

## **Course 301 Investigative Studio II**

Name: Bree Tait

Student Number: 270147104



Bachelor of Software Engineering (Level 7) 360 Credits

CS301 Assessment #2 IDD

Supervisor: Ranju Raveendran

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## **Project Description and Format**

"Kaitiaki", is an immersive educational game aimed at fostering environmental awareness and conservation. This document serves as a comprehensive guide outlining the goals, objectives, schedule, team responsibilities, and technical specifications for the development of "Kaitiaki". Through this IDD, a clear roadmap is provided for the successful creation and implementation of the game, ensuring alignment with our overarching vision of inspiring players to become stewards of the environment. From conceptualization to deployment, each phase of development will be meticulously planned and executed. Overall, the goal is to create a game that not only entertains but also educates and empowers players to have an improved awareness about sustainability within New Zealand.

### **Goals and Objectives**

Create an immersive and engaging educational game experience that raises awareness about environmental conservation and sustainability. Generate a sense of empathy and responsibility towards the environment among players, answering the research question: *"To what extent can playing a game about sustainable practices change attitudes and increase awareness about New Zealand's biodiversity in real life?"* The outcome of this project should provide players with a fun and interactive way to learn about ecological concepts, such as biodiversity, ecosystem management, and climate change adaptation.

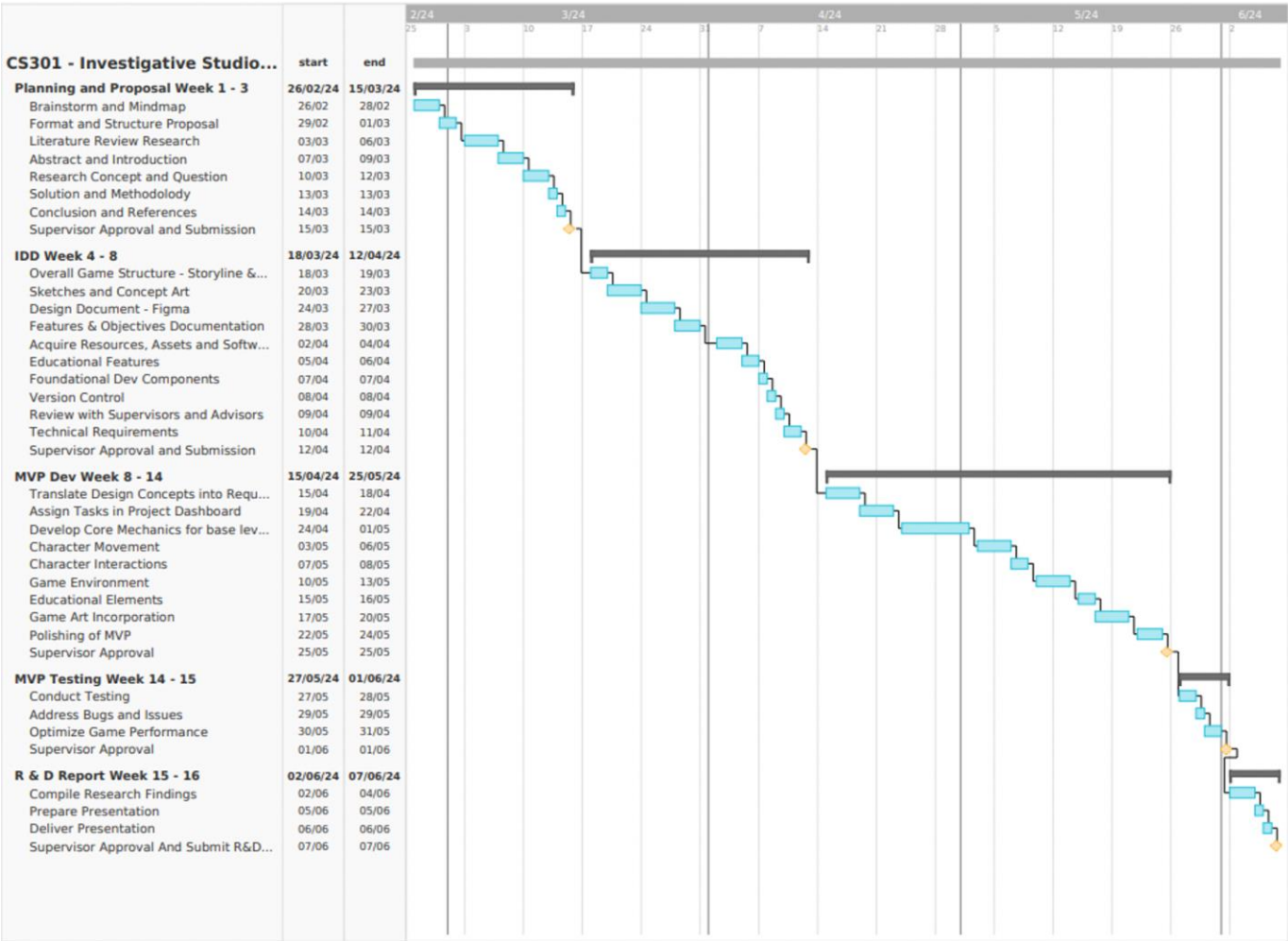
#### **Objectives:**

- Develop a captivating storyline and game world that immerses players in the role of environmental guardians ("Kaitiaki") tasked with solving ecological problems.
- Design gameplay mechanics that blend entertainment with educational content, incorporating interactive elements and puzzles that teach players about ecological principles.
- Conduct user testing and iterate on game mechanics and content based on player feedback to ensure alignment with educational objectives and player preferences.
- Measure the impact of the game on player knowledge, attitudes, and behaviors related to environmental conservation through surveys and analytics.

