the window.



Through this window, you can access a hidden room.



After a set of levels, the player reaches the end of a chapter and will find new challenges in the next one.

b. Type of challenges/enemies engaged

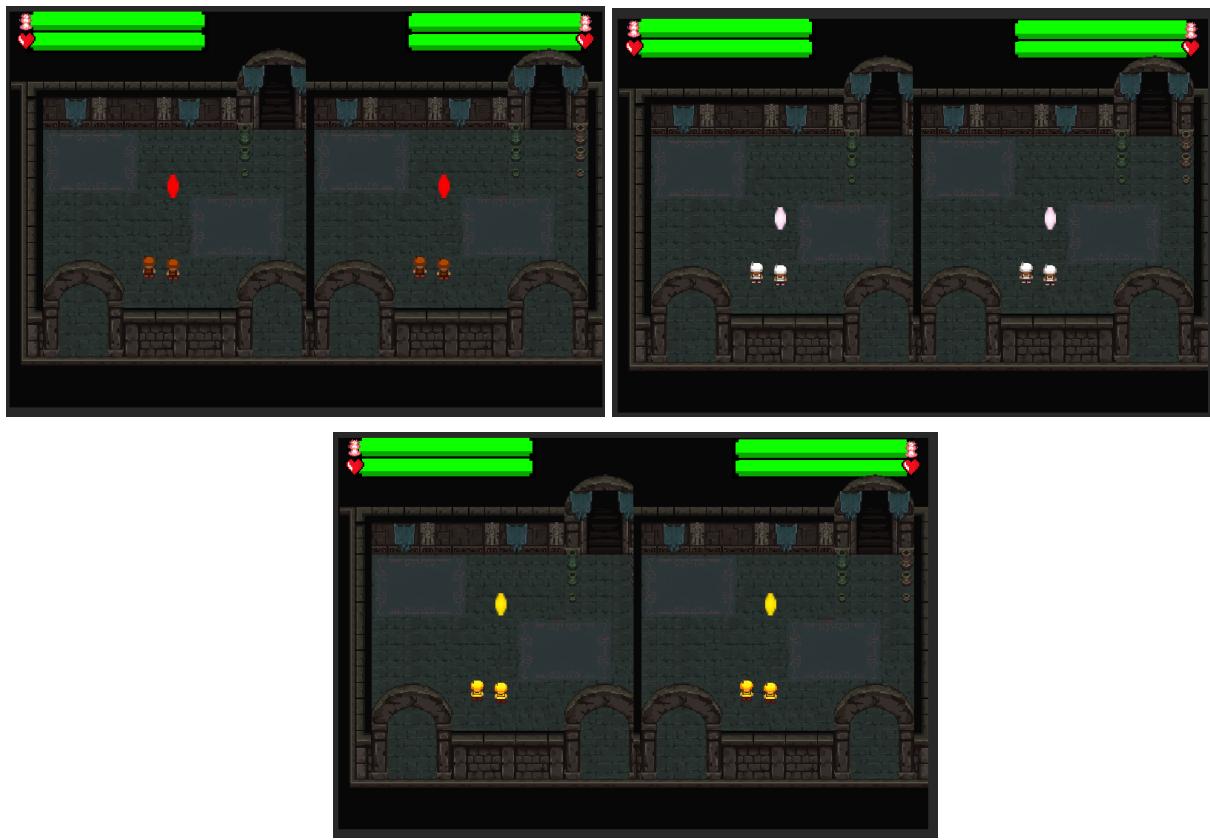
Each chapter will have levels of a fixed thematic, correlating to the existing elements, and so in each chapter there will be new and more difficult challenges as well as enemies that the players will have to overcome.

For example, in the water level there will be water enemies with water-based abilities, in the fire level they will be of that element, and so on.

c. Choices available

The players will be given more ability to choose as they progress through the game. With more elementals at their disposal, they will be able to choose different ways to achieve the same goal. Now we are going to show the combining projectiles for all the elements.





Here the players are combining the water, ground, fire, air and electricity basic projectile to shoot a bigger projectile. (We are still working with the combinations and fusions) They will also have the option to explore the levels they have already passed, finding secret rooms and the hidden story they tell.

#### d. Difficulty

The difficulty of the game is going to be the communication and the power combining stuff in order to choose the right elements in the right moment to maximize the power. You will need to be familiar and understand what each combination/fusion does so you can easily apply the best option when playing the game. You will also need to understand the features that each element has, this way you are also going to optimize your playability through the level. Also, you need to learn or at least be familiar with the rotation order so you can go faster each time you need to switch elements, this way you might avoid the full rotation in one direction when the other one could have been shorter.

#### e. Story

In each level there will be pieces of paper, which the players can pick up and read, that contain fragments of the story the players will be told. Simultaneously, each level will have hidden and inaccessible rooms, which have fragments of the real story and warn the players that they are being fooled.

The hidden rooms will be hidden behind fake walls, or windows, which the players can walk through and the inaccessible rooms will be behind obstacles that can only be traversed by specific elements, which the players don't yet possess in the current chapter.

f. Changes in the game

As the players progress through the game, the scenario of the levels will change, to match the element that is to be unlocked at the end of it.

The players will get more powers and access to new combinations of those powers as they go through the chapters.

The enemies will become faster and will have more health, so they are harder to defeat.

The puzzles/traps the players will have to go through will be more complex and be more dangerous in terms of damage. The players will have a better sense of the story as they play.

2. Progression in the player

a. Knowledge

The players will obtain knowledge in two fields: the story and the elemental powers. The story will be told by pieces of paper that are spread throughout the levels. The powers of the elementals will be learned through experimentation, which can be done in the controls menu, or in throughout the levels.

b. Sensation of mastery

The players will feel that they master the game when they can easily navigate the elementals and use their powers with ease. They can think of different ways to solve the same problem and find optimal solutions for obstacles which seemed difficult to overcome at first.

c. Sensation of challenge

For the players to feel challenged throughout the game, we add different obstacles and enemies in each chapter, which make the players figure out new ways to use their recently obtained powers.

The beginning of each chapter will, therefore, be challenging due to the players inexperience with the newly acquired powers. Towards the end of each chapter, when the players are now used to the elementals they have, the challenge will come from obstacles that require more creativity and enemies that are stronger and harder to kill.

d. Motivation to keep playing the game

The players will feel captivated for two main reasons: to learn the true story of the game and to get new elementals, to grow more powerful and defeat the wizard.

