

FIU | **Engineering & Computing**

School of Computing & Information Sciences



Project Title: Citizen Scientist Project Android v1.0

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Abstract

The Key Biscayne Citizen Scientist Project currently has a published iOS application. It was requested that a version of the application be developed for the Android platform to mimic the currently existing Citizen Scientist iOS application. By achieving an expanded audience, The Key Biscayne Community Foundation can introduce conservation efforts to citizen scientists as well as professional scientists so that they may be able to help protect and monitor the local ecosystem, as well as collect and share information amongst each other regarding the local environment. The aim of the application is to feature dynamic, up to date information on the Key Science website, invite users to upload photos of the local ecosystem, and also allow them to set up profiles and interact with the environment in the EcoQuest game. The Citizen Scientist Project Android Application (1.0) is the first release of the application for the Android platform and allows for users with Android devices to enjoy everything that the Key Biscayne Citizen Scientist Project has to offer. The team working on this project followed incremental development and an iterative approach that was comprised of six Scrum sprints. Throughout the documentation the team further elaborates on each sprint and gives detailed description of each step of the development lifecycle.

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INTRODUCTION

The KeyScience application for Android (version 1.0) extends the reach of the application to users who own Android devices. The current version of the application also goes beyond the features of the currently existing iOS version of the application, featuring the implementation of interactive sections such as the CSP Learn section, as well as the EcoQuest educational game.

We begin by going over the present version of the KeyScience iOS application and outlining the purpose behind creating a version of the application for the Android platform. Secondly, all the user stories that were implemented are showcased. Third, tools and resources that were used for the development process along with the sprint planning process and the application's system design. Following that, we conclude with a summary of the unit tests created to ensure that all components of the project are functioning as expected.

Current System

The Key Biscayne Citizen Scientist Project currently has an existing application for the iOS platform, but did not have a working version for Android limiting its reach to those users. As of right now, users with iPhones can receive news, events, and a multitude of other information regarding Key Biscayne and the local ecosystem. The iOS version of the application however does not yet include features such as dynamic data, the ability to allow users to submit photos, interaction with maps, or the EcoQuest game.

Purpose of New System

While the Key Biscayne Citizen Scientist website is also accessible for Android users, it does not provide the same level of engagement that an application could. By creating an application that mimics the currently existing application for the Android platform, users will be able to access static offline content as well as dynamic data pulled in from the website, as well as being able to create user profiles and play the EcoQuest education game.

USER STORIES

The following section provides the detailed user stories that were implemented in this iteration of the Citizen Scientist Project Android application. These user stories served as the basis for the

implementation of the project's features. This section also shows the user stories that are to be considered for future development.

Implemented User Stories

User Story CTZN-20: Create Action Bar

Description: As a user, I want a header that contains the navigation panel button and the application's logo, so that I can clearly identify the menu and see which application I'm using.

<https://www.youtube.com/watch?v=nrdLNgwZMvI&list=PLG3lylzOg8FgG5QBILv7fvGbVWvP-VID4&index=15>

User Story CTZN-21: Create Social Media Footer

Description: As a user, I want a footer at the bottom of every page, so that I can recognize the foundation and connect to their social media if I would want to.

<https://www.youtube.com/watch?v=nrdLNgwZMvI&list=PLG3lylzOg8FgG5QBILv7fvGbVWvP-VID4&index=15>

User Story CTZN-25: Create 'Home Page' Fragment

Description: As a user, I want a home page that can be accessed through every main page, so that I can access the main components of the app with ease.

<https://www.youtube.com/watch?v=WhqGNpgbdo&list=PLG3lylzOg8FgG5QBILv7fvGbVWvP-VID4&index=16>

User Story CTZN-37: Contact Form

Description: As a user, I want to be able to leave my contact information, so that the organization can reach back to me.

https://www.youtube.com/watch?v=cqSVhmY_YBE&list=PLG3lylzOg8FgG5QBILv7fvGbVWvP-VID4&index=17

User Story CTZN-38: Creation Action Bar Button

Description: As a user, I want to see a back/close button at the top of the navigation to close the navigation drawer because user's need to easily open & close the navigation panel.

<https://www.youtube.com/watch?v=SmWvjo6ntMA&list=PLG3lylzOg8FgG5QBILv7fvGbVWvP-VID4&index=14>

User Story CTZN-40: Create and Design 'Key Challenge' Fragment

Description: As a user, I want to access the Key Challenge fragment so that I may view all the information for this fragment as I well as its child pages, which includes the Mini Challenge and Previous Winners pages.

<https://www.youtube.com/watch?v=YbHL-ix1D5o&list=PLG3lylzOg8FgG5QBILv7fvGbVWvP-VID4&index=5>

User Story CTZN-41: Create Navigation Drawer

Description: As a user I would like a navigation drawer where I can access all pages in the app from the toolbar.

https://www.youtube.com/watch?v=zrXnx-lz2_I&list=PLG3lylzOg8FgG5QBILv7fvGbVWvP-VID4&index=18

User Story CTZN-43: ‘Explore the Key’ Map

Description: As a user, I want a map where I can explore the different natural resources of the key so that I can obtain information about it.

<https://www.youtube.com/watch?v=E97iO70V5WU&list=PLG3lylzOg8FgG5QBILv7fvGbVWvP-VID4&index=6>

User Story CTZN-44: Create ‘Record’ Fragment

Description: As a user, I would like to submit photos I take with my camera and upload them to the app, while the app takes note of my geolocation and other inputs such as photo title, description and name.

<https://www.youtube.com/watch?v=2L7kkZRKNlw&list=PLG3lylzOg8FgG5QBILv7fvGbVWvP-VID4&index=7>

User Story CTZN-45: Create Fragment to Load Dynamic Content

Description: As a developer I must implement a dynamic content loading design so that it can be reuse for different dynamic pages.

<https://www.youtube.com/watch?v=6ccvy7Bcjms&list=PLG3lylzOg8FgG5QBILv7fvGbVWvP-VID4&index=8>

User Story CTZN-46: Create Learn fragment of the Lab Section

Description: As a developer, I want to have dynamic content loaded from the WordPress SQL database for the Learn section. The Learn requires a separate model from the Events and News pages which use a single Java class to make requests for content from the server.

<https://www.youtube.com/watch?v=mXhlDh0TR6o&list=PLG3lylzOg8FgG5QBILv7fvGbVWvP-VID4&index=12>

User Story CTZN-47: Establish connection with the Database

Description: As a developer, I would like to retrieve data from the project's corresponding WordPress database without the need to integrate or hard code the live database password into the project.

<https://www.youtube.com/watch?v=wx3o4X1JO-0&list=PLG3lylzOg8FgG5QBILv7fvGbVWvP-VID4&index=19>

User Story CTZN-57: Create Profile Page

Description: As a user, I want a profile page that displays my information for editing.

<https://www.youtube.com/watch?v=MNDTXKK0o7E&list=PLG3lylzOg8FgG5QBILv7fvGbVWvP-VID4&index=10>

User Story CTZN-58: Authentication functionality

Description: As a developer, I must implement an authentication functionality so that the app can verify the user's identity.

User Story CTZN-64: 'Remember Me' -- Login

Description: As a user, I want the app to remember my credentials so that I do not have to log in every time I open the app.

https://www.youtube.com/watch?v=c_vXp2j5kPM&list=PLG3lylzOg8FgG5QBILv7fvGbVWvP-VID4&index=9

User Story CTZN-66: Leaderboard

Description: As a user, I want to see a leader board that shows how other users rank so that I can compare myself to them.

<https://www.youtube.com/watch?v=NSvv1BTaVHs&list=PLG3lylzOg8FgG5QBILv7fvGbVWvP-VID4&index=11>

Pending User Stories

User Story CTZN-70: Add Search for Users

Description: As a user, I would like to be able to search for other users on the platform using their email.

User Story CTZN-71: View User Profiles

Description: As a user, I would like to be able to view other user profiles so that I may read their bio and view their EcoQuest statistics.

User Story CTZN-72: Implement Friends Feature

Description: As a user, I want to be able to add other users as friends and have a friends list.

PROJECT PLAN

This section describes the planning that went into the realization of this project. This project incorporated the agile development techniques and as such required the sprints to be planned. These sprint plannings are detailed in the section. This section also describes the components, both software and hardware, chosen for this project.

Hardware and Software Resources

The following is a list of all hardware and software resources that were used in this project:

Future developers should have a firm grasp of Java and an understanding of the Android development process.

Hardware:

- For testing, multiple Android devices were used to test the application:
 - Samsung Galaxy Note 9
 - Samsung Galaxy S7
 - Samsung Galaxy Note 3
 - Samsung Galaxy Note 8 (Tablet)

Software:

- Android Studio – IDE used in the development process.
- Android SDK – Android Source Development Kit for developing apps for the Android platform.
- Google Maps API – Allows application to implement Google Maps interaction.
- Jsoup – HTML Parser.
- Squareup Picasso – Used for loading images for user profiles and other dynamic content.
- JIRA – Project management software.
- BitBucket – Repository used for source control (Based off git)

Sprints Plan

Sprint 1

Attendees: Jose Toledo , Edward Terry , Nathan Moyer

Start time: 2:00 PM

End time: 4:00 PM

After discussion, the velocity of the team were estimated to be:

- Since this is the first sprint, we are not yet able to calculate the estimated team velocity.

The product owner chose the following user stories to be done during the next sprint. They are ordered based on their priority.

- [CTZN-25](#) - Create 'Home Page' Fragment (Android)
- [CTZN-35](#) - Bind static content to views (Android)
- [CTZN-38](#) - Create action bar button
- [CTZN-20](#) - Create action bar (Android)

The team members indicated their willingness to work on the following user stories.

- Jose Toledo
 - [CTZN-20](#) - Create action bar (Android)
 - [CTZN-38](#) - Create action bar button
- Edward Terry
 - [CTZN-25](#) - Create 'Home Page' Fragment (Android)
 - [CTZN-35](#) - Bind static content to views (Android)

Sprint 2

Attendees: Nathan Moyer, Edward Terry, Jose Toledo

Start time: 3:30 PM

End time: 4:00 PM

After discussion, the velocity of the team were estimated to be 29 hours.

The product owner chose the following user stories to be done during the next sprint. They are ordered based on their priority.

- [CTZN-42](#) - Style updates
- [CTZN-40](#) - Create and design 'Key Challenge' fragment
- [CTZN-37](#) - Contact form
- [CTZN-35](#) - Bind static content to views (Android)

The team members indicated their willingness to work on the following user stories.

- Edward Terry
 - [CTZN-42](#) - Style updates
 - [CTZN-40](#) - Create and design 'Key Challenge' fragment
- Jose Toledo
 - [CTZN-37](#) - Contact form
 - [CTZN-35](#) - Bind static content to views (Android)

Sprint 3

Attendees: Edward Terry, Jose Toledo, Nathan Moyer

Start time: 3:30 PM

End time: 4:00 PM

After discussion, the velocity of the team were estimated to be 50 hours.

The product owner chose the following user stories to be done during the next sprint. They are ordered based on their priority.

- [CTZN-45](#) - Create Fragment to load dynamic content
- [CTZN-47](#) - Establish connection with the Database
- [CTZN-44](#) - Create Record Fragment
- [CTZN-43](#) - Explore the Key Map
- [CTZN-46](#) - Create Learn fragment of the Lab section

The team members indicated their willingness to work on the following user stories.

- Edward Terry
 - [CTZN-45](#) - Create Fragment to load dynamic content

- [CTZN-47](#) - Establish connection with the Database
- [CTZN-43](#) - Explore the Key Map
- Jose Toledo
 - [CTZN-43](#) - Explore the Key Map
 - [CTZN-47](#) - Establish connection with the Database
 - [CTZN-46](#) - Create Learn fragment of the Lab section
 - [CTZN-44](#) - Create Record Fragment

Sprint 4

Attendees: Jose Toledo, Edward Terry, Nathan Moyer

Start time: 3:30PM

End time: 4:00PM

After discussion, the velocity of the team were estimated to be 47.

The product owner chose the following user stories to be done during the next sprint. They are ordered based on their priority.

- [CTZN-50](#) - Make shade area clickable on Maps
- [CTZN-51](#) - Add CSP Lab to Home
- [CTZN-52](#) - 'View More' on Events/News link out to website
- [CTZN-53](#) - For Events/News items, all caps, and smaller text size for title
- [CTZN-54](#) - Lecture Series and Field Activities -- Change 'Learn More' to load Events fragment
- [CTZN-55](#) - Style markers on Explore Key Map
- [CTZN-56](#) - Begin finding solution for connecting to user profile -- PHP to auth user

The team members indicated their willingness to work on the following user stories.

- Jose Toledo
 - [CTZN-50](#) - Make shade area clickable on Maps
 - [CTZN-51](#) - Add CSP Lab to Home
 - [CTZN-53](#) - For Events/News items, all caps, and smaller text size for title
 - [CTZN-54](#) - Lecture Series and Field Activities -- Change 'Learn More' to load Events fragment
- Edward Terry

- [CTZN-54](#) - Lecture Series and Field Activities -- Change 'Learn More' to load Events fragment
- [CTZN-55](#) - Style markers on Explore Key Map

Sprint 5

Attendees: Edward Terry, Jose Toledo, Nathan Moyer

Start time: 3:30 PM

End time : 4:30 PM

After discussion, the velocity of the team were estimated to be 63.

The product owner chose the following user stories to be done during the next sprint. They are ordered based on their priority.

- [CTZN-57](#) - Create Profile Page
- [CTZN-58](#) - Authentication functionality
- [CTZN-59](#) - Profile table
- [CTZN-60](#) - Study GeoFence
- [CTZN-61](#) - Login Form
- [CTZN-62](#) - Reduce load time of Map layers

The team members indicated their willingness to work on the following user stories.

- Edward Terry
 - [CTZN-57](#) - Create Profile Page
 - [CTZN-59](#) - Profile table
 - [CTZN-61](#) - Login Form
- Jose Toledo
 - [CTZN-58](#) - Authentication functionality
 - [CTZN-60](#) - Study GeoFence
 - [CTZN-62](#) - Reduce load time of Map layers

Sprint 6

Attendees: Nathan Moyer, Edward Terry, Jose Toledo

Start time: 3:30PM

End time: 4:30PM

After discussion, the velocity of the team were estimated to be 48.

The product owner chose the following user stories to be done during the next sprint. They are ordered based on their priority.

- [CTZN-63](#) - Rework Login System
- [CTZN-64](#) - Remember Me
- [CTZN-66](#) - Add EcoQuest Global Leaderboards
- [CTZN-67](#) - Load EcoQuest Content Dynamically from Database
- [CTZN-68](#) - Update User Points upon entering Geofence
- [CTZN-69](#) - Correct issues with updating Profile Fragment

The team members indicated their willingness to work on the following user stories.

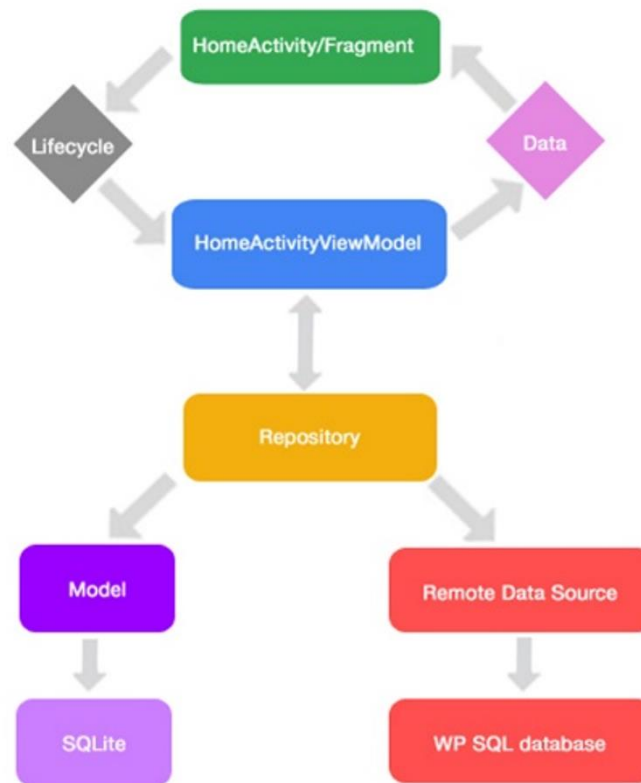
- Edward Terry
 - [CTZN-67](#) - Load EcoQuest Content Dynamically from Database
 - [CTZN-68](#) - Update User Points upon entering Geofence
 - [CTZN-69](#) - Correct issues with updating Profile Fragment
- Jose Toledo
 - [CTZN-63](#) - Rework Login System
 - [CTZN-64](#) - Remember Me
 - [CTZN-66](#) - Add EcoQuest Global Leaderboards

SYSTEM DESIGN

This section contains information on the design decisions that went into this project. The architecture patterns are outlined and explained. The entire system is shown in a package diagram and the subsystems are explained. Finally, the design patterns used in the project are discussed.

Architectural Patterns

The Citizen Scientist Project Android application uses the Model-View-Controller (MVC) system architecture. The MVC design pattern decouples these major components (Model, View, Controller) allowing for parallel development and efficient code. This is done to separate internal representations of information from the ways information is presented to and accepted from the user.



MVC Components & Interactions:

- **Model:** Responsible for handling network and database API, this is the data layer. The model is responsible for the management of logic, data, and rules for the application and

also receives input from the controller.

- View: Visualization of data from the Model, this is the UI Layer. As such, this is the layer that functions as an output of information that the user is viewing.
- Controller: Updates the model as needed and is also notified of the user's behavior, this is the Logic Layer. The controller accepts user input which it then uses as commands for the view or model.

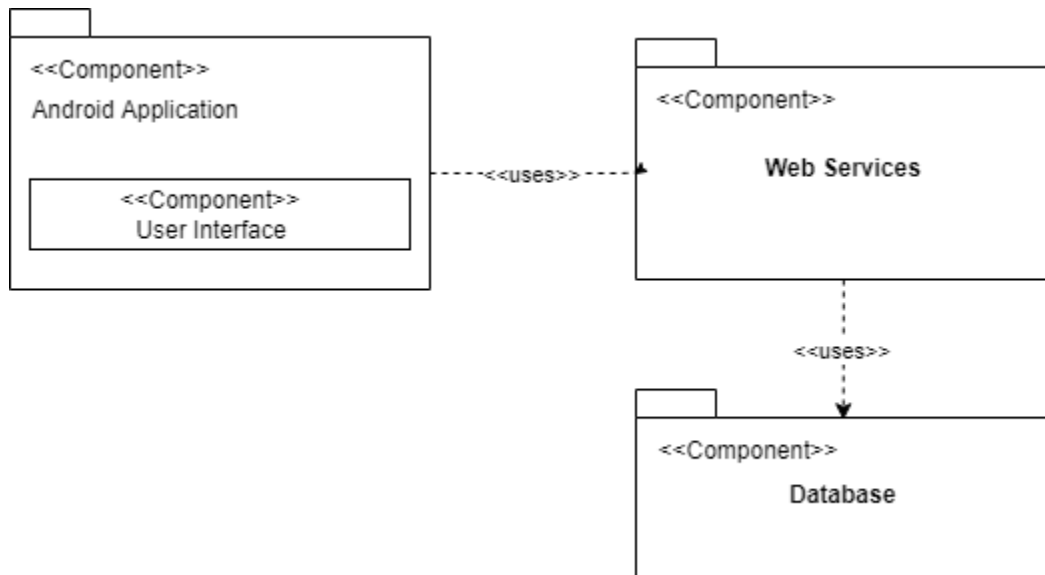
MVC Advantages:

- MVC allows for maintainability, scalability, as well as testability.
- Faster Development Process - MVC helps aid in rapid and parallel development, as developers can work on different sections of the application at once.
- Ability to provide multiple views - Using the MVC model, it is possible to create multiple views for a model.

MVC Disadvantages:

- Consistency of multiple artifacts – Decomposing a feature into three artifacts can cause 'scattering', which will require developers to maintain the consistency of multiple representations at once.
- Navigating the framework can become complicated because new layers of abstraction are introduced and users are required to adapt to the decomposition criteria of MVC.

System and Subsystem Decomposition



Android Application

The application is composed of a single Activity that swaps fragments containing the UI as the user navigates through the app. These fragments are the view model to which information is binded by means of adapters.

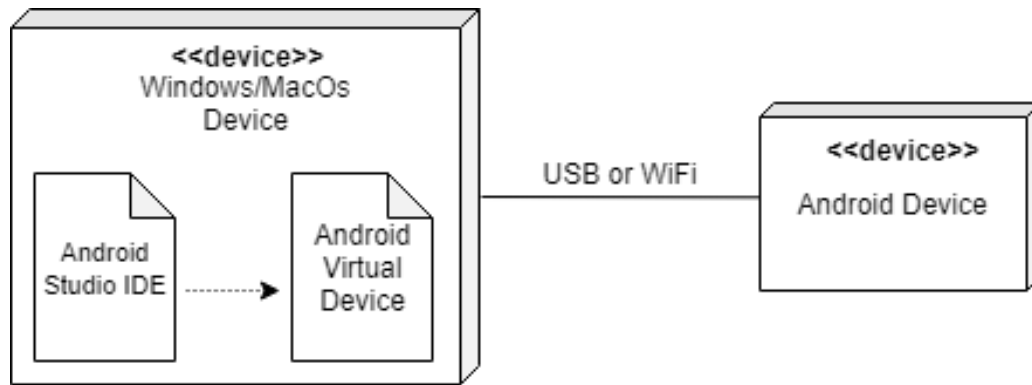
Database

The database is hosted by WordPress. It stores user-login data and EcoQuest game data for each user. There is also a local database (SQLite) that functions as a cache for user data.

