TED UNIVERSITY

CMPE 492 Test Plan Report

EcoFriends Application

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1. Introduction

1.1 Background

EcoFriends is an innovative mobile application designed to promote environmental sustainability by encouraging users to actively participate in recycling efforts. The app utilizes image recognition technology to identify and classify recyclable materials, rewarding users with Ecocoins and Ecopoints for their eco-friendly actions.

1.2 Purpose

The primary purpose of this test plan is to ensure the robustness and reliability of the EcoFriends app. By conducting thorough testing, we aim to validate the core functionalities, including accurate material recognition, proper reward allocation, and the seamless execution of daily and weekly tasks.

1.3 Scope

The testing scope encompasses key features related to image recognition, Ecocoin and Ecopoint distribution, avatar customization, and the successful completion of daily and weekly tasks. The focus is on ensuring a positive user experience and fostering engagement with the app's environmental initiatives.

1.4 Objectives

The key objectives of the testing process are as follows:

1. Verify the accuracy of image recognition for recyclable materials, namely paper, cardboard, metal, glass, trash, and plastic.
2. Validate the correct allocation of Ecocoins and Ecopoints based on user recycling activities.
3. Confirm the functionality of avatar customization using Ecocoins.
4. Ensure the accuracy of the global ranking system based on earned Ecopoints.
5. Validate the completion and reward mechanism for both daily and weekly tasks.

1.5 Roles and Responsibilities

In the beginning of this term, we had made a TO-DO list and divided the jobs to be done. Everyone is responsible for their tasks that include testing.

Gizem ÖZYILDIZ-UI Design and Front-end Coding with React Native

Eren BULDUM-Image Processing

Karya ERCAN-Avatar Designing and Database

Ceren Bilge OYAR: Restful API and implementation

2.Test Items

2.1 Features to be tested

We tested some features of the application independently from each other.

2.1.1 Ui Features

We have to test the User Interface all the time since it is important for code writability. If there are an error or a feature that is eye soring, we have to fix it immediately. Thanks to Android Studio,

we can see our code's output simultaneously that helps us to correct the code depending on our wants. Since we could not connect the API with UI, we can only test some features of UI excluding the compatibility of components with each other and with the screen.

For us, the most important thing that should be tested is the screen navigations. Screen navigations help user to navigation between pages. Mostly, we used "onClick" function for screen navigating. For example, in Home Screen, if the user clicks their avatar, they will be directed to Profile Screen.

Second feature that should be testing in UI is the buttons status. Every button should function their purpose like switching through pages or apply something. To avoid errors, we should check every button to decide whether they are working or not.

While testing UI, we were also careful to make it as user-friendly as possible. As an example of this instead of Hamburger Menu style, we went for bottom navigation bar. With bottom nav-bar, the users can recognize the pages from their icons and switch through pages easier.

