Conservatory Catch

Project Development Report for Conservatory Catch

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I Project Description

Conservatory Catch is a mobile application that uses augmented reality to create an educational game promoting interest in the Garfield Park Conservatory and its nonprofit organization, the Garfield Park Conservatory Alliance (GPCA). The game is played while at the conservatory, which promotes increased visits, new visitors, and more donations.

1 Project Overview

In Conservatory Catch, players will be able to walk around the conservatory in real time alongside their character and have random chances of different species appearing. When a species appears, the player has the ability to catch it by playing a minigame, thus building their collection. Players can view their collection to view information on all of their collected species. The end goal of the game is to complete your collection.

2 The Purpose of the Project

The Garfield Park Conservatory programming does not extend into the world of mobile applications. With Conservatory Catch, the GPCA would be able to offer a fresh new way of educating visitors on the different plant species found in the conservatory. The hope is that the game will lead to an increased number of visitors, and an increased number of donations. Donations to the conservatory will greatly contribute to the different programs that the GPCA runs, as well as accessibility (i.e., free programs) to those programs for the youth.

2a The User Business or Background of the Project Effort

The clients of this project are the GPCA, people who like to learn about plants, and gamers. Much of what goes on at the Garfield Park Conservatory runs through the GPCA. This includes education programming, events, and creating resources for visitors. For gamers and people who like to learn, the project serves an exciting new medium for learning about plant species.

2b Goals of the Project

This project serves as a way to enhance and broaden the operations of the GPCA through encouraging donations and visits. While the game is free to play, we hope many players enjoy the game enough to where they feel the conservatory is worthy of a donation. For gamers and those learning about plant species, we want to provide a fun and accessible way of combining augmented reality gaming with learning.

2c Measurement

We will be measuring the increase in donations on a particular cycle, such as week to week. Increase in donations means two different particular measurements. One being

the total amount of money donated to the conservatory, and the other being the frequency of donations regardless of the amount. These two measurements will allow us to gauge changes in donations starting from before the app's launch, to well after.

Players will be able to measure their own success via their collection level. Each new species collected will increase their collection level by one point. We will also track feedback through user surveys, where we can also inquire about the game's accessibility

3 The Scope of the Work

This product will work inside the work's business, that being the GPCA's vision and mission, that being wanting to change people's lives through the power of nature, and that they hope to achieve this by showing them the importance of nature. They use the GPC as their main work, and provide educational programming, events, and resources in order to further achieve their goal.

3a The Current Situation

Garfield Park Conservatory Alliance goes about achieving their goal by providing educational programming, events, and resources to GPC visitors. These programs can vary, taking place at different, specific times, as well as location, and some of them are available for free, while some of them require a fee on the participator's end. Schools are also able to take their class on field trips to the conservatory for free.

The application will serve as another way to further achieve their goal, providing a means to extend the education to every tourist coming to GPC in a fun, interactive manner for free, and at any time in the GPC. It will also help fund future events through donations.

3b The Context of the Work
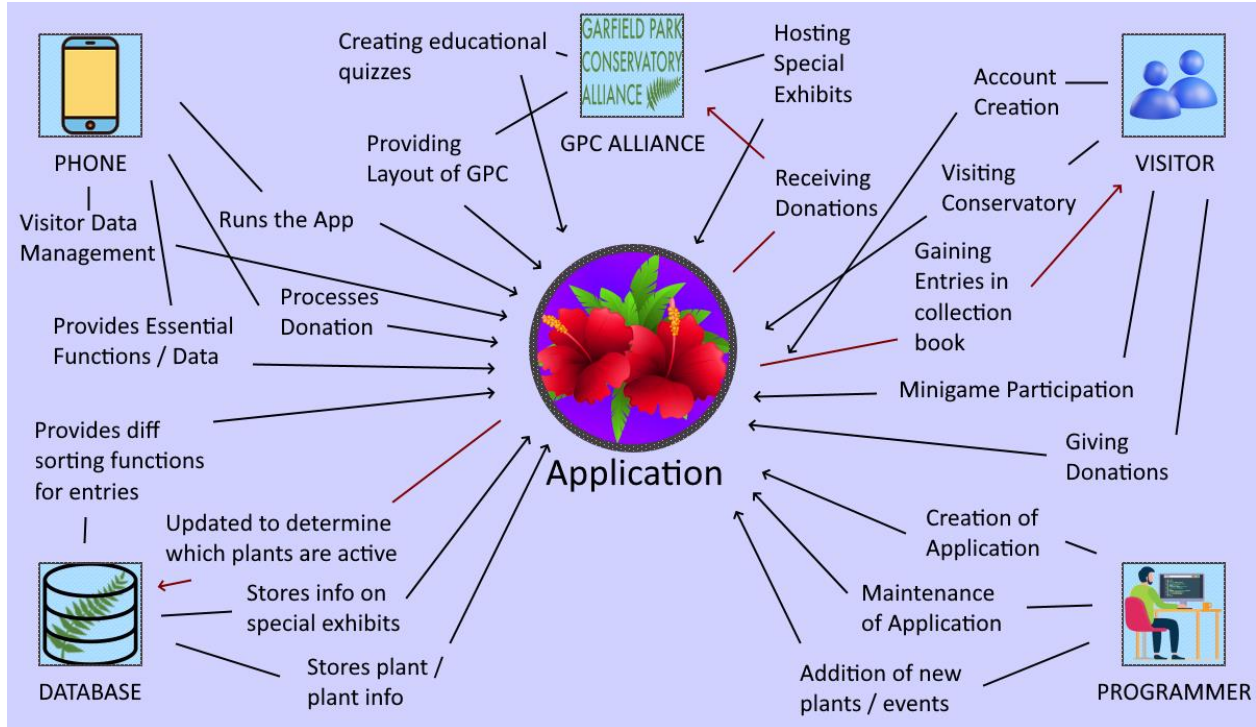
3c Work Partitioning

Business Event List

Event Name	Input and Output	Summary
GPC Alliance 1. GPC Alliance creates educational quizzes 2. GPC Alliance gives the layout of the conservatory 3. GPC Alliance plans and hosts special exhibits 4. GPC Alliance receives donations from visitors	Creating Education Quizzes (in) Providing Layout of GPC (in) Hosting Special Exhibits (in) Receiving Donations (out)	Quizzes will be implemented by programmers in minigames Layout of conservatory used by programmers in creatin app Special exhibits tied to special events in the application Donations to GPCA received by visitors through the app
Visitor 1. Future visitor of GPC create an account on the application 2. Said visitor goes and visits the GPC with account created 3. Visitor participates in the minigames on application	Account Creation (in) Visiting Conservatory (in) Minigame Participation (in)	Creation of account by visitor allows access to app functions Visitor visits conservatory to use app and gain entries Minigames are how visitors gain entries in collection book

4. Visitor gains entries in their collection book on application 5. Visitor gives a donation through the app to the GPCA	Gaining Entries in Collection Book (out) Giving Donations (in)	Entries can show visitor more info on plant caught +fill book Donation given because either enjoy app or + cosmetic item
Programmer 1. Programmer works on creating the application 2. Programmer maintains the application after completion 3. Programmer adds new content to application	Creation of Application (in) Maintenance of Application (in) Addition of New Plants / Events (in)	Creation of application core to being able to use its functions Will need to handle visitor data, ties to the database Addition through new plants and special exhibits, new data
Database 1. Database stores info on GPC's plants 2. Database also stores info on GPC's special exhibits 3. Database gets updated for active plants in conservatory 4. Database provides different sorting functions for entries in collection	Stores Plant / Plant Info (in) Stores Info on Special Exhibits (in) Updated to Determine Which Plants are Active (out) Provides Different Sorting Functions for Entries (in)	Keeps info on GPC plants + can add future ones Info such as runtime, when they happen, special plants, et. Some plants may be seasonal, and some may be added Uses database functions and params to sort the plants, be it by time, if special, other info
Phone 1. Phone manages the visitor's data 2. Phone provides essential functions, such as GPS and camera 3. Phone has the necessary software to run the app 4. Phone uses the visitor's inputs to process and send donation	Visitor Data Management (in) Provides Essential Functions / Data (in) Runs the App (in) Processes Donations (in)	Phone deals with data such as social profile and entries GPS and camera are vital for making the application work Software required to run the app Donation given to GPCA if they like the game or just want an extra cosmetic for profile

3d Competing Products

Competing products do exist, such as the ones listed below, but they do not combine fun, interactions, and availability into one.

