

Requirements Specification

Wildfire Location & Information App

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Abstract

The purpose of the Wildfire project is to develop a mobile application for the General public and professional firefighters. This application should help people who fight fires as well as protect people who don't. The application should be used as a tool to report fires, search for fires and notify people of nearby fires. It also should be able to provide the general public and the firefighters with useful information about fires and how to keep safe around them.

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1. Project Description

Wildfire is an application that is aimed at stopping the spread of wildland or bushfires. This application is designed to make it quick and easy to report a fire, with the use of maps and GPS. This application also offers information to the end user which is aimed at helping and preparing them against the threat of wildland or bush fires. This application is unique in the aspect in which you can report a fire at any time easily and free, which other market solutions do not offer.

This application will give the user peace of mind using the personalisable notification set-up. This feature will allow users both professional and general the ability to be notified if a fire has been reported within a customisable radius to their location. This feature may not only save homes but save lives, as it could give the individual or family time to evacuate. This application will be available on Android making it available to 71% of the market according to stats counter [1].

2. Users

2.1 - General public

The General public users of this application are classed as normal people, Normal people with an interest in keeping safe and keeping their home safe. Most members of the general public are very aware of the threat of wildland fires and what they can do if left untreated. This application will help provide as much information as possible to the general public and aims to prepare and guide people to be ready if a wildfire arises.

The general public users of this application will not have to create an account. The reasoning behind this decision is speed. If a user wishes to report a fire, and they have not yet made an account, it is important that they will be able to report the fire as quickly as possible. The problem then may arise that a malicious user may try to report fake fires, the solution to this problem will be documented further on in the report documentation.

The main features of this application that will benefit the general public users is the notifications feature, report fires and the information centre. These three features combined should more than prepare the members of the general public against the threat of wildland fires. The information centre will be a key feature for the general public users, most users will not have the knowledge of a professional firefighter so all the knowledge they can gain at quick notice will be very valuable.

2.2 - Professional Firefighters.

The professional users of this application are somewhat the most important users. Professional firefighters are the personnel that have the most valuable insight into fighting and protecting people from wildland fires. These people have gone through tough training in order to be in this position and should be respected in that aspect. This application will help the professional firefighters in many different ways. It will allow the professional firefighters to

get an in depth insight provided by the user that reports the fire and also give the firefighters an advantage with the precise location.

The Professional firefighters will have the option to make an account that will allow them to report fire and also allow them to resolve fires. When a professional user wishes to create an account they will have to verify that they are in fact a registered professional firefighter.

The main features of this application that will benefit the Professional firefighters is the Report Fire & Resolve Fire features, the Information centre and location feature. Same as for the general public users, the report fire button is a key feature that helps notify people that there is a fire so users can be aware, but also the resolve fire feature which is exclusively available to professional firefighters, this feature allows firefighters to safely say that the fire has been dealt with. The information centre will be home to some useful tools and guides that are made to help the professional firefighters, in this section there will be an exclusive feature for professional users which allows them to view a list of current and resolved fires. Lastly, the location feature is important as it will give the professional firefighter the ability to get the exact location in which the fire is and provide information on wind direction etc.