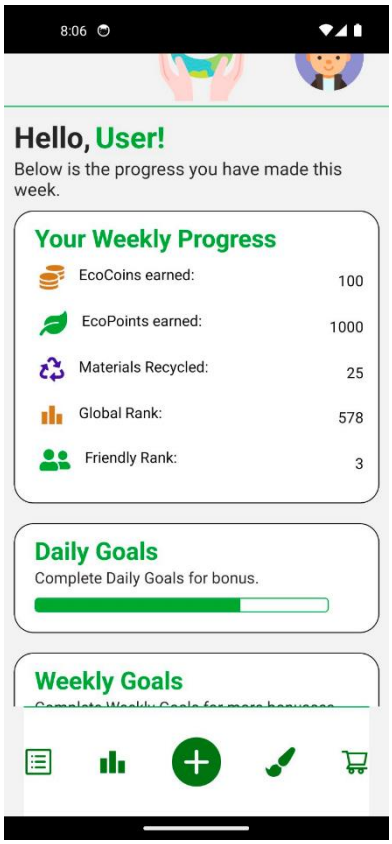

Figure 1: Home screen UI

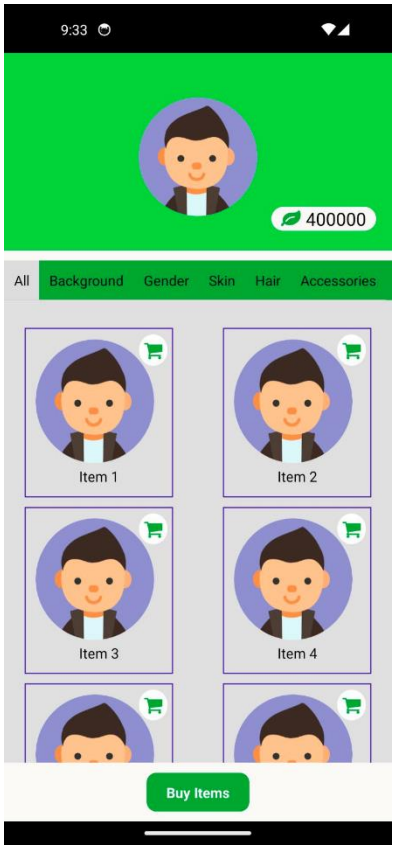

Figure 2: Shop Screen UI

2.1.2 Image Processing Features

MobileNet algorithm which is a known algorithm with it's speed and accuracy is used for classifying images with the dataset that we have about waste types. The accuracy of the model when it is trained can be seen below:
Final Test Accuracy after fine-tuning: 84.06%

2.1.3 Database Features

The EcoFriends database is designed to efficiently manage and store essential data for the EcoFriends mobile application. The database comprises several interconnected tables, each serving a specific purpose to support the application's functionality. Here's a glimpse of the key features:

User Table:

Columns:

ID_Number (Primary Key): Unique identifier for each user.

Name: User's name.

Email: User's email address.

EcoCoin: Amount of Ecocoins associated with the user.

EcoPoint: Total Ecopoints accumulated by the user.

Avatar: User's chosen avatar.

Overall_Statistics Table:

Columns:

User_ID (Foreign & Primary Key): Linked to the ID_Number in the User table.

Plastic: Quantity of recycled plastic materials.

Glass: Quantity of recycled glass materials.

Cardboard: Quantity of recycled cardboard materials.

Paper: Quantity of recycled paper materials.

Trash: Quantity of recycled trash materials.

Metal: Quantity of recycled metal materials.

User_Task_Info Table:

Columns:

Days_Passed: Number of days since the task was initiated.

WantedCount: Target count for the task.

Completed_Count: Actual count of completed task items.

Task_Index (Foreign Key): Corresponds to the index in the Task table.

User_ID (Foreign Key): Linked to the ID_Number in the User table.

Task Table:

Columns:

DW: Daily and weekly goals for the task.

Type: Type of task.

Index (Primary Key): Unique identifier for each task.

Count: Counter for the task.

Add_Ecocoin: Amount of Ecocoin added when the task is completed.

Add_Ecopoint: Amount of Ecopoint added when the task is completed.

User_ID (Foreign Key): Linked to the ID_Number in the User table.

Unlocked_Customizable Table:

Columns:

User_ID (Foreign & Primary Key): Linked to the ID_Number in the User table.

Skin_Color: Avatar's skin tone.

Background: Avatar's background.

Accessories: Avatar's accessories.

Hair: Avatar's hairstyle.

Outfit: Avatar's outfit.

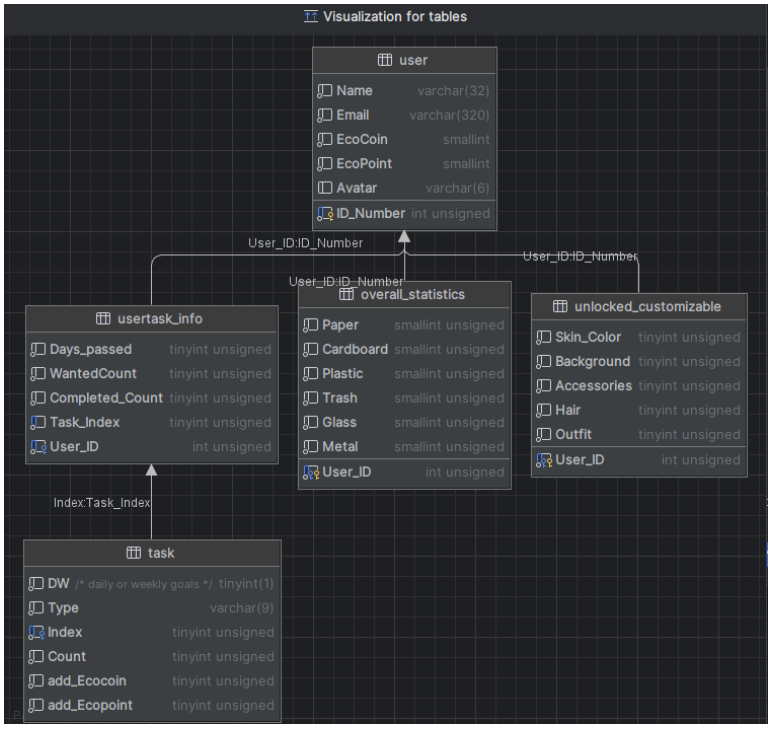

Figure 3: Database diagram visualization

During the testing phase of the EcoFriends database, a systematic approach was adopted to evaluate the robustness and flexibility of the system. To achieve this, different attributes were introduced and tested across various tables, providing a comprehensive assessment of the database's performance.

