PROJECT EMBER

The platform for elderly to connect freely.

Software Requirement Specifications

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1 Problem Statement

There has been an increasing number of elderly disregarding death due to a lack of meaningful human interaction, which has aggravated the number of elderly that experience depression, which is an increasing problem in Singapore's society. Many elderly refuse to seek for help, which further elevates the problem where the spend most of their time alone. When they spend long periods of time alone, this results in them feeling lonely, which is the main cause behind the depression experienced by elderly.

By using "Ember", a platform for elderly to communicate and meet new people, elderly can take advantage of this system to have a chance to make more relationships and spend lesser time by themselves.

2 Overview

2.1 Background

Singapore is currently experiencing an increasingly ageing population, in which the number of citizens aged 65 and above grew by a significant amount of 14.4 percent in 2017. While indeed, if the seniors of our society are able to enjoy a healthy lifestyle and support themselves, there would be a lesser unease in the society.

However, this is regretfully not the case in Singapore, and worldwide. Many people now give excuses that they are too busy and do not have the time to care for the elderly, leaving them to be cared for by nursing homes or to live on their own. There has been an increasing number of elderly suffering from depression due to multiple reasons, but with the main reason being loneliness.

Many elderly experience loneliness especially when their partner or friends have passed on. This is especially evident when they have been in each other's company for a long period of time, in which the feeling of loss is more heavily felt.

Many elderlies do not believe that their depression is a problem, and only a small handful of them seek for help. However, professionals' tips regarding how to help them curb depression and loneliness would be for society to help plan and move forward in the elderly's social aspects of life.

2.2 Overall Description

The mobile application, "Ember", will be based off the android phone platform where we will be making use of a client-server implementation method. The android phones running the application would be the front-end of the application and call the backend server through RESTful APIs. User and chat data will be stored in a MySQL database.

3 Investigation and Analysis Methodology

3.1 System Investigation

Users' personal information and details are all stored in the MySQL database. A matching algorithm would make use of these data in order to match the user with another user of similar data, which would indicate that they are similar in nature or interests. Matches would also be stored in the database which would then be transmitted back to the front-end for users to view and select. Upon selection, a chatroom would be created between the users. Chatrooms can be identified through the room id, where chat text of a particular chatroom will have the same room id.

3.2 Analysis Methodology

3.2.1 System analysis and requirements specification

An external view of the system has been modelled using Unified Modelling Language (UML) as seen in Figure 1. This includes records of the account's information, matches between users and partner chatrooms. This System Requirement Specifications documentation will be part of the documentation of the entire project.

Some requested and necessary features of the system are as follows:

- Ease of finding matches
- Simple chatroom functions
- Simple account creation and modification

These are all in considerations that the elderly are the target audience, and are garnered to be easier for their usage.