3. Use Cases

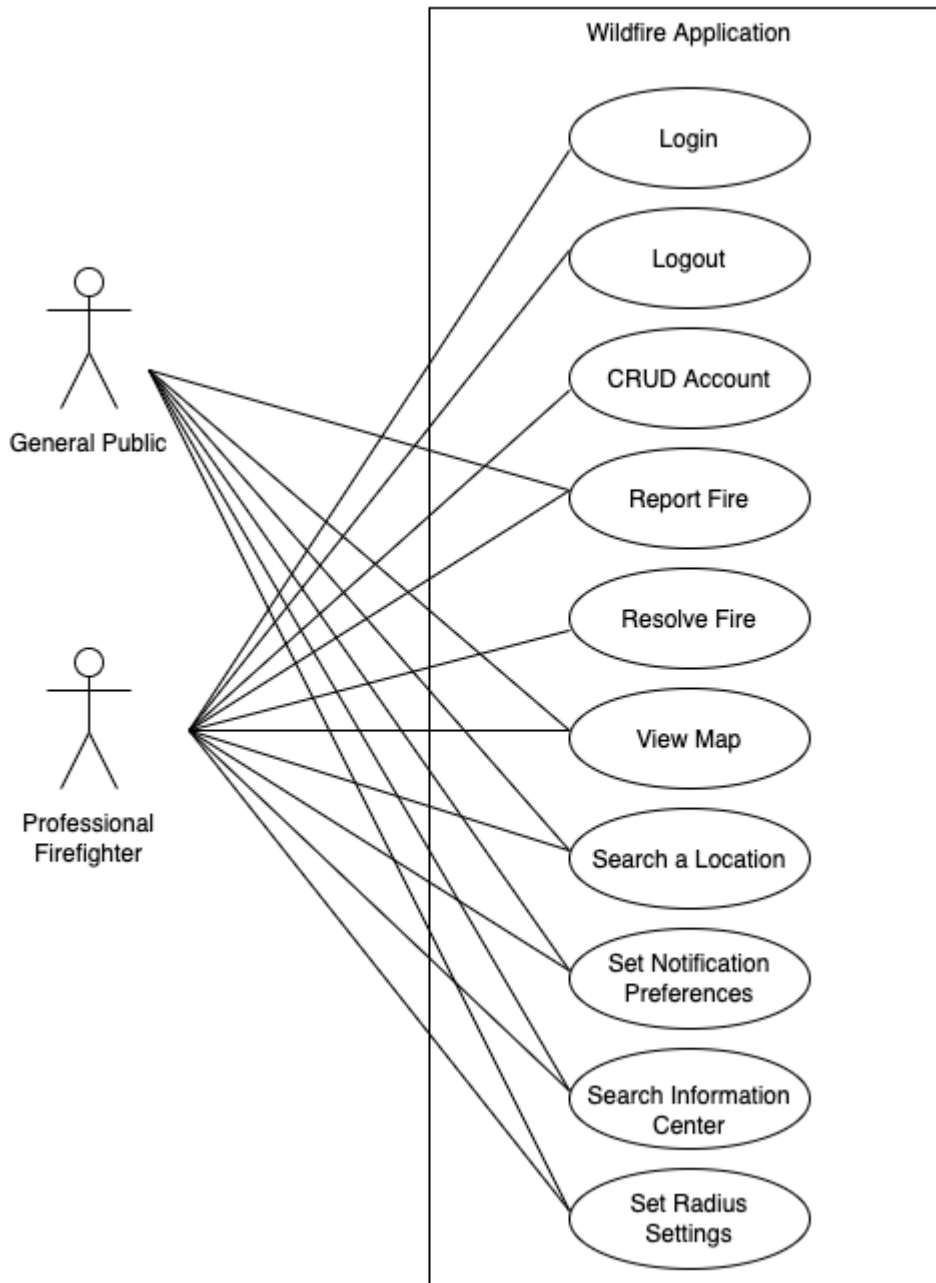


Figure 1 - Main wildfire application use case.

4. Brief Use Cases

4.1 - Wildfire Application

4.1.1 - Login

Use Case Name: Login

Actor(s): Professional Firefighter.

Description: This use case begins when a Professional firefighter launches the application. The actor will then enter their email and password. If the login credentials are correct and they will go to the View Map page. Otherwise the General public user will select the continue without account option.

4.1.2 - Logout

Use Case Name: Logout

Actor(s): Professional Firefighter.

Description: This use case begins when a professional firefighter wishes to log out of the application. The professional firefighter will select the logout option and then be redirected to the first view page.

4.1.3 - CRUD Account

Use Case Name: CRUD Account

Actor(s): Professional Firefighter

Description: This use case begins when a Professional firefighter wishes to create, read, update or delete their account. If the actor wishes to do this, there will be an edit account option in the settings page of the application. When an actor wishes to create an account the actor must provide verification to verify that the actor is a registered firefighter.

4.1.4 - Report Fire

Use Case Name: Report Fire

Actor(s): General Public, Professional Firefighter

Description: This use case begins when a General public or Professional firefighter wishes to report a fire. When the actors wish to do this they must be on the View Map page. When the actors want to report the fire they may first get their location using a feature on the View Map page. Once the actor has their location they can then begin to press on the map and place a marker or select the option page to place a pin on their current location. Once the marker is placed, the actor will then begin to add useful information to the fire in which they have reported. The actor will have the option to add the wind direction, a photo and a description. Information such as the coordinates, location and time are automatically mapped. Once the actor has added all of the information that they wish to add, the actor will select Report fire. Once the actor has selected that option they will be redirected to the View Map screen. The map will be updated to show the newly reported fire.