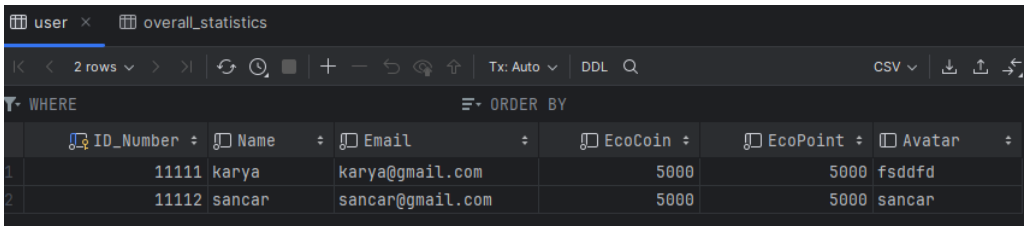

Figure 4: Testing for user table

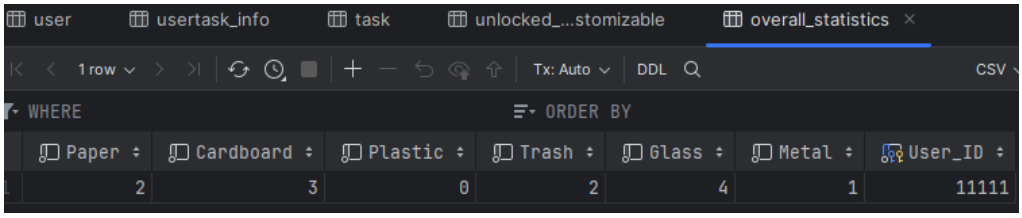

Figure 5: Overall Staticstics table testing

2.2 Features will be tested

We couldn't test some features due to our lectures and jobs. However, we're planning to test it soon.

2.2.1 API Testing

2.2.2 Integration Testing

The application is not finished 100%. That's why we couldn't unite our tasks and integrate them with each other. When everyone makes their own parts and combines these parts, we can do integration testing.

2.2.3 Clerk

Clerk is the application that helps us to authenticate and keep a small database for users. With Clerk, we can securely keep the user's info. Also we can apply some functions such as "Forget Password?", "Sign in with Google". In clerk's database we can keep user's information like username, e-mail, password, unique ID. We couldn't apply clerk to our UI yet, since we had technical problem with the computer.

3.Testing

3.1 Test Plan

Test Objectives:

Verify the accuracy of material recognition through the camera.

Ensure proper points allocation for recycled materials.

Validate the functionality of the shop and points redemption.

Test the user authentication and database integration processes.

Testing Methodologies:

Utilizing a combination of manual and automated testing approaches.

Employing real-world scenarios to simulate user interactions.

Test Coverage:

Covering all major user flows, including registration, recycling, points redemption, and shop interactions.

Addressing edge cases and error-handling scenarios.

3.2 Test Environment

Devices and Platforms:

Test the app on various devices (Android and iOS) to ensure compatibility.

Ensure the app functions correctly on different screen sizes and resolutions.

3.3 Testing Tasks

Camera Functionality Testing:

Task 1: Verify material recognition under different lighting conditions.

Task 2: Test material recognition accuracy with varying angles and distances.

Points System Testing:

Task 1: Validate points allocation for different types of recyclable materials.

Task 2: Test the upper and lower limits of points allocation for materials.

Shop & Points Redemption Testing:

Task 1: Verify successful redemption of points for items in the shop.

Task 2: Test scenarios where users have insufficient points for redemption.

User Authentication and Database Integration Testing:

Task 1: Validate user registration with valid and invalid data.

Task 2: Test login functionality with correct and incorrect credentials.

3.4 Schedule for testing activities

While setting a schedule for our application and testing activities, we considered the school and took a break if it’s necessary (due to midterms). We set a schedule which balanced, not too tight, not too flexible.

Week 1-2-3: Introduction and Code Implementation

Week 4-5-6-7: Unit Testing and Code Corrections

Week 8-9: Break due to midterms

Week 10-11-12: Code integration and Integration Testing

Week 13: Final Assesments

Week 14: Preparations for Demo Day and Poster Presentation

4.Test Cases

4.1 Test Case 1: User Log in, Sign up, Log out (#TC411)

Description:

This test case validates the fundamental user authentication functionalities of the EcoFriends application, including user registration (Sign up), user login, and user logout.