The fact that the story is told piece by piece, in such a mysterious tone, will leave the players with the desire to learn more and explore the levels to their full potential, to uncover all the details of the story.

The chapter-like structure of the game ensures that the players have a building up sensation, going from the discovery of the new chapter and learning about the new element, to the final fight with the guardian that keeps the respective spirit.

#### e. Goals

The main goal is to defeat the wizard who is imprisoning the spirits.

To achieve this goal, the players will have to free the various spirits to receive their powers, becoming strong enough to kill the wizard.

#### f. Feelings and emotions

The players will feel more free and more powerful as they go through the game. They will have access to more elementals, which, besides giving them the freedom to explore areas that were previously impeded, have distinctive features (speed, damage, etc.) which will leave the players with a greater toolbox for fighting and overcoming obstacles.

The players will also feel intrigued by the secret messages left over in the hidden rooms. They will have the sensation that something is wrong with what they are being told and will want to know more by exploring the levels and trying to find their secrets.

Now, we are going to resume how should be the game progress through this experience matrix:

	Early game	Mid game	Late game
Time	2 mins	20 mins	30 mins
Player deaths	0 to 1	10 to 30	20 to 40
Enemies	Basic enemies	Basic enemies, elite enemies	Basic enemies, elite enemies, challenge wizard
Weapons	Nothing	Basic projectile, combining/fusion power	Basic projectile, combining/fusion power
Feelings	Curiosity	Learning	Learning, improvement and frustration
Focus/Goals	Exploration	Exploration and survival	Exploration, survival, and defeat a final boss

This first experience matrix shows the progression and the experience all over the game. When talking about early games, we refer to the first chapter, which is the one in which the player is going to be a human and he is going to be introduced into the controls and interactions with the game. When talking about mid game, we are referring to the next two chapters, in which the player is going to get introduced to the elements and combinations between them. When talking about late game, we are talking about the game after the third chapter till the end of the game, where the player already knows how the game works and he can focus more on improving and strategy.

The time expected is more or less an approximation taking into account that you spend time looking for the hidden levels and level exploring.

Talking about the enemies, when we refer to a basic enemy, we refer to those enemies that we can find every level and every room, they can be enemies that chase you, enemies that shoot in different directions, etc. When we refer to elite enemies, we mean the ones that you need to kill in order to release a spirit and get a new element. And finally, the Wizard is going to be the final boss, and you need to kill him in order for you to end the game.

	First chapter	Second chapter
Time	5 to 10 mins/level	5 to 15 mins/level
Player deaths	0 to 5	0 to 15
Enemies	Basic enemies	Basic enemies, elite enemies, challenge wizard
Weapons	Basic projectile, combining/fusion power	Basic projectile, combining/fusion power
Feelings	Learning, improvement and frustration	Learning, improvement and frustration
Focus/Goals	Exploration and survival	Exploration, survival, and defeat a final boss (Last chapter)

In this second experience matrix, we are going to specify how the player is going to progress all over a chapter; each chapter has two levels. As told before, the time expected and the number of deaths is approximately. Every chapter, you will have one first level, in which you are going to fight some basic enemies and also you will have to explore the level in order to find the hidden room. And you will have a second level, in which you will have to do the same as you usually do in the first chapter, but adding that elite enemy, which is the guardian keeping the element in prison.

## 9. Testing Plan

We are going to organize multiple gameplay sessions, where we will be with the players, either physically or virtually, to observe their game experience.

The gameplay session will consist of the following stages:

- Introduction (2 min)
- Play session (20-30 min)
- Post play interview/questionnaires and wrap-up (5-10 min)

During the play sessions, where the players will actually play the game, we will act as external observers and analyse their behaviour without interfering. We chose this approach to get a more objective point of view from the players, as we are not influencing their actions, and to let them have an uninterrupted and more realistic gameplay experience.

We also want to use these unguided sessions to test *Captivity*'s guidance mechanism. In each level there are pieces of parchment which provide advice, set the mood and explain the story of *Captivity*. We want to know if the players can understand and figure out how to overcome each obstacle, using only the information contained in the parchments and in the controls/instructions menu.



Regarding the data collection, we are going to use three strategies: Recording, Analytics and Questionnaire.

## Recording

We are going to record the players' gameplay session in order to identify bugs we might have missed, to get a better insight on the players' feelings towards the game and to gather footage for the game's trailer.

Regarding bugs, some that we have identified in the past include:

- Walls that don't have a collider and they should.
- Objects or zones that have a collider and they shouldn't.
- UI elements that get shifted in the build version.
- Combinations that don't work properly or whose position isn't correct.

Regarding the players' feelings, we will be able to analyse them through the players' expressions and voice, if they express themselves whilst playing. If not, we will have a small post-game session to ask them about their experience.

## Analytics

We will use Unity Analytics to answer the following questions:

- Is an elemental or combination too powerful → We can tell that a given elemental/combination is too powerful if the players, when faced with a decision, always (or often) choose the same option.
- Is the first chapter too long → We can get that information looking at the time spent by the players in the first chapter. Ideally, since this serves as a tutorial chapter, we are looking for a time no longer than 5 minutes.
- Did they manage to find the hidden rooms in the first run → We are going to measure that by checking if they entered the hidden room at any moment while playing the chapter during the first run.
- Is it too complicated to overcome a chapter/level/room/obstacle → We can tell that by counting the number of times the players die and the time spent trying to overcome the obstacles.

## Questionnaire

Using a questionnaire, we will ask the following questions, which regard the players' feelings and might not be correctly obtained using solely analytics:

- Did you enjoy the visuals of the game?
- Did you find the scenarios too repetitive?
- Was any level too long or too short? If so, which ones?
- Did you find the game too easy or too hard?
- Did you feel bored at any given time?
- Did you enjoy the game and would you play it again?
- Do you have any suggestions for future updates?

## 10. Focus Group

Our focus group is composed of 8 people, some of which served as inspiration for the player Personas. Besides describing each person, we will also point to the persona that they were inspired by.

