HEART HOPE HELP

Prepared For:
Nathan Cho, Pastor
Bellevue Sarang Church

Prepared By: Hope
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Software Engineering, Seattle Pacific University

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1.0 Executive Summary

Hope is a team of prospective software engineers in their final year of college who are dedicated to providing clients with the best possible system to fulfill their needs. The team consists of Charlie Ang (leader), Jeannie Lee (recorder), Yonathan Yonathan (librarian), and Tai Tran.

Bellevue Sarang Church (BSC), a local community Church coordinated by Pastor Nathan Cho, has consulted Hope to design and implement an application to assist homeless individuals and to further educate the public on the issue of homelessness. The system will be used to benefit the homeless around the city and surrounding communities, all while helping educate the greater public on the issue of homelessness.

Hope has assessed the System Request provided by Bellevue Sarang Church and deemed it a feasible project with little to no additional resources required. The proposed system will be named HeartHopeHelp (HHH). HHH will allow clients using the application to locate homeless individuals around their current position and read upon the homeless individual's biography and story. The client can then contribute to the homeless by finding them using the homeless individual's last known location. Because HHH is a user-based application, users will also have the ability to add and pinpoint the spotting of a homeless individual on the application, in which they are able to create a profile of the homeless individual they have talked to or interviewed. So essentially, users of this application can locate homeless individuals to read on their biography and contribute if they desire, users can help by marking the location of a homeless individual with the homeless individual's details, or users can do both. The main beneficiary from this system will of course be the homeless individuals themselves because their stories, made possible to generous/caring viewers thanks to this system, will be getting the help they need from users to move on with their lives. To help achieve this, Hope will be developing a mobile application as well as database management to ensure that all the functionalities set forth by BSC are met beyond expectations.

2.0 Project Description

2.1 System Description and Rationale

HeartHopeHelp is built for users to view profiles of nearby homeless individuals. Users can read the homeless individual's biography and read more into their life stories if provided. This in turn helps educate users on homelessness because it may help eliminate any previous stereotypes or preconceptions users may have toward the homeless. It also helps the homeless individuals themselves because they are simply trying to live their everyday lives and, they too, need the necessities to move on with their lives. The hope is that users will show compassion and generosity toward the homeless, and assist them with basic needs.

2.2 System Scope

For this project, we plan to implement a mobile application in which users will have the capability to use their current location to locate nearby homeless individuals who have been spotted at that specific location. Users will have the ability to add a spotting of a homeless individual to the application, as well as a more detailed biography of the individual. This application will be mainly user-interactive where users will can add the location of a homeless individual, and where users can also locate homeless individuals (and hopefully make some sort of contribution). Our primary goal is to hopefully educate people who want to contribute and help make a difference in a fashion that will make it easier for them to learn and locate certain individuals.

Ideally, users will have interacted with the homeless to gain more insight into their personal life and how they ended up in the unfortunate situation in which they are in now. The application will pinpoint the exact location of where the homeless individual was encountered (homeless individuals tends to stay around the same general vicinity), the name of the individual, an image of the individual (if consent is provided from the homeless individual), some personal information such as age, height, hometown, and most importantly, the life story provided by the homeless individual (this can be a video of the individual speaking or it can be written up). To get the most out of this application, a picture and a meaningful life story will be essential to help inform the public about that certain individual, versus just encountering and passing by the individual on the street without giving that person a second thought.

On the other hand, users using this application will have displayed to them homeless individuals that were marked nearby the user's current position. The user can click and read details about that individual that they otherwise wouldn't have known about if it wasn't for this application. If the user decides to, they can then contribute to the homeless individual by locating and assisting the homeless individual in whatever fashion they would like.

2.3 System Development and Constraints

The following are constraints on the implementation of HeartHopeHelp:

- **Performance Feature:** The cloud database will need to be large enough to support any number of users
- **User-Interface:** The system will need to be user-friendly and easy to use as clients will vary by age and experience with technology
- **Compatibility/Portability:** This system will only be available on the Android mobile phones to begin with. Since clients will need to have access to our service from their personal devices, multiple operating system will be required. We hope to expand this to iOS as well.
- **Method of Payment:** Contributions will be restricted to being made only directly from users themselves. We hope to integrate a feature where contributions are immediately made available to the homeless individual users choose (through reloadable card, etc.)
- **Security Concerns:** When encountering the homeless, users need to be concerned about their own safety. Hope will need to make sure profiles are legitimate, no one intends to use this app to harm the homeless, and users are safe when encountering the homeless.
- **Management Issues:** Due to our limited resources, we are currently not available 24/7 for system maintenance and customer support.
- **Legal Constraints:** Users use the application at their own risk and we are not responsible for any liabilities resulting from the use of this app. We also need consent from the homeless to publicize their personal information.

CPE/CSC 415n – Team and Project Proposal

PART 1 à TEAM
Team Name →

Hope

Team Members
(Initial) Leader → Charlie Ang (angc@spu.edu)

(Initial) Recorder → Jeannie Lee (leej64@spu.edu)

Librarian → Yonathan Yonathan (yonathany@spu.edu)

Members → Charlie Ang, Tai Tran(addytran@spu.edu), Jeannie Lee, Yonathan Yonathan

PART 2 à PROJECT
Working Name of System →

Heart Hope Help

Project Sponsor →

Name: Bellevue Sarang Church
Contact: 425-999-0917 (Nathan Cho)

Project Scope →

For this project, we plan to implement a mobile application in which users will have the capability to use their location services (current GPS location) to locate nearby homeless individuals who have been spotted at that specific location. Users will have the ability to add a spotting of a homeless individual to the application, as well as a more detailed biography of the individual. This application will be mainly user-interactive where users will be able to add the location of a homeless individual, and where users can also locate homeless individuals (and hopefully make some sort of contribution). Our primary goal is to hopefully educate people who want to contribute and help make a difference in a fashion that will make it easier for them to learn and locate certain individuals.