Precondition:

The EcoFriends application is installed on the user's device.

The user has a valid email address.

Test Steps:

1. Sign up:

a. Open the EcoFriends application.

b. Click on the "Sign up" button.

c. Enter valid user details (Name, Email, Password).

d. Click on the "Submit" button.

e. Verify that the user is successfully registered.

2. Log in:

a. Navigate back to the application's login screen.

b. Enter the registered email and password.

c. Click on the "Log in" button.

d. Verify that the user is successfully logged in.

3. Log out:

a. Navigate to the user profile.

b. Click on the "Log out" option.

c. Confirm the log out action.

d. Verify that the user is successfully logged out.

Expected Results:

The user should be able to sign up successfully with valid information.

After successful sign-up, the user should be able to log in using the registered credentials.

Logging out should terminate the user session and return the user to the login screen.

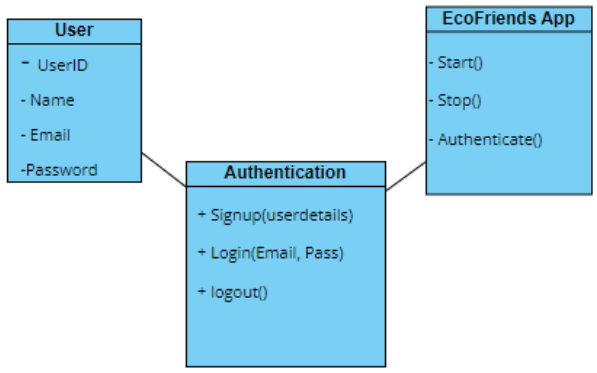

Figure 6: Class Diagram for User Log in, Sign up, Log out (#TC411)

low and Alternate Flow Table:

Step	Action	Flow	Alternate Flow
1	Open the EcoFriends application.	User starts the sign-up process.	N/A
2	Click on the "Sign up" button.	User is presented with the sign-up form.	N/A

Step	Action	Flow	Alternate Flow
3	Enter valid user details (Name, Email, Password).	User fills in the required information accurately.	If invalid information is entered, display an error message and prompt the user to correct it.
4	Click on the "Submit" button.	User submits the sign-up form.	If there is an issue with the submission, display an error message and allow the user to try again.
5	Verify that the user is successfully registered.	System confirms successful registration.	If registration fails, display an error message and guide the user on the next steps.
6	Navigate back to the application's login screen.	User goes back to the login screen to log in.	N/A
7	Enter the registered email and password.	User provides the registered credentials.	If the entered credentials are incorrect, display an error message and prompt the user to re-enter.
8	Click on the "Log in" button.	User submits the login form.	If there is an issue with the login, display an error message and allow the user to try again.
9	Verify that the user is successfully logged in.	System confirms successful login.	If login fails, display an error message and guide the user on the next steps.
10	Navigate to the user profile or settings.	User goes to the profile/settings to log out.	N/A
11	Click on the "Log out" option.	User initiates the logout process.	N/A
12	Confirm the log out action.	User confirms the logout action.	If the user cancels the logout action, the session should not terminate.
13	Verify that the user is successfully logged out.	System confirms successful logout.	N/A

4.2 Test Case 2: User navigation between pages (#TC423)

Description:

This test case focuses on verifying the seamless navigation experience for the user within the EcoFriends mobile application. It includes testing the functionality of screen transitions triggered by user interactions, with a special emphasis on the successful validation of the bottom navigation bar.

Precondition:

1. The EcoFriends application is installed on the user's device.
2. The user has successfully logged in.

Test Steps:

1. Navigate from Home Screen to Profile Screen:

- On the Home Screen, locate the user's avatar.
- Click on the avatar.
- Verify that the application successfully transitions to the Profile Screen.

2. Navigate from Profile Screen to Home Screen:

- On the Profile Screen, find a navigation option or button to return to the Home Screen.
- Click on the option/button.
- Confirm that the application smoothly navigates back to the Home Screen.

3. Navigate from Home Screen to Statistics Screen:

- On the Home Screen, find the statistics section or a related button.
- Click on the statistics section or button.
- Ensure that the application navigates to the Statistics Screen without issues.

4. Navigate from Statistics Screen to Home Screen:

- On the Statistics Screen, locate a navigation option or button to return to the Home Screen.
- Click on the option/button.
- Confirm that the application effectively returns to the Home Screen.