- Continuous iteration and expansion of the game with new content, features, and challenges to keep players engaged and motivated to learn and enhance the User Experience of the game.
- Complete analysis of Research question to measure project success.

Timeline and Schedule Constraints

The timeline below outlines the key milestones and tasks to be completed over CS301.



Below, I have specified a more detailed timeline for the Intergrated Development Document portion of CS301.

|                               |   |
|-------------------------------|---|
| Week 1 (March 21 - March 25): | <ul style="list-style-type: none"><li>- Define project goals and objectives based on the submitted proposal.</li><li>- Begin drafting the SRS document, focusing on functional and non-functional requirements.</li></ul>   |
| Week 2 (March 28 - April 1):  | <ul style="list-style-type: none"><li>- Continue refining the SRS document, incorporating feedback and suggestions.</li><li>- Develop use-case diagrams for functional requirements.</li><li>- Develop class diagrams and activity diagrams.</li></ul>  |
| Week 3 (April 4 - April 8):   | <ul style="list-style-type: none"><li>- Complete the SRS document, ensuring comprehensive coverage of requirements.</li><li>- Conduct a review of UI/UX modeling approaches and tools.</li><li>- Research for a style guide</li><li>- Start sketching and creating lo-fi wireframes for the user interface.</li></ul>   |
| Week 4 (April 11 - April 15): | <ul style="list-style-type: none"><li>- Progress to hi-fi wireframes, refining the visual design and user experience.</li><li>- Conduct usability testing of wireframes to gather feedback for improvements.</li><li>- Begin outlining the tools and technologies to be used for application development.</li></ul>   |
| Week 5 (April 18 - April 19): | <ul style="list-style-type: none"><li>- Finalize UI/UX modeling, incorporating feedback from usability testing.</li><li>- Conclude the documentation phase with the completion of all necessary diagrams.</li><li>- Review the timeline and schedule for any necessary adjustments or refinements.</li><li>- Present PowerPoint showing the document, prototyping and findings of user testing.</li></ul> |

### **Team Members Responsibilities and Contributions**

As the only team member, it is imperative to be responsible for all tasks required to complete this development project. It is essential to manage time effectively and prioritize tasks based on their importance and deadlines. Also, seeking feedback from supervisors and potential players can help refine ideas, gain assurance, and ensure this project's success.

#### **Project Manager:**

- Overseeing the entire development process.

- Creating and maintaining the project schedule and timeline.
- Setting project goals and objectives.



**Game Designer and Writer:**

- Developing the game concept, storyline, outsourcing and crediting creative works when needed.
- Designing game mechanics.
- Creating character designs and environments.
- Balancing gameplay elements for an engaging experience.

**Developer:**

- Programming the game using the chosen game engine and programming language.
- Implementing game mechanics, user interfaces, and interactions.
- Debugging and troubleshooting issues during development.
- Optimizing performance for various platforms.

**Quality Assurance (QA) Tester:**

- Conducting playtesting sessions to identify bugs, glitches, and gameplay issues.
- Providing feedback on game mechanics, difficulty levels, and user experience.
- Ensuring overall quality and polish before release.

***Feature List for MVP***

- Character movement controls (e.g., arrow keys, WASD)
- Basic interaction with environment (e.g., object interaction)
- Simple quizzes through interactions with NPC's
- Goal-oriented tasks or objectives for players to complete

**Educational Content:**

- Integration of educational concepts related to the game theme (e.g., environmental conservation, problem-solving)
- In-game tutorials or hints to teach players about game mechanics and educational content
- Collection of knowledge shown through journal entries

**User Interface (UI):**

- Clean and intuitive UI design for easy navigation and story immersion
- Menu system for pausing and accessing educational resources

**Audio and Visuals:**

- Atmospheric background music and sound effects to enhance immersion
- Original Audio recorded from real life communities
- Simple, yet engaging visual elements, including character sprites, environments, and animations
- Visual cues and indicators to guide players through the story

**Interactive Elements:**

- Interactive objects and elements within the game environment (e.g., birds, people, plants crucial to storyline)
- Non-player characters (NPCs) with dialogue and interactive behaviors

**Progression and Rewards:**

- Collection of in-game items or tokens as rewards for exploration and achievement

**Performance Optimization:**

Efficient coding practices to ensure smooth performance across different devices and platforms

Testing and optimization of game mechanics and features to minimize bugs and glitches

Compatibility with various screen sizes and resolutions for optimal user experience

**Feedback and Testing:**

Regular playtesting sessions to gather feedback from audience

Iterative development process based on user feedback to refine and improve gameplay experience

## ***Tools and Technologies***

**Game Development Engine & Programming Languages:** C# programming language In Unity Game Engine were chosen based on experience, accessibility, and suitability to 2D side-scrolling games.

**Project Management Software:** Notion is a valuable tool which will be an online hub and portal for resources, timelines, and the task dashboard to keep track of productivity and deadlines.

[Notion Team Space Link](#)

**Graphic Design Software:** Based on cultural contexts it may be difficult to source certain game elements, however most visual features will be able to be sourced from royalty free assets available on the Unity Engine Marketplace. For wireframes and UI elements Figma will be used to illustrate basic elements.

**Audio Software:** Story is critical to this project's success so voice actors may be used from within the Māori community. Music and sound effects will be sourced from royalty-free assets available online and recorded from areas within the Bay of Islands.

**Data Collection and Analysis Tools:** Google forms serves as a reliable source of data collection via surveys and questionnaires.