### Abed

Gender: Male

Age: 17

Profession: High School student

Favourite Games: Action games

Player type: Daredevil

Interests: Music and sports

Goals: Plays to feel adrenaline

Persona Reference: Vincent Vega

### Brandy

Gender: Female

Age: 17

Profession: High School student

Favourite Games: Strategy games

Player type: Mastermind

Interests: Music and arts

Goals: Plays to relax and enjoy the sense of overcoming an obstacle

Persona Reference: Vincent Vega

### Chang

Gender: Male

Age: 26

Profession: Engineering Undergraduate

Favourite Games: Real Time Strategy Games

Player type: Achiever

Interests: Basketball

Goals: Plays to have fun whenever has time with his friends

Persona Reference: Yulian Kuzmin

### Dean

Gender: Female

Age: 28

Profession: Biology Graduate Student

Favourite Games: Multiplayer online battle arena

Player type: Mastermind, Achiever

Interests: Cryptocurrencies and Skimboard

Goals: Plays to achieve higher ranks

Persona Reference: Yulian Kuzmin

## **Eobard**

Gender: Male

Age: 24

Profession: Studying veterinary

Favourite Games: MOBA

Player type: Teamplay

Interests: Sports and multi-player game

Goals: To know a little bit of every game genre and find one in particular which can challenge him.

Persona Reference: Angel Lahera

## **Floyd**

Gender: Male

Age: 25

Profession: Studying engineering

Favourite Games: Puzzles, MOBAs, Platform

Player type: Achiever

Interests: Music, sports and videogames

Goals: Plays to have fun, but also to challenge himself by improving over the days

Persona Reference: Henry Oak

## **Gregorovitch**

Gender: Male

Age: 27

Profession: Working in IT;

Favourite Games: Shooters, Action, Adventure;

Player type: Seeker;

Interests: Sports, Video Games, Technology;

Goals: Constantly wants to improve at every game he plays.

Persona Reference: Henry Oak

## **Hella**

Gender: Female

Age: 21

Profession: Studying Engineering;

Favourite Games: Action, Adventure, RPG;

Player type: Mastermind;

Interests: Video Games, Music, Content Creation

Goals: Plays to have fun and to pass the time, but always wants to be good.

Persona Reference: Angel Lahera

# 11. Prototypes and user feedback

## Introduction

In this report we present the prototypes we created to test and explore the key aspects of the game. These include:

- the cooperation between the players
- the character's basic movements
- the need to explore multiple rooms to complete the level
- the interaction between the characters and the traps and obstacles
- the interaction between the characters and the entities of the game
- the camera view
- the combination of powers

We will briefly explain how we built the prototypes and present the user feedback and conclusions we draw.

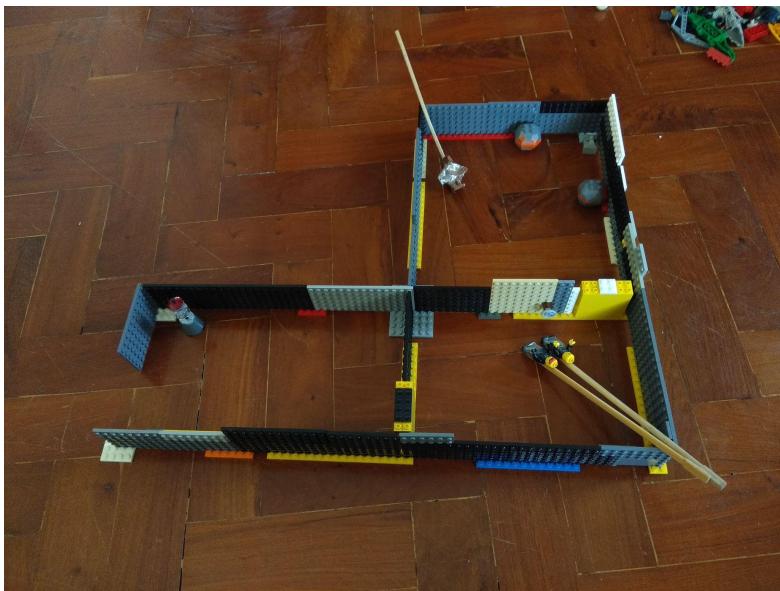
The videos of the prototypes can be found here:

- Player Cooperation, Basic movement and exploration: <https://youtu.be/75EGpfDHnUo>
  - Developed by Eduardo Skapinakis
- Captivity Traps Prototype: <https://youtu.be/u4Ho04t99dQ>
  - Developed by Rui Melo
- Character's abilities Prototype: <https://www.youtube.com/watch?v=q2mp2EuDbFs>
  - Developed by Miguel Lahera
- Story Interaction: [https://youtu.be/Gbh5\\_2-LFX0](https://youtu.be/Gbh5_2-LFX0)
  - Developed by Rodrigo Carvalho

## Player Cooperation, Basic movement and exploration

This prototype was made using pieces of Lego, wooden sticks and duct tape (see image below). We built a 3d example of what a first level would look like, where the characters, still with no special abilities, have to cooperate to distract a monster and open a valve that will unlock the door to the exit.

The person testing the prototype (family of a group member) reported to have enjoyed the feature of cooperation, the freedom of movement in 2d and the fact that opening the exit door required a non-direct route.



## Traps and Obstacles Interaction

The traps and obstacles were drawn using a pen on paper. Each trap is presented in a room using a bird's eye view perspective. In order to gather user feedback and explain how to overcome each trap and each interaction, a simple video was made. This video is backed by a form provided to some users in our focus group, in order to get some more formal data.

Overall, there are different types of obstacles and traps. Each room has a way to advance to another room. Usually, this is made through a door that needs to be open. If the door is closed, it might have a lever connected to it, which needs to be activated. Another way of activating some doors would be by placing an eternal flame on a sacred torch. These levers and torches may not be present in the same room as the door it opens. A special way to go from one room to another is by using the power of an Electric Elemental and going through a cable that connects two rooms or using ventilations that are only useful by fusing the Water and Fire Elementals.

Other straight-forward obstacles and traps were added, like mazes in rooms or holes with spikes. Pits of lava only allows for the Fire Elemental to cross. The same idea of only allowing a certain Elemental to cross an obstacle was added by designing an electromagnetic field, to which only the Ground Elemental would be immune.