Web Service

Dynamic data and user related functionality works directly with the database. This information is transmitted via http requests to PHP files residing on the server side. These files query the database, generate JSON files, and send them to the app as response to the initial request.

Deployment Diagram



Design Patterns

The following design pattern was used in the project to help maintain flexibility and use ability for planned iterations as well as to shorten development time:

Singleton

The singleton pattern ensures that only one single instance of a class exist throughout the lifecycle of the application.

Adapter

An Adapter object acts as a bridge between an AdapterView and the underlying data for that view. The Adapter provides access to the data items. The Adapter is also responsible for making a View for each item in the data set. (Android Developers, 2019)

Observer

Objects of the app are observed, and notifications or user interface updates are triggered upon changes to this objects.

SYSTEM VALIDATION

Sprint 1

01/18/2019

CTZN-20

- Test case ID: Action Bar
- Description/Summary of Test: Upon application launch, an action bar should appear at the top, containing the application logo as well as a navigation panel button to the left.
- Pre-condition: Action bar is displayed at top upon launching application.
- Expected Results: Action bar should contain application logo and navigation drawer button.
- Actual Result: Action bar is displayed and works as expected.
- Status (Fail/Pass): Pass

CTZN-21

- Test case ID: Social Media.
- Description/Summary of Test: User can connect with the organization's social media.
- Pre-condition: App is running.
- Expected Results: Tapping on the social media icons launches the corresponding app.
- Actual Result: Each of the social media icons launch their corresponding apps and land on the organization's profile.
- Status (Fail/Pass): Pass.

CTZN-25

- Test case ID: Home Page
- Description/Summary of Test: Home page displays upon launching the app, and pressing the back button takes the user to the home page.
- Pre-condition: N/A
- Expected Results: Home page loads under 3 secs upon launching the app. Pressing back button reloads home page under 1 sec.
- Actual Result: Home page loads in less than 2 secs. Pressing back button loads home page in less than 0.5 sec.
- Status (Fail/Pass): Pass

CTZN-38

- Test case ID: Back Button
- Description/Summary of Test: Tapping back button closes navigational drawer.
- Pre-condition: Navigation drawer is open.
- Expected Results: When navigation drawer is open, back button is shown top left. Tapping the button closes the drawer.
- Actual Result: Back button appears when drawer is displayed, and tapping the button closes the drawer.
- Status (Fail/Pass): Pass.

CTZN-41

- Test case ID: Navigation Drawer
- Description/Summary of Test: Nav. Drawer contain items by categories.
- Pre-condition: Nav. drawer is open.
- Expected Results: Nav. Drawer items are organized by categories within an expandable list.
- Actual Result: Items are contained inside an expandable list. The currently selected item highlights as a visual aid to let the user know the current content that is being displayed. Tapping on an item loads the corresponding content.
- Status (Fail/Pass): Pass.

Sprint 2**02/01/2019****CTZN-37**

- Test case ID: Contact Form
- Description/Summary of Test: User can send his information to the organization.
- Pre-condition: Contact Form is open
- Expected Results: The user is able to fill out the form and send the email.
- Actual Result: User can send an email and it is received by the organization.
- Status (Fail/Pass): Pass

CTZN-40

- Test case ID: Key Challenge
- Description/Summary of Test: The Key Challenge fragment will be accessed and load properly, and its child fragments can be accessed and loaded successfully as well.
- Pre-condition: User opens the application and has not yet navigated to the Key Challenge fragment
- Expected Results: Key Challenge fragment opens successfully and its child fragments function as well.
- Actual Result: Key Challenge fragment as well as child fragments load successfully
- Status (Fail/Pass): Pass

Sprint 3**02/15/2019**

CTZN-43

- Test case ID: Key Map
- Description/Summary of Test: Google Maps is integrated into the app. The user can change map type and can select the different layers of natural resources.
- Pre-condition: Explore the Key fragment is open.
- Expected Results: User can see the layers and switch map style.
- Actual Result: Layers of natural resources are highlighted on the map. The user can also change map type to terrain, satellite, hybrid, and standard.
- Status (Fail/Pass): Pass

CTZN-44

- Test case ID: Send Photo to Server
- Description/Summary of Test: User will take a photo and give it a title and description, before submitting it to the server.
- Pre-condition: Fragment has just been loaded and does not have any photo or image for sending.
- Expected Results: Photo is sent successfully and is logged in the database as well as uploaded to the server.
- Actual Result: Photo is uploaded successfully, and its corresponding data is added to database table.
- Status (Fail/Pass): Pass.

CTZN-45

- Test case ID: Dynamic Loading
- Description/Summary of Test: All dynamic pages load correctly.
- Pre-condition: Database connection is already established.
- Expected Results: The design pattern developed is reusable for every dynamic page.
- Actual Result: All dynamic pages load their content from the database.
- Status (Fail/Pass): Pass

CTZN-46

- Test case ID: Dynamic Loading (Learn Fragment)
- Description/Summary of Test: Dynamic content loading correctly.
- Pre-condition: Connection to database is already established.
- Expected Results: Dynamic content is loaded properly.
- Actual Result: Dynamic content for the Learn fragment is loaded properly.
- Status (Fail/Pass): Pass

CTZN-47

- Test case ID: Establish Database Connection
- Description/Summary of Test: Opening fragment or activity with dynamic data will load its corresponding dynamic data
- Pre-condition: Fragment/Activity with dynamic data has not yet been loaded.
- Expected Results: Upon selecting the fragment/activity with dynamic data, it should begin loading the data and finally display it for the user.
- Actual Result: SQL Query data successfully passed to JSON file. JSON successfully loaded and read by application. Application successfully loads data for user to see.
- Status (Fail/Pass): Pass.

Sprint 4**03/01/2019**

CTZN-56

- Test case ID: Login Connection
- Description/Summary of Test: User's login credentials are verified against the database.
- Pre-condition: Credentials are added to login form.
- Expected Results: Login is successful.
- Actual Result: Login succeeds.
- Status (Fail/Pass): Pass

Sprint 5**03/08/2019**

CTZN-57

- Test case ID: Profile Fragment
- Description/Summary of Test: A user logs in and then reaches the Profile fragment.
- Pre-condition: Login is successful.
- Expected Results: User logs in and reaches the Profile fragment, displaying the information for that user.
- Actual Result: Login succeeds, and user is taken to their own profile.
- Status (Fail/Pass): Pass

CTZN-58

- Test case ID: Authentication
- Description/Summary of Test: Credentials are correctly match against database.
- Pre-condition: User provides credentials.

- Expected Results: If credentials are valid, access must be granted, otherwise deny access.
- Actual Result: Upon successful verification, user is granted access. When wrong credentials are provided, access is not granted.
- Status (Fail/Pass): Pass

Sprint 6

04/01/2019

CTZN-64

- Test case ID: Remember Me
- Description/Summary of Test: Login in with the 'Remember Me' option allows the user to restart the app without having to log in again.
- Pre-condition: "Remember Me" is selected by the user.
- Expected Results: After closing the app, the user can reopen and not have to log in.
- Actual Result: Using the 'Remember Me' option stores user data in local cache which allows to reopen the app without asking for login.
- Status (Fail/Pass): Pass.

CTZN-66

- Test case ID: Leaderboard
- Description/Summary of Test: Launching EcoQuest activity loads a leader board.
- Pre-condition: EcoQuest activity is running.
- Expected Results: Top 50 users are shown in descending order by points.
- Actual Result: Top 50 users are shown in descending order by points.
- Status (Fail/Pass): Pass.

GLOSSARY

Citizen Science Projects: Outreach projects in which members of certain communities and scientists work together to gather data and learn about current research.

Android: Operating System developed by Google. and used solely on its mobile hardware.

Agile: A collection of software development methods described in the Agile Manifesto that focus on developing software which is responsive to change.

Scrum: Agile framework which is composed of iterative and incremental sprints and used

for managing product development.

Jira: Project Management Software kit developed by Atlassian with the purpose of facilitating Agile development.

Bitbucket: Online Git repository hosting service, used for version control.

Confluence: Online documentation, manuals, reports etc.

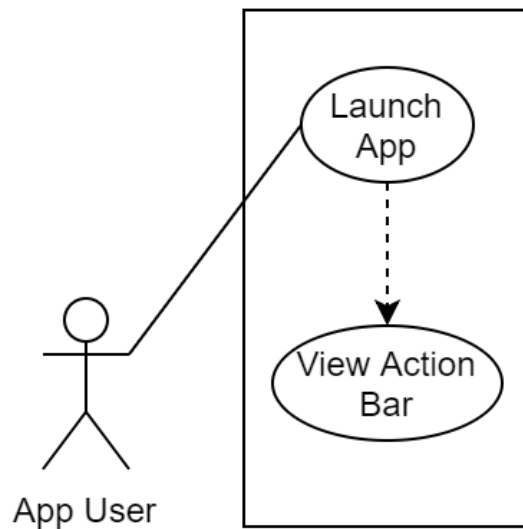
APPENDIX

Appendix A - UML Diagrams

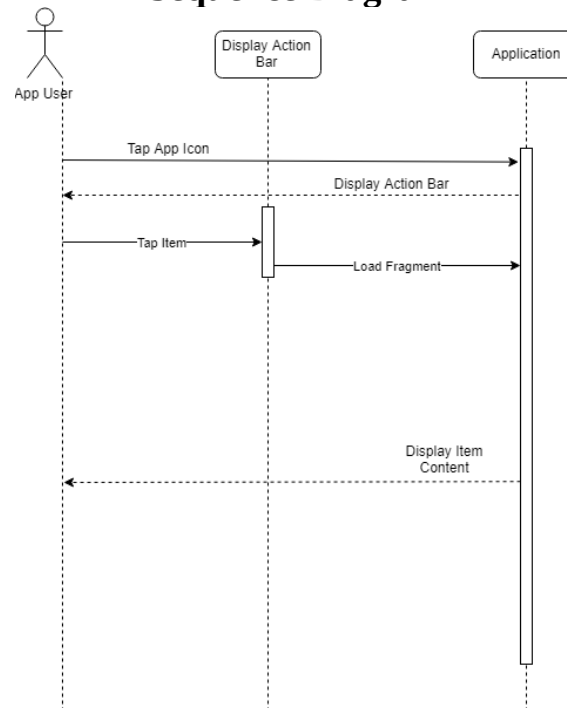
CTZN-20 - Create action bar (Android)

CTZN-20 Use Case Diagram

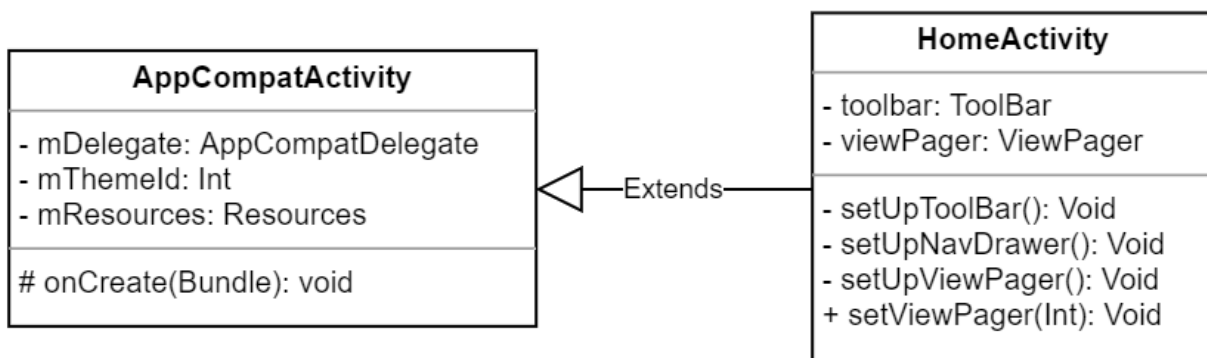
Edward Terry | Citizen Scientist Project Application



Sequence Diagram

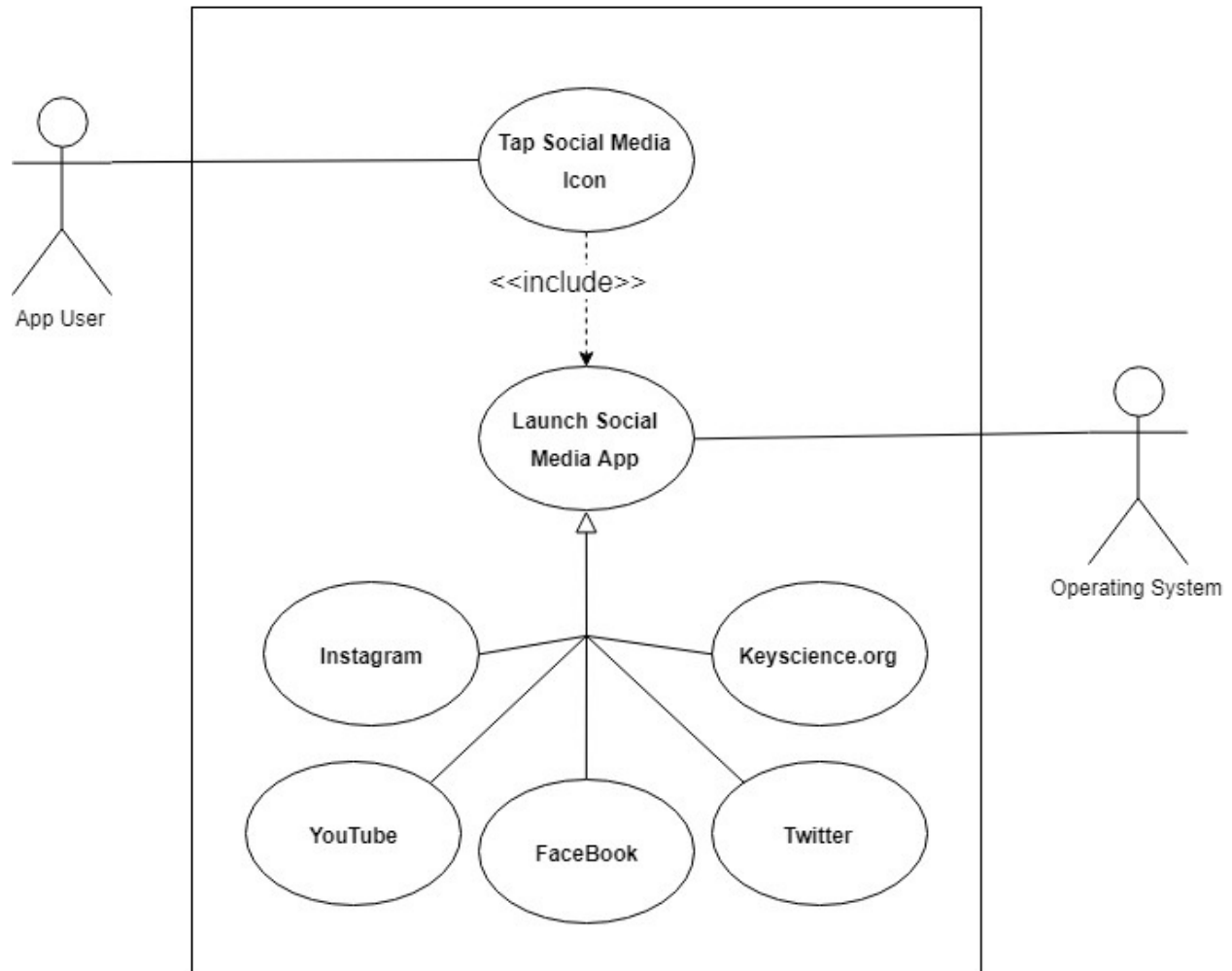


Class Diagram

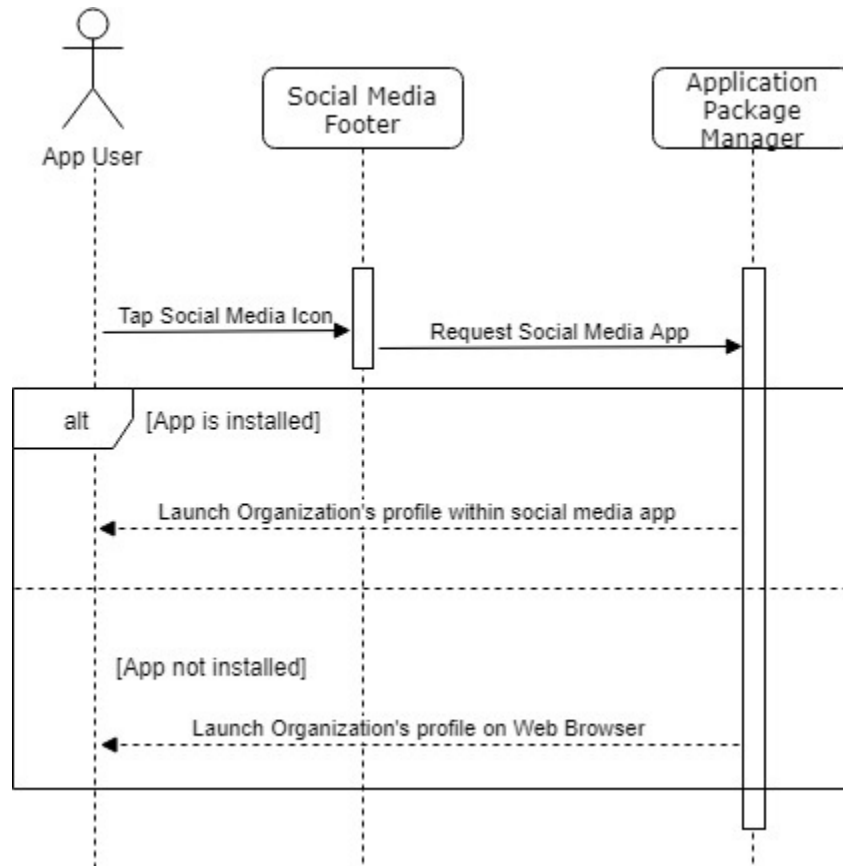


CTZN-21 - Create Social Media Footer (Android**CTZN-21 Use Case Diagram**

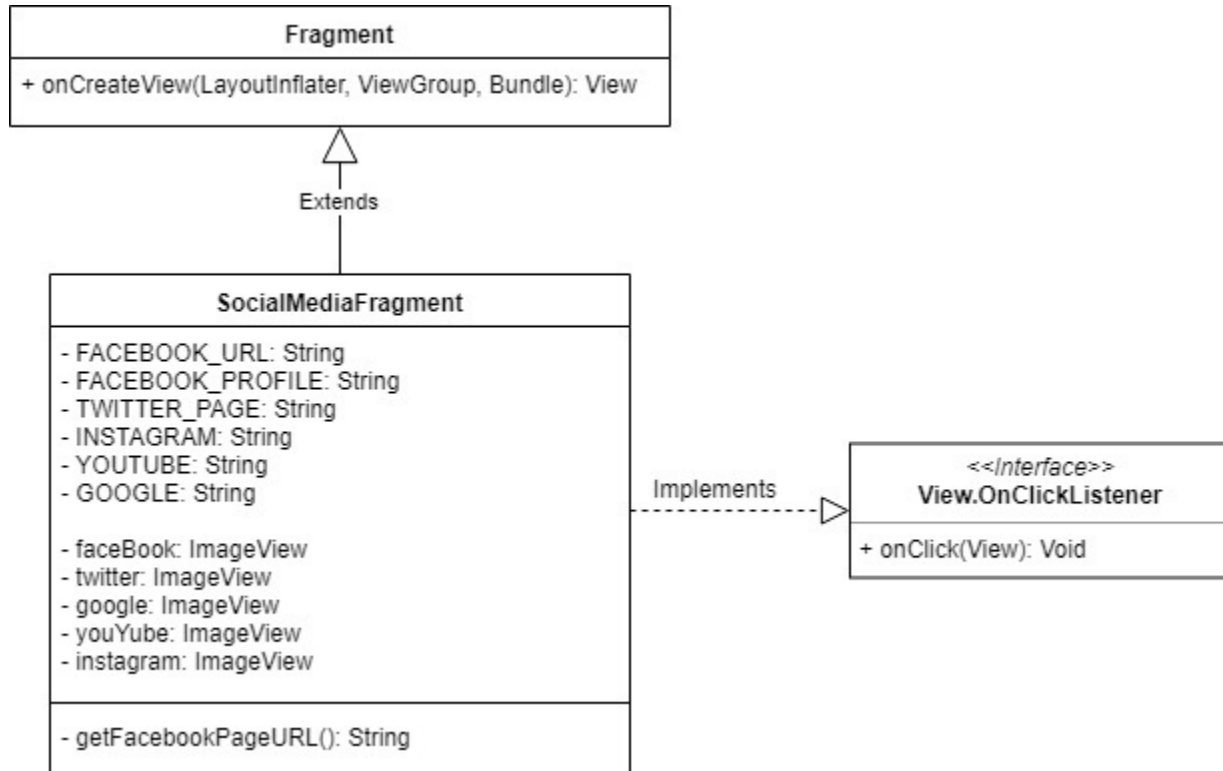
Jose Toledo | Citizen Scientist Project Application



