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Technical Report



**Eirzone Application
(Electronic Irish Community Zones)**

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Executive Summary

Ireland contains a vast and growing population that is divided by different communities in each area. As a result, some places are underdeveloped and prone to household crimes, robbery and unwanted accidents. New comers may also need help with the information about the area.

Eirzone works like an online notice board that provides useful information posted by the users for the users that lives within a community. This application is about sharing the current news and incoming events or any activities in the area. It will also provide emergency features for the community.

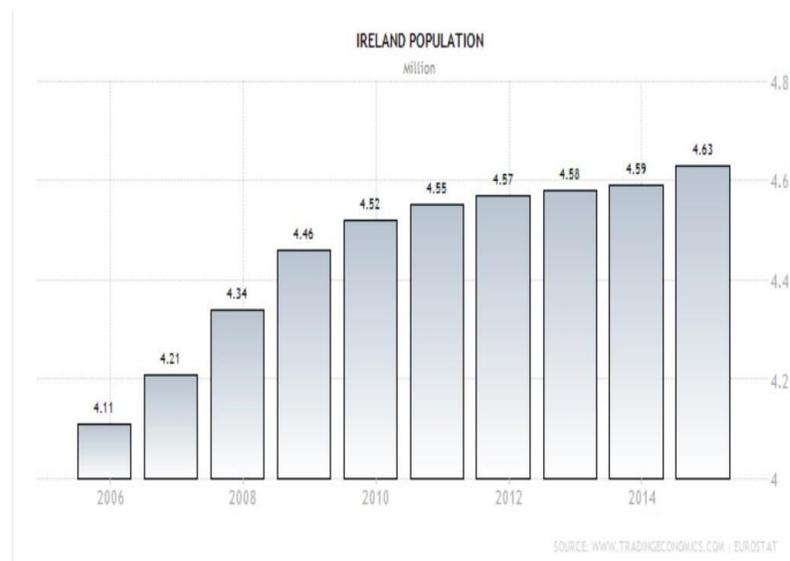
The user will need to create an account for them to become active and to be able to access the features of the application like News feed, Create Post, Map and Emergency.

Eirzone is an Android application that can be downloaded onto the Android Mobile Phones. Internet will be required in order to use the application. The application server side will use RESTful Web Services that includes PHP, MySQL/SQLite and Data Bindings to prevent SQL injections for the database connection. These frameworks will be used to link the front end of the Android application that uses Java.

1 Introduction

1.1 Background

Irish population massively grew over the years reaching about 4.63 Million in 2014. The histogram below shows the number of increase from 2006 to 2014.



With the unstoppable rising of the population, it is expected to increase up to 10 million before 2050¹. More migrants and newborn babies will come to Ireland, which would lead to the expansion of communities.

Organizing and having a proper communication in a community would be a necessity. Without it, pollution, crimes and social problems are prone to happen. Emergency information, options and services should also become available.

An example of this scenario is the incident that happened in my area, Rialto Dublin. A local male taxi driver's life was at risk when an unknown man tried to point the knife at him.² He did not get any injury but his mobile phone and cash were stolen. The Garda in the area took an action and arrested the suspect.

This incident could have been prevented by being active in a community. It would be helpful to have a medium for communication so we can be more alert and careful with unfamiliar people in our area. Crime watch or looking for each other is one of the features that Eirzone is focused on.

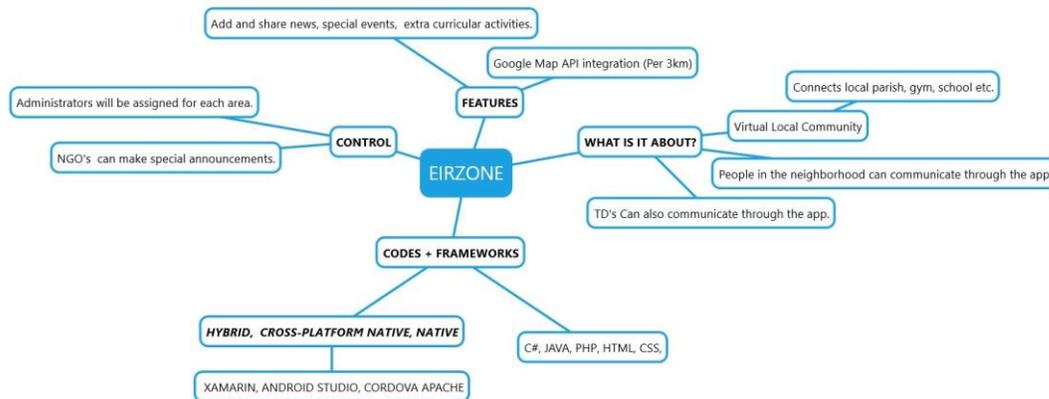
Another consequence of having a populated and unorganized neighborhood is the pollution and the negligence of cleaning the surrounding environment. It is significant to take part in helping the community to achieve an eco-friendly and disease-free environment.

The following images show the cooperative endeavour of the Irish community.



As an experience of being socially active in my area, I noticed how people were still divided and hindered by their cultures. Only a few are aware about the latest news, Non-Government Organisation events and local events; leading to a further division of small groups. This creates some issues regarding the safety and awareness of the local people. It has inspired me to think of a way in enlightening everyone in my area. The Eirzone App holds a fundamental element for a growing community.

The diagram below shows my initial plan in gathering the basic components of my application.



“Eirzone” originates from the Irish word Eire meaning Ireland and the word Zone is inspired by the areas and communities that are present in Ireland.

This mobile application project is like an online noticeboard inspired by the website applications called Gumtree.ie, Nextdoor.com, Reddit.com and Adverts.ie. All of the applications offer similar features. However, they don’t offer emergency information and nearby services of the map. Some of the applications are not built on Android platform or IOS platform.



It is clearly evident that an application like Eirzone could possibly change the way we communicate and share news and information in a community; making everyone more active and aware; contributing to a positive, safer and wealthier neighborhood.

1.2 Aims

The main goal of this project is to provide substantial information across the neighborhood or communities. It will be also beneficial for the locals, newcomers and foreigners.

The Eirzone Application will function as an online notice board that will contain recent news and activities. It will have a section for emergency information and will show other nearby services available in the area.

This application will help all the individuals to unite and to have a peaceful and better community.

1.3 Technologies

Android Studio – This software is installed and used as the environment of the application development.

Java – This language is one of the fundamental languages used in Android Studio and this have also been used for the front end development which focused on the development of the graphical user interface.

XML – This language is the other necessary language used for developing applications in Android Studio. It is used in different areas of Android Studio like the manifest.xml which holds all the existing activities. When an activity is created, it has to be declared on this file; content.xml takes care of what goes in the activity; and the activity.xml is used for structuring the overall activity that contains important functions.

PHP – CodeIgniter PHP framework is a web service used for connecting the front end to the back end server. This is necessary as it uses the RESTful service to send and retrieve data from the database using an API.

MySQL/SQLite – This framework is used in the back end for sending and retrieving data from the database.

1.4 Structure

In this documentation, I have covered the application system which includes the Requirements, Design and Architecture, Implementation, Testing, Graphical User Interface Layout, Customer Testing and Evaluation. These topics are provided with the Conclusion and Further Development and Research.

The appendix includes the documents that have been previously submitted such as the Project Proposal, Project Plan and Monthly Journals.

2 System

2.1 Requirements

The potential users can register and log in to the application. The users must be verified to be living in that specific area using Google Map. Once verified, the users can choose different features to communicate to their family or neighbors. They can create new post, access the map to find out how many of their neighbors have joined in and find out any event happenings.

It will be very interesting to create an application with fully functional features like this; however there were a few restraints in making this college application project.

The following are the requirements:

- A user must have an access to the Internet.
- A user must have an Android mobile phone.
- A user must download the application from Google Store.
- A new user must be able to register, and verify their identity and address.
- An existing user must be able to log in.
- An existing user must be able to create new post.
- An existing user must be able to access account to change information.
- An existing user must be able to view news feed.
- An existing user must be able to access the Map to see communities or neighbors.
- An existing user must be able to access Emergency page.
- The system must be able to verify password and username match.

- The system must be able to send and store data in the database.
- The system must be able to retrieve and display data from the database to the application.

2.1.1 Functional requirements

Main User Functions

- i. **Post/Edit/Delete**
 - Post, edit or delete any link, text or photo information provided by the user. A category must be chosen when planning to post.
- ii. **Account**
 - Users can edit their profile.
- iii. **Map**
 - The map provides data analytics. Users can find out how many communities exist, how many active neighbours are in the area and how many services are available in the area.

Application Functions

- i. **Newsfeed**
 - Newsfeed should be constantly updated in real time.
- ii. **Emergency**
 - User can use this function for calling emergency number such as the Garda.
- iii. **Set Notification**
 - Notifications will be sent to a user when they are added as a connection by other users.

2.1.2 Data requirements

Data requirements involve User Interaction to input data to the database, and do tasks or activities. Data has to be sent and retrieved from a working and an accessible database.

2.1.3 User requirements

User must have an Internet connection, and an Android mobile phone.

2.1.4 Environmental requirements

Android Studio IDE used for developing the application. Internet connection is needed for the server side to run. MySQL and CodeIgniter must be downloaded on the computer. Android mobile phone with the latest update is also needed for testing purposes like the Map.

2.1.5 Usability requirements

Understandability:

The users should understand the basic functions or the layout of the application.

Operability:

The application should work according to its function written in the documentation.

Attractiveness:

The application should provide a user-friendly layout.

Learnability:

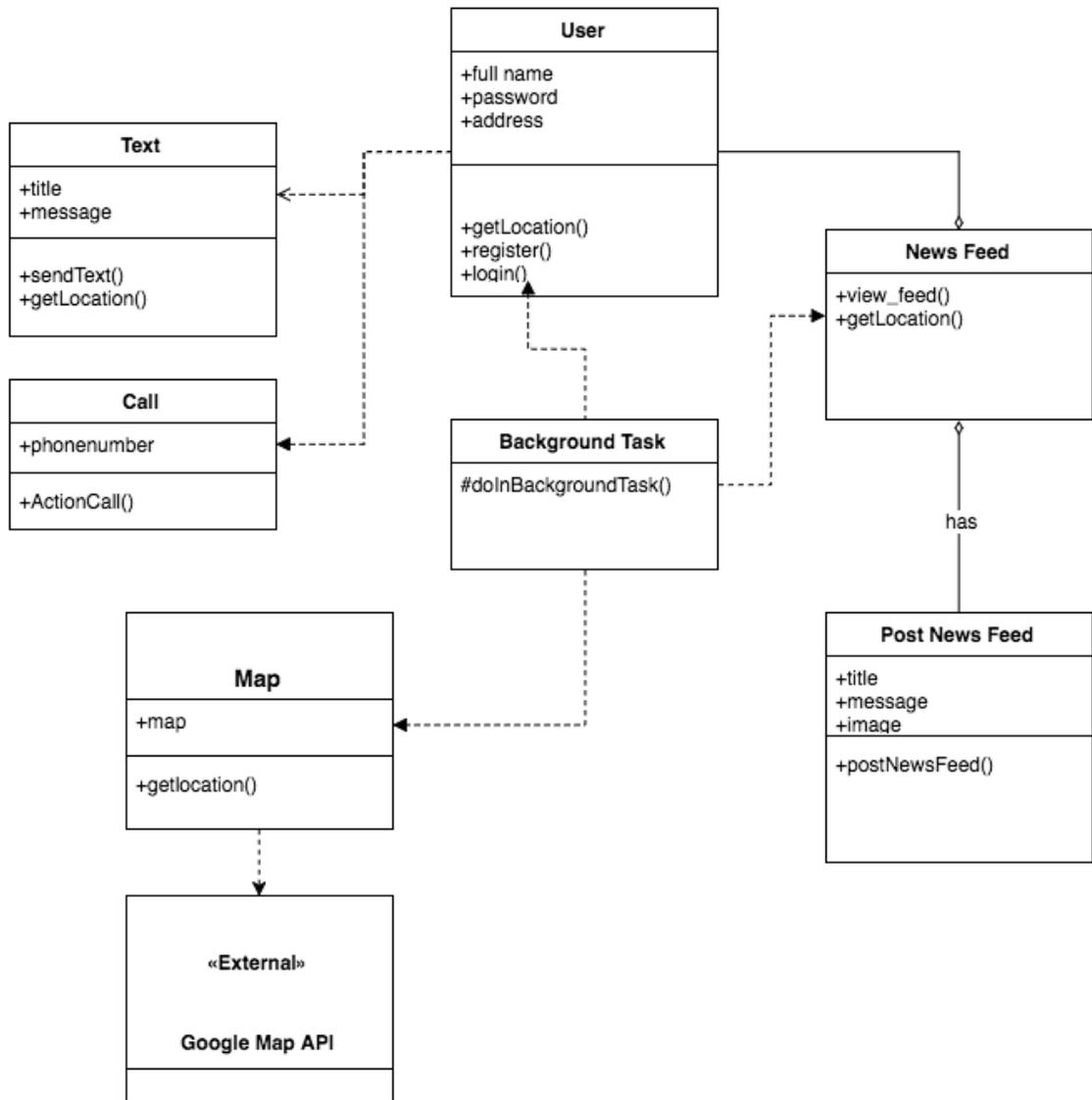
The user should be able to learn how to use the application without finding any error or complexity.

2.2 Design and Architecture

Architecture Diagram:

This section outlines the system architecture design of the system that is being built.

System Architecture Diagram

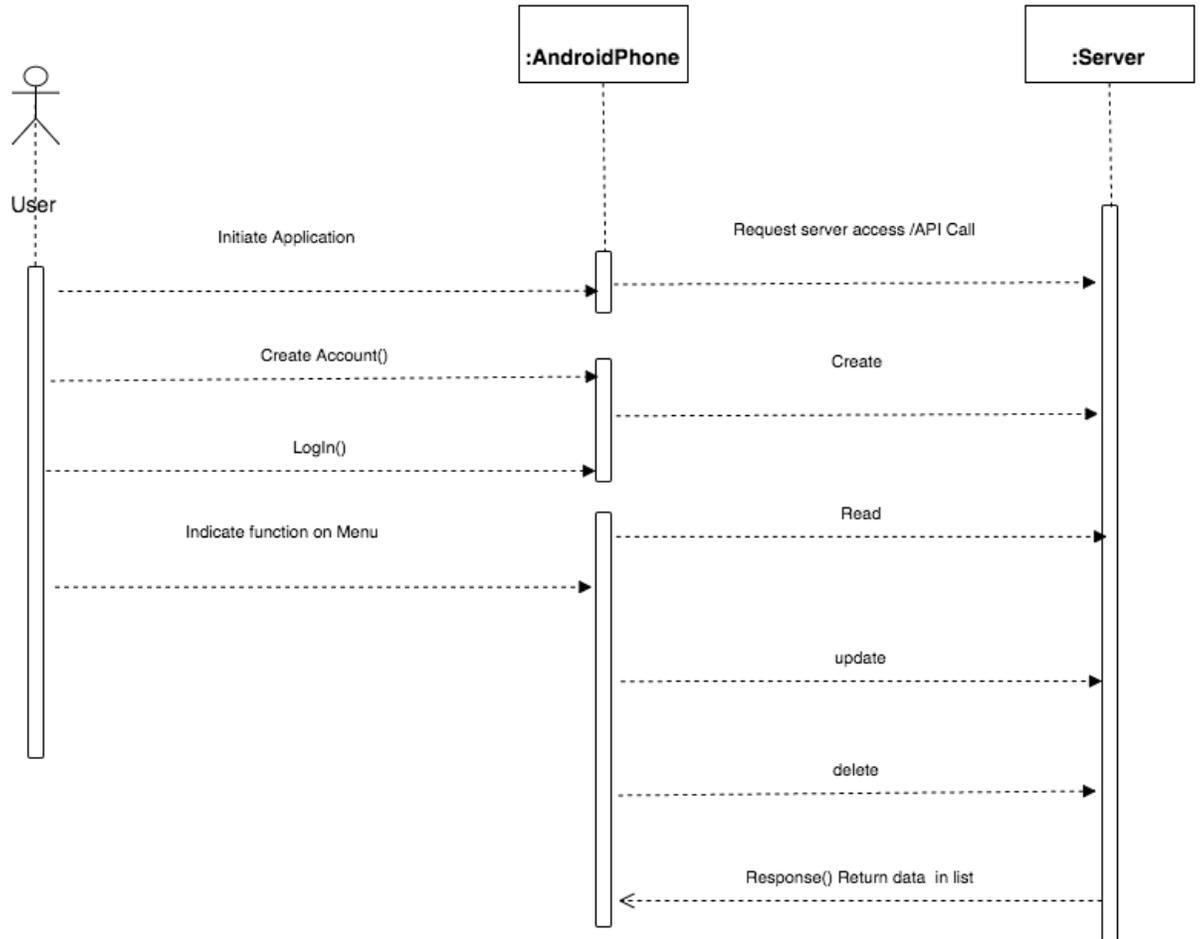


The class diagram above is the current architecture that I have chosen. It shows the relationship, functions among the features and it also has the necessary external resources that my application will be using.

2.2.1 Logical View

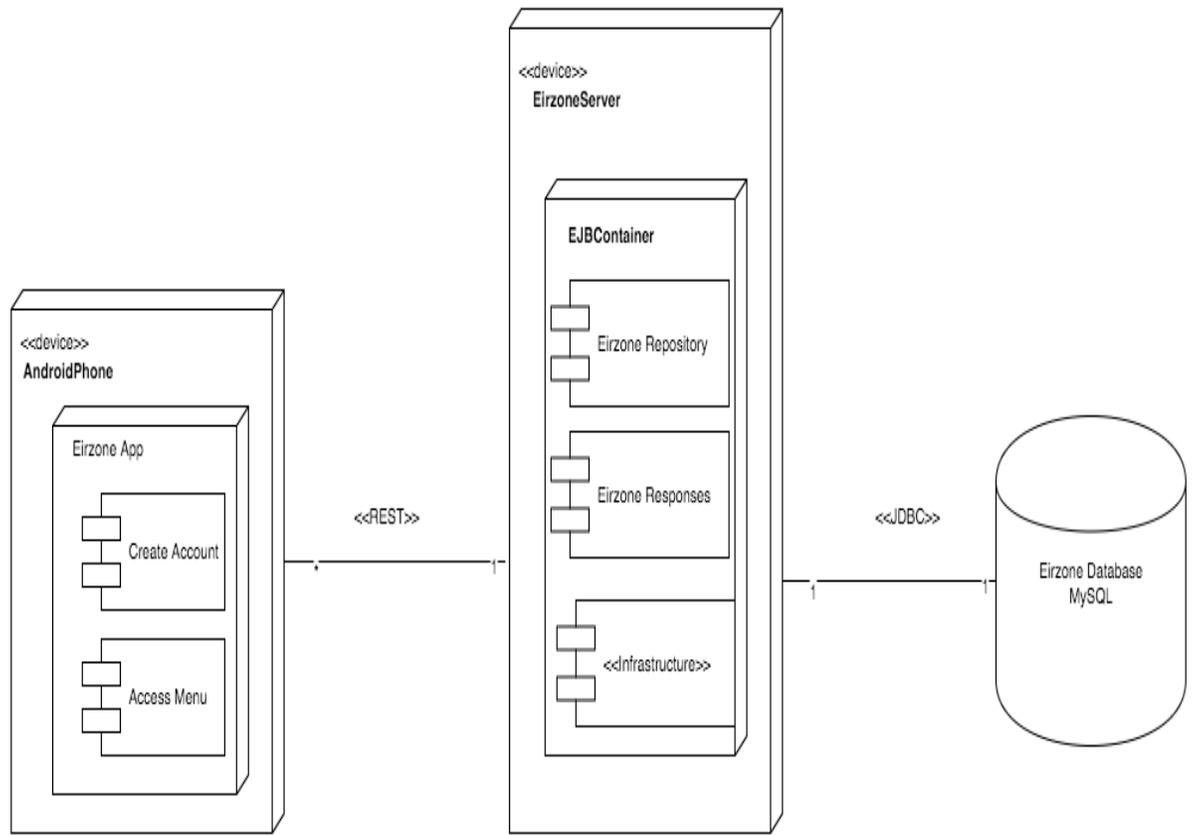
The sequence diagram below shows the interactions and responses happening from the user, to android and to the server.

