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Safe & Sound

Technical Report

Declaration Cover Sheet for Project Submission

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SECTION 2 Confirmation of Authorship

The acceptance of your work is subject to your signature on the following declaration:

I confirm that I have read the College statement on plagiarism (summarised overleaf and printed in full in the Student Handbook) and that the work I have submitted for assessment is entirely my own work.

Signature: 

Date: 13 - 5 - 18

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Executive Summary

In modern day society, many elderly people now live independently in the community, whether it is in their own homes or in sheltered accomodation. They may live apart from their families or carers, perhaps in a different country, county or just 20 minutes away in the same city. This separation can lead to the elderly themselves to feel vulnerable and unsafe and the families to feel a sense of concern.

The product in this project is called Safe & Sound which is a system for that can ensure the safety of elderly people, by contacting their family members or emergency contacts quickly if a disturbance occurs. Raspberry Pi sensors will detect if movement has occured once the system has been turned on through the Alexa skill command. If movement is detected an Alarm will be sounded through Alexa. If the user is unable to tell Alexa to turn the alarm off, this in turn informs the system that they may be in trouble and their contacts are alerted via their phone.

I hope that this system can give elderly people a sense of safety in their own homes while keeping their independence and also give their families peace of mind knowing that their loved ones are being monitored.

1. Introduction

The main objective of this project is to create a security system dedicated to the safety of elderly people by seamlessly incorporating a raspberry pi with motion sensors, a camera with an Alexa enabled device and an android app. The raspberry pi with sensors will be located with a view of the main entrance in the home while the Alexa enabled device will be located in/beside the bedroom and the android app will be on both mobile phones of elderly person and family member. This Safe and Sound system will detect if someone is in their house or a disturbance has occurred. It is a medium that connects the user and their list of contacts, creating a safe environment for them to live in.

a. Background

The original idea for this system was to detect if a child was trying to leave their room when they had been put to bed by their parents. After further consideration, it was decided that elderly people or those who suffer with dementia or alzheimer's would find it more beneficial. After further discussion with academic staff, it was clear that focussing on the elderly had more potential as some live in fear that they will not be able to defend themselves if someone tried to enter their home uninvited. Currently many home security systems are quite complex and difficult to navigate, however, the purpose of the Safe and Sound system is not to replace the home security/alarm system, but an additional precautionary measure that further ensures their safety. The status button, highlighting if the system has been turned on or not at a designated time, allows the family member to see if the elderly person is safe. This is important especially for elderly people who may not live near their relatives, as it allows the contact to know if they should give the user a call to check their status or in the case of the contact living in another country, it can give reassurance that the user is safe even though they can't physically check on them.

There are many security systems with a growing number of IoT based systems, however, the Safe and Sound system is aimed at a particular group in society, the elderly. It is focused on ensuring their safety and giving both the elderly person and family members peace of mind.

b. Structure

This report is presented using:

1. An initial overview highlighting the aims of this project, as well as the system requirements and the technologies employed to develop it
2. A technical explanation outlining the details of the project iand a summary of the system.
3. A conclusion, evaluation and further developments for the system,
4. Bibliography, any extra resources, and appendices are listed at the end of report.

c. Aims

Through the incorporation of a raspberry pi with sensors, an Alexa enabled device and a Android app, the following features are developed:

i. Turning the sensors on/off

The elderly person instructs Alexa to turn the sensors on by saying ‘Alexa ask safe and sound to turn the system on’, this phrase is simple and easy enough to remember. The Alexa skill communicates with the raspberry pi using Amazons SQS (Simple Queue Service) which enables the PIR sensor. To turn the sensors off the elderly person says ‘Alexa ask safe and sound to turn the system off’.

ii. Enabling the warning

Once the elderly person has enabled the PIR sensor, it checks for motion. If it detects motion, it communicates with the Alexa enabled device using SQS. The buzzer on the raspberry pi is triggered. If the elderly person hears the warning, they can say ‘Alexa

stop'. If the warning is not stopped within 1 minute a notification is sent to the designated contacts who are listed on the Android app. The elderly person will need an android phone or tablet to use the system.

iii. Contacting emergency services

Once the designated family member sees the notification they may call the elderly person or the emergency services if need be.

iv. User experience/interaction

The elderly user will interact with an alexa enabled device, the contact/family member user will interact with the app. The app will show the status of the system whether it is active or dormant. The designated family member using the Android phone app can access the camera on the system by pressing the camera button on the app. The elderly user will be informed of the ability to access the camera during the setup of the system.

d. Technologies

The main technologies used in this project are an Alexa enabled device, an Android phone app and a raspberry pi.

Androids Studios will be the main technology used for developing the phone app. Android Studios is an IDE (integrated development environment) for developing android apps and products. It is developed by Google and is based on IntelliJ IDEA.

The code for the raspberry pi sensors will be developed in python. Photoshop will be used to develop some of the visual aspects like the icons. Photoshop is photo editing software developed by Adobe.

The Alexa skill is developed using AWS Lambda. AWS Lambda runs the code once a request from Alexa has been sent. It is a serverless computing program run by Amazon web services.

The alexa skill and the raspberry pi communicate using AWS SQS (Simple Queue Service)

** Add in bits about AWS and screenshots **

2. System

a. Requirements

The system is made up of three main parts; the app, the Alexa enabled device and the raspberry pi. After a few hours of training, anyone would be able to install the system in the homes of the elderly and demonstrate how the system works. The functionality within the app is minimal allowing any programmer to maintain and update the code with minimal training.

i. Non Functional Requirements

1. Performance/Response time requirement

The sensors response time is approximately 5 seconds to the request from Alexa. The buzzer will sound the disturbance alarm until the user instructs Alexa to turn the system off.

2. Availability requirement

The system must be available on an continual basis. The system requires a wifi signal for Alexa to work and connect to an android phone app. The android phone app must be connected to a wifi connection or a mobile data connection.

3. Security requirement

As this system is about adding security measures, when the designated family member contact is alerted about a disturbance they have the option to view a feed from a camera

connected to the raspberry pi. It is important that the user's privacy is not invaded, hence the elderly person must consent to this during setup.

4. Reliability requirement

The reliability of the system is dependent on a wifi connection. The raspberry pi is connected to alexa via bluetooth which has a high dependability.

5. Maintainability requirement

If errors occur, they are reported in the app and support will check the system.

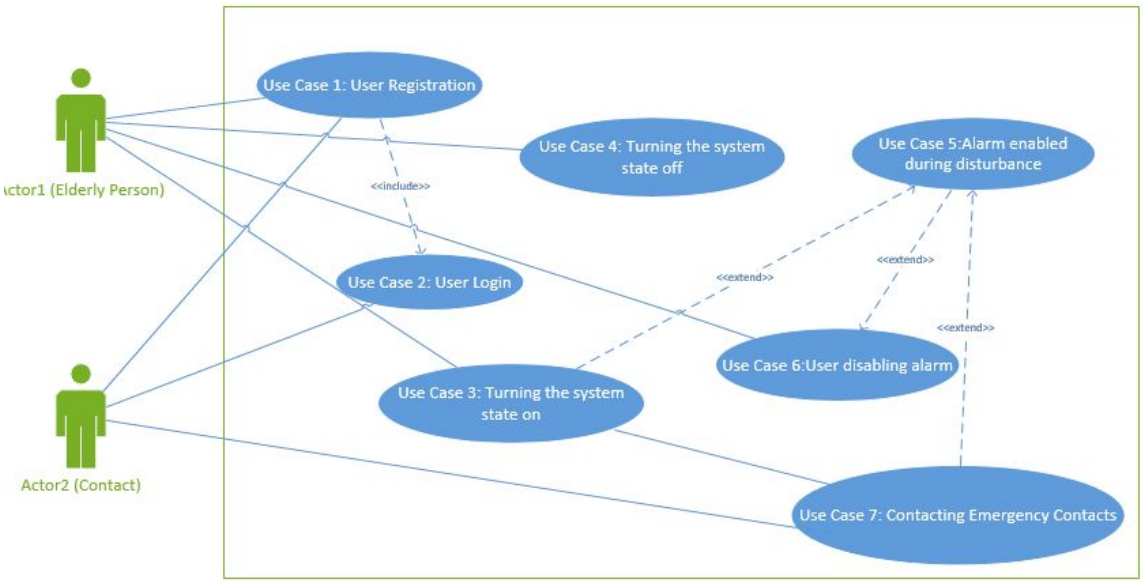
6. Reusability requirement

As the system is aimed at use by elderly people, simplicity is important to reduce confusion and improve confidence when using the system, which in turn, will ensure the system will continue to be used.

ii. Functional requirements

The prime functionality of this system is to detect motion and alert the user of a disturbance and further alert the designated family member contacts of a disturbance. The system contains an app which shows any user the state of the system and the list of the designated family member contacts. The three main parts of the system are connected to each other via the server and the data for the user is stored in a database.

1. Use Case Diagram



2. Requirement 1 <User Registration/Agreement>

a. Description & Priority

When the system is installed an employee gives a short brief of the system and the user manual. When the family member contact registers their account they are informed that by doing so they agree to terms and conditions.

b. Use Case

User Registration/Agreement

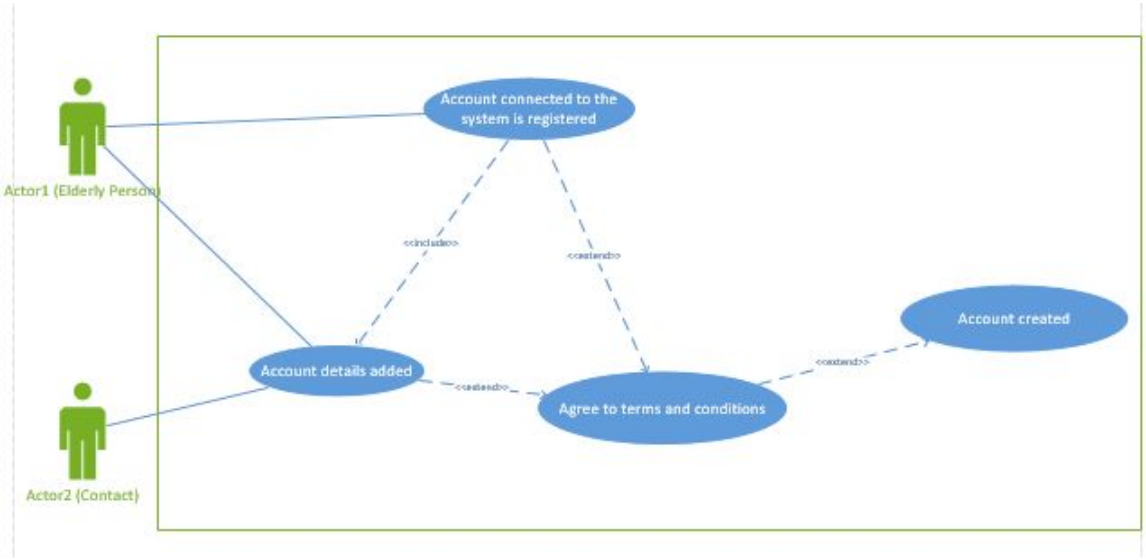
Scope

The scope of this use case is to set up the accounts of the users both the elderly person and the family member contact.

Description

This use case describes the setup of the initial accounts

Use Case Diagram



Flow Description

Precondition

The system is in wait mode

Activation

This use case starts when the app is installed for the first time

Main flow

1. The system identifies the initial launch of the app
2. The system presents the user with the register or login option
3. The <Actor> selects register
4. The system opens the registration page
5. The <Actor> inserts their details and agrees to the terms and conditions
6. The system adds the users details to the database

Alternate flow

5a. The user disagrees to the terms. Their account is not created.