**Version Control System:** GitHub will be used for version control.

## **SRS Document**

This section of this document outlines the essential specifications for *Kaitiaki*. It defines both functional, non-functional requirements, and Diagrams serving as a guide for developers and stakeholders. This document ensures a clear

understanding of the project's goals and requirements, facilitating successful development and implementation.

### ***Functional Requirements***

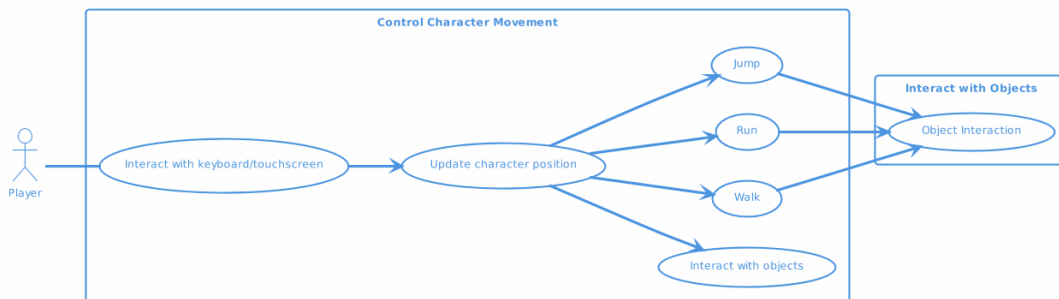
- *Player Movement:* The game must allow players to control the movement of the main character using keyboard input – WASD or arrow keys. The character should be able to walk and interact with objects in the game environment.
- *Journal Mechanics:* The game should feature interactive birds and plant life that can be logged onto the journal once found. Objectives will also be listed within the journal.
- *Educational Content Integration:* The game must incorporate educational content related to the chosen theme or subject matter. Educational concepts should be seamlessly integrated into gameplay mechanics to provide meaningful learning experiences for players. Each objective should introduce content to keep players engaged and learning.
- *Feedback Mechanisms:* The game should provide feedback to players to guide them through challenges and reinforce learning. Feedback can include visual cues, audio cues, hints, and messages that help players understand their progress and performance.

### ***Non-functional Requirements***

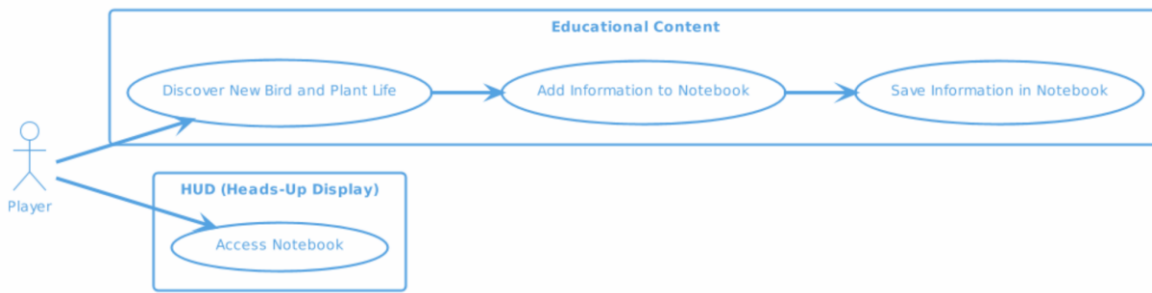
- Performance: The game should load quickly and run smoothly on a variety of devices, including computers, tablets, and smartphones. Response times for player actions should be minimal to ensure a seamless gaming experience.
- Usability: The game should have an intuitive user interface that is easy to navigate and understand, even for players with limited gaming experience. Controls and interactions should be responsive and accessible, with clear instructions provided to players as needed.
- Scalability: The game should be designed to accommodate future updates and expansions, including additional dialogue, features, and educational content.

### ***Use Case Diagrams***

1. *Control Character movement*: The player interacts with the game system to control the movement of the main character, fulfilling the requirement for character movement in the game. The precondition to this is that the game is running, and the main character is spawned in the game environment



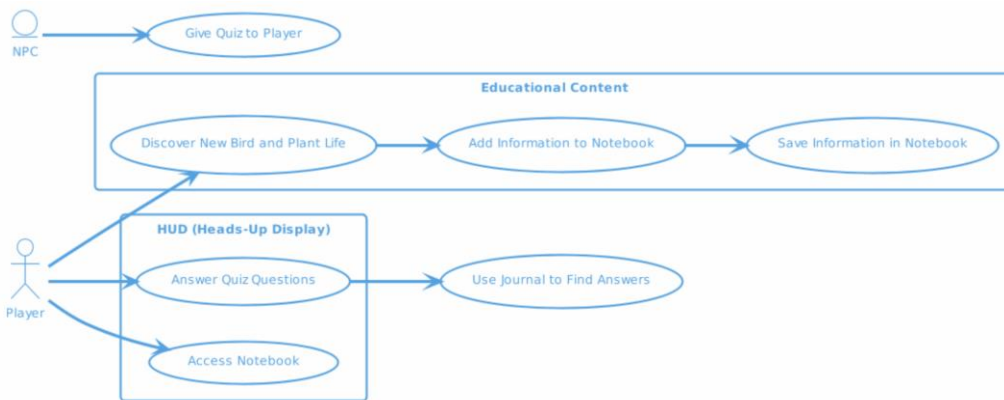
2. *Plant and Birdlife Interaction and Collection*: The diagram includes the functionality for saving information in the notebook and accessing it from the HUD (Heads-Up Display). After adding information to the notebook, the system saves the data using the process "Save Information in Notebook." The HUD provides an interface for players to access the notebook, allowing them to review the information they've collected at any time during gameplay.



3.

