Software Engineering
Software Requirements Specification (SRS) Document

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E-care native Application

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Revisions

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Review & Approval

Requirements Document Approval History

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1. Introduction

1.1 Purpose of this document

The purpose of this requirement specification document is to detail the functions and requirements for the the E-care native application. This system is needed to use the application to help increase communication between the dementia patients, their families, and caregivers as a way to improve the overall patient satisfaction and wellbeing at the long-term care homes.

1.2 Scope of this document

The application will specifically address 3 main areas of concern in regards to communication in long-term care homes: Dementia residents' limited memories and physical capacity to use technology for daily communication. The application will not require dementia residents to be the direct user (but rather the "viewer"). Most of the functions are designed for families and caregivers to remotely control and communicate with the residents.

1.3 Stakeholders

The stakeholders for our project is the Project Management Team(Our Team) which is responsible for creating the SRS document, which includes why the software is being made, the requirements and its use case. The development team, which is responsible for developing the software using the SRS document provided by the Project Management Team. Professors Susan Murtha and Robert Allison who provided us with the project, general description of the problem and are there for additional support. Additionally, potential customers dementia patients, families, private/informal/volunteer caregivers, management/staff and caregivers at long term care home facilities, health care providers, personal support workers, nurses, clinicians working in long-term care, Centre for Vision Research (research community partner), Ministry of Health, Ministry of Long-term Care, the Local Health Integration Networks/ Ontario Health Teams (LHINs/ Ontario Health Teams).

1.4 Business Context

Business factors such as cost and partnerships to enhance scalability and reach will be considered

2. General Description

2.1 Product Functions

Resident's profile includes name, age, location, hobbies, interesting facts, health conditions. Fields are updated and edited by authorized family members/caregivers anytime and anywhere and could be viewed in a real-time manner by all members in the circle of care. The community feature addresses the lack of communication (mostly remote communication) among families, caregivers and residents. The schedule addresses the concerns and frustrations of families, friends, or caregivers for the lack of information, updates about the dementia resident on a regular basis at the long-term care home. The media feature addresses the lack of customized and personalized social media platforms for dementia residents, enabling residents to feel engaged and involved in the daily life of communities, spirit and nature. The games feature facilitates entertainment and interactive activities for dementia residents. This is also a future development with in-depth research regarding Cognitive, Memory and Exercise games. Content could be chosen to be included/ excluded by members.

2.2 User Characteristics

The E-care native application is intended to be used by stakeholders mentioned in section 1.3. A typical user should have some experience using mobile operating systems. A basic knowledge of the iOS or Android operating system on a mobile device.

2.3 General Constraints

The application must run on OS versions that are Android 5+ and **iOS** 10+. A user's device must provide network connectivity (both hardware and software) in order for the application to fully function.

3. System Features

Criticality Scale

Non-Critical	Non
Less Critical	Less
Critical	Normal
Very Critical	Very
Extremely Critical	Extreme

1. Family-Member

1. Invite/add/remove people from the circle of care

i. Description and Priority

This feature provides the "family member" the ability to create their community list for viewing purposes, users would also be able to contact each other (through message, audio call, or video call). It is of High priority seeing as it is one of the main functions of our system, and it responds most to our user needs.

benefit: 9
penalty: 7
cost: 4
risk: 2

ii. Stimulus/Response Sequences

<User > *<User fills the necessary information> - <Query System Database> - <Display corresponding Result> -<User adds Contact> - <Community List updates> - <User deletes User from circle of care> - <Community List updates>*

iii. Functional Requirements

4.1.1-R1: The user shall have the ability to invite users to the circle of care .
Priority: 1
Error Response: N/A

4.1.1-R2: The user shall have the ability to search for contacts using name.
Priority: 1
Error Response: invalid entry → system displays "contact not found".

4.1.1-R4: The user shall have the ability to view Contact information.
Priority: 1
Error Response: N/A

4.1.1-R5 The user shall have the ability to search a specific contact.
Priority: 1
Error Response: invalid number (out of bounds) → contact not added to circle of care

4.1.1-R6: The user shall have the ability to add users to the community list.
Priority: 1
Error Response: N/A

4.1.1-R7: The user shall have the ability to view Community list.
Priority: 1
Error Response: N/A

4.1.1-R8: The user shall have the ability to delete user from circle of care
Priority: 1
Error Response: N/A

2. Viewing contact information (name, role/relationship with resident, e-mail, phone number)

i. Description and Priority

This feature provides the user the ability to view contact information of members in the circle of care. This feature is of high priority.
benefit: 9
penalty: 5
cost: 1
risk: 1

ii. Stimulus/Response Sequences

<User navigates to the list of community> - <System queries the list of contacts in the circle of care> - <Display corresponding Result>

iii. Functional Requirements

4.1.2-R1: The user shall have the ability to navigate to the community list
Priority: 1
Error Response:N/A

4.1.2-R2: The user shall have the ability to navigate to a specific user
Priority: 1
Error Response: invalid entry → system prompts user for another entry.