Exceptional flow

-

Termination

The system presents the next use case

Post condition

The system goes into a wait state

3. Requirement 2 <User Login>

a. Description & Priority

Logging into the app is a requirement. Without a login, the user will not have access to the other features beyond the login page.

b. Use Case

User Login

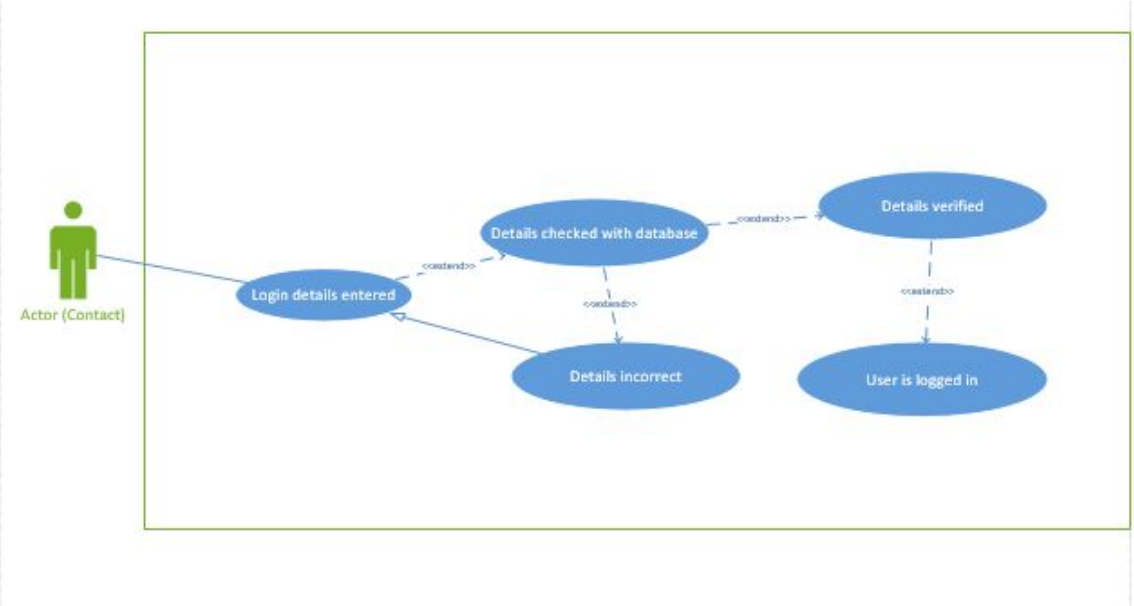
Scope

The scope of this use case is to log the user into their account

Description

This use case describes how the family member/contact logs into their account on the app

Use Case Diagram



Flow Description

Precondition

The system is running

Activation

This use case starts when an <Actor> selects the login button

Main flow

1. The system opens the login page
2. The <Actor> enters their details
3. The system checks the details with what is stored in the database
4. The system allows the user access to the rest of the features of the app

Alternate flow

3a. The details entered do not match what is stored in the database

3a1. The user is prompted to enter their details again

Exceptional flow

-

Termination

The system presents the home page

Post condition

The system goes into a wait state

4. Requirement 3 <user turning on system>

a. Description & Priority

To turn the motion sensors from the raspberry pi on the user must say the command. The user (Elderly Person) will speak a command to alexa which will turn the sensors on.

b. Use Case

User turns the system on

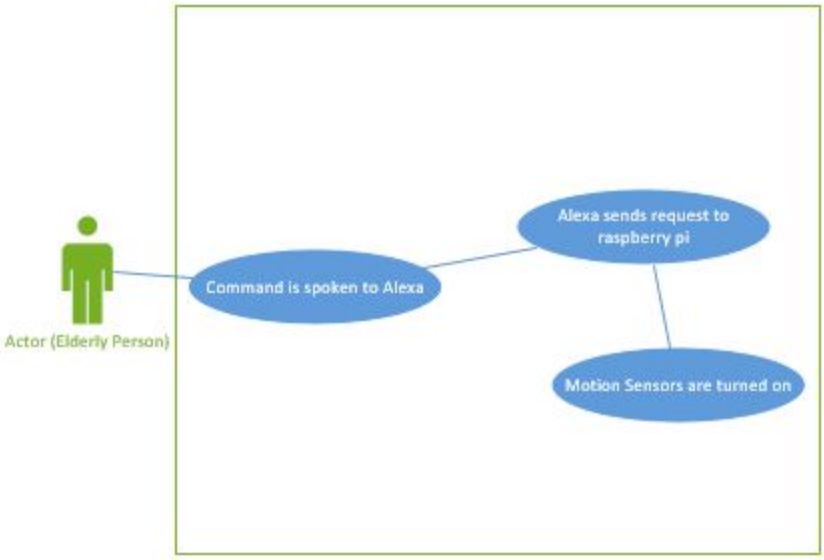
Scope

The scope of this use case is to turn on the motion sensors on the raspberry pi

Description

This use case describes how the motion sensors are turned on

Use Case Diagram



Flow Description

Precondition

The sensor system is not running

Activation

This use case starts when an <Actor> speaks the command to Alexa

Main flow

1. The <Actor> says the command to turn on the sensors
2. The system identifies that a command has been spoken to Alexa
3. The system checks which command was spoken
4. The Alexa enabled device sends a request to the raspberry pi
5. The raspberry pi gets the request
6. The raspberry pi turns the motion sensors on
7. The system sends a request to the app to change the status feature of the system to on
8. Alexa tells the user that the sensors have been turned on

Alternate flow

5a. The sensors are already on

5a1. The system does nothing

Exceptional flow

-

Termination

The system presents the next use case

Post condition

The system goes into a wait state

5. Requirement 4 <User turning off system>

a. Description & Priority

If the system is not turned off then the sensors will continue to run.

b. Use Case

User turns the system off

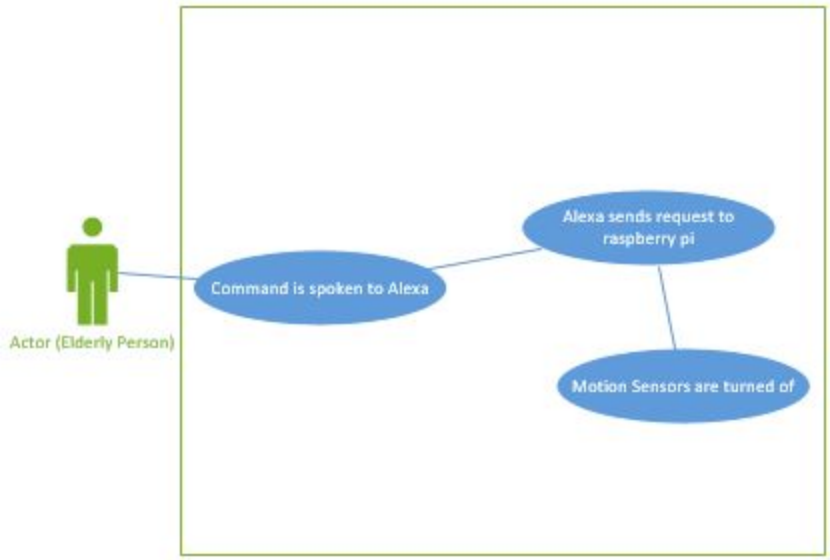
Scope

The scope of this use case is to tell Alexa to turn the sensors off

Description

This use case describes how the user commands Alexa to turn the sensors on the raspberry pi off.

Use Case Diagram



Flow Description

Precondition

The sensor system is running

Activation

This use case starts when an <Actor> speaks the command to Alexa to turn the motion sensors off

Main flow

1. The <Actor> says the command to turn off the sensors
2. The system identifies that a command has been spoken to Alexa
3. The system checks which command was spoken
4. The Alexa enabled device sends a request to the raspberry pi
5. The raspberry pi gets the request
6. The raspberry pi turns the motion sensors off
7. The system sends a request to the app to change the status feature of the system to off

8. Alexa tells the user that the sensors have been turned off

Alternate flow

5a. The sensors are already off

5a1. The system does nothing

Exceptional flow

-

Termination

The system presents the next use case

Post condition

The system goes into a wait state

6. Requirement 5 <Alarm enabled during disturbance>

a. Description & Priority

The motion sensors are on and have detected motion. The buzzer sounds an alarm to state that there has been a disturbance.

b. Use Case

Alarm enabled during a disturbance

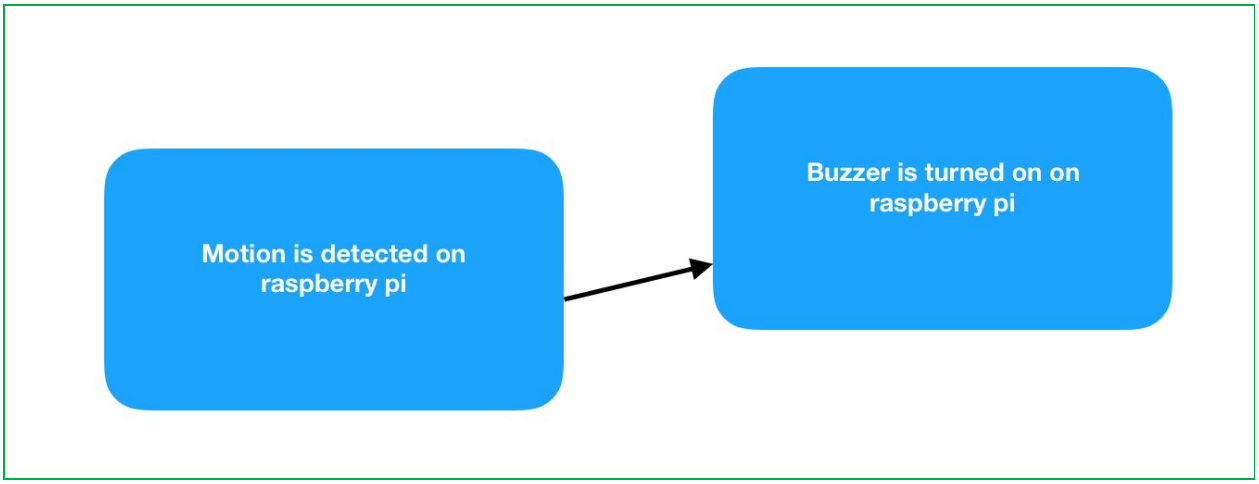
Scope

The scope of this use case is to get sound an alarm

Description

This use case describes how the system gets the raspberry pi to sound an alarm when motion is detected from the motion sensors on the raspberry pi.

Use Case Diagram



Flow Description

Precondition

The system is running

Activation

This use case starts when the system detects motion from the sensors on the raspberry pi.

Main flow

1. The system identifies that motion was detected from the sensors on the raspberry pi
2. The raspberry pi request turn buzzer on
3. Buzzer sounds an alarm for the user to hear

Alternate flow

-

Exceptional flow

-

Termination

The system presents the next use case

Post condition

The system goes into a wait state

7. Requirement 6 <User disabling alarm>

a. Description & Priority

When the alarm is going off via Alexa the user may disable it stating that they are okay and that there is no emergency.

b. Use Case

User disabling the alarm

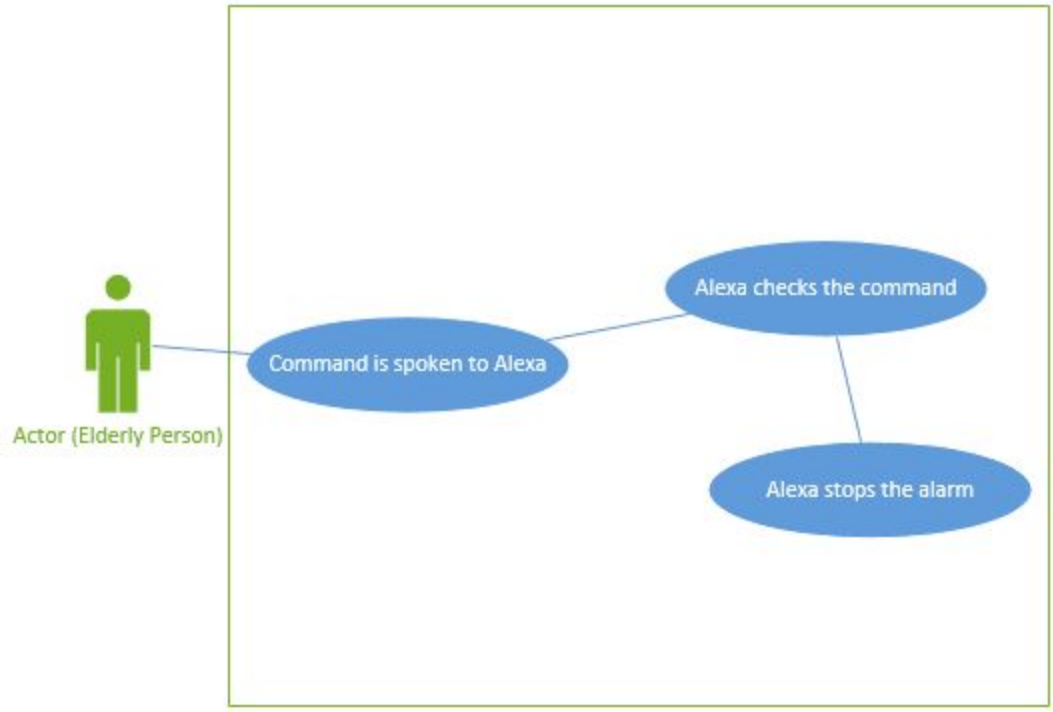
Scope

The scope of this use case is to turn the alarm off

Description

This use case how the user turns the alarm off indicating that they are safe

Use Case Diagram



Flow Description

Precondition

The system is running

Activation

This use case starts when an <Actor> speaks the command to Alexa to disable the alarm

Main flow

1. The <Actor> speaks the command to Alexa to turn the alarm off
2. Alexa checks which command has been spoken
3. Alexa tells the raspberry pi to turn the alarm off