- Books on plants
- GPC's events
- Courses on plants

4 The Scope of the Product

This project will allow the following actions to be performed by users:

1. "Login" – allows new players to create accounts and returning players to login to their respective accounts in order to retain all previously earned rewards.
2. "Overworld" – allows players to physically walk through a one-to-one mapping of their environment, using their location data provided by their smart devices, and complete different reoccurring events and challenges in the form of minigames.
3. "Minigames" – allows users to perform specific tasks in order to complete a variety of events spawned in from the overworld, their reward being a new addition to their growing collection of rewards.
4. "Collection" – allows the user to access any rewards gained from the minigames completed in the overworld and retains all completions specific to the currently logged in user.
5. "Exit" – allows the user at anytime to exit the app without losing important data

4a Scenario Diagram(s)

Scenario 1 (User logs in and checks their current collection):
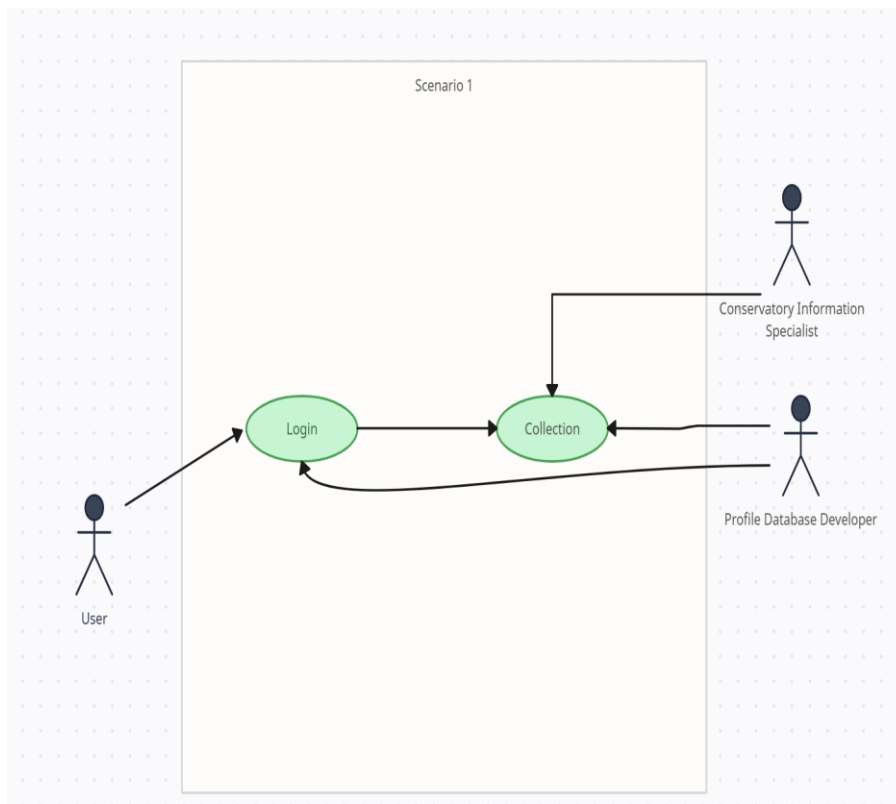
Scenario 2 (User logs in, finds an event in the overworld but exits before completing the game):
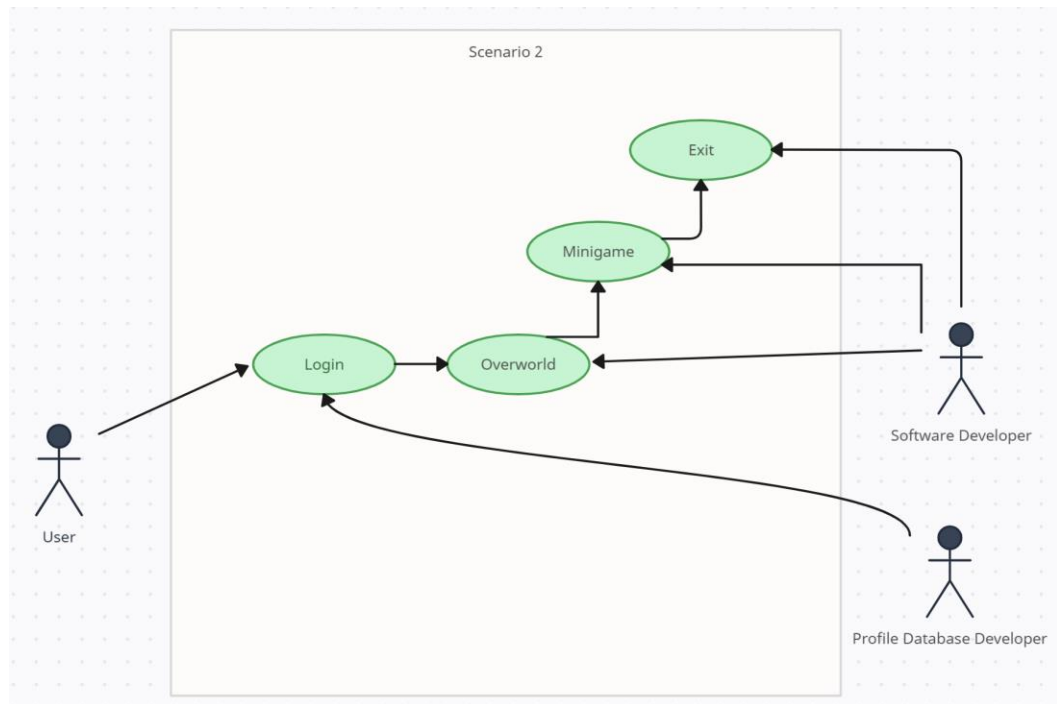
4b Product Scenario List

Scenario Names	Scenario Number	Next Scenario	External Actors
Overworld Scene	1	2	
Minigames Scene	2	3	Conservatory Specialist

Collection Scene	3	4	Conservatory Specialist
Login Scene	4	1	

4c Individual Product Scenarios

1. **Overworld Scene** – Our user, Ryan, enters the conservatory with the app up and running, his location is displayed to him in the form of his real life location casted over a digital map on his phone. He gets to walk around in real life and encounter random events that trigger minigames.
2. **Minigames Scene** – Ryan encounters a random event in the overworld, he taps it. A randomly generated minigame is displayed to Ryan for him to complete. Depending on the results, he may be rewarded with an item for his collection.
3. **Collection Scene** – Ryan, after successfully completing his minigame, enters his collection to view his newly acquired item.
4. **Login Scene** – Ryan, after seeing his newly acquired item, logs out for the day knowing that his data will be saved to his specific login so he may return and continue hunting for more rewards.

5 Stakeholders

5a The Client

- The Garfield Park Conservatory Alliance (GPCA) would be the main benefactor for this application, as this would allow for a different avenue for repeat visitors, leading to a higher potential for donations. A monetization shop can also be introduced down the line, leading to even more avenues for donations.

5b The Customer

Potential customers range from:

- Those who enjoy Augmented Reality style games
- Those who enjoy learning about exotic species
- Those who enjoy collectathon games

5c Hands-On Users of the Product

Hands-on Users of this product will most likely be:

- Conservatory visitors, ages range from children to elderly. It is necessary to have easy to understand UI elements and minigames that are widely accessible to all ages due to novice technology knowledge depending on the visitor.

- New and untrained Conservatory Employees. Assumption that this app can be used as training device as well, for employees to practice their trivia and learn new things they may not be learning on immediately. Assumption that if they are working for the conservatory then their technology prowess and intellect is at the bare minimum, high school level

5d Maintenance Users and Service Technicians

Maintenance users:

1. Debugging Maintenance Users
   i. These users will be tasked with debugging potential errors that may occur when updating the app with new content
2. New Content Users
   i. These users will take client feedback and provide updates for the app in terms of new content (new minigames, different versions of displaying the overworld), and quality of life updates (easier to understand UI design)

5e Other Stakeholders

Potential Stakeholders may include:

- Conservatory Workers: the workers themselves may be impacted both negatively and positively. This app as specified above, could be used to help train new employees, and also help guide guests through the conservatory with information they may not find out via the guides placed there. Yet, if the app does such a good job of guiding users, workers could be phased out entirely.
- Testers: With new content, there will need to be extensive testing concerning each and every new update. Testers would need to understand how to push the game to its limits in terms of not only minigames but also the overworld aspect of physically walking around the map. This would require not only extensive knowledge on programming to determine bugs in the UI/Minigames themselves, but also physical ability to walk around the area and mimic the true user experience.
- Technology Experts: The use of technology cannot be understated in this project. Not every person has the same phone. Technology Experts must be tasked with ensuring that the app will be made available for all devices, regardless of being on IOS or Android.
- Usability Experts: For an app to be truly available for all, usability experts will need to work hand in hand with programmers to determine different how to approach a much broader user experience that has the ability to be played by anyone no matter the physical disability/impairment.
- Exotic Species Experts: This app is meant to help teach users about exotic plant species located in the conservatory, and around the world. If the data isn't accurate,

it would fail to be a benefit to the conservatory and its guests. Exotic Species Experts must be on hand when creating rewards, trivia, and minigames in order to legitimize the content we wish to reward players with. Exotic Species Experts must also maintain a high degree of knowledge so that we ensure this knowledge is passed on to the user.