Ideally, users will have interacted with the homeless to gain more insight into their personal life and how they ended up in the unfortunate situation in which they are in now. The application will pinpoint the exact location of where the homeless individual was encountered (homeless individuals tends to stay around the same general vicinity), the name of the individual, an image of the individual (if consent is provided from the homeless individual), some personal information such as age, height, hometown, etc, and most importantly, the life story provided by the homeless individual (this can be a video of the individual speaking or it can be written up). To get the most out of this application, a picture and a meaningful life story will be essential to help inform the public about that certain

individual, versus just encountering and passing by the individual on the street without giving that person a second thought.

On the other hand, users using this application will have displayed to them homeless individuals that were marked nearby the user's current position. The user can click and read details about that individual that they otherwise wouldn't have known about if it wasn't for this application. If the user decides to, they can then contribute to the homeless individual by locating and assisting the homeless individual in whatever fashion they would like.

Why you have chosen this project →

We have chosen this project because the homelessness crisis continues to be a major problem in cities across the nation, especially locally here in Seattle. In response to this crisis, our idea is to create a system that will help educate the public and the surrounding community in regards to homelessness by providing more insight and help shed light into specific homeless individuals. This system will help restore any stereotypes people may have in regards to homeless individuals by providing the homeless individual an opportunity to voice their life stories and how they ended up in their position in which they belong today. Each individual has their own unique story and we think it is important for the public to at least be aware of these stories. All in all, our hope is that this system will be an outlet for homeless individuals to broadcast/inform the public on their struggles and current situation. Hopefully, this system will educate/inform/engage users and the surrounding community with hopes that they can somehow contribute to the homeless (whether that be providing monetary value, food, shelter, etc.). Our hope is that this system will one day help drastically reduce the homelessness population on the streets, and most importantly, eliminate stereotypes people have regarding the homeless.

Team Preparation →

Our chosen development environment is: Mobile Application (preferably Android to begin with and hopefully also IOS if time permits)

Previous coursework or practical experience:
- Android Mobile Dev experience (CSC 4800)
- Some database familiarity (SQL/Cloud)
- C++, Java experience

SYSTEM REQUEST – (HEART HOPE HELP)

Project Sponsor[1]

Name: Nathan Cho   Email: wabora@gmail.com
Organization / Department: Bellevue Sarang Church
Phone: 425-999-0917

Opportunity Statement[2]:

Our Church has been doing some homeless outreach for 6+ years and we are seeing an increase in the homeless population around the Seattle metro area. As a Church that has been actively assisting and helping the homeless, we understand that the homeless have their own unique stories that resulted in their current situation, and we would like to educate the public or make the public aware of each homeless individual's stories.

Proposed Product
Background and Context[3]:

There are around 10,000 homeless individuals currently living on the streets of Seattle. I believe that part of why people are not contributing to the homeless is because of their preconceived stereotypes they have against the homeless. If only there was a way in which the homeless can voice their life stories for the public to hear, I think this would better educate and inform the public on the current homelessness situation, and maybe even feel the need to help out a certain homeless individual based on their unique story. Using this system, I am envisioning that the users of this system will not only be for members of our Church, but also for the public (app users) to give to the homeless people.

Initial Vision and Scope[4]:

- Allows users to open the application and view all homeless people that have been tagged around their location (within a certain vicinity e.g. 1 mile)
- Allows user to enter a location and view all homeless people that have been tagged around their location
- Allows users to pinpoint the location of a homeless person and create a profile (picture, name, age, hometown, story, etc.)

Stakeholders[5]:

- Bellevue Sarang Church
- Nathan Cho (pastor)
- Homeless individuals
- Users - anyone using the app

Expected Benefits:

- Homeless individuals will benefit directly from user contributions (money, food, shelter, etc.)
- Increase contributions made to the homeless to help lower the homeless population
- The biggest benefit is to help educate the public on the homelessness issue and helping users learn more about certain homeless individuals instead of ignoring and judging based on skin color, etc.

Other Issues or Constraints to be considered (what else you would like us to know):

- Method of Payment: should contributions be made to the homeless in person with cash, donate to a reloadable card, etc.
- Ensure that users will make legitimate posts
- User safety when encountering a homeless

4.0 Nonfunctional Requirement

The following nonfunctional requirements are attributes of the system and constraints that may limit the boundaries of the proposed solution. Operation requirements include constraints on the system itself and specify physical and technical environments in which the system must operate. Performance requirements specify the speed, capacity, and reliability the system is required to exhibit to meet the needs of its users. Security requirements specify who has authorized access to the system under what circumstance. Cultural and political requirements include company policies restricting purchases, products, supply channels, and industry standards or requirements. Project requirements/project constraints include constraints the project will exhibit.

Operational Requirements
- User interface must be user-friendly and easy to learn for users of all age groups and technical abilities
- System must be compatible only on Android smartphones
- All application data must be stored in the cloud database
- System will require an internet connection to function
- Users must have a Facebook account to login to the system

Performance Requirements
- Login process into the system must be completed in no more than one minute
- Response time for fetching data from the API must be completed within 30 seconds

Security Requirements
- Log user out of system after 15 minutes of no activity
- Encrypt all data in the cloud database to ensure user privacy; decrypt data before sending data back to user
- Only authorized personnel (admin/owner) will be able to access the database

Cultural/Political Requirements
- System must be in English

Process Requirements/Project Constraints
- System must be fully functional by June 7, 2017
- Cloud database must be large enough to support 2,000 profiles
- We are not available 24/7 for system maintenance and customer support

Other Nonfunctional Requirements
- We are not responsible for any liabilities or legal issues arising from the use of this system
- Privacy/personal rights: consent is needed from the homeless individual before publishing the homeless profile

5.0 Development and Operating Environments

The Architecture Design section is divided into several sections. The first section contains the infrastructure architecture overview model to provide a graphical representation of the major components of the physical system architecture. The second section describes the hardware and software requirements needed to support the application. The third section describes any potential security threats or stated security requirements. Lastly, the fourth section describes any tools to be used in system development.