4.1.5 - Resolve Fire

Use Case Name: Resolve Fire

Actor(s): Professional Firefighter

Description: This use case begins when a Professional firefighter wishes to resolve a fire. When the actor wishes to resolve a fire in which they have resolved they must select the fire on the view map screen and this will redirect the actor to a resolve fire info page. This will prompt the actor with a screen which will ask them a series of questions asking them about the fire to gain a greater understanding about the fire. Once the actor fills in the information, the actor will select "Resolve". Once the users selects the resolve option they will be redirected to the back to the View Map screen where they can verify if the fire has been resolved or not. Once the fire has been resolved the fire will be added to the resolved fires list.

4.1.6 - View Map

Use Case Name: View Map

Actor(s): General Public, Professional Firefighter

Description: This use case begins when a General Public or Professional firefighter enters the application after login. The view map feature is the map that the actors will use to report and resolve wildland fires. This functionality will bring the actors to their GPS location on the map, from here the actors can view fires around them. The actors will also

be able to view the fire detail on the map, this will allow the actors to gain a greater understanding of the fire.

4.1.7 - Search a location

Use Cases Name: Search a location

Actor(s): General Public, Professional Firefighter

Description: This use case begins when a General public or Professional firefighter wishes to search a location. The actor will navigate to the view map page and then use the magnifying glass icon to search a location. This feature will be integrated with the map as they go hand in hand. This feature will allow the actors to quickly search a location and see if there are any fires in the area.

4.1.8 - Set Notification Preferences

Use Case Name: Set Notification Preferences

Actor(s): General Public, Professional Firefighter

Description: This use case begins when a General public or Professional firefighter wishes to set their notification preferences. This feature will allow the actors to set notifications preferences to On or Off. This feature will work hand in hand with another use case which is the set radius setting, if an actor sets notifications to be on and does not set their radius a default of five kilometers will be used as a fire radius. If a fire appears within this radius a notification will be sent to the users device.

4.1.9 - Search Information Centre

Use Case Name: Search Information Centre.

Actor(s): General Public, Professional Firefighter

Description: This use case begins when a General public or professional firefighter wishes to search for information. The information centre holds some very important information. The user will select one of the four options, they are Home, Wildland, Local Information and Firefighter(exclusively firefighters). Each individual section will feature information to keep the user safe from wildfire events or any fire event.

4.1.10 - Set Radius Settings

Use Case Name:	Set Radius Settings
Actor(s):	General Public, Professional Firefighter
Description:	This use case begins when a General public or professional firefighter wishes to set their radius settings. The actor will have the option to set a radius in kilometers around their current location. This feature works hand in hand with the set notification preferences feature as if a fire appears or is reported within that radius the user will receive a notification.

5. Detailed Use Cases

5.1 - Wildfire Application

5.1.1 - View Map

Use Case Name:	View Map.
Actor(s):	General Public, Professional Firefighter
Main success scenario:	<p>This use case begins when general public or professional Firefighter wishes to view the map.</p> <ol style="list-style-type: none">1. The actor selects the View Map option2. Actors have the ability to zoom in & out of the map.3. Actors have the ability to search the map.4. The Actor may select the search option.5. The system will then display the search function and screen.6. The Actor may then search for their desired location.7. The Actors have the ability to view the detail of a fire.8. The Actor must select a fire which they wish to view.9. The system will then display detail about the fire.
Alternative(s):	<ol style="list-style-type: none">2a. The Actor wants to Report a Fire and selects "Report a Fire".

2b. Professional Firefighter wants to Resolve a Fire by Selecting a Fire on the map.

2c. The Actor user needs to get their current location and selects the current location option.

5.1.2 - Report Fire

Use Case Name: Report Fire.

Actor(s): General Public, Professional Firefighter

Main success scenario: This use case begins when general public or professional firefighter wishes Report a fire.

- 1.** The actor selects the fire location on the map.
- 2.** Marker added by system.
- 3.** Actor adds additional information about fire on the Report Screen, photos, wind direction and a description.
- 4.** The Actor finishes by selecting Report Fire and is redirected to View Map screen.

Alternative(s):

- 1a.** The actor selects the current location option and gets the exact location.
- 3a.** The Actor selects cancel while entering information and it redirected to the View maps screen and the Marker is removed.
- 4a.** The actor selects the cancel and is directed back to the Map and the marker is removed.

5.1.3 - Resolve Fire

Use Case Name: Resolve Fire.

Actor(s): Professional Firefighter

Main success scenario: This use case begins when a professional firefighter wishes to Resolve a fire.

- 1.** The actor selects on the fire they wish to resolve and is directed to the resolve fire resolve screen.

2. The actor then enters information about the fire that they wish to resolve.
3. The Actor selects Resolve fire and is directed to the view map screen and the marker is removed. The resolved fire is then added to a resolved fire list.