Sequence Diagram

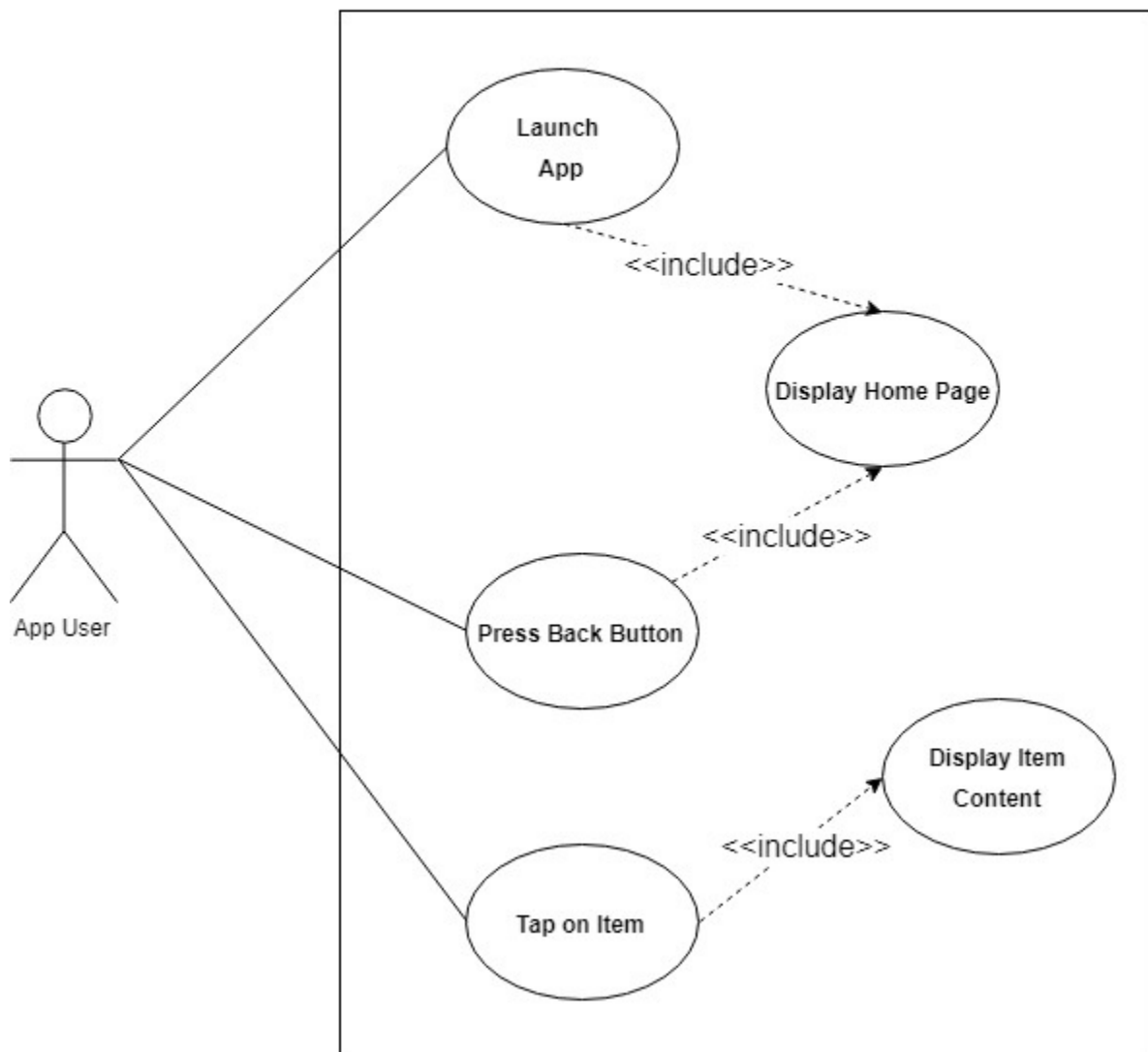


Class Diagram

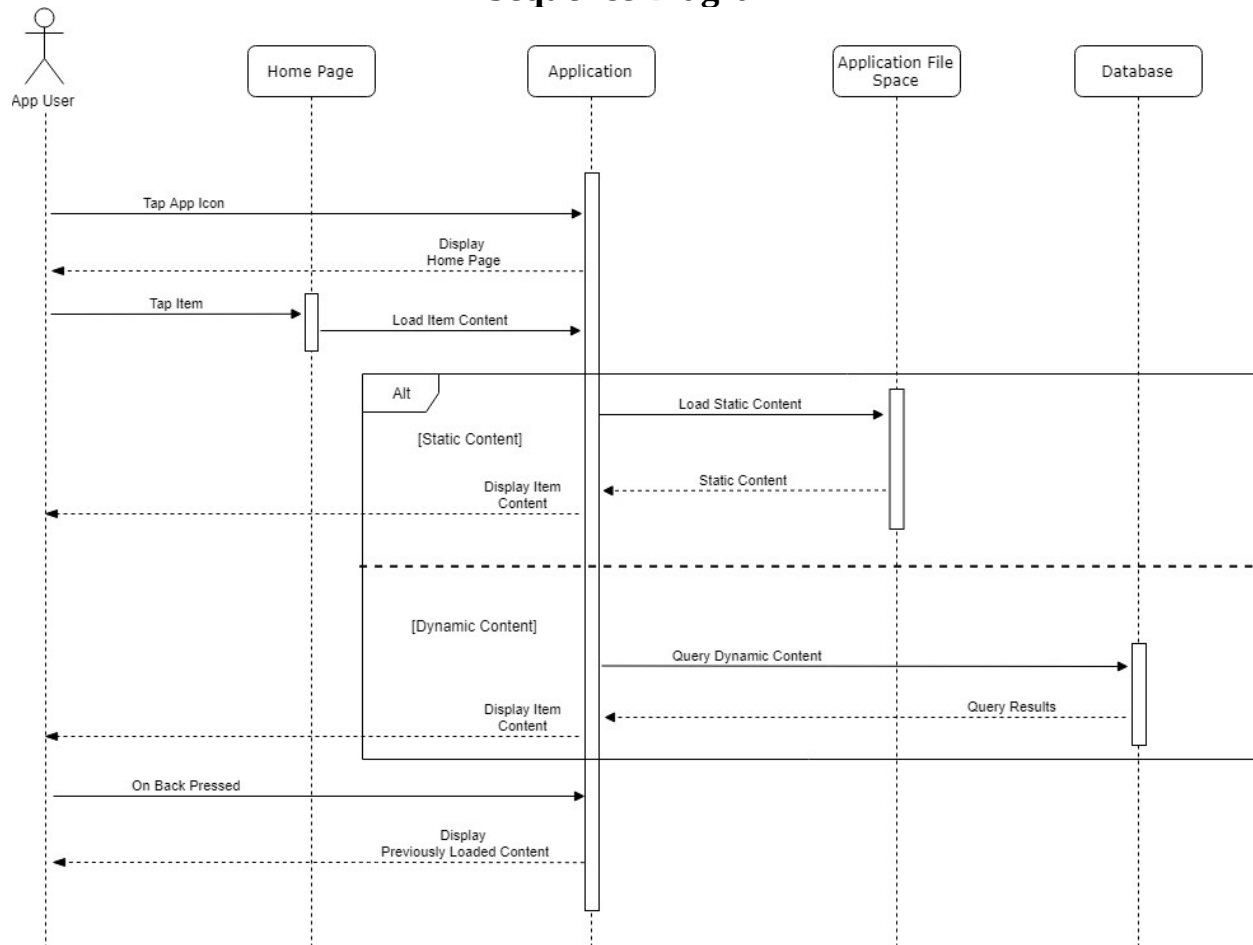


CTZN-25 - Create 'Home Page' Fragment (Android)**CTZN-25 Use Case Diagram**

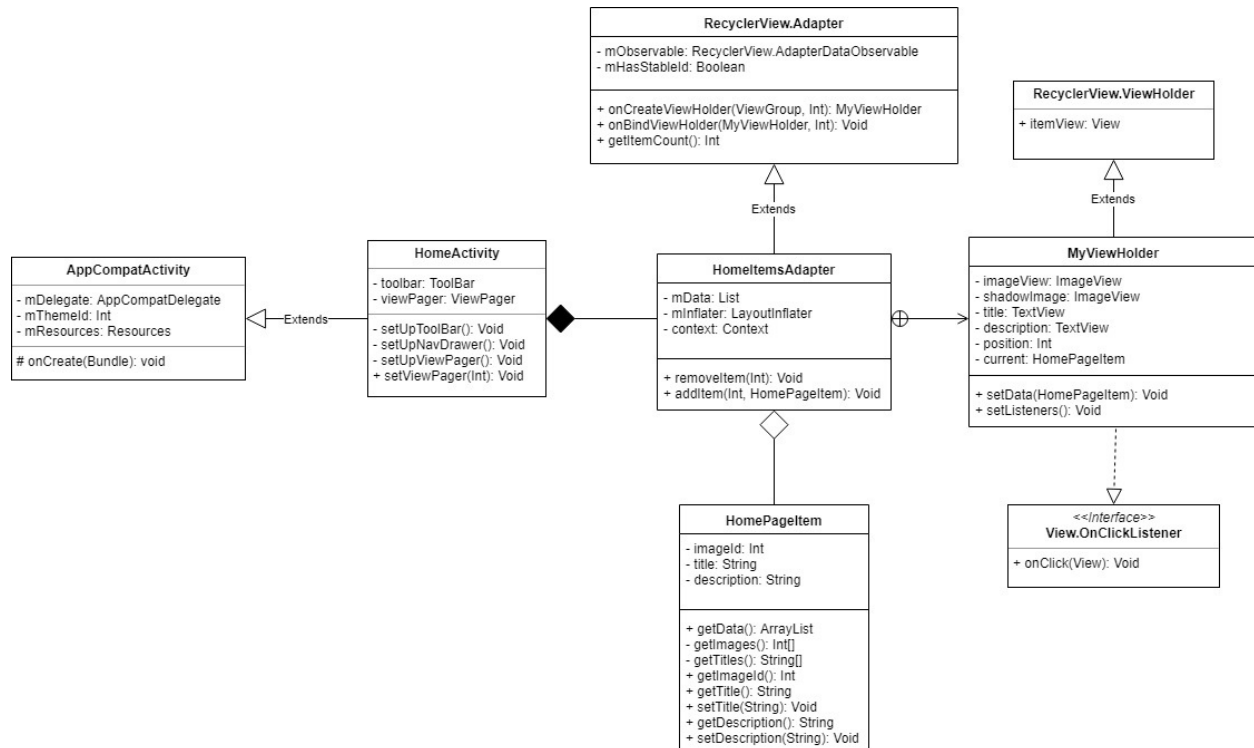
Jose Toledo | Citizen Scientist Project Application



Sequence Diagram

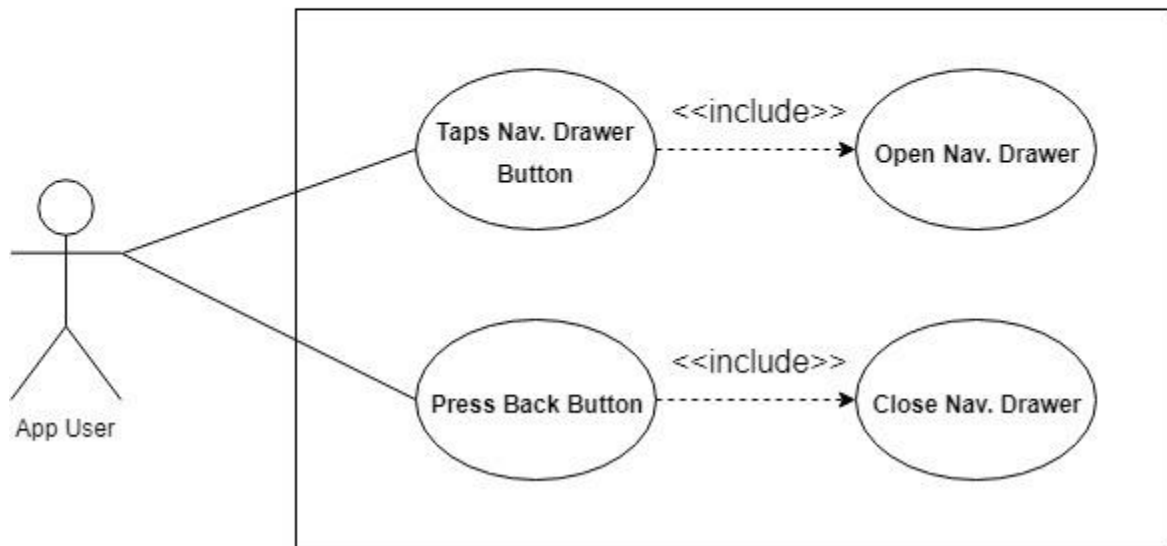


Class Diagram

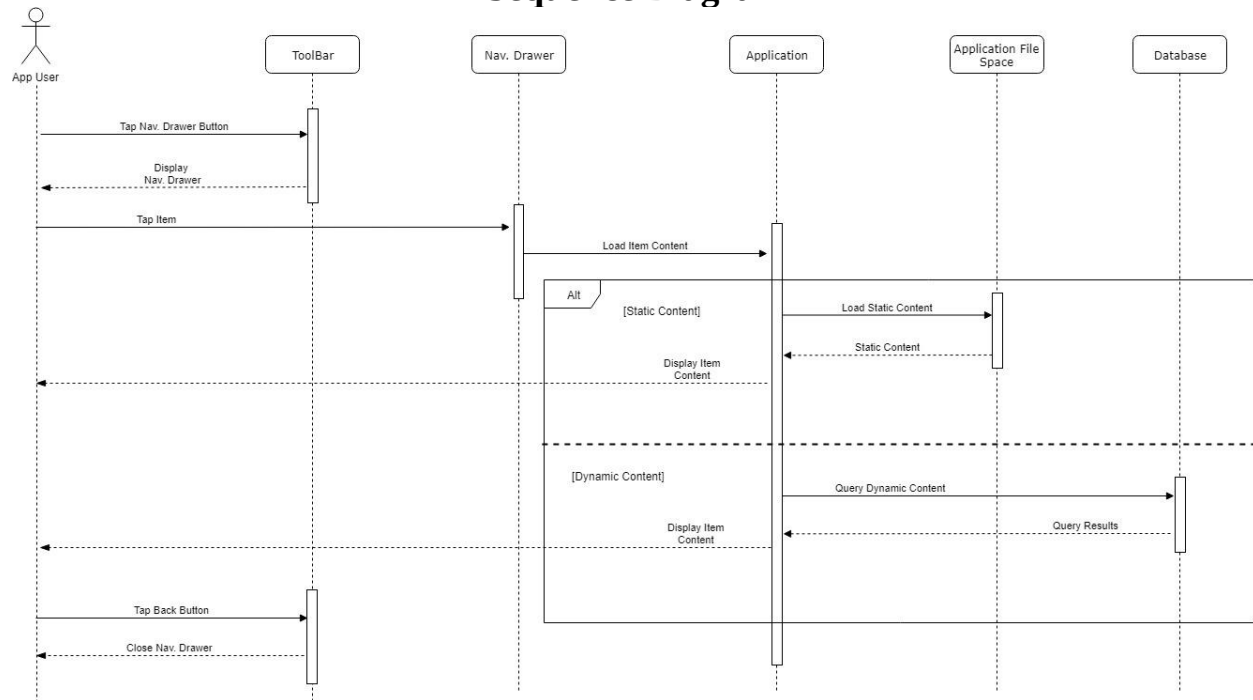


CTZN-38 - Create action bar button**CTZN-38 Use Case Diagram**

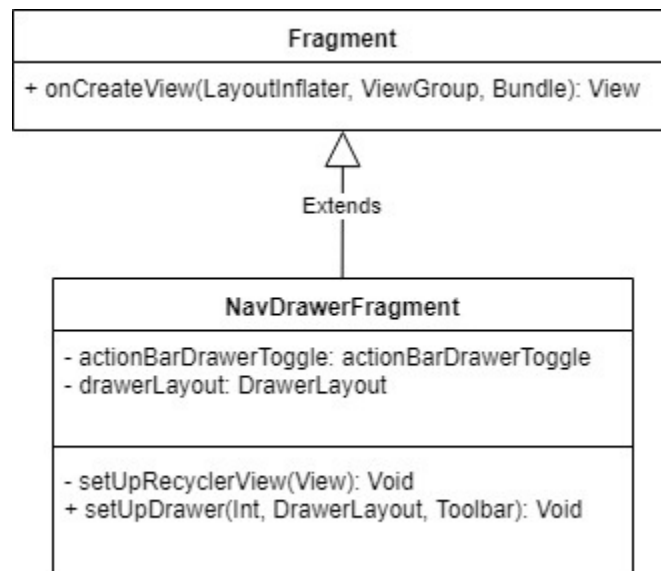
Jose Toledo | Citizen Scientist Project Application



