CareCoord
Design Document

A mobile application for coordinating elderly care

The Caretechers

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Executive Summary

Many of us will become a primary caretaker of an elderly relative at some point in our lifetime. However, we will likely have busy lives of our own, and many people simply don't have time to check up on elderly relatives consistently. Leaving elderly relatives alone at home without consistent caretaking visits can be incredibly dangerous physically, mentally, and financially (food can run out, heating/cooling issues can arise, falls can become lethal, bills can go unpaid, etc.).

Most families attempt to ensure elderly loved ones are consistently taken care of by sharing the burden of caretaking between multiple family members. However, coordinating care between family members can be messy. Family members could forget which days they are responsible for caretaking visits, or neglect important caretaking tasks (such as refilling medication). Thus, by attempting to split up caretaking visits, the quality of caretaking for the elderly loved one might actually be *worsened*, which paradoxically exposes the elderly loved one to the same dangerous situations previously described!

Our project, CareCoord, is a mobile application for family caretakers (the users) that will mitigate the problems of shared caretaking by accomplishing four main goals, which are:

1. Ensure that the elderly relative does not go more than "X" days (defined by the user) without a wellness-check. This will be accomplished through an in-house scheduling solution that allows caretakers to coordinate different tasks and schedule time off, as well alert caretakers (SMS, email) that a visit is needed.
2. Ensure that crucial caretaking information is centralized and easily accessible. This will be achieved by an in-app group messaging system for conversations about caretaking, as well as a notes section. This messaging system and notes will have search functionality so that caretakers can search for any information needed.
3. Make sure that caretakers complete all of the essential household chores and perform a proper wellness check. In order to accomplish this goal, we will implement a feature to create a checklist of items that need to be completed around the house or for the elderly person.
4. Facilitate better tracking of the elderly person's health. There will be a feature that allows the caretaker to enter health vitals (heart rate, temperature, etc.) which will then be displayed using auto-generated graphs so that a caretaker can easily recognize positive or negative patterns in the elderly person's health.

After extensive discussion with people that have shared caretaking responsibilities with other family members, we are very confident that our project will ease the burdens of shared caretaking and bolster the safety of elderly loved ones living alone if the goals above are accomplished.

Background and Technical Requirements

Why CareCoord?

Elderly loved ones are subjected to a variety of serious dangers as a result of poorly coordinated/low quality shared caretaking. Bills can go unpaid, heating/cooling issues can arise, food can run out, fall risks can become more lethal, and more. Unfortunately, shared caretaking between family members is often not executed well. Family members often forget which days they are responsible for visiting elderly relatives, or neglect important caretaking tasks, such as checking if there is food in the pantry. Additionally, important caretaking information is often "lost in the weeds" of various text messages between caretakers. All of these scenarios expose elderly loved ones in need of caretaking to the dangers previously described.

Our project, CareCoord, will ensure that family-centered shared caretaking is properly coordinated and executed correctly, therefore mitigating the aforementioned dangers. It will accomplish this by providing family caretakers with a mobile application that will facilitate easier coordinated scheduling and reminders for caretaking visits, sharing of relevant caretaking information between family members, caretaking visit checklists, and health tracking mechanisms, all in *one place*.

Currently, family members responsible for shared caretaking tend to use existing tools such as iMessage, Google Calendar, Notes, the Health App, or a combination thereof to achieve the proposed functionality of CareCoord. Having to use many different tools can be overwhelming. There is no current platform that keeps track of the different aspects of caretaking in one place and in an easy to use manner. Additionally, these tools are not tailored for caretaking of a loved one. CareCoord is unique because it provides a centralized platform for caretakers, and it is designed specifically for caretaking.

Required Technologies

<u>React Native:</u> React Native is a frontend framework that is very similar to React for the web. It has the same great features of the web version such as component based html elements and hooks to keeping track of and manipulating various state variables. React Native was the framework of choice because it allows us to seamlessly create user interfaces for mobile devices for both Android and iOS using one codebase. In addition, our team possesses a fair amount of prior experience with either the web version of React or React Native.

<u>Express.js:</u> Express.js is a JavaScript framework that allows us to easily implement a web server that will contain all of our REST API endpoints.