3.2.2 Object-oriented Design using UML

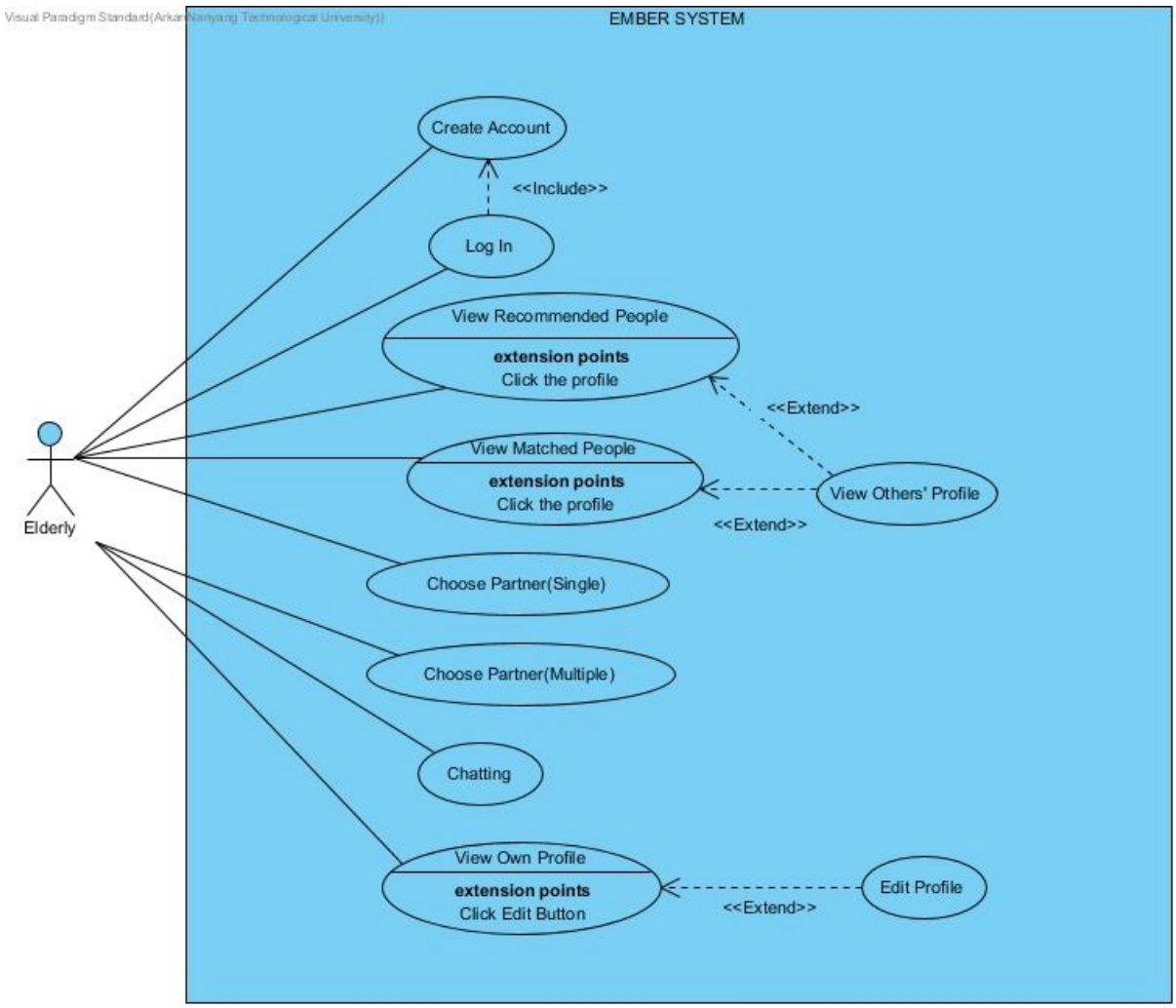

Figure 1: System's UML Use-Case Diagram

A UML use-case diagram has been designed and drawn in order to represent the user and the system's interaction. In general, the user will be able to interact widely with the system in different aspects and matches will be processed and stored into the database. Their choice of people chosen will be processed in real time, where pairing match will be notified instantly as well. The system will be secured by the user's ID and password.

3.2.3 Prototyping

The development team will implement a limited prototype system to show the basic and simple functions of the mobile application, "Ember". It will include the matching algorithm and main interface of all the functions for better visualisation. Prototype will then be presented to implementation team for evaluation.

4 Constraints

4.1 Scalability

The system only makes use of one database and one computer in order to run currently, hence, the operating system is currently not able to handle more than one concurrent operation to match the users with the matching algorithm. Error handling would also be limited to commonly anticipated errors.

4.2 Load Balance

With a limited budget, we are only able to run the proposal on one computer, making it impossible to distribute the workload across multiple computing resources. With limited resources, the system will have a limited amount of load it can take.

4.3 Database

With a limited budget, we can only make use of one database, and this would limit the amount of data we can store. Hence, we are currently accommodating to only a few users and storage of matches at a time since we are unable to store large amounts of data.

4.4 Project Schedule

With a limited project schedule of only 13 weeks, our system would be very simple and only have basic coverage of details, instead of being able to cover every detail.

5 Operational Requirements

5.1 Help Desk Support

System users have access to email assistance for questions that are technical in nature, such as, but not limited to slow or sluggish system response time, incompatible browser features, application errors, system downtime inquiries, and account lock-out assistance. Support and responses will be provided within 3 to 5 working days.

General inquiries:

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Jeslynna	jeslynna.jellyfish@gmail.com
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Technical inquires:

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5.2 Administration Features

System security and access levels are provided in the application system. There are varying levels of system access and functional authority. Users can only access the application after logging in via their Username and password. Each user's access is only limited to their own private profile and other user's public profile. Only authorized system administrator(s) has access to all users' information.

5.3 System hardware fail over and routine back up

Computer operations will be handled by the technical team. Furthermore, we will have routine back-up copies up on GitHub, as well as on each developers' individual's laptop.

6 Functional Requirements

The Ember application addresses the need for the elderly to have more interaction with others and make more friends, whether locally and globally.

1. User Create Account
    1.1. User must be able to enter Username into the Username textbox.
        1.1.1. System must display an error message if user does not input anything in the Username textbox.
    1.2. User must be able to enter Name into the Name textbox.
        1.2.1. System must display an error message if user does not input anything in the Name textbox.
    1.3. User must be able to enter Password into the Password textbox.
        1.3.1. System must display an error message if user does not input anything in the Password textbox.
        1.3.2. System must display an error message if second Password input does not match the first Password input.
    1.4. User must be able to enter their email into the Email textbox.
    1.5. User must be able to enter date of birth into the date of birth textbox or select it from the calendar.
        1.5.1. System must display an error message if date of birth exceeds current date.
    1.6. User must be able to enter preferred language in the Language textbox.
        1.6.1. System must display an error message if user does not input anything in the Language textbox.
    1.7. User must select a gender from the given choices.
    1.8. User must be able to enter their address in the Address textbox.
    1.9. User must be able to select their hobbies from a dropdown list.
    1.10. User must be able to upload a profile picture to the system.
        1.10.1. The picture must be within 300x250 dp.
        1.10.2. The system must be able to display the uploaded picture.