5.1 System Architecture

HeartHopeHelp is an interconnected system. This is a server-based system that utilizes the cloud. Moreover, we also have a local backup server to backup our database frequently. Users and admins access the internet and connect to our cloud database to retrieve information and populate the system.
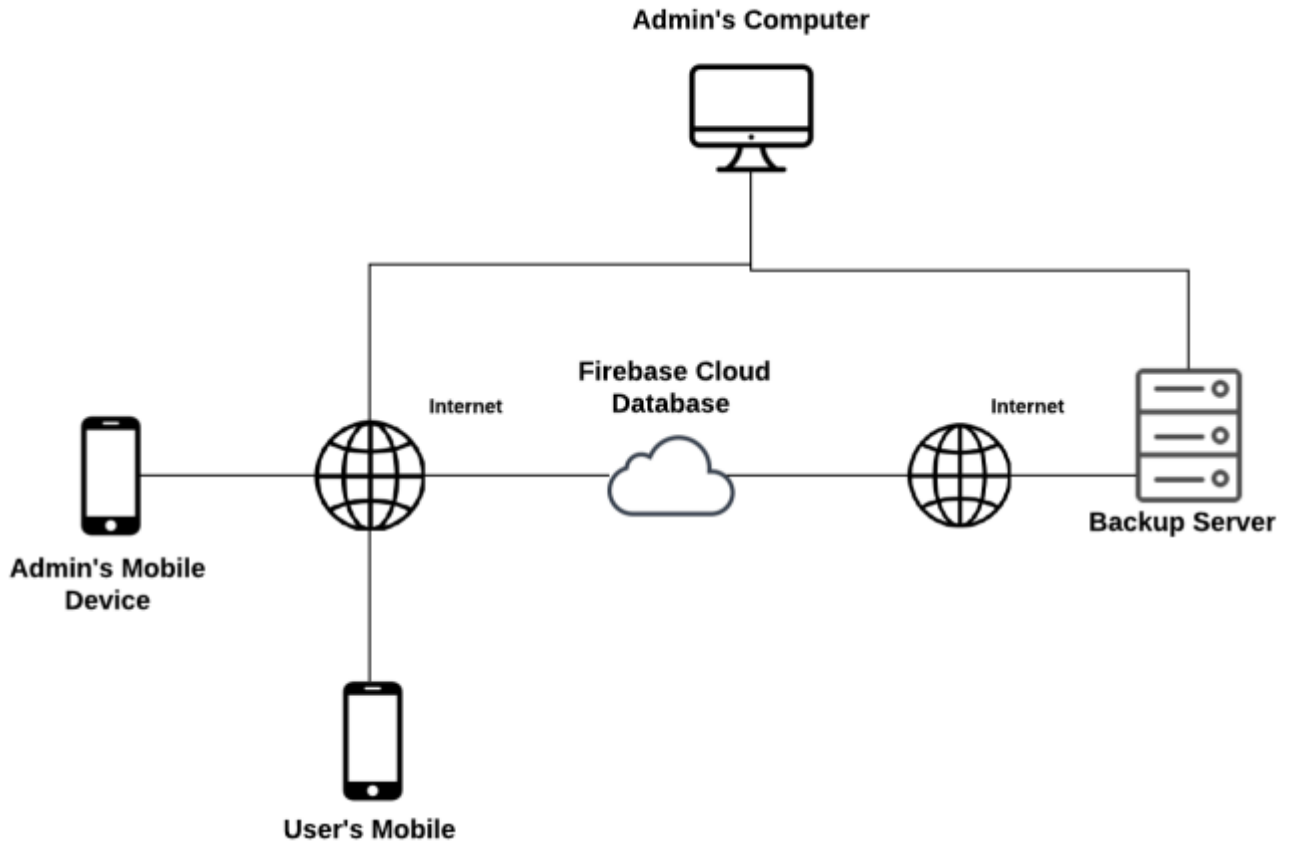
5.2 Hardware/Software Environment

The following are a list of hardware and software requirements needed to implement HeartHopeHelp. The required hardware components describe what hardware will be required to implement the system's architecture. The required software components describe what software will be required to implement this system.

Required Hardware Components
- **HeartHopeHelp Web Server**
  - This server runs on the Firebase Cloud Server. The server will host the database for HeartHopeHelp that users connect to. The database will store and contain application details. The estimated cost for the server ranges from $0 - $200.
- **Admin Computers**
  - This includes all the computers needed for administrators and developers to design and implement the system. The estimated cost for the computers is around $5000. Our admins will likely have their own computers to use.
- **Admin Mobiles**
  - This includes all the mobile devices needed for administrators and developers to implement and test the designed system. The estimated cost for the mobile devices is around $2000.
- **Local Backup Server Computer**
  - This machine will be located locally within the HeartHopeHelp premise. It will be primarily used by the owners and management of HeartHopeHelp. This computer's primary purpose serves to backup the cloud server with vital information to run the application. The estimated cost for the local backup computer is $1500.