Sequence Diagram



2.2.2 Communication Architecture

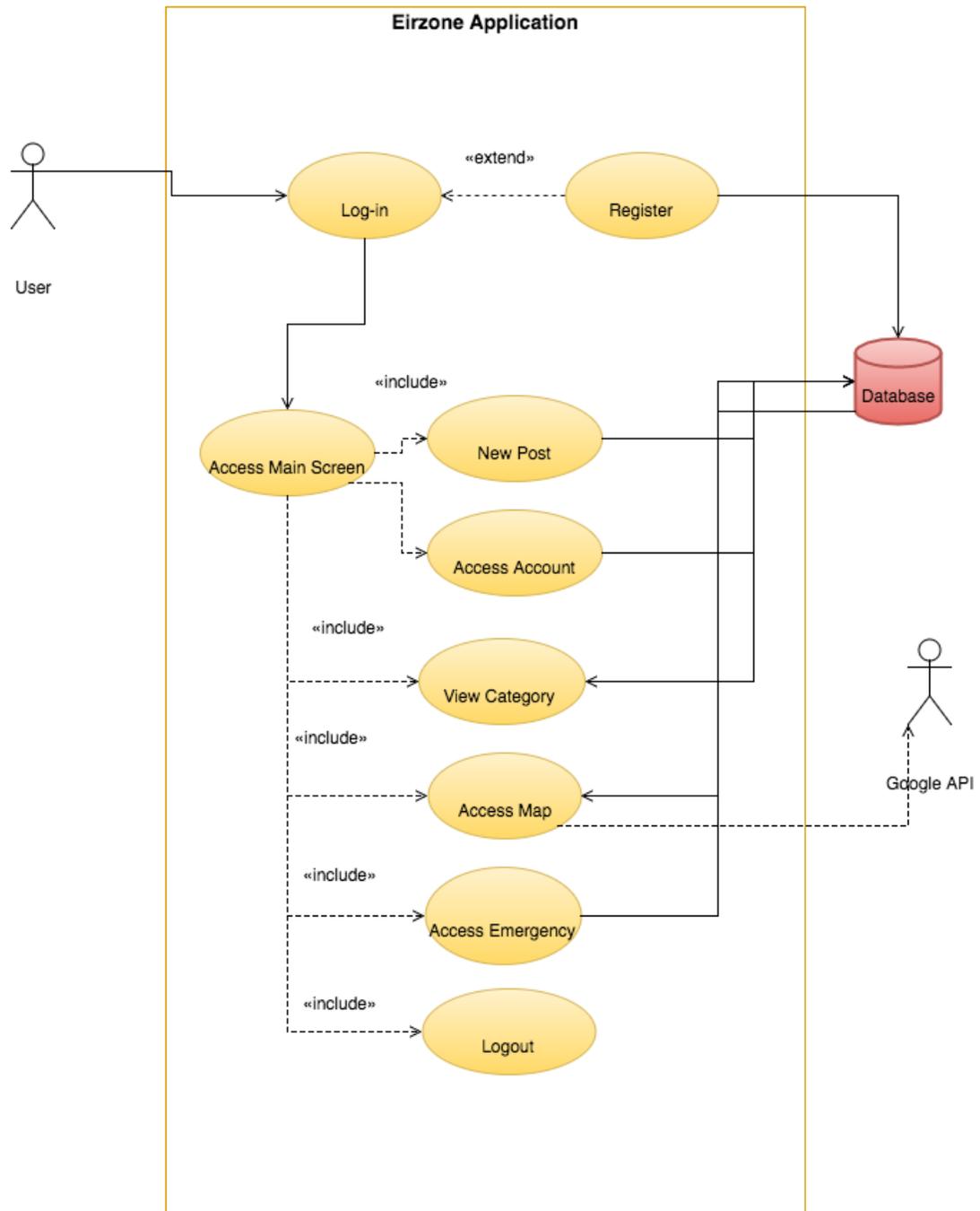
The communication architecture of the Eirzone shown in a deployment diagram that illustrates the components being used to create the overall application system.



2.2.3 Use-Cases

1.1.1 Use Case Diagram

Overview of the Application Use Case Diagram



1.1.2 Requirement 1: User Log In/Registration

1.1.2.1 Description & Priority

The user login and registration is one of the vital parts of this application project. The user will need to be registered or logged in so they can access the features of the application.

1.1.2.2 Use Case

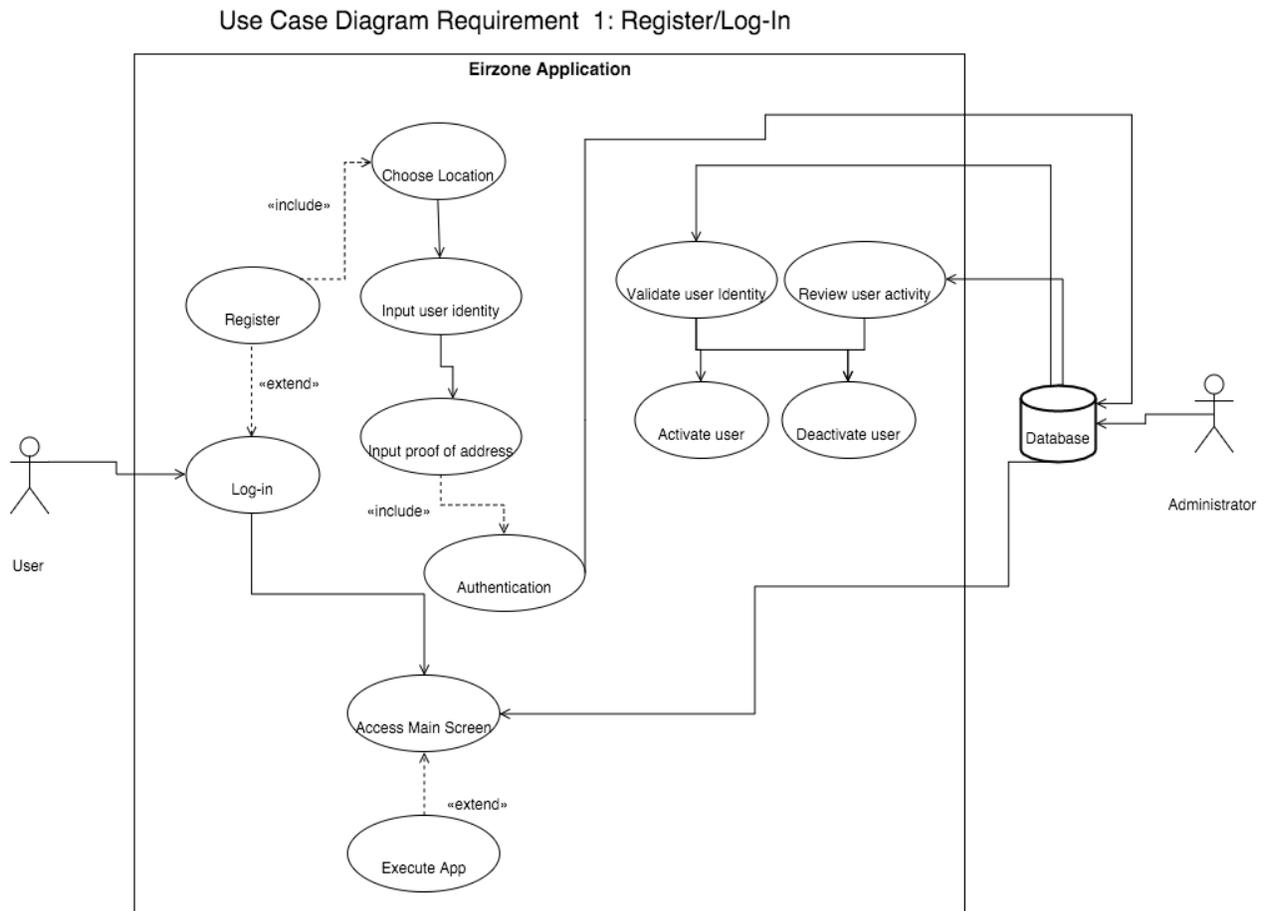
Scope

The scope of this use case is to allow users to log in or register to be able to access the main screen or menu page of the application.

Description

This use case describes the sign in and registration system.

Use Case Diagram



Flow Description

Precondition

The system is in initialisation mode.

Activation

This use case starts when the user clicks the application and the login or register fields are prompted.

Main flow

1. The system identifies the user details being put in from the log in screen.
2. The user can access the main screen directly when they logged in successfully. The main screen contains all the activity buttons. These buttons contain different screens and information that are connected to the database.

Alternate flow

A1: Registration

1. The system identifies the user details being put in from the registration screen.
2. The user will have to choose location, input user identity and address.
3. The system authenticates the user details and stores the collected information in the database.
4. The administrator checks if the proof of address and identity are valid; allowing them to activate or reject a user.

Exceptional flow

E1: Rejected/Invalid Proof

5. The system sends the user a notification to provide valid proof.
6. The user should repeat A1: Registration, step 2.

Termination

The use case is terminated when the user successfully logs in.

Post condition

The system goes into idle.

1.1.3 Requirement 2: New Post

1.1.3.1 Description & Priority

The New Post feature is the allowing of user to create a message to be posted publicly. It will be stored in a database and displayed in the news feed.

1.1.3.2 Use Case

Scope

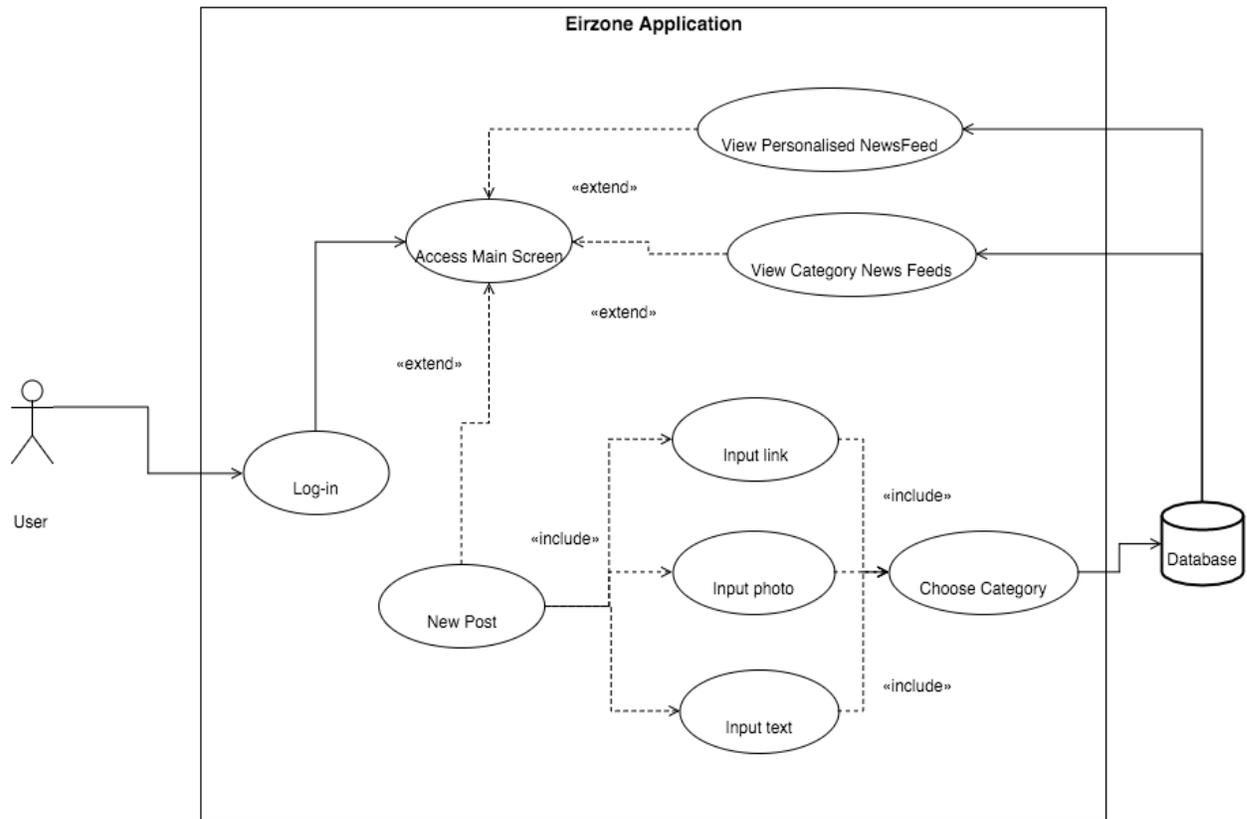
The scope of this use case is to allow the users to create a new post with a choice of posting a link, a photo or a text.

Description

This use case describes the procedure to create a new post. The user will have a choice to post a website, photo or a text and will also be able to choose which category they want to post it in.

Use Case Diagram

Use Case Diagram Requirement 2: New Post



Flow Description

Precondition

The system is in initialisation mode.

Activation

This use case starts when the user selects the New Post activity button from the Main Screen.

Main flow

1. The system identifies the activity button selected.
2. The user must choose what to post.
3. The system stores the data collected in the database.