5f User Participation

Users we be expected to attend weekly meetings where they will update the team on the completion of weekly objectives that pertain to content updates and bug fixes. If potential app breaking bugs pop up, it is expected that all teams will work to fix these bugs immediately before anything else.

5g Priorities Assigned to Users

Key Users: Conservatory workers and the conservatory itself will take highest priority in terms of what is required. It will essentially become their tool to help visitors navigate exotic species, so they must have the highest priority in how that tool takes shape.

Secondary Users: The visitors themselves, specifically repeat visitors, will be the 2nd highest on the food chain, but since users may want things that exit the realm of what the product is meant to do, they cannot come before the key users.

Unimportant Users: Non-visitors that download the app to try will have no priority in terms of what becomes requirements for the app. The whole point of the app is to stimulate visitation, so users that can't meet that requirement won't have a say in any requirement.

6 Mandated Constraints

6a Solution Constraints

<u>Constraint 1:</u>

- Description: This product will be available on mobile devices
- Rationale: The augmented reality style of game we are aiming for will require easy transportation methods in order to convey the overworld style to the user. Mobile devices will allow users to walk around the map physically.
- Fit Criterion: The product will be easily accessible via mobile devices, allowing all users to effectively participate as opposed to being constrained by bulkier technology such as desktop computers.

<u>Constraint 2:</u>

- Description: This product will be available on a mobile platforms (IOS, Android, etc)
- Rationale: If all mobile devices is a goal that must be achieved, then it is imperative that all mobile development platforms contain a version of the application
- Fit Criterion: The product will be available for all devices, not gating off certain financial brackets that may not be able to afford the newest hardware from the most well-known brands.

6b Implementation Environment of the Current System

Conservatory Catch will be developed for mobile platforms using Flutter Framework, this will ensure development for both operating systems used in mobile platforms. Phones will be used to gather location data and project users onto the digital space within the app.

6c Partner or Collaborative Applications

Conservatory Catch, as stated in 6b, will be developed using Flutter Framework as it's primary coding software. Weekly meetings as explained in section 5f, will use Microsoft Office products to present data, such as Word for word documents, and PowerPoint for presentations.

6d Off-the-Shelf Software

Flutter Framework by Google will be an External COTS software used to develop the app.

6e Anticipated Workplace Environment

The product will be developed as a mobile app so the main environment will be a phone app, used in the conservatory.

The workplace can be noisy at times, depending on how many visitors show up on a given day, so audible based minigames may not work as well depending on the atmosphere that day.

The user will be navigating a potentially congested environment so there must be steps implemented to maintain ensure events don't spawn in specifics areas that are dangerous to enter or causes potential health concerns by multiple users piling up to access said event.

6f Schedule Constraints

Product development should expect to take 3 years, with rigorous testing and client feedback, this deadline would allow for time to ensure maximum device reach, allowing the client to encourage the maximum amount of visitor retention. Monetization aspects should be expected to be implemented 6 months after launch,

after a player base can be nurtured and donations for the client can begin to be collected digitally.

6g Budget Constraints

This product is expected to be rather low budget in terms of game development. Considering the fact that this is being made for a non-profit organization, it shouldn't be expected to have hundreds of millions of dollars at disposal. At most, the budget would be estimated to be around 4 million dollars, covering expenses of the development team, and required testing.

7 Naming Conventions and Definitions

7a Definitions of Key Terms

Game Mechanics Keywords

Overworld: This will be the digital representation of the users physical location in the real world. Here the user will be able to interact with other elements of the game

Events: randomly appearing events will populate the overworld, allowing users to initiate different minigames

Minigames: randomly generated sets of games, ranging from encounters to trivia

Minigame Keywords

Encounters: two types of encounters will be used within minigames, one being a battle encounter, the other being a capture encounter

Species: species will be the primary focus of all trivia and encounters. These will be exotic plant species that users can see/learn about at the conservatory.

Trivia: not just any trivia will be displayed in minigames. This trivia must pertain to the exotic species the player encounters in the overworld events.

7b UML and Other Notation Used in This Document

This document generally follows the Version 2.0 OMG UML standard, as described by Fowler in "UML Distilled, 3rd Edition". Any exceptions are noted where used.

7c Data Dictionary for Any Included Models

Species rewards from minigames will stored in a class structure known as the collection class, which will have a primary data member in the form of a map structure, where the key will be the species ID number, and the value will be the trivia/image associated with said species. This collection object will be paired with the player accounts player ID that will then be combined into another map object that will use the player ID as the key, and the collection object as the value. This will be used to store the required data used to identify player logins and accounts.

8 Relevant Facts and Assumptions

8a Facts

The application will be made for Android phones.

The application will be coded in Flutter.

The application will be up and running and maintained for about 2-4 years, depending on GPCA's willingness.

GPCA and the programmers maintaining the application will be communicating with each other at least once a day after the program has been created

8b Assumptions

Any and every visitor who plans on using the app is assumed to be able to read English at a middle-school grade level.

Every visitor who plans on using the app should have a phone that has the necessary components, such as GPS tracking, a touchscreen, and a camera, in order for the application to use to carry out some of its functions. This will also require permission from said visitor access to these functions so the application can utilize them.

Every visitor who plans on using the app should have a phone that is recent enough to have the necessary software to be able to run the app.

Every visitor who plans on using the app should have enough available storage space to download the app.

Every visitor needs to have the app running while they are at the conservatory, and should be able to hold their phone and utilize their touchscreen efficiently enough to properly use the application.

The Garfield Park Conservatory Alliance will provide to us the layout of the conservatory, so that we may use it for GPS purposes, plan out possible spots for users to engage with the application's minigames.

The Garfield Park Conservatory Alliance will provide to us educational quizzes for every plant that they want logged into the database, as well as information on special exhibits and information on special plants that will be logged into the database for that specific exhibit.

The database will be kept up and running, and it will be visitor's responsibility to remember their login information, such as their username and password.