Alternative(s):

- 1a. The actor selects cancel before enter information and is redirected to the view map screen.
- 3a. The actor selects cancel and is redirected to view map screen.

5.1.4 - Login

Use Case Name: Login**Actor(s):** Professional Firefighter**Main success scenario:** This use case begins when a professional firefighter wishes to Login.

1. The Actor opens the Application.
2. The Actor is prompted with the opening page of the Application and then selects the "Login" option.
3. The actor is then redirected to the Login screen.
4. The actor then enters their Email and Password and Selects the "Login" option.
5. The actor is then directed to the View Map screen.

Alternative(s):

- 2a. The actor selects the continue without account option and is redirected to the view map screen.
- 2b. The Actor selects the create account button and is redirected to the sign up view screen.
- 4a. The actor enters the incorrect email or Password and is prompted that Email and Password is incorrect.
- 4b. The Actor selects "Forgot Password?" and is redirected to the forgot password view.
- 4c. The Actor selected the back option and is redirected to the first view screen.

5.1.5 - Logout

Use Case Name:	Logout
Actor(s):	Professional Firefighter
Main success scenario:	<p>This use case begins when a professional firefighter wishes to Logout.</p> <ol style="list-style-type: none">1. The Actor is already logged into the application.2. The Actor navigates to the “Settings” page and selects the logout option.3. The actor is redirected to the Opening screen.

5.1.6 - CRUD Account

Use Case Name:	CRUD Account
Actor(s):	Professional Firefighter
Main success scenario:	<p>This use case begins when a professional firefighter wishes to CRUD Account.(Create Read Update Delete).</p> <ol style="list-style-type: none">1. The Actor opens the Application.2. The Actor is prompted with the opening page of the Application and then selects the “Create Account” option.3. The actor is then redirected to the Create Account Screen.4. The actor enters their “Email” & “Password” and then must verify the account. The actor must select the confirm option.5. The actor then selects the Create Account option and is redirected to the View Map Screen.

5.1.7 - Search Information Centre

Use Case Name:	Search Information Centre
Actor(s):	General Public, Professional Firefighter

- Main success scenario:** This use case begins when a General public or professional Firefighter wishes to search the information centre.
1. The Actor opens the Application.
 2. The Actor selects the info centre option.
 3. The Actor as the option to select the Home, Wildland, Local Information or firefighter options.
 4. Actor selects the Home option and Navigates through the information.
- Alternative(s):**
- 4a. Actor selects the Wildland option and Navigates through the information.
 - 4b. Actor selects the Local Information option and Navigates through the information.
 - 4c. Actor selects the Firefighter option and Navigates through the information.

6. FURPS+

6.1 - Functionality

The functionality section refers to the main features of the application and these can be broken down in two further categories, main functionality and secondary functionalities.

6.1.1 - Main Functionality

The main functionalities of this project include View Map, Report Fire and Resolve Fire. These three functionalities make up the main features of the application and are somewhat the most important.

- **View Map** - Allows the general public or professional firefighters to view the map, get GPS location, as well as the interface to Report and Resolve a fire. This functionality also allows the users to view fire details of certain fires.
- **Report Fire** - Allows the general public or professional firefighters to Report a fire. This functionality allows the users to place a marker/pin on the map and also add additional useful information. In this section it is also important to take the malicious users into consideration. The functionality I wish to implement involves, if a user reports 3 or more fake fires their device ID will be stored on a block list. This means when a malicious user attempts to create another fake fire the device ID will be checked and the user will not be able to report any more fake fires.

- **Resolve Fire** - Allows the professional firefighters to Resolve a fire. This feature is restricted to professional firefighters and allows the professional firefighters to mark a fire as resolved if it has been dealt with appropriately. Once the fire is resolved it is added to a resolved list and can be viewed by other firefighters on the information screen exclusively for the firefighters.

6.1.2 - Secondary Functionality

The secondary functionalities focus more on the information and notification side of the project. These features, although considered secondary, are also very important to the overall application and also to the functionality of the application. These features include search information centre and set notification preferences.

- **Search Information Centre** - Allows the general public and professional firefighters to search different information which is aimed at helping and preparing people to keep safe from wildland or bush fires.
- **Set Notification Preferences** - allows the general public and professional firefighters to set notification based on a radius and if a fire appears within the radius a notification will be pushed through to the user's phone notifying them of the possible threat. This feature is a user preference.
- **Set Radius Settings** - allows the general public and professional firefighters to set a radius around their current location. This allows for notifications to be sent to the devices if fires appear within the radius, this functionality works hand in hand with Set notification preferences functionality.