Alternate flow

A1: Post Choice

1. The user can post a photo, or a text.
2. The database continuously updates and displays the on the personalised news feed and category news feeds.

Termination

The system presents the next screen and moves to the post condition.

Post condition

The system goes into a wait state.

1.1.4 Requirement 3: News Feed

1.1.4.1 Description & Priority

A description of the requirement and its priority. Describes how essential this requirement is to the overall system.

The News Feed is an integral part of the application. It is the way to display the stored information posted by the users from each categories. There are two ways to view the news feed. The first one is a personalized news feed that allows users to choose what category they want to see. This category will be randomized and will be updated in real time in the personalized news feed.

The other one is the Category News Feeds. For each category there is a designated news feed. These are restricted and are only viewable upon the division of communities.

1.1.4.2 Use Case

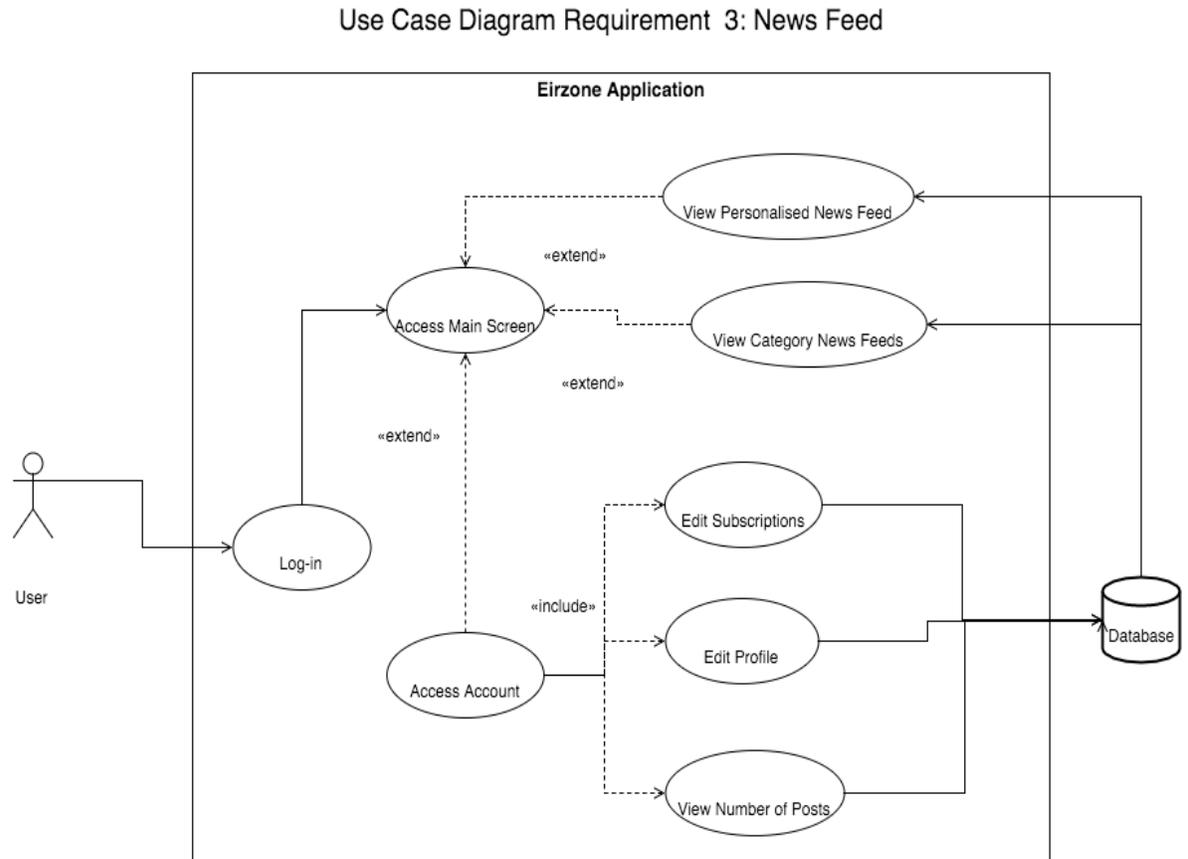
Scope

The scope of this use case is to enable users to see their news feed updated in real time and to allow them to personalise what they want to see on their feed by editing the subscriptions.

Description

This use case describes the procedure on how to find specific topics and how to personalise topics on the news feed.

Use Case Diagram



Flow Description

Precondition

The system is in initialisation mode.

Activation

This use case starts when the user selects the Category to find and view a specific topic.

Main flow

1. The system identifies the selected button activity.
2. Allows the user to create new post and view updates.

Alternate flow

A1: Error prompt

1. When the system fails to load contents from server, it restarts the application connection.

Termination

The system presents the next screen and moves to the post condition.

Post condition

The system goes idle.

1.1.5 Requirement 4: Map

1.1.5.1 Description & Priority

The map is an additional feature that represents the data stored in the database. These data are the location of each existing communities and services.

1.1.5.2 Use Case

Scope

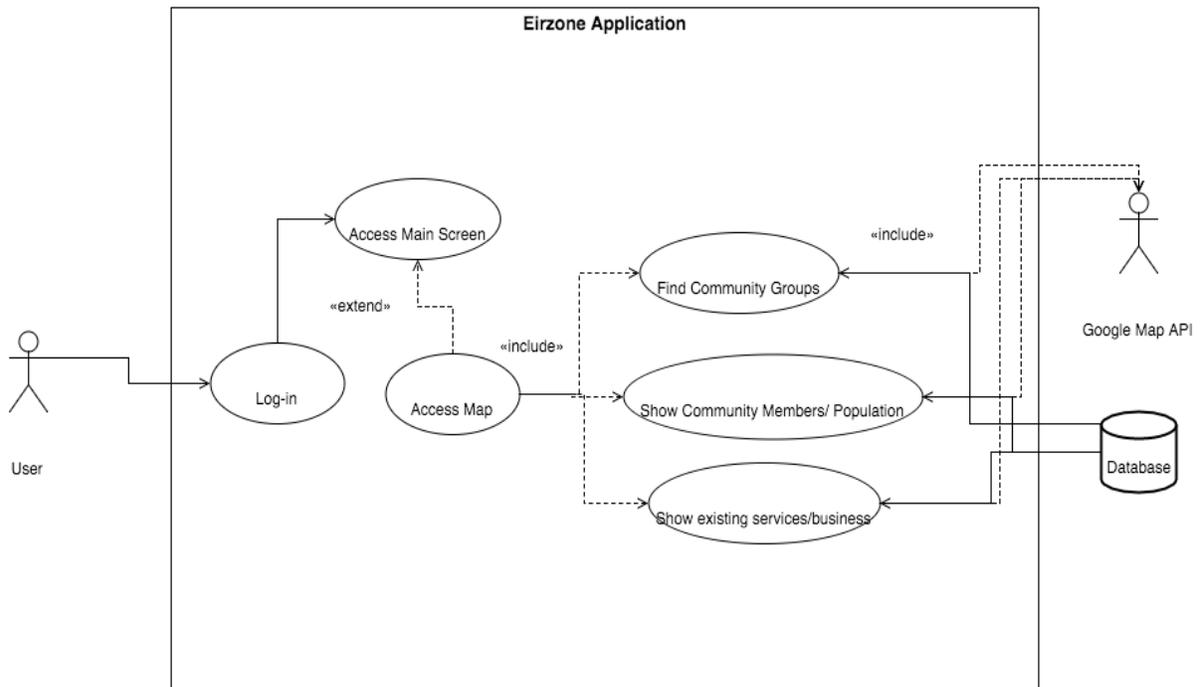
The scope of this use case is to show how many communities are involved in the application.

Description

This use case describes the functions of the map. The map uses an API from Google to show the existing communities in Dublin.

Use Case Diagram

Use Case Diagram Requirement 4: Map



Flow Description

Precondition

The system is in initialisation mode.

Activation

This use case starts when the user selects the Map activity button.

Main flow

1. The system identifies the selected activity button and displays the map.
2. The user selects the show community member's button under the map.
3. The system retrieves data from the database and displays the existing communities on the map.

Alternate flow

A1: Error prompt

1. When the activity fails to show its content, it should ask the user to enable location.
2. The activity restarts.

Exceptional flow

E1: API connection

3. The community location is automatically populated in the registration.
4. The location is stored in the database and triggers the system and the API to show the existing communities in the map.

Termination

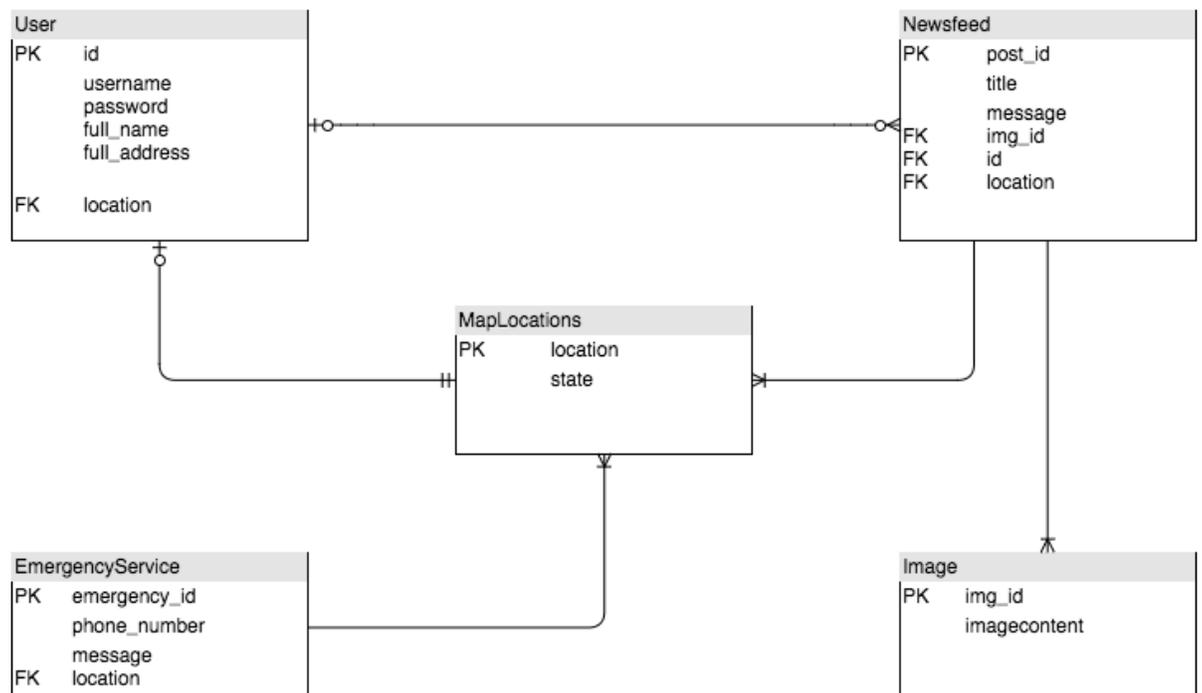
The system presents the next screen and moves to the post condition.

Post condition

The system goes into a wait state.

2.2.3 Database Design

The following diagram shows the design of the Eirzone Database. It contains five tables with corresponding relationships.