MySQL: For our database, we will be using a MySQL database. We chose this database because it was what we had the most experience with as a team.

AWS: AWS is a cloud platform that provides many services for building and maintaining software. We will mainly be using AWS to host our servers (frontend, backend, database).

SendGrid: If an elderly person has not been checked on for a certain amount of time, our mobile app will send a notification to notify users that they need to be checked on. We will send these notifications using a push notification on mobile devices as well as email. SendGrid provides an API that allows us to easily send these email notifications.

Google OAuth 2.0: Google OAuth 2.0 will allow our team to easily implement login functionality in a simple and secure manner. In addition, Google OAuth 2.0 allows us to pull important information such as an email when a user logs in using Google.

Docker: Docker is a technology that allows us to containerize our project so that we can start up a clean version of our mobile application every time. If we run into a situation where we need to restart our app because of an error or unexpected behavior, we will be able to consistently restart it to a working state.

Git: Version control is a crucial part of software development. It allows us to keep track of changes that have been made and combine different branches. Git is widely used and our team has previous experience with it which was why we decided to utilize this technology.

Assets & Engines
Although most of the mobile application components will be built from scratch, we can leverage certain resources in order to speed up development time. There is a rich library of open-source React Native mobile UI components available for reuse online (that can be installed through Node JS's npm package manager). This will allow us to develop the frontend (the mobile interface) much faster.

Rather than implementing our own secure login functionality from scratch, we will be using Google OAuth (see "Required Technologies" section above). This will save us plenty of development time, as well as ensure proper security protocol is being adhered to.

Most of the application will be designed and developed from scratch, from the structure of the database to the individual API endpoints on the backend. This will provide us with flexibility to make the app function exactly as desired (see "UI Sketches").

Software/Hardware Requirements

The CareCoord application will be developed and tested as a mobile app for iOS on an Apple iPhone. Our clients will download an iOS application to their iPhone, which should be updated to the most recent operating system. At the moment, we do not foresee any abnormal memory usage from our app. It will be cloud-operated, without the need for excessively large files on the client's IPhone.

We are planning on using Google OAuth 2.0 as our account management system, and this will require our clients to have a Gmail account.

Since we are using React Native to develop the CareCoord application, it will likely work on Android phones as well. However, we are focusing on iPhone development, and are considering Android compatibility as a stretch goal. Thus, Android compatibility will not be guaranteed.

Use Cases

Use Case 1: Edit frequency of visits - Aaron Heo

- Actor/User: Caretaker
- User Story: A caretaker needs to set the frequency of visits that need to be made to the elderly person. If the elderly person has not been visited for this certain period of time, they will receive a notification via text and/or email.
- Course of Events:
    1. Login
    2. Go to settings page
    3. Go into the notifications menu
    4. Update notification preferences
- Exceptions/Alternates: none
- Related UI: Figure 5a

Use Case 2: Edit the tasks list- Aaron Heo

- Actor/User: Caretaker
- User Story: Caretakers need to know what tasks need to be done on each visit so they need to add tasks to the todo list. These tasks will be organized into recurring tasks and one-off scheduled tasks.
- Course of Events:
    1. Login
    2. Navigate to the checklist page
    3. Click new task button
    4. Fill out modal for new task
    5. Click save task button
- Exceptions/Alternates:
    - Alternate: A simple reminder app could be used such as the "Reminders" app on the iPhone, but it does not integrate into the caretaking calendar.
- Related UI: Figure 3a, Figure 3b

Use Case 3: Enter health vitals- Aaron Heo

- Actor/User: Caretaker

- User Story: It is important for caretakers to log health vitals such as heart rate and blood pressure of the elderly person. This way, doctors or professional caretakers will be able to see a history of the elderly person's health or find patterns in their health.
- Course of Events:
    1. Login
    2. Main caretaking group page is presented
    3. Navigate to health vitals page
    4. Click desired health vital
    5. Fill our health vital modal
    6. Click save
- Exceptions/Alternates: none
- Related UI: Figure 6b