6.2 - Usability

The usability refers to the UX or user experience of the application and the times in which certain tasks should be completed. In the instance of this application the main functionalities as well as some other functionalities should be able to be completed to a very quick and high repeatable standard.

- **Login** - Logging into the application should not take more than 4 Seconds 90% of the time.
- **Report Fire** - Reporting a fire in the application should not take more than 15 Seconds 90% of the time.
- **Resolve Fire** - Resolving a fire in the application should not take more than 10 Seconds 90% of the time.
- **Search a location** - Searching a location should not take more than 15 Seconds 90% of the time.

The initial learning of this application should not take more than 1 minute 90% of the time this will ensure users do not exit the application for usability reasons. The tabbed interface should switch within 1 second of selecting it 99% of the time, this will ensure that users do not lose patience with the application.

6.3 - Reliability

The reliability of this application is key. The main features of this application need to be reliable as it could be the deciding factor if a wildland or bush fire is reported in adequate time. This application needs to be ready for when users need it there for this application should be available and ready 99% of the time.

The application is using a Firebase back-end service. Firebase is considered a reliable database [4] and back-end service for companies such as Twitch and inVision. Considering the fact that these high level companies chose Firebase, Firebase should be reliable for this application's needs.

6.4 - Performance

The performance of this application must be quick and consistent. The use of the Google Maps API is key and it is important that connection to this API is constant and uninterrupted. In the event of disconnection from the Google Maps API the application will not be updated and the data will be inaccurate.

The response time of the application is also very important. This application should have an average response time of 0.99 seconds [3]. By achieving this the performance of the application will be on par with most applications and will also help achieve higher user satisfaction.

6.6 - Supportability

The Supportability aspect of this application is important as this application will be cross platform, therefore the platform will be available on Android . Another aspect of supportability that is important is keeping the code to a set of standards. It is very important to make the code readable and to keep the code commented appropriately as this would help tremendously if another developer was to work on this code in the future.

This application will be able to be expanded and customized in the future and this will be achieved by making the code reusable and easy to understand. Some examples of this may be the naming conventions of the functions and variables.

6.7 - "+"

The '+' section supports the additional non-functional requirements that are not covered in the FURPS acronym. In the case of this project the most important additional requirement is Security. Security is a very important part of any application. In particular in this application it is important that the passwords which are part of the making of accounts are encrypted when stored in the appropriate manner. This is a very important feature as some users may use passwords which unlock other accounts and applications.

Another reason why security is important is protecting the system against malicious users. These users have one goal and will do anything to achieve it and it is very important that this system is ready to withstand the attacks.

7. Basic Main Wireframes

These basic wire frames are for the main features of the application. These will give the readers a basic understanding of the application's flow and the main features. These wire frames are very basic and not the final design.