Required Software Components
- **Windows 10 (or newer)**
  - A version of the Windows operating system to run on the admin computers and local backup server computer. Any version of the Windows operating system would work, but we simply recommend the most up-to-date version for maximum efficiency and security features. The estimated cost for the operating system is around $500 since we will need about five copies to begin with.
- **Android Studio**
  - This is the developer software we are using to create the android application system. The software is free and is of no cost to us as developers to use.
- **Oracle Database Security Software**
  - This software helps to ensure data privacy and protect against threats. It also helps protect valuable information stored in the database and web server. The estimated cost for the security software is from $200 - $500.

5.3 System Security

- Unauthorized/restricted access
    - o Only admins and owner can access the database and servers.
- Internet/web issues
    - o Internet and web access should be protected by some form of anti-virus protection to protect from harmful threats
- Privacy concerns
    - o Consent should be required from the homeless individual before publishing their picture and/or profile information to the public
- Security/database server protection
    - o Database security software to ensure data privacy. Data should also be encrypted and protect against threats.
- User devices
    - o User devices must protect their device against bugs and viruses from the use of our application

5.4 Development Environment

Tools to be used in the system development:

- **Android Studio**: the official integrated development environment for Android and provides the fastest tools for building apps on every type of Android device
- **Firebase Cloud Server**: real time cloud-hosted database which stores data as JSON and synchronized in real time to every connected client
- **Google Maps API**: popular and widely-used map interface to power location experiences ofr users
- **Facebook API**: popular platform for building applications that are available to members of Facebook
- **Lucid Chart**: web's leading diagramming and visualization tool for creating flowcharts, diagrams, and UML sketches
- **Balsamiq**: a great wireframing and mock up tool that can easily be shared with clients

6.0 Data (Structural) Design

This section contains a UML class diagram displaying the classes of HeartHopeHelp, as well as the attributes and operations for each class. This section also contains detailed metadat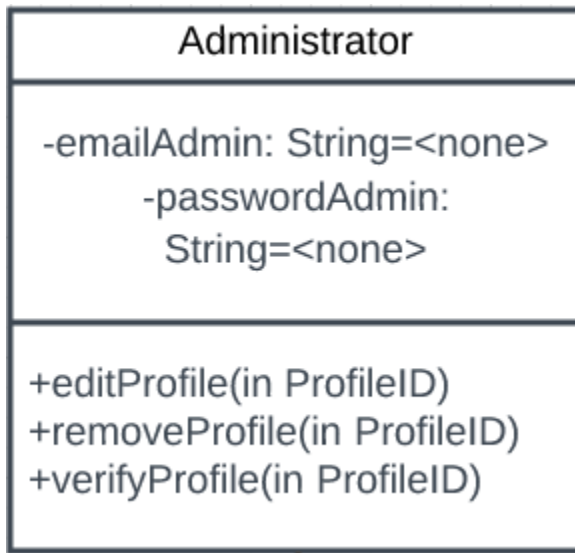a to show each class in greater detail. The metadata will display the class model, followed by the class description, attributes, operations, and the documentation for each of the operations.