3. Contacting each other through messages

i. Description and Priority

This feature provides the user the ability to contact other members in the circle of care. This feature is of high priority.
benefit: 9
penalty: 3
cost: 4
risk: 4

ii. Stimulus/Response Sequences

<User navigates to the list of community> - <System queries the list of contacts in the circle of care> - <Users select the > <Display corresponding Result>

iii. Functional Requirements

4.1.3-R1: The user shall have the ability to navigate to a specific user
Priority: 2
Error Response: invalid entry → system prompts user for another entry.

4.1.3-R2: The user shall have the ability to message the user
Priority: 2
Error Response:N/A

4. View activities daily, weekly or monthly

i. Description and Priority

This feature provides the user the ability to have a real-time calendar of resident's activities updated and managed by authorized members in the circle of care.. This feature is of high priority.

benefit: 7
penalty: 4
cost: 2
risk: 2

ii. Stimulus/Response Sequences

<User navigates to schedule feature> - <System queries the list of activities of the dementia patient>

iii. Functional Requirements

4.1.4-R1: The user shall have the ability to navigate to the schedule feature
Priority: 3
Error Response:N/A

4.1.4-R2: The user shall have the ability to view the list of activities
Priority: 3
Error Response:N/A

5. Register/edit/remove activities

i. Description and Priority

This feature provides the user the ability to register/edit/remove their own activities with the resident on any certain date and time. All activities with different members are displayed on the calendar, which allows ease of cooperation and communication, while avoiding conflicts around the care of residents.This feature is of high priority.

benefit: 10
penalty: 4
cost: 3
risk: 1

ii. Stimulus/Response Sequences

<User > *<User fills the necessary information> - <Query System Database> - <Display corresponding Result> -<User adds activity> - <Activity List updates> - <User deletes activity from schedule> - <Activity List updates>*

iii. Functional Requirements

4.1.5-R1: The user shall have the ability to invite users to the activity .
Priority: 3
Error Response: N/A

4.1.5-R4: The user shall have the ability to view Activity information.
Priority: 3
Error Response: N/A

4.1.5-R5 The user shall have the ability to search a specific activity.
Priority: 4
Error Response: invalid number (out of bounds) → contact not added to circle of care

4.1.5-R7: The user shall have the ability to edit an activity.
Priority: 3
Error Response: N/A

4.1.5-R8: The user shall have the ability to delete activity from the list
Priority: 3
Error Response: N/A

6. Receive reminder notification

i. Description and Priority

This feature provides the user with a reminder notification sent to a member's account. This is another important aspect of Schedule to remind them to show-up for their own activities.

benefit: 6
penalty: 4
cost: 3
risk: 2

7. Upload daily short stories

i. Description and Priority

This feature provides the user the ability to upload daily short stories in the form of pictures, videos, etc. that could be played automatically from one member to another. Stories are available within 24 hours.This feature is of high priority.

benefit: 7
penalty: 2
cost: 5
risk: 5

ii. Stimulus/Response Sequences

<User navigates to the Media Feature> - <User selects and upload media to the application> -<Display corresponding Result>

iii. Functional Requirements

4.1.3-R1: The user shall have the ability to navigate to the Media feature
Priority: 5
Error Response: N/A

4.1.3-R2: The user shall have the ability to select a particular media
Priority: 5
Error Response:N/A

4.1.3-R2: The user shall have the ability to upload a particular media
Priority: 5
Error Response:N/A

8. View pictures and videos

i. Description and Priority

This feature provides the user the ability to view pictures and videos uploaded from members, together with captions, name tags for the content. Users can also create albums with topics and set up a digital frame for the albums. This digital frame acts like a slideshow of pictures and videos with the option of background music/ voice audio for a convenient and engaging viewing experience.

benefit: 6
penalty: 1
cost: 6
risk: 7

ii. Stimulus/Response Sequences

<User navigates to the Media Feature> - <User selects and upload media to the application> -<Display corresponding Result>

iii. Functional Requirements

4.1.3-R1: The user shall have the ability to navigate to the Media feature
Priority: 5