Sequence Diagram

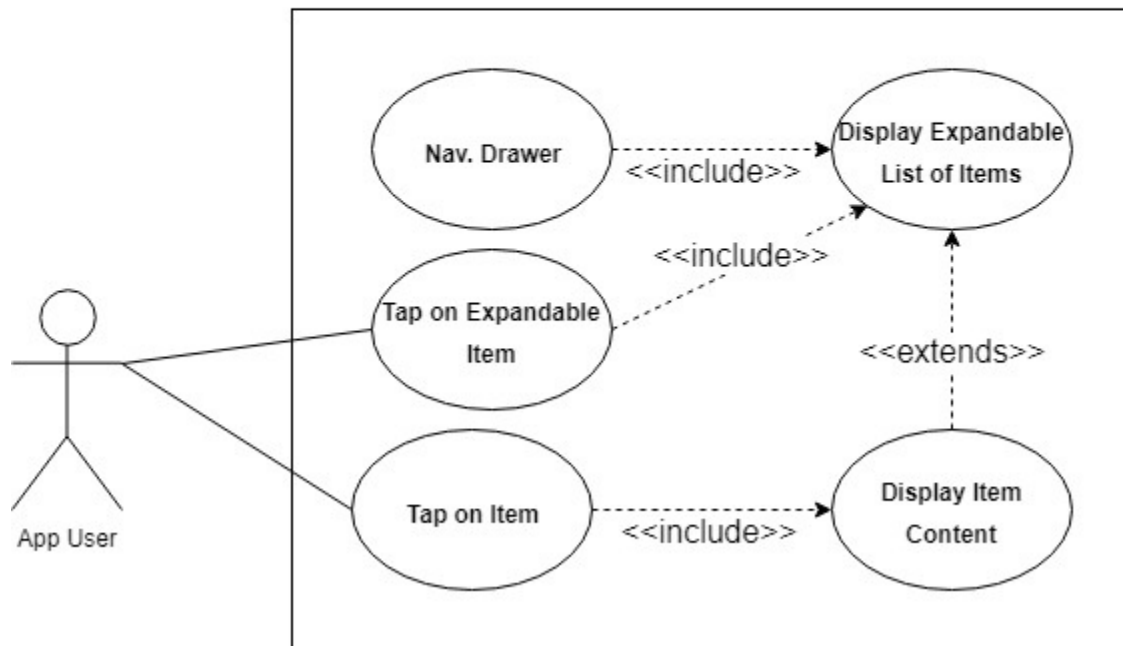


Class Diagram

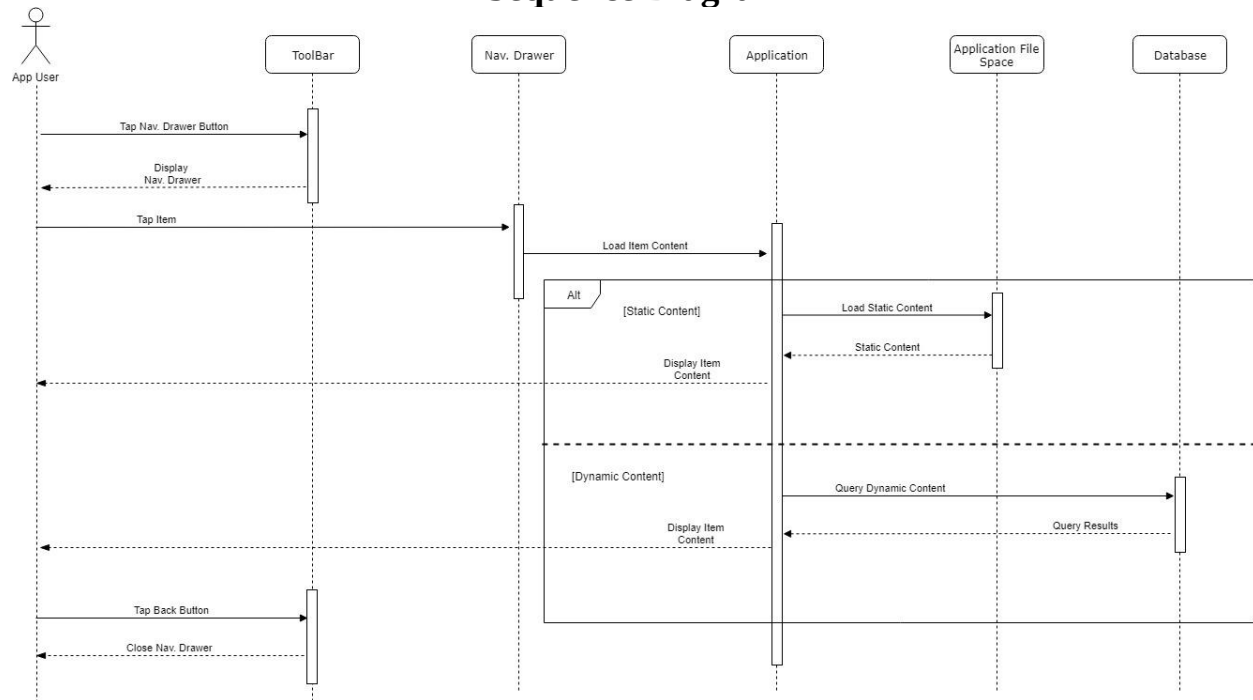


CTZN-41 - Create Navigation Drawer**CTZN-41 Use Case Diagram**

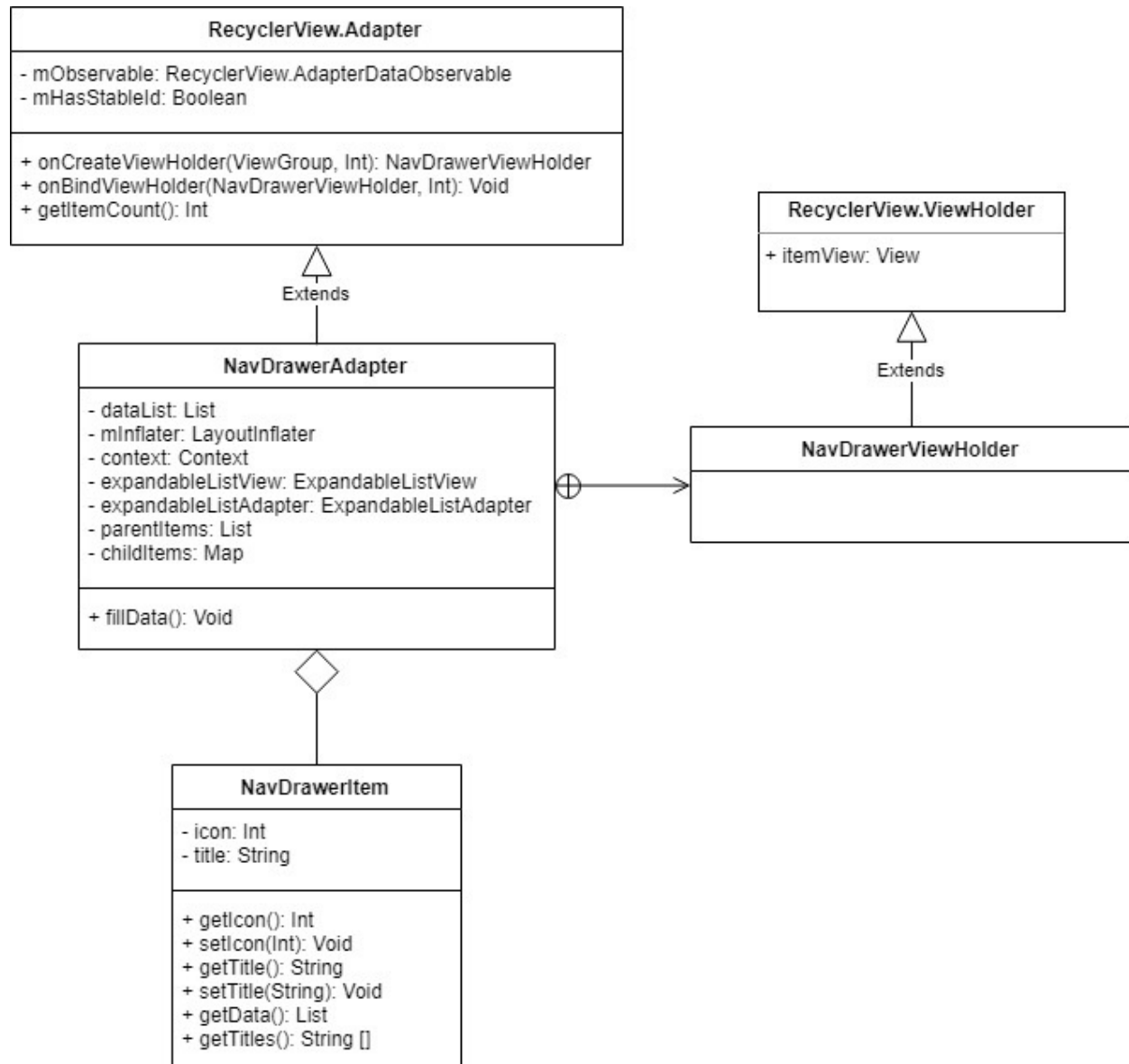
Jose Toledo | Citizen Scientist Project Application



Sequence Diagram

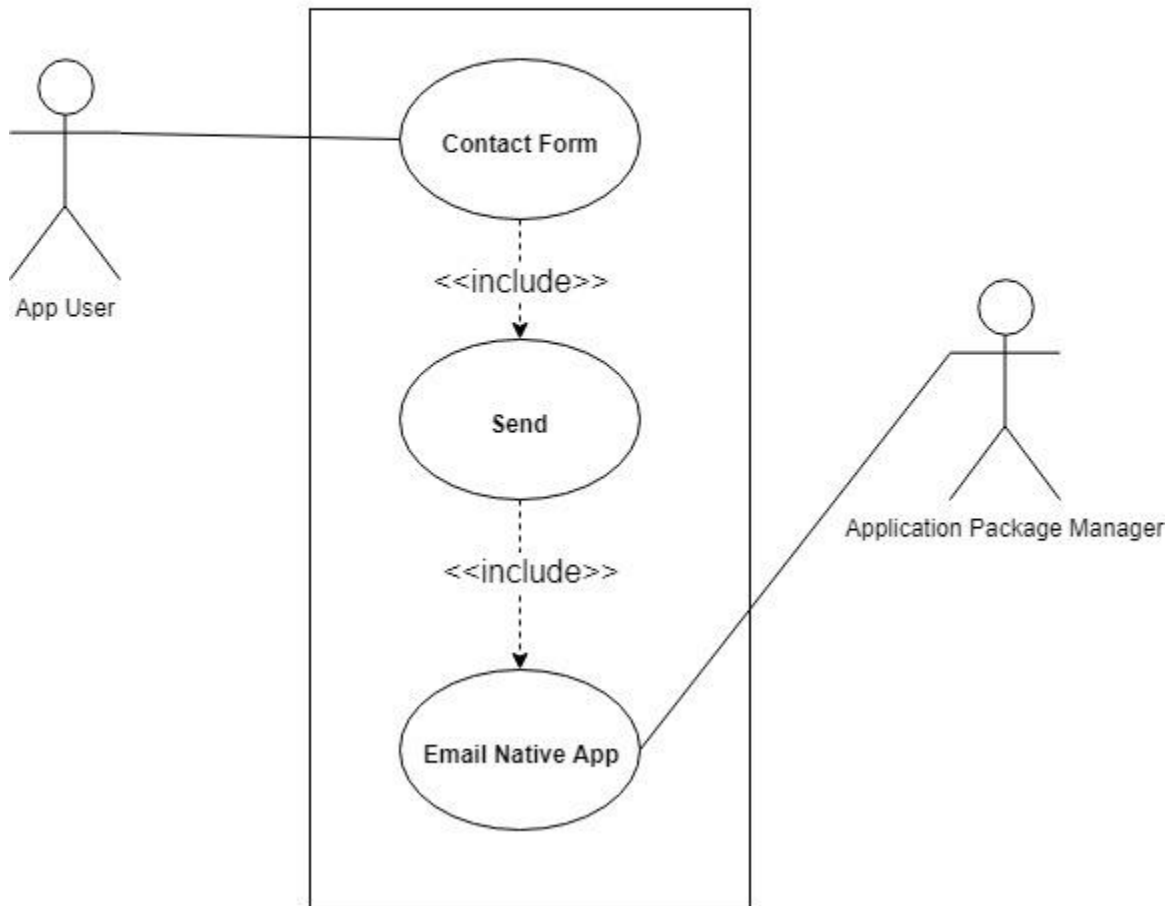


Class Diagram

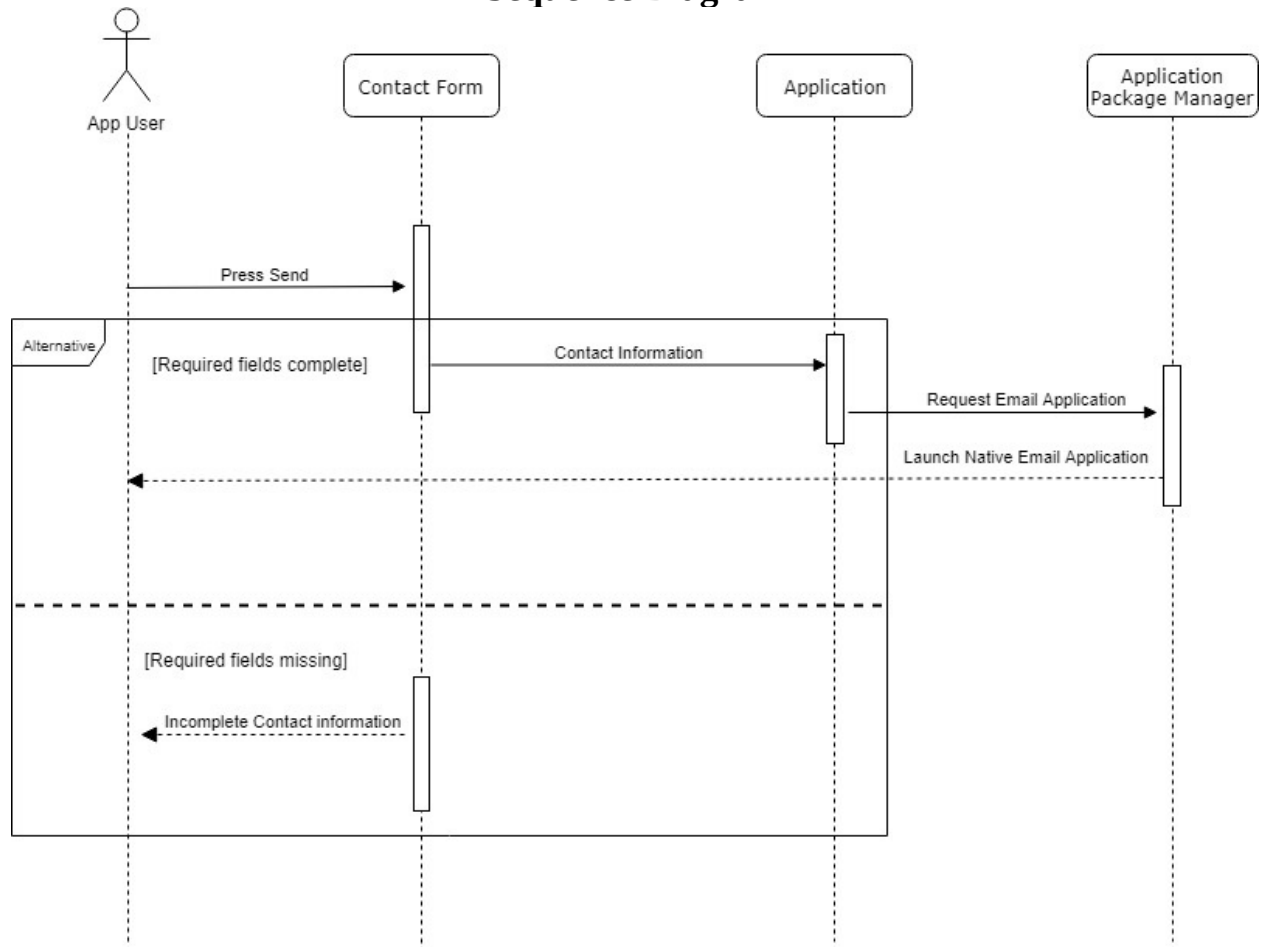


CTZN-37 - Contact form**CTZN-37 Use Case Diagram**

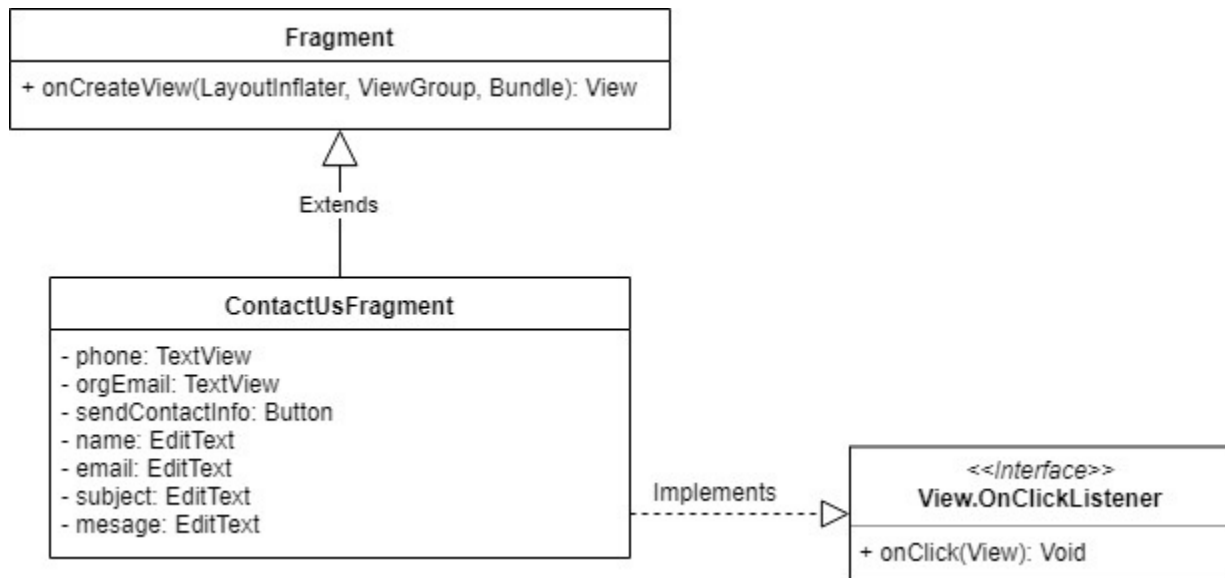
Jose Toledo | Citizen Scientist Project Application



Sequence Diagram

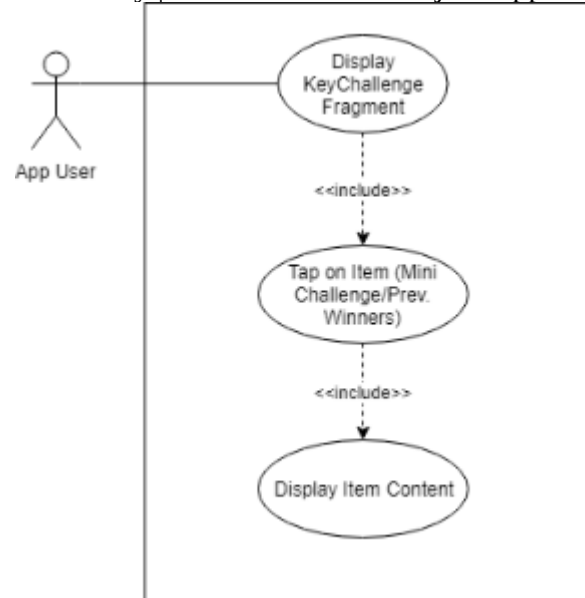


Class Diagram

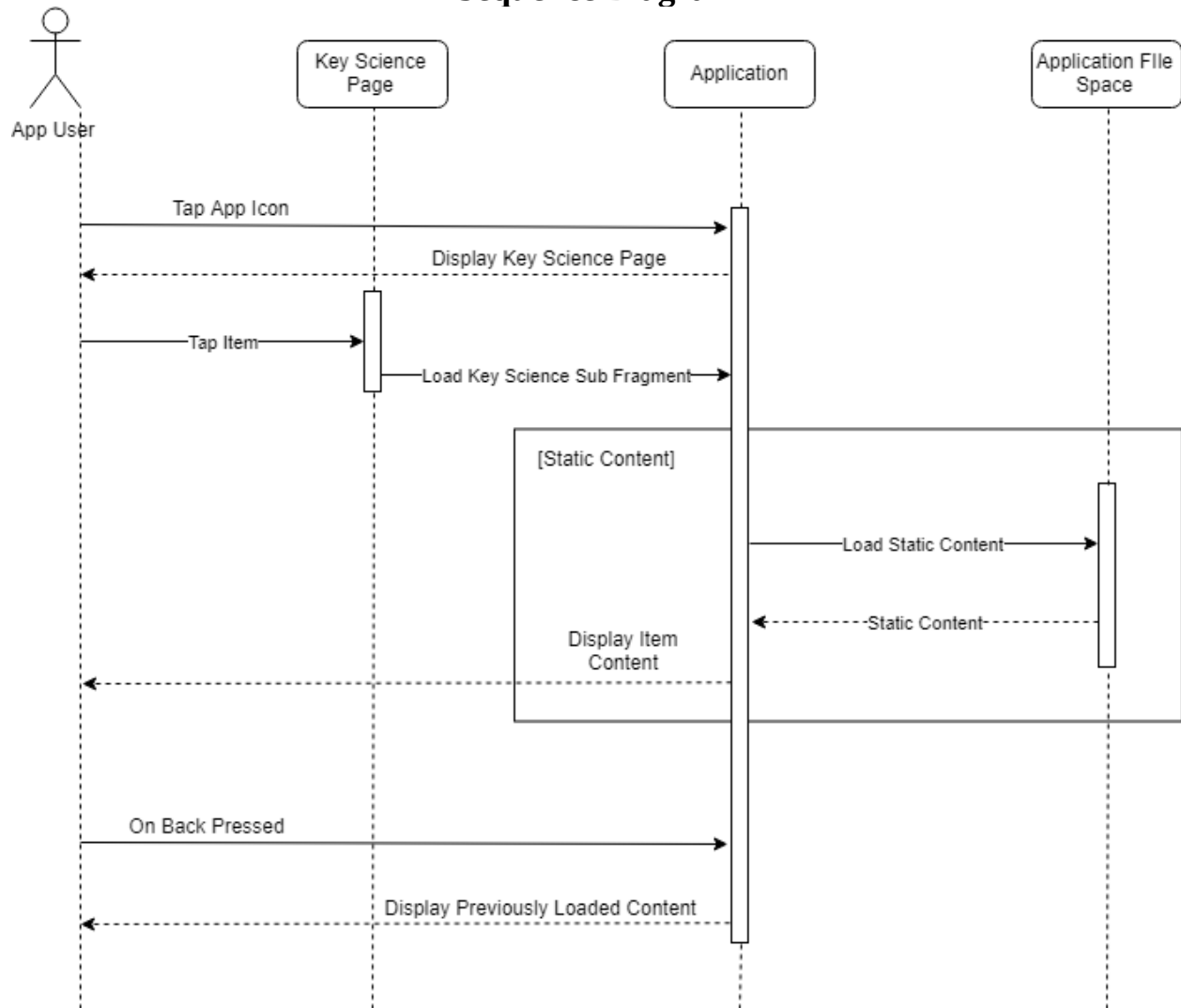


CTZN-40 - Create and design 'Key Challenge' fragment**CTZN-25 Use Case Diagram**

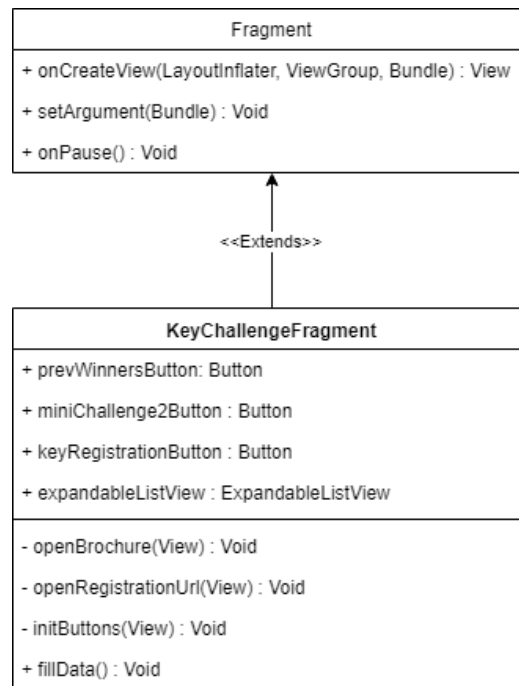
Edward Terry | Citizen Scientist Project Application



