DESIGN DOCUMENT

Cow Stealer

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In this report we present the design document for our game, *Cow Stealer*.

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Core Experience

The main goals of our game experience we want to achieve are:

Players feel challenged by the game's obstacles.

Players feel motivated while: competing with each other in the versus mode, gathering all 3 stars of each level of the game, achieving the highest scores, surpassing each level and getting to the next one.

Players feel surprised by different gameplays and difficulties in each specific level and must adapt with new approaches in order to beat these levels

Players feel impressed by the game design and different scenery of each level.

Players have fun while playing our game.

Help more casual players to feel motivated.

First "tweet"

Aboard your UFO, capture as many cows as you can to save the planet while angry farmers throw vicious hay block attacks against you. Experience a twist of events as each farm takes on a completely different scenery. A single-player or versus mode casual game!

Base References

The base references that present similarities to our game are the following:

- Moon Patrol: This game relates to ours as it's a side-scrolling arcade game whose strengths are mainly being a casual game that, despite having rather stimulating gameplay, has an accessible difficulty to most players. Also, the design of this game is a characteristic 2D pixel art from the 80s that was rather modern at the time. However, one downside of this game is that it is very long, and each time you pass a level you don't see much difference in the game design and overall gameplay.

Figure 1. Moon Patrol level gameplay

- Cuphead: This run and gun action game relates to our game since in each level the player must deal with challenging new difficulties, adapt the gameplay to each boss enemy they face, and constantly avoid and dash attacks from enemies. In addition, each level features a completely new design and environment, has an interesting story to motivate the player, and allows the player to choose which level he wishes to play next. One drawback of this game is that the gameplay has a high difficulty and can lead players to abandon the game and not complete it.

Figure 2. Cuphead level gameplay

- 1941 - Counter Attack: The relation between our game and this up-scroller game is that throughout the game the player can catch "power-ups" that increase the player's power temporarily, and the player must be constantly dodging the obstacles and enemies that appear in the environment. This game also features a 2D pixel-art design that was common in 80's arcade games. The main problem with this game is that it is too repetitive and highly challenging, and players can become annoyed and bored while playing it.
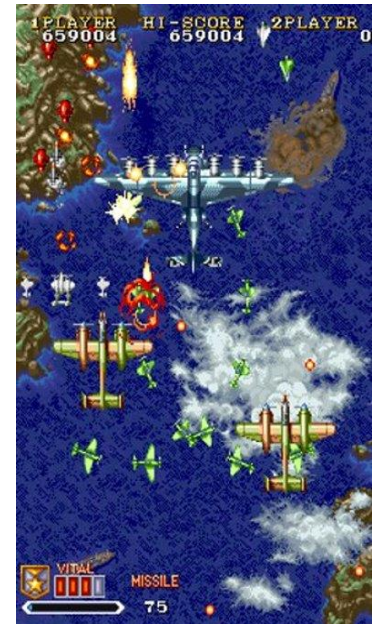

Figure 3. Counter-Attack gameplay

- Bombjack: The strengths of this platform game are that the gameplay is extremely fun, and the player must collect all bombs while avoiding colliding with the monsters that fly around the environment. These features relate very strongly with our game. Despite this, this game also suffers from being too repetitive and the environment design, and gameplay do not change a lot from level to level.

Figure 4. Bombjack gameplay

- <u>Outside references and activities</u>: Inspiration is also taken by daily activities such as trips to the supermarket, where we wish to collect all the products we need while facing the difficulty of not knowing where the products are, dodging all the people and shopping carts during peak hours and wanting to complete this process as fast as possible. "Powerups" in this situation come from finding a supermarket clerk that helps us find the products we need faster, finding a supermarket checkout with no one in it, and being in the possession of a car or bicycle to carry the groceries home faster. Additionally, activities like playing darts relate to the notion of practicing your aim, and playing dodgeball mimics the experience of trying to avoid being hit by the ball that is thrown against you.

Figure 6. Darts

Figure 7. Dodgeball

Figure 5. Shopping at a supermarket

In our game we intend to capture the qualities of each one of these games and create a fun gameplay, that does not get too repetitive but still features familiar mechanics and controls for the player not to feel "lost" during the game.

Also given our alien theme, our game story can relate to extraterrestrial documentaries, from the "Discovery Channel", where people claim to have seen UFOs, to have been abducted and studied by aliens, and old monuments like the pyramids being built by beings from outer space.