Alternate flow

2a. Alexa does not recognise the command

2a1. The alarm continues to sound off

Exceptional flow

E2a. The Actor begins the command but doesn't finish it

E2a1. The alarm continues to sound off

Termination

The system presents the next use case

Post condition

The system goes into a wait state

8. Requirement 7 <Contacting Emergency Contacts>

a. Description & Priority

If motion has been detected and the alarm hasn't been turned off within a certain period of time. Alexa will turn it off and send a request to the smartphone app to alert the emergency contacts which are set in the app that there has been a disturbance.

b. Use Case

Contacting Emergency contacts

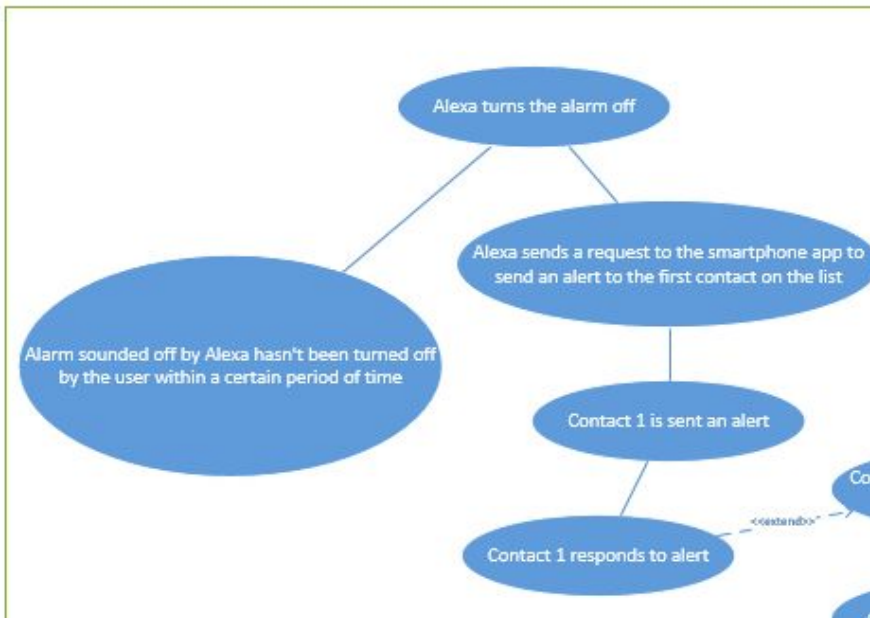
Scope

The scope of this use case is to send an alert to the listed emergency contact

Description

This use case describes how the system alerts the emergency contacts once the alarm hasn't been turned off by the user.

Use Case Diagram



Flow Description

Precondition

The system is running

Activation

This use case starts when the alarm hasn't been turned off after a period of time

Main flow

1. The system identifies that the alarm has not been turned off by the user
2. The system tells Alexa to turn the alarm off
3. Alexa sends a request to the smartphone app
4. The smartphone app sends an alert to the contacts in the list

Alternate flow

-

Exceptional flow

-

Termination

A contact responds to the alert notification

Post condition

The system goes to sleep

iii. Data requirements

The system needs the ability to transfer and save data to work. Some of the data requirements are as follows:

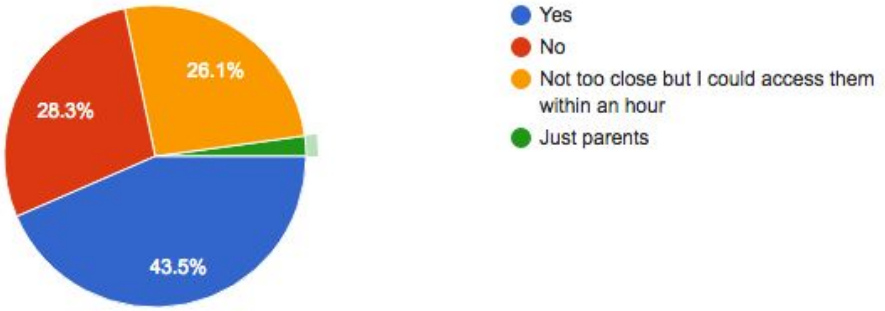
- The raspberry pi sensors need to transfer data to AWS which transfers it to the alexa enabled device
- The alexa enabled device transfers data to AWS which sends it to the raspberry pi and the smartphone app.
- The smartphone app transfers data to the database (Google Firebase) which is saved there.

iv. User requirements

A survey was sent to a number of people, with the following results:

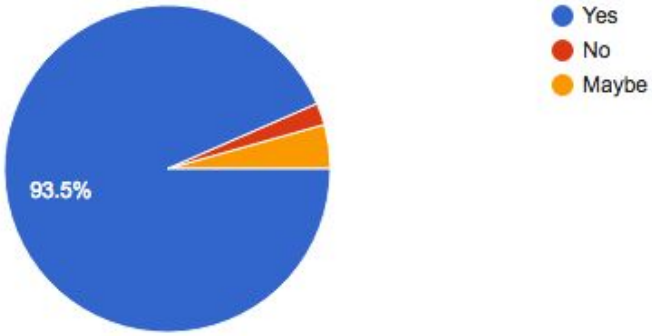
Do your parents/grandparents live close to you?

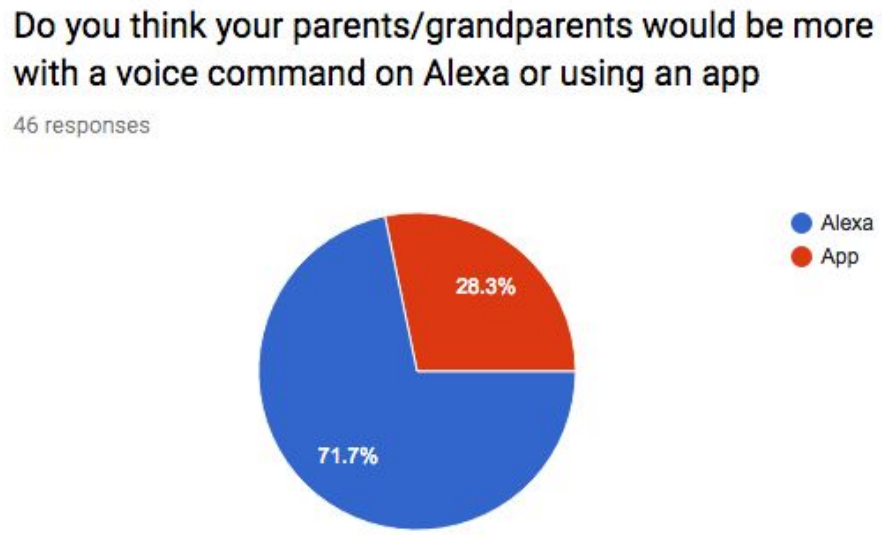
46 responses

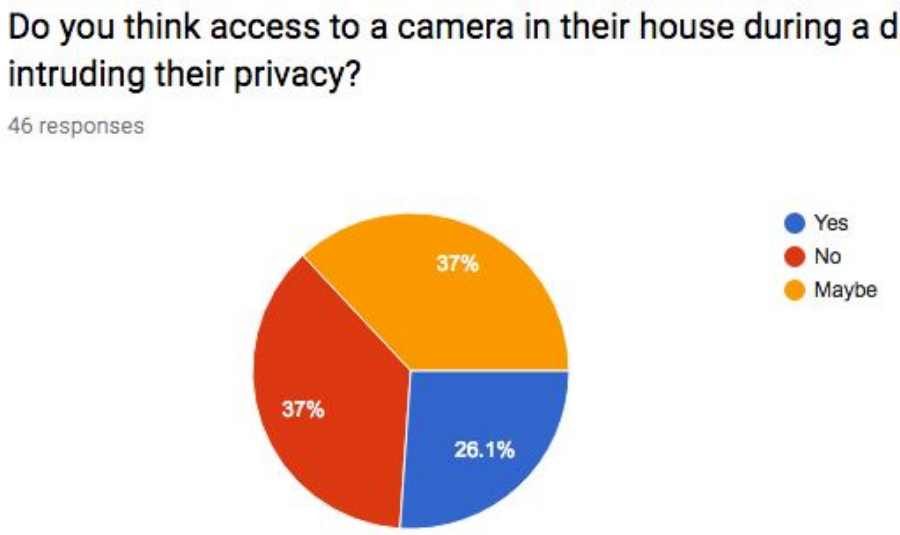


Would you like to be alerted if there is a disturbance in their house?

46 responses





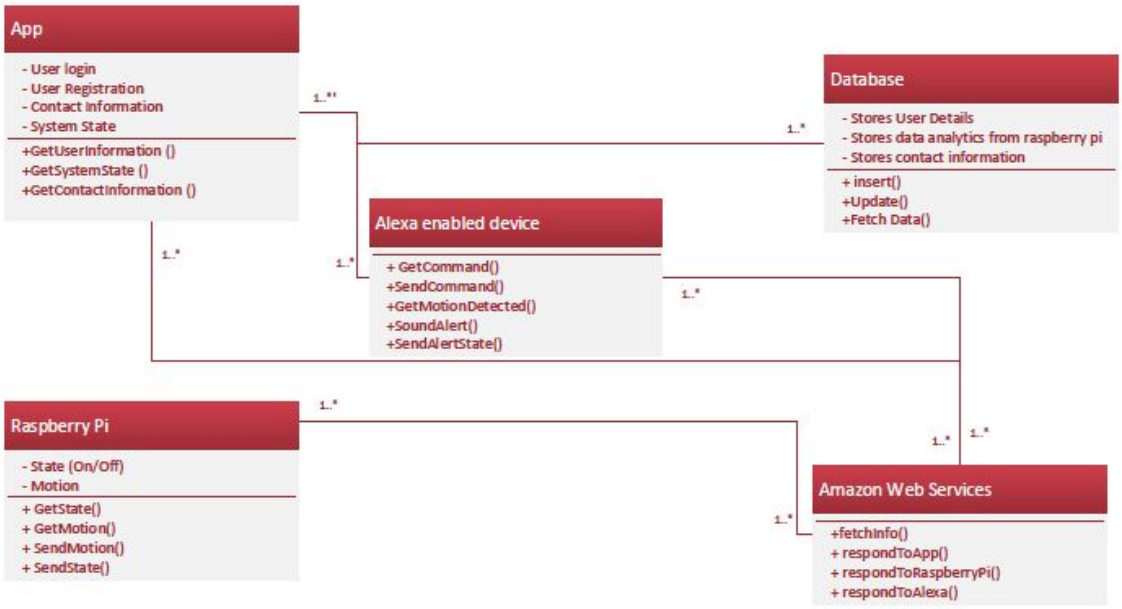


Feedback from possible users defines the necessary requirements needed for the system.

The users indicated they needed a system that allows them to be alerted if their Grandparents/Elderly Parents are in danger in their home.

b. Design and Architecture

Class Diagram:



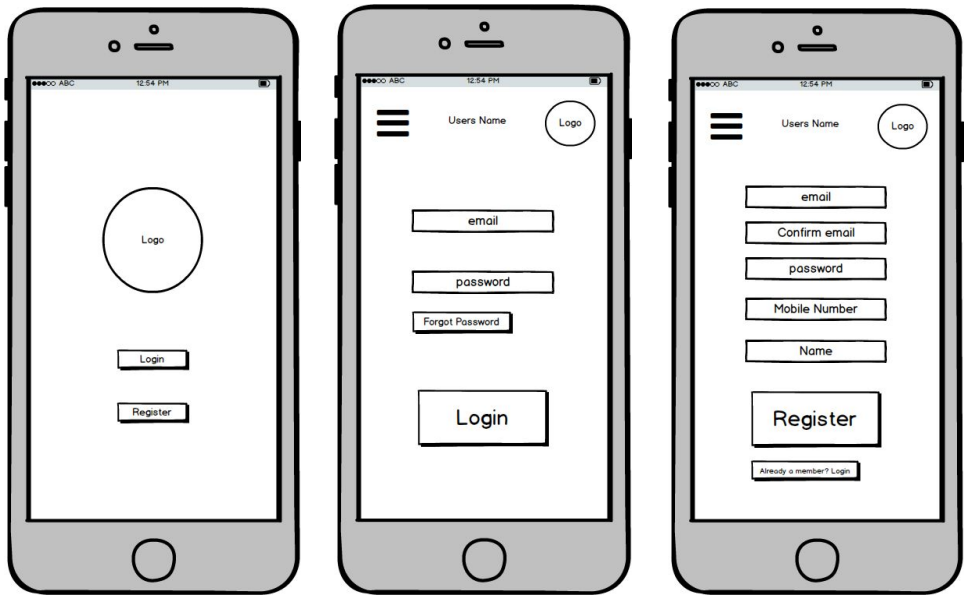
The above architecture illustrated above in the class diagram highlights the most appropriate method to connect all of the different elements of the whole system. The three main devices all connect to the server and from there they essentially are connected to each other. Alexa receives a command that is sent to the server first and then to the raspberry pi. The app is updated from the server indicating that the sensors have been turned on. When motion is detected the raspberry pi triggers the buzzer. A command spoken to Alexa is needed to stop this alarm. Alexa needs to transfer this data to the raspberry pi to do so. The app grabs the contact information from the database to alert them of a disturbance.