7.1 - View Map

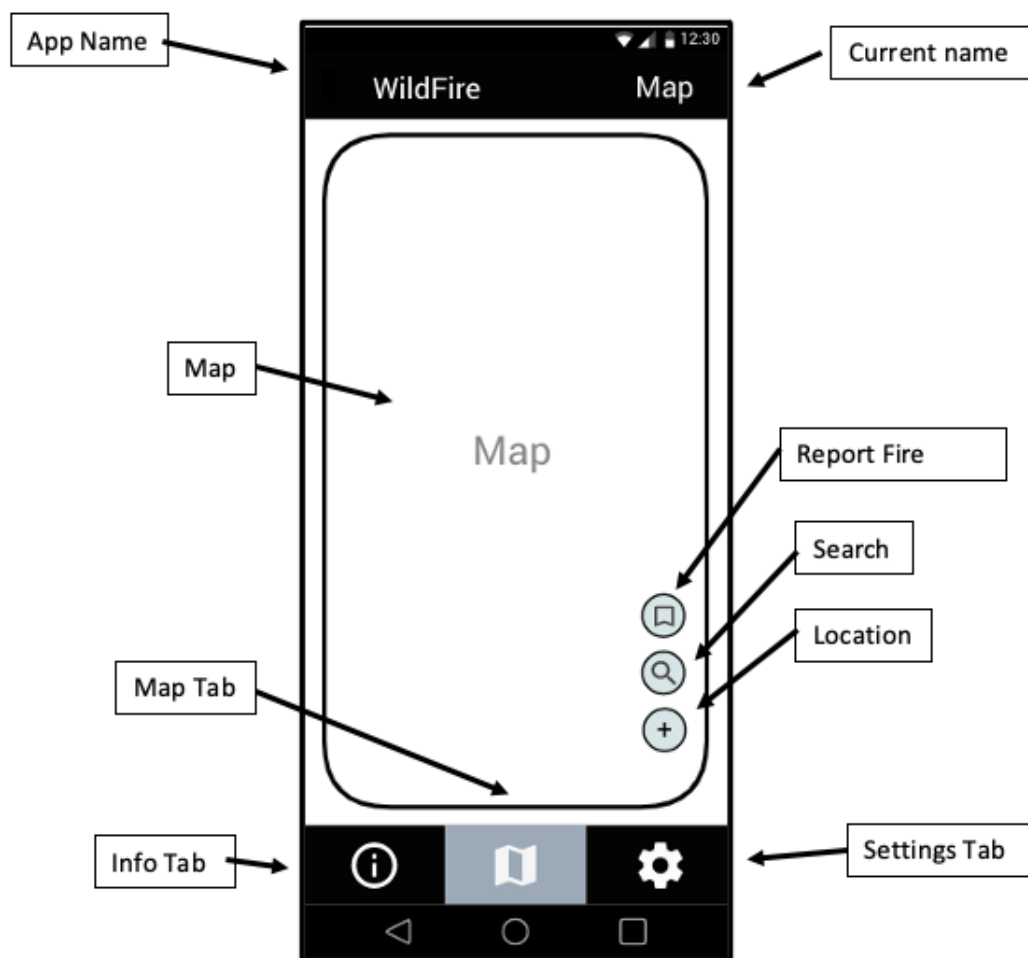


Figure 2 - View Map Screen.