II   Requirements

9 Product Use Cases

9a Use Case Diagrams
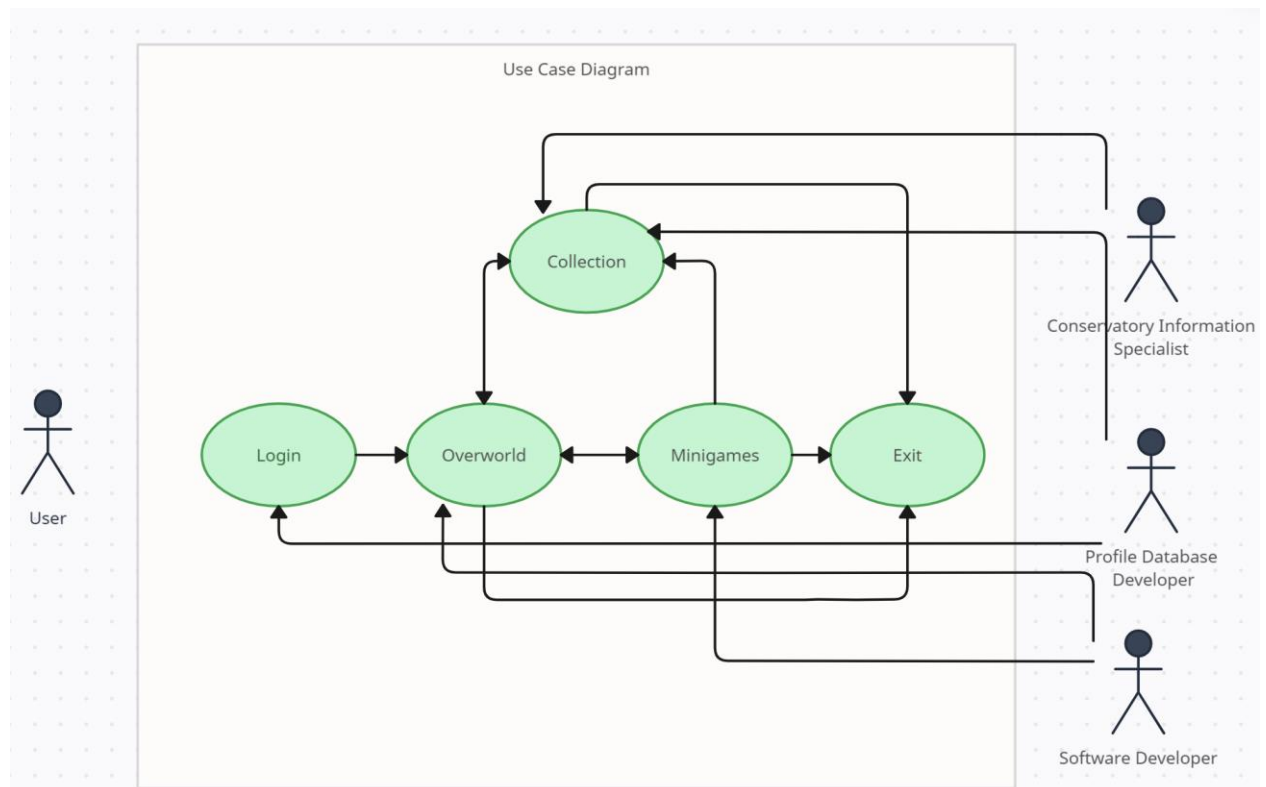
9b Product Use Case List

Use Cases
Login
Overworld
Minigames
Collection

9c Individual Product Use Cases

Use case ID: CCL   Name: Login Case

pre-conditions: (1) User must have an account created.

post-conditions: (1) Once a user logs in, they will be allowed to access their collection and interact with the overworld.

(2) If a user cannot log in, they are prompted to make an account or recover a lost password

Initiated by: User initiating app startup.

Triggering Event: User prompting app to login with user credentials

Additional Actors: An mobile cellular service provider is required as the user will be expected to connect to app servers to verify credentials via the user profile database

Sequence of Events:

1. As the player chooses to open the application.

- Player is greeted with login screen requesting credentials tied to their account

2. The player will then enter their credentials

- The system will cross reference the entered credentials with the profile database holding all player credentials.
- If a user's entered credentials do not match any credentials the system will not allow the user to login until proper credentials are entered
- When correct credentials are supplied, the user will enter the game, starting on the overworld scene.

Alternatives: Users that don't have an account will be directed to how to create one. Users with accounts that cannot remember their credentials will be allowed to enter a recovery process.

Exceptions: Users without an internet connection will not be allowed to log in nor will they be allowed to create any account, since without internet it would be impossible to track user movement on the overworld. Users that have previously logged in will be allowed to enable a saved log in, and skip the login process entirely.

Use case ID: CCO   Name: Overworld Case

pre-conditions: (1) User has logged in with proper credentials.

(2) User has completed a minigame.

(3) User has returned from visiting their collection

post-conditions: (1) User has entered a minigame via an overworld event.

(2) User has entered their personal collection.

(3) User has exited the application.

Initiated by: User interacting with an augmented reality map displaying their IRL coordinates onto a map.

Triggering Event: User will initiate returning to overworld from other scenes like Login, Minigames, and Collection scenes.

Additional Actors: The user must maintain a stable internet connection, via a mobile service provider, in order to accurately update their location on the overworld map.

Sequence of Events:

1. The user has entered the world from the log-in screen.

- The overworld receives the user's GPS coordinates and plots them on a 1 to 1 map of their location, much like Google would when showing your location on Google Maps.
- Once the location is updated on the map, the overworld is populated with random events, that when interacted with will trigger a minigame.

- A button will also appear in a convenient area of the UI, allowing the user to enter their personal collection of items received from minigames.

2. The user interacts with a randomly generated event displayed to them as they walk through the real world.

- The user will be transported to another scene that will display the minigame that has been chosen for them to play, leaving the overworld behind until the user can finish the encounter.

3. The user returns from the minigame and wishes to enter their collection. They press the collection button while on the overworld screen.

- The user will be transported to the collection scene, which will display all rewards earned from minigames/events/encounters.
- The user may return to the overworld and have their location again updated, to accurately reflect any changes while in other scenes.

4. The user has finished playing for the day, the user exits the games.

- Depending on how the user has set up their account log-in, the application will either exit and not store their saved credentials, leading to them to have to reenter them upon opening the application again, or the game will have their credentials saved. Skipping the log-in process.

Alternatives: Users may be allowed to interact with events on the overworld map, simply by clicking on said events as they generate, bypassing the need to physically walk through the map.

Exceptions: In the case of users that wish to experience the app but health problems won't allow them to do so, clearance will be given to allow location updating to be simulated via button presses on the map, as opposed to having to physically walk to new locations that they cannot feasibly access in their condition.

Use case ID: CCC   Name: Collection Case

pre-conditions: (1) A user has a registered account.

(2) A user has completed at least 1 minigame

post-conditions: (1) User will be allowed to view their collection of rewards.

(2) User will be allowed to return to the Overworld in order to continue playing.

(3) User will be allowed to exit the application.

Initiated by: The user wishes to see the rewards they have collected through minigames/events from the Overworld.

Triggering Event: User clicks on the button labeled "Collection" that appears on the Overworld.

Additional Actors: Profile database developers will be in charge of maintaining the profile systems, allowing smooth interaction between log-in and entering their respective collections. They will also be tasked with allowing for user's collections to accurately display their rewards, maintaining all progress made throughout their lifetimes using the application.

Sequence of Events:

1. The user has recently finished a minigame and wishes to interact with whatever reward they may have received, so they press the button labeled "Collection" on the Overworld map.

- Upon button press, the user's rewards will be displayed back to them within a different widget, this widget will double check with the profile data to make sure the user is seeing only what he has unlocked so far.
- The rewards themselves will be able to be interacted with, examined, and trivia pertaining to said rewards will also be displayed to the user.

2. The user, after interacting with their rewards, chooses to either return to Overworld, or exit the application.

- Upon returning to the Overworld, the application will pull the user's GPS location once again, in order to update the map with the location they are now at. Since the user may have changed location since entering the Collection.
- Exiting will work the same as exiting the Overworld Case/Scenario

Alternatives: Down the line, monetization aspects may be implemented in order to help boost donations. Some aspects of monetization that are being considered are allowing users to pay to gain rewards they may have missed out from time specific events.

Exceptions: N/A

Use case ID: CCM   Name: Minigames

pre-conditions: (1) User must have interacted with an event on the Overworld map

(2) User must have a reliable internet connection, as some minigames may require precise server/client-side actions

post-conditions: (1) Once a minigame is completed, the user may exit the application, or return to the Overworld with their rewards.

(2) If the user cannot complete the minigame, the user may exit or return to the Overworld but without the rewards from post-condition (1)

Initiated by: The user sees an event on their Overworld screen and wishes to interact with it.

Triggering Event: The user enters the event through on screen pressing, or physically walking through said event on the Overworld map.

Additional Actors: N/A

Sequence of Events:

1. The user sees an event on their Overworld screen and presses the event to enter the encounter/minigame.

- The Overworld scene changes to whatever randomly generated minigame for that area is pulled from the random scene generator.
- The minigame propagates itself to the user and allows for much deeper interaction between the user and the application, depending on the minigame that is chosen.

2. The user completes the encounter/minigame and a reward is displayed to the user.

- Upon completion, a reward is chosen from a list of potential awards, some locked behind specific minigames, and the rewards are then sent to the player's collection which is saved to the player's profile permanently.

Alternatives: As mentioned in the Alternatives section of the Collections Use Case, monetization aspects lean themselves to allowing for more retries, or even tools that will help conquer minigames that some users cannot complete normally.

Exceptions: N/A

10 Functional Requirements

ID#: F1 – **Name:** Smooth Scene Transition

Description: The application will have a smooth transition back and forth between different scenes

Rationale: Many scenes will be swapped out while playing the game. Scenes like the Overworld will need to seamlessly transition to random minigames, and even to the player's collections. Smooth transitions will be important so that the user experience is not diluted.