c. GUI

i. Mockup design and logic of the GUI based on original proposal

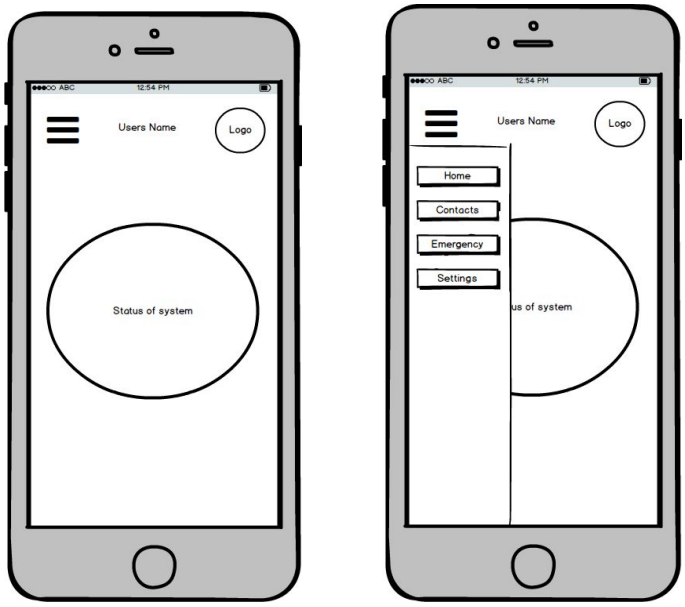
The interface for the android phone app must be designed with simplicity as the main focus.. Although the elderly person is not required to use it, they may do so if they wish, however, it is for their family/emergency contacts primarily. When an employee is sent out to install the system a family member/emergency contact must be present for set up. During this process the elderly person and the family member/emergency contact will be shown how to set up their app.

When the app is opened the user will be prompted to login or register. The user (Family member/contact) can login or register, however, once logged in they will not be logged out automatically, they must do this manually.

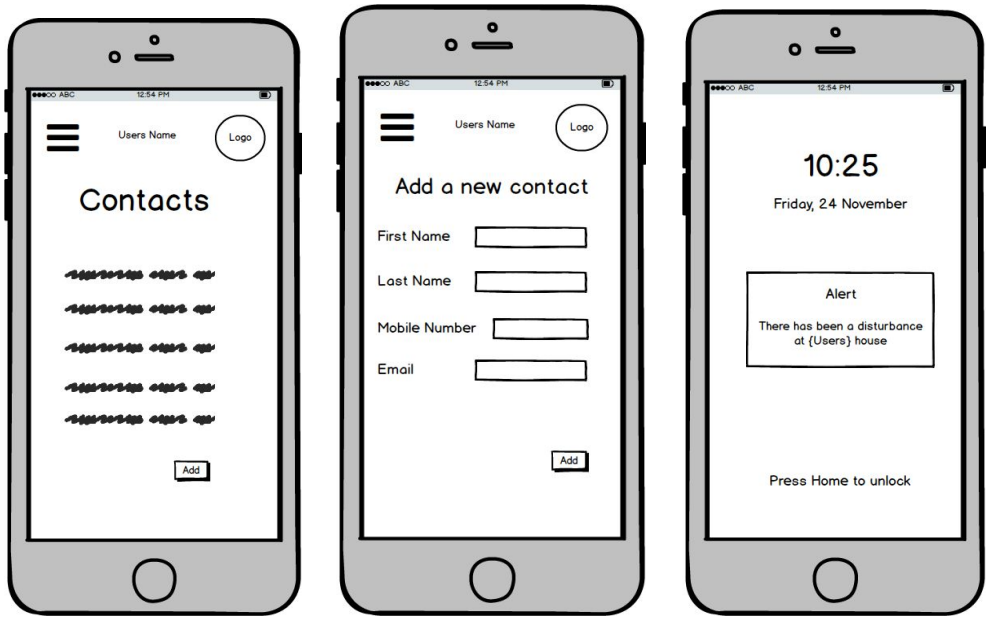


The home page is designed as simple as possible so that the user can easily use the features. A status icon will be the only thing visible on the page. It will be green when the

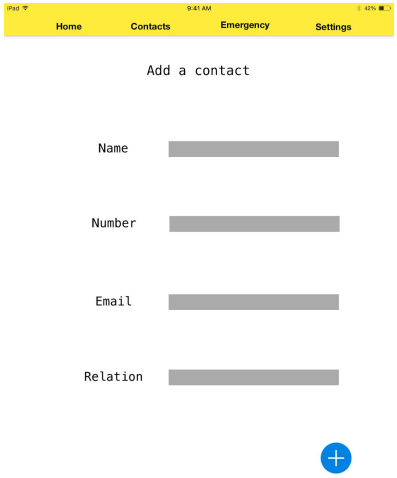
system has been turned on and red when it is off. The hamburger menu will allow the user to access the other pages available.

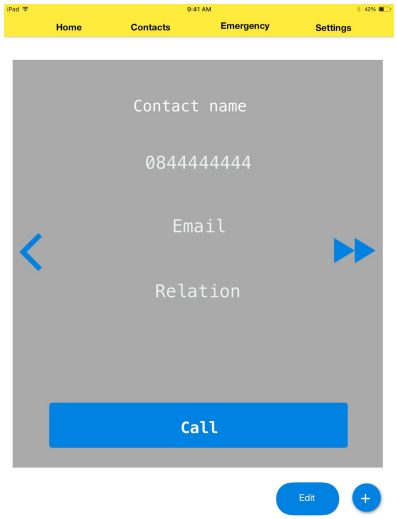


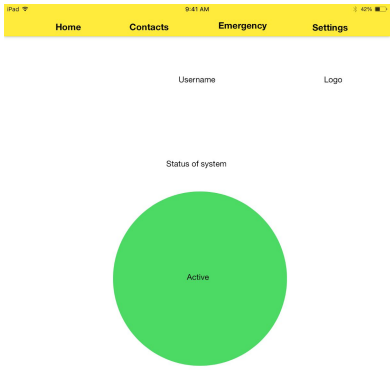
Emergency contacts are listed, however, this is read only information, as the app will not call any of the users. This action is carried out by Alexa when a disturbance occurs. The contact ranked at the top of the list is most important and so on. If the top contact does not respond to the emergency alert within a certain period of time then the next contact on the list will be sent the alert and so on. Contacts may be added, removed and edited on the list.

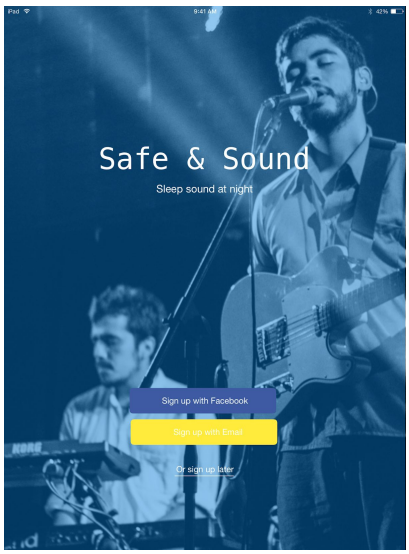

Users Name
Logo
Contacts
Add
Users Name
Logo
Add a new contact
First Name
Last Name
Mobile Number
Email
Add
10:25
Friday, 24 November
Alert
There has been a disturbance at {Users} house
Press Home to unlock

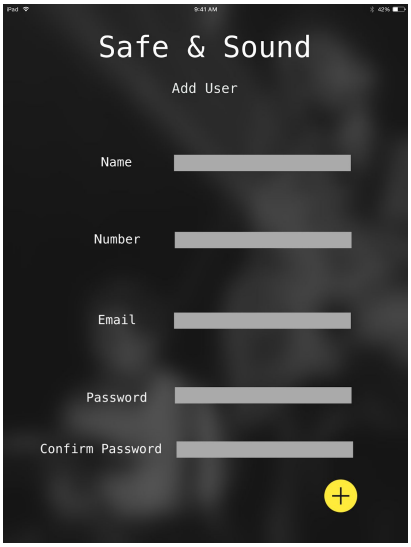
ii. Updated mock ups

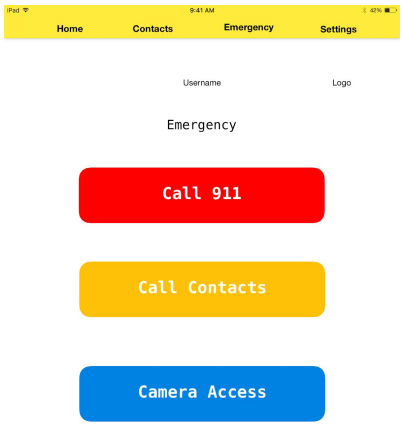








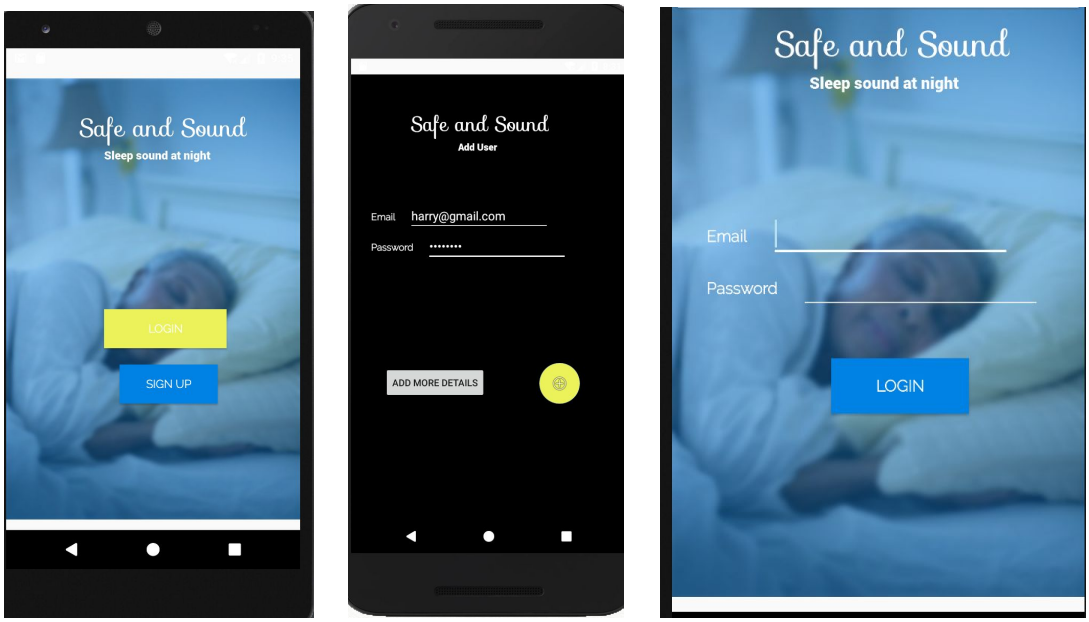


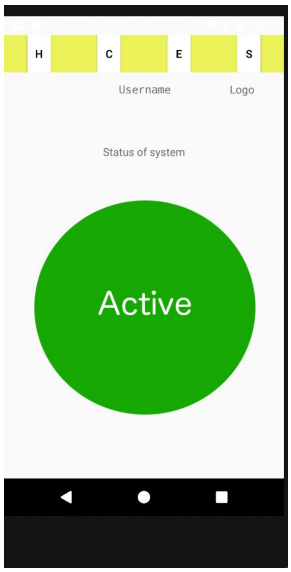


iii. GUI in App

During the development stage changes were made. Initially the iOS app was part of the design, however, a decision to use an android app was made due to previously acquired knowledge of Android studios. The updated mock ups in the above diagrams include the following changes:

1. Instead of the hamburger menu, a top bar was perceived to more user friendly for anyone who is technically aware, such as an elderly person.
2. The buttons are on top for easy access.
3. The updated contact page now uses fragments to switch between the contacts.
4. The emergency alert has no changes except with use of an android instead of iOS.
5. A settings button was added to allow logout and access the guidelines/user manual.





d. Testing

Testing is vital in developing the software, as it informs the designer if the product is successful or not.

Firstly, an anonymised survey which was created before development began, inviting friends and family and a wider audience through the use of Facebook to participate. The age range was from 22 to 54 years old. The questions were aimed at this age group to gather opinions of people in regard to their elderly relatives. The survey highlighted the necessary requirements needed to develop the system.

To test the android application, the emulator is used on the iMac and the phone is connected through a USB cable. Both the phone and emulator is used due to the phone has an old version of android and the emulator can run all versions. If an error occurs or the app crashes the logs in Android Studios can be accessed to detect the causes.