Player Personas

Ferdinand Persona

Gender: Male

Age: 47

Background: Born in Lisbon, plays with his friend group since childhood.

Profession: Poet

Favorite Games: Moon Patrol, Space Invaders

Currently Playing: Flappy Bird

Player Type: Achiever, Conqueror,

Interests: Spaceships, Illuminati, Astrology

Context of Play: Plays alone in the evening and plays against his friends when they stop by.

Goals: Plays to relax and to pass the time

Activities: Defeats aliens, writes poems, makes new friends

Knowledge: Knows some games, not a hardcore gamer.

Skills: Methodical, organized, never gives up

Limitations: Bad at competition games, friends always completely take over

Christine Blacksmith

Gender: Female

Age: 44

Background: Born in Malveira, started playing in college. Known as *JLo from Malveira*.

Profession: Entertainer

Favorite Games: Pacman, Guitar Hero, Pictionary, Monopoly

Currently Playing: Singstar

Player Type: Socializer, Achiever, Survivor

Interests: Business Management, Talking Loudly, Making TV Shows

Context of Play: Plays alone but streaming to audiences. Collaborates with other streamers.

Goals: Plays to earn money.

Activities: Screaming at screens, Getting High Scores

Knowledge: Has good knowledge of games.

Skills: Persistent, High Achiever, Good Vocal Range

Limitations: Bad at fast pacing games.

Imane Poki

Gender: Female

Age: 26

Background: Born in Morocco. Twitch Streamer.

Profession: Streamer

Favorite Games: Fortnite, League of Legends

Currently Playing: Among Us

Player Type: Socializer, Conqueror,

Interests: Playing games, Streaming, Pokémon

Context of Play: Plays alone most of the time but enjoys playing with friends

Goals: Plays to have fun and pass the time.

Activities: Streaming, playing games, Getting headshots 360 no-scope

Knowledge: Expert gamer

Skills: Good reflexes, good eye to hand coordination

Limitations: Bad at puzzle games.

Play Scenarios

First Scenario

Ferdinand is waiting for his friend, Richard Kings, to come over for dinner. He has his computer on to search for a recipe but gets bored and just orders food. While he waits he decides to play the new game that his other friends told him about – a casual 2D side scroller game called Cow Stealer. Because he's alone, Ferdinand chooses the single-player mode, astonished at the beautiful pixel art of the game. He is taken through a little cutscene displaying the basic premise of the game. He finds it very exciting to take part in the otherworldly cow-stealing conspiracy. The first level begins. An angry-looking farmer steps in and starts throwing hay blocks at the UFO Ferdinand controls. He quickly understands the game mechanics and steals more than the necessary number of cows, earning the maximum rank of three stars. He is very pleased with the result. It was a fun level, but now he has to choose which level to do next. Unfortunately, his friend arrives and he has to put the game on hold.

Second Scenario

Christine Blacksmith made a mean comment about Imane Poki on a stream. Imane decided to settle the score by challenging her to a gaming battle. They couldn't agree on a game where both of them would have a similar level of skill or experience, so they took a suggestion from the fans – Cow Stealer, a fun 2D scroller game with a versus mode. They met in person for the competition. Some provocations were exchanged but they tried to keep it PG. As the game started, Imane complained that Christine was talking loudly and preventing her from enjoying the background music. They used the very reliable system of rock-paper-scissors to decide who would be who. For the first level, Christine would play as the UFO and Imane as the farmer. They both quickly understood the mechanics of each playable character, but Imane was so good at throwing hay blocks that Christine barely scored any points. She complained it was luck, that it was easier to play the role of the farmer. So, for the second level, they switched roles. Christine still got destroyed by Imane, proving that the playable characters were well balanced. With a 2-0-win streak against Christine, Imane was crowned the winner by the audience watching the stream.

Third Scenario

Christine was very upset that she wasn't particularly good at fast-paced games, so she decided to beat all levels of Cow Stealer with the highest scores possible (to show Imane Poki who's boss). Unfortunately, she didn't have much time because of her busy work schedule. She played the first level. It took some tries to get the 3 stars rank and she ran out of time for the day. Fortunately, Cow Stealer is a casual game that doesn't need to be completed in one sitting. Christine ended up playing and replaying the levels until she achieved her goal of being the best Cow Stealer player in existence. At the end of the game, Christine felt very proud of her playing abilities and decided to challenge Imane Poki for round two.

