Council Alert

Technical Architecture Document

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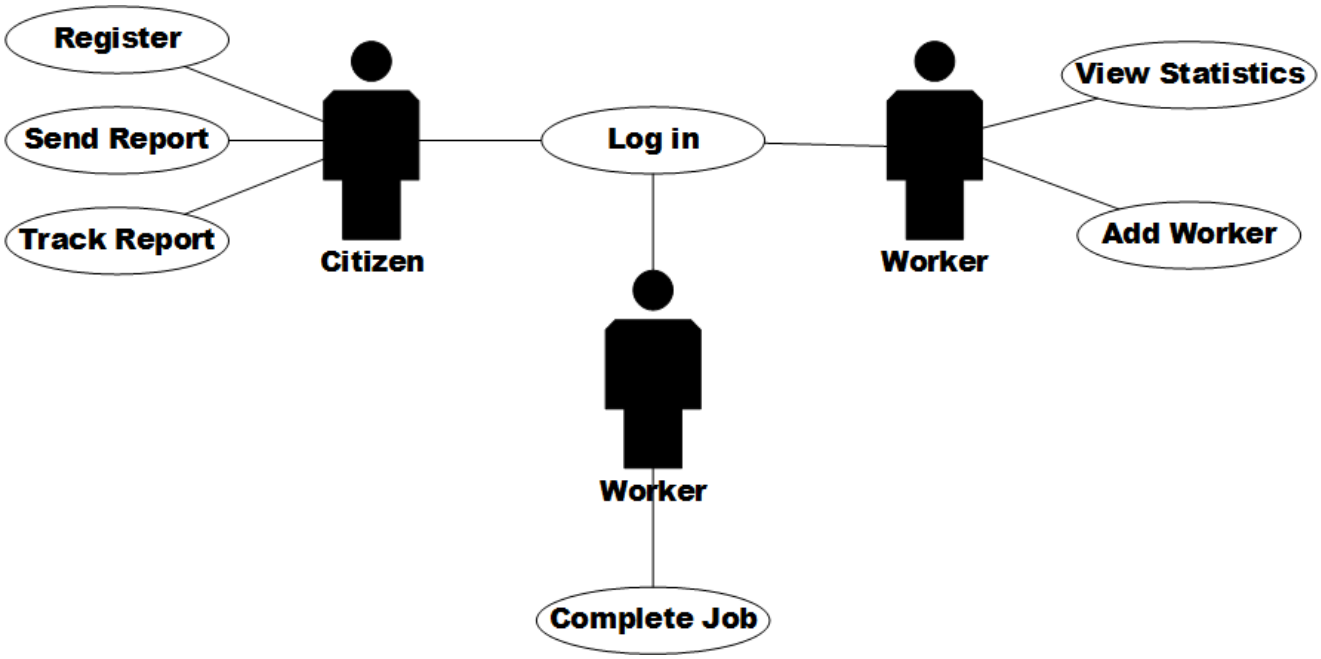
Use Case Diagram



Use Cases

Register

Title	Register
Primary Actor	Citizen
Scope	Mobile Application
Level	User Goal
Story	**Successful Scenario:** 1. Citizen clicks register button. 2. Citizen enters in personal information. 3. Citizen information gets validated. 4. Citizen becomes successfully registered. **Alternative Scenario:** 3. (a) Error message is displayed if invalid details are entered. (b) Error message is displayed if citizen is already registered.

Send Report

Title	Send Report
Primary Actor	Citizen
Scope	Mobile Application
Level	User Goal
Story	**Successful Scenario:** 1. Citizen selects report option. 2. Citizen selects category of report. 3. Citizen selects specific report type. 4. Application acquires citizen geolocation. 5. Report is sent successfully. **Alternative Scenario:** 4. No connection error message is displayed

Track Report

Title	Track Report
Primary Actor	Citizen
Scope	Mobile Application
Level	User Goal
Story	**Prerequisite:** Register Login **Successful Scenario:** 1. Citizen chooses view report option. 2. Application displays list of reports w/ progress updates.

