Emergency Info Hub

Functional Specification

Osama Abou Hajar - C00220135.
4th Year Software Eng.

Supervisor Paul Barry

INSTITUTE of TECHNOLOGY CARLOW
Institiúid Teicneolaíochta Cheatharlach

Abstract

Emergency Info Hub (EIH), Is a central website that helps the emergency services to prepare for, respond to & recover from disaster, by providing all needed data for the targeted building (E.g. Number of people, area size and emergency exits).

The main objective of this project is giving the number of trapped people under rubbles or inside a building, by tracking their number using a simple movement sensor fitted on the main gate and face detection technology and save this number to the cloud to be used when a disaster happens

Table of Contents

Table of Figures

1. What is Product Description:

The simplest and direct idea of this project as it is shown in **figure 1** below, is counting the number of people inside buildings and store the number on the cloud since the disaster happened the emergency services can reach this number by an Eircode request to the database to return the number stored.

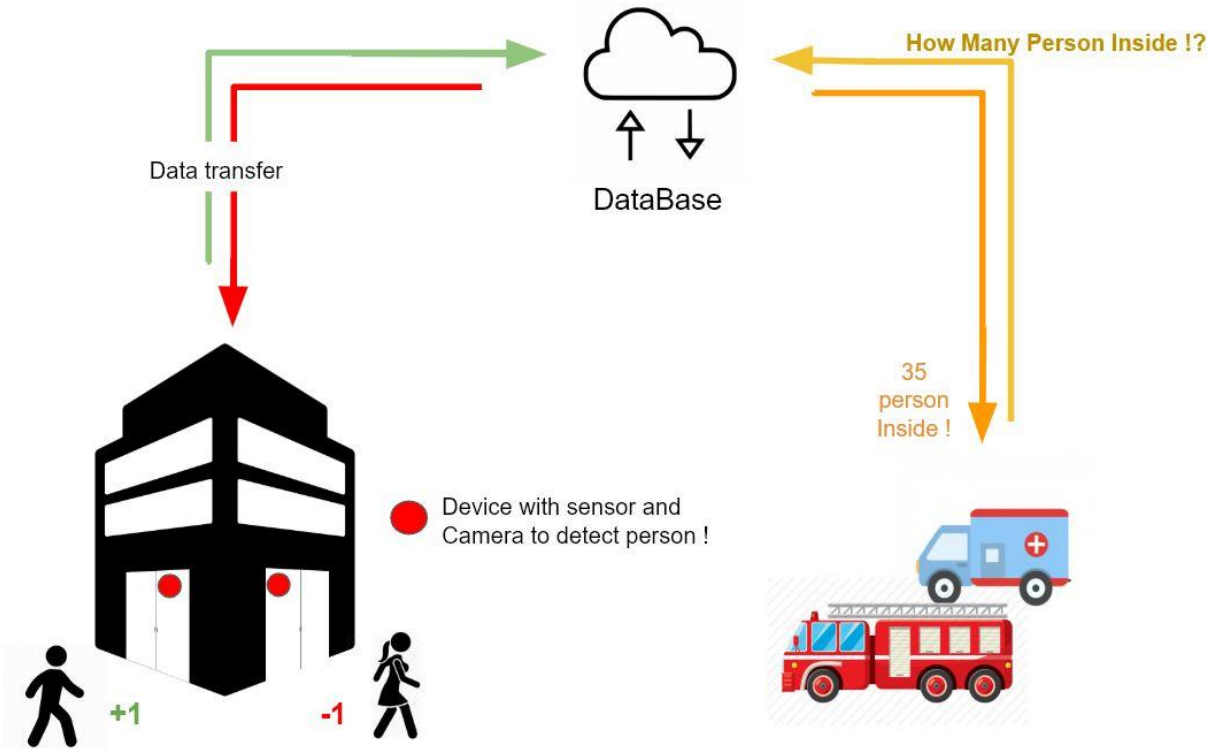

Figure 1 Overview diagram to show the system work

1.1. Hardware.

The Camera and the Motion sensor with the processing board will represent the hardware part of the project. Where it's responsible mainly for taking a photo for any object approaching the building and process the photo to detect if this object was a human or not, using the software installed and programmed to this hardware.