Conceptual Models

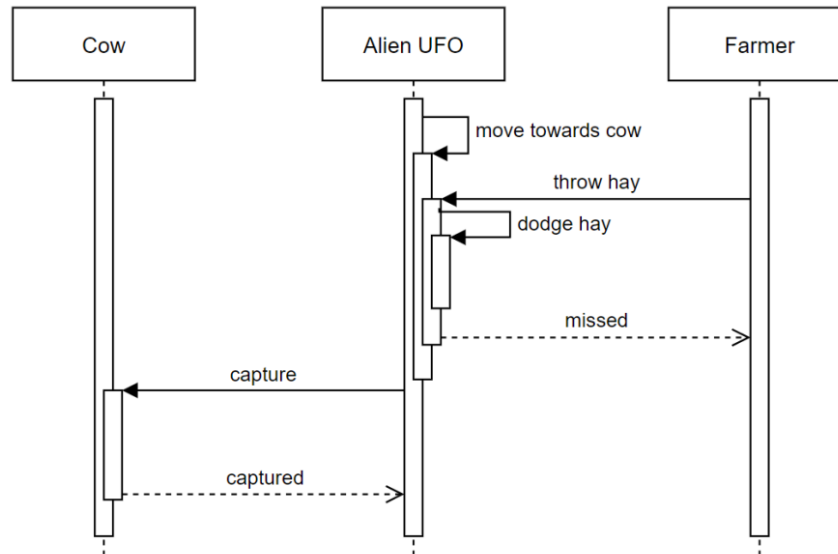- Capturing a cow and dodging farmer attacks example (Sequence Diagram):

Diagram 1. Sequence Diagram for Capturing a cow

- Entity relations: (Note: not all instances are specified. For example, there might be more animals or special attacks)
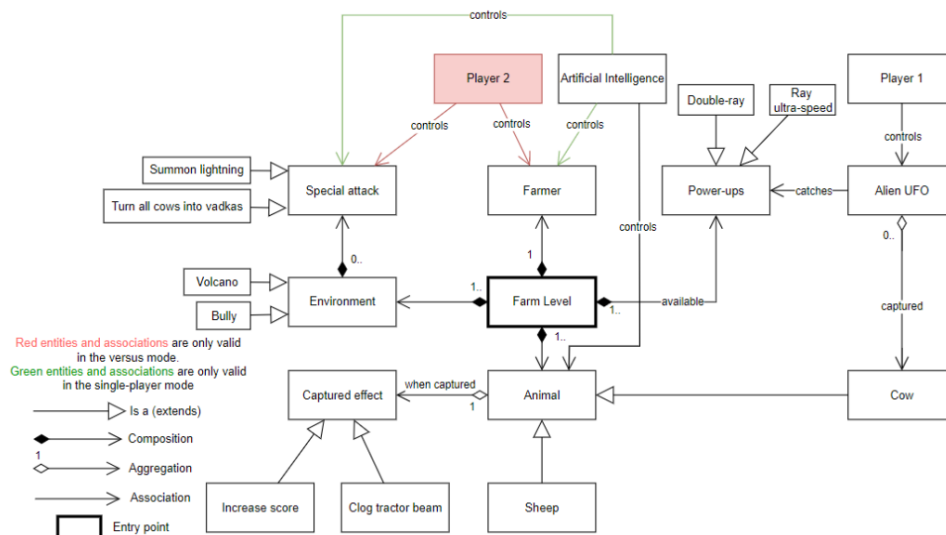

Diagram 2. Entity-relation diagram

- **Simple Gameplay State Diagram** (single player): In the following diagram, we show what happens from the point where a player selects a level to the point where the level ends. This is "Simple" because we're not considering more complex gameplay aspects such as catching power-ups that change the state of the UFO, as that would create a very complex and hard-to-read diagram.
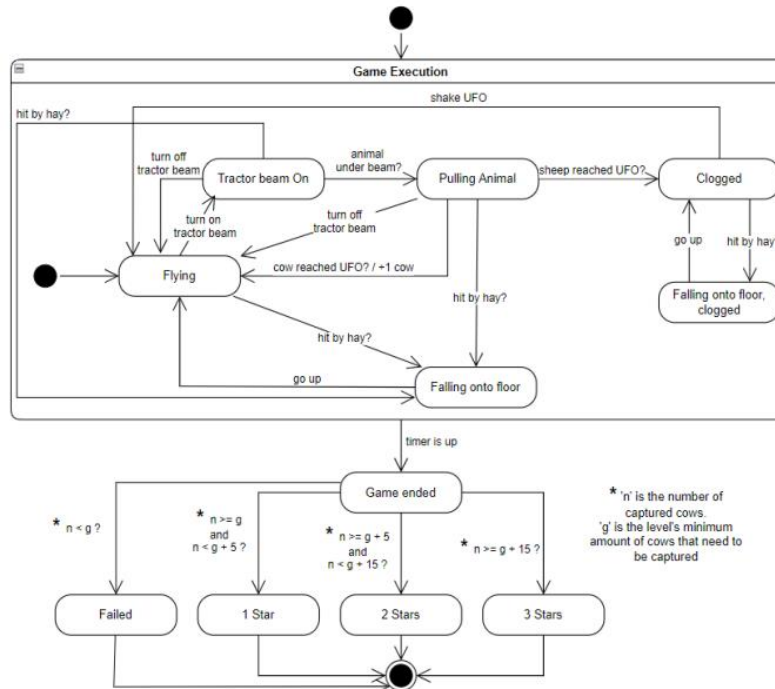