5. Test Bottom Navigation Bar:

- Verify that the bottom navigation bar is visible on all applicable screens except shop and customization.
- Test each icon/button on the bottom navigation bar to ensure they correctly navigate to their respective pages.
- Confirm that the bottom navigation bar enhances user navigation by providing a user-friendly and visually appealing experience.

5.1 Navigate Home:

- Click on the "Home" option in the bottom navigation bar.
- Verify that the application successfully transitions to the Home Screen.

5. 2. Navigate to Overall Statistics:

- Click on the "Overall Statistics" option in the bottom navigation bar.
- Confirm that the application smoothly navigates to the Overall Statistics Screen.

5.3. Navigate to Add Action:

- Click on the "Add Action" option in the bottom navigation bar.
- Ensure that the application navigates to the Add Action Screen without issues.

5.4. Navigate to Shop:

- Click on the "Shop" option in the bottom navigation bar.
- Confirm that the application effectively transitions to the Shop Screen.

5.5. Navigate to Customize Avatar:

- Click on the "Customize Avatar" option in the bottom navigation bar.
- Verify that the application successfully navigates to the Customize Avatar Screen.

Expected Results:

User interactions with the bottom navigation bar options should seamlessly transition between respective screens.

The transition between screens should be visually smooth and without glitches.

Navigating back from secondary screens to the Home Screen should occur without errors.

Flow and Alternate Flow Table:

Step	Action	Flow	Alternate Flow
1	Navigate from Home Screen to Profile Screen.	User clicks on the avatar on the Home Screen.	N/A
2	Verify that the application successfully transitions to the Profile Screen.	The Profile Screen is displayed after clicking the avatar.	If the transition fails, display an error message and guide the user on the next steps.

Step	Action	Flow	Alternate Flow
3	Navigate from Profile Screen to Home Screen.	User clicks on the navigation option or button to return to the Home Screen.	N/A
4	Confirm that the application smoothly navigates back to the Home Screen.	The Home Screen is displayed after clicking the return option/button.	If the transition fails, display an error message and guide the user on the next steps.
5	Navigate from Home Screen to Statistics Screen.	User clicks on the statistics section or related button.	N/A
6	Ensure that the application navigates to the Statistics Screen without issues.	The Statistics Screen is displayed after clicking the statistics section/button.	If the transition fails, display an error message and guide the user on the next steps.
7	Navigate from Statistics Screen to Home Screen.	User clicks on the navigation option or button to return to the Home Screen.	N/A
8	Confirm that the application effectively returns to the Home Screen.	The Home Screen is displayed after clicking the return option/button.	If the transition fails, display an error message and guide the user on the next steps.
9	Test Bottom Navigation Bar.	N/A	N/A
9.1	Navigate Home.	User clicks on the "Home" option in the bottom navigation bar.	N/A
9.2	Verify that the application successfully transitions to the Home Screen.	The Home Screen is displayed after clicking the "Home" option.	If the transition fails, display an error message and guide the user on the next steps.
9.3	Navigate to Overall Statistics.	User clicks on the "Overall Statistics" option in the bottom navigation bar.	N/A
9.4	Confirm that the application smoothly navigates to the Overall Statistics Screen.	The Overall Statistics Screen is displayed after clicking the "Overall Statistics" option.	If the transition fails, display an error message and guide the user on the next steps.

Step	Action	Flow	Alternate Flow
9.5	Navigate to Add Action.	User clicks on the "Add Action" option in the bottom navigation bar.	N/A
9.6	Ensure that the application navigates to the Add Action Screen without issues.	The Add Action Screen is displayed after clicking the "Add Action" option.	If the transition fails, display an error message and guide the user on the next steps.
9.7	Navigate to Shop.	User clicks on the "Shop" option in the bottom navigation bar.	N/A
9.8	Confirm that the application effectively transitions to the Shop Screen.	The Shop Screen is displayed after clicking the "Shop" option.	If the transition fails, display an error message and guide the user on the next steps.
9.9	Navigate to Customize Avatar.	User clicks on the "Customize Avatar" option in the bottom navigation bar.	N/A
9.10	Verify that the application successfully navigates to the Customize Avatar Screen.	The Customize Avatar Screen is displayed after clicking the "Customize Avatar" option.	If the transition fails, display an error message and guide the user on the next steps.