Fit Criterion: Transitions must have an obvious flow to them, they cannot have harsh fast swapping of scenes so as long as the presentation doesn't mimic a power point presentation while swapping, it should be fine.

Acceptance Tests: 1

ID#: F2 – **Name:** Player reward tracking

Description: Player rewards will be accurately tracked upon completion/failure of minigames.

Rationale: Users must trust that actions they perform will be backed by rewards or else player retention could fall through due to unreliable reward systems

Fit Criterion: Complete minigames and ensure that rewards are being accurately updated within the collections. Also ensure that players are not rewarded for failing to finish minigames.

Acceptance Tests: 2, 3

ID#: F3 – **Name:** User Location Accurately Updated

Description: User location on the Overworld is accurate to their real-world location

Rationale: One of the main hooks in this game is that it is an Augmented Reality style game, and the feature that takes advantage of that is the Overworld map. If this isn't working correctly then there wouldn't be anything to separate this game from other regular games.

Fit Criterion: Display the location data of a user for testing, if this matches their GPS coordinates then it should mean that the location tracking of the mobile devices is accurately being read into the application

Acceptance Tests: 4

11 Data Requirements
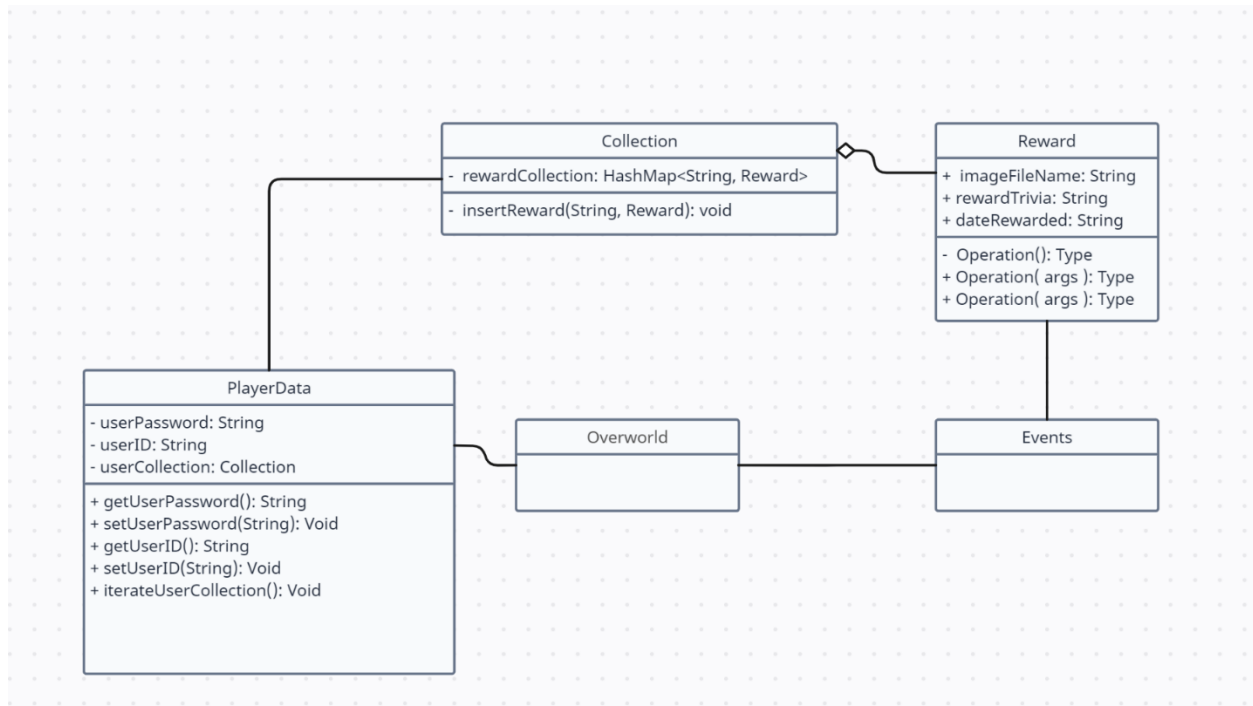
ID#: D1 – **Name:** Reward Naming Format

Description: Rewards are expected to follow a coherent and similar naming format

Rationale: For both Users and Programmers, having a naming format that is clear and concise will allow for a much easier ease of application when trying to differentiate between all the potential rewards, ensuring there aren't any potential duplicates within the HashMap for the Collection

Fit Criterion: Naming formats must use the name of the species being rewarded and include nothing else. If duplicate species exist, follow species name with a sub identifier.

Acceptance Tests: 5, 6

ID#: D2 – **Name:** Unique User IDs

Description: User IDs are expected to be unique to each user.

Rationale: ID log-ins are expected to differ from each other user in order to accurately track each user's data. Repeat names may allow for confusion when the systems checks for valid credentials.

Fit Criterion: 2 ways to accomplish this task, allow for all users to use any names, but specify their login with a unique identifier that trails their given username IE: nick#123. Or don't allow repeat usernames.

Acceptance Tests: 7

12 Performance Requirements

12a Speed and Latency Requirements

ID#: S1 – **Name:** Latency

Description: Latency must not exceed 100 ms

Rationale: In a game with potential to have minigames that rely on effective timing, it would be incredibly detrimental to the player if the latency allowed for unresponsiveness, leading to high levels of player frustration, which would lead to low levels of player retention.

Fit Criterion: Attempt different actions in specific minigames, if any actions don't provide a fast enough response, throw a warning and add to bug report.

Acceptance Tests: 8

12b Precision or Accuracy Requirements

ID#: A1 – **Name:** Actions Accurately Interpreted

Description: Actions performed by the user, primarily touch screen presses, are accurately interpreted by the application

Rationale: Since this game will primarily be played on mobile devices with touch screens, it is imperative that the users actions track correctly when pressing the device.

Fit Criterion: Test user actions via touch screen presses for all actions, thoroughly.

Acceptance Tests: Test 66

12c Capacity Requirements

ID#: C1 – **Name:** Number of Users

Description: Product must be able to handle multiple users playing at once

Rationale: Since this game will primarily be played at the Garfield Park Conservatory, it will be expected to handle many different users stressing out the servers and systems at the same time

Fit Criterion: Rush times would primarily exist between opening at 10 AM – 2 PM, allowing for up to 500 users to be playing at once, in case of school trips and other educational trips that visit the conservatory. Later implementation would include being able to play outside the conservatory, so a higher user limit would need to be achieved to allow for full day/night coverage.

Acceptance Tests: 9

13 Dependability Requirements

13a Reliability Requirements

ID#: R1 – **Name:** Crash Allowance Rate

Description: Application must not allow frequent crashes

Rationale: This game is meant to be a learning tool for users that visit the Garfield Park Conservatory, if it crashed all the time, it would severely hamper the user experience not just concerning the app, but also the experience within the park, as with constant unreliable crashing, visitors would disrupt others in an attempt to find a solution.

Fit Criterion: System failures should be limited to 1 crash an hour, if not 1 crash every few hours of being open. Ideally crashing should be limited to 1 time every 24 hours of game play (the application being opened and used)

Acceptance Tests: 10

ID#: R2 – **Name:** Player Reward Retention

Description: On crashing, any rewards gained from the user completing an event, must be retained on crashing during transitions from minigames to Overworld.

Rationale: Considering the higher likelihood of the application crashing during transitions between minigames and the Overworld, it should be expected that any rewards that were gained prior to crashing will still be retained post-crash.

Fit Criterion: The application should effectively store all player data, prior to scene transitions.

Acceptance Tests: 11

13b Availability Requirements

ID#: A2 – **Name:** 24/7 server availability

Description: Users should be free to visit the Overworld map, and interact with their collections, whether it is during visiting hours or at the comfort of their home.

Rationale: Users should feel a sense of pride in what they have, they may want to view some of their hardest earned rewards while they are at home, or even with friends. 24 hours server availability will allow users to openly access all the data they earned, at any time.

Fit Criterion: Check server availability at all times, alerting developers to any outages that may occur. Peak times will tend to lead to higher server congestion and potentially server failure.

Acceptance Tests: 12, 13

13c Robustness or Fault-Tolerance Requirements

ID#: RF1 – **Name:** Offline Collection Browsing

Description: Users that opt to save their log-in credentials to their specific device, will be allowed to view their collection while servers are offline.