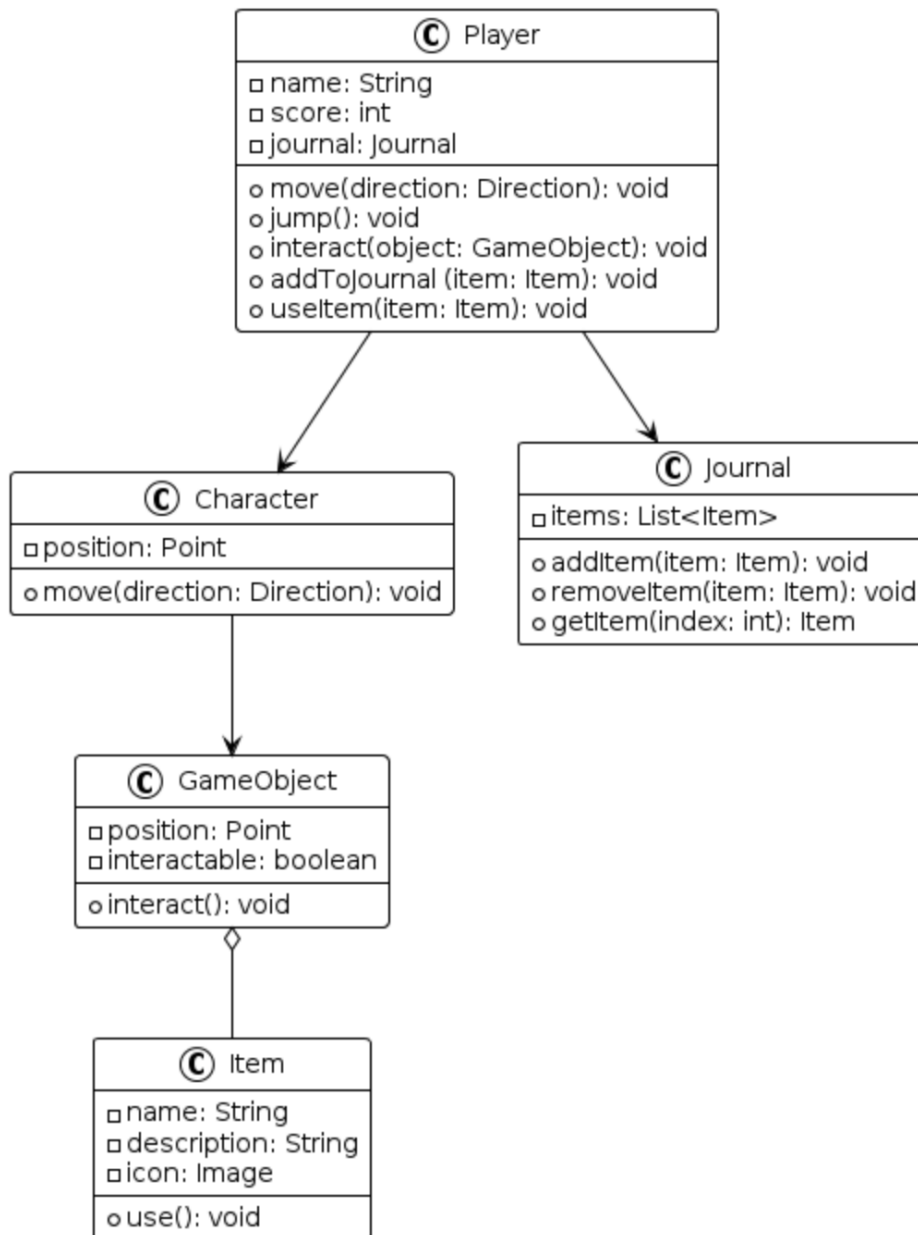
*NPC Quiz to*

*learn:* Non-Player Character entity, represented by "NPC," which gives quizzes to players. Players interact with the NPC to receive quiz questions. To answer the quiz questions, players must use the journal to find the necessary information about certain birds. The process of answering quiz questions involves utilizing the journal to locate the answers



## Class Diagrams

### Player and Character Classes



move(direction: Direction): Allows the player to move in a specified direction.

jump(): Enables the player to jump.

interact(object: GameObject): Allows the player to interact with game objects.

addToJournal(item: Item): Adds an item to the player's journal.

useItem(item: Item): Allows the player to use an item from their inventory.

#### 1. Player Class:

Attributes:

name:

Represents the name of the player.

score: Stores

the player's score in the game.

journal:

Represents the player's journal, where information about birds and plants is stored.

Methods:

#### 2. Character Class:

Attributes:

position: Represents the character's position in the game world.

Methods:

move(direction: Direction): Allows the character to move in a specified direction.

### 3. Journal Class:

Attributes:

items: Represents a list of items stored in the journal.

Methods:

addItem(item: Item): Adds an item to the journal.

removeItem(item: Item): Removes an item from the journal.

getItem(index: int): Retrieves an item from the journal based on its index.

### 4. Item Class:

Attributes:

name: Represents the name of the item.

description: Provides a description of the item.

icon: Stores the image/icon associated with the item.

Methods:

use(): Defines the action performed when the item is used.

### 5. GameObject Class:

Attributes:

position: Represents the position of the game object in the game world.

interactable: Indicates whether the game object is interactable by the player.

Methods:

interact(): Defines the interaction behavior of the game object.