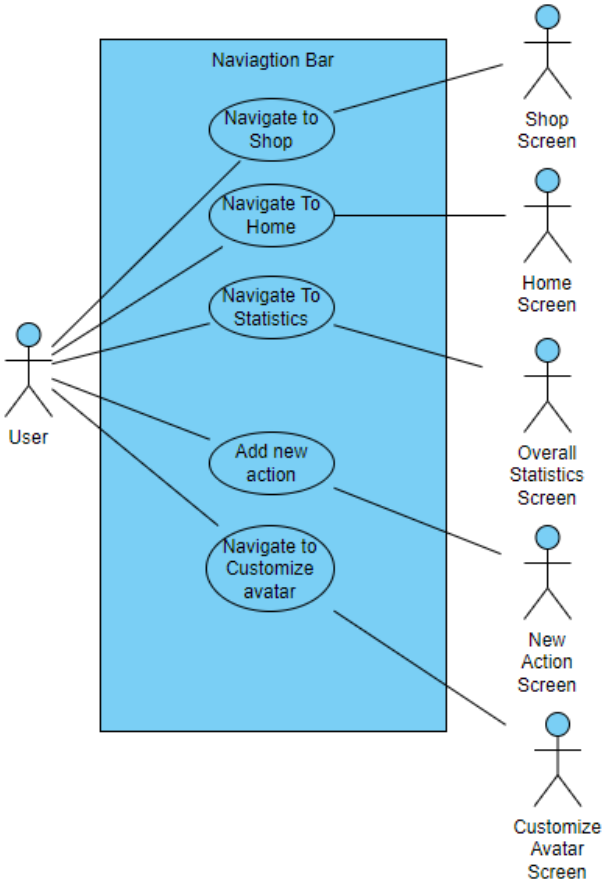

Figure 7: Use Case Diagram for User navigation between pages (#TC423)

4.3 Test Case 3: User Add Action (#TC435)

Description:

This test case focuses on the "Add Action" functionality in the EcoFriends mobile application. It ensures that the user can successfully utilize the camera to identify and recycle materials, and that the system accurately recognizes the materials, updates the database, and rewards the user with Ecocoins and Ecopoints upon completing a task.

Precondition:

1. The EcoFriends application is installed on the user's device.

2. The user has successfully logged in.
3. The device has a functional camera.

Test Steps:

1. Open "Add Action" Section:

- Navigate to the "Add Action" section through the bottom navigation bar.
- Confirm that the camera interface is accessible.

2. Capture Material Image:

- Within the "Add Action" section, use the device's camera to capture an image of a recyclable material.
- Verify that the camera interface is responsive and provides clear imaging.

3. Identify and Add Material:

- Allow the system to process the captured image and identify the recyclable material.
- Confirm that the identified material is displayed on the screen.
- Verify that the system adds the identified material to the database.

4. Task Completion and Rewards:

- Ensure that the added material contributes to the completion of a user task.
- Confirm that Ecocoins and Ecopoints are appropriately credited to the user's account upon task completion.

5. Error Handling:

- Intentionally attempt to capture an image that is not recyclable or difficult to identify.
- Verify that the system provides appropriate feedback or error messages.

Expected Results:

- The "Add Action" section should open, allowing the user to capture recyclable materials using the camera.
- The system should accurately identify the captured material and update the database.
- Task completion should trigger the appropriate reward of Ecocoins and Ecopoints.
- The system should handle errors gracefully, providing clear feedback in case of unsuccessful material identification.

Additional Consideration:

- **Camera Performance:**
    - Assess the responsiveness and clarity of the camera interface.
    - Ensure that the image processing system accurately recognizes a variety of recyclable materials.

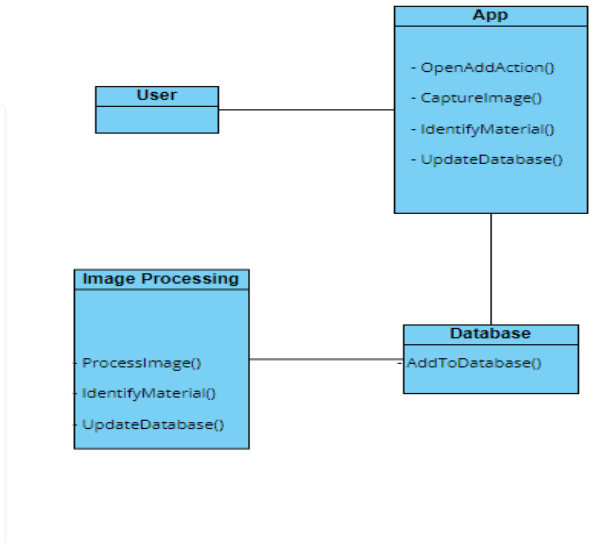

Figure 8: Class Diagram for User Add Action (#TC435)

Figure 9: Visualiztion of ecocoin and ecopoint adding.