Sequence Diagram

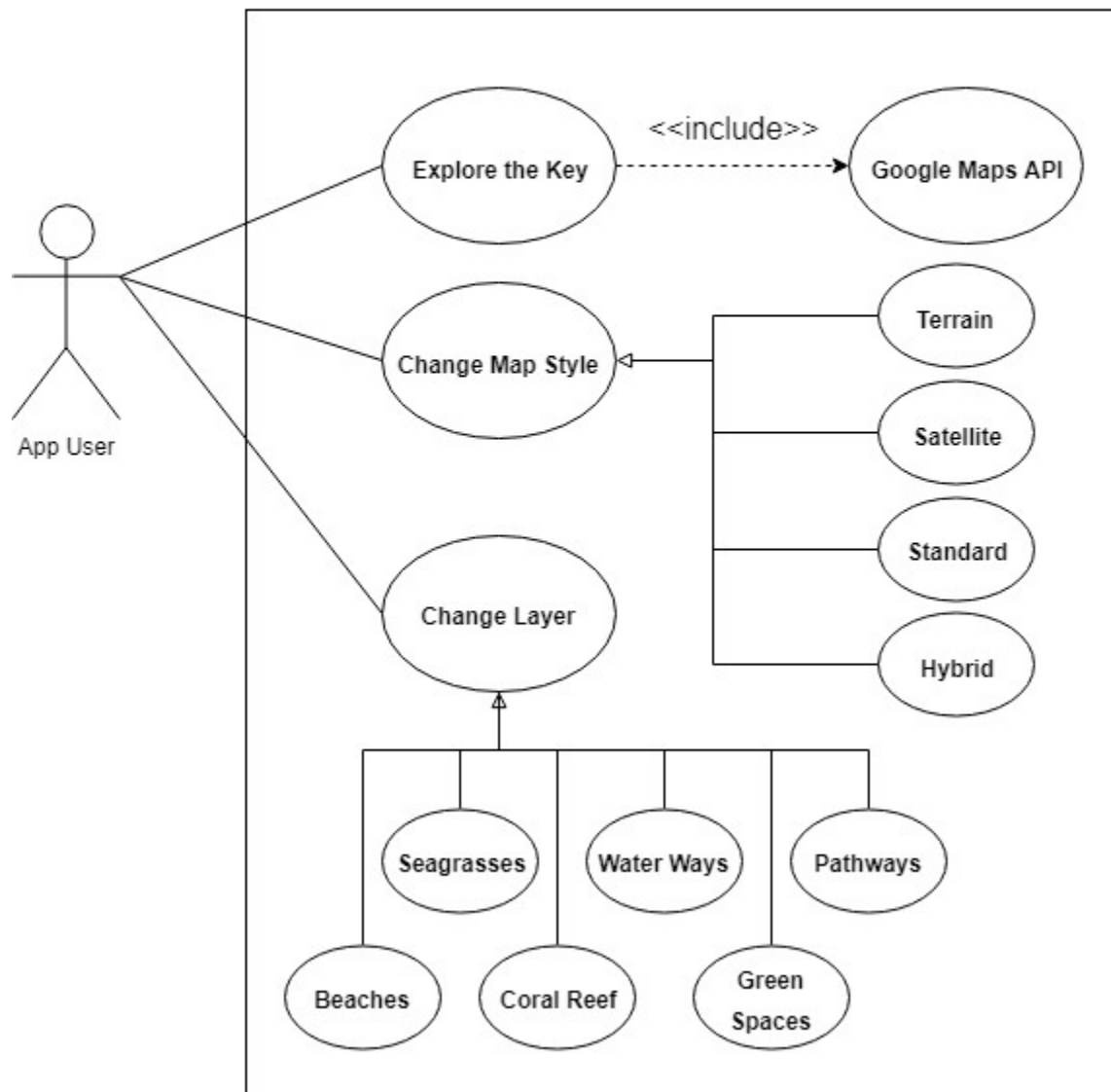


Class Diagram

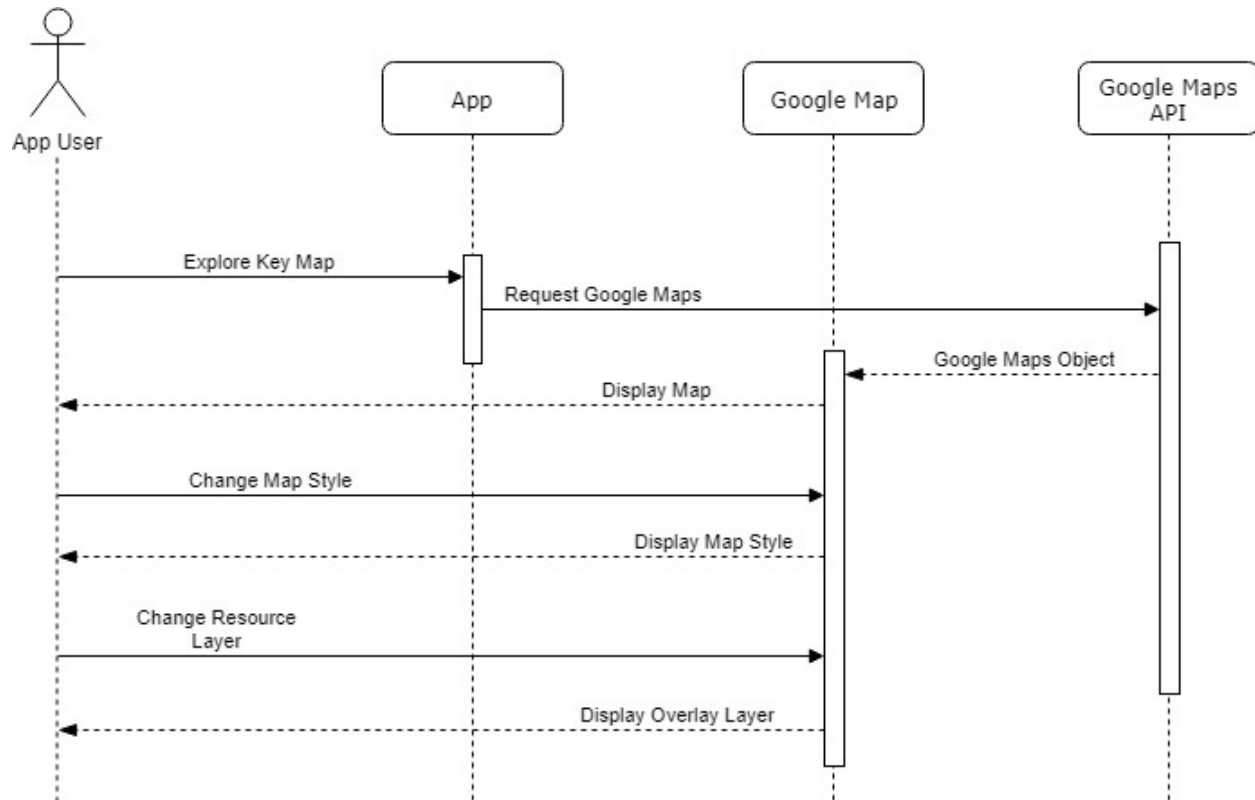


CTZN-43 - Explore the Key Map**CTZN-43 Use Case Diagram**

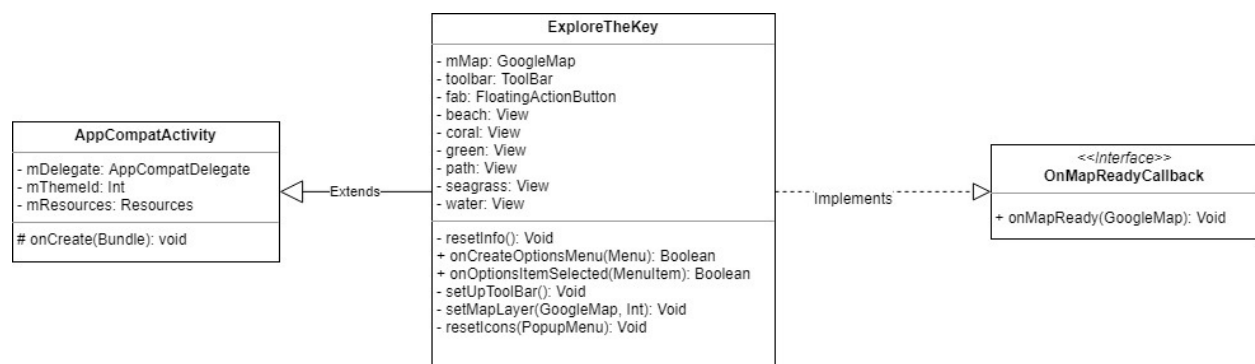
Jose Toledo | Citizen Scientist Project Application



Sequence Diagram

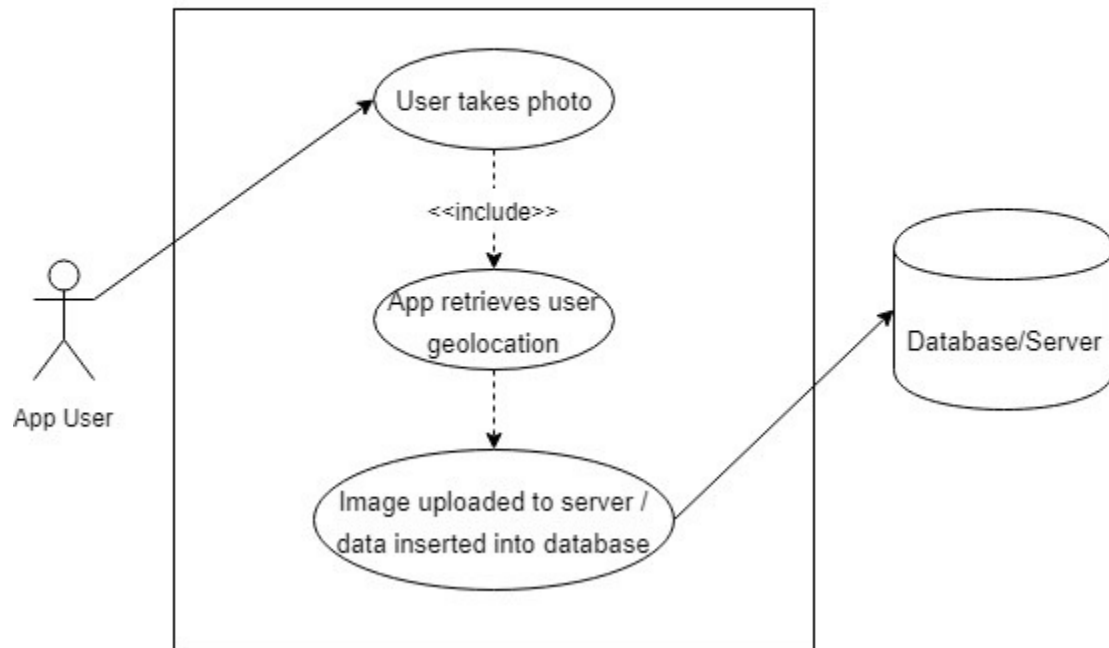


Class Diagram

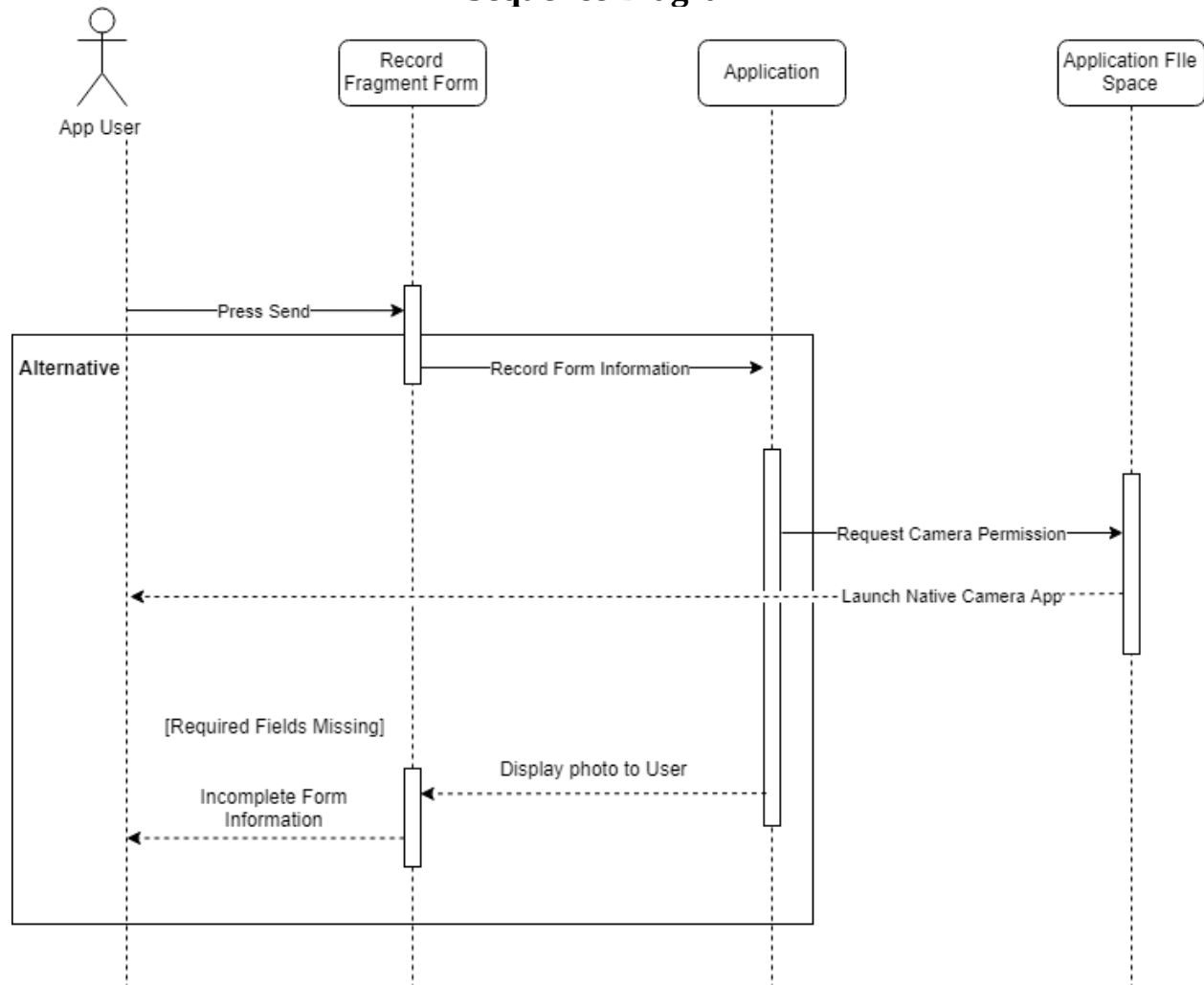


CTZN-44 - Create Record Fragment**CTZN-44 Use Case Diagram**

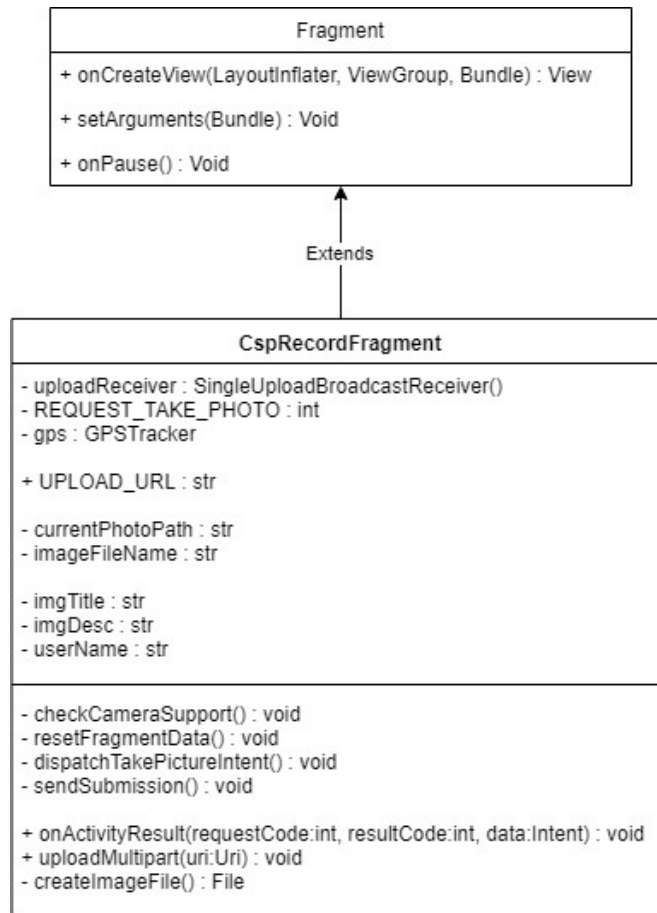
Edward Terry | Citizen Scientist Project Application



Sequence Diagram

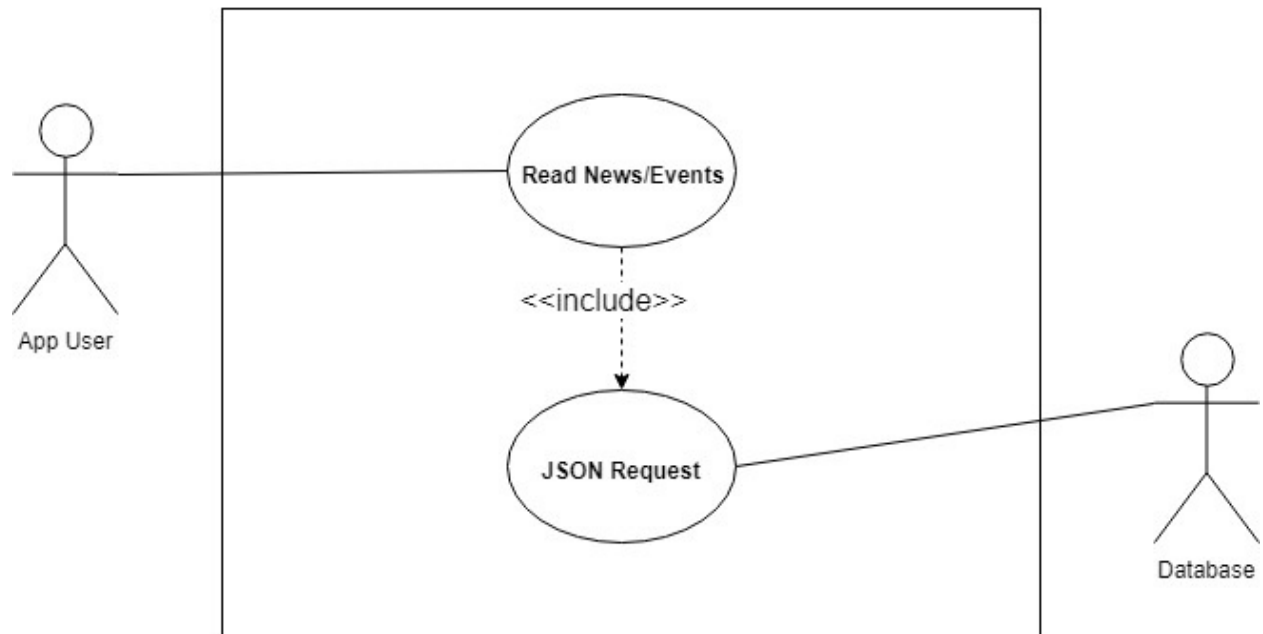


Class Diagram

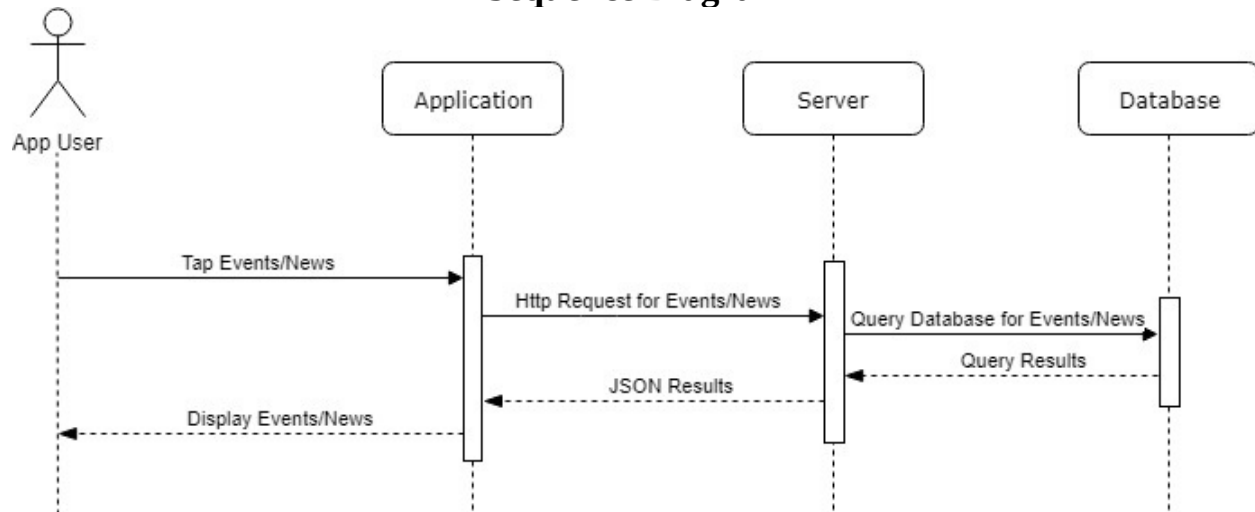


CTZN-45 - Create Fragment to load dynamic content**CTZN-45 Use Case Diagram**

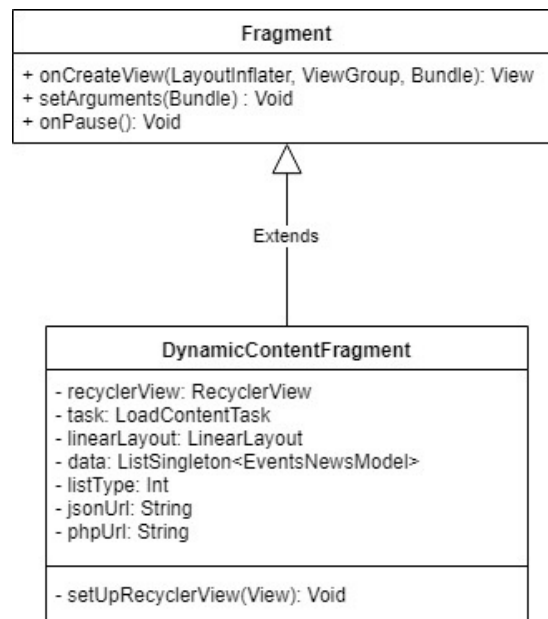
Jose Toledo | Citizen Scientist Project Application