Error Response: N/A

4.1.3-R2: The user shall have the ability to select a particular media
Priority: 5
Error Response:N/A

4.1.3-R2: The user shall have the ability to upload a particular media
Priority: 5
Error Response:N/A

9. Listen to song playlists

i. Description and Priority

This feature provides the user the ability to listen to customized list of songs, audios for the residents based on their preferences. This feature is a future development with concerns regarding audio/music providers.

benefit: 3
penalty: 2
cost: 1
risk: 5

ii. Stimulus/Response Sequences

<User navigates to the Media Feature> - <User selects and upload song to the playlist> - <User can customize the playlist based on his/her preference>-<Display corresponding Result>

iii. Functional Requirements

4.1.3-R1: The user shall have the ability to navigate to the Media feature
Priority: 5
Error Response: N/A

4.1.3-R2: The user shall have the ability to select a particular song
Priority: 5
Error Response:Error message: "Song not found"

4.1.3-R2: The user shall have the ability to upload a particular song
Priority: 5
Error Response:Error message: "Song not found"

4.1.3-R2: The user shall have the ability to customize a playlist
Priority: 5
Error Response:N/A

10. Watch videos with built-in nature sound.

i. Description and Priority

This feature provides the user the ability watch videos with built-in nature sound (morning, night, rain, forest, waterfall). Content could be chosen to be included/ excluded by members.

benefit: 3
penalty: 2
cost: 5
risk: 1

ii. Stimulus/Response Sequences

<User navigates to the Media Feature> - <User selects video from the application> - <User can customize the playlist based on his/her preference>-<Display corresponding Result>

iii. Functional Requirements

4.1.3-R1: The user shall have the ability to navigate to the Media feature
Priority: 5
Error Response: N/A

4.1.3-R2: The user shall have the ability to select a particular video
Priority: 5
Error Response:N/A

4.1.3-R2: The user shall have the ability to listen to the selected video
Priority: 5
Error Response:N/A

11. Play Games

i. Description and Priority

This feature provides the user the ability to play games. This feature facilitates entertainment and interactive activities for dementia residents. This is also a future development with in-depth research regarding Cognitive, Memory and Exercise games. Content could be chosen to be included/excluded by members.

benefit: 7
penalty: 1
cost: 6
risk: 1

2. Caregiver Management

1. Add/remove people from the Patient List

i. Description and Priority

This feature provides the "Caregiver" the ability to add/remove patients from the application. "Family Member" will be notified

benefit: 9
penalty: 7
cost: 4
risk: 2

ii. Stimulus/Response Sequences

<User > *<User fills the necessary information> - <Query System Database> - <Display corresponding Result> -<User adds Contact> - <Patient List updates> - <User deletes User from list> - <Patient List updates>*

iii. Functional Requirements

4.1.1-R2: The user shall have the ability to search for patients using name.
Priority: 1
Error Response: invalid entry → system displays "contact not found".
4.1.1-R6: The user shall have the ability to add users to the *Patient List*.
Priority: 1
Error Response: N/A
4.1.1-R7: The user shall have the ability to view *Patient List*.
Priority: 1
Error Response: N/A
4.1.1-R8: The user shall have the ability to delete user from *Patient List*
Priority: 1
Error Response: N/A

2. View people from the Patient List

i. Description and Priority

This feature provides the "Caregiver" the ability to view informations of patients from the application. "Family Member" will be notified

benefit: 9
penalty: 2
cost: 1
risk: 1

ii. Stimulus/Response Sequences

<User > *<User navigates to the Patient List> -<Query System Database> - <Display corresponding Result>*

iii. Functional Requirements

4.1.1-R2: The user shall have the ability to search for patients using name.
Priority: 1
Error Response: invalid entry → system displays "contact not found".
4.1.1-R7: The user shall have the ability to view *Patient List*.
Priority: 1
Error Response: N/A

3. *Patient User*

3. View pictures/videos/stories

i. Description and Priority

This feature provides the user the ability to view pictures and videos uploaded from members, together with captions, name tags for the content. Users can also create albums with topics and set up a digital frame for the albums. This digital frame acts like a slideshow of pictures and videos with the option of background music/ voice audio for a convenient and engaging viewing experience.