The relationships between classes are indicated by the arrows:

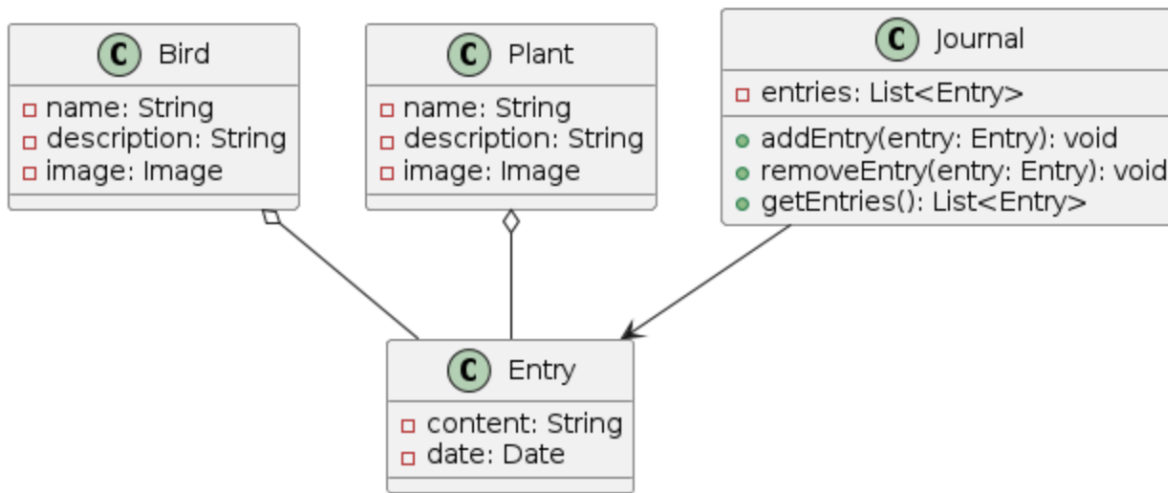
Player has a relationship with Character and Journal.

Character has a relationship with GameObject.

GameObject has a composition relationship with Item.







1.

#### **Bird Class:**

Attributes:

- name: Represents the name of the bird.
- description: Provides a description of the bird.
- image: Stores the image/icon associated with the bird.

#### **2. Plant Class:**

Attributes:

- name: Represents the name of the plant.
- description: Provides a description of the plant.
- image: Stores the image/icon associated with the plant.

#### **3. Journal Class:**

Attributes:

- entries: Represents a list of entries in the journal.

Methods:

- addEntry(entry: Entry): Adds a new entry to the journal.
- removeEntry(entry: Entry): Removes an entry from the journal.
- getEntries(): Retrieves all entries from the journal.

#### **4. Entry Class:**

Attributes:

content: Contains the content or information related to the entry.

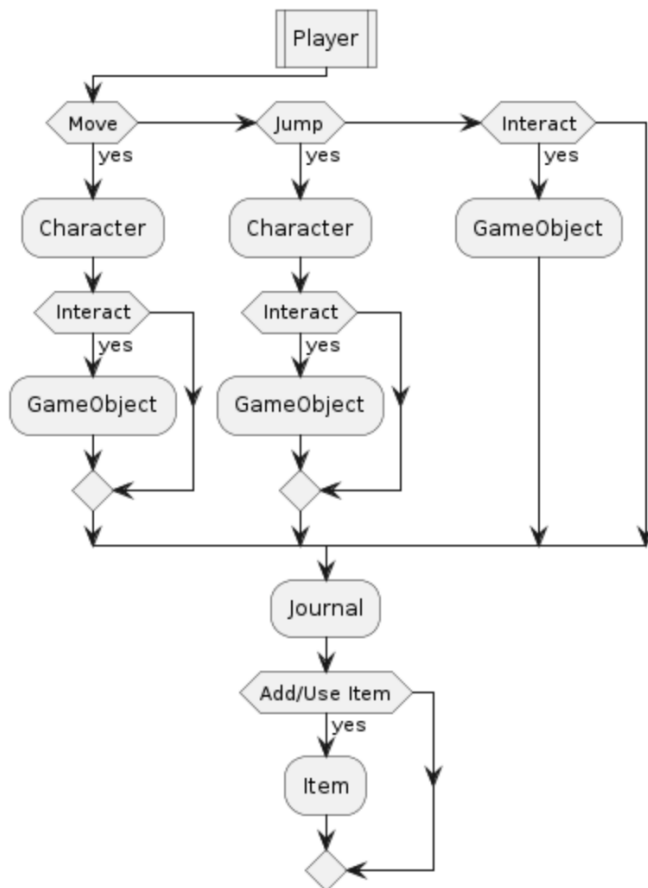
date: Represents the date/time when the entry was made.

- The relationships between classes are indicated by the arrows:
- Bird and Plant classes have a composition relationship with the Entry class, indicating that each Bird or Plant entry in the journal consists of content and a date.
- Journal has an association relationship with Entry, indicating that it contains multiple entries.

## Activity Diagrams

### Player interaction with the Game Environment.

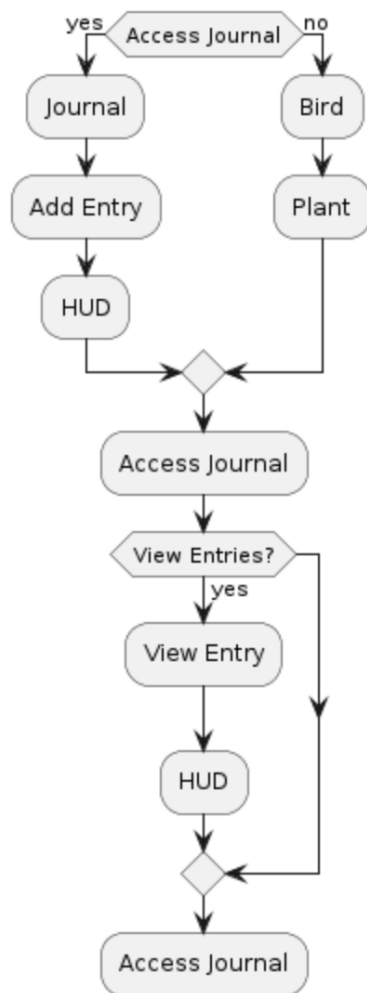
- If the player chooses to move, the character's activity is initiated. If interaction is required, the game object's activity is executed.
- If the player chooses to jump, the character's activity is initiated. If interaction is required, the game object's activity is executed.
- If the player chooses to directly interact with an object, the game object's activity is executed.
- Throughout these activities, the player interacts with the journal to add or use items when necessary.