Use Case 4: Recording a Caretaking Visit - Ben Hatch

- Actor/User: A family member responsible for taking care of an elderly relative (Mom)
- User Story: As a caretaker, I want to be able to track what days I have visited my elderly relative and record the tasks that I complete each visit.
- Course of Events:
    1. Get a reminder from the CareCoord app to visit Mom
    2. Go visit Mom
    3. Navigate to the "Record a Visit" page in the app
    4. View caretaking tasks for that day on this page and mark them as completed as I finish them
    5. Click "Done" to finish recording the caretaking visit
    6. See that the caretaking calendar is now updated to show that I visited mom and completed all caretaking tasks today
- Exceptions/Alternates:
    - Exception: If I do not visit mom, the app will alert myself and other caretakers that someone needs to check up on her.
- Related UI: Figure 2b

Use Case 5: Communication with other caretakers - Ben Hatch

- Actor/User: A family member responsible for taking care of an elderly relative (Mom)
- User Story: As a caretaker, I want all relevant caretaking communication to be in one place and easily digestible so that information is not "lost in the weeds" between other caretakers.
- Course of Events:

1. Learn some new important caretaking information (let's say Mom no longer needs to take medication)
2. Open the CareCoord app and navigate to the "Messages" page in the app
3. Type "medication" in the search bar to see if anyone else has sent a message about this information already
4. Construct message about Mom's medication. ?Give message a "importance" rating of ⅘?
5. Click "send" to notify other caretakers about this information
6. Click "pin" to make sure this message is not "lost in the weeds" as other messages are sent in the future
7. Click on the "pinned messages" panel to make sure the message is stored there

- Exceptions/Alternates:
    - Alternative: Users can forward text messages they receive to the CareCoord app for storage (would need to interface with Apple iMessage)
- Related UI: Figure 6a

Use Case 6: Viewing the caretaking schedule - Ben Hatch

- Actor/User: A family member responsible for taking care of an elderly relative (Mom)
- User Story: As a family member who is sharing the responsibility of taking care an elderly loved one with my siblings, I want to see who is visiting mom on specific days, as well as the caretaking tasks they need to complete on those days.
- Course of Events:
    1. Open CareCoord application
    2. Navigate to the "Calendar Page"
    3. See a calendar that has my siblings' names next to the corresponding days they are responsible for visiting Mom
    4. Click on a specific day on the calendar
    5. See a summary of who is visiting Mom that day and what tasks need to be completed.
- Exceptions/Alternates:
    - Alternative: Users can forward text messages they receive to the CareCoord app for storage (would need to interface with Apple iMessage)
- Related UI: Figures 1a & 1b

Use Case 7: Signing In/Out of the App - Ben Hatch

- Actor/User: A family member responsible for taking care of an elderly relative (Mom) that is using the CareCoord app

- User Story: As a user of CareCoord, I want to be able to log in and out of the application so that I can protect my privacy/sensitive caretaking information.
- Course of Events:
    1. Open the CareCoord app on my smartphone
    2. If I'm not logged in already, the "Login" page should be the only viewable page on the app
    3. Login to CareCoord conveniently using Google OAuth (aka "Sign in with Google")
    4. Once I'm done using the app, navigate to the "Account" page and click "Sign Out" button
    5. I'm now signed out of my account and automatically redirected to the "Login" page
    6. See a summary of who is visiting Mom that day and what tasks need to be completed.
- Exceptions/Alternates: none
- Related UI: Figure 2a

Use Case 8: Edit profile - Seng Rith

- Actor/User: Person who uses CareCoord to take care of their beloved elders
- User Story: As a good caretaker that works cooperatively with other caretakers, I want people to see what my appearance is like. I also want other caretakers who have mutual caretaking groups to be able to see my information like my name, pronoun, DOB(optionally) and especially contact information(email or phone number)
- Course of Events:
    1. Navigate to the user profile page
    2. Upload a profile photo
    3. Add/edit contact information
    4. Edit username if needed
    5. Add or edit pronoun if needed
    6. Save the changes
- Exceptions/Alternates: none
- Related UI: Figure 5b

Use Case 8a: Change Notification Settings Preferences - Seng Rith

- Actor/User: As the eldest sibling in my family, I am responsible for taking care of my mom's parents AND dad's parents. Since I am in two different care providing groups, I would like to set available time to take care of my grandparents. I'm available on Monday to take care of my dad's parents who are located in downtown Salt Lake City. On Friday, I usually drive to Ogden

to visit my cousins who are in the same town as my other grandparents. So, I want to set Monday available to one group and Friday to another group.