Diagram 3. Gameplay State Machine

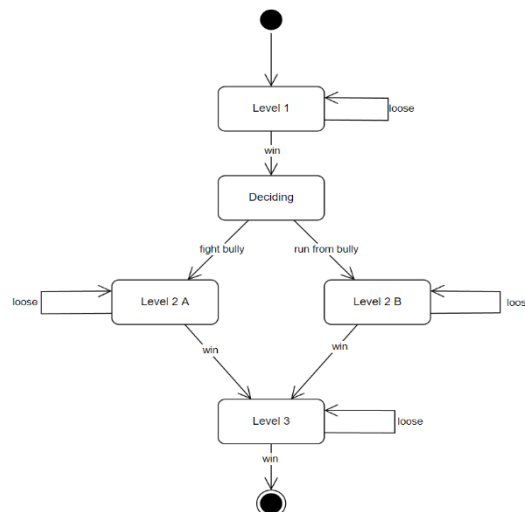- **Going Through the Levels State Diagram:**

Diagram 4. Levels State Machine

Core Gameplay Loops

- Level selection and surpassing:
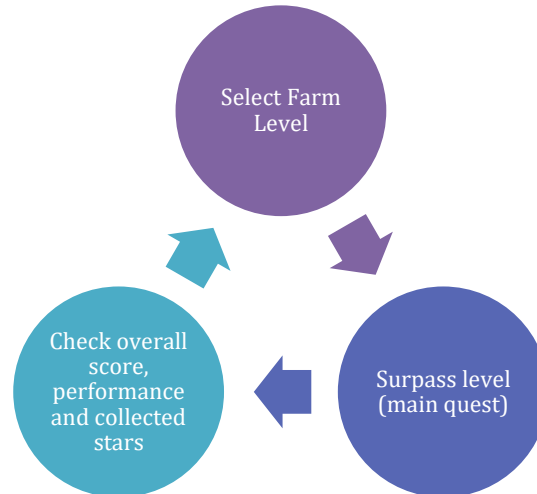
Diagram 5. Basic Gameplay Loop

Level selection is one of the main loops of our game. The players select the farm level that they wish to play, then after surpassing this level a game board will appear with a review of the player's performance during the game with the number of gathered cows and the amount of earned stars. After this the player can choose to either continue playing and select another level or exit the game.

- Main Quest - Pass Levels (Obstacles, Events): Single Player

Diagram 6. Single Player Main Loop

The main quest includes a general gameplay where the player must try to move towards the cow, while dodging the attacks thrown by the farmer. Throughout the game, the player can pick up "power up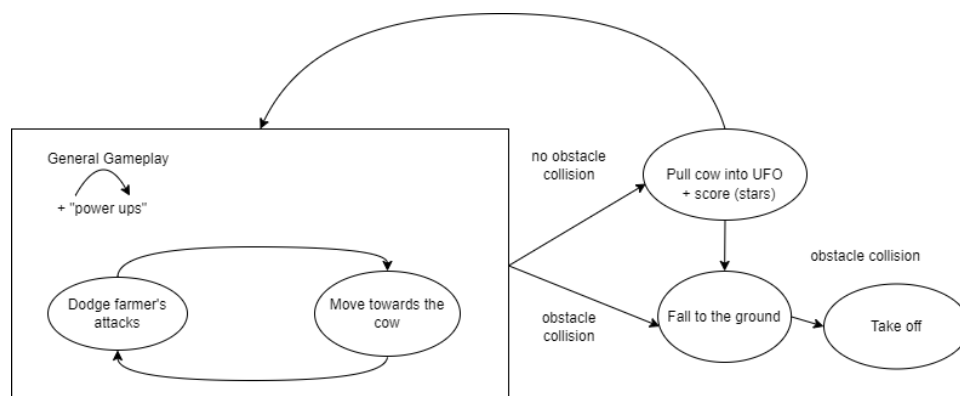s" that increase the player's power temporarily. If the player is pulling a cow and gets by a block of hay, he drops the cow and falls to the ground and must take off to air again. Otherwise, the player collects the cow and increments the cow counter. By the end of the level the amount of collected cows will reflect the player's score and the number of earned stars.