2.2.4 Data Conversion

Java to JSON	Get and retrieve information from the server. Allows usage and connection with the API's.
Database Data to JSON String	Allows display of data from the database to the UI.

Information in the Data conversion table could still may change and may have other additional data conversions.

2.2.5 Application Program Interfaces

My application will be developed using the Android Studio and its available tools. The Application Programming Interface that my system will integrate is Google Map API.

My application will contain its own API and will use HTTP methods for RESTful Services. The following diagram will be filled in and may be changed along the way of planning and developing the application.

NOTES	LOCATION/SOURCE	Path			
		POST	PUT	GET	DELETE
Connected to Server & Database	My Account	/myaccount/user/post	/myaccount/user/update	/myaccount/user/read	N/A
Connected to Server & Database	News Feed	/newsfeed/user/feed	N/A	/newsfeed/user/view_feed	/newsfeed/user/delete

2.3 Implementation

Registration by Location

Eirzone Application requires users to enable location access on their device to automatically detect their location. The method **onLocationChanged()** handles the

actual position of the user using latitude and longitude. It will then give the result of the address.

The registration may be a usual implementation but this was one of the most difficult to implement in the application; as it involves saving user information by their location.

```
public void register (View v){
    String _full_name = full_name.getText().toString();
    String _username = username.getText().toString();
    String _password = password.getText().toString();
    String _full_address = full_address.getText().toString();
    String _location_ = location_.getText().toString();
    _full_address = _full_address.replaceAll(" ", "_");
    _location_ = _location_.replaceAll(" ", "_");
    String message = "";

    try {
        String res = bg_task.execute("register", _username, _password, _full_name,
        _full_address, _location_).get().toString();
        JSONObject json = new JSONObject(res);
        message = json.getString("message");
        Toast.makeText(ctx, message, Toast.LENGTH_LONG).show();
    } catch (InterruptedException e) {
        Toast.makeText(ctx , e.toString(), Toast.LENGTH_LONG).show();
    } catch (ExecutionException e) {
        Toast.makeText(ctx , e.toString(),
        Toast.LENGTH_LONG).show();//e.printStackTrace();
    } catch (JSONException e) {
        Toast.makeText(ctx , e.toString(),
        Toast.LENGTH_LONG).show();//e.printStackTrace();
    }
```

```

    }
    Intent intent = new Intent(Register.this, MainActivity.class);

    startActivity(intent);
}
@Override
public void onLocationChanged(Location location) {
    double latitude = location.getLatitude();
    double longitude = location.getLongitude();
    Geocoder geocoder = new Geocoder(ctx, Locale.getDefault());

    List<Address> addresses = null;
    try {
        addresses = geocoder.getFromLocation(latitude, longitude, 1);
        String city = addresses.get(0).getLocality().toString();
        String state = addresses.get(0).getAdminArea().toString();
        String zip = addresses.get(0).getPostalCode().toString();
        String country = addresses.get(0).getCountryName().toString();
        full_address.setText(city+ " " + state + " " + country);
        location_.setText(city);
    } catch (IOException e) {
        full_address.setText(e.toString());
    }

}
}

```

The application gets the user information like name, password and address, which triggers the background task class to commence, connect and to save data to the database server. When these are done, the user will be redirected to the news feed.

The background task class uses json, string builder and buffered reader to allow the conversion of data.

```
else if(this.method.equals("login")){
    try {
        login = login + "?user_name="+params[1]+"&password="+params[2];
        URL url = new URL(login);
        HttpURLConnection con = (HttpURLConnection) url.openConnection();

        StringBuilder sb = new StringBuilder();

        bufferedReader = new BufferedReader(new
InputStreamReader(con.getInputStream()));

        String json;
        while((json = bufferedReader.readLine())!= null){
            sb.append(json+"\n");
        }

        return sb.toString().trim();

    }catch(Exception e){
        return null;
    }
}
```

Post in News Feed

In order to create a post in the news feed, the user must enter the title and the content to their message.

```

public void post_feed(View v){

    String _title = title.getText().toString();

    String _message = message.getText().toString();

    String result;

    try {

        String res = bg_task.execute("post_feed", _title,_message, id,
location).get().toString();

        JSONObject json = new JSONObject(res);

        result = json.getString("message");

        Toast.makeText(ctx, result, Toast.LENGTH_LONG).show();

        Intent intent = new Intent(Post_news_feed.this, dashboard.class);

        intent.putExtra("id", id);

        intent.putExtra("location", location);

        intent.putExtra("full_name", full_name);

        startActivity(intent);

    }
}

```

Emergency Call

The following method in Call class allows the user to specifically call the Garda number using the device for emergency purposes.

```

Intent intent = new Intent(Intent.ACTION_CALL);
intent.setData(Uri.parse("tel:" + " 1800 666 111"));

```

```
ctx.startActivity(intent);
```

Emergency SMS/Text

When a message is sent to another device, it uses the method `sendSMS()` which initiates Broadcast from the user to another device.

```
private void sendSMS(String phoneNumber, String message)
{
    String SENT = "SMS_SENT";
    String DELIVERED = "SMS_DELIVERED";

    PendingIntent sentPI = PendingIntent.getBroadcast(this, 0,
        new Intent(SENT), 0);

    PendingIntent deliveredPI = PendingIntent.getBroadcast(this, 0,
        new Intent(DELIVERED), 0);
```

2.4 Testing

Several test cases were written as a record for the application development.

Test Case	Register/LogIn				
Description	Lets new users to register and log in.				
Data Requirements	Name, address, location				
Test Case ID	Description	Expected Results	Actual Results	Pass/Fail	Remarks
Log In 1	Validate user credentials.	User should be able to access their account by validation from server to database.	Validation success.	Pass	N/A

Test Case	News Feed				
Description	Newsfeed constantly updates and lets users post and view.				
Data Requirements	Title, message, location				
Test Case ID	Description	Expected Results	Actual Results	Pass/Fail	Remarks
Post 1	Create new posts composing of title, message and location.	User should be able to create new post.	Successful post.	Pass	N/A
View 2	Retrieve data from database which updates in real time.	User should be able to see	Successful retrieval of	Pass	N/A

		real-time update.	data from database.		
--	--	-------------------	---------------------	--	--

Test Case	Emergency SMS/Call				
Description	Users can send SMS and perform call operations.				
Data Requirements	Title, message, location, phone number				
Test Case ID	Description	Expected Results	Actual Results	Pass/Fail	Remarks
Send SMS 1	Users should be able to send SMS with their location.	Send SMS with geo location.	Can send SMS but with no specified location.	Fail	Retry different approach with location implementation.
Call 2	Users should be able to call from the android application.	Call emergency phone numbers through the application.	Can perform call operation.	Pass	N/A

Test Case	Map				
Description	Detect user's geo location.				
Data Requirements	Location				
Test Case ID	Description	Expected Results	Actual Results	Pass/Fail	Remarks

Show current location 1	Retrieve user's latitude and longitude locations.	Users should be able to be tracked by the application and get displayed on a map.	Retrieved user's location.	Pass	N/A
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2.5 Graphical User Interface (GUI) Layout

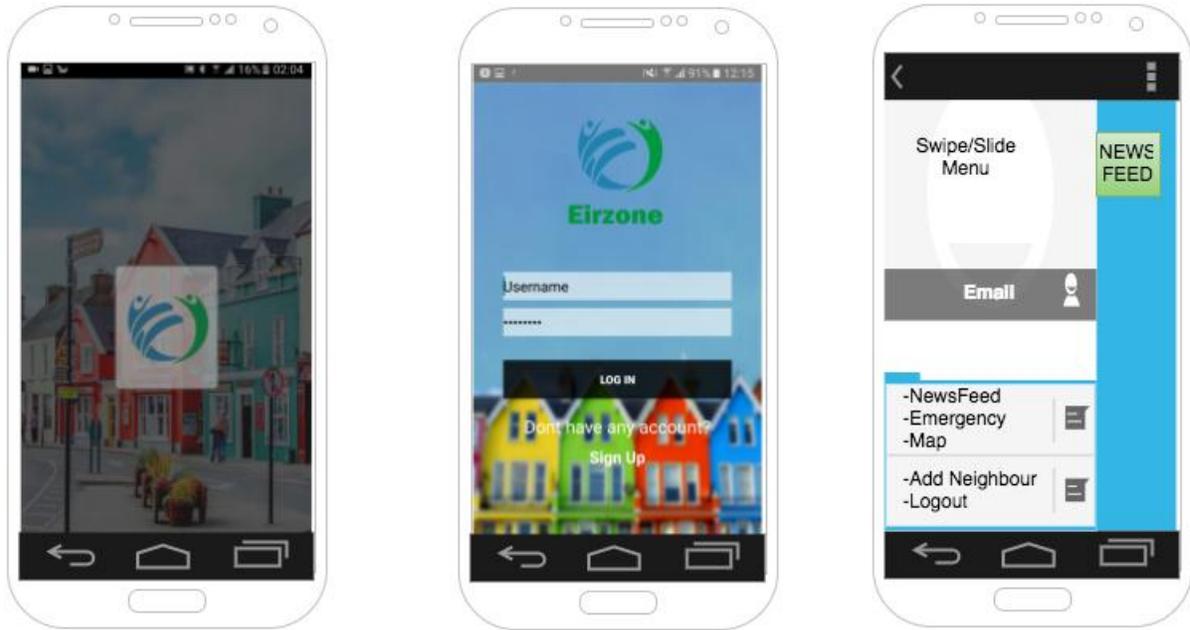
Initial GUI Design

The following image shows the initial design of Eirzone wireframe.

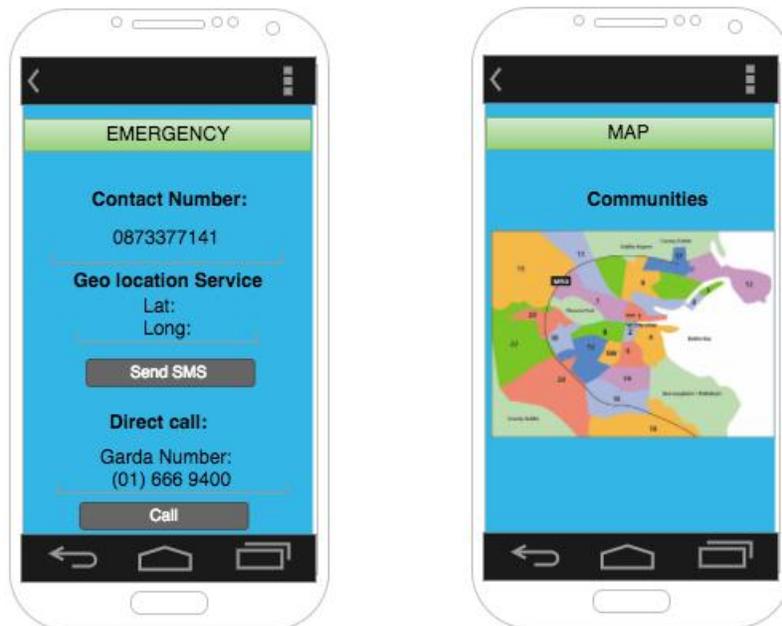


New GUI Design

These GUI images are the redesigned version of the application.