6.1 Class Diagram
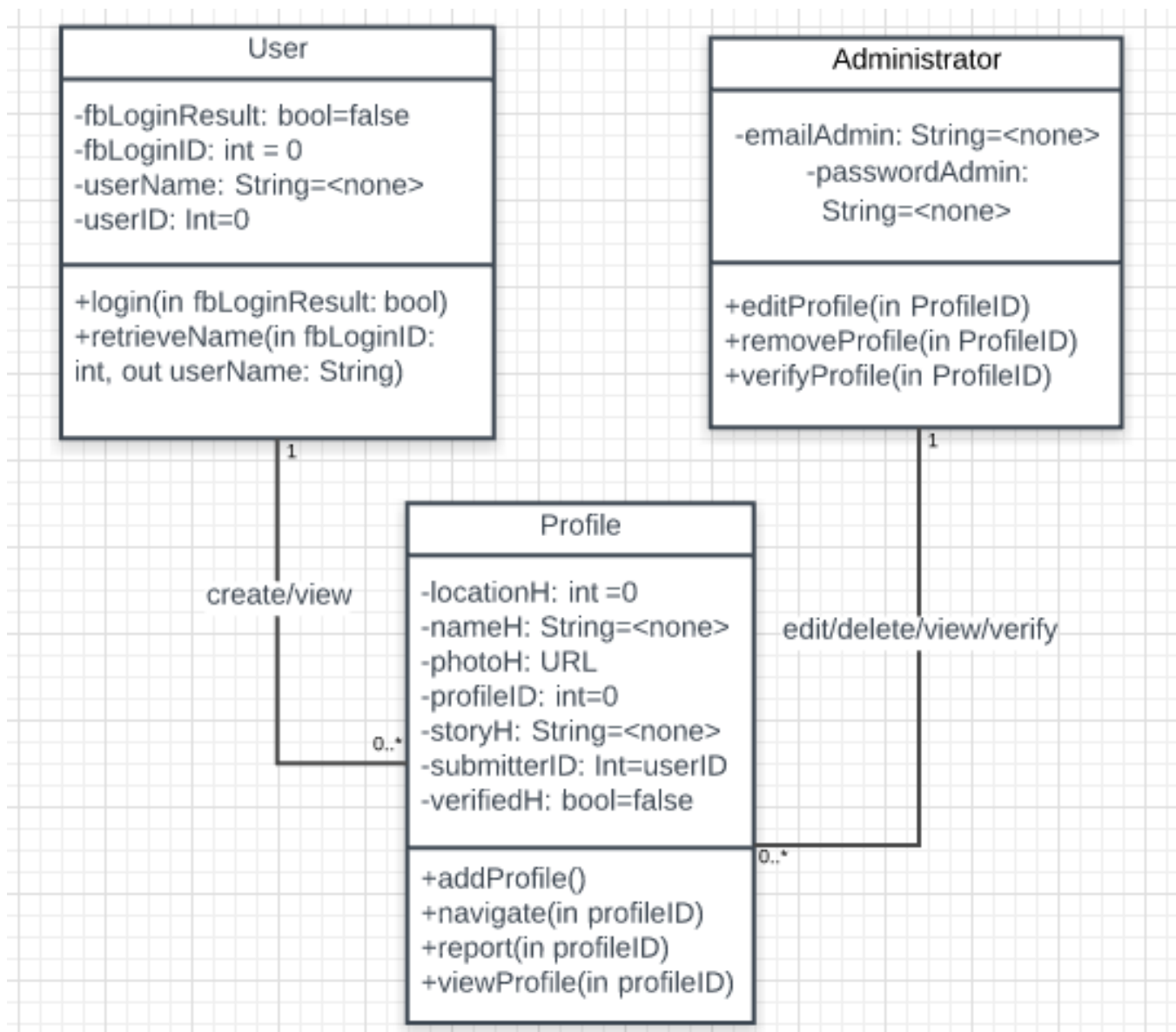
6.2 Data Dictionary (Metadata)

Description: Represents the system administrator
Visibility: Public
Is Abstract: No

Attributes:

Name	Description	Data Type	Is Derived	Is Read Only	Visibility	Multiplicity	Default Value
emailAdmin	Email address of administrator	String	No	No	Private	1	<None>
passwordAdmin	Password for administrator's login	String	No	No	Private	1	<None>

Operations:

Name	Description	Return Type	Parameters	Visibility	Scope	Is Query	Is Polymorphic
editProfile	Let administrator edit profile of homeless individual	<None>	None	Public	Instance	Yes	No
removeProfile	Let administrator remove profile of homeless individual	<None>	None	Public	Instance	No	No

verifyProfile	Let administrator verify profile of homeless individual	<None>	None	Public	Instance	No	No

pseudocode:
system will ask admin to login using email and password
if
        the email and password match with the database
      redirect admin to the edit, remove and verify user page
            editProfile()
                admin will have the privilege to edit the user/ homeless individual profile, system
                will ask admin when the editing is done.
            removeProfile()
                system will ask admin to remove / keep the user/ homeless individual profile
            verifyProfile()
                system will ask admin to verify the legitimate of the user profile
else
      the email and password does not match with the database
      system will ask admin to re-enter the email and password / exit the system

```
┌─────────────────────────────────────┐
│              Profile                 │
├─────────────────────────────────────┤
│ -locationH: int =0                   │
│ -nameH: String=<none>                │
│ -photoH: URL                         │
│ -profileID: int=0                    │
│ -storyH: String=<none>               │
│ -submitterID: Int=userID             │
│ -verifiedH: bool=fasle               │
├─────────────────────────────────────┤
│ +addProfile()                        │
│ +navigate(in profileID)              │
│ +report(in profileID)                │
│ +viewProfile(in profileID)           │
└─────────────────────────────────────┘
```

Description: Represents the profile of a homeless individual
Visibility: Public
Is Abstract: No

Attributes:

Name	Description	Data Type	Is Derived	Is Read Only	Visibility	Multiplicity	Default Value
location	Name of chef	Integer	No	No	Private	1	<None>
nameH	Name of homeless individual	String	No	No	Private	1	<None>
photoH	Photo of homeless individual	URL	No	No	Private	1	<None>