Rationale: Collection browsing is a major selling point to user retention, allowing offline saves for users that opt-in, will allow users to browse their rewards even if the servers are down.

Fit Criterion: Add an offline save of a user's collection, but upon coming back online, only show the user their online collection, and update their offline save back to the online version. This allows for bypassing of potential user exploits, changing their offline collection values somehow.

Acceptance Tests: 14, 15

13d Safety-Critical Requirements

ID#: SC1 – **Name:** Epileptic-free Animations/Transitions

Description: Ensure that animations and transitions are not prone to triggering epileptic seizure

Rationale: Epilepsy is something that can be triggered by intense flashing in media, since this game should be open to everyone, it must consider the chance of provoking this condition.

Fit Criterion: Keep flashing at or below 3 seconds, as any prolonged flashing could lead to higher chances of seizures.

Acceptance Tests: 16

14 Maintainability and Supportability Requirements

14a Maintenance Requirements

ID#: M1 – **Name:** Server Maintenance

Description: Ensure weekly if not daily server maintenance.

Rationale: Server stability is a major aspect to the application running smoothly, so weekly checkups should maintain any problems that may occur

Fit Criterion: Weekly server maintenance checkups to ensure any server congestion/slowdowns are dealt with.

Acceptance Tests: 17

ID#: M2 – **Name:** Broken Maintenance

Description: Ensure any game breaking bugs that crop up are dealt with at the highest priority

Rationale: Game breaking bugs occur all the time. This could lead to user retention falling off a cliff if those bugs aren't fixed fast enough.

Fit Criterion: Run user submitted bug reports, prioritize fixing the most game breaking bugs that appear during the applications lifecycle.

Acceptance Tests: 18, 68

14b Supportability Requirements

ID#: SUP1 – **Name:** Bug Reporting

Description: Enable user-based bug reporting

Rationale: Not everything can be found through Q&A. Allowing users to report specific bugs and the steps they took to reproduce them, allows developers to recreate bugs based on a much higher population of testers

Fit Criterion: Enable a button that submits user-based bug reports into a queue that the development team has access to.

Acceptance Tests: 19

14c Adaptability Requirements

ID#: Mob1 – **Name:** Mobile Device Porting

Description: The game will be made to work on mobile devices, including Android/Apple products.

Rationale: This is expected to be a game that users can easily walk around the conservatory and play. Mobile devices allow this and allowing both main platforms, Android/Apple, to house the application will allow a majority of users to play it.

Fit Criterion: This game is being made with the intention of being played on phones, build a working phone model first, then branch out to mobile devices like tablets.

Acceptance Tests: 20

14d Scalability or Extensibility Requirements

ID#: Pop1 – **Name:** External User Retention

Description: Allow for a broad range of population to access the application, even outside the expected Garfield Park Conservatory population.

Rationale: With the potential for this game to expand outward and help other animal/plant conservation efforts, it is important that we build the game with that in mind, so we can scale the servers and game to allow for a much higher population.

Fit Criterion: When stress testing servers and application aspects, test and build with the idea that one day thousands of users could be playing this. Ensure smooth and bug free multithreading throughout the process of development.

Acceptance Tests: 21

14e Longevity Requirements

ID#: L1 – **Name:** Lifetime

Description: This application is expected to last as long as the Garfield Park Conservatory exists.

Rationale: This is meant to be a specific tool to help the Garfield Park Conservatory, so this won't be something that dies off after 5 months as some sort of special promotion. This is being built with the intention to last.

Fit Criterion: Develop a fundamentally sound product, with the intention to last decades, and feasibility to scale to newer software. This means regularly updating and maintaining the code base.

Acceptance Tests: 22

15 Security Requirements

15a   Access Requirements

ID# Sec-1 – Name: Code Security

Description: Users and conservatory staff should not be able to alter the game code in any way.

Rationale: Users should only be allowed to play the game, not change aspects of it through changing code. Staff should not need access to the game code.

Fit Criterion: Code should only be altered by the game developers.

Acceptance Tests: 23

ID# Sec-2 – Name: Location Data

Description: Users are generally only able to access their own location data, unless they are in a party, where they can view their party members' locations. Staff will have access to users' location data so long as they are in the park.

Rationale: Users can only view their party's locations, but under no circumstances need to be able to view the location of non-party users. Staff will have access to locations of users to maintain general safety.

Fit Criterion: Users can view their own location data, and only staff can view all user's location data,

Acceptance Tests: 24

ID# Sec-3 – Name: Personal Data

Description: Users can only view and edit their own personal data, such as name, email, and date of birth. Staff can only view the names and email addresses of users.

Rationale: Users have no need to see the personal information of other users. Staff may view email addresses and names for communication purposes.

Fit Criterion: Users can view and edit their own personal data, and staff can only view names and email addresses of users.

Acceptance Tests: 25, 26

15b Integrity Requirements

ID# Sec-4 – Name: Database Integrity Protection

Description: Plant data will only ever come from the database, to which only staff and developers have full access to. Users can only view data from their collections, no other permissions.

Rationale: Plant data needs to remain accurate and credible. Therefore, users can only view data. Staff and developers can make changes to the database as needed.

Fit Criterion: Only staff and developers are granted full access to the database.

Acceptance Tests: 27, 28

ID# Sec-5 – Name: Data Loss Prevention

Description: Account data and the database itself will be backed up on a separate private server in the event that current systems are unusable or corrupted. Only developers will have access to the backup.

Rationale: In the event that an update corrupts the servers, or incomplete changes are pushed, or servers are physically damaged, the backup will allow for quick and easy game restoration, with minimal loss.

Fit Criterion: Only developers have access to the backup.

Acceptance Tests: 29, 30

15c Privacy Requirements

ID# Sec-6 – Name: Data Collection Notification

Description: Users will be notified of what data will be collected prior to account creation. Users will be made aware that sensitive data is not shared with anyone, and only names and email addresses will be shared with staff.

Rationale: Users need to know what information will be collected and shared.

Fit Criterion: Sensitive personal data aside from location, will not be shared with anyone.

Acceptance Tests: 31

ID# Sec-7 – Name: In-Game Purchases Privacy

Description: Payment details of users will not be made available to anyone. Payment will be handled through the Google Play Store, and the Apple App Store, thus no credit card information will be stored. Only personal transaction dates and amounts will be viewable to the user, staff, and developers.

Rationale: Maintain security of users' financial data.

Fit Criterion: Only Apple and Google will have access to the credit card information of users.

Acceptance Tests: 32, 33, 34

15d   Audit Requirements

ID# Sec-8 – Name: Transaction History

Description: Payment is handled externally, but logs of transaction dates and amounts will be kept for auditing purposes.

Rationale: Keep track of financial information.

Fit Criterion: Users will be able to view their own transaction history. Developers can view the transaction history of all users.

Acceptance Tests: 34

15e   Immunity Requirements

ID# Sec-9 – Name: Manipulation Protection

Description: Only authorized developers will be able to alter game code. In the event that the system gets infected, the system will be reverted to the backup server.

Rationale: The program needs to be protected from potential threats.

Fit Criterion: Only authorized developers are able to alter game code. Devs can also enable the backup server in case of infection.

Acceptance Tests:

16 Usability and Humanity Requirements

16a   Ease of Use Requirements

ID# Use -1- Name: Accessibility Options

Description: Developers must consider the needs of users with visual impairments, auditory impairments, motor impairments, and cognitive impairments. To do so, special accessibility options will be made available in the game settings.

Rationale: The game needs to be accessible so that all visitors of the conservatory can play without difficulty.

Fit Criterion:

General Criterion:

- Anonymous survey shall that 98 percent of users feel as though they are adequately able to enjoy the game given the accessibility options.

Visual Impairment Accommodations:

- Adjust game colors for different types of color blindness.
- Text-to-speech option
- Font size option
- Adjust brightness and contrast.

Auditory Impairment Accommodations:

- Audio description option for sound effects

Motor Impairment Accommodations:

- Ability to turn off specific minigames that require swiping and tapping.
- Enable voice command to play trivia minigames.
- Enable voice navigation.

Cognitive Impairment Accommodations:

- Disable AR, instead use 2d background to collect plant species.
- Ability to enable shorter and less flashier animations.

- Easy menu navigation
- Music and sound slider

Acceptance Tests: 35, 36, 37, 38, 39, 40, 41, 42, 43, 44

16b   Personalization and Internationalization Requirements

ID# Use -2 – Name: Language Option

Description: Users will have the ability to change the language of the game text.