- Course of Events:
    1. Navigate to Settings and then Notifications
    2. Select reminder for assigned duty
    3. Choose how many days or hours before the duty I want to be notified
    4. Save changes
- Exceptions/Alternates:
    - Alternative: The user can turn off the notification from their device settings if they don't want to get any notification. They can also set their own reminder if they want to.
- Related UI: Figure 8b

Use Case 9a: Edit/Set Availability for care duty - Seng Rith

- Actor/User: Person who uses CareCoord to take care of their beloved elders
- User Story: As a responsible caretaker with a busy schedule, I want the application to notify me about my care duty so I can be ready for it.
- Course of Events:
    1. On the Home Page, Choose the group I want to set the availability for.
    2. In the group, I navigate to schedule and change availability in the schedule settings.
    3. Then, I save changes.
    4. Lastly, proceed to do the same thing with another group.
- Exceptions/Alternates: none
- Related UI: Figure 8a

Use Case 9b: Set out of town period - Seng Rith

- Actor/User: Person who is responsible of caretaking duty
- User Story: As Fall break comes, I want to go on vacation for a week. I have already asked my boss at work for the time off. But, I still need to let everyone in my caretaking groups know that I will be out of town from Monday to Saturday. So, someone else needs to take care of my duty while I'm out of town.
- Course of Events:
    1. Navigate to the care taking groups on CareCoord and check which groups I'm supposed to be on duty during my vacation plan.
    2. When I see my time conflict on the schedule of a caretaking group, I set an "out of town" time and the application notifies everyone that I'm going to be "out of town".

3. I then also check who else is available on my duty day and reach out to them to see if they can take care of it.
- Exceptions/Alternates: none
- Related UI: Figure 5a

Use Case 9c: Set "on call" caretaker - Seng Rith

- Actor/User: Person who is responsible of caretaking duty
- User Story: Having many people in the same care providing group can be a complicated thing. Sometimes, we want to check up what mom is doing with the person who's taking care of mom. So, it is nice to be able to set who is on duty and have the application automatically set who is the on-call person.
- Course of Events:
    1. Group owner or admin assigns people to which day they will be on duty
    2. CareCoord uses this information to set the current "on call" caretaker and update it every day.
- Exceptions/Alternates:
    - Alternate: There's no one on duty during the time.
- Related UI: Figure 4a

Use Case 10: Look at past visits info - Seng Rith

- Actor/User: Person who is responsible of caretaking duty
- User Story: As I arrived at my grandparents house on my care-duty date, I noticed the plants on the front porch were drying out and dying. I'm suspecting that it hasn't been watered last week. So, I'm going to find out who was on duty last week and didn't water the plants.
- Course of Events:
    1. Navigating to the history of the schedule, I found out that Som was on care duty last week.
    2. Looking at the check lists, I didn't see anything marked as done. I had to reach out to Som and ask him what happened.
    3. I texted Som through and asked him if he forgot to do the checklists and water the plants. Som admitted that he forgot to water the plants. He explained to me that grandad asked him to work on the garden when he was at the house. It was a tiring day for him so he forgot about the plants.
- Exceptions/Alternates:
    - Alternate: There's no one on duty during the time.
- Related UI: Figure 1a

Use Case 11a: Creating notes - Brynnli Borrowman

- Actor/User: Caretaker
- User Story: As a user of CareCoord, I want to be able to store information that is important to my caretaking in the CareCoord app.
- Course of Events:
    1. Open the CareCoord app on my phone
    2. Navigate to the "Notes" section
    3. Click on the button that looks like a "+"
    4. Enter a title
    5. Enter the information I want to save
- Exceptions/Alternates: none
- Related UI: Figures 7a and 7b