Once the development of the project was finished three family members tested it, aged between 19 and 54 years of age with varying degrees of technological skills.

Before testing began, a brief introduction about the system was given, explaining the basic idea, what each part of the system was used for and also showed them the user

manual. No further instructions were given and they had to use the system based on what they read in the user manual.

The testing was carried out on an individual basis with the developer (myself) and the participant in a room. All three participants did not interact until the testing was finished. The three testers used an android phone that was currently being used for testing.

After reading the manual each participant began using it, observations were noted how they used it. They had to speak out loud and their thoughts were recorded. While the participant was testing the system they were also recorded. This is called the think aloud test. By doing this test the participant's reactions and thoughts are registered as they're using it. Feedback was given as they were going through the app and using the system. This is helpful as it is sometimes difficult to remember what you're thinking during when you were using the application afterwards when answering the survey.

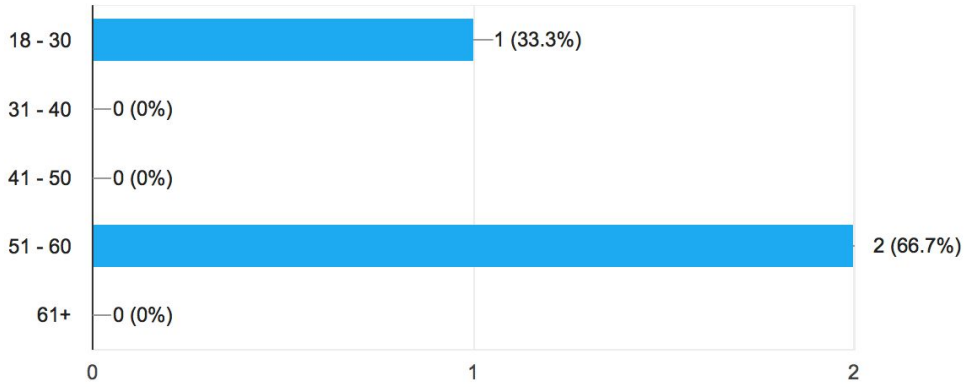
While they registered and logged in on the app, firebase was checked to see if the data had been added.

User feedback

After they tested the system a survey was issued with a list of questions to gather feedback.

What age range do you fall under?

3 responses



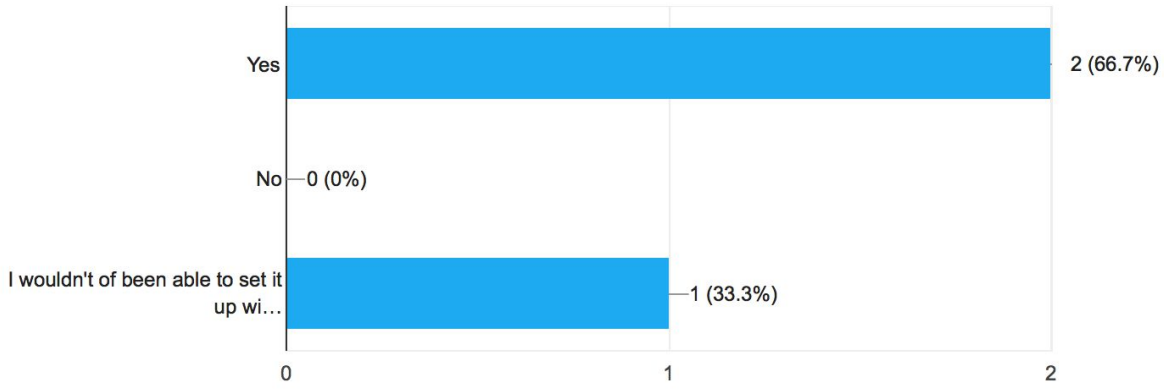
What improvements would make to the installation process?

3 responses

I wouldn't change anything
Nothing
Comdense the number of steps it takes to set it up

Overall did you find installation was an easy process?

3 responses



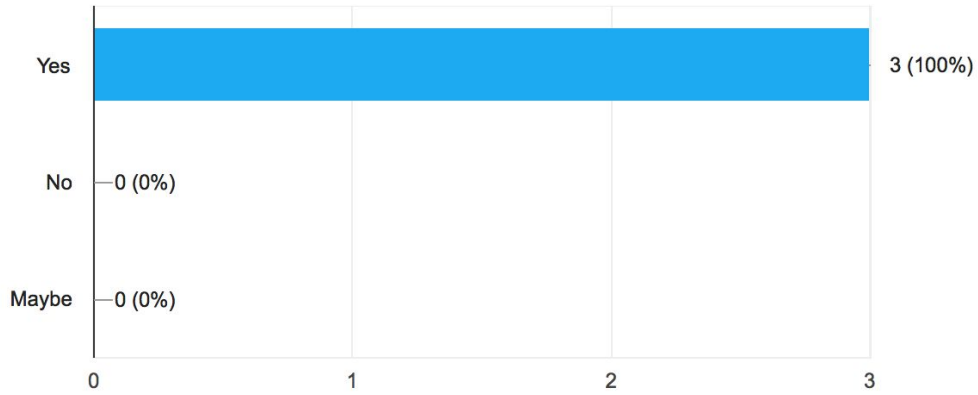
Do you have any other comments?

2 responses

No
I enjoyed this app very much

Do you think Safe and Sound will be useful for Elderly People?

3 responses



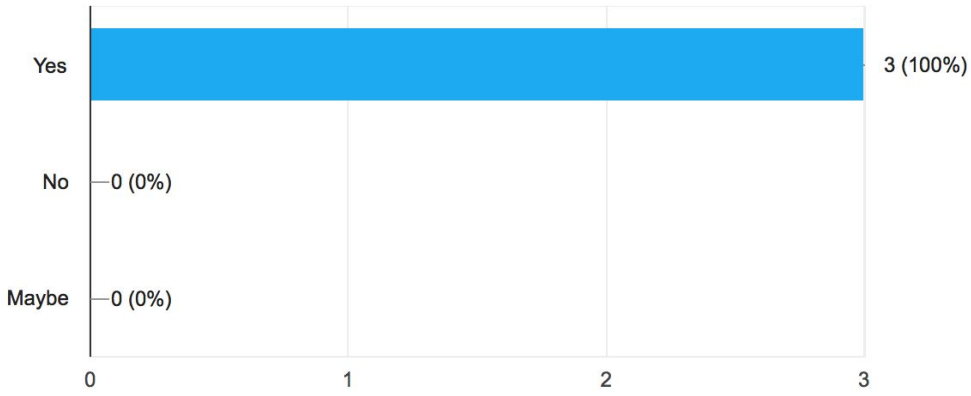
How would you improve the smartphone app?

3 responses

Add more features
I wouldn't
Make it a bit more interactive

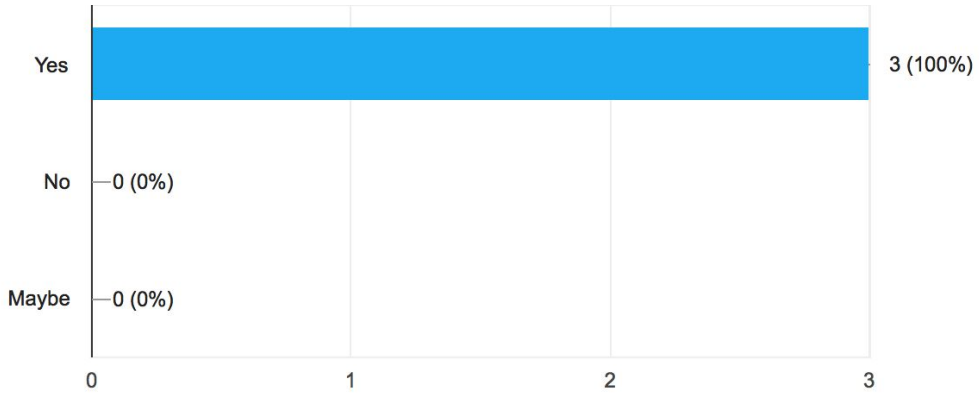
Did you find the smartphone app user friendly?

3 responses



Did you find the smartphone app easy to navigate?

3 responses



After reading the 'How to get started' guide did you understand how the Safe and Sound product works?

3 responses

Yes
Yes I was able to get a basic understanding of how the app worked
Yes I got a good idea of how the app worked from reading the manual

General feedback from user:

Setting up the system	Setting up the two physical parts, the raspberry pi and alexa were simple enough
Reading the user manual	Easily readable
Adding the Safe and Sound skill to alexa device	I deleted the skill from the testing echo dot each time a new user was testing it. They said it was simple to add.
Downloading the app	No difficulties
Registering	Users did this easily
Logging in	One user misspelled their email and couldn't log in but once they realised what they had done they could log in fine
Logging out	Testers stated that it was hard at first to see where to logout. They had to think of where this might be within the app. Once found within the settings page logging out was easy.
Getting Alexa to turn arm the system	The process of this was easy. Users had to say the phrases which were listed in the User Manual. Alexa sometimes failed to recognise what they were saying but this is due to dialect and accent and is a

	regular occurance when using Alexa commands. The users just kept trying until Alexa responded correctly.
Turning the alarm off during a disturbance	One User stated that in the moment they forgot what to say and had to read the user manual again which is located in the settings page in the app. Again Alexa isn't always responsive so it took one user three times.
Add contacts in the app	Users found no difficulties in this.
View contacts in the app	Users were able to navigate to this section easily by using the app bar at the top of the app.
Delete contacts in the app	Easily done with the delete button
Access the camera	Easy to do without any issues
Call 999 in an emergency	Users said that in an emergency they would just use their phone to call the emergency services as opposed to going into the app to do it but that having it available there was still useful

The users who tested the system found no difficulties in using the app and the alexa skill. They carried out the instructions in the User manual with ease and didn't voice any

irritation during the test. This concluded that the system is user friendly and that the app is easy to navigate. The testing users did not ask many questions while using the app which shows that it is efficient and can perform well. The users gave feedback on further developments for the next version of this system.

3. Conclusions

Understanding the requirements of a project and comparing them to the ability of the project owner is vital. During the development of this system, it was necessary to re-evaluate the aims and objectives due to the incompatibility of the initial idea and the skills and resources necessary to complete it. This proved to be a valuable lesson and what I have researched and developed so far, I have realised how much work goes into making a device for the Internet of Things. Certainly, in the development of any device will require multiple versions and constant testing to gain crucial feedback if any product is to succeed.

4. Further development or research

With technology improving everyday I hope that over time Alexa could call the emergency services if a disturbance happened in the user's home. At the moment Alexa can only make calls to other alexa enabled devices.

Version 2 of this system could also be used in hospitals, nursing homes and homes of people who suffer with dementia or alzheimer's, with a few adjustments. The system could detect if the user was trying to leave the house when they shouldn't be.

Also additional features, such as, multiple cameras could be positioned at front and back doors, and in all rooms, as well as motion sensors on windows which would enable the elderly to feel more secure.

Version 2 of the app could include interaction between the elderly person and their family members. Although this is available in other mobile devices, the fact that it is on one device would allow the elderly person to have to use one device.

5. References

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6. Appendix

a. Project Proposal

Objectives

Summary

I have decided to create a security system dedicated to elderly people. The main objective is to seamlessly incorporate a raspberry pi with motion sensors and a camera with an Alexa enabled device and an iOS app. The raspberry pi with sensors will be located with a view of the front door. The Alexa enabled device will be located in/beside the bedroom. The system will detect if someone is in their house when they shouldn't be e.g they are getting robbed or with a patient with dementia or alzheimer's they are trying to leave. It is a medium that connects the user and their list of contacts creating a safe environment for them to live in. Incorporating a raspberry pi with sensors, an Alexa enabled device and a iOS app I hope to achieve the following features:

Turning the sensors on/off

The user will tell Alexa to turn the sensors on by saying 'Alexa tell __ that I am going to bed, this phrase is simple and easy enough to remember. The Alexa skill will communicate with the raspberry pi over bluetooth and tell it to enable the infrared (IR)

sensors. To turn the sensors off the user will say ‘Alexa tell ___ that I am awake’, this will turn the sensors off.

Enabling the warning

Once the user has enabled the IR sensors they will check for motion. If they detect motion they will communicate with the Alexa enabled device over bluetooth. Alexa will sound a warning. If the user hears the warning they can say ‘Alexa stop’. Then it is up to the user to call emergency services themselves and scope out the situation. If the warning is not stopped within 2 minutes a notification is sent to the person who is first on the users contact list. If that person does not respond the notification goes to the next person and so on. The contact list is set in the iOS app. The elderly person will need a smartphone or tablet to use this system.

Contacting emergency services

Unfortunately at the moment Alexa can’t call the emergency services but with new features coming out all of the time for the voice assistant I hope to find a way to get this to work. If a contact in the list does not respond that they have seen the warning then the emergency services are called.