The first GUI that I created conveys how the Eirzone Application would start up when it is clicked by the user. It will then lead to the sign up or register screen. The user will need to put in their email and password to sign in. After signing in, the main screen with news feed will appear. The menu can be accessed using gesture pattern by swiping to the right.



The path to the Emergency activity and Map activity can be seen on the menu. The Emergency activity detects the user's current position and lets the user send it to any phone number. It also provides quick emergency call from the application.

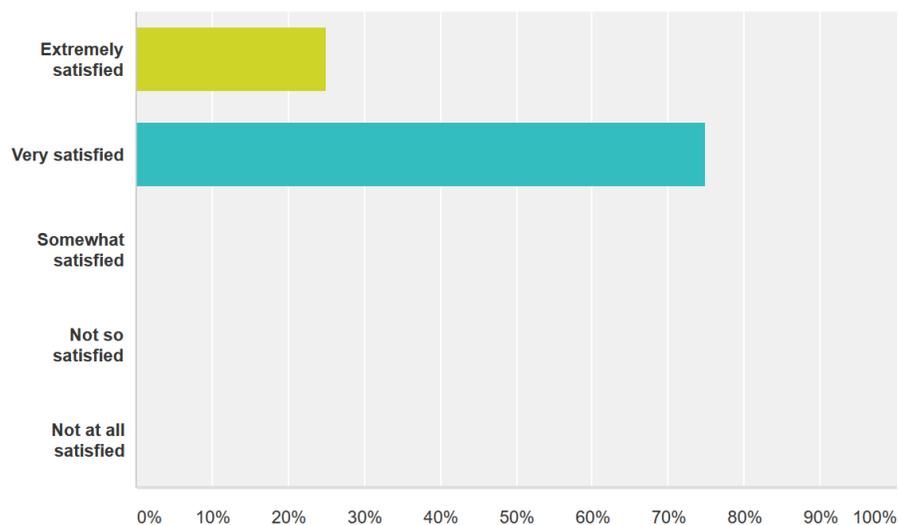
2.6 Customer testing

I have approached different potential users around my neighbourhood and asked for application testing and feedback. I have given them a few survey questions using surveymonkey.com which they answered thoroughly by ranking each topics. These topics are:

- User-friendly Interface
- Application responsiveness
- Accuracy
- Reliability
- Security
- Usability

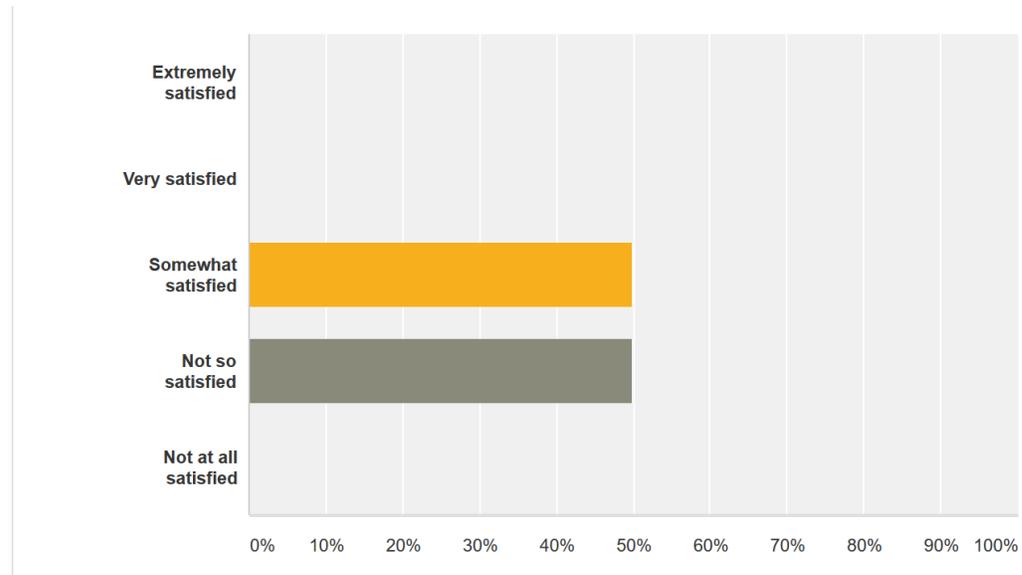
2.7 Evaluation

The evaluation of the customer testing according to its Usability or software ease of use:



It appears that majority of users or 75% of the users are very satisfied with the usability feature of the application.

However the results on the application's security resulted to a 50-50 result which suggests that the application's security could have some vulnerabilities.



3 Conclusions

The idea behind Eirzone application has initially interested various people from my local area.

Quote from a Religious Associate in Dolphin's Barn church: "It is a good idea to create an application for the neighbourhood to let the people know the events in the church. It will also be great to share the history of the area, here in Dolphin's Barn."

Quote from a Nurse in the Coombe's Hospital: "As a foreigner, I think it will be usable for us to see nearby services."

Quote from a Garda: "That's a brilliant idea. You can check out our website to share the latest information on how to keep your houses and yourselves safe."

These opinions helped in shaping the Eirzone Application, leading to the right path of development.

4 Further development or research

With more research and resources, the results of this project could lead to a development of a faster and secured application. Sources will be spent for the development of the integrity and robust functionality of the application.

Implementation of administration control and website development for Eirzone is also foreseeable in the future.

5 References

¹Bodkin, See. 'Ireland Should 'Embrace' A Population Of 10 Million'. *Business ETC.* [online] Available at: <http://businessetc.thejournal.ie/ireland-population-forecast-1970782-Mar2015/> [Accessed 25 Sept. 2015].

²UTV Ireland,. 'Taxi Driver Robbed At Knife-Point In Dublin'. [online] Available at: <http://utv.ie/News/2015/06/04/Taxi-driver-robbed-at-knife-point-in-Dublin-38427> [Accessed 28 Sept. 2015].

³Rodericogorman.com,. 'Royal Canal « Roderic O'gorman – Dublin West Green Party'. [online] Available at: <http://rodericogorman.com/?tag=royal-canal> [Accessed 28 Sept. 2015].

⁴hAlmhain, Oisín. 'Spring Cleaning'. *Real-dublin.ie.* [online] Available at: <http://www.real-dublin.ie/oisins-opinions/102-spring-cleaning> [Accessed 28 Sept. 2015].

6 Appendix

6.1 Project Proposal

4th Year Project Proposal



EIRZONE

(Electronic Irish Community Zones)

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BSc (Hons) in Computing

Specialising in Networking and Mobile Technologies

30/09/2015

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1. Objectives

Eirzone is an interactive mobile networking application targeted towards local communities to increase awareness and improve communication. It holds all the community information and services in one place making the application handy and accessible for everyone.

It is a medium used to connect members from local parishes, gyms, businesses, colleges and other organisations. It is a digital way of developing a community that will bring people closer together.

Its main purpose is the sharing of news and happenings in the area. Setting up schedules, meetings, announcing special events like heritage week and extra-curricular activities like fun run and football matches.

Another important aspect of the application is the advertising of available jobs in the local area. Non-Government Organisations can also offer voluntary works. People can look for one another and take responsibility for the cleanliness of the environment.

This application would give more opportunities for making new friends and learning other cultures. It would enhance and develop our community outreach skills which could help maintain our population and flourish our community for its success in the future.

2. Background

Irish population massively grew over the years reaching about 4.63 Million in 2014. The histogram below shows the number of increase from 2006 to 2014.



With the unstoppable rising of the population, it is expected to increase up to 10 million before 2050¹. More migrants and new-borns will come to Ireland which would lead to the expansion of communities.

Organising and having a proper communication in a community would be a necessity. Without it, pollution, crimes and social problems are prone to happen.

An example of this scenario is the incident that happened in my area, Rialto Dublin. A local male taxi driver's life was at risk when an unknown man tried to point the knife at him.² He did not get any injury but his mobile phone and cash were stolen. The Garda in the area took an action and arrested the suspect.

This incident could have been prevented by being active in a community. It would be helpful to have a medium for communication so we can be more alert and careful with unfamiliar people in our area. Crime watch or looking for each other is one of the features that Eirzone is focused on.



Another consequence of having a populated and unorganised neighbourhood is the pollution and the negligence of cleaning the surrounding environment. It is significant to take part in helping the community to achieve an eco-friendly and disease-free environment.

The following images show the cooperative endeavour of the Irish community.

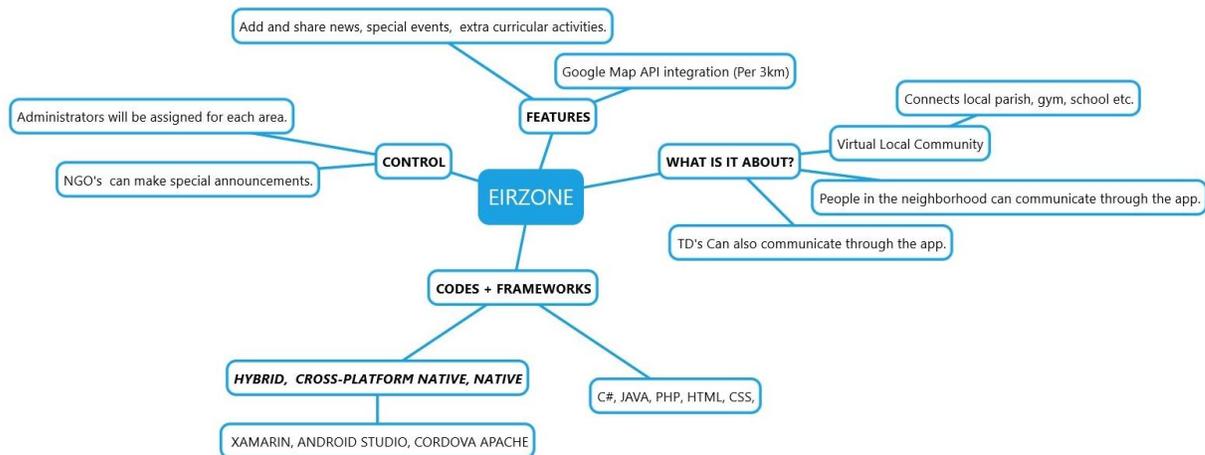


(Courtesy of Roderic O’Gorman and the Dublin West Greens at the 2010 Annual Royal Canal Clean Up³ and Spring Cleaning by Oisín O hAlmhain⁴)

Eirzone provides a category specifically made for cleaning up the environment. This will enable the people to post and check the activity schedules conveniently.

It is clearly evident that an application like Eirzone could possibly change the way we communicate in a community; making everyone more active and aware; contributing to a positive, safer and wealthier neighbourhood.

As an experience of being socially active in my area, I noticed how people were still divided and hindered by their cultures. Only a few were aware about Non-Government Organisation events. This has inspired me to think of a way in enlightening everyone in my community. The Eirzone App holds the fundamental elements for a growing community. The diagram below shows how I planned to gather the basic components of my application.