Finally, three more obstacles that need the combination of powers of different Elementals were designed:

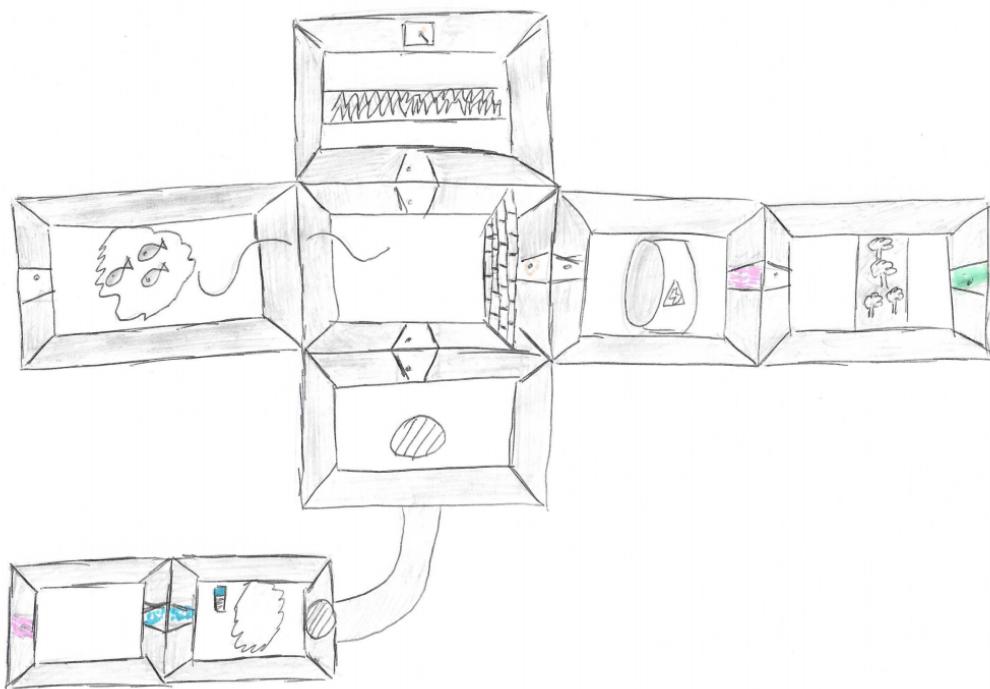
- There is a lake/pool of piranhas, which is only crossable by combining the power of the Electrical Elemental and Water Elemental;

- A destructible wall which needs to be destroyed by causing an explosion. That same explosion can be possible by combining the Electrical and Fire Elemental;

-An Ancestral Abyss that has a bunch of trees and vegetation at the very bottom. A huge tree can be formed by combining the Light and Ground Elemental. This tree can provide passage to other sections of the room, overcoming the abyss.

The form and the video were seen by 4 elements corresponding to our focus group. In that form, the users were asked to rate from 1 to 5, with 1 being "Awful" and 5 "Excellent" the overall design, the difficulty behind it, like its complexity and how inclined to play a game with this style and these kind of traps were they. To the first question, the average answer was 2.75, to the second 3, the third 3.5 and to the fourth, all answered with a 4.

Overall, the users who provided feedback were not impressed by the global design, but enjoyed the main idea behind. They answered that it makes a complex game and would be thrilled to try it out.

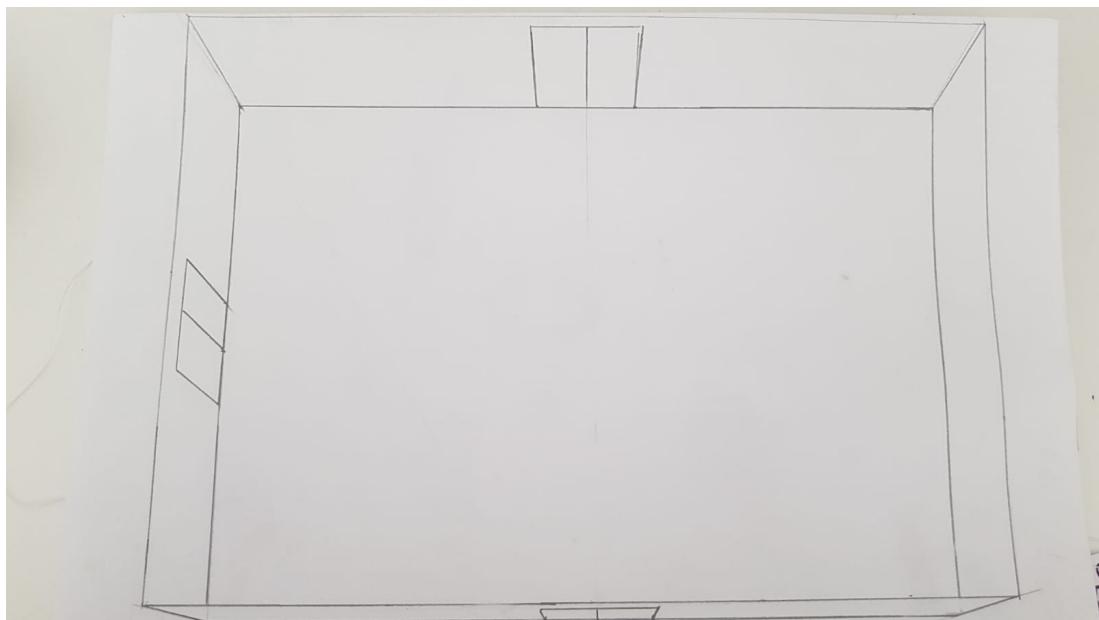


## Character's abilities

This prototype has been done using a pen, paper, some images printed and white sewing thread. For this prototype, we wanted to show, not only the different combinations, fusions and abilities that the characters have, but also we wanted to show the birds eye view perspective. So first of all, we created the room following a vanishing point perspective trying to simulate the perspective of a camera, once we reached more or less the right point of view, we started decided to think about the enemies and the characters, at the end, we just wanted to make sure that the characters are going to show as people (but with different colors depending on the spirit they are using in that moment) and we also wanted to make clear that there is going to be different types of basic enemies: tanks, slayers and mages among other bosses that we are going to define in the future. Then we just thought that for the aim of this prototype, we do not need to show all the powers, as this is something you need to discover all over the game, so we just make the prototyping about the different combinations the fire has within the other elements. So we thought about it, we made some drawings and at the end we built up the scenario by putting threads to

everything in order to move the characters and show the different animations. Here you can see how everything was prepared.