Sequence Diagram

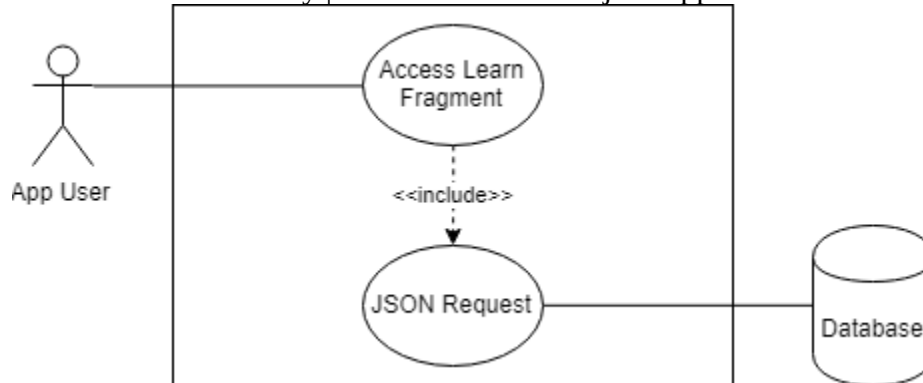
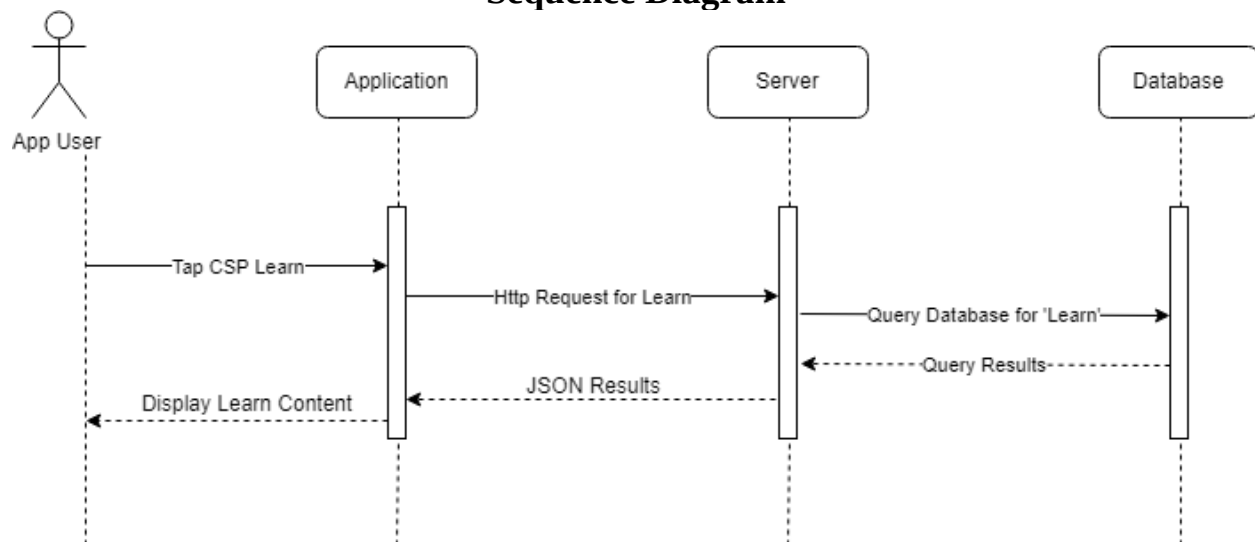


Class Diagram

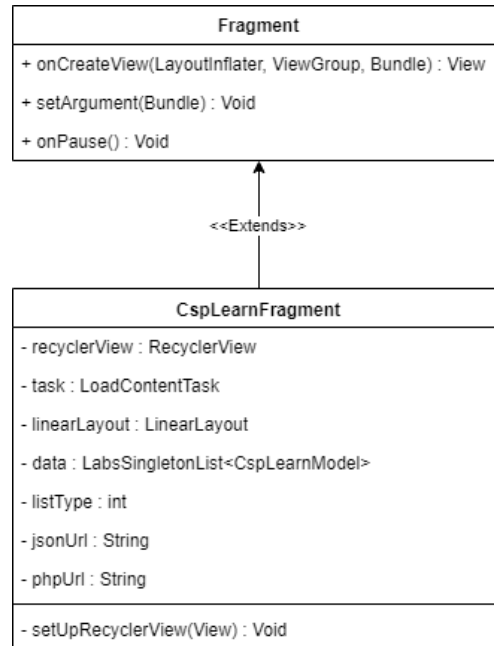


CTZN-46 - Create Learn fragment of the Lab section**CTZN-46 Use Case Diagram**

Edward Terry | Citizen Scientist Project Application

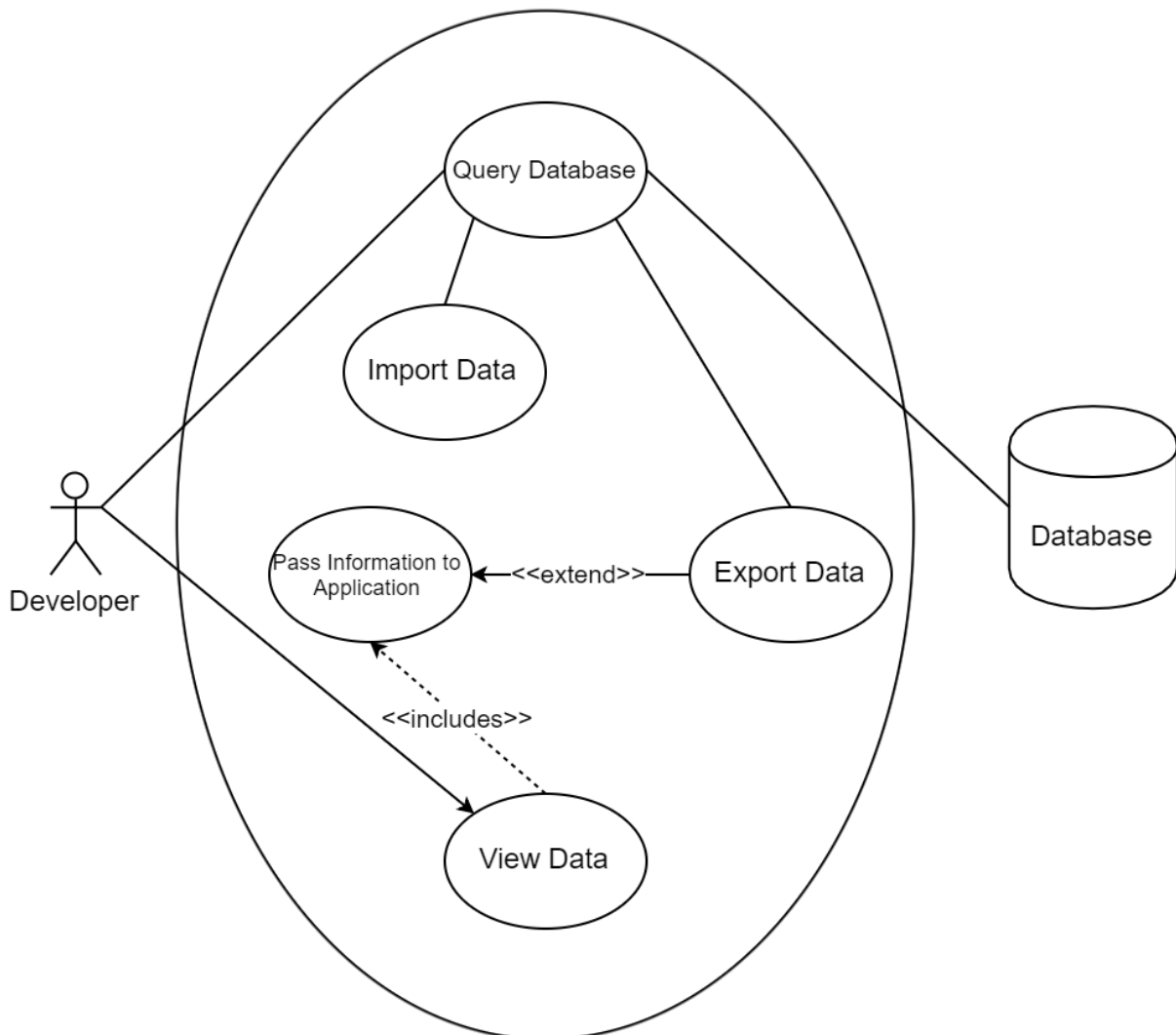
**Sequence Diagram**

Class Diagram

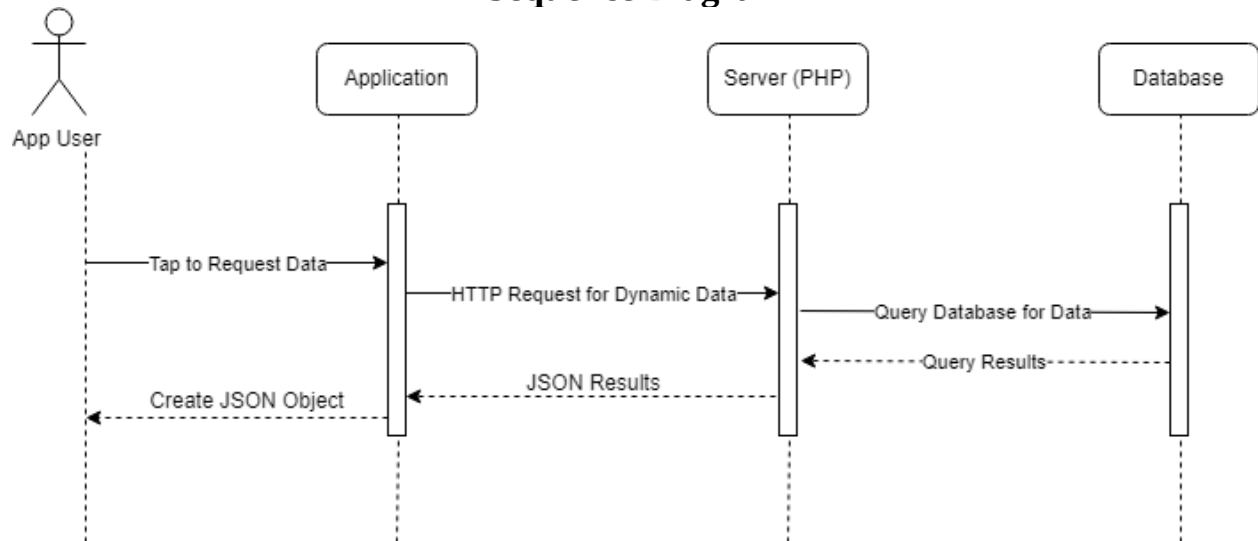


CTZN-47 - Establish connection with the Database**CTZN-47 Use Case Diagram**

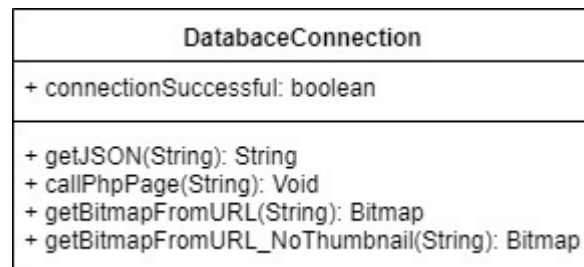
Edward Terry | Citizen Scientist Project Application



Sequence Diagram

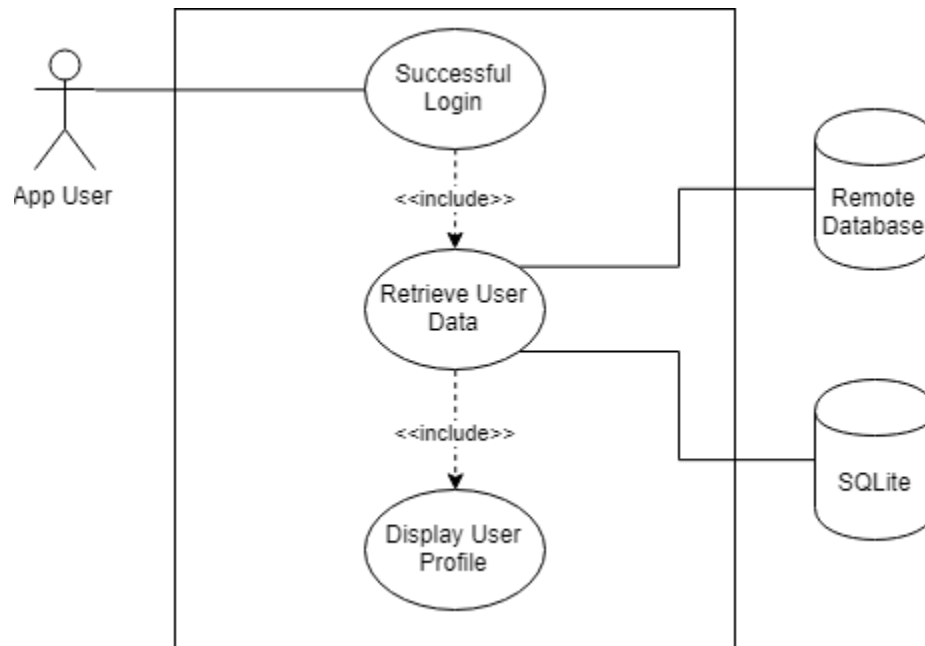


Class Diagram

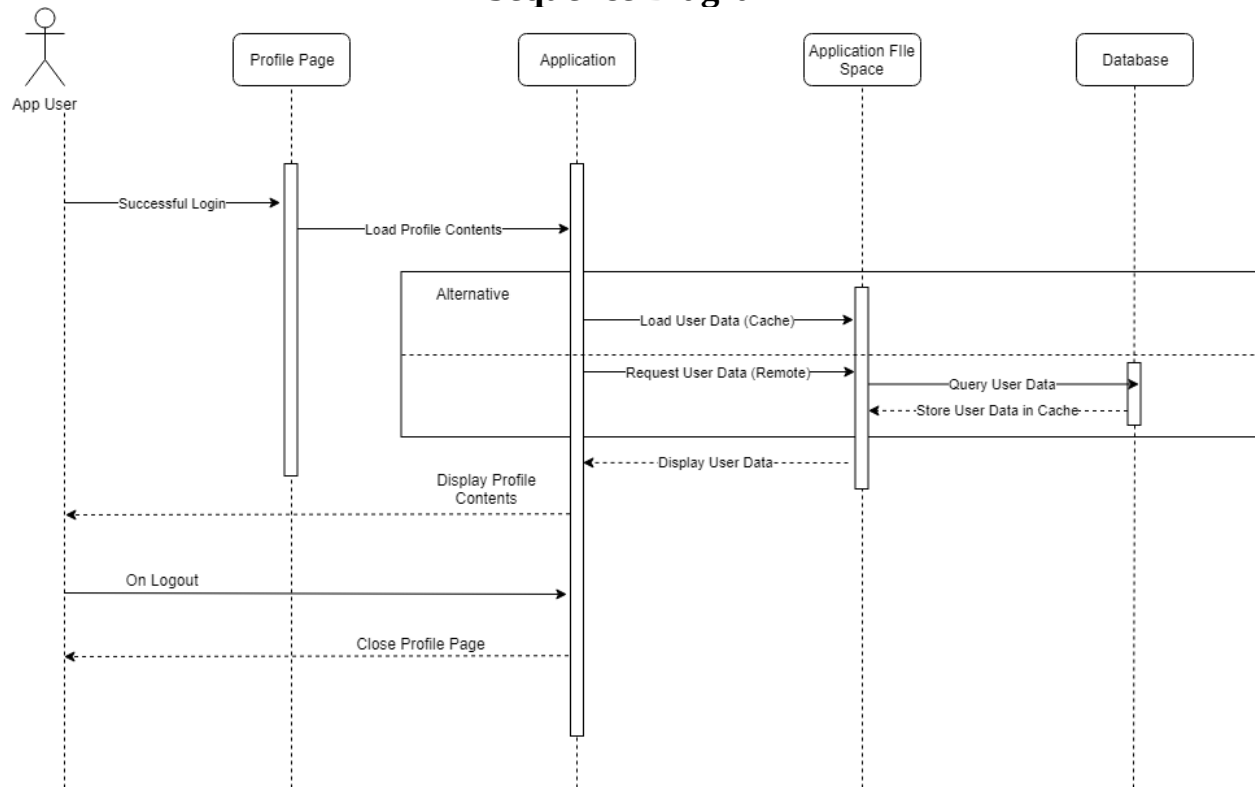


CTZN-57 - Create Profile Page**CTZN-57 Use Case Diagram**

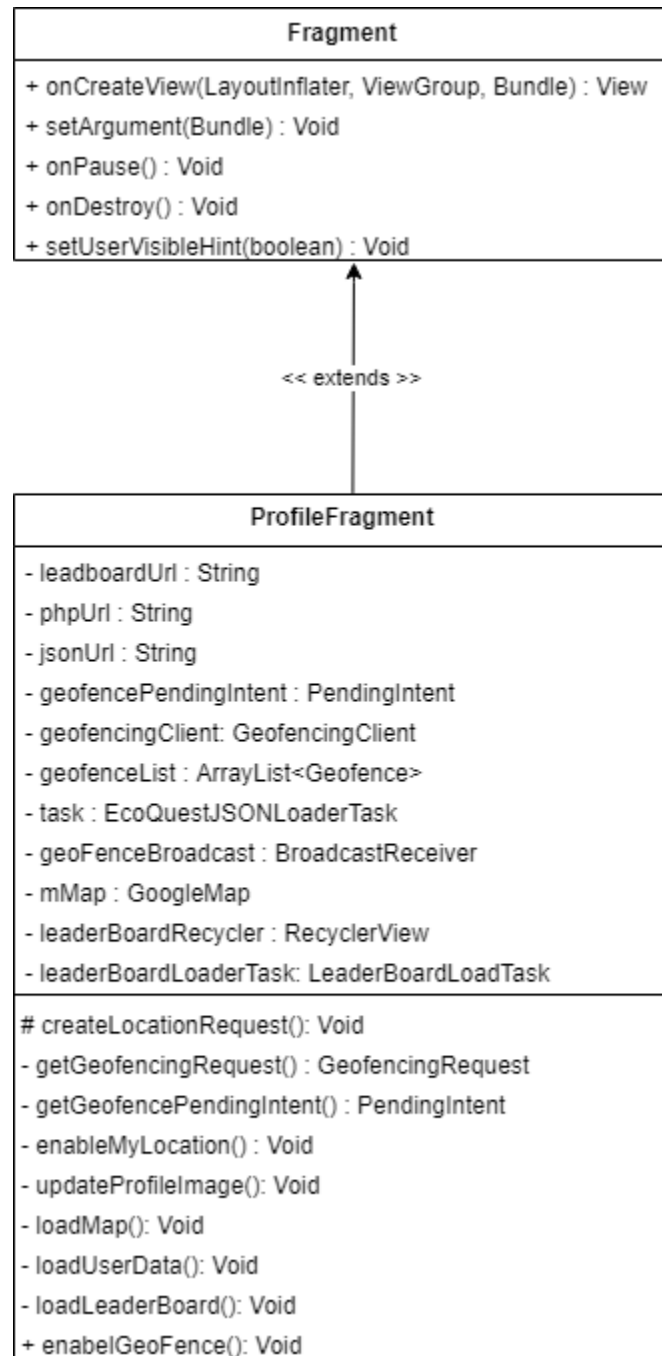
Edward Terry | Citizen Scientist Project Application