profileID	Unique ID number for profile	Integer	No	No	Private	1	<None>
storyH	Story of homeless individual	String	No	No	Private	1	<None>
submitterID	Unique ID number for submitter	Integer	Yes	No	Private	1	UserID
verifiedH	Verify homeless individual	Boolean	No	No	Private	1	false

Operations:

Name	Description	Return Type	Parameters	Visibility	Scope	Is Query	Is Polymorphic
addProfile	Let users add profile of homeless individual	<None>	None	Public	Instance	No	No
navigate	Navigate users to location of homeless individual	<None>	None	Public	Instance	No	No
report	Allow user to report if there's any issue	<None>	None	Public	Instance	No	No
viewProfile	Allow user view profile of homeless individual	<None>	None	Public	Instance	Yes	No

Pseudocode:
User:
      addProfile(in profileID)
      user will be ask for:
            locationH
            NameH
            PhotoH
            ProfileH
            StoryH
      of the homeless individual
      Submit button
            if user click the submit button
                  add the new profile
            else
                  if the user cancel the profile add
                  back to profile page

      navigateProfile(in ProfileID)
      user will be ask whether they want to navigate their current position to the homeless individual
            navigate button
            if user click the navigate button
                  redirect to google maps
            else
                  back to profile page

report(in Profile Id)
user will be able to report the homeless individual/ any error on their apps
        report button
        if
                user click the report button
                report form will pop up
        else
                if the user cancel the report
                back to profile page
viewProfile(in Profile ID)
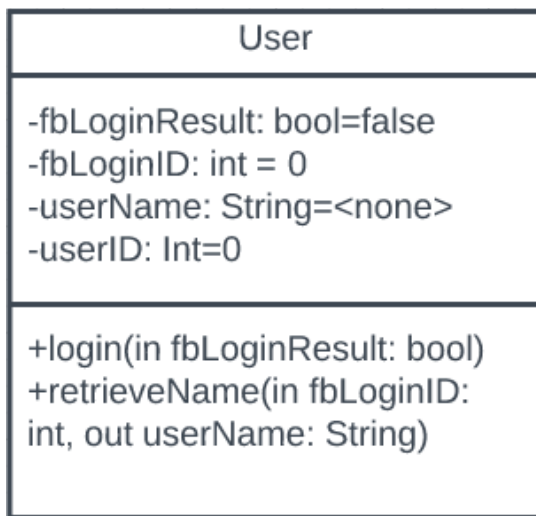user will be able to view nearby homeless individual profile
        view profile button
        if
                user click the view profile button
                homeless individual profile will pop out

```
┌─────────────────────────────────────┐
│               User                  │
├─────────────────────────────────────┤
│ -fbLoginResult: bool=false          │
│ -fbLoginID: int = 0                 │
│ -userName: String=<none>            │
│ -userID: Int=0                      │
├─────────────────────────────────────┤
│ +login(in fbLoginResult: bool)      │
│ +retrieveName(in fbLoginID:         │
│ int, out userName: String)          │
│                                     │
└─────────────────────────────────────┘
```