Use Case 11b: Viewing notes - Brynnli Borrowman

- Actor/User: Caretaker
- User Story: As a user of CareCoord, I want to be able to view stored information that is important to my caretaking in the CareCoord app.
- Course of Events:
    1. Open the CareCoord app on my phone
    2. Navigate to the "Notes" section
    3. There is a list of previously created notes, and I can see their title and a sample of the information they contain
    4. When I click on one, it enters into the page for that note, displaying the title and information
- Exceptions/Alternates: none
- Related UI: Figures 7a and 7b

Use Case 11c: Searching notes - Brynnli Borrowman

- Actor/User: Caretaker
- User Story: As a user of CareCoord, I want to be able to search for stored information that is important to my caretaking.
- Course of Events:
    1. Open the CareCoord app on my phone
    2. Navigate to the "Notes" section
    3. Click on the "search" button
    4. Enter a keyword
    5. Look through the list of results until I see what I need

- Exceptions/Alternates: none
- Related UI: Figures 7a and 7b

Use Case 12: Creating a CareCoord Account - Brynnli Borrowman

- Actor/User: Caretaker
- User Story: As a caretaker, I want to create an account on CareCoord
- Course of Events:
    1. Download the CareCoord app from the app store
    2. Open the CareCoord app
    3. Register for an account with Google OAuth
    4. Enter required profile information
- Exceptions/Alternates: none
- Related UI: Figure 2a

Use Case 13a: Creating a CareCoord Group - Brynnli Borrowman

- Actor/User: Caretaker
- User Story: As a caretaker, I want to create a Group on CareCoord
- Course of Events:
    1. Open the CareCoord app
    2. Navigate to the "Group" page
    3. Click on the "Create CareCoord Group" link
    4. Enter a group name
    5. Click the "Create" button
- Exceptions/Alternates: none
- Related UI: Figures 5a, 4a and 4b

Use Case 13b: Inviting Others to Your CareCoord Group - Brynnli Borrowman

- Actor/User: Caretaker
- User Story: As a caretaker, I want to invite other people to my group on CareCoord
- Course of Events:
    1. Open the CareCoord app
    2. Navigate to the "Group" page
    3. Click on the "Invite others to join your group" link
    4. Enter the person's phone number and/or email
    5. Click the "Invite" button
- Exceptions/Alternates: none
- Related UI: Figures 5a, 4a and 4b

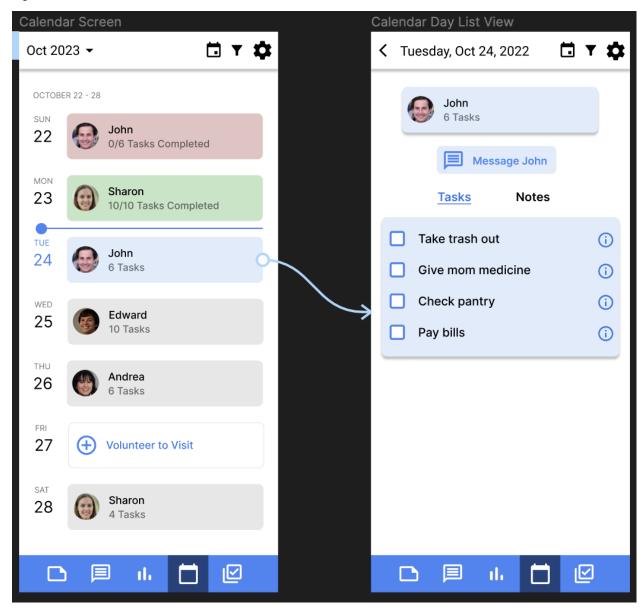**Use Case 13c: Joining a CareCoord Account - Brynnli Borrowman**

- Actor/User: Caretaker
- User Story: As a caretaker, I want to join a Group for the person I take care of on CareCoord
- Course of Events:
    1. Open the message or email containing the link your friend sent you
    2. Click on the link
    3. The CareCoord app will open
    4. A pop-up will open, asking you to confirm you would like to join the group
    5. Click "Yes"
- Exceptions/Alternates: none
- Related UI: Figures 5a, 4a and 4b