4.4 Test Case 4: Shopping and Customization (#TC447)

Description:

This test case verifies the functionality of the "Shop" and "Customize" features in the EcoFriends application. It ensures that users can successfully spend Ecocoins on items, update the database with purchased items, and customize their avatars by placing the acquired items.

Precondition:

1. The EcoFriends application is installed on the user's device.
2. The user has successfully logged in.
3. Sufficient Ecocoins are available in the user's account.

Test Steps:

1. Shop for an Item:

- Navigate to the "Shop" section through the bottom navigation bar.
- Select an item to purchase.
- Confirm that the Ecocoins are correctly deducted from the user's account.
- Verify that the purchased item is added to the system.

2. Confirm Ecocoins Deduction:

- Check the user's profile or account details to ensure that Ecocoins have been deducted accurately.

3. Customize Avatar:

- Navigate to the "Customize" section through the bottom navigation bar.
- Select an item from the purchased items to place on the avatar.
- Verify that the selected item is correctly placed on the avatar.

4. Confirm Database Update:

- Check the database to confirm that the purchased item and avatar customization details are accurately updated.

5. Repeat Process:

- Repeat the process by purchasing another item and customizing the avatar with the new item.
- Confirm that the database is consistently updated with each purchase and customization.

Expected Results:

- Users should be able to successfully purchase items from the "Shop" section using Ecocoins.
- Ecocoins should be accurately deducted from the user's account.
- The purchased items should be correctly added to the system and reflected in the user's profile.
- Users should be able to customize their avatars by placing purchased items, and the avatar customization details should be accurately updated in the database.

Additional Considerations:

- **Ecocoin Balance Display:**
    - Verify that the user's Ecocoin balance is dynamically updated and displayed.

- **Error Handling:**
    - Test error scenarios, such as attempting to purchase an item with insufficient Ecocoins, and verify that appropriate error messages are displayed.

Flow and Alternate Flow Table:

Step	Action	Flow	Alternate Flow
1	Open "Add Action" Section.	User navigates to the "Add Action" section through the bottom navigation bar.	N/A
2	Confirm that the camera interface is accessible.	The "Add Action" section opens with an accessible camera interface.	If the camera interface is not accessible, display an error message and guide the user on the next steps.
3	Capture Material Image.	User uses the device's camera to capture an image of a recyclable material.	N/A
4	Verify that the camera interface is responsive and provides clear imaging.	The camera interface responds to user actions, and the captured image is clear.	If the camera interface is unresponsive or the image is unclear, display an error message and guide the user on the next steps.
5	Identify and Add Material.	The system processes the captured image and identifies the recyclable material.	N/A
6	Confirm that the identified material is displayed on the screen.	The identified material is visually presented to the user.	If the identification fails, display an error message and guide the user on the next steps.
7	Verify that the system adds the identified material to the database.	The database is updated with information about the recycled material.	If the database update fails, display an error message and guide the user on the next steps.
8	Task Completion and Rewards.	The added material contributes to the completion of a user task.	N/A
9	Confirm that Ecocoins and Ecopoints are credited to the user's account.	The user's account is appropriately credited with Ecocoins and Ecopoints.	If the crediting fails, display an error message and guide the user on the next steps.

Step	Action	Flow	Alternate Flow
10	Error Handling.	User intentionally attempts to capture a challenging image.	N/A
11	Verify that the system provides appropriate feedback or error messages.	The system displays clear feedback in case of unsuccessful material identification.	If the system fails to provide appropriate feedback, display an error message and guide the user on the next steps.

4.5 Test Case 5: Leaderboard (#TC459)

Description:

This test case focuses on the functionality of the Leaderboard in the EcoFriends application, where users earn Ecopoints based on the recyclable materials they contribute through image processing. It also includes testing the feature of adding friends using their user IDs, viewing friends' avatars, and verifying the global and friends' ranking system.

Precondition:

1. The EcoFriends application is installed on the user's device.
2. The user has successfully logged in.
3. The user has contributed recyclable materials to earn Ecopoints.
4. The user has at least one friend on the platform.

Test Steps:

Leaderboard:

1. Navigate to Leaderboard:

- Navigate to the "Leaderboard" section through the bottom navigation bar.

2. Verify Global Ranking:

- Confirm that the user's global ranking is displayed.
- Check that the rankings are updated based on the Ecopoints earned from contributed recyclable materials.

3. Verify Friends' Ranking:

- Navigate to the friends' section of the Leaderboard.
- Confirm that the user's friends' rankings are displayed.
- Ensure that the rankings reflect the Ecopoints earned by friends from their contributed recyclable materials.