Complete Job

Title	Complete Job
Primary Actor	Worker
Scope	Mobile Application
Level	Summary
Story	**Prerequisite:** Worker receives job notification. Login **Successful Scenario:** 1. Worker inputs job comments. 2. Worker selects complete job option. 3. Application displays prompt. 4. Worker confirms option. 5. Report completion is successful **Alternative Scenario:** 5. No connection error message is displayed

Add Worker

Title	Add Worker
Primary Actor	Admin
Scope	Web Application
Level	User Goal
Story	**Successful Scenario:** 1. Admin selects add worker option. 2. Admin enters in worker information. 3. Information gets validated. 4. Worker becomes successfully registered. **Alternative Scenario:** 4. (a) Error message is displayed if invalid details are entered. (b) Error message is displayed if worker is already registered.

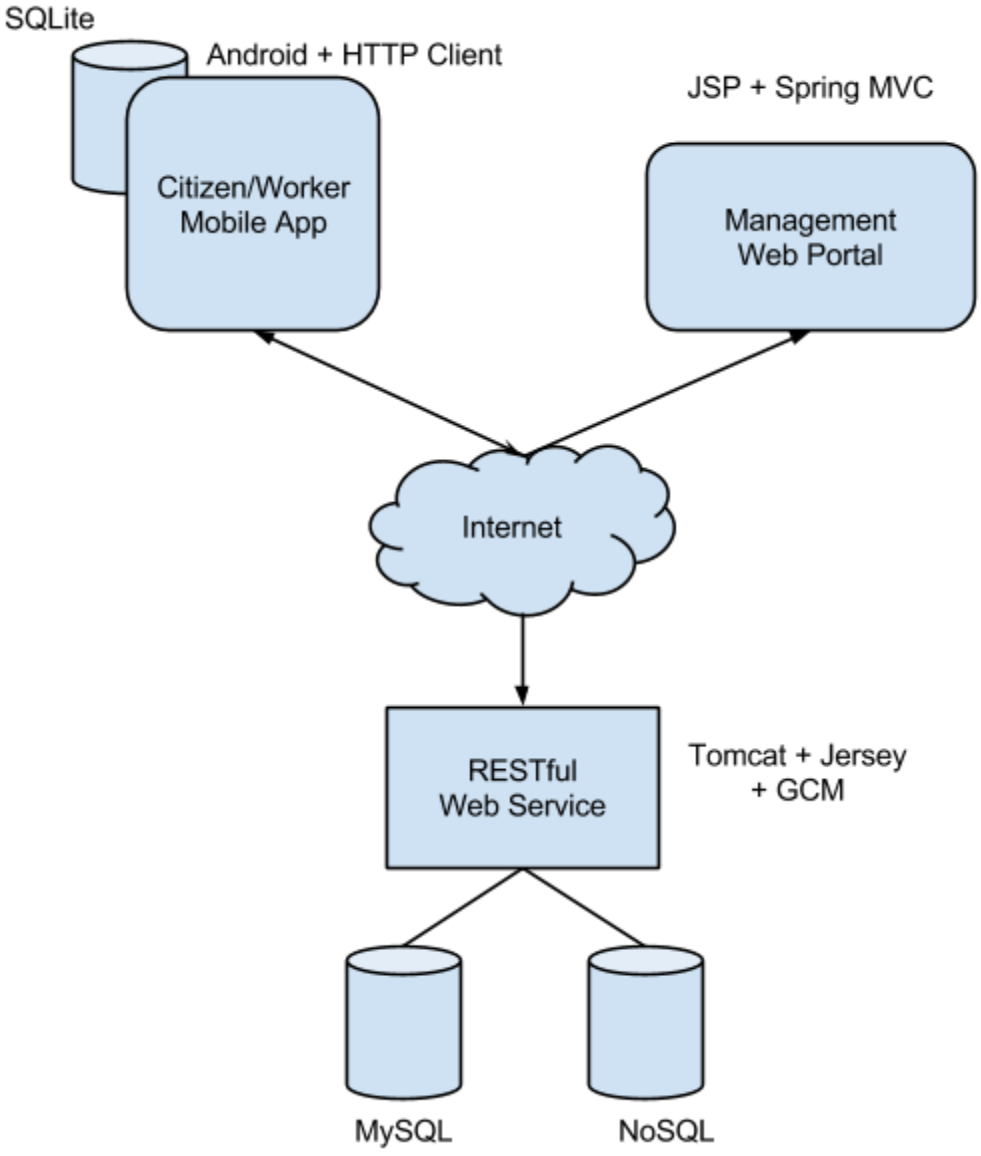
View Statistics

Title	View Statistics
Primary Actor	Admin
Scope	Web Application
Level	Summary
Story	**Prerequisite:** Admin logs in to web portal **Successful Scenario:** 1. Admin selects view reports option. 2. System displays graphical visualisations and other report information.