Use Case 14: Viewing Contact Information for Group Members - Brynnli Borrowman
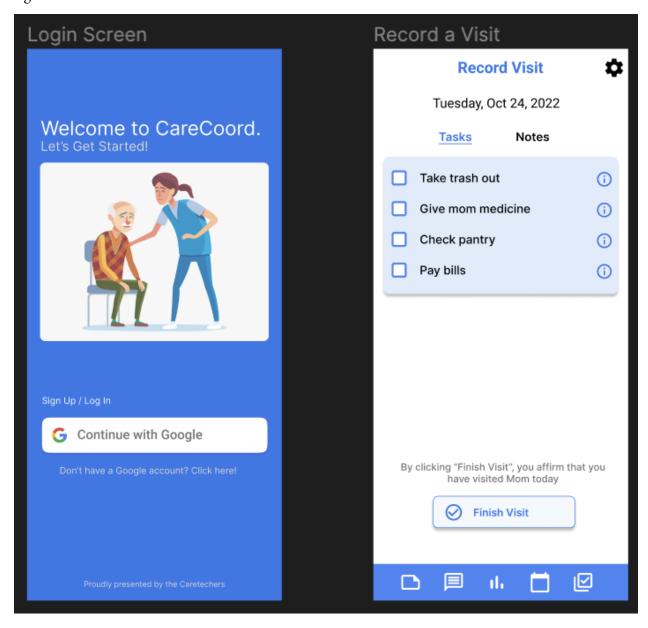
- Actor/User: Caretaker
- User Story: As a caretaker and CareCoord user, I want to find contact information for the members of my group.
- Course of Events:
    1. Open the CareCoord app
    2. Navigate to the "Group" page
    3. Under the "Group Members" section, there is a list of the group members
    4. Click on the name of the group member you want to view
    5. Their profile will pull up, which contains their contact information.
- Exceptions/Alternates: none
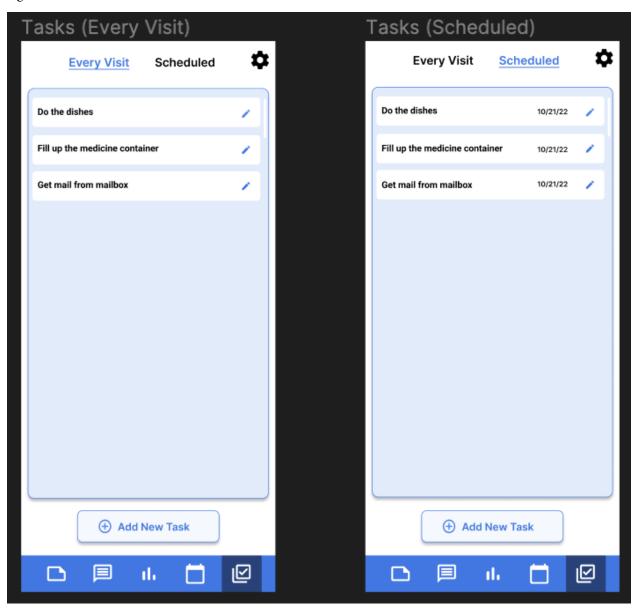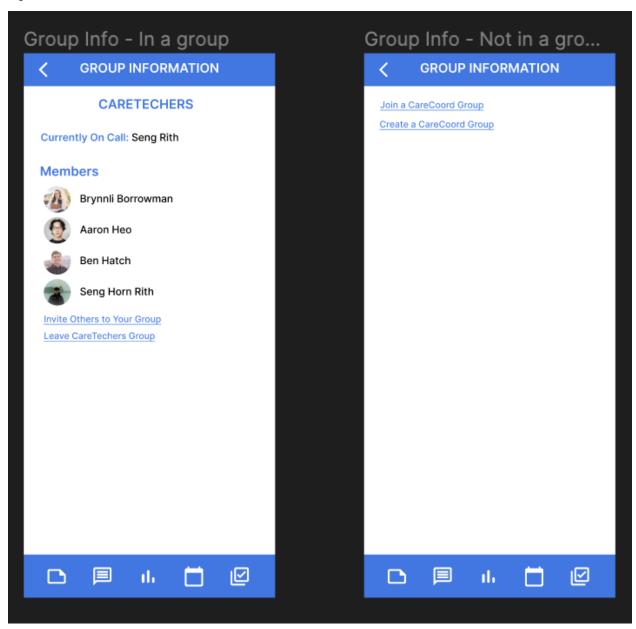- Related UI: Image 5a and 4a