This prototype has been seen by the two members of the focus group and some other people in order to know more about how the game is going and changes we could do. First of all, we asked them what they expected from the game so far, and they all agreed, summing all the responses up, that the game seems funny, interesting, dynamic and entertaining. Then, they were asked if they would play the game when released, all of them said yes but one, which specified that he would play only if the game is free. We kept asking if the game could be successful in the market, and they answered that the game was original and the way you can combine different powers in order to go through the levels seems amazing. For the next question, we asked them to rate it up on a scale from 1 to 5, and we got a score of 4,5, which means the game seems cool and has a future. And last but not least, they were told to add any comments in order to add new things for next updates. Here we were told different things, some interesting ones have been: put sound to the game, put hidden chests to reach something, put some animations/history and have special attacks, like a stronger one. So we will take into consideration all those little nuances in order to satisfy our potential clients.





## Story Interaction

This prototype was built using pen and paper. As they had to be in a physical format, we decided that it would be easier to do this one with pen and paper. We started out by drawing the characters with pencil on a sheet of paper to get the basic designs, as well as the dialogue boxes that were used. The design for the characters and for the dialogue boxes were inspired by similar styles of many existing games. In order to show that the characters are speaking to each other, we drew only half the character's bodies in order to place them on top of the dialogue boxes. This could also be used to show a different perspective of the characters, as they will probably have a different look to them in-game, given that the game has a bird's eye view perspective. This method is used in a lot of different games that have characters speaking to each other.

This prototype was seen and tested by a member of the focus group. After inspection of it, the tester explained they liked the direction and intention of the prototype. But also further explained that the story might need some work. Which we agree with and will develop and change the story more in the future. The tester also said that we should take into consideration how we want the feeling of the story to be. Meaning that, if the story follows a more casual/relatable feel to it, we should have to stick to that way of showing it throughout the whole game, in order to not break the immersion. Overall they liked the structure and the mechanic of presenting the story through dialogue but only if it's captivating and not boring. This person's personal preference was to be presented a story through narrative, with cutscenes, impactful gameplay, etc. which we also thought about having so that's a good starting point for further development. They also stated that the character's art style was pleasing and fun, but since that wasn't the focus of this prototype, we will be changing the characters heavily in the future. In conclusion, the tester was happy with the result of the interaction with the story, found it fun and captivating and wishes to see how it progresses in the future.

The goal of this prototype was to show the player how the story would be presented to them and the interaction needed to do so. This was a successful way of doing so as it showed exactly how the story is revealed to the player, how they interact with it, and it gave us some ideas on what might be possible to do next to further develop it.



## 12. Tech feasibility report

### Introduction

In this section we present the game engine we chose to develop *Captivity*. We will justify our choice and discuss the possible issues we foresee in the development of the game.

### The game engine

We chose to work with Unity, an idea that came from a group member, who had already worked with it in the previous semester.

These are some of the aspects that lead to the final decision:

- The Unity asset store (<https://assetstore.unity.com>) provides a lot of free materials and there is a great deal of online support in forums;
- The camera perspective can be easily changed, so we can experiment with different perspectives;
- Since *Captivity* is a light game, we don't need a powerful game engine (like Unreal Engine);
- We expect it will be easy for the remaining group members to learn how to use the engine, given the previous experience and the free tutorials that can be found online.
- If for some reason we need something that doesn't exist as we want it, Unity allows us to build our own tools.

There is also a Unity plugin called Bolt, that has visual, node-based graphs that we can use to design final logic or to quickly create prototypes. It also features an API that can be used for more advanced tasks, or to create custom nodes that can be used by others.

### Conclusion

We think Unity will be a good engine for us to develop *Captivity*, mostly because it's suitable for beginners, and due to the wide availability of free resources.

We predict no major in the development of the game and are confident that we will be able to create the vertical slices within the semester.

# 13. Workshop Report

## Introduction

In this section we present the workshop we prepared on the 17th of April, in which we discussed some aspects of Captivity with people outside our group. We had 6 outside participants and the ESCS student who works with us, who only participated in some activities. The workshop was done online through a Zoom meeting scheduled in the week before.

## Goals

Our goal for having this workshop was to get a new perspective on the game. We asked the participants for their opinion on some of the aspects we have already decided for Captivity, like the number of different elementals and the perspective of the camera, and also asked them to discuss things we are still deciding upon, like if the characters should have a life bar and what objects from the game they associate with each chapter.

## Procedure

After an introduction, we started the workshop with a description of the game and with a presentation of the prototypes using a powerpoint and other different websites/tools. We explained the story of the game, presented some different elementals and some of their power combinations and talked about how the game would be played. After making sure that everyone understood the basics of the game, we started the workshop activities.

To see how the participants would structure the game, we prepared a **Card Sorting** activity, where they had to place different components of the game (objects, enemies,...) in different chapters. This way, we can make the game more coherent (since it is based upon how the participants organized it) and give each chapter a sense of uniqueness, by having specific elements for each one.

For gathering opinions, we implemented two activities: the **6 Thinking Hats** and **Zen Voting**, which we chose for their opposite nature. We wanted to see how people would react to each other's opinions, but also what they would think, without being tampered by or feeling embarrassed about the other participants.

We will now discuss the preparation and the results we obtained from the activities we implemented.

## Results

### Six Thinking Hats

We started the workshop activities with the six thinking hats, in which we asked the participants to discuss different features of *Captivity*, now that they had been introduced to the game's concept.

We explained the procedure for this activity by talking about the different hats and what they should do to adopt each hat's personality. Afterwards, we randomly assigned each participant a hat, using a website called "Wheel of Names" which we thought would improve the overall experience of selecting each one's roles: The link to the website is <https://wheelofnames.com/eng/#> and the wheel we used can be found in this link: [workshop wheel](#).

And last but not least, we started to introduce to them the different questions in order for them to be able to discuss and provide different ideas and points of views.

At the beginning, when the first question was asked, the debate we were expecting for them to have was non-existent, some of them tried to speak but they got no response from the other hats/participants, so they ended telling us their ideas. As the activity continued and we asked them for more questions,, we could start to see what we expected from them. The “debate” thing. So different and new interesting ideas came up achieving what we wanted.

The question we proposed to the participants were the following ones:

- How many elements should the game have (elements in the sense of water, fire,...)

For this question, as we said before, it was the first one people were still shy and not with the intention of talking too much. But we got some ideas from here such as 7 elements are good for us to do interesting stuff and combinations, but we also got the idea that if we are talking about elements, you usually refer to water, fire, ground... But light and dark are not elements at all. So we also got that point of view.