### Player Journal Access

- If the player chooses "yes" to access the journal, they are directed to the Journal where they can add an entry based on a wildlife interaction
- After adding an entry, they return to the HUD.

- Regardless of the initial choice, the player can then choose to access the journal again.
- If the player decides to view entries, they are directed to view the entries in the journal and then return to the HUD.

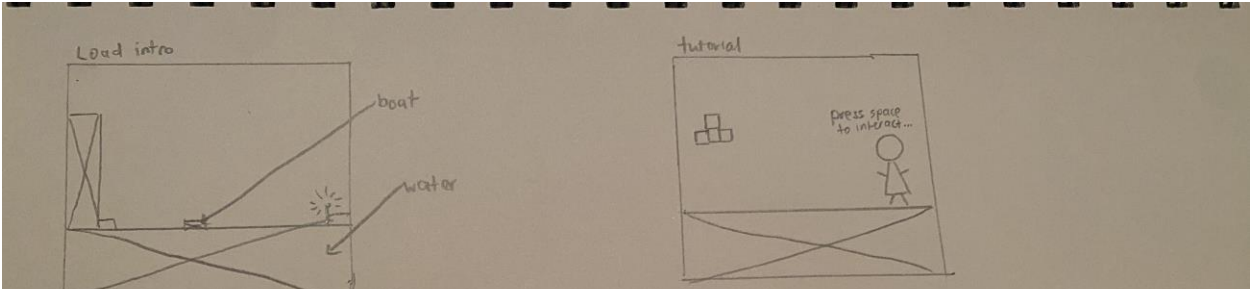


## UX/UI Modelling

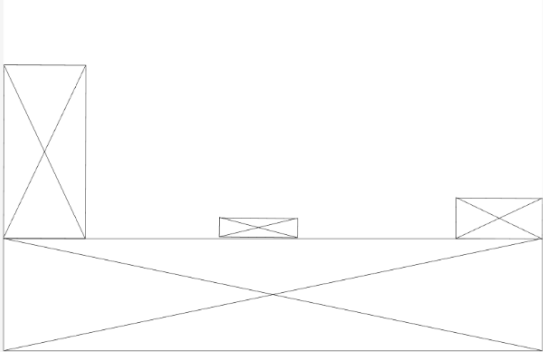
This section of this document outlines the Lo-fi and Hi-fi Wireframes for *Kaitiaki*. This will act as a guideline for future development, showing potential art styles, UI, and UX elements required for a successful outcome. The user testing completed will cover technical, visual, overall feeling of the project and other crucial variables assessing its efficacy. The results from this will be analyzed thoroughly and provide valuable insights that may improve further development.

**Figma link:** <https://www.figma.com/file/dGQYrzPptSaxWwwqi1UpDn/Kaitiaki?type=design&node-id=0%3A1&mode=design&t=K92dciduJSN53o8n-1>