Friends Interaction:

4. Add a Friend by User ID:

- Navigate to the "Add Friends" section.
- Add a friend by entering their user ID.
- Confirm that the friend is successfully added.

5. View Friends' Avatars:

- Navigate to the "Friends" section.
- Verify that the avatars of added friends are displayed.
- Confirm that the avatars are visually clear and correctly represent the friends.

6. Verify Friends' Rankings:

- Navigate to the Leaderboard and check the friends' rankings.
- Confirm that the rankings accurately represent the Ecopoints earned by friends from their contributed recyclable materials.

Expected Results:

- The Leaderboard section should display the user's global ranking and friends' rankings.
- Rankings should be updated based on the Ecopoints earned from contributed recyclable materials.
- The "Add Friends" feature should successfully add friends to the user's friend list using their user IDs.
- The "Friends" section should display avatars of added friends.
- Friends' rankings should accurately reflect the Ecopoints earned by friends from their contributed recyclable materials.

Step	Action	Flow	Alternate Flow
1	Navigate to Leaderboard.	User navigates to the "Leaderboard" section through the bottom navigation bar.	N/A
2	Verify Global Ranking.	The user's global ranking is displayed, and rankings are updated based on earned Ecopoints.	If the global ranking is not displayed or not updated, display an error message and guide the user on the next steps.
3	Verify Friends' Ranking.	Navigate to the friends' section of the Leaderboard. Friends' rankings are displayed, reflecting Ecopoints earned from recyclable materials.	If friends' rankings are not displayed or not updated, display an error message and guide the user on the next steps.

Step	Action	Flow	Alternate Flow
4	Add a Friend by User ID.	Navigate to the "Add Friends" section and add a friend by entering their user ID.	If adding a friend fails, display an error message and guide the user on the next steps.
5	View Friends' Avatars.	Navigate to the "Friends" section. Avatars of added friends are displayed.	If avatars are not displayed or are unclear, display an error message and guide the user on the next steps.
6	Verify Friends' Rankings.	Navigate to the Leaderboard and check friends' rankings, ensuring accuracy.	If friends' rankings are inconsistent or not updated, display an error message and guide the user on the next steps.

5.Testing Methodology

5.1 Unit Testing

As we mentioned before, first of all we tested some features independently. For example, for UI part, every component tested first, then their compatibility with each other and lastly their place on the page.

5.2 System and Integration Testing

After deciding the all unit testings are successful and as expected, we will perform system and integration testing. We will perform this testing type after we connect all parts with each other. In that testing we will test all unit tests as a whole and examine it’s behavior because successful unit tests can be failed while they’re connected.

5.3 Performance Testing

After we will pass the unit testing and integration testing successfully, we will focus on nonfunctional requirements such as speed, responsiveness. We are also planning the overload the server to see it is stable or not. We are planning the use method “stress testing” that makes apps traffic higher than expected. So, we can see its responsiveness and behavior.

5.4 User Acceptance Testing

Since we don’t finish the project 100%, we couldn’t implement UAT now. From the beginning, our purpose was to help nature while using people’s competitive nature. After the application has finished, we will take a small experiment with small group of people. We will want them to use the application at least a week. After that week we will meet them again and ask them about the application. The most important question here is does the app encouraged them to recycling more than before. If the answer is “yes” we will be accepted by users and we will have a successful attempt.

5.5 Beta Testing

Since EcoFriends is not published, we cannot test our mobile application with large number of users in a short time. As a result of that, we decided to test our application step by step. First, we will want our friends to examine our application and give feedback. Before publishing the app, we will consider this feedback to improve our app.

6.Test Results

6.1 Test Results

Camera Functionality Test Results:

We will test and get specific results for material recognition with varying angles, lighting, and distances.

Points System Test Results:

Overview of points allocation accuracy for different recyclable materials.

Details on successful and unsuccessful points allocations.

Shop & Points Redemption Test Results:

We will test and see if attempts to redeem Ecopoints and Ecocoins are being accurately done or not.

We will test to see any issues encountered during shop interactions.

User Authentication and Database Integration Test Results:

Testing of successful and unsuccessful user registration attempts will be done.

Testing of assessment of data persistence and retrieval from the database will be done.

6.2 Risks

Technical Risks:

Issues with the accuracy of material recognition by the camera.

Database integration problems leading to data loss or inconsistency.

Security vulnerabilities, especially concerning user authentication and points handling.

Operational Risks:

Compatibility issues on certain devices or platforms also compatibility issues with android and apple.

7.References

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