User experience/interaction

The user will interact with an alexa enabled device, the contact will interact with the app. The app will show the status of the system whether it is active or dormant. It will only allow the contact to access the camera feature if they have received the notification about there being motion detected. So the user’s privacy is protected until there is a problem.

Background

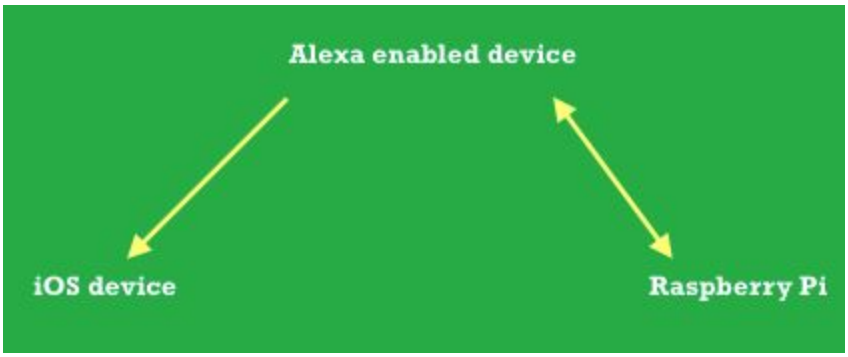
My original idea was to use this system to detect if a child was trying to leave their room when they had been put to bed by their parents. Then I decided it would be of a better benefit for elderly people or it could be used for people who suffer with dementia or alzheimer's but I am going to focus on how it can be used for elderly people. After discussing my idea with my lecturers it was clear that this idea was better than the first

and had more potential. A lot of elderly people live in fear that they will not be able to defend themselves if someone tried to break into their house. Many security systems are very complex and difficult to use but my system isn't to replace their security/alarm system it is an extra precaution that they can take to ensure their safety. The feature which allows designated contacts to check that the person is okay is very important especially for elderly people who may not live near their relatives. The contact may live in another country and can be a little more assured that the user is okay even though they can't physically check on them.

There are many security systems out there and a growing number of IoT based systems but I feel that the system which I want to develop will differ from the rest because it is based on one niche of people. It is focused on ensuring the safety of elderly people and hopefully it gives its users a peace of mind when they are going to bed.

Technical Approach

The Alexa enabled device is going to connect to the raspberry pi over bluetooth. The Alexa enabled device will connect to the iOS app through Wifi. The main niche of people using this system will be the elderly. Many elderly people wouldn't be very comfortable trying to use a very complex system, if they find it too complicated or that they aren't good enough at technology to use it then they just won't. My aim is to make the system as simple as possible so that they can feel comfortable using it.



Special Resources Required

I received a raspberry Pi, Grove pi and sensors from NCI. I need to get a camera and an infrared motion sensor.

Technical Details

The iOS app will be developed in Xcode using the language Swift and will use MySQL for the database. I will develop the code for the raspberry pi in IntelliJ using the language python. I will use the amazon Alexa api to code the skill for Alexa. I have chosen to code the app using Swift because I have used Android Studios to develop apps in previous projects and would like to try an iOS app instead. I have never coded in Swift or used the IDE Xcode so I am looking forward to learning something new. I have a small bit of experience with python but I hope to further the knowledge that I have when coding for the raspberry pi.

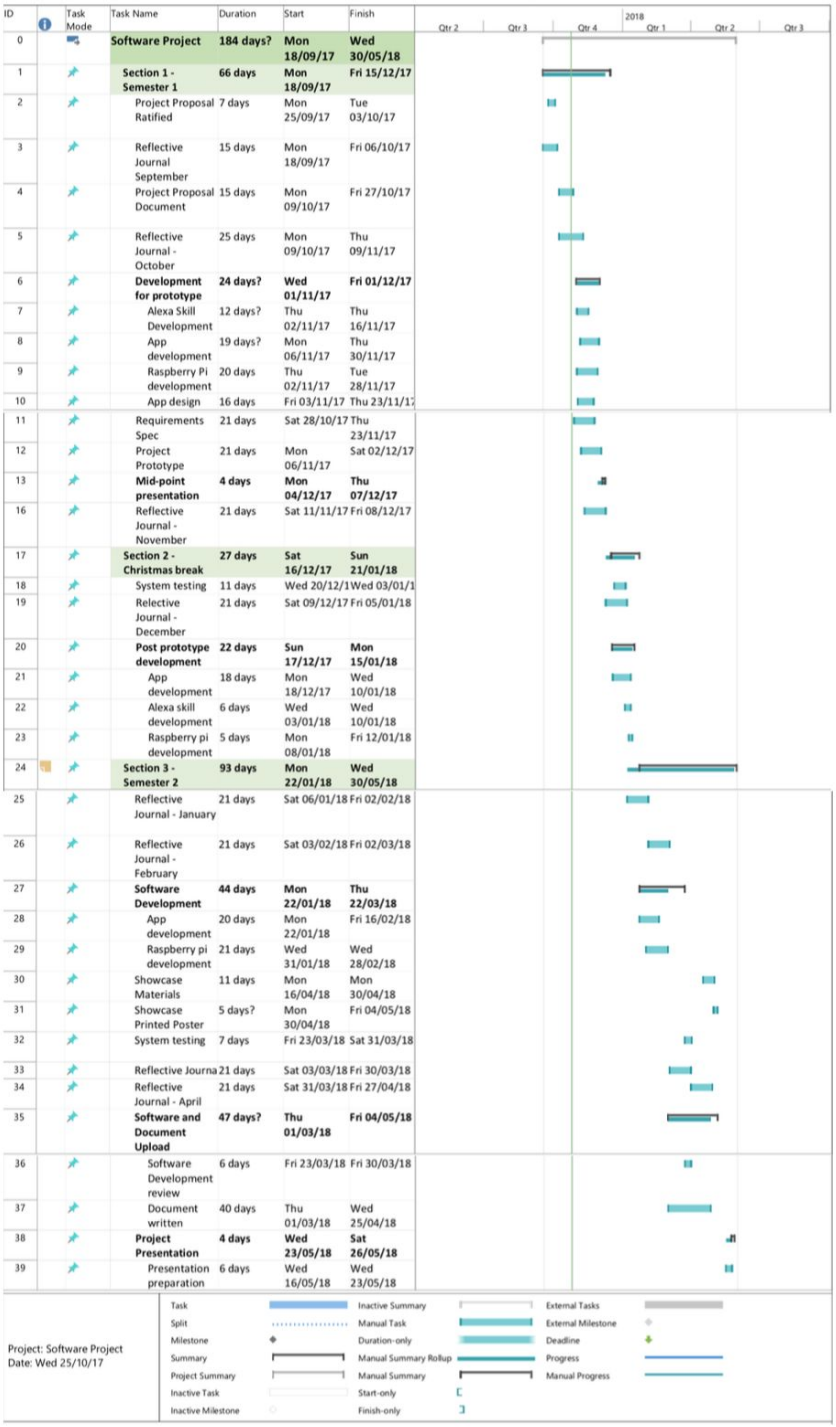
Evaluation

To evaluate and test this project I will get a number of people to use the system. After they have done so I will get them to fill out a survey and give me their feedback. I will ask them a number of questions which scale from the whole system. I will get a mixture of people with different technical levels from beginners to experts. I will focus on getting a number of people who have used an alexa device before and a number who haven't so that the evaluation is fair.

I will get them to ask alexa to turn the system on and off. I'll create a motion in front of the IR sensor and get the user to turn the warning off. I will also get them to use the app as if they are the emergency contact. They will receive the notification that their relative is in trouble and they can access the camera on the raspberry pi. I will go through the same scenarios with each person in the test so that everyone has had the same experience.

I will also perform a unit test. Each section will be tested. The information needs to be precise because if something didn't work the way that it is meant to it could become very dangerous in an emergency situation. Using this method of testing it should be easier to discover if something was not working and fix it right away.

b. Project Plan



ID	Task Mode	Task Name	Duration	Start	Finish
0		**Software Project**	**184 days?**	**Mon 18/09/17**	**Wed 30/05/18**
1		**Section 1 - Semester 1**	**66 days**	**Mon 18/09/17**	**Fri 15/12/17**
2		Project Proposal Ratified	7 days	Mon 25/09/17	Tue 03/10/17
3		Reflective Journal September	15 days	Mon 18/09/17	Fri 06/10/17
4		Project Proposal Document	15 days	Mon 09/10/17	Fri 27/10/17
5		Reflective Journal - October	25 days	Mon 09/10/17	Thu 09/11/17
6		**Development for prototype**	**24 days?**	**Wed 01/11/17**	**Fri 01/12/17**
7		Alexa Skill Development	12 days?	Thu 02/11/17	Thu 16/11/17
8		App development	19 days?	Mon 06/11/17	Thu 30/11/17
9		Raspberry Pi development	20 days	Thu 02/11/17	Tue 28/11/17
10		App design	16 days	Fri 03/11/17	Thu 23/11/17
11		Requirements Spec	21 days	Sat 28/10/17	Thu 23/11/17
12		Project Prototype	21 days	Mon 06/11/17	Sat 02/12/17
13		**Mid-point presentation**	**4 days**	**Mon 04/12/17**	**Thu 07/12/17**
16		Reflective Journal - November	21 days	Sat 11/11/17	Fri 08/12/17
17		**Section 2 - Christmas break**	**27 days**	**Sat 16/12/17**	**Sun 21/01/18**
18		System testing	11 days	Wed 20/12/17	Wed 03/01/1
19		Relective Journal - December	21 days	Sat 09/12/17	Fri 05/01/18
20		**Post prototype development**	**22 days**	**Sun 17/12/17**	**Mon 15/01/18**
21		App development	18 days	Mon 18/12/17	Wed 10/01/18
22		Alexa skill development	6 days	Wed 03/01/18	Wed 10/01/18
23		Raspberry pi development	5 days	Mon 08/01/18	Fri 12/01/18
24		**Section 3 - Semester 2**	**93 days**	**Mon 22/01/18**	**Wed 30/05/18**
25		Reflective Journal - January	21 days	Sat 06/01/18	Fri 02/02/18
26		Reflective Journal - February	21 days	Sat 03/02/18	Fri 02/03/18
27		**Software Development**	**44 days**	**Mon 22/01/18**	**Thu 22/03/18**
28		App development	20 days	Mon 22/01/18	Fri 16/02/18
29		Raspberry pi development	21 days	Wed 31/01/18	Wed 28/02/18
30		Showcase Materials	11 days	Mon 16/04/18	Mon 30/04/18
31		Showcase Printed Poster	5 days?	Mon 30/04/18	Fri 04/05/18
32		System testing	7 days	Fri 23/03/18	Sat 31/03/18
33		Reflective Journa	21 days	Sat 03/03/18	Fri 30/03/18
34		Reflective Journal - April	21 days	Sat 31/03/18	Fri 27/04/18
35		**Software and Document Upload**	**47 days?**	**Thu 01/03/18**	**Fri 04/05/18**
36		Software Development review	6 days	Fri 23/03/18	Fri 30/03/18
37		Document written	40 days	Thu 01/03/18	Wed 25/04/18
38		**Project Presentation**	**4 days**	**Wed 23/05/18**	**Sat 26/05/18**
39		Presentation preparation	6 days	Wed 16/05/18	Wed 23/05/18

c. Monthly Journals

i. September

Student name: Caoimhe Malone
Student number: x14447022
Programme: BSc in Computing
Month: September
Reflective Journal - September 2017

Thursday September 21st 2017

Over the Summer I came up with a few ideas that I could do for my Software Project. I have narrowed down two final ideas which I will choose from. I want to incorporate Amazon's Alexa in my project.

The first idea is a smartphone app which allows you to tell your bin collection company that your bin is full. Each wheelie bin will have its own unique QR code. You can scan the QR code with the app and allocate that bin a name which Alexa will recognise. You can tell Alexa that bin 'X' is full and Alexa will communicate with the smartphone app which will alert the bin company that your bin is full. If you don't want to use alexa you can just directly press the 'my bin is full' button on the app and scan the QR code for that bin.

For my second idea I want to make a child surveillance system which detects if a child has gotten out of bed and is trying to open their door. I want to incorporate a raspberry pi with infrared sensors with an Alexa enabled device and a smartphone app. When a parent puts a child to bed they can ask Alexa to turn on the raspberry pi sensors through the Alexa skill which I will develop or they can use the app on their phone to turn it on. Most people who have Alexa enabled devices, like the amazon echo, keep them in their kitchen or sitting room and most parents after they get their child to bed may go and watch tv in the sitting room. If the child has gotten out of bed the raspberry pi will detect the movement and send an alert to the Alexa device. Alexa will give out a warning for 1 minute which can be turned off by saying Alexa stop. If the warning hasn't been verbally turned off within the minute it will stop and send a notification to their phone which they can then use the app to say that they've seen the warning. Other uses for this system could be in nursing homes or hospitals for people with Alzheimer's

I think I am going to go with the second idea but nothing is final yet. I have a lot more research to do.