Sequence Diagram

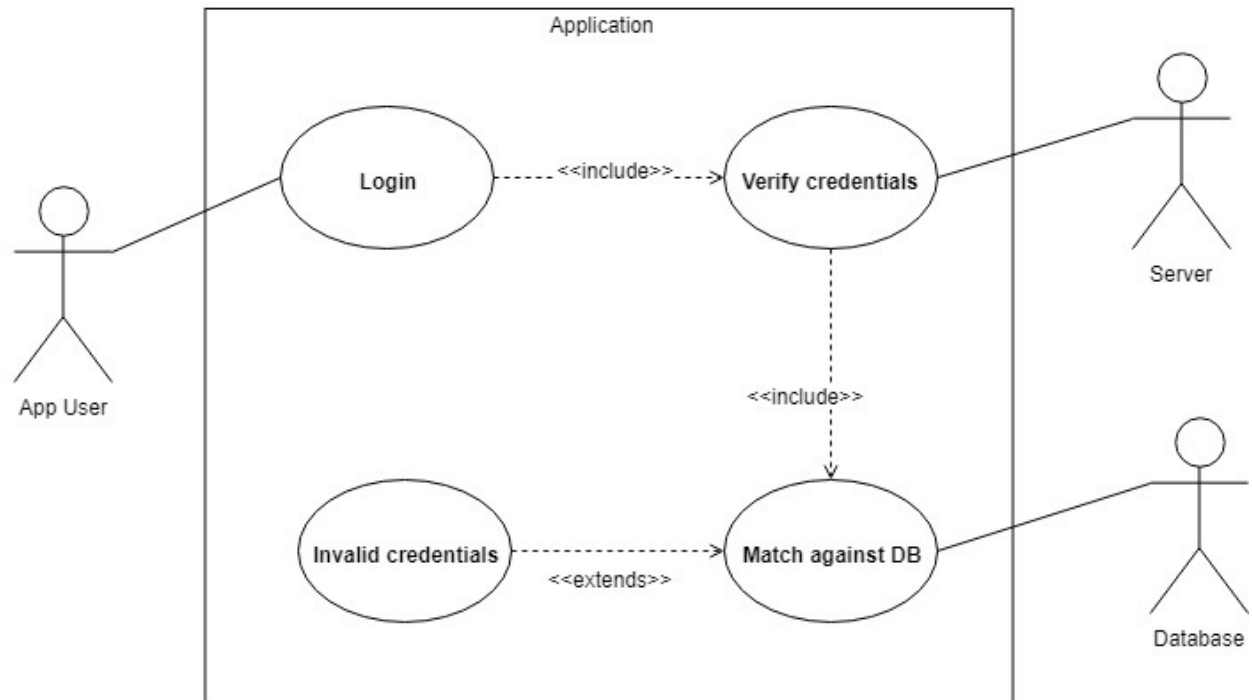


Class Diagram

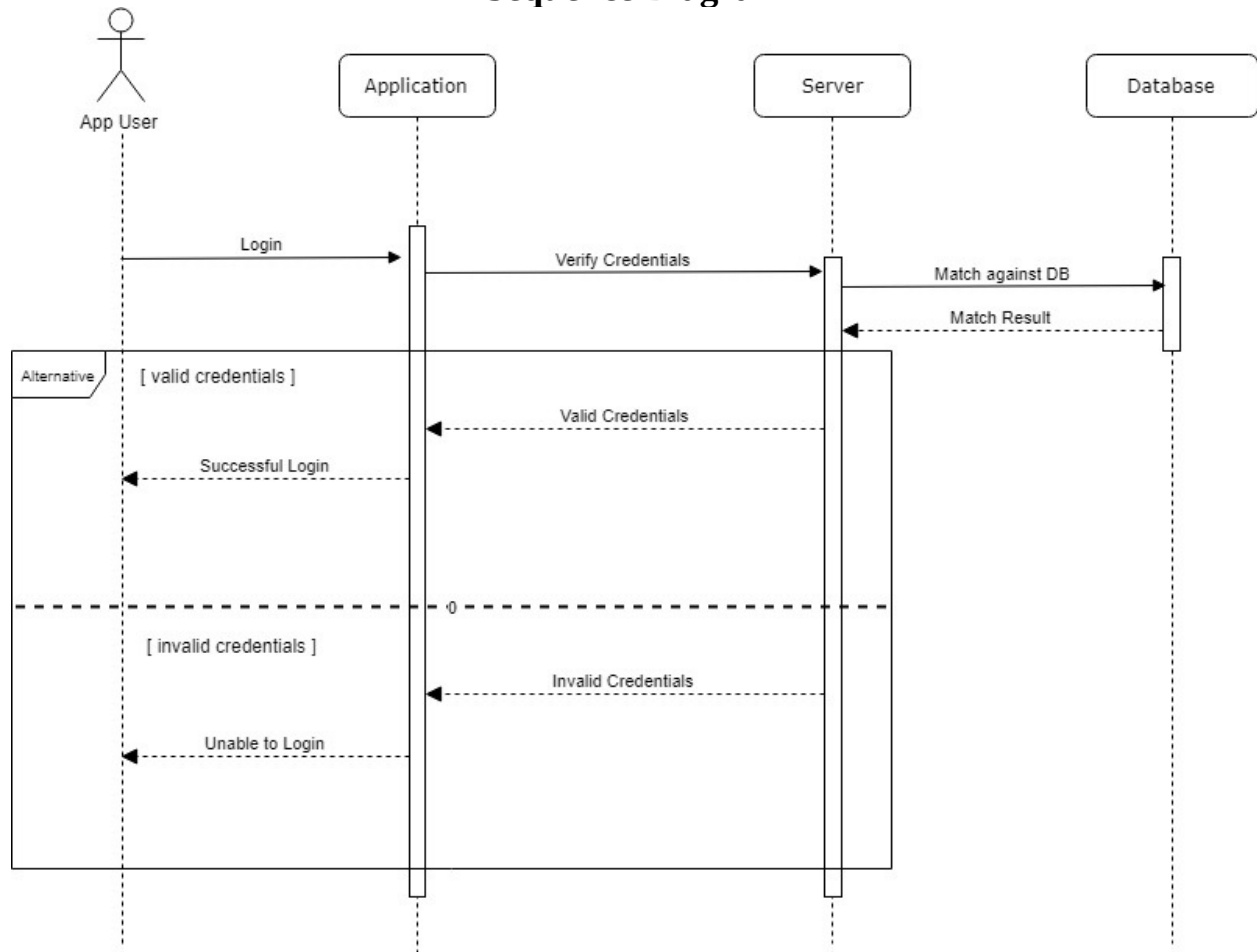


CTZN-58 - Authentication functionality**CTZN-58 Use Case Diagram**

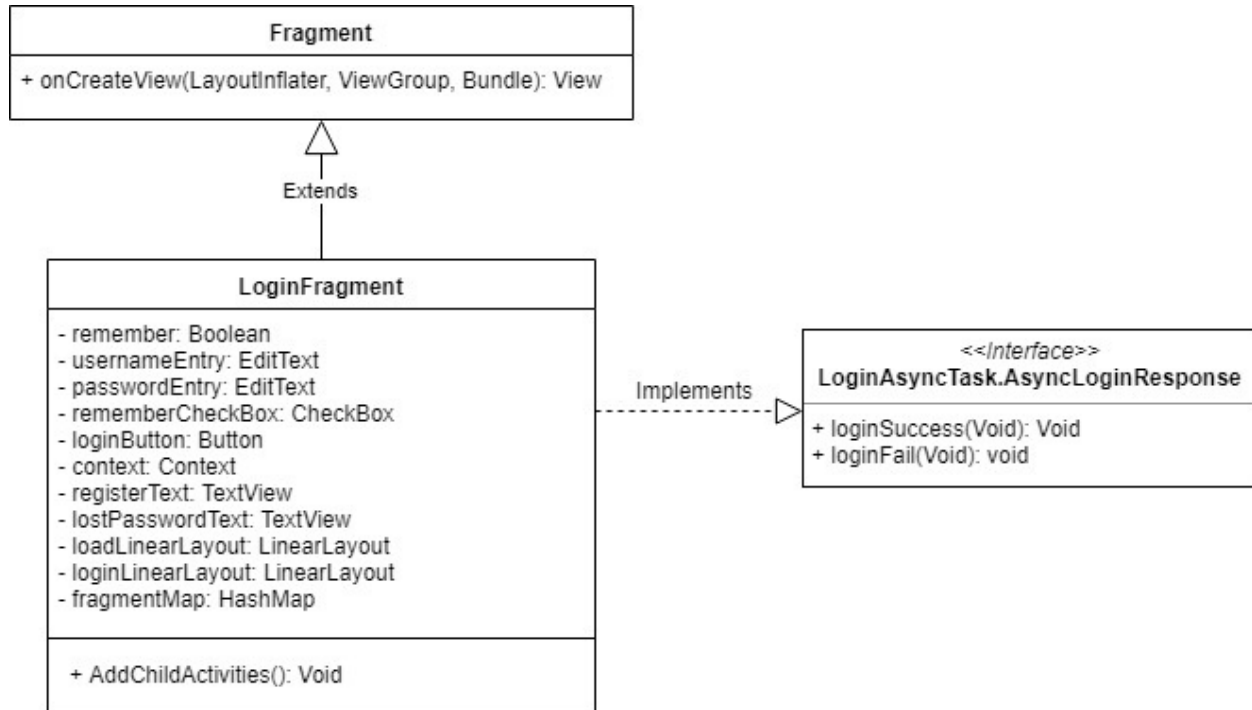
Jose Toledo | Citizen Scientist Project Application



Sequence Diagram

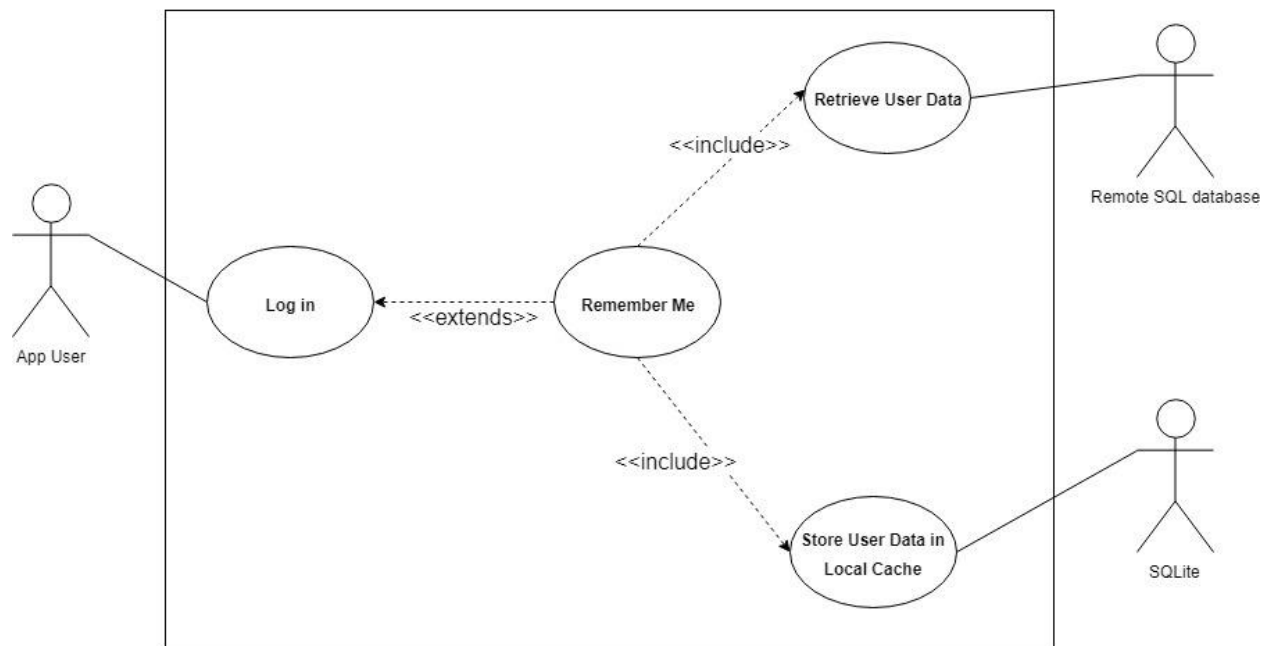


Class Diagram

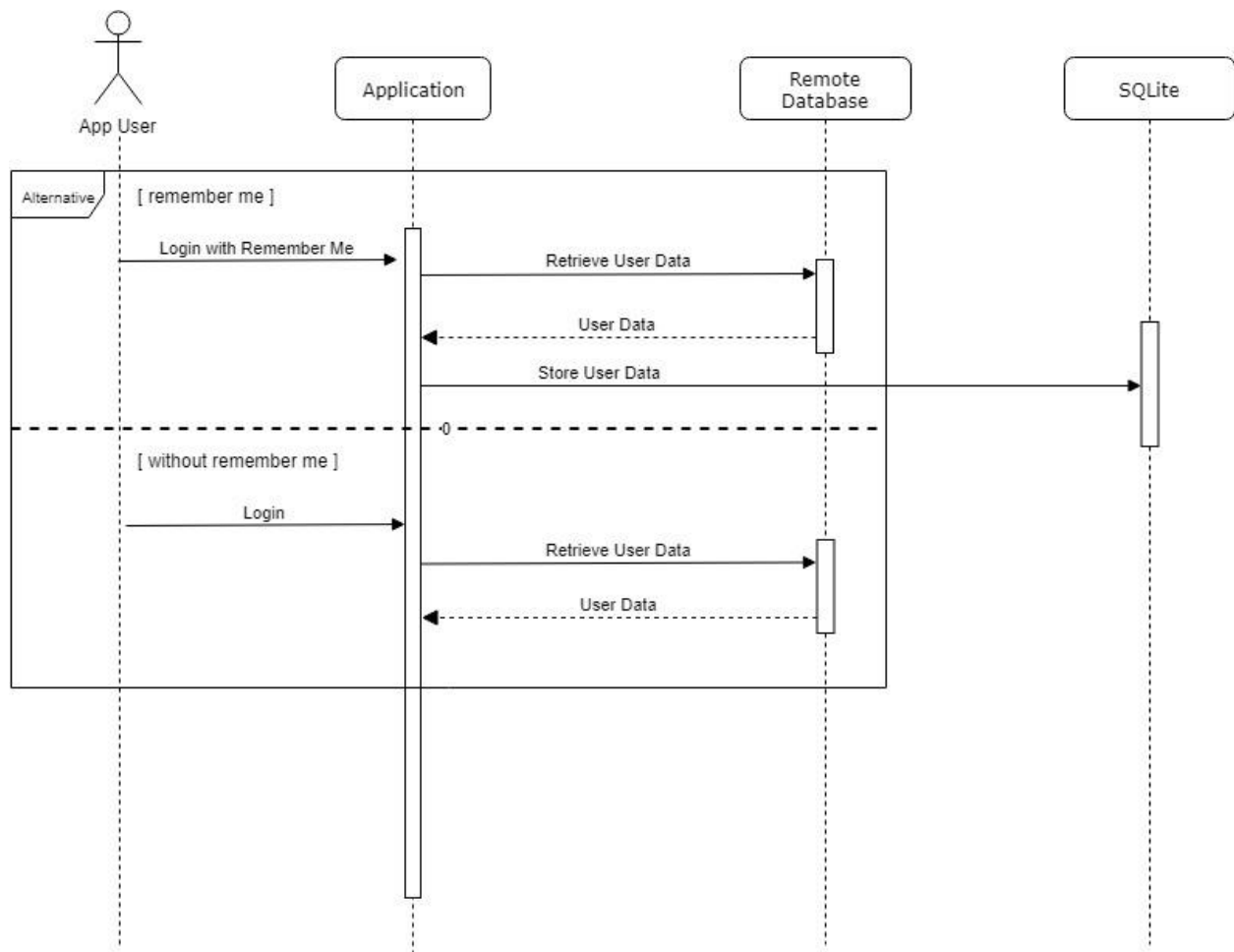


CTZN-64 - Remember Me**CTZN-64 Use Case Diagram**

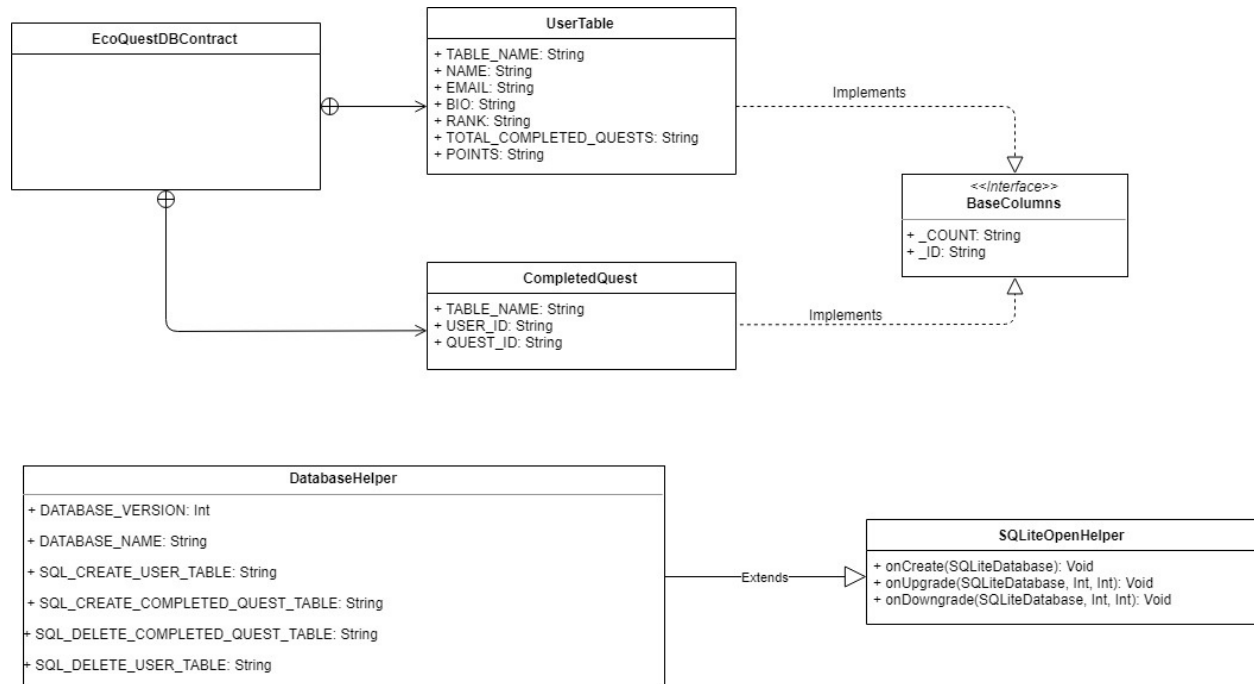
Jose Toledo | Citizen Scientist Project Application



Sequence Diagram



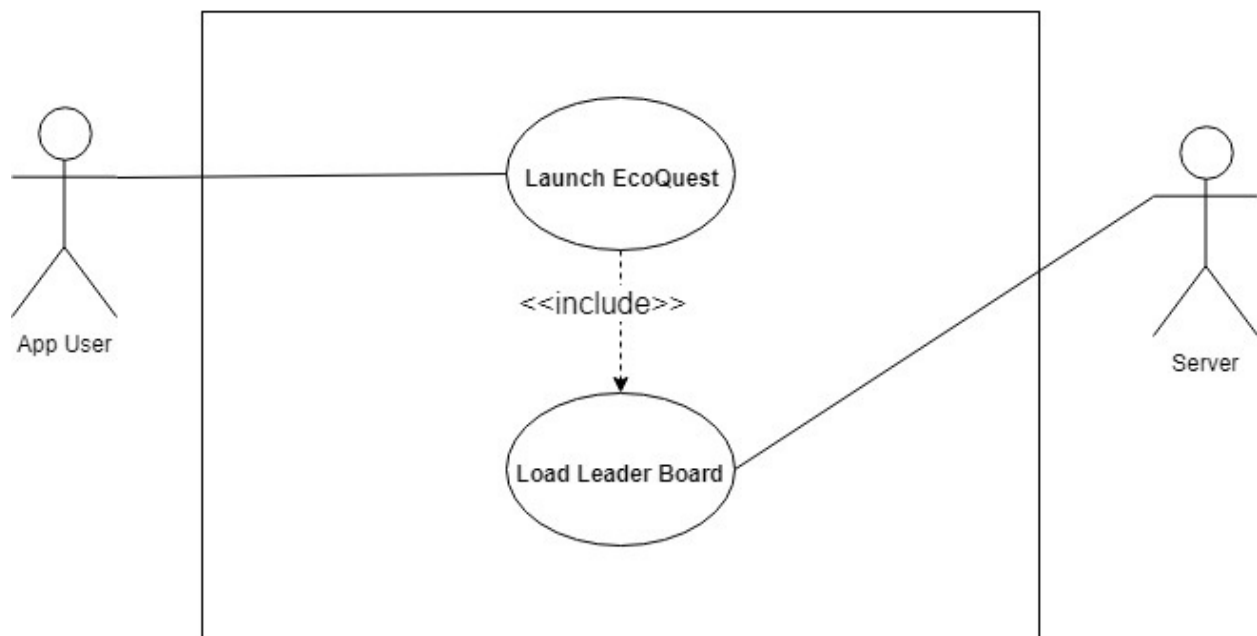
Class Diagram



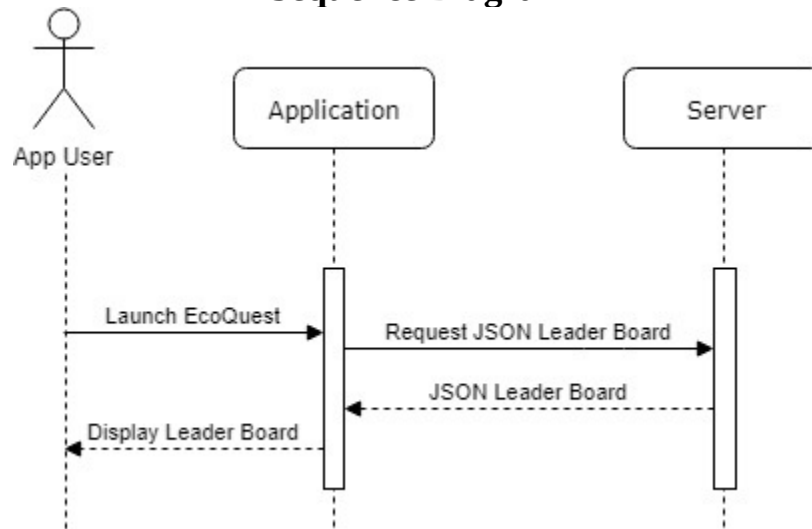
CTZN-66 - Leaderboard

CTZN-66 Use Case Diagram

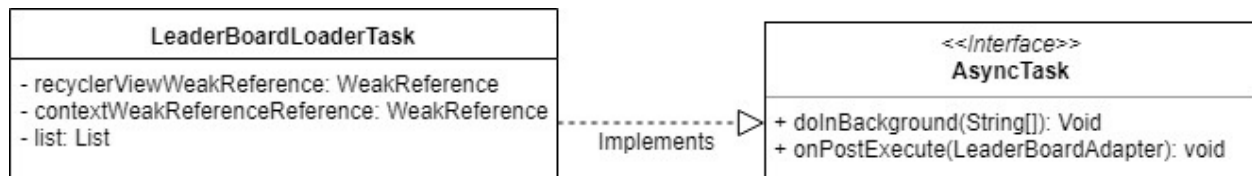
Jose Toledo | Citizen Scientist Project Application