After that, we decided to introduce a new topic to talk about for them to start the discussion. So we went for the next question.

- What should be the effect of combining the powers of two elementals. (Basically everything related to the powers combining) and also the different types of puzzles and obstacles we could have

Here they got a lot to talk about and they gave us several ideas. The main one came from the fact said in the first question, “dark” and “light” are not elements at all, so someone proposed the possibility of having those spirits as “wild cards”, as something you can use but just when you meet the established conditions. They are going to be used as special powers, so here we got the ultimate idea we also thought about during the previous weeks. They mentioned that this ultimate idea should be like an overpowered whole room ability, but it can only be thrown when charged with what they called “the ultimate bar”. It might be charged by killing enemies or collecting gems. Besides that, they discussed a bit between the different powers and combinations and the way they like there are different abilities: basic projectile, combined power, fusion and this new ultimate idea.

Also, someone talked about the intensity of the different powers, he mentioned that we didn't really explain if they are going to have different power intensity depending on what you are throwing or combining instead of having everything the same power but with different numbers of targets. So they also introduced this new idea.

Talking about obstacles and puzzles they thought, it is a good idea to have different traps that only one element could go through, but they weren't really creative regarding that question. We did not get new ideas besides a teleportation portal, which is interesting and we might go over this idea too.

- Life of the characters (having a certain number of hearts, have a bar of life or if hit you are dead)

To end this activity we asked them about the kind of life they would like to have on the characters. We didn't know which one was the best option to develop. So one of the participants started saying that liked the idea of having only one life, so if you get hit you die, because it made it more interesting and challenging, but then a lot of people said that for them, repeating and repeating a level it was nice, but there is a moment that you get tired of it. It is not cool when you are reaching the guardian (for example) and you get hit at the end. That means you need to repeat everything again and it can be a bit tiring sometimes. So they proposed the idea of having a bar of life, where you can have an idea on what you can do and what you need to do to survive. You will know how much damage a simple enemy takes if you get hit, etc. So they said that is a way to know and administrate your gameplay.

During this activity, an interesting suggestion came up, regarding the exploration of the castle: instead of having a straight progression throughout the levels of the game, the players would walk freely through the castle. This way, when they encountered an obstacle they couldn't solve, they would have to explore different rooms to try to find the spirit whose powers would enable them to overcome it.

## Card Sorting

The Card Sorting activity was meant to figure out which environment elements/objects should be together in order to create attractive and richer environments. This activity was done through the Website “OptimalWork”: <https://24idi8fp.optimalworkshop.com/optimalsort/kkk146g7-0-0>.

The participants were presented with cards that they had to arrange in chapters. We wanted to see possible combinations between those objects. Also, we did not name the chapters after elements, instead we named “Chapter 1” and so on. This way, the participants did not have to follow a specific path, since someone might prefer to start in a fire environment instead of others and just focus on the combination itself.

Illusions																			
71	Mirrors																		
57	42	Candle Chandelier																	
28	28	42	Lamps																
0	0	0	28	Forge															
0	0	0	0	42	Levers														
0	0	0	0	14	28	Stairs													
0	0	0	14	0	14	42	Wheels												
0	0	0	28	28	14	28	42	Cables											
0	14	0	0	0	14	0	0	28	Air Currents										
0	0	0	0	0	0	0	28	0	42	Trees									
14	0	0	0	0	14	42	28	14	28	42	Ropes								
0	0	0	0	0	28	14	14	0	28	42	14	Movable Rocks							
0	0	0	0	14	14	14	0	14	14	0	0	28	Friendly Neighbor Octopus :)						
0	0	0	0	0	0	0	0	0	14	28	14	0	28	Waterfall					
28	42	14	14	0	0	0	0	0	0	0	0	14	0	28	Portals				
14	0	28	14	14	0	0	0	0	0	0	0	14	0	0	Skeleton				
0	0	0	14	42	28	14	28	0	0	0	0	0	14	0	0	28	Lavafall		
14	0	28	28	28	0	0	14	14	0	14	0	14	14	0	0	28	14	Spikes	
0	0	28	14	14	14	28	0	0	0	0	14	0	0	14	14	28	14	14	Fog

Through this similarity matrix, we can see the correlation between the different cards like intended. It is safe to assume that participants would match in a room “Illusions” with “Mirrors” or a “Lavafall” with a “Forge”. This approach will allow us, hopefully, to create better environments.

## Zen Voting

After the Six Thinking Hats, we decided to work with the Zen Voting activity and the participants were presented with 8 different questions. This activity was done using Google Forms: <https://docs.google.com/forms/d/e/1FAIpQLSeGEsp-jUNy3uawldns9BbJl4E3k8iTPTEH43mWspS6U9ZkKA/viewform>

.Each question was multiple choice, besides the last one that worked as a suggestion box where participants could complement answers from previous questions or, simply, leave an overall suggestion.

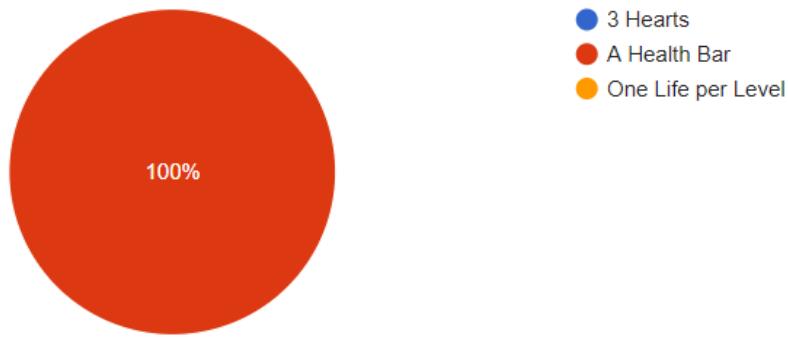
The first question was "What life mechanic do you prefer?". To this question there were given 3 options:

- 3 Hearts;
- A Health Bar;
- One Life per Level.

To our surprise, every participant preferred having a health bar.

What life mechanic do you prefer?