Eirzone Mind-Map Diagram

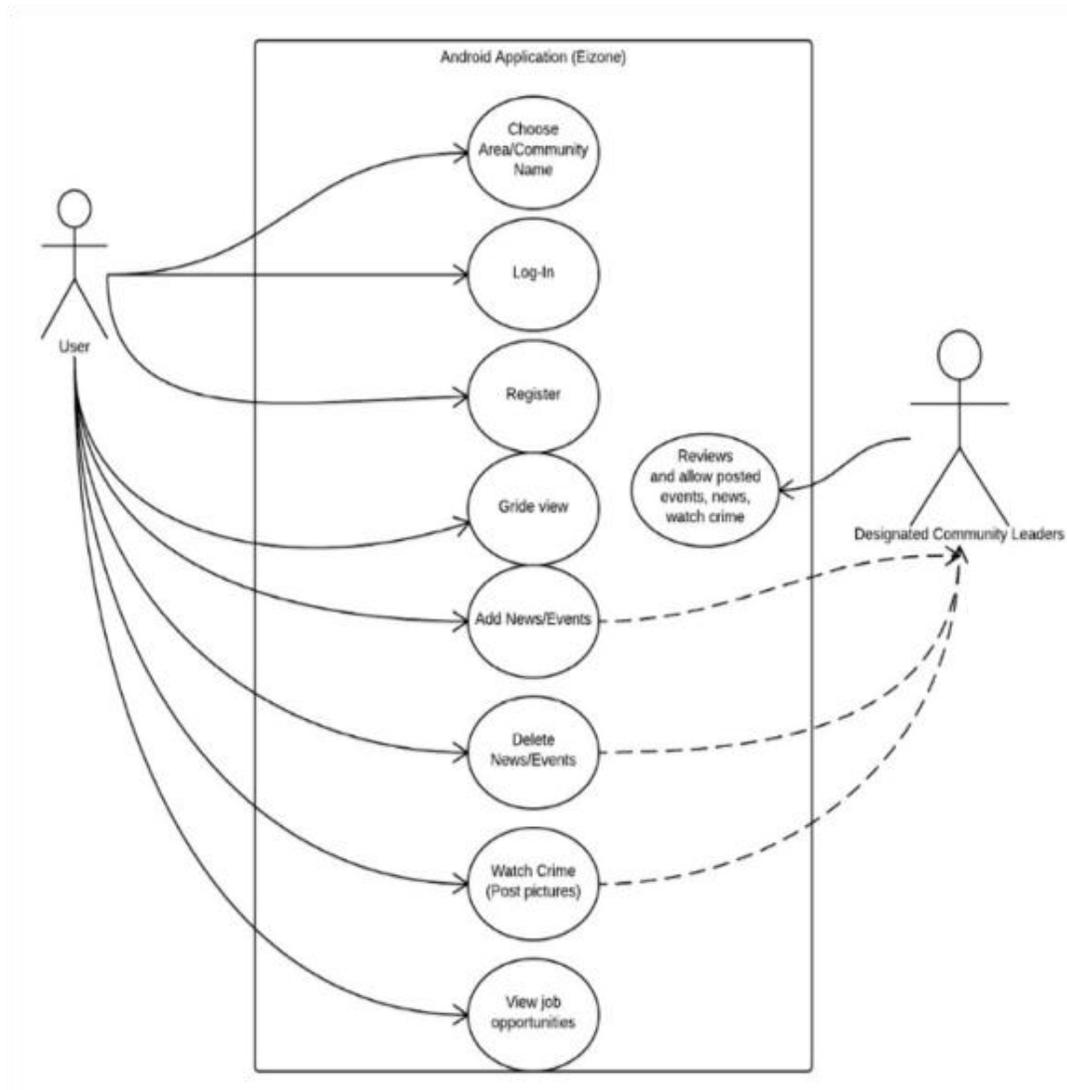
3. Technical Approach

There are different ways of developing a mobile application. They are categorized into three types; Hybrid Web, Cross-Platform Native and Native.⁵ Hybrid Web like Ionic for example, uses HTML5 as their foundation. Some major disadvantages are the

unavailability of accessing native objects and native API's. It only offers limited SDK features so there is no notification and it's much slower to process. However Cross-Platform Native like Xamarin is said to be better than the Hybrid Web as it uses native UI objects, which allow developers to manipulate specific codes. One disadvantage is the usage of custom API. This restricts the duplication of the code. It is not fully reliable to use the translated codes both in IOS and Android. On the other hand, Native such as Android uses pure java that contains native UI and native API. It offers best performance and features.

Based on my research, it results that Native programming outweighs the other two methods for developing a mobile application. I personally choose Android because of my experience at coding in Java. I also found out that the Android Studio framework has released an updated version of their software, which includes designing tools and new other features. <http://android-developers.blogspot.ie/2015/09/android-studio-14.html>. I have already installed the latest update and it will be interesting to experience coding my first android mobile application.

The use case diagram conveys the basic requirements capture of the Eirzone App. Initially, the user will need to have an internet and an android mobile to download and use the application. The user will have to choose an existing area of community name in order to log in and register. After logging in, the user will be shown the grid view of the latest News, Events, Watch Crime and Job Opportunities. If the user decides to add or delete his or her post, the designated community leaders will have to review and control what's being posted. This design could still possibly change due to user experience testing and functions.



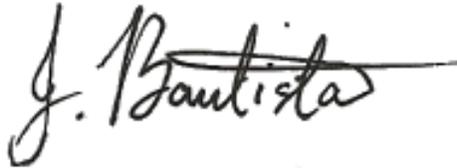
4. Special Resources Required

The special resources required on my project are android mobile phone, laptop, android studio, internet website articles, video tutorials and programming books for Android, Java, Object-Oriented Programming, Advanced Database, SQL, SQLite and Networking.

5. Project Plan

This file contains the Gantt chart I created for my project plans.

- For the end-user or user acceptance test, I will ask a lecturer or a student to test the overall application. The main functionality should perform its specific duties like posting, deleting and retrieving data.



Signature: _____

Date: 30/09/2015

Joanna Bautista

8. References

¹Bodkin, See. 'Ireland Should 'Embrace' A Population Of 10 Million'. *Business ETC*. [online] Available at: <http://businessetc.thejournal.ie/ireland-population-forecast-1970782-Mar2015/> [Accessed 25 Sept. 2015].

²UTV Ireland,. 'Taxi Driver Robbed At Knife-Point In Dublin'. [online] Available at: <http://utv.ie/News/2015/06/04/Taxi-driver-robbed-at-knife-point-in-Dublin-38427> [Accessed 28 Sept. 2015].

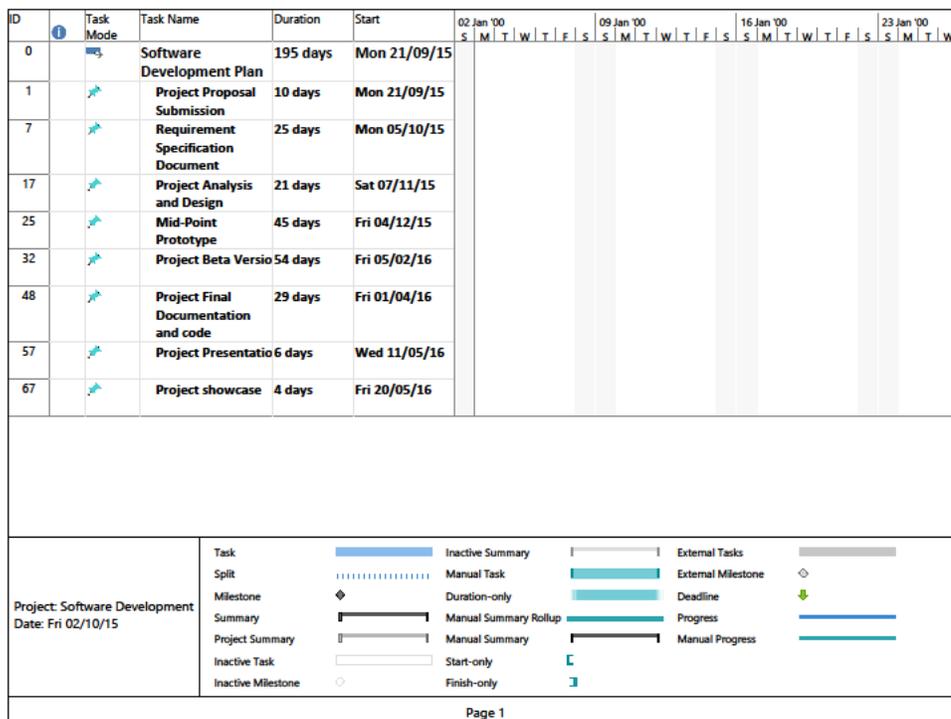
³Rodericogorman.com,. 'Royal Canal « Roderic O'gorman – Dublin West Green Party'. [online] Available at: <http://rodericogorman.com/?tag=royal-canal> [Accessed 28 Sept. 2015].

⁴hAlmhain, Oisín. 'Spring Cleaning'. *Real-dublin.ie*. [online] Available at: <http://www.real-dublin.ie/oisins-opinions/102-spring-cleaning> [Accessed 28 Sept. 2015].

⁵Thorntech.com,. 'Native Or Hybrid Apps: Things To Consider When Developing A Mobile Platform For Your Business | Thorn Technologies'. [online] Available at: <http://www.thorntech.com/2015/06/native-or-hybrid-apps-things-to-consider-when-developing-a-mobile-platform-for-your-business/> [Accessed 30 Sept. 2015].

6.2 Project Plan

This image shows a preview of my Project plan developed in Microsoft Project.



6.3 Monthly Journals

REFLECTIVE JOURNAL

Student name: Joanna Bautista (X12374571)

Programme: BSc in Computing

Month: September 2015

My Achievements

This month I was able to come up with a good concept for my project.

My contributions to the project included brainstorming of ideas, researching on various frameworks for developing an application, comparing programming languages and contemplating on which platform I would use.

In week one, I gathered up all the ideas that I had in mind. It took one week for me to decide which topic I was going to do.

Here is the following mind-map of my ideas:

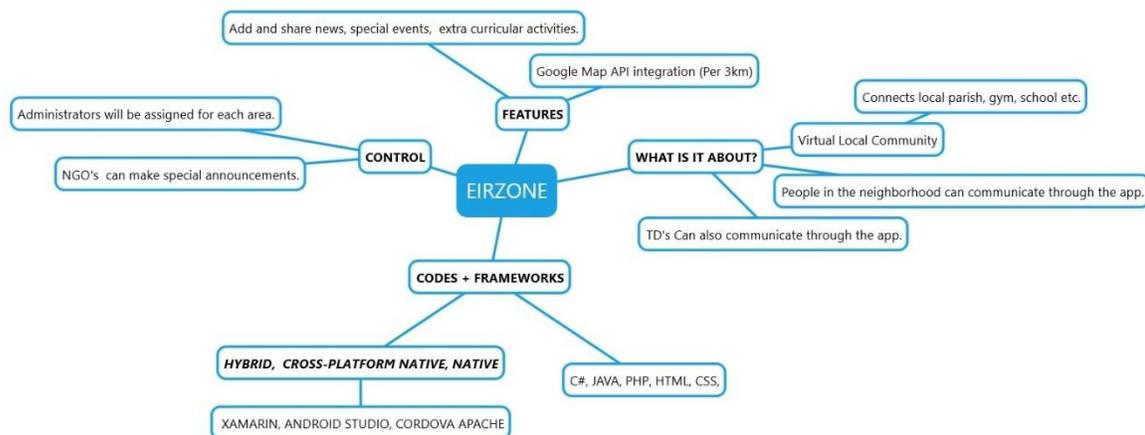
(My general ideas)



After a week of thinking that caused some confusions in all my ideas, I decided to choose the concept of creating a Community Application and called it as “Eirzone” because I have been inspired by the communities around me. I want to have a safe

and secure environment with helpful and friendly community. With these in mind, I created another diagram showing the main contents and features it will have in the future.