1.2. Software

After the hardware takes the photo, the software installed on this hardware alongside with all the designed systems, APIs and databases will be responsible to process the photo and update the people number on the cloud depending on if the person entering or leaving the building.

1.3. Back-End

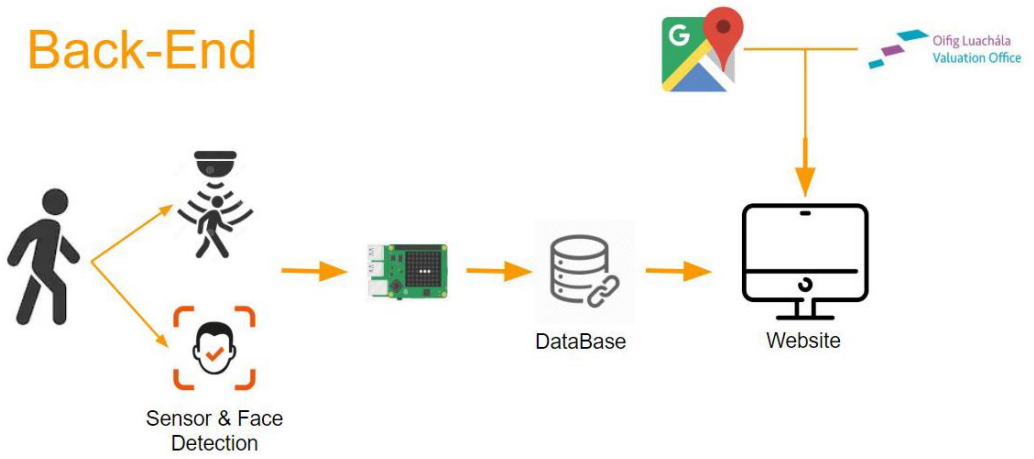

Figure 2 How it works - Front End

The above picture describes briefly what is the project Back-End process is, where the system action starts when an object approach to the gate where is the hardware fitted and installed, then the hardware updates the corresponding variables within the system.

1.4. Front-End

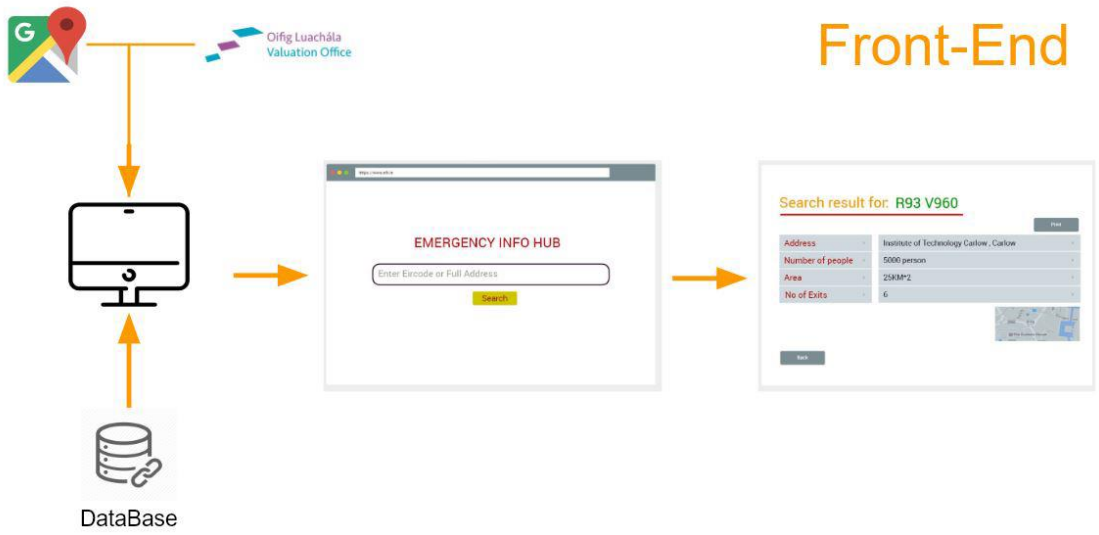

Figure 3 How it works - Back End

The above picture describes briefly what is the project Front-End process, the process starts when the user accesses the main webpage to the system and enter the searched address or Eircode, then all the related data will be displayed.