Core Gameplay Modes:

Versus Mode:

Table 1. Actions for both game modes 1

Player 1 (UFO)	Player 2 (Farmer)
Moves towards cows	Selects attacks direction
Dodges attacks	Launches attacks
Gets hit	Fills up special attack meter in each hit
Pulls cows	Launches special attacks
Picks up power ups	Gets hit by block and hay (Player 1 has "Ultra UFO powerup")
Repeat	Repeat

In the versus mode, player 1 maintains the same gameplay as described above but player 2 has now the ability to control the farmer. As a farmer, player 2 can select in which direction he wishes to throw the hay block and launch the attack. Every time player 2 hits player 1, a bar meter will fill up, and when it is full, player 2 can launch the farmer's special attack. If player 2 hits player 1 with a hay block but player 1 has the "Ultra UFO powerup", player 1 will launch back the hay block against the farmer and the farmer stays stunned temporarily.

Storyboards

Storyboard 1 – Game Experience Overview

The player Ferdinand Pessoa decides to play the 2D side-scroller game "Cow Stealer".

Ferdinand chooses to play in single mode, instead of the versus mode while he waits for his friend.

The story of the game starts: "The US goverment has enlisted the help of aliens in order to ...

... save the planet from the eminent danger of cows. The aliens' task is to snatch as many cows as possible"

The first level starts. The commands are shown on the screen. Ferdinand hits "continue".

As the game starts, Ferdinand moves and activates the alien's beam in order to snatch cows while dodging attacks from the farmer.

The level ends. Ferdinand steals more than the necessary number of cows, earning the maximum rank of three stars.

Ferdinand is taken back to the main menu, where he can explore the rest of the levels. At this point his friend arrives and he leaves the game.

Storyboard 2 – Main Quest Gameplay (Single mode)

The game starts. The commands of the game are illustrated by an image.

The player moves left, right, up and down in order to get closer to the cows and snatch them.

The owner of the farm is not happy with the player's invansion and throws blocks of hays to attack the alien.

The player is able to dash, dodging the farmer's attacks

The farmer launches another attack.

The player isn't able to dash and gets hit by a block of hay.

The player's spaceship falls down to the ground.

After a few seconds, the player is able to start the spaceship back again and continue playing.

The alien gets hit by a block of hay while snatching a cow.

The cow falls immediately to the ground and the player does not capture it.

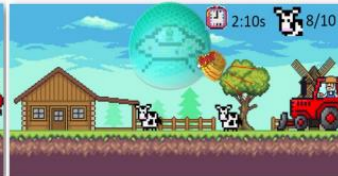The spaceship falls on the ground once again.

After a few seconds, the player starts the spaceship back again and continues playing.

The player catches a "powerup".

The powerup is the Ultra UFO.

This powerup blocks the farmer's attacks …

… and throws back the block of hay against the farmer, stunning him temporarily.

The time has run out and since the player didn't capture the minimum number of cows necessary to pass the level, they lose.

Storyboard 3 – Level Star System

The game is about to end and the Alien has only captured 8 cows.

Capturing 8 cows was under the level's goal, so the player has failed its mission.

Or

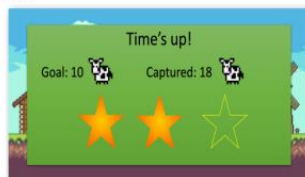The game is about to end and the Alien has captured 11 cows.

The player scores 1 star, since it captured 11 cows.

Or

Or

Situation 3

Situation 4

The game is about to end and the Alien has captured 18 cows.

This time, the player captured 18 cows, so it scores 2 stars.

Or

The game is about to end and the Alien has captured 23 cows.

The player attains the maximum score of 3 stars, since it captured 23 cows.