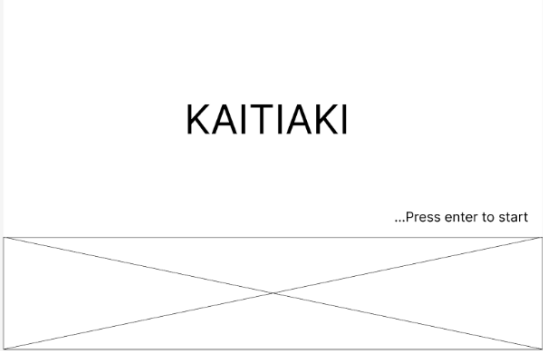
## Sketches and Lo-fi Wireframes



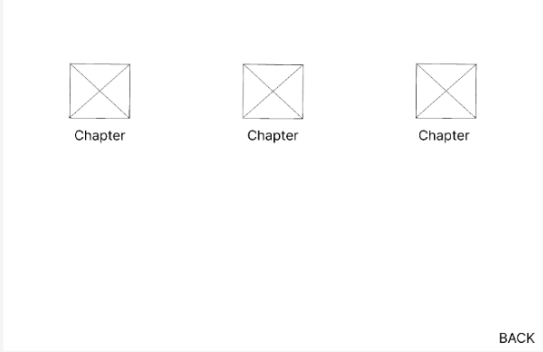
Load Intro



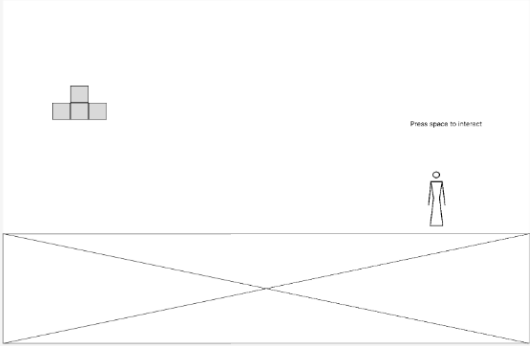
Title



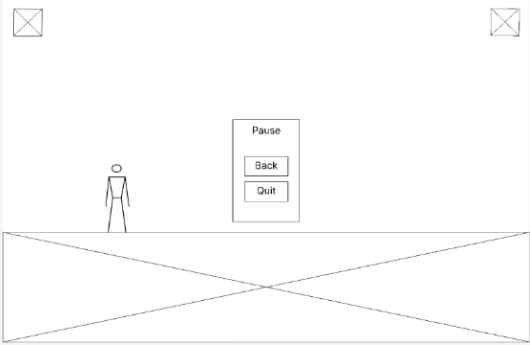
Checkpoint



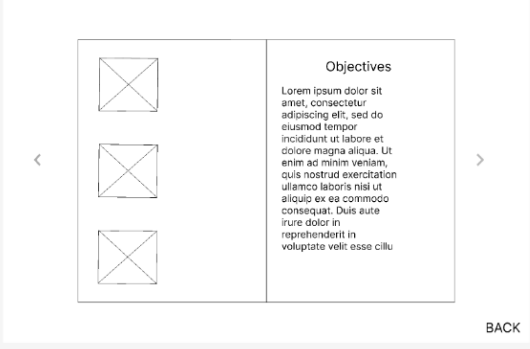
Tutorial



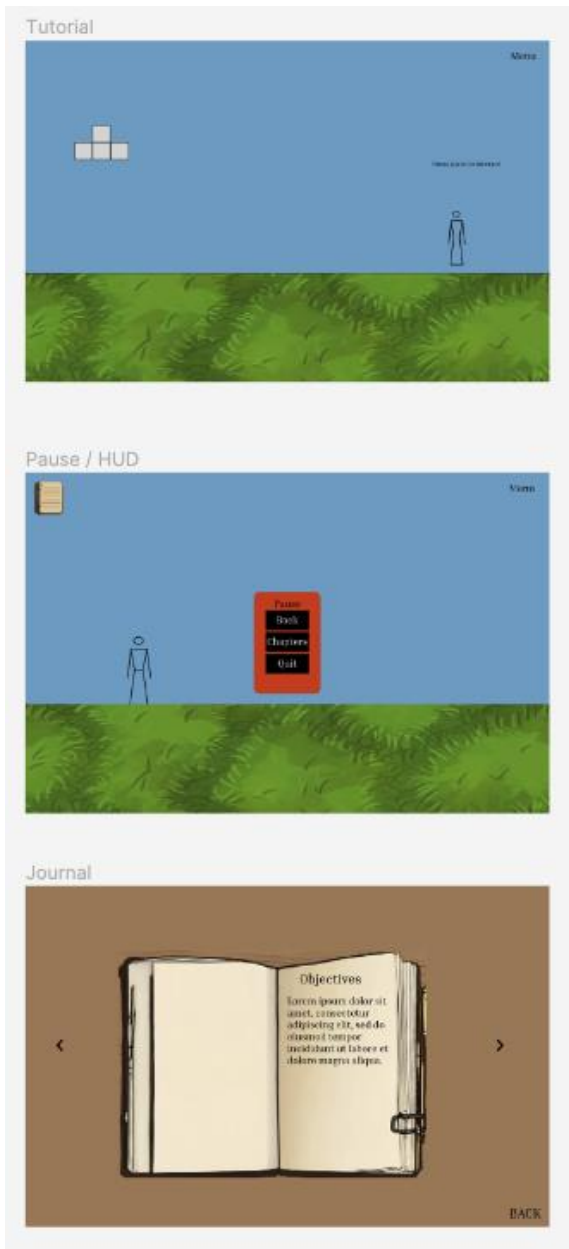
Pause / HUD



Journal



## Hifi Wireframes



## ***Usability Testing***

For User testing a range of questions designed to elicit valuable insights into participants' perceptions and preferences. Through a series of thoughtful inquiries, we aimed to gather feedback on various aspects of the visual design, including colour choice, recommended additions, emotional resonance, genre interpretation, and font preference. By engaging participants in critical evaluation, we sought to refine and enhance the wireframes to ensure they effectively convey the intended aesthetic, mood, and genre of the game. This introduction sets the stage for a comprehensive exploration of user perspectives, providing invaluable guidance for the iterative design process.

- 1. Do you find these colours pleasing?**
- 2. If you could add anything, what would you recommend?**
- 3. What sort of feelings do you get from this image?**
- 4. What sort of genre do you think this game is just from the looks?**
- 5. Do you like the font? If so what about it?**



## Questionnaire Responses:

Christian - Flat mate

Technology literacy: competent

### **1. Do you find these colours pleasing?**

I love them! Natural and earthy

### **2. If you could add anything what would you recommend?**

Maybe some darker ones to help balance the image

### **3. What sort of feelings do you get from this image?**

It gives me a nice feeling, a cool summer day and the boat makes me think of travel and new beginnings.

### **4. What sort of genre do you think this game is just from the looks?**

A life sim or something like that

### **5. Do you like the font? If so what about it?**

I think it's ok I think it could tie into the game a bit more.

Rebbeca - Co-woker

Technology literacy: average

**1. Do you find these colours pleasing?**

I love green and blue I think they are nice, very relaxing

**2. If you could add anything what would you recommend?**

Flowers or maybe some birds.

**3. What sort of feelings do you get from this image?**

Reminds me of the west coast where I'm from. I lived by the ocean.

**4. What sort of genre do you think this game is just from the looks?**

Is seems very charming it's definitely not a horror or anything like that. Maybe like a farming game.

**5. Do you like the font? If so what about it?**

Yeah the font is nice not sure what it means

Toby - friend of a friend

Technology literacy: average

**1. Do you find these colours pleasing?**

They are ok just looks like the ocean

**2. If you could add anything what would you recommend?**

You could put some clouds in?