Sequence Diagram



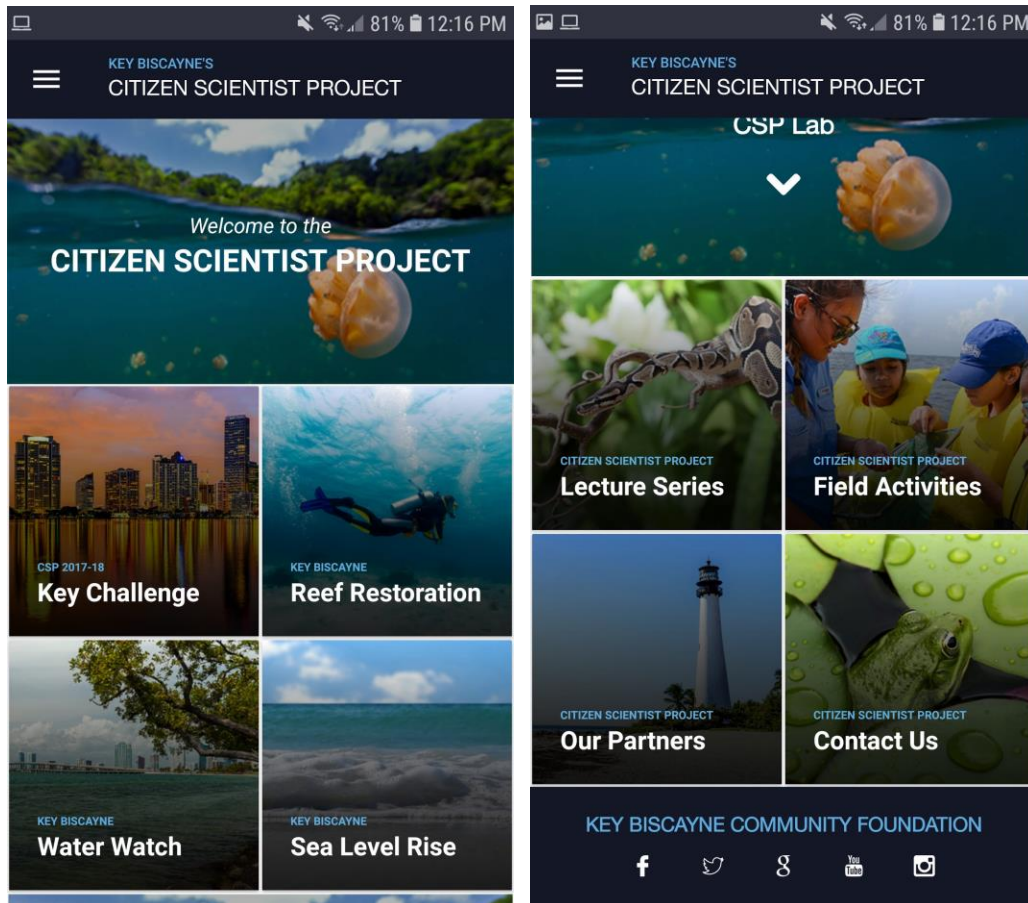
Class Diagram



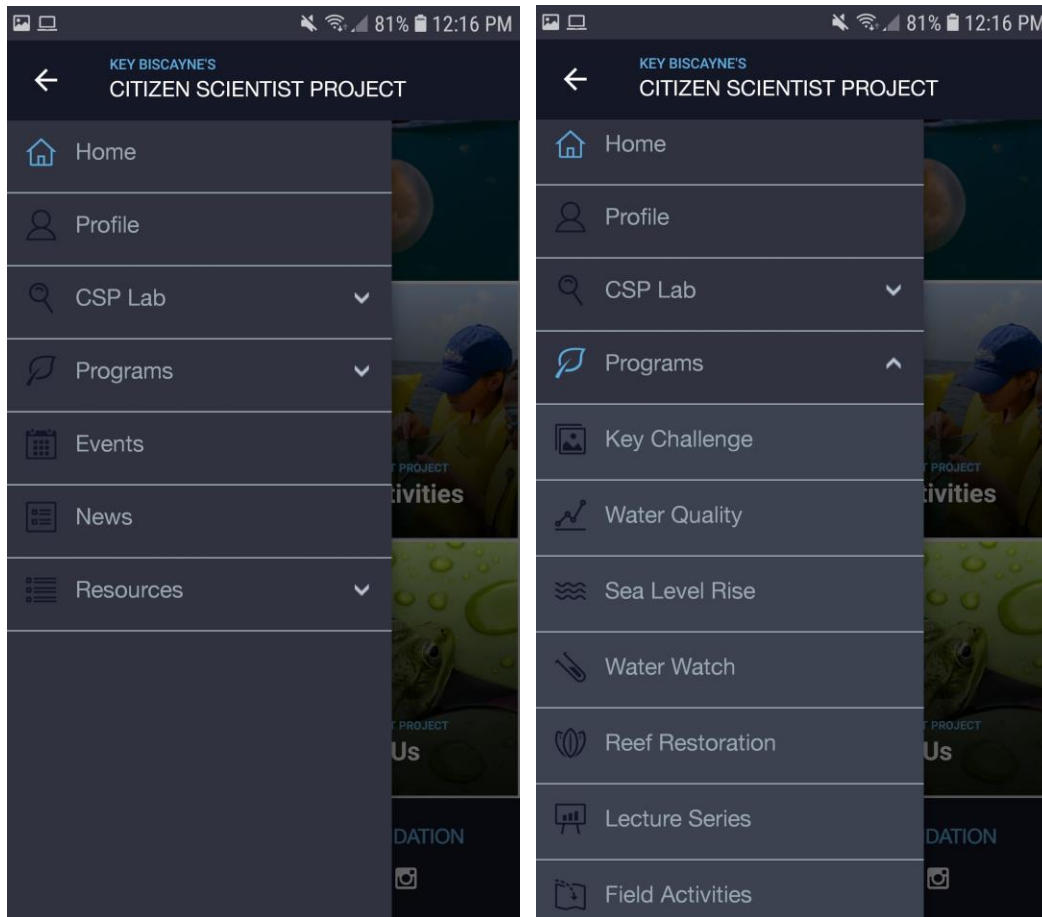
Appendix B - User Interface Design

The artistic design aspect of the UI was provided by Nathan Moyer, and the implementation was done by Jose Toledo and Edward Terry.

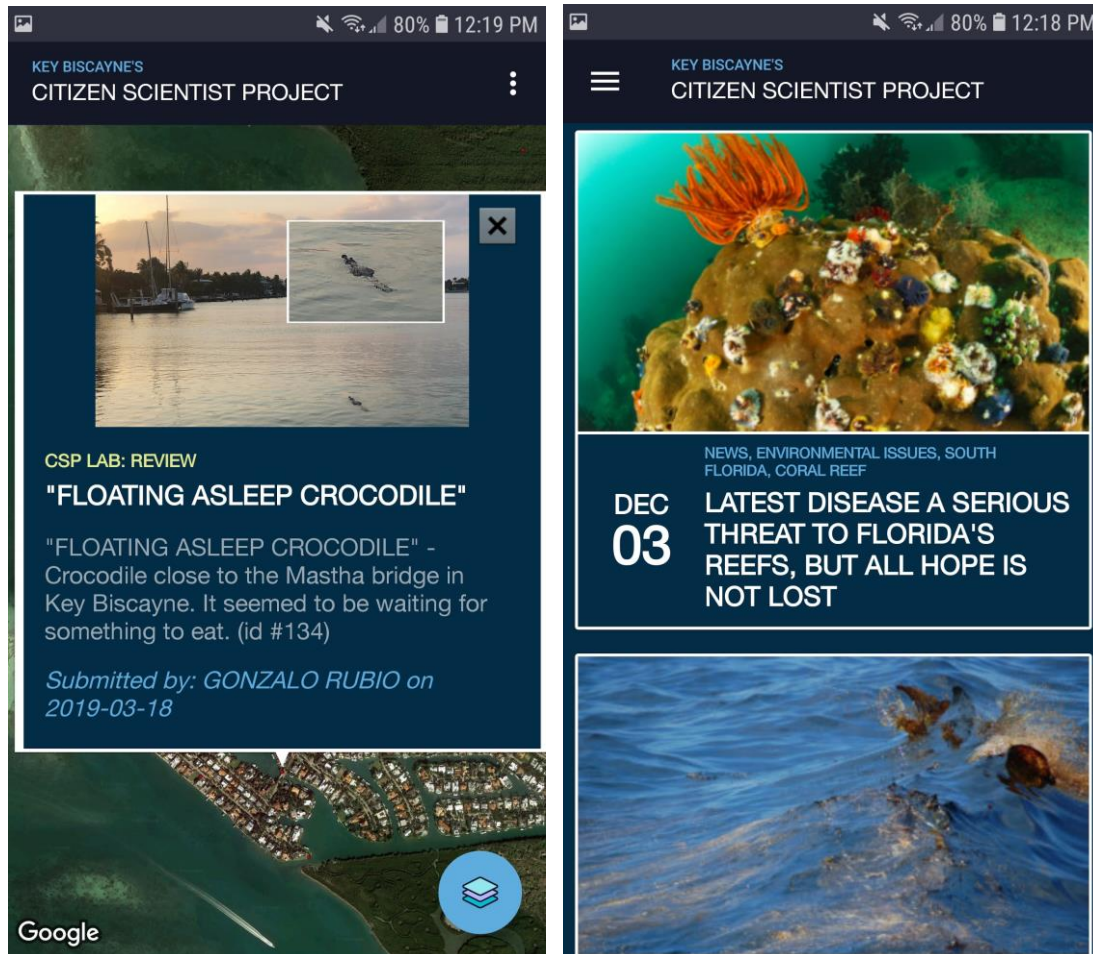
- Home Page



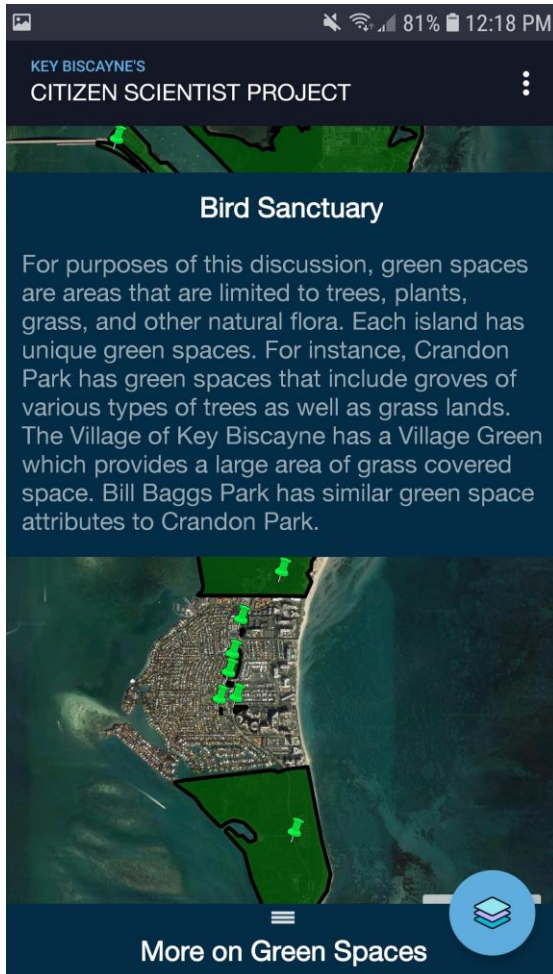
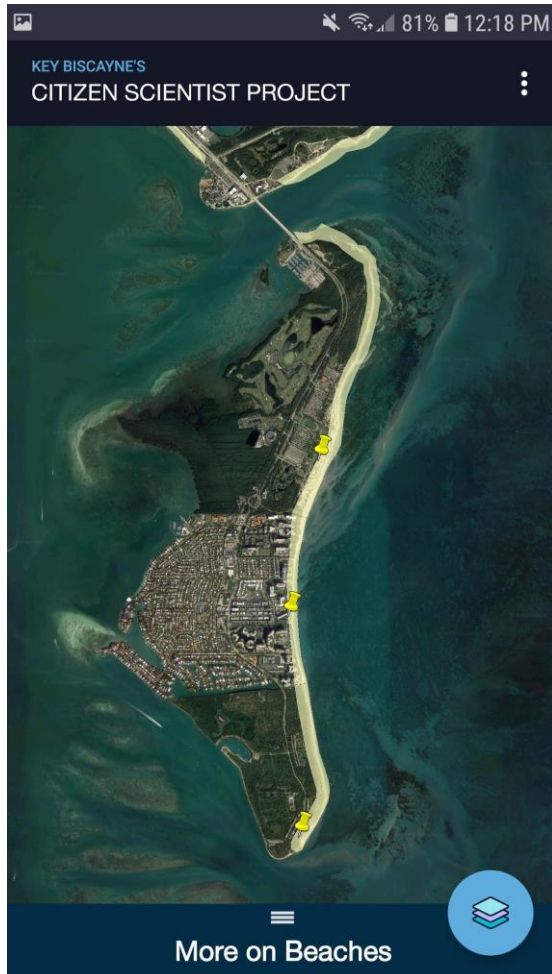
- Navigation Drawer



- Review and News



- GIS Layered Map



- User login and EcoQuest

KEY BISCAYNE'S
CITIZEN SCIENTIST PROJECT

KEY BISCAYNE'S
CITIZEN SCIENTIST PROJECT

Username or Email Address

Password

☐ Remember Me **LOG IN**

[Register](#) [Lost your password?](#)

KEY BISCAYNE'S
CITIZEN SCIENTIST PROJECT

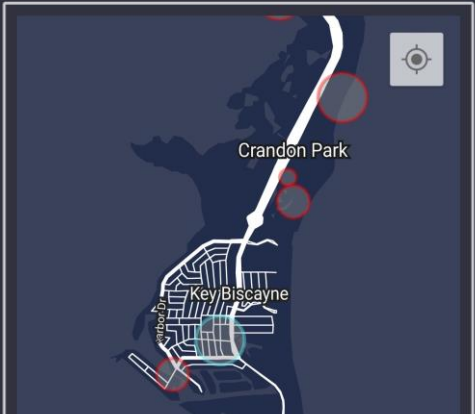
 **Super Man** *Log Out*
Key Science Citizen Scientist

 10  0

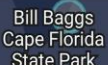
TOTAL POINTS: 540

YOUR BIO:
Im a Super Hero

YOUR ECO QUESTS:



KEY BISCAYNE'S
CITIZEN SCIENTIST PROJECT

LEADERBOARD

Super Man	540
Edward Terry	150
Tester	80
corazonwhitingto	0
Citizen Scientist Project	0
VGEAlethea	0
SanoraRodriguez	0
DulcieButeau	0
taryek	0

KEY BISCAYNE COMMUNITY FOUNDATION

Appendix C - Sprint Review Reports

Attendees: Nathan Moyer, Edward Terry, Jose Toledo

Start time: 2:00 PM

End time: 4:00 PM

Sprint 1

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners: All.

- [CTZN-20](#) - Create action bar (Android)
- [CTZN-25](#) - Create 'Home Page' Fragment (Android)
- [CTZN-38](#) - Create action bar button
- [CTZN-21](#) - Create Social Media Footer (Android)
- [CTZN-41](#) - Create Navigation Drawer
- [CTZN-39](#) - Create Fragment container in HomeActivity

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- [CTZN-40](#) - Create and design 'Key Challenge' fragment
- [CTZN-35](#) - Bind static content to views (Android)

Sprint 2

Attendees: Edward Terry, Jose Toledo, Nathan Moyer

Start time: 3:00 PM

End time: 3:30 PM

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners: All.

- [CTZN-35](#) - Bind static content to views (Android)

- [CTZN-42](#) - Style updates
- [CTZN-40](#) - Create and design 'Key Challenge' fragment
- [CTZN-37](#) - Contact form

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- N/A

Sprint 3

Attendees: Jose Toledo, Edward Terry, Nathan Moyer

Start time: 3:00PM

End time: 4:00PM

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners: All.

- [CTZN-45](#) - Create Fragment to load dynamic content
- [CTZN-47](#) - Establish connection with the Database
- [CTZN-43](#) - Explore the Key Map
- [CTZN-45](#) - Create Fragment to load dynamic content
- [CTZN-44](#) - Create Record Fragment
- [CTZN-46](#) - Create Learn fragment of the Lab section

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- N/A

Sprint 4

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners: All.

- [CTZN-50](#) - Make shade area clickable on Maps
- [CTZN-51](#) - Add CSP Lab to Home
- [CTZN-52](#) - 'View More' on Events/News link out to website
- [CTZN-53](#) - For Events/News items, all caps, and smaller text size for title
- [CTZN-54](#) - Lecture Series and Field Activities -- Change 'Learn More' to load Events fragment
- [CTZN-55](#) - Style markers on Explore Key Map

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- N/A

Sprint 5

Attendees: Nathan Moyer, Edward Terry, Jose Toledo

Start time: 2:00pm

End time: 3:00pm

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners: All.

- [CTZN-57](#) - Create Profile Page
- [CTZN-58](#) - Authentication functionality
- [CTZN-59](#) - Profile table
- [CTZN-60](#) - Study GeoFence
- [CTZN-61](#) - Login Form
- [CTZN-62](#) - Reduce load time of Map layers
-

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- No user stories were rejected and moved back to the product backlog.

Sprint 6

Attendees: Edward Terry Jose Toledo Nathan Moyer

Start time: 12:40

End time: 12:55

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners: All.

- [CTZN-63](#) - Rework Login System
- [CTZN-64](#) - Remember Me
- [CTZN-66](#) - Add EcoQuest Global Leaderboards
- [CTZN-67](#) - Load EcoQuest Content Dynamically from Database
- [CTZN-68](#) - Update User Points upon entering Geofence
- [CTZN-69](#) - Correct issues with updating Profile Fragment

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- [CTZN-70](#) - Add Search for Users
- [CTZN-71](#) - View User Profiles
- [CTZN-72](#) - Implement Friends Feature

Appendix D - User Manuals, Installation/Maintenance Document, Shortcomings/Wishlist Document and other documents

User Manuals

Index

1. Accessing Pages
2. User Profiles
 - a. Creating a Profile
 - b. Editing your Profile
 - c. EcoQuest
 - i. How to Play
3. CSP Lab
 - a. Learn
 - b. Explore
 - c. Record
 - d. Review
4. Programs
5. Events/News
6. Resources

1) Accessing Pages

Once the Key Science application has loaded, you will be met with the Home activity, from which you can access each of the apps sections. At the top there is a toolbar which includes a navigation drawer that can be used to also access each of the apps sections. Pressing on any of these sections on either the Home activity or navigation drawer will take you to those sections.

2) User Profiles

a. Creating a Profile

Creating a profile will allow you to interact with the EcoQuest portion of the application, in which you can earn points for completing quests. At the login screen, there is a button which will forward you to the official KeyScience website so that you may create your login. This same login account will also be used for the application.

b. Editing your Profile

Once you have logged into your profile, you can edit your name, bio, and profile image by pressing on the image of the Key Science butterfly at the top left-hand corner. This will open a new activity that will contain fields for your name, bio, and a button to choose your profile

image. This button will take you to the Gravatar website, where you may be able to login with your WordPress account.

If your login does not work, you will be required to create an account with Gravatar using the same email for your KeyScience app login. Once your account with Gravatar has been created, you can then upload and choose your profile image, which will display in the app after 10 minutes.

c. EcoQuest

EcoQuests are an interactive activity that allows players to go out in the field at Key Biscayne and other locations to make discoveries about the environment around them. The themes of these quests revolve around animal and plant life in the ecosystem.

i. How to Play

To get started on an EcoQuest, a player can view the EcoQuest map under their bio. Pressing on any of the rings on the map of Key Biscayne will display an info window that contains information regarding that quest. A player must travel into the ring displayed and seek out the goal for the quest to succeed in gaining points and completing that quest. While playing, it is important for players to be mindful of the environment around them and always proceed with caution.

Players with the highest points will appear on a global leaderboard just under the map, in which players will compete to get to the top of the leaderboard.

3) CSP Lab

a. Learn

The Learn section of the KeyScience app will display a list of presentations and lectures for the Citizen Scientist project. Pressing on any of these items will link you out to the official KeyScience website where more information regarding that lecture will be displayed.

b. Explore

The Explore section allows users to interact with a map of Key Biscayne, allowing them to view information regarding the many beaches, coral reefs, greenspaces and more around Key Biscayne.

c. Record

The Record section lets users submit photos taken by their device to the KeyScience app. Photos will require the name of the person making the submission, as well as a title and description of the image. These images will then appear as a pinpoint on the Review map.

d. Review

The Review section of the app lets users view photo submissions made by other users as well as their own submissions from the Record section of the app. By clicking on any of the pinpoints on the map, you can pull up any of the photos taken.

4) Programs

The Programs section includes a multitude of information regarding the KeyScience application, such as the Key Challenge, information regarding water quality and sea level rise, reef restoration and field activities as well as lecture series.

5) Events/News

The Events and News section of the application displays up to date dynamic content regarding any news and events going on in the area. Clicking on any of the items displayed will show more information regarding the news or event content.

6) Resources

The Resources section displays more information about the Key Biscayne organization, as well as newsletters, biomes, partners of the organization, and methods for contacting the Key Biscayne Community Foundation.

INSTALLATION/MAINTENANCE DOCUMENT

Installation would normally be done by downloading the application through the Google Play Store. If the application does not yet exist on the Google Play Store under the name “Key Science Citizen Scientist”, then you will need to add the APK (Android application package) file to your device. The APK can be obtained by building the project with the android device of your choosing as the target.

To install an APK on your android device, you must have already enabled Developer Mode on your device. Instructions for each android version exist at the following link:

<https://developer.android.com/studio/debug/dev-options>

Once developer mode has been enabled, the APK file can be selected and installed on the device. Before running the application, be sure to go into the app info and activate the required permissions. The application should prompt you to do so, but this helps speed up the process of testing the newly installed APK.

SHORTCOMINGS/WISHLIST DOCUMENT

In this iteration of the project the team focused on creating the application's design, structure and main components based off the currently existing version of the application, including the addition of features that had not yet been added. The application has various planned features that could not be added as a result of how much additional time would be required for development of these features, as well as their complexity, and will be required to be implemented during future iterations. These features include, but aren't limited to:

1. Implementation of the Friends feature
2. Ability to search for other users
3. Friend leaderboards
4. Viewing other user profiles

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