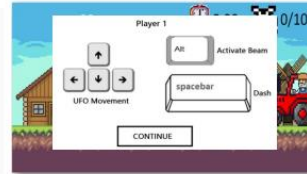Imane Poki challenges Cristina Blacksmith to play Cow Stealer in versus mode.

Imane Poki chooses to play in the versus mode with Cristina Blacksmith.

The commands of the game for Imane Poki appear on the screen. Imane plays as the alien.

The commands of the game for Cristina Blacksmith appear on the screen. Cristina plays as the farmer.

The game starts. Cristina Blacksmith playing in the role of the farmer, directs her attacks at Imane Poki (the alien).

Cristina Blacksmith hits Imane Poki with a block of hay.

Cristina's ability meter fills with each attack that sucessfully hits the alien.

As Cristina's ability reaches a 100% she is awarded a special attack.

Cristina Blacksmith launches her special attack, which consists of animals falling from the sky and landing on the ground. If Imane Poki captures animals that aren't cows, the alien's beam becomes clogged.

The game ends and the scores of both players are displayed on the screen. The star system of the farmer is similar to the star system of the UFO. In the case of the farmer, the number of stars are related to the number of times that the farmer was able to hit the alien.

Control and Presentation

- First, we explain what actions can be done in the scope of the world of the game:

UFO:	Movement (Primary Actions):	Move Up, Down, Left and Right.
		Dash.
	World Interactions (Contextual Actions):	Catch Cows and other animals.
		Pick up "Powerups".
		Get hit by obstacles and attacks.
	Level Selection Menu Interactions:	Move Up, Down, Left and Right.
		Select/Replay Levels.

Farmer:	Attack and Special attack (Primary Actions)	Select the direction of the attack.
		Launch Primary Attack.
		Launch Special Attack.
	World Interactions (Contextual Actions)	Fill up special attack bar meter.
		Hit UFO.

- Controls:

  - The controls of the UFO:

Figure 5. Single Player controls

  - The controls of the UFO in the Level Selection Menu:

Figure 6. Level Selection controls

o   The controls of the farmer in the versus mode (Player 2):

Figure 7. Versus Mode controls

- Controls to Action:
  - o   *UFO*

Control Key / Interaction	Action
Up Arrow	Move Up
Down Arrow	Move Down
Left Arrow	Move Left
Right Arrow	Move Right
Space Bar	Dash
Alt	Abduct Cows
Go through "Powerup"	Pick up Powerup
Enter	Play selected level on the Level Selection menu

  - o   *UFO in the Level Selection Menu*

Control Key / Interaction	Action
Up Arrow	Move Up
Down Arrow	Move Down
Left Arrow	Move Left
Right Arrow	Move Right
Hover over farm	Enter window to select level
Enter	Play selected level

  - o   *Farmer (VS Mode)*

Control Key / Interaction	Action
Direct Mouse Cursor	Choose Attack Direction
Left Mouse Button	Shoot Hay
Right Mouse Button	Launch Special Attack
Hit UFO	Fill Special Attack Meter

- **Presentation**:
  - Regarding the presentation of our game, the level world's background will be side scrolling but the camera will stay fixed on current scene.
  - During the game, the following information will be displayed:
    - Single Player Mode:
      - Player controls panel
      - Number of abducted cows.
      - Minimum number of abducted cows to complete level (Goal).
      - Level duration timer.
      - Powerups.
      - Overall cows and stars score panel.
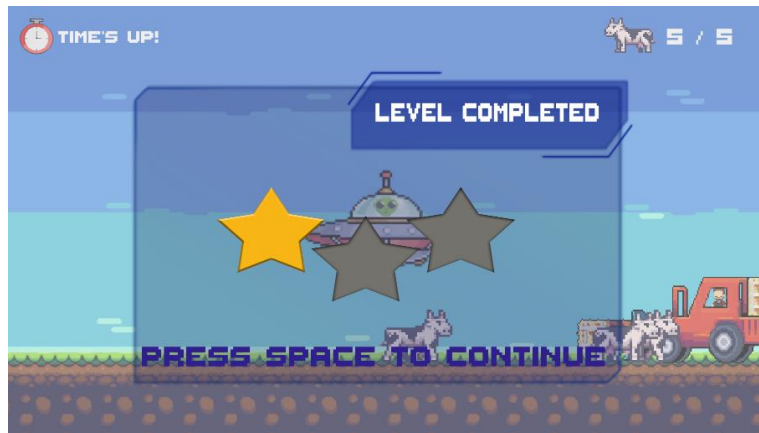