benefit: 10
penalty: 2
cost: 5
risk: 2

ii. Stimulus/Response Sequences

<User navigates to the Media Feature> - <User selects and upload media to the application> -<Display corresponding Result>

iii. Functional Requirements

4.1.3-R1: The user shall have the ability to navigate to the Media feature
Priority: 5
Error Response: N/A

4.1.3-R2: The user shall have the ability to select a particular media
Priority: 5
Error Response:N/A

4.1.3-R2: The user shall have the ability to upload a particular media
Priority: 5
Error Response:N/A

4. Listen to song playlists

i. Description and Priority

This feature provides the user the ability to listen to customized list of songs, audios for the residents based on their preferences. This feature is a future development with concerns regarding audio/music providers.

benefit: 10
penalty: 1
cost: 6
risk: 1

ii. Stimulus/Response Sequences

<User navigates to the Media Feature> - <User selects and upload song to the playlist> - <User can customize the playlist based on his/her preference>-<Display corresponding Result>

iii. Functional Requirements

4.1.3-R1: The user shall have the ability to navigate to the Media feature
Priority: 5
Error Response: N/A

4.1.3-R2: The user shall have the ability to select a particular song
Priority: 5
Error Response:Error message: "Song not found"

4.1.3-R2: The user shall have the ability to upload a particular song
Priority: 5
Error Response:Error message: "Song not found"

4.1.3-R2: The user shall have the ability to customize a playlist
Priority: 5
Error Response:N/A

5. Watch videos with built-in nature sound.

i. Description and Priority

This feature provides the user the ability watch videos with built-in nature sound (morning, night, rain, forest, waterfall). Content could be chosen to be included/ excluded by members.

benefit: 9
penalty: 1
cost: 5
risk: 1

ii. Stimulus/Response Sequences

<User navigates to the Media Feature> - <User selects video from the application> - <User can customize the playlist based on his/her preference>-<Display corresponding Result>

iii. Functional Requirements

4.1.3-R1: The user shall have the ability to navigate to the Media feature
Priority: 5
Error Response: N/A

4.1.3-R2: Th e user shall have the ability to select a particular video
Priority: 5
Error Response:N/A

4.1.3-R2: The user shall have the ability to listen to the selected video
Priority: 5
Error Response:N/A

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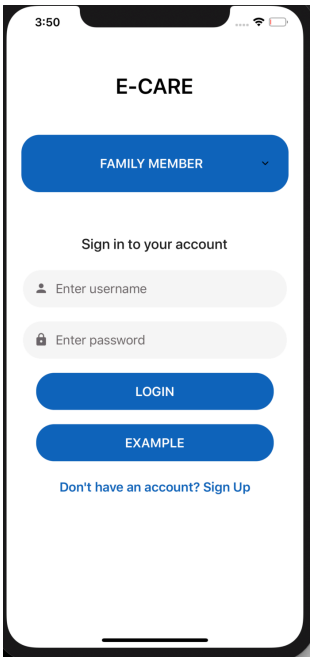
4. Interface Requirements

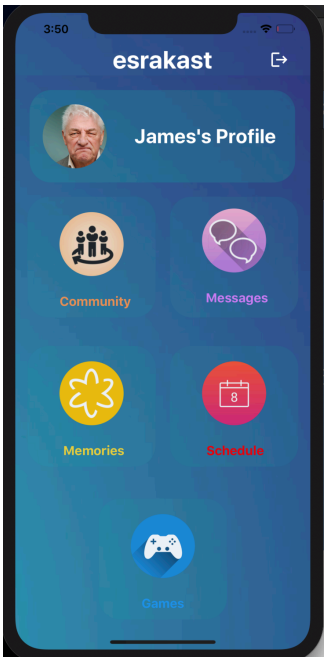
4.1 User Interfaces

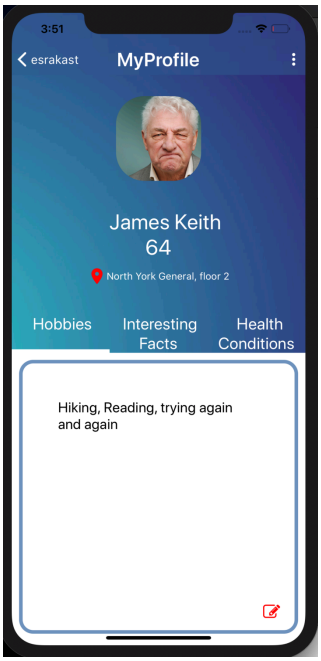
The system will provide the user with an accessible User Interface (UI) that will allow them to interact with the system and execute all of the available features and services. The UI will adhere to best practice guidelines to ensure its accessibility to users who are used to certain conventions, and relative newcomers to the platform. The UI will run on Android 5+ and **iOS** 10+.