Monday September 25th 2017

Today I began to write out a very rough copy of a project plan. Once I get the jist of what I need to do over the coming months I will redo my project plan in a more professional manner. I planned out what work I have to do this week. The project pitches start next week so I will begin preparing for that this week. I did a small bit of research on how you can create your own skill for Alexa as I hope to incorporate that in my project. I set up up an Amazon Developers account as I will be using AWS in my project. I have never used or seen a raspberry pi before so I did a bit of research in that.

Thursday September 28th 2017

I received my raspberry pi from Dominic today. I spent the day setting it up and downloading Etcher and the Raspian image. It took a while to burn the Raspian image onto the SD card using etcher so I didn't get around to doing the rest of the steps. I will continue the setup tomorrow.

Friday September 29th 2017

I continued the setup of my raspberry pi from yesterday. I was able to connect it to my phone's hotspot the first try so I was happy with that as it was taking a few student's a couple of times to get it working. I'm sure we will move onto the next steps in next week's IOT Principles class.

Sunday October 1st 2017

Today was focused on getting everything that I have thought of in my head for my software project written out properly and given a bit of structure to. I have my project pitch tomorrow at 9am. I'm quite nervous for it as I am the first person. I made bullet points on everything that I wanted to talk about and then wrote out a paragraph including those points. I will read over this paragraph multiple time so that I have a good idea in my head of what I am going to say during the pitch. I'm nervous about the pitch but I feel a bit better now that I know what I'm going to talk about.

Monday October 2nd 2017

Today we had our project proposal pitches for our Software Project. I was really nervous and worried this morning. It went really well! My judges were Dominic, Glen and Vikas. I decided to go with idea number 2 (see first journal entry). At the end of my pitch I threw in that my idea could be also used in hospitals or nursing home's for patients with Alzheimer's. This really resonated with the three judges and immediately they began giving me ideas and ways that I could improve my idea. I'm going to change the concept of my idea so instead of monitoring children you can monitor elderly people. I need to refine the situations in which the system will be active. Some of their suggestions were to add a camera to the raspberry pi so that you can use the smartphone app and check in on the elderly person. A list of emergency contacts that will be contacted according to priority. If one contact is unavailable it goes to the next and so on. Alexa can't make phone calls but I'm going to research and see if there are emergency services exceptions. Now that I have their input I need to refine my idea and then begin to really produce the system.

Thursday October 5th 2017

We will be using the coding language Python to code the raspberry pi. So today in IOT Principles we did a few coding examples. It doesn't seem like a bad language to learn but I'm definitely going to learn a bit more in my own time. I'll start off with code academy then find more tutorials online.

Intended Changes

Next month, I will try to begin planning out the aspects of my project more. I want to have a mockup of the app done and even begin coding it. I would like to have done a good bit of work with the raspberry pi in terms of sensors and cameras. I realised that I need to get my head down and really focus on the project if I want it to work. I need to do work bit by bit because if I leave a lot of the work to be done in the end it will be harder to achieve what I want to do.

Month: October

Reflective Journal - October 2017

Monday October 9th 2017

I'm struggling to refine my idea. I spent this morning researching other devices used in IoT for Elderly Care and so far nothing came up too similar to my idea which is good I suppose, but it means I may have less resources. I wrote out the three concepts of my project; the app, the raspberry pi, and the Alexa enabled device. Under each one I wrote a few points of what I would like them to do but now that I have changed my idea from child care to elderly care it seems to be getting more complicated. With the child care aspect it was a simple turn on the motion sensor and then allows Alexa to speak if movement was picked up. But now I'm not sure what my main function is going to be. Is it voice help? Is it the camera? Is it the app? Does the elderly person have access to the app? As far as I know at the minutes Alexa can not make phone calls to to anything other than other Alexa enabled devices so what will I do if there's an emergency? I have a lot of brainstorming to do! I have an AI assignment due this week so that has been taking all of my focus so hopefully after I finish that I can really concentrate on getting this project rolling.

Tuesday October 11th 2017

In my IOT Principles class today we got given our GrovePi and sensors. We have an assignment for that class in a few weeks where we have to use the sensors but it will be good practice as I will be using some of them in my Software Project. I haven't had much time to do a lot of my Software Project as we have a chess AI assignment due this friday. It's a big assignment and is taking up a lot of my time. Once I get that done I'll be able to focus on my Software project and begin writing up my project proposal.

Wednesday October 18th 2017

I got my chess assignment done and uploaded last friday, it was a hard and strenuous assignment but now that it's done I've been able to focus on my other modules. I took the software project proposal from moodle and put it into google docs. I wrote out the points in which I want to talk about under each of the headings. I feel this will help me organise my thoughts and know what I need to write about. I will elaborate on these points as the week goes on. I have a multimedia and mobile app development assignment due on Sunday so this week is focused on that and the project proposal.

Monday October 23rd 2017

Today I focused on the project proposal. It is due this Friday. I have everything that I want to talk about laid out in bullet points in a rough copy of the project proposal template so

now I just need to transfer those points to my final document and elaborate on them. I was still finding it difficult to refine my idea so I drew out a mind map and this helped me to connect all of the aspects that I wish to achieve.
* insert mind map*

I still haven't decided which language I want to code my app in. I'm developing an iOS app for the first time as opposed to previously building android apps. I've been looking into apples Swift language it seems like the best one to go with but if I don't chose that I'll probably chose python. I'll be coding in python for the raspberry pi so it would be nice to learn a new language instead but I don't mind furthering my knowledge of python as I'm not very experienced in it. I will ask my supervisor which language she thinks will be better to do. This week is going to very busy as the software project proposal is due this weekend as well as the strategic management assignment.

Tuesday October 24th 2017

I elaborated on my points for the project proposal. I was finding it difficult to understand some of the headings in the template so I looked at a few past final project technical reports and looked at the project proposals to get an idea of what people were writing under the headings. Once I got an idea of what to write I was able to elaborate on my points. I thought this was going to take me a really long time but once I started writing I was ¾ of the way to completing the project proposal. I need to write a bit more and then to the gantt chart.

Thursday October 26th 2017

I had my first meeting with my supervisor, Anu, today. She went through my project and gave me some helpful APIs to research. This was our first meeting so we didn't delve into too much detail about the project but we will have weekly meetings every thursday. We don't have one next week as it's reading week. The project proposal is due tomorrow I think I have it just about done I'm going to read over it and make sure everything is okay. The hardest part of the proposal was figuring out how to export the gantt chart from Microsoft Project. Everytime I exported it it didn't look right but with a bit of adjustment on photoshop I got it all on one page looking nice. I'm happy I got the proposal done before tomorrow because I start a new job this weekend and it would be very stressful trying to get the project proposal finished tomorrow. I'm going to send it to my supervisor for a review and then upload.

Saturday November 4th 2017

I'm currently in the library I usually don't go on a Saturday but unfortunately I didn't get to do much college work this week. It was reading week this week but I started a new job which took up the majority of my time. I'm off this weekend and plan on working all day both days to get my IOT and AI assignments done or almost done. My IOT assignment ties in with my Software Project. We have to attach the GrovePi to our Raspberry Pi with some of the sensors and gather the data. This will be good practice for when I have to use the sensors for my software project. Yesterday after work I met up with my Web services and API team in college. We went through the assignment and got it finished. It's not due until next Saturday but it's a relief to have one less assignment to worry about as I have three assignments due next weekend.

Thursday November 9th 2017

By doing my IOT assignment I have a better understanding of what way I want to approach using the raspberry pi for the software project. I'm not the strongest at coding so this assignment has helped me understand my limitations and what I have to work on. This week was very stressful as I had three assignments due plus this reflective journal but because the workload was a lot my IOT lecturer pushed our due date back a week. That took a lot of stress off me as it gives me more time to concentrate on my assignments instead of rushing them. I can now focus on my AI assignment for the rest of the week and then focus on IOT and other assignments this weekend. I think I might need to simplify my idea a little bit. I'm not great at coding so I might have to make it a bit easier for me to do or else my work will suffer.

Intended Changes

Next month, I will try to work more on my Software Project especially because the requirements
spec is due. I realised that I need to simplify my idea for my project so that I can work with my abilities and not
over complicate the idea to a point where I won't be able to code it.

Supervisor Meetings

Date of Meeting: 26th October 2017
Items discussed: It was the first meeting with my supervisor, Anu. Myself and another student were present. We discussed our ideas and she gave us a few things to research over reading week. We discussed our project proposals.

Month: November

Reflective Journal - November 2017

Wednesday November 15th 2017

I've been working on my IOT and AI assignments so I haven't been able to do much in regards to the software project. The requirement specification is due next weekend so after I have uploaded the two assignments I've been working on this week I will be able to focus more on the requirements specification.

Monday November 20th 2017

The requirement specification is due this Friday. Today I put the template in a google doc and wrote points beside the headings to what I want to put in them. I planned out what use cases I'm going to use, I will create them tomorrow and hopefully get a good load of the report done. I created a survey with a few questions in it so that I can see peoples opinions on the system that I am making. I posted it on facebook and sent it to family members so hopefully I get enough responses to make a good comparison of the results.

Tuesday November 21st 2017

I have a multimedia assignment due on Wednesday so I've been focusing on that today however I did get three of my use cases and use case diagrams done today I have 7 use cases in total so I will finish the rest tomorrow when I can. I finished the introduction for the requirements specification and put my results from my survey into the user requirements part of the document. I was happy with the results of the survey and it clarified a few requirements that my project needs. By doing this requirement specification document I've really been able to narrow down my idea and now I know exactly what way I want it to work.

Wednesday November 22nd 2017

I'm supposed to have a meeting with my supervisor tomorrow as she has dedicated a time slot every Thursday for the students she is a supervisor for to come and talk to her about the project but I don't think tomorrow's meeting is happening. Anu is my lecture for Multimedia and Mobile Application development and she has missed classes this week. I've heard from a few students that a member of her family died. I didn't go the the supervisor meeting the last 2 weeks as I hadn't made an progress on my software project so I didn't have anything to say to her. With the deadline for the requirement specification I am beginning to get nervous in case I can't send it to be checked before I upload it.

Thursday November 23rd 2017

I got a big chunk of my requirement specification done today. I finished my use cases and have filled most of the rest of the headings in I just have to finish the system architecture and the GUI tomorrow and then read over it all and make sure it is okay before I upload it. I hope that I have conveyed what I understand in my head correctly in the document and that my idea comes across the way I intend it to.

Friday November 24th 2017

I think I was able to get my document finished this morning. I was in the library this morning and then in work at 3 and now I'm back in the college at 8 reading over my document and making small changes before I upload it. I think it's done now so I will upload it in a few. I haven't heard anything about a replacement supervisor as Anu has had to go back to India for personal issues so I will just have to upload the document without my supervisor reading it.

Thursday November 30th 2017

My midpoint tech review is due tonight. I spent all morning finishing it. It wasn't as hard as I expected as a lot of the points were repeated from the requirements specification and the project proposal. I was really nervous when I started writing this document but now that I basically have it finished I am feeling a lot better about it. I am in work at three until eight but I am going to come back to the college and go to the library to read over the document and fix what needs to be fixed before I upload it.

Monday December 4th 2017

I was meant to have my mid point presentation today but due to personal circumstances it has been pushed back until next week. I had spent the whole weekend working on my AI assignment and my prototype for my software project along with my presentation. I was extremely stressed all weekend and my personal issues that have been going on didn't help with the stress. I was so relieved when Louise Devlin called me and allowed me to get an extension on my presentation. This gives me a little extra time to gather my thoughts and present my project well.

Month: January
Reflective Journal - January 2018

Supervisor Meeting:
Feb 5th

Monday January 1st 2018

The ‘break’ for Christmas is over now. Our exams start on Thursday so I really need to get my head down now and study as much as I can. I had no time over the Christmas break to study as Our CA’s went on until the December 20th and I had my Midpoint presentation deferred until the 19th December so I was working on those right up until Christmas week plus working in retail. I was very busy. My goal now is to focus as much as I can studying for the exams and then get back into the Software Project.

Thursday January 11th

Exams are finished now. We had our last one, IOT Principles, today. It went really well I think. Strategic Management was also okay but AI was awful. Nothing that I studied came up. I’m really worried about the results because I really don’t want to have to repeat in August as I am going to America for the Summer and I don’t want to have to come home early for the repeat. We’ll see how it goes when the results come out.

Tuesday January 16th 2018

I’m off work for the week until Saturday. I’m going to try and fit in as much project work as I can this week before classes start back again on Monday so that I can get a good idea of what I need to achieve this month. I was meant to do some project work yesterday but ended up taking the day off so I’m going to put in extra work today. I’m currently in the canteen in NCI organising what I want to do this week. I’ve done a bit of research before on working with Alexa and a raspberry pi together but I’m going to do a bit more research and get an understanding before I begun setting them up. When I go home tonight I might work on the python script to incorporate the camera and the PIR sensor on the raspberry pi.