(My chosen idea)



On the third week I researched about the frameworks and programming languages being used in developing an application. At first I was deciding on using a Cross Platform framework because I thought it will be easy to develop an IOS and Android application at the same time. When I searched about cross-platform, the reviews were mostly negative and less than what I have expected so I made a comparison of ways to create an application between Hybrid Web, Cross-Platform Native and Native.

Based on my research, developing an application in a native platform is much easier and applicable for the beginners in mobile app developing as it uses a strong and tested language foundation like Java in Android and Swift (Objective-C) in IOS. Native platform offers more feature and available solutions online.

As a first time mobile app developer, I was convinced about creating an application in a native platform and I have a good experience with programming in Java; so in week

four, I chose Android Studio as the framework for building my project. I downloaded the Android Studio on my laptop and had a quick skim of the features and functions.

At the end of the month I was able to gain knowledge about the different ways of creating a mobile application. I was also able to develop the overall basic structure of my project and I managed to complete and submit my proposal on time.

My Reflection

I felt that creating mind maps are really helpful in building up a concept and conducting a research before making a decision is important.

I felt that I did not have enough time to think so I was not successful in designing a detailed functionality of my application.

Intended Changes

Next month I will try to start designing the system of my application in detail so that it will be easier for me to follow and implement the requirements on the developing stage.

I realised that I need to look on programming techniques about using Android Studio. I will be following tutorials online by using Plural sight, YouTube and website articles and reading related books in the library.

Supervisor Meetings

This month, no supervisor was yet assigned to us. We were tasked to finish our proposal initially so our advisor could have a look on each of our ideas and decide which supervisor is suitable for us regarding our specialties and ideas.

REFLECTIVE JOURNAL

Student name: Joanna Bautista

Programme: BSc in Computing

Month: October 2015

My Achievements

On the first week of this month, I was assigned with a supervisor. I was assigned to have Frances Sheridan as my software project supervisor. I was really grateful to have her as I've already known her since first year, in my programming subject.

During the month, I emailed the Dublin City council to request for an API key that contains the communities in Dublin. I was granted a permission to use that for the near future and implement it on the map of my application.

My contributions to the projects included research on the existing applications similar to my idea, created use case diagrams, class diagrams and GUI.

My Reflection

I felt so determined and really sure about my first application design, but when I talked to my supervisor, I realised that there are a lot to consider like implementing the crime watch application. I have decided to change that and create a structure that would apply to the other features.

Intended Changes

Next month, I will work on my class diagram and normalize the entities to create my main database design.

I realised that I need to clean up the design and features of my application; therefore I will do more research and start creating my actual applications by following tutorials.

Supervisor Meetings

Date of Meeting: 20/10/2015, 21/10/2015, 03/11/2015

Items discussed:

20/10/2015

Our first meeting happened at the boardroom in the fourth floor where ten of us gathered to introduce ourselves and show our proposals. Frances asked each of us to give a brief explanation of our individual projects. She gave us advices and some resources for our project. Frances asked each of us to go for an individual meeting with her on the next day so she could clarify and help us understand what we really want in our application project.

21/10/2015

On this day I went to meet France's at her office at 3pm. I took some notes while we talked more about my plans for the project. I was asked the main purpose of my project. When she found out that I wanted to make a community application with a feature of crime watch, she told me to find any existing application similar to my idea and compare the differences.

03/11/2015

Frances set another meeting to check each of us and see how we are doing with the specification requirements.

REFLECTIVE JOURNAL

Student name: Joanna Bautista

Programme: BSc in Computing

Month: November 2015

My Achievements

This month, I was able to submit my software requirements specifications. I also completed my first draft of the design and analysis specification document.

My contributions to the projects included the building of the core foundations of my application through the documentation and the creation of the first page or activity on my application.

My Reflection

I felt good and relieved when I finished and submitted my requirements specification, which included most of the fundamental assets of my application. Another documentation I started doing was the design and analysis specification, which I thought that it was just a repetition of the requirement specifications but I realised that I will benefit from it by creating a thorough and clean guidelines in making my application.

I need to do more research and practical work on the application. I need to learn how to properly manage my time in developing my application and to do tasks from other subjects.

Intended Changes

My goal next month is to complete more achievements. I will try to make changes and add information in my design and analysis documentation as the other diagrams are still under a development stage. I will be adding more details and explanations to the system and architecture designs which should be precise and related to the working application. I realised that I need to create a better system design with the help of testing and doing more research. I will also continue on building the basic UI and functionality of my application using Android Studio.

Supervisor Meetings

Date of Meeting: 04/12/2015

Items discussed:

In week 4, I had a quick meeting with Frances. We talked about how we're getting along with the design and analysis specification. I asked a few questions relating to the documentation and she explained to me that the current documentation can still be updated while we are working on our programming application and we must keep our documentation at a good standard.

A meeting in the first week of January 2016 has been scheduled so she could check the development of our prototypes. We are expected to start the app development as soon as we can in order to be ready and prepared for the presentation set in February.

REFLECTIVE JOURNAL

Student name: Joanna Bautista

Programme: BSc in Computing

Month: December 2015

My Achievements

This month I was able to add more specifications to the document like sequence diagram and I was also able to initiate my database design for the main application. On the technical programming side, I have created different activities on the Android Studio programming environment and based my design on my proposed GUI in the Analysis and Design Report.

My Reflection

I felt that the first three weeks of this month flew by really fast. I have not made any major developments but the positive thing is I have started my software application with the help of tutorials in YouTube, Plural Sight and the Advanced Android Application Development book resource from the library. I will need to spend more time on the development of the core functions of my application like map API integration, calendar integration, topic creations and divisions.

My first thought of the project development would be easy, but now I realised that I still have plenty to learn and I must follow the schedule I have set to meet the required standard and also to meet the submission time.

Intended Changes

Next Week I will try to improve the page directions, the system design of the application and the database design by doing more tests and research.

I have not made much difference to my previous achievements but will definitely work on managing different tasks in a designated time.

Supervisor Meetings

Date of Meeting: 04/12/2015

Items discussed:

Since I have already met up and asked the necessary questions to my supervisor on the 4th of December, I decided to continue working on my project. Our supervisor is

very approachable making it easy for us to ask her any questions regarding our software projects. She told us to start building our applications and work on the core functions. The development will be checked in our meeting, which is going to be held in January.

REFLECTIVE JOURNAL

Student name: Joanna Bautista

Programme: BSc in Computing

Month: January 2016

My Achievements

In the month of January I have managed to initiate some core functions of my project. This will be shown as a prototype for the mid point presentation. I decided to create different versions of my application to test its functionality. I created the GUI and developed the Google Map and some Newsfeed functions separately.

I have successfully integrated the Google Map API key and have the marker automatically enabled to track the current position of the user on the map.

I have filled most of the requirements in my documentation to show the time that I have spent in understanding and finding solutions for my project.

My Reflection

Starting to create and code the main project was the hardest part. I feel happy that I have started yet under pressure at the same time especially in the month of January because CA, exams, and other module's project submission happened within the same month. I tried my best to keep up to date with my documentation and journal.

I have done more research on the backend coding and realised that coding or developing an application using the Native method was more tougher and complex than using a hybrid framework development. Although android development challenges me in a way, I am still willing to pursue the project in this type development.

The Google Map integration took me a while to have it functioning. I based my code in online tutorials and learned how to layout it properly by finding and setting the latitude and longitude.

Intended Changes

I have started working on the News Feed function of my application I had issues with the connection to the server. Some library from Android Studio have deprecated such as the AsyncHttpClient. I have found an alternative library to use, which is called Volley, but I still have to try and figure out how to use it.

The GUI that I have created may still change due to usability testing. The documentation will still be updated according to the current coding functions.

The Map function still needs to be updated with the functions of showing existing services in such place and/or showing existing communities.

Supervisor Meetings

Date of Meeting: 03/02/2016

Items discussed:

We had a meeting with Frances and talked about the progress of our work, how we're getting along with the project and documentation. We also talked about the preparation for our mid-point presentation. We showed each of our slideshows and obtained tips and advices from each other. I was told to change a few of my slide like removing the GUI design, as it could resemble unfinished project.

REFLECTIVE JOURNAL

Student name: Joanna Bautista

Programme: BSc in Computing

Month: February 2016

My Achievements

My achievements for this month include the successful submission of my technical report and presentation slideshow. All the diagrams I have created since first semester were included in that report which should be constantly kept up to date.

In addition to that, I presented properly to the two judges. I showed the apparent application I have created which included map SDK and other functionalities.

My Reflection

I felt relieved after the pressure of having to submit both the report and tailoring the presentation slideshow at the same time. I also had to prepare for my presentation, which resulted to a good grade. I felt that it was really helpful to have my supervisor as one of the judges.

Intended Changes

Based on my feedback, one of the judges told me to transfer and use cloud based server provider instead of the free local server providers because of having a high risk of losing data. I have also looked on using Firebase to help me set up the environment for the backend connectivity, which also uses RESTful Web Services. For next month, I will need to test the get and post API once the connection to the cloud is completed. I will also commence testing and implementing camera SDK to the application. The Google map still needs to be updated and developed. I will have to integrate user interaction for the map to show the existing communities.

Supervisor Meetings

Date of Meeting: 19/02/2016

Items discussed: Feedback

After the Presentation our supervisor asked each of us for a meeting to discuss feedback about our presentation. Overall they were happy with my presentation. My supervisor and the other judge made some suggestion as to having a clear and concise slideshow. Frances, my supervisor also told me to level up the technicality of my application project. She gave me two days to brainstorm few more ideas and

we met again the following week. I told her about the usage of camera sdk to capture potential security hazards or crime happening in an area which would send automatically to added friends or family. There would also be an emergency call button that will contact nearby services like Fire Brigade, Hospital, Garda, Family members and friends. I would also put more functionality to the map sdk which will let users view statistics of communities available and which will get users current location in case of emergency.

At the end of the month, we worked on creating drafts for our short profile. I sent an email to my supervisor to have my profile reviewed. Frances made some suggestions that I gladly incorporated to my profile.

REFLECTIVE JOURNAL

Student name: Joanna Bautista

Programme: BSc in Computing

Month: March 2016

My Achievements

In the month of March, I was able to implement camera API and can take a photo and upload a photo. I also improved the development of my Map feature.

My Reflection

It is very challenging to race with the specific time given and the decision to move from local to Firebase did require having some time in learning its functionality, leaving me to decide that I should really just focus on developing what I currently developed my application with; which was MySQL and PHP.

Intended Changes

Next month I will be implementing an SMS feature that will let users collect their location and send this as an SMS to a family member's number. I hope to improve my user interface also to decide which type of menu I will be using. I also hope to do tests on the overall application and conduct a local neighbourhood survey when everything is completed.

Supervisor Meetings

Date of Meeting: N/A

Items discussed:

No meeting happened after February since we were all occupied with exam revisions and individual projects.