Log in

Title	Log in
Primary Actor	Admin/Worker/Citizen
Scope	Mobile & Web Application
Level	User Goal
Story	**Prerequisite:** User is registered **Successful Scenario:** User selects login option. User enters in username and password. Login is verified. User is granted access to system. **Alternative Scenario:** Error message is displayed if invalid credentials are entered.

Technical Architecture



Distribution and Deployment

The applications are going to be connected with a RESTful service for communication with the database. Sessions will be implemented to reduce the necessity for constant user logging in. Authentication will be set in placed using APIs such as OAuth tokens and Spring Security.

Technical Components

Android Mobile Application

Native Android development is developed using the Android SDK which is a feature rich set of libraries dedicated to providing developers with optimized design and development for mobile performance and user interface. This will make design and development simplified whilst improving the user experience quality.

GSON

As JSON is the chosen method of information transfer, GSON will provide easily translation between POJO to JSON objects and vice versa.

Apache HTTP Client/Volley

Apache HTTP Client is a popular RESTful client library used for Android development to easily communicate with an external RESTful service. Volley is an Android library used to provide asynchronous RESTful communication.

Google Play Services

Google play services is a library shipped with the Android SDK but is not automatically included in a default Android application. This library will provide the application with means of obtaining geolocation.

Google Maps API

Google Maps API will provide the application ability to incorporate Google maps.

Google Directions API

Google Directions API will provide the application ability to provide users with directions to a specific locations

SQLite

SQLite will be used as a caching mechanism for the mobile devices to reduce the necessity for constant client server communication.

TestNG

The Java code will be tested using TestNG. This is a test framework that provides all of the functionality of JUnit and extra features. It incorporates xml for a configuration separation.

HTTP Server - Tomcat

Tomcat is a lightweight open source pure Java HTTP server. This will be used to host a RESTful service for the multiple applications.

GCM

Google Cloud Message will be used to send notification to the mobile devices.

Jersey

Jersey is a Java library that allows for easy creation of a RESTful web service. Jersey will be used to create the RESTful service as it integrates with Tomcat easily.

MySQL

MySQL will be used to store simple objects such as Workers and Employees. This will be a simple database with few reads/writes.

NoSQL (MongoDB/Cassandra)

This database will be used to store the reports. This database will deal with a lot more read/writes from external applications and also used to produce mass result sets for data visualization.

Web App - JSP:

JSP is a powerful web technology that will allow for easy separation of web application components through the use of JavaBeans.

Spring MVC

Spring MVC is a web framework that applies the MVC design pattern to JSP. This will simplify the design and implementation of the web application.

D3/DyGraph

These javascript libraries will be used to create a user friendly visualization of data sets.

Bootstrap

Bootstrap is a web design framework that will be used to produce a high quality user experience.

Sass

SASS is a CSS library that implements the use of variables. This will be used to develop clean and clear code.

Google Maps API

Google Maps API will be used to provide visualizations using maps.

Selenium

Selenium will be used to extensively test the web application.

Risk Assessment

Problem Areas and Pitfalls

Users may need to be restricted to a certain number of reports submitted in a given period of time.

Authentication restrictions

Ideally the application should not require user registration or login as it restricts the application usability. There may still be an option for registration/login for users wishing to track their reports.

Number of councils

Initially this app will be prototyped aimed towards providing functionality for one unified council. If time allows, a breakdown of reports into specific council areas will be provided.

System Scope

As this project aims to produce a multiple platform system, it is important that each system is functionally developed on time and to a high standard in relation to user experience.

Novelty

As FixMyStreet is a popular mobile and web application, it is important that the project aims to provide a novel attribute and to improve on any existing implemented systems.

Time Constraints

As this project incorporate a lot of technical components and features, time constraints may make it difficult to implement the project according to plan. This will be solved using project management skills and also the ordering and prioritizing of use cases to ensure that core system functionality is implemented.