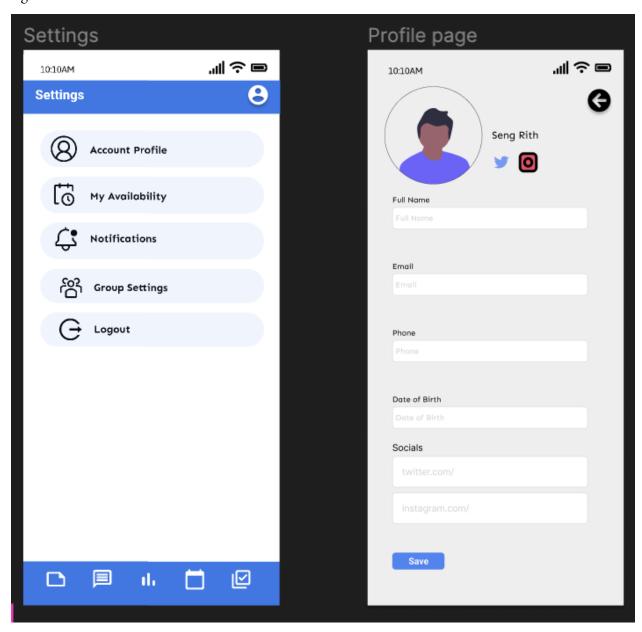# UI Sketches

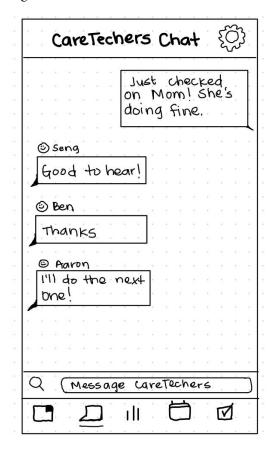Figures 1a & 1b

Figures 2a & 2b

Figures 3a & 3b

Tasks (Every Visit)

Every Visit   Scheduled   ⚙

Do the dishes	✏
Fill up the medicine container	✏
Get mail from mailbox	✏

⊕ Add New Task

Tasks (Scheduled)

Every Visit   **Scheduled**   ⚙

Do the dishes	10/21/22	✏
Fill up the medicine container	10/21/22	✏
Get mail from mailbox	10/21/22	✏

⊕ Add New Task

Figures 4a & 4b

Group Info - In a group

< **GROUP INFORMATION**

CARETECHERS

Currently On Call: Seng Rith

Members

Brynnli Borrowman

Aaron Heo

Ben Hatch

Seng Horn Rith

Invite Others to Your Group
Leave CareTechers Group

Group Info - Not in a gro...

< **GROUP INFORMATION**

Join a CareCoord Group
Create a CareCoord Group

Figures 5a & 5b

Figures 6a & 6b

CareTechers Chat ⚙

Just checked on Mom! She's doing fine.

☺ Seng
Good to hear!

☺ Ben
Thanks

☺ Aaron
I'll do the next one!

🔍 (Message CareTechers)

⚙

Heart Rate

BPM

10/1   10/3   10/5   10/7

Blood Pressure

10/1   10/3   10/5   10/7

Blood Oxygen

%

10/1   10/3   10/5   10/7

Enter Vitals

sticky

Figures 7a & 7b

Notes

Q   Notes   ⚙

Sort By Date ⌄

Groceries
10:01 am   Eggs

Garage Code
4/9/22   1234

Groceries

‹   Groceries   ⬆

Eggs
Milk

Figures 8a & 8b

Availability Schedule

Aaron's. Group

Sat | _____
Sun | _____

Ben's Group

Sat | _____
Sun | _____

Brynnli's Group

Sat | _____
Sun | _____

Seng's Group

Notifications

▢ Email Notification

▢ Mobile Push Notification