7.2 - Report Fire - Report Screen

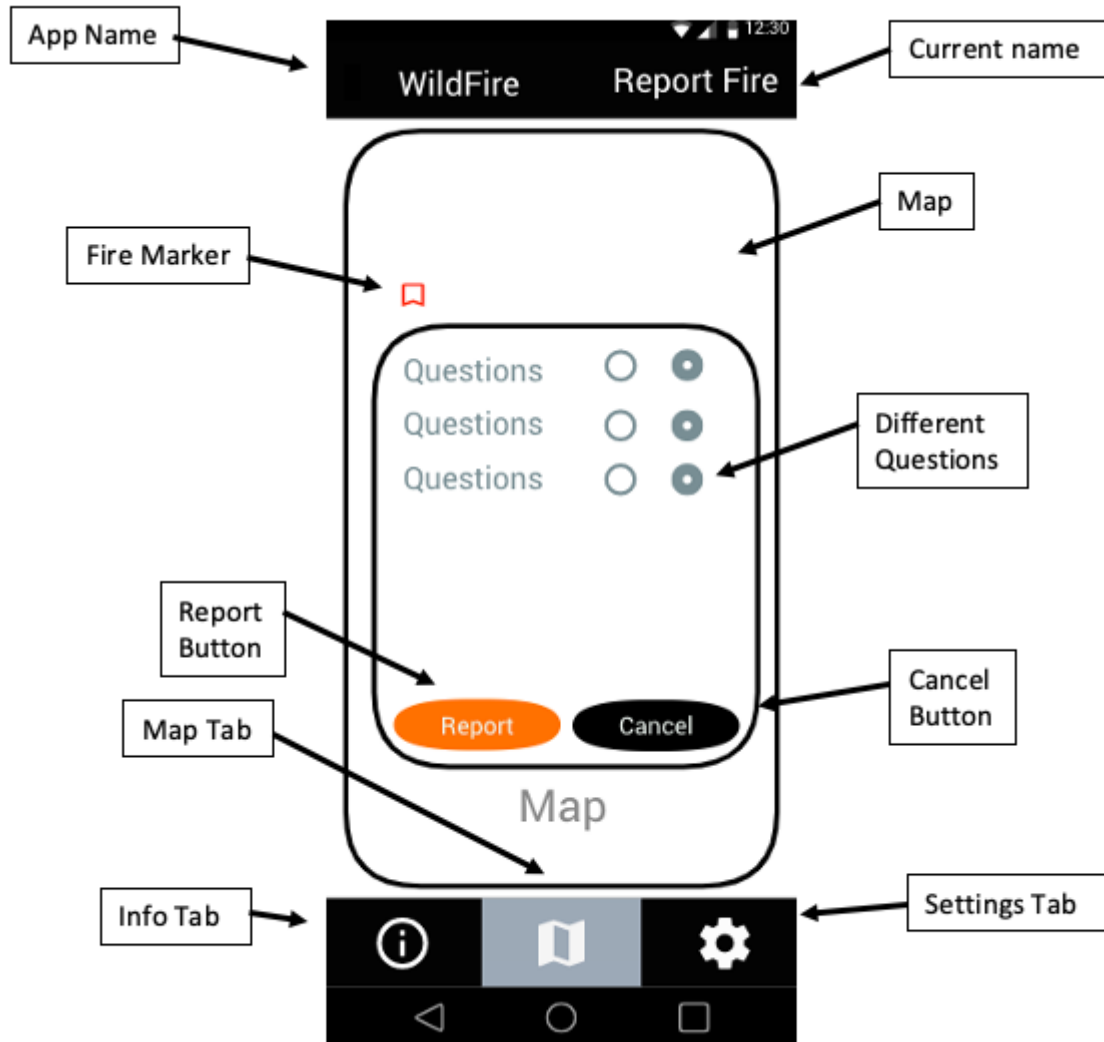


Figure 3 - Report Fire - Report Screen.

7.3 - Resolve Fire - Resolve Screen

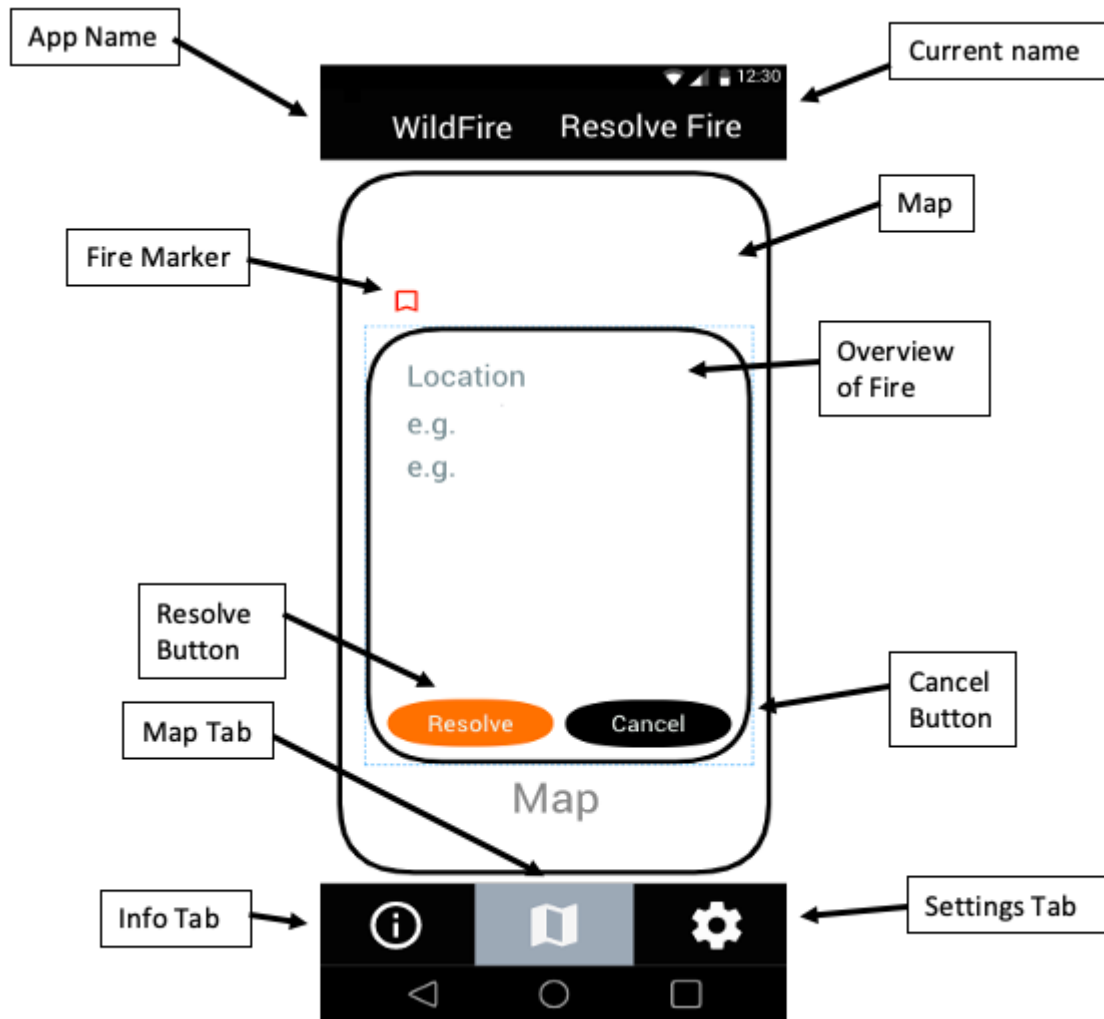


Figure 4 - Resolve Fire - Resolve Screen.