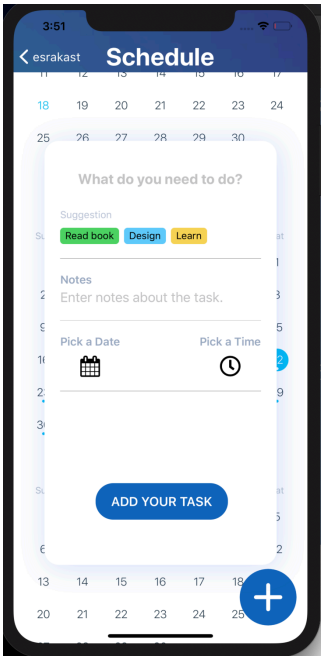
4.1.1 GUI

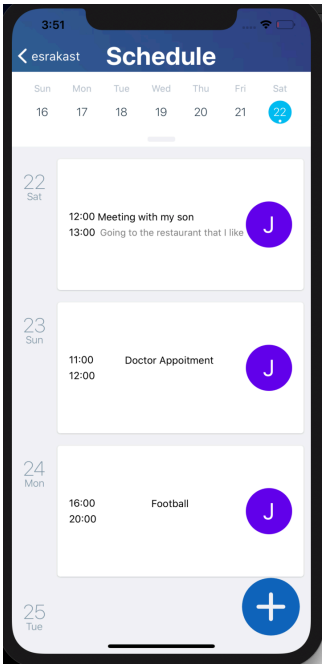
Screens:

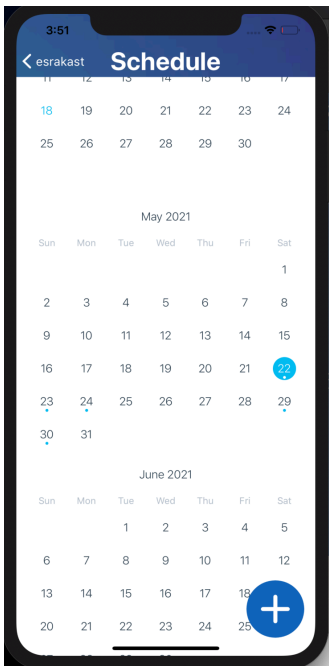

3:50
E-CARE
FAMILY MEMBER
Sign in to your account
Enter username
Enter password
LOGIN
EXAMPLE
Don't have an account? Sign Up

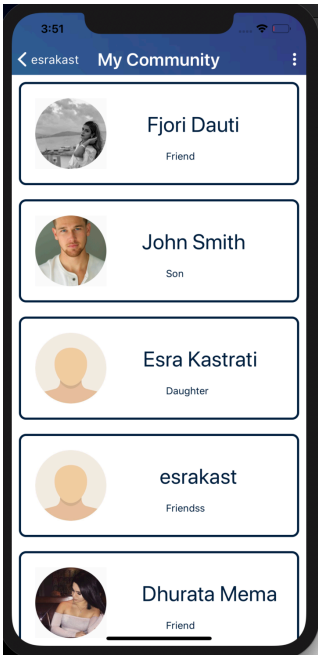

3:50
esrakast
James's Profile
Community
Messages
Memories
Schedule
Games

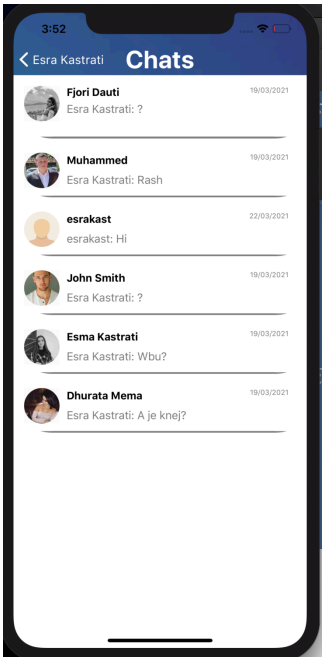

3:51
esrakast
MyProfile
James Keith
64
North York General, floor 2
Hobbies
Interesting Facts
Health Conditions
Hiking, Reading, trying again and again