Rationale: Keep the game accessible to as many people as possible.

Fit Criterion: User will be able to select a language from a list of supported languages.

Acceptance Tests: 67

ID# Use -3 – Name: Measurement Option

Description: Users will have the ability to choose either imperial or metric as the in-game measurement system.

Rationale: Allow users further customization to ensure better experience.

Fit Criterion: User will be able to select imperial or metric system.

Acceptance Tests: 45

16c   Learning Requirements

ID# Use -4- Name: Education

Description: All players shall be given the opportunity to learn about different plant species.

Rationale: One of the main goals of the program is to teach visitors about plant species. We want the learning experience to be simple and effective.

Fit Criterion:

- Include pictures and text to convey information.
- Aim for around middle school level reading.
- Keep descriptions concise.
- Provide short summaries where necessary.

Acceptance Tests: 46

16d   Understandability and Politeness Requirements

ID# Use -5- Name: Dictionary

Description: An in-game dictionary shall be available for basic plant definitions.

Rationale: Allow users with zero prior knowledge to still participate in the game.

Fit Criterion: A list of words in bold text will be accompanied by their respective definitions.

Acceptance Tests: 47

16e   Accessibility Requirements

ID# Use -1- Name: Accessibility Options

Description: Developers must consider the needs of users with visual impairments, auditory impairments, motor impairments, and cognitive impairments. To do so, special accessibility options will be made available in the game settings.

Rationale: The game needs to be accessible so that all visitors of the conservatory can play without difficulty.

Fit Criterion:

General Criterion:

- Anonymous survey shall that 98 percent of users feel as though they are adequately able to enjoy the game given the accessibility options.

Visual Impairment Accommodations:

- Adjust game colors for different types of color blindness.
- Text-to-speech option
- Font size option
- Adjust brightness and contrast.

Auditory Impairment Accommodations:

- Audio description option for sound effects

Motor Impairment Accommodations:

- Ability to turn off specific minigames that require swiping and tapping.
- Enable voice command to play trivia minigames.
- Enable voice navigation.

Cognitive Impairment Accommodations:

- Disable AR, instead use 2d background to collect plant species.
- Ability to enable shorter and less flashier animations.
- Easy menu navigation
- Music and sound slider

Acceptance Tests: 35, 36, 37, 38, 39, 40, 41, 42, 43, 44

16f   User Documentation Requirements

ID# Use -6- Name: Game Manual

Description: An in-game manual will be provided to teach users how to play the game.

Rationale: Users should have a reference as to how the game is played, how the game mechanics work, and how to navigate the game.

Fit Criterion: The manual shall be created by the developers. Upkeep on the document will be maintained by the developers.

Acceptance Tests: 48

16g   Training Requirements

ID# Use -7- Name: Tutorial

Description: After account creation, users will be put into a tutorial sequence which will teach them the basic mechanics of the game.

Rationale: To teach players the basic mechanics of the game.

Fit Criterion: The tutorial will be created by the game developers. Users will automatically experience the tutorial after completing account creation. The tutorial can be revisited at any time.

Acceptance Tests: 49, 50

17 Look and Feel Requirements

17a   Appearance Requirements

ID# LF -1- Name: Color Palette

Description: The game shall utilize a nature inspired color palette.

Rationale: A nature inspired color palette fits in with the setting that the game is played in.

Fit Criterion: The client shall approve of the color palette, or potential changes.

Acceptance Tests: 51

ID# LF -2- Name: Fonts and logos

Description: The game shall utilize fonts and logos that are simple yet engaging.

Rationale: Create a welcoming and fun look and feel for the game.

Fit Criterion: The client shall approve of the all fonts and logos used.

Acceptance Tests: 52

17b   Style Requirements

ID# LF -3- Name: Style

Description: The presentation of the game shall look fun, welcoming, and engaging.

Rationale: Create a welcoming environment where anyone can play. Maintain users by simultaneously providing a fun environment.

Fit Criterion: After the user's first time playing, at least 60 percent shall have played for at least 75 percent of their trip.

Acceptance Tests: 53

18 Operational and Environmental Requirements

18a   Expected Physical Environment

ID# OE-1- Name: Environment

Description: The game shall only be playable at the conservatory.

Rationale: The product is meant to promote visits to the conservatory; therefore, it is only playable at the conservatory.

Fit Criterion: The product can only be used as intended at the conservatory. Outside of the conservatory, no plant species can be caught.

Acceptance Tests: 54

18b   Requirements for Interfacing with Adjacent Systems

The product runs independently without the need for partner applications.

18c   Productization Requirements

ID# OE -2- Name: Installation

Description: The product shall be distributed on the Google Play and Apple App Store. These will be the only supported methods of installation.

Rationale: Keep the installation easy. The process will be identical to any other mobile app.

Fit Criterion: Nearly all users are able to install the app without issue.

Acceptance Tests: 55

18d   Release Requirements

ID# OE -3- Name: Game Updates

Description: The product shall receive bug fixes post-launch, as well as seasonal updates that correspond to new exhibits at the conservatory.

Rationale: Keep players engaged by providing a bug-free experience, and more content.

Fit Criterion: Fewer bugs are reported. Player counts stay consistent.

Acceptance Tests: 22

19 Cultural and Political Requirements

19a   Cultural Requirements

ID# CR -1- Name: Content Sensitivity

Description: The product content and imagery shall not include elements that could be offensive, derogatory, culturally insensitive to any religious, ethnic, or social groups.

Rationale: This requirement ensures that the content of the product remains inclusive and respectful of diverse cultural backgrounds, promoting a positive user experience for everyone.

Fit Criterion: The product shall be reviewed by a diverse group of people to ensure that nothing offensive is contained in the game.

Acceptance Tests: 56, 57

ID# CR -2- Name: Cultural Awareness

Description: The product shall incorporate features or information that demonstrate an awareness and consideration of various cultural norms, practices, and holidays.

Rationale: This requirement aims to enhance user engagement by recognizing and respecting the diversity of cultural practices among potential users.

Fit Criterion: The product shall provide features such as the option to view content in multiple languages, display relevant cultural holidays relevant to the Conservatory, and avoid scheduling notifications or events on significant cultural observance days.

Acceptance Tests: 58

19b   Political Requirements

ID# PR -1- Name: Compliance with Organizational Politics

Description: The product shall comply with any internal political directives or preferences set forth by key stakeholders within the client company.

Rationale: This requirement recognizes that internal political dynamics within the client organization may impact product development decisions.

Fit Criterion: Documented evidence of compliance with internal political directives shall be provided, demonstrating adherence to specific organizational preferences.

Acceptance Tests: 59, 60

20 Legal Requirements

20a Compliance Requirements

ID# CR -1- Name: Data Protection Compliance

Description: Personal information processing within the product shall adhere to the regulations outlined in the Data Protection Act, ensuring the privacy and security of individuals' data.

Rationale: This requirement addresses legal obligations regarding the handling of personal information, safeguarding against potential legal repercussions and protecting individuals' privacy rights.

Fit Criterion: Legal opinion provided by the company's legal department confirming compliance with the Data Protection Act.

Acceptance Tests: 61

ID# CR -2- Name: Intellectual Property Protection

Description: The product shall incorporate measures to protect copyrights and other intellectual property rights, preventing infringement and safeguarding the company's proprietary assets.

Rationale: This requirement ensures the protection of intellectual property, reducing the risk of legal disputes and safeguarding the company's creative and innovative work.

Fit Criterion: Legal opinion from the company's legal department confirming the implementation of appropriate measures for intellectual property protection.

Acceptance Tests: 62, 63

20b Standards Requirements

ID# SR -1- Name: Insurance Industry Standards

Description: The product shall adhere to the standards set forth by the insurance industry, ensuring compatibility and compliance with industry-specific requirements.

Rationale: This requirement ensures that the product meets the criteria established by the insurance industry, reducing the risk of compatibility issues in regard to mapping the Conservatory and ensuring acceptance within the sector.

Fit Criterion: Certification from the designated authority affirming adherence to insurance industry standards.