7.4 - Settings Page

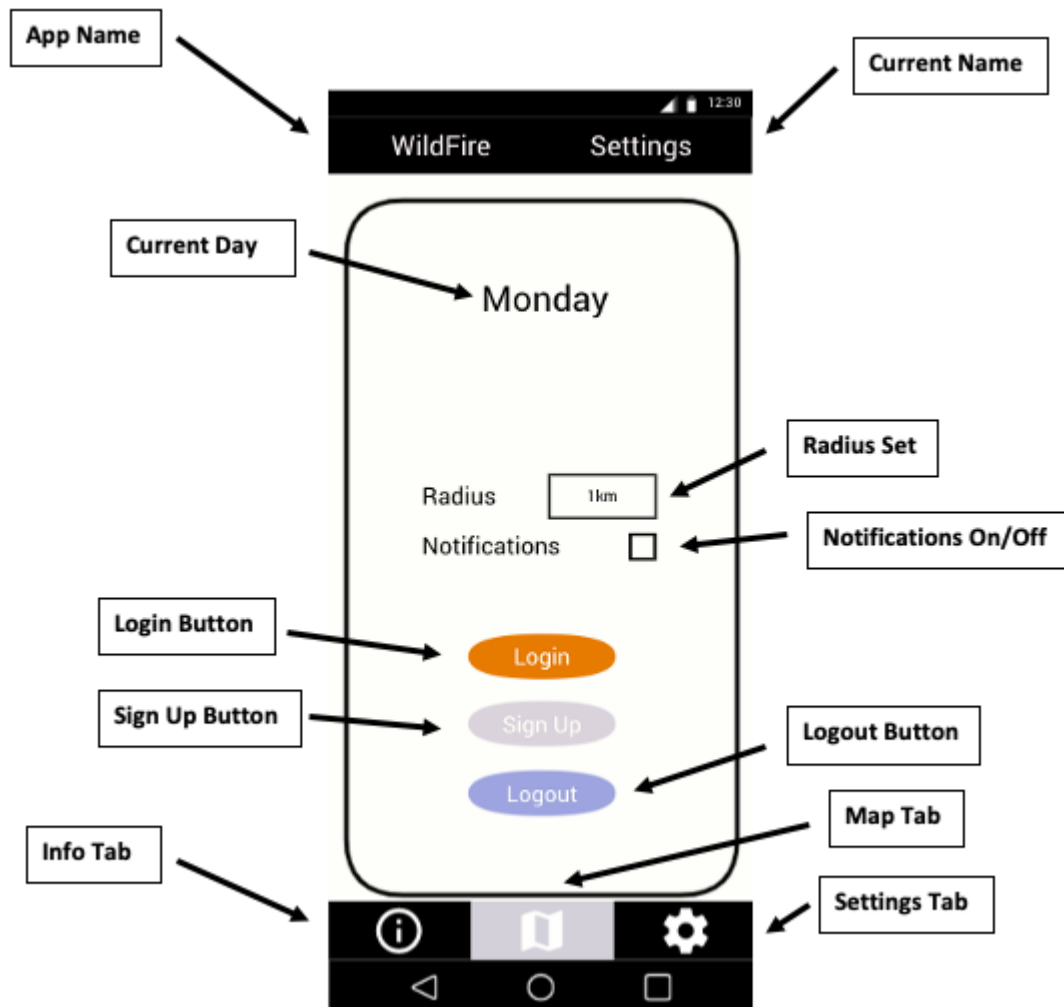


Figure 5 - Settings Page.

7.5 - Information Centre Page



Figure 6 - Information Centre Page.

8. Declaration

- I declare that all material in this submission, e.g. thesis/essay/project/assignment, is entirely my own work except where duly acknowledged.
- I have cited the sources of all quotations, paraphrases, summaries of information, tables, diagrams, or other material; including software and other electronic media in which intellectual property rights may reside.
- I have provided a complete bibliography of all works and sources used in the preparation of this submission.
- I understand that failure to comply with the Institute's regulations governing plagiarism constitutes a serious offense.

Student Name : Jack McNally

Student Number : C00228768

Student Signature :



Date: 30 | 04 | 21

9. References

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