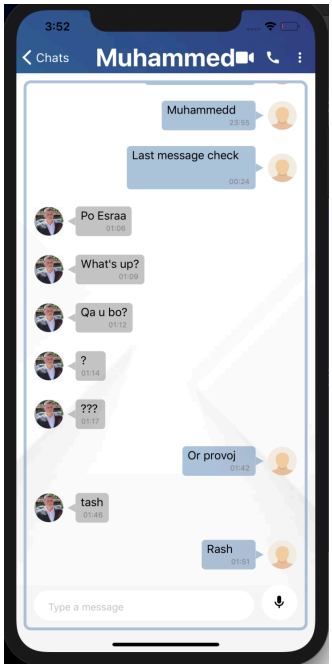

3:51
esrakast
Schedule
What do you need to do?
Suggestion
Read book
Design
Learn
Notes
Enter notes about the task.
Pick a Date
Pick a Time
ADD YOUR TASK


3:51
esrakast
Schedule
Sun Mon Tue Wed Thu Fri Sat
16 17 18 19 20 21 22
22 Sat
12:00 Meeting with my son
13:00 Going to the restaurant that I like
23 Sun
11:00 Doctor Appoitment
12:00
24 Mon
16:00 Football
20:00
25 Tue


3:51
esrakast
Schedule
May 2021
June 2021


3:51
esrakast
My Community
Fjori Dauti
Friend
John Smith
Son
Esra Kastrati
Daughter
esrakast
Friendss
Dhurata Mema
Friend


3:52
Esra Kastrati
Chats
Fjori Dauti
Esra Kastrati: ?
Muhammed
Esra Kastrati: Rash
esrakast
esrakast: Hi
John Smith
Esra Kastrati: ?
Esma Kastrati
Esra Kastrati: Wbu?
Dhurata Mema
Esra Kastrati: A je knej?


3:52
Chats
Muhammed
Muhammedd
Last message check
Po Esraa
What's up?
Qa u bo?
?
???
Or provoj
tash
Rash
Type a message

4.1.2 CLI
N/A

4.2 Hardware Interfaces
The app is designed for the Android 5+ and **iOS** 10+ and market.

4.3 Communications Interfaces
The application will utilize the networking hardware of the user's device through network communications services provided by the operating system. Network communications capability will be used to connect to remote databases and/or web services for authentication and importing the user's information.

4.4 Software Interfaces
None additional

5. Performance Requirements

System
The application will run on Android 5+ and **iOS** 10+. It will be around 15mb in size. The application will respond to the size of the screen and/or window the application is running in.

Response Time
The application should take less than 4 seconds when running on a phone and less than 8 second when on an emulator or tablet. The application will run fine until the user begins to multi-task between 4 or more processes.

Workload
System can support 200 active users. This requirement ensures that the system can withstand a decent amount of people. Since interactions with the system from the user side are observational or affect local storage, 200 is not too high a number

Scalability
Database Scalability: adding servers or storage would allow our system to support a wider range of users. Administrative Scalability: the system will be able to scale up to 400 concurrent users.

6. Other non-functional attributes

6.1 Security

There needs to be specified roles for the users. These are "patients", "family members" and "caregiver". Each type of user would be able to interact with the system differently. (i.e a "patient" cannot remove a "family member" from the system). Patients accounts will be created from family members and caregivers, this is due to the scope of their access to the system. System should be secure enough to prevent data breach

6.2 Flexibility

The system can run automatically for the user without developer interaction.

6.3 Maintainability

The system will be developed in a way to make adding functionalities easier, this would also benefit developers when fixing possible bugs.

6.4 Portability

The minimum **supported** OS versions are Android 5 and **iOS** 10.

6.5 Robustness

Errors in querying the database will be displayed to the user in real-time. Unprecedented system failures will be logged for debugging.

6.6 Usability

User's experience with the system is simple and intuitive to use.

6.7 Application Affinity/Compatibility

The application shall be compatible with Android 5 and **iOS** 10 or any later version.

7. Preliminary Use Case Models and Sequence Diagrams

7.1 Use Case Model

7.2 Sequence Diagrams

8. Appendices

1. Definitions

Communication Protocol - Set of rules that allow two or more entities of a communication system to transmit information

GET - an HTTP method used to request data from

resource

Instruction Set/Architecture - Computer architecture

Javascript - Programming Language

Operating System - Interface between user and hardware

POST - an HTTP method used to send data to a server

2. Acronyms

ARM - Advanced RISC machine

API - Application Programming Interface

CPU - Central Processing Unit

DB - Database

HTTP - Hypertext Transfer Protocol

SRS - Software Requirements Specification

TLS - Transport Layer Security

UI - User Interface