Our timetable for next semester is really nice we aren’t in that many hours but I’m going to make sure at minimum I’m in 9-5 everyday maybe even later and just work on my project as much as I can. This months work is vital as I will need to start testing it and gathering data near the end of February.

Tuesday January 23rd 2017

Classes began again this week. We only have three modules plus the software project so it’s not too bad it gives us more time to work on our project. I’m going to fill in the time that I don’t have classes with going to the library and working on assignments but mainly my software project. All three modules this semester are 100% so we have no more exams left. I’ve come up with an idea for my IOT project but I need to research it a little bit more and make sure my idea meets the criteria. Basically, I want to make a smart clock. This isn’t a new idea I’ve seen them before. What I want to do is use the android app to control what is being shown on the clock. The clock will be made from a raspberry pi with the LCD screen, temperature and humidity sensor, buzzer and button. The ‘home page’ will be a loop of information which will scroll

horizontally across the screen so for example the time then the current temperature then the time in Los Angeles, then the time for you next alarm. These will be customisable to the user by using the app. Setting one clock face can also be set too instead of looping through the information the user can set the Temperature to be shown constantly. Alarms may be set on the app and will physically have to be turned off by the button on the raspberry pi. That's a rough idea of my project I'm going to talk to Dominic and check that it meets the requirements.

We talked about amazon AWS in IOT today. I want to use this for my software project as the database and server. I've signed up for an education account so hopefully I get approved and that the package includes what I need.

Monday February 5th 2018

I had my first supervisor meeting in a few months. My supervisor, Anu, had to take some personal time so we couldn't have any meetings before Christmas. The meeting wasn't long we just discussed where I'm at at the moment and I will show her my prototype in the next meeting ans she did not get to see it in my midpoint presentation. By next week I would like to have my raspberry pi set up with all of the sensors that I need. I purchased a camera and a PIR sensor, I have never worked with them before so I am going to research the python script for them to work and hopefully have them working by next week. I've planned out what I want to get done each week and hopefully by the end of february I will have the system up and running and I can begin to do some testing.
We got our exam results today. I passed everything but AI. I knew I didn't do great I'm more annoyed that you can't pass by compensation in final year as I got 36.5% in the module. I'm going to America for the Summer so now I will have to come home early for the repeat in August.

Month: February

Reflective Journal - February 2018

Monday February 12th 2018

I was meant to have a supervisor meeting today but our class had a meeting to discuss the big fail rate in our AI exam. It turns out that you can pass by compensation so I won't have to repeat the exam or come home early from America. I'm so happy but the results from our class were not good it was a huge fail rate so our class reps are trying to find a remedy for this. I set up my sensors for my pi. I set the camera up and ran an example python script to test it out. I was able to get it to take a photo and video so I'm going to try and add this code to my project with a few tweaks. The video bit is difficult because it saves in a h264 file which is very difficult to view it has to be converted in terminal. I'm going to do a bit of research and see if I can find a way to get the video to convert into an mp4 without me having to type it. I couldn't set up my PIR sensors because I didn't have the female-female cables that is needed to connect them, I've

ordered them off Amazon so they should arrive soon. I'm going to try and incorporate the camera and PIR sensors in my IOT CA1, this will be good practice for my software project.

Friday February 16th 2018

I've made more progress with my IOT project but I'm still running into problems. I've set up all of my sensors and I have the camera working. So far I have the project working but it's very basic like the other CA we had before christmas. The deadline is Sunday so I have a lot of hours to put in to get it working.

Friday March 2nd 2018

I ended up submitting my assignment 11 days late! I could of submitted it the day it was meant to be done but I would of lost so many marks because I didn't meet most of the requirements. I wanted to use AWS instead of dweet to get the 10% which I did. It was a bit of a struggle but with the help of my friend I was able to get it working. I kept getting stuck on small errors that actually had easy fixes but just figuring out how to fix them took time. For some reason when using AWS to send the message to the android app it wouldn't work but it worked with the emulator. It was strange as my friends phone was running the same software and it worked on his. I eventually got everything working and met most of the requirements in the project description. I didn't have much error handling and unfortunately when I went to record the video explaining how everything worked my emulator stopped working. I had other assignments that I needed to do so instead of spending a huge amount of time figuring out how to fix it I just had to upload without the video. My software project will use everything that I used in this assignment so it was really beneficial for me to learn everything I did during this assignment.

Tuesday March 6th 2018

I got my photos taken in the Atrium today for my project profile. It's the last thing I need to upload for my profile. I completed the 40/50 word description the other day. It was actually really hard to give a good description with such a small word count. I wanted my idea to come across right but that was hard with such little words. Dominic gave me an LCD screen for the raspberry pi today. He gave us our project descriptions for IOT and I need a screen for my idea. I think I might also incorporate it into my software project. I'm thinking I could use it to show if the system is armed or not. I don't think I'll add any functionality to it I'm just going to use it for visuals. I need to learn how ti use it for my IOT project anyway so I might as well add it to my software project.

Month: March

Reflective Journal - March 2018

Monday March 12th 2018

I haven't had the chance to do much project work this past week as I had a data mining and visualisation assignment due so that took up a good bit of my time. I have the presentation for that module tomorrow. I'm kind of nervous because he hasn't said if it's a casual presentation where he'll just come around to everyone's laptop or if we have to present at the top of the class. But we're on Reading Week next week so I plan on getting a good bit of project work done.

Friday March 30th 2018

The easter break was spent more on planning rather than coding etc. I re-evaluated my project and what my goal with it was. I spent too long trying to figure out simple things in Xcode so I think trying to teach myself how to make an iOS app is too much work and I just simply don't have the time to dedicate to that. So I've decided to do an android app. I've made a few of them for past projects and I can get three times the amount of work done than I would trying to do something in Xcode. I'm going to wait until I add the functionality into the app but my idea for ranking contacts and calling them by rank might be a good idea but too hard in reality but I'll see when it comes to coding that.

Thursday April 5th 2018

I've made a lot of progress this week. My MacBook Pro is slowly dying. It was frustrating me so much because it was so slow and the CPU couldn't handle using the emulator for android studio. So I moved my project to my iMac. It's amazing how much you get done when you have a fast machine. I redesigned my mockups for my app. They're pretty much the same design I had in my midpoint proposal I just changed a few things and made them more realistic as opposed to a wireframe. I have 50% of my UI done in my app already. I'm hoping to have the UI done completely by the end of the week and then the functionality done by next week. The only thing that I need to research is fragments. I used them in a past app but that was 2 years ago and a lot of the code which was used is now deprecated. Once I have the app done. I'm gonna work on the python script this shouldn't take long as I am basing it off of my IOT project and then the alexa skill shouldn't be too hard. This next month is so vital. I was hoping to have more progress done by now but I'll just have to work extra hard to accomplish what I want to.

Month: April

Reflective Journal - April 2018

Thursday April 12th 2018

I haven't been able to do much of Software Project lately as I have three projects due this month. Data Mining & Visualisations is due on Sunday. I've so much to do for it that I don't think I'll get to work on Software Project for a while. Cloud Application Development is due Sunday the 22nd so once I upload my Data Mining & Visualisations project I'll have to focus on working on that.

Friday April 22nd 2018
Two assignments down, one more to go and then the Software Project. We had our presentations for Cloud Application Development on Tuesday. I was last for the day. I didn't mind because it meant I could prepare for the presentation. It was quite casual so I wasn't extremely stressed about it. I'm starting to worry as I have a lot of work to do for my IOT Development final project and my Software Project. I think I'm going to be really tight on time.

Month: May
Reflective Journal - May 2018

Wednesday May 1st 2018

My IOT Development final project was due last Sunday. I couldn't get it working so I have to upload it late. I was working on it today in the library while trying to work on Software Project work too. The stress of everything got to me and I had a bit of a breakdown. I had to go for a walk along the quays and clear my head. I think I was trying achieve too much in both projects and I just didn't know how to do what I wanted to. So after I calmed down a bit I reevaluated what I wanted to do and what I can do with the skill set that I have. I simplified my IOT project, I'll probably lose marks for it being a little bit different to the proposal but it turned out to be a lot harder to make than I expected. I'll receive a 10% penalty for late upload but it's better than uploading nothing at all.

Thursday May 10th 2018
I'm happy with where my app is at the moment. I have it mostly done. I added in the firebase code for the database and the authentication today. Most of the functionality is working so tomorrow I just have to do a few visual bits and a couple of extra things.

Friday May 11th 2018
I spent all day today trying to fix an error. I'm really annoyed because I spent the whole day trying to fix it. It was to do with firebase which I had working last night. I didn't even do anything differently I picked up right where I left off so I couldn't understand why it wasn't working. I tried all of the steps again and nothing. I even reverted back to when it was working on github and still nothing. I ended up creating a new project to just test out the firebase code with nothing else and I was still getting the error even though it was a brand new project with brand new AWS credentials and everything. It was so frustrating. I ended up reverting back to when I didn't have anything to do with firebase in the app and eventually I got it working with a few changes. It was infuriating because I spent so much time trying to fix it and I had it working the night before perfectly. I suspect it was something to do with the AWS files but I couldn't tell because there was no error in the logs! That's why it took me so long to fix it because I didn't know what I was looking for to fix. I wanted to start testing today but I'll have to wait until tomorrow.

We got our table numbers and presentation times. Mine is May 23rd at 11am. I'm really nervous about it. I hope my system doesn't crash.

Saturday May 12th 2018

I did my testing today. I got my mam, dad and sister to test out the app. It went well but I was very nervous beforehand. I was worried that I would encounter big errors and not have time to fix them. The firebase issue really set me back for time.

Sunday May 13th 2018

The final upload is today. I have a good bit of the report to do before I can upload it. I also need to design my poster and fix up a few pieces of my code. It's been a tough few days there was so much to do. I've barely slept or eaten all week. These past few weeks have been very difficult as every week for three weeks there was an assignment due for a module and then on the fifth week the final project was due. Having this many assignments due at the same time didn't allow for much work to be done on the software project so it was very stressful. It's going to be such a relief to upload this project.

d. Other Material Used

Google Forms was used to create a survey.

e. User Manual/ Guidelines

i. Materials needed

The extra materials needed to use this system are a smartphone and an Alexa enabled device.

ii. Setting up the system

To set up the system mount it in from of the place that you wish to be monitored eg. the front door

iii. Download the app

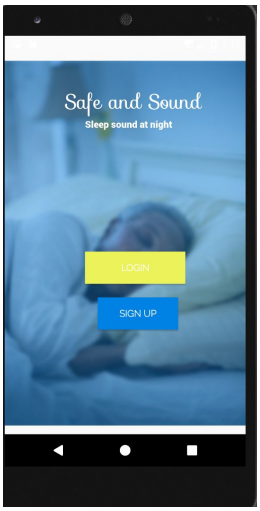
To download the app go the the google play store and look up Safe and Sound

iv. Add the safe and sound skill to your alexa enabled device

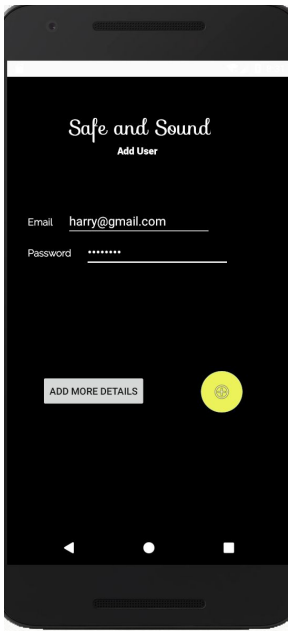
The safeandsound skill can be added to your alexa enabled device via the Alexa app.

v. Set up an account on the app

To set up an account you must register your details. To do this click the login button.



You can then enter your details.

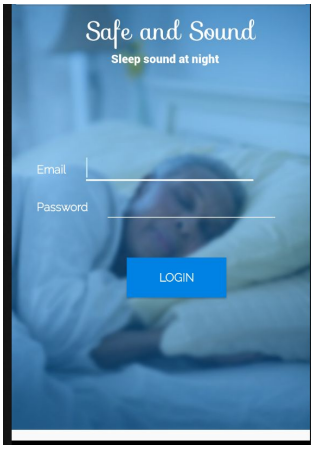


To add more details like name, phone number and username click the add more details button. Or else just click the plus button (+)

Once your details have been registered you will be brought to the login page.

vi. Login to the app

Enter your details to login.



Once logged in you will be brought to the home page.

vii. How to turn system on

To turn the system on say the following command to your Alexa enabled device: “Alexa ask safeandsound to turn the system on”

viii. How to turn system off

To turn the system off say the following command to your Alexa enabled device: “Alexa ask safeandsound to turn the system off”

ix. How to log out

Go to the settings tab and then select the logout button.