Description: Represents a user
Visibility: Private
Is Abstract: No

Attributes:

Name	Description	Data Type	Is Derived	Is Read Only	Visibility	Multiplicity	Default Value
fbLoginResult	Result from Facebook verification	Boolean	No	No	Private	1	false
fbLoginID	ID from Facebook login	Integer	No	No	Private	1	<None>
userName	Name of user	String	No	No	Private	1	<None>
userID	Unique number ID for user	Integer	No	Yes	Private	1	<None>

Operations:

Name	Description	Return Type	Parameters	Visibility	Scope	Is Query	Is Polymorphic
login	Let users and administrators login	<None>	fbLoginResult Direction: in Boolean Default: false	Public	Instance	Yes	No
retrieveName	Let users and administrators retrieve username	<None>	fbLoginID Direction: in Integer Default: None username Direction: out String Default: None	Public	Instance	No	No

pseudocode:

system will ask user to login using Facebook

system will give user feedback after successful login (fbLoginResult = true)/(fbLoginResult = false)

if

       the feedback is (fbLoginResult = true)

       redirect user to the homepage / main page

else

       the feedback is (fbloginResult = false)

       return an error message saying that login is failed, please try again

7.0 Behavioral Diagram

The following section contains the behavioral designs for the system. A structure chart will be used for the system services implementation model and this shows how use-cases will be implemented. The structure chart will be organized by menu items. The statechart diagram shows the states of one object type in our system

7.1 System Services Implementation Model

Structure Chart
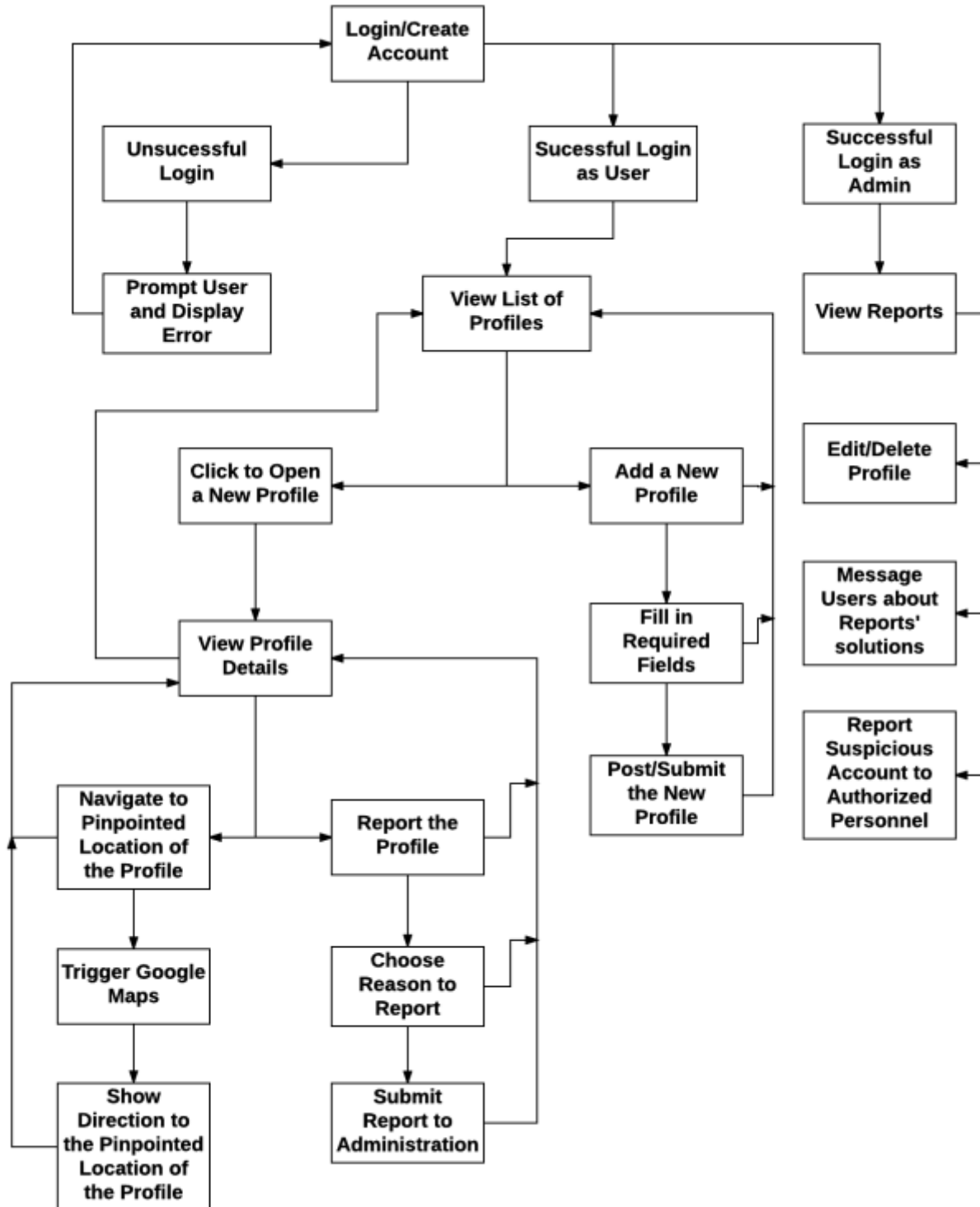
7.2 Statechart Diagram
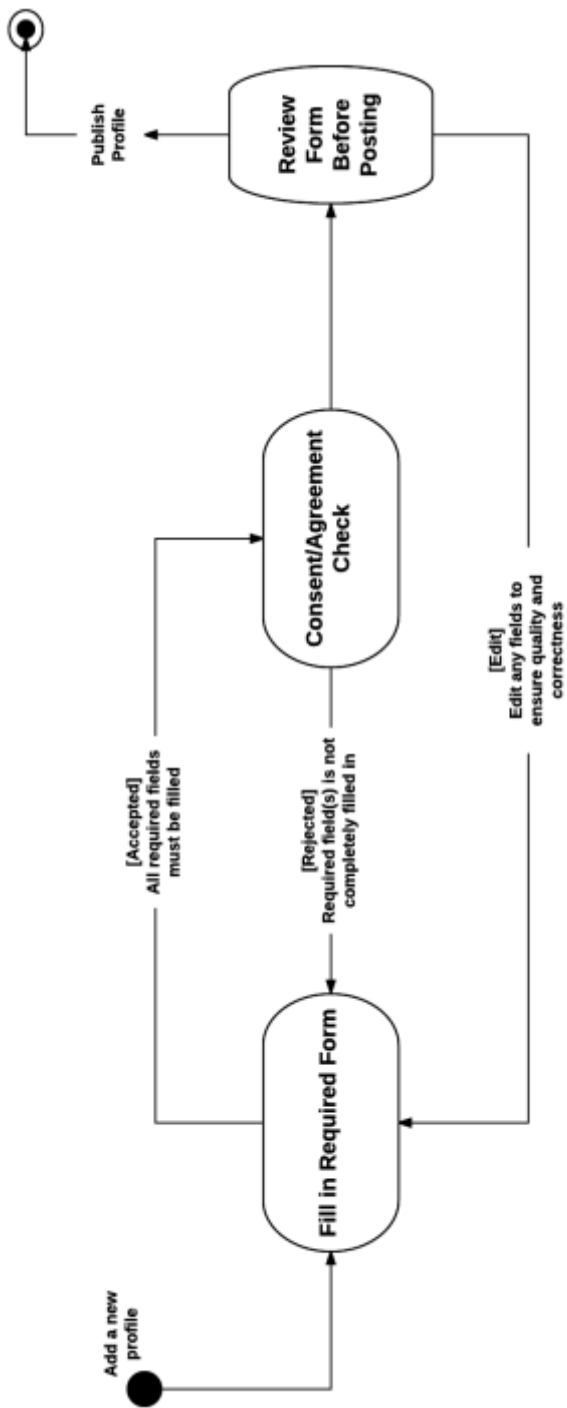
8.0 User Interface Design Plan