2. What is the User Screens?

2.1. Main search box Screen

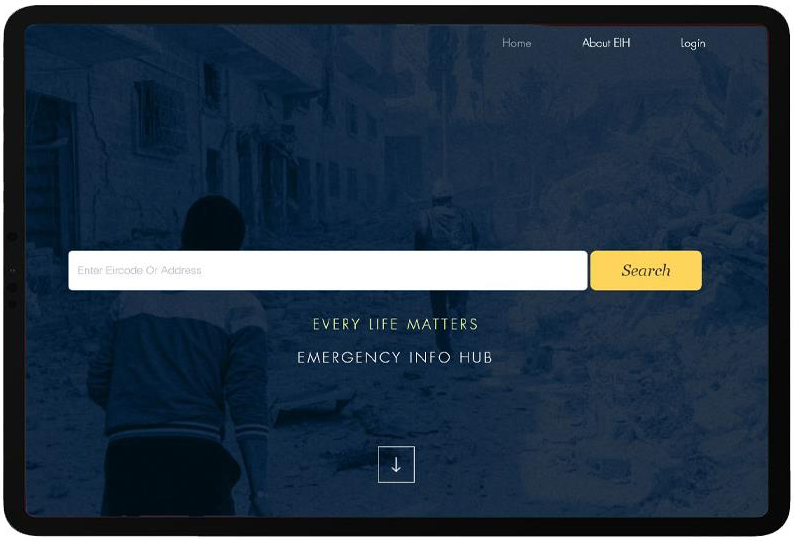

Figure 4 Main Screen - Search Screen

This page will be the main page of the project where it gives the Eircode or Address search functionality.

2.2. Results Screen

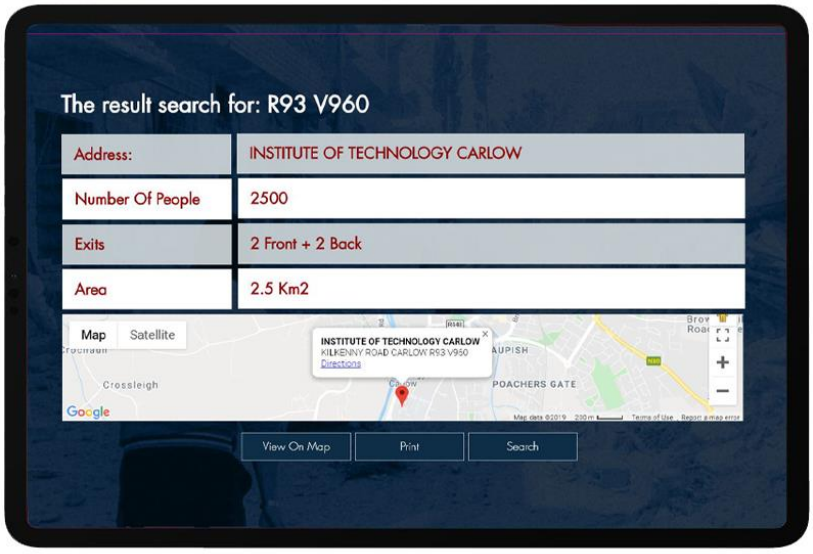

Figure 5 Results Screen

After the user enters the Eircode or the Address, the result page will display the search results, such as the Address, the number of people inside the building, exits, and the Area.

2.3. Login Page Screen

Figure 6 Login Screen

Login Screen where the system admins can access the system dashboard and make needed changes for the saved buildings or Admins users.