Figure 8. Basic level design

Figure 9: Overall cows and stars score panel

    - VS Player Mode: In this mode, the previous information is still displayed, as well as
      - Players controls panel.
      - The farmer (Player 2) hit counter.
      - Minimum number of hits against the UFO (Goal)
      - Special attack meter bar.
      - Overall score panel of both players.
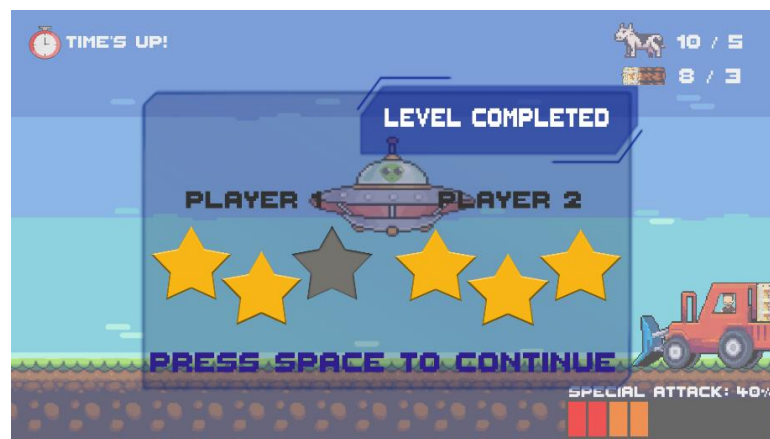
Figure 10. Versus Mode level design

Figure 11. Versus Mode Score panel

- Level Selection Menu:
  - ➢ Navigation controls.
  - ➢ Farm levels.
  - ➢ Level pop-up with star score.

Figure 12. Level Selection Pop Up

Progression

- **Player Progression:**

Single Player

- Level Up: The player must abduct cows during the game to pass to the next level. There is a minimum number of cows to unlock the next level, which corresponds to one star in the star score system. The player has the option of improving their score by replaying the level and gathering more stars. The game will become progressively harder as the player goes through each level.

Abducted Cows	Gathered Stars
5 cows	1 star
10 cows	2 stars
15 cows	3 stars

One iteration of game corresponds to going through all the 5 levels sequentially. The current level unlocks the next level and so on.

The difficulty of each level will depend on the attack intensity of the farmer and the level's obstacles and interactions diversity.

The number of collected stars reflects the type of ending the player will get at the end of the game. This is because the number of collected stars is directly proportional to the number of temperature degrees lowered on planet earth and increased in alien planet.

One of our goals is to help less experienced players to dodge obstacles and complete the level. For this we added "Powerups" that temporarily increase the player's abilities. Also, the player is not obligated to collect all the 3 stars of each level to pass it. It only requires one star to get to the next level. On the other hand, for more experienced players, they will still feel challenged by wanting to collect the maximum number of stars possible.

Versus Mode

Level Up: Player1 must abduct cows during the game, while Player 2 must hit Player1 with blocks of hay to pass to the next level. There is a minimum number of cows or hits to unlock the next level, which corresponds to both players getting globally at least one star in the star score system. Both players have the option of replaying the level to improve their individual scores.

Hits	Player 2 Stars
5 hits	1 star
10 hits	2 stars
15 hits	3 stars
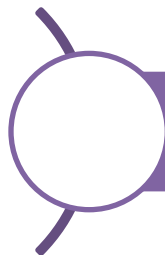
Once again, our goal is to help less experienced players to hit the UFO. For this we added a bar meter that fills up each time the farmer hits the UFO. Once the bar is full, player 2 gets to launch a special attack during a defined duration of time.

Story connection:

Our background story aims to emerge our player more with its character. By simultaneously being tasked to save planet earth and its own planet, the player should feel more empowered and motivated to complete the game. Also, since the collected number of stars reflects the type of ending the player will get at the end of the game, this should motivate the player to retry the level and get better scores in order to unlock a better ending.

- **Game progression**

Background Story:

The game starts with a cut scene that describes its backstory, as shown below, and a small animation that illustrates the story.

THE YEAR IS 2050. HUMANS HAVE MANAGED TO CONTROL GLOBAL WARMING WITH STATE-OF-THE-ART TECHNOLOGY. HOWEVER, A BIG THREAT REMAINS: COWS! HUMANS CAN NOT STOP EATING THEM. FOR THIS REASON THE NATIONAL INTELLIGENCE AND DEFENSE OFFICE HAS TASKED YOU TO HELP SAVE THE WORLD!