8.1 User Interface Requirements and Constraints

This section will cover the user-interfaces for the HeartHopeHelp system. User-interfaces will provide a general guideline for how the user-interface should be designed. The drawings are purely sketches and does not provide an accurate representation of color, font, style, or graphics. These interfaces show the functionality that HeartHopeHelp provides for the users. Since we have designed this application with the mind that most users will not be tech-savvy, the interface should be designed with ease of use in mind. Buttons, text fields, user input, and other components of the interface should be clearly labeled. The following section contains several examples of what the interface for HeartHopeHelp may look like.

8.2 Windows Navigation Diagram
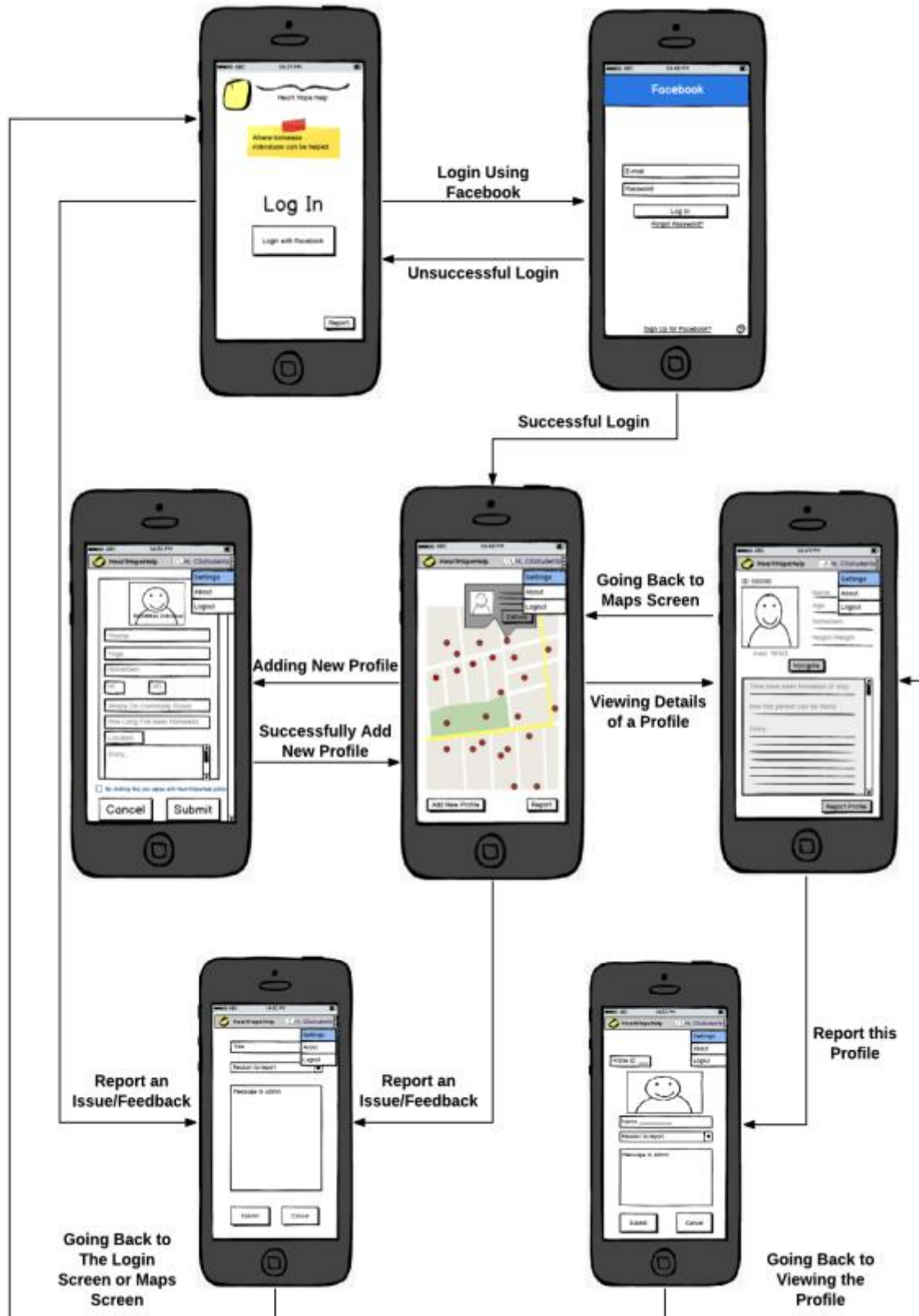
8.3 Screen Interface Design

Login Screen

Logging in with Facebook

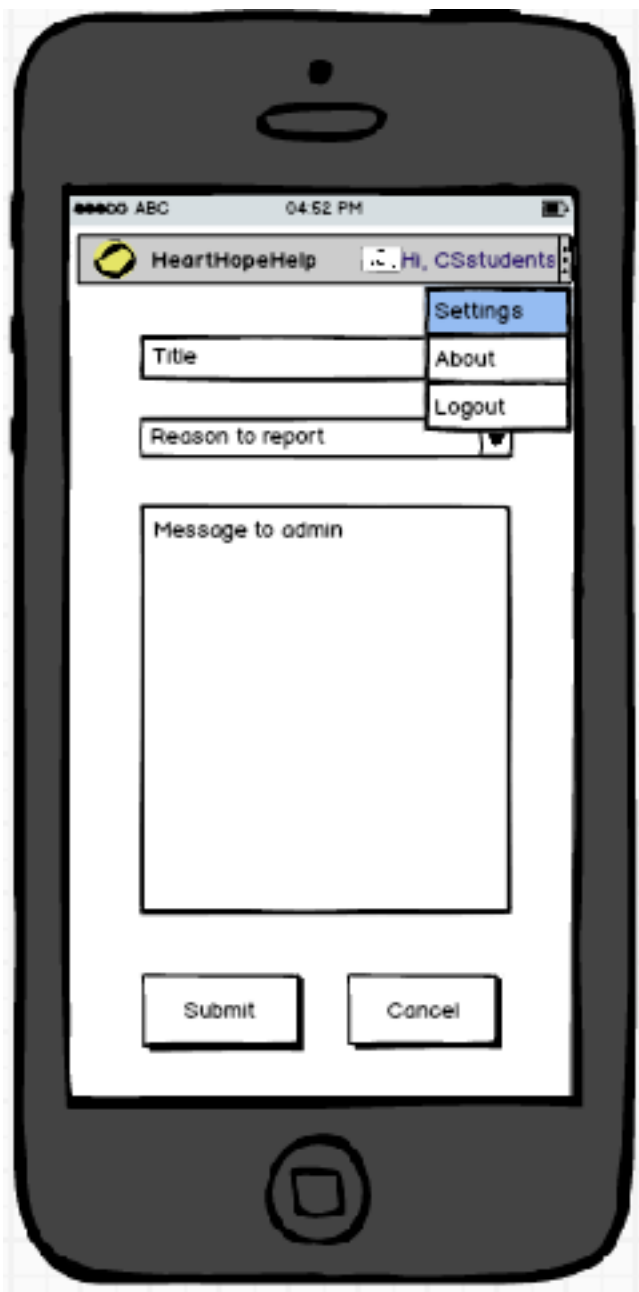Map upon successful login

Add new profile screen

View profile details screen

Reporting a profile screen

Reporting general issues/feedback screen

Bibliography

Dennis, Alan, Barbara Haley Wixom, and David Tegarden. *System Analysis and Design*. Student Value Edition ed. Hoboken, NJ: John Wiley, 2015. Print.

Lucidchart. November 2016. *Lucid Software Inc.* © 2016.

Pfeiffer, William S. *Pocket Guide to Technical Communication*. Upper Saddle River, NJ: Pearson, 2011. Print.

Weltz, Elaine. CSC 4151 Software Engineering I (Winter 2017), multiple lectures (PowerPoint slides, PDF files, Word Documents). Retrieved from Professor Weltz and Seattle Pacific University Canvas.

Appendices

Lucidchart was used to create the use-case diagram, the class diagram, structure chart, and statechart diagram. Lucidchart is an online visual communication tool used for creating flowcharts, diagrams, UML sketches, and other models.

Balsamiq was used to create the user-interface designs and windows navigation diagram. Balsamiq is a wireframing and mockup software.

Glossary

API – Application programming interface
BCB – Bellevue Sarang Church
Hope – Developer team name
HeartHopeHelp – Name of the system/application