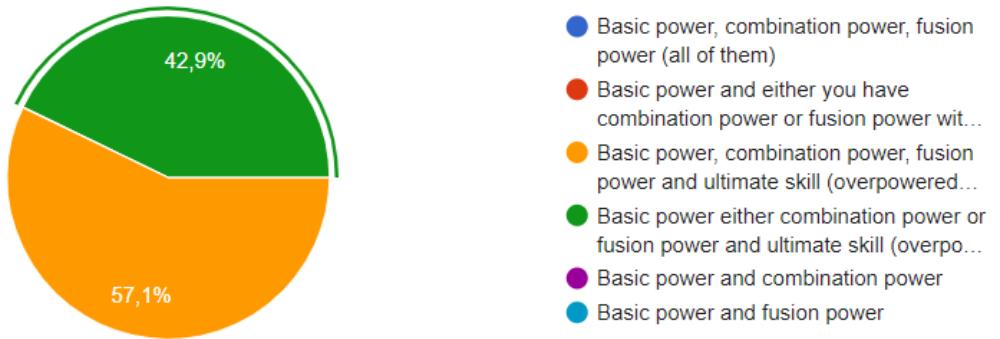
7 respostas



The second question was about the overall powers of the characters. To this question, the answers were almost evenly matched between having a Basic power and either combination power or fusion power and ultimate skill (overpowered rechargeable skill) (4 votes) and Basic power either combination power or fusion power and ultimate skill (overpowered rechargeable skill) (3 votes). This question allowed us to realize that having an ultimate ability would be something that participants would like to have.

Which of these options would you prefer for a character's abilities?

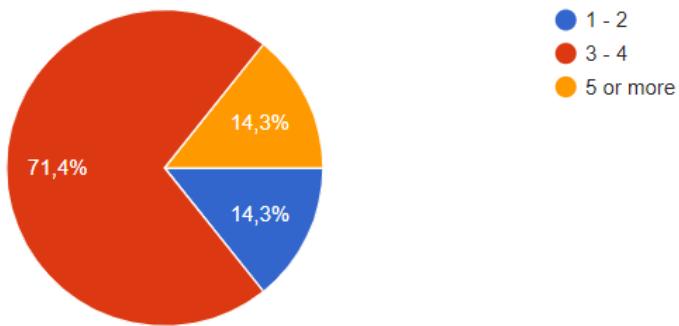
7 respostas



The third question resides on how complex, in terms of size, the participants think the levels should be. Reflecting on the answers is safe to assume the participants would not like to have either too simple levels or too complex ones. This factor can incrementally increase as a player progresses in the game.

How many rooms would be comfortable to have in each level?

7 respostas

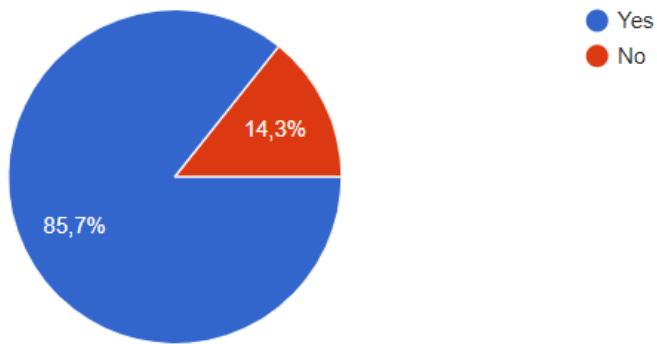


Regarding the fourth question, the participants were asked how they feel about having gems or some special items to collect during the game. The majority answered that they would, which can make this game a little more interesting and maybe even attract more players.

(To be noted that the question had an error.)

Would you be like to pick up scattered hidden items throughout the game, for the sake of collection (like hidden gems)?

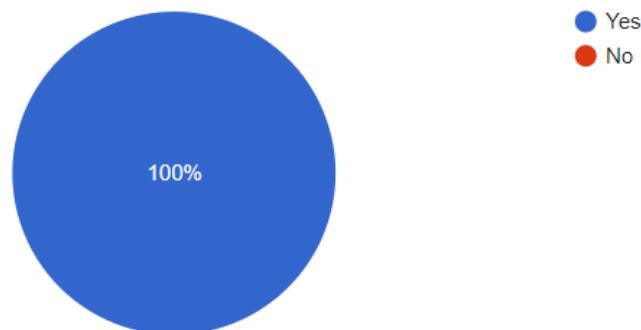
7 respostas



The last 2 multiple choice questions were to provide some feedback about the overall workshop. To those questions we can assume that the participants enjoyed the workshop and were interested and willing to play Captivity.

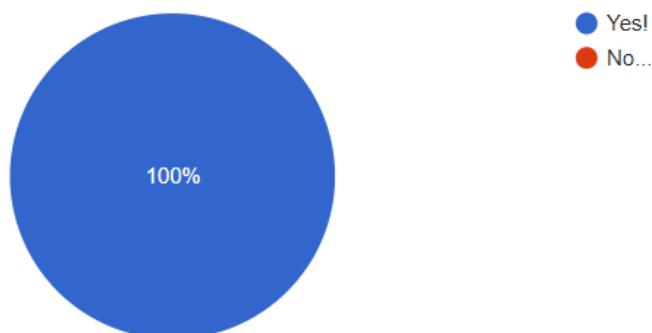
Did you enjoy the workshop?

7 respostas



Would you want to play this game?

7 respostas



Finally, the last section of the Zen Voting activity was an open question that was used to express suggestions or to complement previous answers. From this section, we got 4 different opinions/suggestions

Suggestions: (Here you can suggest whatever you think is missing or something that was not mentioned but you think might be interesting)

4 respostas

Some portals could go one-way only, making it harder to go back to where you were.

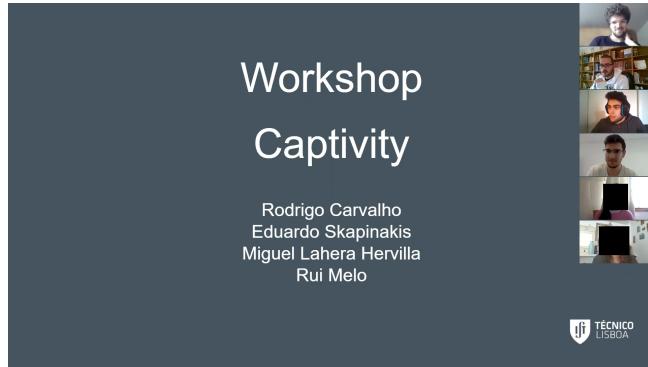
The use of some elements like light and dark as wildcards that can enable the ultimate skill that is rechargeable with combinations and fusion powers to highlight co-op playstyle

I am not expert in this field, but with my experience in games I would like to play this one. I never thought about planning a game, so I don't know if I am going to be helpful. But the story of the game is really cool and the combinations of elements are great idea.