2.4. Add Building Screen

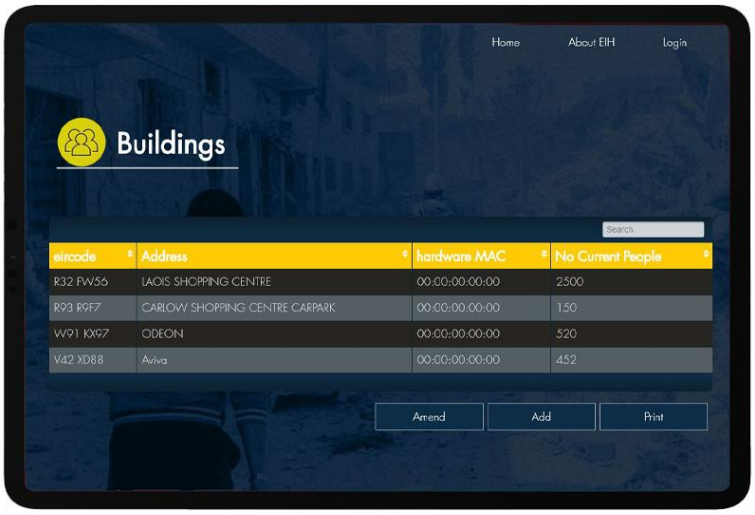

Figure 7 CRUD Building Screen

The Functionality of the buildings screen is giving the admins the ability to add, edit or delete a building, each building should have a unique Eircode, the hardware MAC address will be specific for the devices installed in this building.

2.5. Add Building Screen

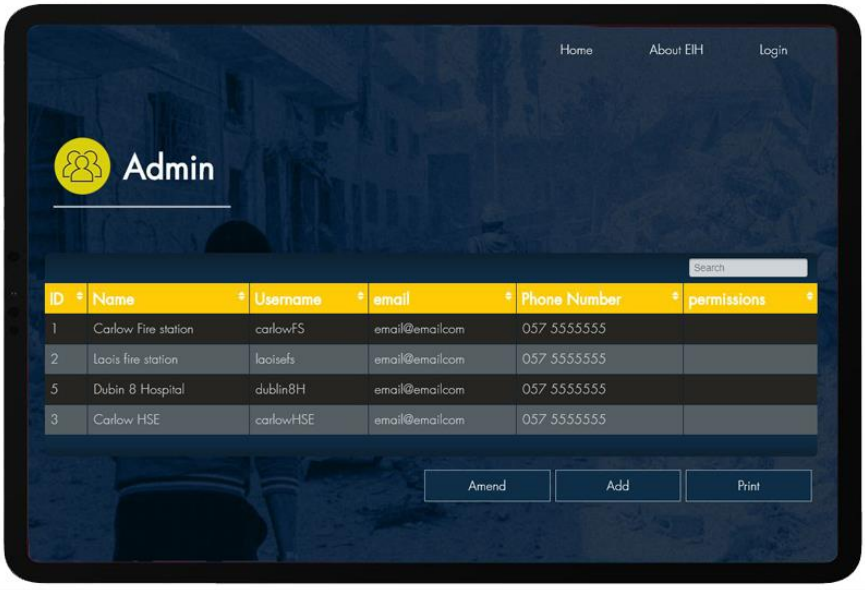

Figure 8 CRUD Admin users screen

The Functionality of the admins' screen is giving the admins the ability to add, edit or delete an admin user, where are the users could have a different level of precisions to access the system.

3. Non-Functional Requirements:

5.1. Usability

- The emergency services should be able to access and reach the website within 10 seconds 90% of the time.
- Adding a new building or admin user should be saved and stored with the database within under 30 seconds 75% of the time.

5.2. Performance

The system will respond within 0.1 seconds for all interactions'

'the hardware should process the face/body detection within 2 seconds in all circumstances'

'the system should upload all the details of a people number in 1 second'

4. Target Users

This project has two categories of users:

5.1. Emergency services

- Fire services
- Garde station
- HSE services
- Civil Defence
- All other organizations and groups dealing with the emergencies.

5.2. Public buildings

- Hospitals
- Cinemas
- Stadiums
- Governmental buildings
- Shopping centers
- University, colleges, schools.
- And all the buildings that like to improve the emergency system they have.

5. Potential Risks, Challenges, and Issues

Some several challenges and risks might occur within the system running time within the hardware or the software parts.

- Hardware challenges and risks:

As the hardware should be running 24 hours during the full 7 days a week to keep tracking all the objects approaching the building gates, some risks may occur such as the power connectivity, the weather conditions, network connection, database accessibility, and response quality. This risk may affect the working efficiency of the hardware which effects the object tracing resulting in a wrong or not the specific number of people counted, where this risk may be a reason for life losing.

- Software challenges and risks:

Alongside with the hardware, the software including the all the coding and the website respond and servers should be tested and working 100% to do what it was designed for, at the same time the website, the database and the outside source APIs should reachable at the requested time as non-accessibility results may make a delay in the response time and lifesaving.