Acceptance Tests: 64, 65

21 Requirements Acceptance Tests

21 a Requirements – Test Correspondence Summary

Test	Req 1	Req 2	Req 3	Req 4	Req 5	Req 6	Req 7	Req 8	Req 9	Req 10	Req 11	Req 12	Req 13	Req 14	Req 15	Req 16	Req 17	Req 18	Req 19	Req 20
Test 1	X																			
Test 2		X				X														
Test 3			X	X																
Test 4					X	X														
Test 5																				
Test 6																				
Test 7																				
Test 8																				
Test 9																				
Test 10																				
Test 11																				
Test 12																				
Test 13																				
Test 14																				
Test 15																				

Table 1 - Requirements - Acceptance Tests Correspondence

Acceptance Test Descriptions

Test #1

Description: Check for all scene transitions, make sure they're at least 0.5 seconds long or greater, accompanied by an animation that leads to the next screen.

Test #2

Description: minigameReward function checked to only reward players once minigamePassed is true, and not at other points of the minigame.

Test #3

Description: minigameReward function checked to give reward to players after minigame has been completed, no matter what happens afterwards, such as game closing, sudden server crash, etc.

Test #4

Description: compare location of user to GPS coordinates, done for multiple user + GPS coordination points, checked to see they match within a certain threshold.

Test #5

Description: Pass all existing names into a function, if any duplicates are found in said function, throw a duplicateName error.

Test #6

Description: Pass all existing names and species into a function. If a name is found that doesn't use a species name, throw a noSpeciesName error.

Test #7

Description: accountCreation function tested with a list of usernames. accountCreation function should never allow users to create an account with a username that already exists in the list.

Test #8

Description: Perform actions in the minigames (or force the game to if not possible) that would cause it to exceed 100 ms. Make sure warning goes off 100% of the time, as well as the bug report.

Test #9

Description: Have 500+ instances of the app running at once, with the servers being able to handle requests from each of those instances, ranging from minigame events, checking social profile, as well as payments.

Test #10

Description: Have 500+ instances of the app running at once, with the servers being able to handle requests from each of those instances, with the amount of crash reports being below 1 per hour per instance

Test #11

Description: Instance of reward created upon the start of the minigame, considered valid upon completion of minigame, and checked to see it given to the player upon booting up the game and connecting to the servers once more. Multiple tests with (ideally) 0% error rate.

Test #12

Description: serverDownNotifier should notify whenever server is down, checked with 1000 instances, ranging from when server is down and expected to notify vs when server is not down and expected to not notify.

Test #13

Description: App checked to see if able to pull user data from anywhere with a connection.

Test #14

Description: Check instances of user saves stored on phone and save on servers (except in instances of crash on minigame completion). Should always be the same save, throw error if not and set save to one stored in server.

Test #15

Description: Check instances of app upon booting up with no access to server, should still be able to access their user data, specifically collection.

Test #16

Description: Check for all animations and transitions longer than 3 seconds and scan them to see if they contain any sudden shifts in color or brightness (determined by a function). Throw an error if found and replace or rework on animation / transition that threw the error.

Test #17

Description: Check serverMaintenance function, set it to a weekly time and ensure it goes off in order to perform the routine checkups and shut off the servers if needed.

Test #18

Description: Pass all user reports through a filter that enables them to be listed via amount of reports as well as severity (checked via keywords). If needed, shut down the server in order to quickly patch these bugs.

Test #19

Description: Check bugReport function to make sure users are able to submit a bug report, as well as the button related to attached function is able to lead users to the bug report page.

Test #20

Description: Create an APK and an IPA file to be tested on an Android phone and a iPhone, respectively. Ensure the application is able to run and be interacted with on both phones.

Test #21

Description: Checks that app supports multithreading throughout the process of development as well as the release version of the product to ensure it supports it afterwards.

Test #22

Description: Checks that app is able to support updates and patches down the line.

Test #23

Description: Checks that code is unable to be directly accessed by the user, barring the ability to edit them.

Test #24

Description: Users will only be able to access their own data, and only able to view the public profile of other users. They will not be able to access private information of other users, such as their location and date of birth.

Test #25

Description: userInformation function checked to see if it allows the accessing it to edit their own information, and not someone else's information. It will also check to see if the user can only view their own information.

Test #26

Description: Check to see if staff are allowed to view the information of every user in the database.

Test #27

Description: Check to see if staff and and developers can edit and pass changes to the database.

Test #28

Description: Check to see if users are unable to gain access to the database.

Test #29

Description: backupData function checked to see if it backs up the data from the main servers to the separate server, about once a week.

Test #30

Description: Check to see that developers and no one else are able to access the backup server.

Test #31

Description: privacyNotification function checked to see if it runs on every instance of an account being created. Happens every time someone signs up for a new account.

Test #32

Description: Pass the sensitive information through the stores and make sure none of the sensitive information gets stored in our servers.

Test #33

Description: transactionSave function checked to see if it works, which only takes the amount paid and the date the payment was made and saves it to the server.

Test #34

Description: transactionView function checked to see if it works, allowing users to only view their own transactions while developers are allowed to view everyone's.

Test #35

Description: check colorBlindness function is able to work and complies with the standards.

Test #36

Description: implement subtitles and check to see if the subtitles function works (closed captions appended to it if needed).

Test #37

Description: ability to change font size in settings works.

Test #38

Description: ability to change contrast and brightness in settings works.

Test #39

Description: ability to navigate scenes, do some minigames with them (trivia), combination of them via voice in settings works.

Test #40

Description: ability to turn off minigames that require swiping and tapping in settings works.

Test #41

Description: Swapping animations function activated in settings, which changes the animations to be shorter and less flashier, works.

Test #42

Description: Ability to change volume for specific things, such as music and sound effects in settings, works.

Test #43

Description: Ability to make the background in AR 2D via settings works.

Test #44

Description: Ability to swap the menus to one more easily navigable in settings works.

Test #45

Description: Function that changes measurements from imperial to metric and vice-versa, check to see if it works (changes the value as well as the accompanying text).

Test #46

Description: Check all information given via the collection and make sure it is simple and easy to digest.

Test #47

Description: wordDefinition function checked to see if words in bold, when clicked on, provide a little popup that gives a definition of said word. Test with different words.

Test #48

Description: manual function checked to see if it works (leads the user to a manual that teaches them how to play), as well as the button attached to said manual function leads them to the manual.

Test #49

Description: tutorial checked to see if it launches every time a new user creates their account, as well as saving their point in the tutorial in case the user leaves in the middle of it.

Test #50

Description: tutorialButton checked to see if it leads back to the tutorial, being able to be done any amount of times.

Test #51

Description: all images and colors used in the application will be passed through a function, checking to see if at least 90% of each one match a nature-inspired color palette, otherwise ask the client for approval of said palette.

Test #52

Description: Fonts must be approved by the client.

Test #53

Description: Checks the amount of time users had the app open and checks the amount of time users spent in the Garfield Park Conservatory. If about 60% of them have a ratio of time in GPC and time in app of 0.75 or higher, pass.

Test #54

Description: minigame function checked to see if it works only at the conservatory and nowhere else. Alternatively, checks to see if it works at the conservatory to begin with, then we can see about not making it work elsewhere.

Test #55

Description: Check to see if at least 95% of users are able to install the app without issue from the Google Play and Apple App stores.

Test #56

Description: Have a list of words that cannot be added to the game and pass all the text of the game through a function. Check to see if any of those words are in, and if so, remove them.

Test #57

Description: Conduct a demo of the product to a diverse group and take feedback on anything they see problematic in regard to sensitive content.

Test #58

Description: culturalHolidays function checked to see if it works on specific days of the year where it coincides with special events at the Conservatory.

Test #59

Description: Provide documentation of adherence to internal political directives.

Test #60

Description: Conduct stakeholder interviews to confirm alignment with organizational politics.

Test #61

Description: Validate that personal information handling processes align with the requirements of the Data Protection Act and document a legal opinion affirming compliance with relevant data protection regulations.

Test #62

Description: Verify the presence and effectiveness of measures implemented to protect copyrights and intellectual property.

Test #63

Description: Obtain and document a legal opinion affirming compliance with intellectual property protection requirements.

Test #64

Description: Verify that the product aligns with the standards specified by the insurance industry.

Test #65

Description: Obtain and document certification confirming compliance with insurance industry standards.

Test #66

Description: Function that handles touch screen presses coupled with current scene, area where screen is expected to be touched, and expected next scene or event. Multiple trials conducted with a 0% expected error rate.

Test #67

Description: Function that allows users to changes settings via setting, as well as upon initial bootup of the application

Test #68

Description: check patchRelease function, ensure that it's able to detect whenever a new patch is out and prevent the user from being able to interact with the application until it is downloaded.