2. Account access
    2.1. The user must be able to enter the Username in the Username textbox.
        2.1.1. The system must be able to display error messages when the user enters unregistered Username.
        2.1.2. The system must be able to display error messages when user does not input anything in the Username textbox.
    2.2. The user must be able to enter the password in the password textbox.
        2.2.1. The password field must not display the entered password.
        2.2.2. The system must be able to display error messages when the user enters wrong password.
        2.2.3. The system must be able to display error messages when user does not input anything in password textbox.
    2.3. The system must be able to verify the user's input data with the data in the database.

3. Matched To You page
    3.1. The system must be able to display the list of matched users' profile.
    3.2. The user must be able to view matched user's public profile by tapping on the 'View' button.
        3.2.1. The system must display the profile picture.
        3.2.2. The system must display the name.
        3.2.3. The system must display the age.
        3.2.4. The system must display the language.
        3.2.5. The system must display the hobbies.
        3.2.6. The system must display the address.
    3.3. The user must be able to accept the match by tapping on the 'Match' button.
    3.4. The user must be able to open a chatroom with the matched user by tapping on the 'Chat' button.

4. Home page
    4.1. The system must be able to display the list of matched users' profile arranged according to percentage similarity.
    4.2. The user must be able to view matched user's public profile by tapping on the 'View' button.
        4.2.1. The system must display the profile picture.
        4.2.2. The system must display the name.
        4.2.3. The system must display the language.
        4.2.4. The system must display the hobbies.
        4.2.5. The system must display the address.
    4.3. The user must be able to match with the other user by tapping the 'Match' button.

5. View his own profile
    5.1. The system must be able to display the user's information.
        5.1.1. The system must display the user's profile picture.
        5.1.2. The system must display the user's name.
        5.1.3. The system must display the user's language.
        5.1.4. The system must display the user's hobbies.
        5.1.5. The system must display the user's address.
    5.2. The system must display the button to edit account information.
    5.3. The system must display the button to delete account.

6. Edit his own profile
    6.1. The user must be able to update Username.
    6.2. The user must be able to update Name.
    6.3. The user must be able to update profile picture.
        6.3.1. The picture must be within 300x250 dp.
        6.3.2. The system must be able to display the uploaded picture.
    6.4. The user must be able to update language.
    6.5. The user must be able to update hobbies.
    6.6. The user must be able to update address.
    6.7. The user must be able to update password.
        6.7.1. The password field must not display the entered password.
        6.7.2. The previous password entered must match the password currently stored in the database.
    6.8. The user must be able to update date of birth.
    6.9. The user must be able to update gender.

7. Chat
    7.1. The user must be able to send text messages through the built-in chatroom.
    7.2. The user must be able to receive messages through the built-in chatroom.
    7.3. Older messages must be viewable.

8. Chat notification
    8.1. The user must receive a notification when receiving a message.
    8.2. The user must receive a notification when another user matches with him/her.

7 Input Requirements

7.1 User identifier key and user access

Each user can create a unique Username and password. The Username and password are the verifications required for the user to log in into his/her account. The user must know the Username and password for his/her account. This identifying key maps to all the user's personal information stored in the system. They will have access to the matched list of users, as well as the list of users the system generated according to the matching algorithm. Should the user delete his/her account, the account would be disabled and re-entry unpermitted.

8 Process Requirements

The following are among the inherent requirements that the SQL database must be able to handle.

8.1 SQL transaction

The EMBER system must be able to send, receive and trigger transaction to the SQL database system.

8.2 Data integrity

Commit transactions that are completed and/or rollback unfinished or time-out transactions.

8.3 Data validation

Data error from the user's end and from the back-end SQL database-processing end must be gracefully handled. There will be data validation and error-handling routines as part of the SQL database system.

8.4 Performance

Must resolve locking issues and handle concurrent use of the system on a 24x7 basis. Send, receive and display user messages to assist the overall user experience.

8.5 Data repository

The EMBER system will maintain the existing SQL database as the main repository of data.

9 Output Requirements

9.1 Transaction summary and confirmation

Each online user must have an understanding of their actions done for a particular session or a particular registration function. The SQL database will be able to display all successfully committed transactions.

9.2 Exception reports

System exception reports must be consolidated to record unique inputs or special conditions not normally handled using regular registration and matching procedures. Examples are user being unable to match with anyone else from the database, system unable to compute 10 points end for matched interest.

9.3 Registration Reports and summaries

Registrar and Match personnel must be able to extract summarized and rolled-up data into meaningful information. All records will be archived but accessible on demand.

10 Hardware Requirements

10.1 Network

Wi-Fi infrastructure

10.2 Client Phones

Samsung, HTC, Xiaomi, Huawei phones

10.3 Production support systems

Web server computer(s) and related hardware support

11 Software Requirements

11.1 Client Operating Systems

Ø Android 5.0 onwards

11.2 Client Application

Android compatible phones

- Ø Samsung
- Ø Huawei
- Ø Xiaomi

11.3 Network system

Network software and protocols for systems to communicate:

Ø TCP/IP

Ø HTTP

Ø HTTPS

Ø FTP

11.4 Mainframe system

Ø Ember system

Ø SQL database

11.5 Licenses

Valid licenses are required to run software from third party vendors:

- Ø To use application development tools such as Android Studios
- Ø To use application server and database software in development, test and production mode

12 Deployment Requirements