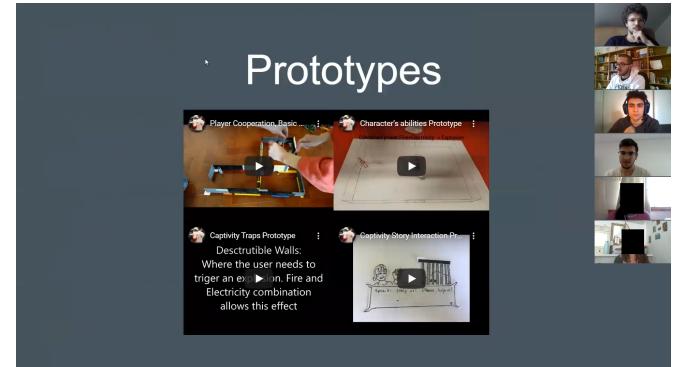
It would be nice to be able to change the scenario. For example if you'd have ground and water, maybe you could make plants grow and create structures, like stairs

This section provided a lot of good ideas. The portal idea can be useful in order to increase the complexity of the game. The wildcards elements are also a good one since they are not, as a participant referred during the workshop, "standard elements". Finally, the ability to change the environment and create little structures can add more dynamic to the game.

Here are some pictures we extracted from the recorded workshop:



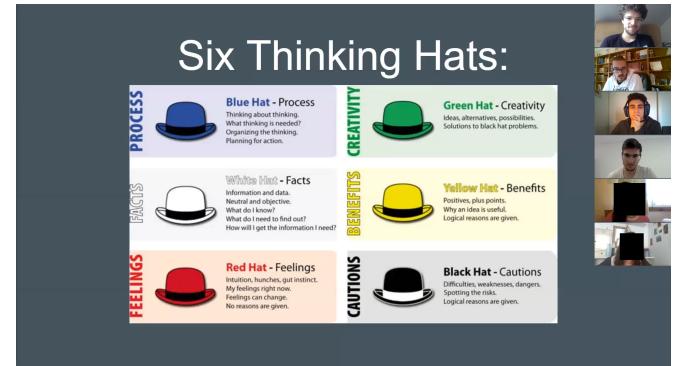
Introduction to the Workshop



Showing and explaining the prototypes



Video of a specific prototype



Six thinking Hats activity

## User Feedback

To make the user feedback more legible, we will split it into “game sessions”, which represent the situation where the people we send the prototype to play the game. Some of these sessions were “live”, in the sense that we were with the players, and some were not.

In the case where the sessions were live, we will briefly describe the experience and conclusions we draw.

### Game Session 1 (live - in presence)

I met with two friends that had been to our workshop and asked them to try the prototype on my computer.

They enjoyed the movement of the characters and spent some time just playing around in the instructions menu (where you can move the players).

When the game started, they took some time to figure out that to cross the river you have to turn blue.

They noticed the button on the floor that didn't do anything and moved on.

A few moments after reaching the second room they died due to the moles touching them. They took a while until they managed to run

## 14. Other relevant information

In this section we introduce the vocabulary and better explain certain aspects of the game.

The terms we introduce are:

- **Character:** The two humans that the players control to play the game;
- **Spirits:** Magical creatures that control a power related to a nature element. Spirits can provide the player with the ability to control that same power;  
The spirits in *Captivity* are of seven different types: Water, earth, fire, air, light, dark and electricity.
- **Elemental:** Form that the characters obtains, to use the powers of a spirit.
- **Guardians:** Major enemies with the main goal of keeping the spirits imprisoned;
- **Room:** A room containing obstacles, enemies, traps and puzzles;
- **Level:** A set of connected rooms, which you have to cross to complete;
- **Chapter:** Each spirit has a dedicated chapter. A chapter is a group of levels that have the same “theme” as the spirit you’re trying to save. For the dark spirit, for example, the chapter be placed in the lower dungeons of the castle;
- **Gems:** Shiny objects that are spread or hidden throughout the game. They don’t serve any crucial role to the game and serve only to add an element of “exploration”. When the gems are found, they are added to a log where the players can see which gems they found, which gems are still missing and the levels where they are;

Other important aspects and clarifications:

- **Camera:** The camera will always only show the room the player is currently in, in a bird’s eye view perspective (similar to “The Binding of Isaac”);
- **Characters, Spirits and Elementals:** The players control the characters, which are the two humans who are freeing the spirits. When the players free an imprisoned spirit, it gives the characters the ability to turn into an elemental. Throughout the game, the players can choose to turn the humans they control into the elementals of the spirits they’ve already freed. When this happens, the characters get a color that matches the elemental they are turning into.
- **Powers of the elementals:** When a character turns into an elemental, it gains the ability to shoot projectiles and immunity to its element. For example, the fire elemental can shoot red projectiles and walk through fire.
- **Fusing and combining Powers:** Some combinations of elementals can fuse together and some have a combined power. To use this ability, the elementals must be placed next to each other.
- **Fusion:** When two elementals fuse, they become a single entity, whose controls are split by the player: one of the players controls steering and the other controls the use of the powers. The water and fire elementals, for example, can fuse to turn into vapor, which will allow the players to travel through small holes or obstacles of the sort.
- **Combinations:** When the dark and earth elemental combine their powers, for example, they can erect a small army of skeletons to help them in their fight.

- **Ultimate Power:** When a player's ultimate meter fills up to the max, that player is able to use a very powerful ability, which the effect will depend on the selected elemental.

*Captivity* has four main scenarios:

- **First level:** In the first level of the game, the characters are humans, with no special abilities, and will have to solve simple puzzles to free the first spirit. This will unlock the first elemental;
- **Freeing a spirit:** When the players reach the end of a chapter, there will be a boss of the same element as the spirit you have to free. To free the spirit, the boss has to be defeated;
- **Regular Level:** Once the characters have the ability to turn into elementals, passing a level has two different scenarios: fighting enemies and overcoming obstacles, traps, or puzzles;
- **Fighting the Final Boss:** To go through the last level, the players have to kill the final boss, the master wizard, to leave the castle where they are held captive and win the game.