PRESS SPACE TO CONTINUE >>

Figure 13: Backstory overview

Level sequence:

The players go through the five levels in the map as indicated in the image bellow. The collected stars per each level appear on the popups of the farms, corresponding to the levels.

Start Level: Standard gameplay of our game. The UFO tries to abduct the maximum number of cows while dodging attacks from the farmer. Some cows will run away from the UFO while others will not care. There will be powerups throughout the level the UFO can catch in order to enhance its abilities. This gameplay will be the basis for all the following levels.

➤ *Versus Mode*: The farmer's special attacks consist on an increase attack rate.

Barn Yard Level: Other farm animals, such as, pigs and chicken will be present in this level. If the UFO captures pigs or chickens, they will explode obstructing the screen with feathers or bacon.

➤ *Versus Mode*: The farmer's special attacks consist of spamming the farm with even more chickens and pigs.

"Vadkas" Level: In this level, cows will be either overweight or drunk. Overweight cows take longer to pull, while drunk cows will blur the screen once captured.

➤ *Versus Mode*: The farmer's special attacks consist of feeding normal cows or making them drunk.

Bully Level: An old high-school alien bully appears. This alien will steal cows from the player.

➤ *Versus Mode*: The second player plays as the second alien against player 1 and the farmer goes back to being controlled by AI.

Boss Level: A number of natural catastrophes will take place, such as, thunderstorms, wind and volcanic eruptions.

➤ *Versus Mode*: The farmer's special attacks consist of having control over these natural catastrophes.

Figure 14: Level Sequence path

COW STEALER

| In-between levels cutscenes: | At the start of each level a small cutscene will appear to explain the environment and small backstory of the new level. |

| Final cutscene: | At the end, depending on the player's star score an ending cutscene will take place. This cutscene encompasses a small animation that illustrates the ending to our story and the player's performance on its initially assigned task. |

- o Difficulty:

Level	Goal
Start Level	The player gets a first glimpse of how the game works. This level works as a tutorial for the player.
Barn Yard Level	In this level the player starts to deal with added difficulties. In this case the player must avoid chickens and pigs.
"Vadkas" Level	The added difficulty consists of dealing with the challenge of slow pulling cows and blurred screen.
Bully Level	The difficulty increases as the player must now battle with another alien challenger.
Boss Level	Most difficult level. The players will be confronted by several natural catastrophes.

Personas Experience Matrix and Time Window:

Scenario 1 - Single-Player Mode

Ferdinand Persona: Ferdinand has some experience playing video games. Even though Ferdinand is not the most hardcore kind of player, he still likes to achieve most of the goals the game has to offer. This way he may not achieve the highest score right away, but he does replay some levels in order to improve his score.

Metrics	Start Level	Barn Yard Level	"Vadkas" Level	Bully Level	Boss Level	Total
Time	2 mins	2 min	3 mins	3 mins	5 mins	15 min
Replays	1	0	2	2	4	9
Abducted Cows	16	15	13	11	12	67
Feelings	Entertained	Surprised	Challenged	Excited	Nervous	-
Stars (Level)	3	3	2	2	2	12

Scenario 2 - Versus Mode

- **Christine Blacksmith (Plays as the Farmer):** Cristina is not a very good player at fast-paced games, she has some difficulties. However, she is a persistent person and is willing to try again, even though, she loses a lot.

Metrics	Start Level	Barn Yard Level	"Vadkas" Level	Bully Level	Boss Level	Total
Time	5 mins	6 mins	6 mins	7 mins	9 mins	33 min
Replays	4	5	5	6	8	28
UFO Hits	7	6	6	5	5	29
Feelings	Insecurity	Fear	Fear	Nervous	Rage	-
Stars (Level)	2	2	2	1	1	8

- **Imane Poki (Plays as the alien):** Imane is a skilled player and since she has good reflexes and coordination she enjoys challenging games, as well as conquering all the players that play against her. Even though she played as many times as Cristina, the replays number of this scenario corresponds to how many times she had to repeat the level to get the stars presented below.

Metrics	Start Level	Barn Yard Level	"Vadkas" Level	Bully Level	Boss Level	Total
Time	1 min	1 min	2 mins	2 mins	3 mins	8 mins
Replays	0	0	1	1	2	4
Abducted Cows	20	16	15	15	15	81
Feelings	Relaxed	Surprised	Entertained	Hyped	Challenged	-
Stars (Level)	3	3	3	3	3	15