**3. What sort of feelings do you get from this image?**

Reminds me of staring at the ocean

**4. What sort of genre do you think this game is just from the looks?**

Is it an rpg? Or an adventure game?

**5. Do you like the font? If so what about it?**

Sure I can read it

Andy - acquaintance

Technology literacy: advanced

**1. Do you find these colours pleasing?**

I think they look great the deep blues give an emotional look to the image

**2. If you could add anything what would you recommend?**

Maybe some waves in the ocean to make it look more dramatic.

**3. What sort of feelings do you get from this image?**

It looks like the start of a story book, or the beginning of journey. Or maybe an arrival.

**4. What sort of genre do you think this game is just from the looks?**

I would say its a story based game seems a little emotional too

**5. Do you like the font? If so what about it?**

I like it it looks like the title for a story book and does remind me of the font used sometimes for official New Zealand documents.

Sean – Flatmate

Techn0logy literacy – Advanced

**1. Do you find these colours pleasing?**

They are ok. The tones are very cool. There is nothing too bright so it's pleasing to the eye.

**2. If you could add anything what would you recommend?**

I think it's fine as is I can't think of much else to add

**3. What sort of feelings do you get from this image?**

I think it's quite simple but that's not a bad thing. It's giving a calming feeling it's not overwhelming.

**4. What sort of genre do you think this game is just from the looks?**

Is it a drama or story based game? It kinda looks like a children's game maybe

**5. Do you like the font? If so what about it?**

It's ok nothing too special you could change it if needed. Maybe something a bit bolder you could even change the colour.

**Feedback Analysis:**

Based on the provided user test data, here's a summary of the feedback:

Christian (Flatmate):

Enjoys the natural and earthy colours.

Suggests adding darker tones for balance.

Associates the image with feelings of a cool summer day and new beginnings, guessing it's a life simulation game.

Finds the font okay but suggests better integration with the game.

Rebecca (Co-worker):

Likes green and blue colours, finds them relaxing.

Recommends adding flowers or birds.

Associates the image with the west coast and ocean, guessing it might be a farming game.

Likes the font but doesn't understand its relevance to the game.

Toby (Friend of a friend):

Neutral about the colours but suggests adding clouds.

Associates the image with staring at the ocean, unsure about the game's genre.

Accepts the font but doesn't provide detailed feedback.

Andy (Acquaintance):

Appreciates the deep blues and emotional aspect of the colours.

Suggests adding waves for more drama.

Associates the image with the start of a story or journey, guessing it's story-based and emotional.

Likes the font, comparing it to storybook titles and official documents.

Sean (Acquaintance):

Finds the colours okay and pleasing to the eye.

Doesn't recommend any additions.

Associates the image with simplicity and calmness, guessing it might be a drama or children's game.

Thinks the font is okay but suggests something bolder and possibly a different colour.

Improvements:

Colour Palette: Consider adding darker tones for balance, as suggested by Christian.

Visual Elements: Incorporate elements like flowers, birds, and clouds to enhance the scene, as suggested by Rebecca and Toby.

Font Integration: Ensure the font ties well with the game's theme and consider making it bolder or changing its colour, as suggested by multiple users.

Genre Clarification: While most users associate the image with story-based or emotional games, clarifying the genre visually or through accompanying text might help set clearer expectations.

Overall, incorporating these suggestions can enhance the visual appeal and coherence of the game's presentation.

### **Conclusion:**

Based on the feedback gathered from user testing sessions with Christian, Rebecca, Toby, Andy, and Sean, we've got some valuable insights and improvement ideas. Firstly, everyone seems to dig the natural and earthy colours used in the game's visuals, but Christian and Andy reckon we should throw in some darker tones to balance things out. Rebecca and Toby suggest spicing up the scene with extra visual goodies like flowers, birds, and clouds to give it more pop. When it comes to the font, it's generally well-received, but there's a call for making it fit the game's vibe better—maybe by making it bolder or changing up the colour. Plus, there's some confusion among testers about the game's genre, so we might need to make that clearer with some visual cues or text. Overall, taking on board these suggestions, like tweaking the colour palette, adding more visual elements, fine-tuning the font, and clarifying the genre, could really level up the game's visuals and make it more immersive for players.

### *Style Outcomes and Changes*

Through user testing it became apparent that more of a common theme needed to be created regarding the art style based on the prototyping. Below are some inspiration images of the watercolour theme that will be incorporated into the game art using physical watercolour as well as Photoshop tools. This idea was inspired by the game “The Masters Pupil” which was described in [designwanted.com](http://designwanted.com) as a game *where the player experiences the ups and downs of his timeline over the course of the whole game – fragments and emotions are filtered down and portrayed with spectacular visual design, an intricately dynamic as well as emotive soundscape and score.*



# Inria Serif

Inria Sans possesses a sleek and welcoming appearance. Its square shape and compact design render it apt for UI creation. Even when scaled down, it remains easy to read. The bold variant is somewhat delicate, which may not offer a strong emphasis, yet it's perfect for titles and in-game dialogues.

### ***References***

Pimpmytype. (2021, March 26). My thoughts on Inria Sans & Inria Serif. Retrieved from <https://pimpmytype.com/font/inria/#:~:text=Inria%20Sans%20has%20a%20very,and%20running%20text%20as%20well.>

Choraria, N. (2023, August 30). The Master's Pupil: A Game Set Inside the Eye of Monet. DesignWanted. Retrieved from <https://designwanted.com/the-masters-pupil-game-set-inside-eye-monet/>



