

Piller™

Introduction

Medication non-adherence is one of the greatest challenges facing patients and doctors today. Patients, especially older adults may often forget to take their medication at the right time or forget the right dosage or forget to take it altogether. Old age amplifies some of these problems. Even though some older people might have a caregiver living with them, some of the users might live alone and have no opportunities to meet their relatives or friends, especially given the pandemic. In this scenario, technology can help them manage their medications and hence increase patients and their caregiver's quality of life and autonomy at home.

We have the ambition to develop an IT solution for the wellbeing of older people. The project will provide a medication management service for older adults. The product will provide users with an easy way to remember to take their medication, so no caregiver's assistance is required.



Figure 1: Application Logo

Conceptual Model

The primary concept is to enter the details of a medication which includes the dosage and the time at which it needs to be taken so that the user can get a reminder to take the medication at the aforementioned time. Another concept is that the user gets voice notifications with details on what medication to take so that the notification is not missed. Another concept is that if the user does not take the medication and/or dismiss the notification, then the caregiver is notified of the missed medication. Another concept is that if the user is stuck and wants to contact the caregiver, then the product provides an emergency calling service that the user can use to contact the caregiver. Another concept is that the patient can add the number of pills they have left, and the app will send a reminder every time the medication needs to be refilled.

Vision

The vision for the Piller™ is focused on increasing autonomy at home for older adults. This product will be a way for older adults to manage their medications without a caregiver's assistance.

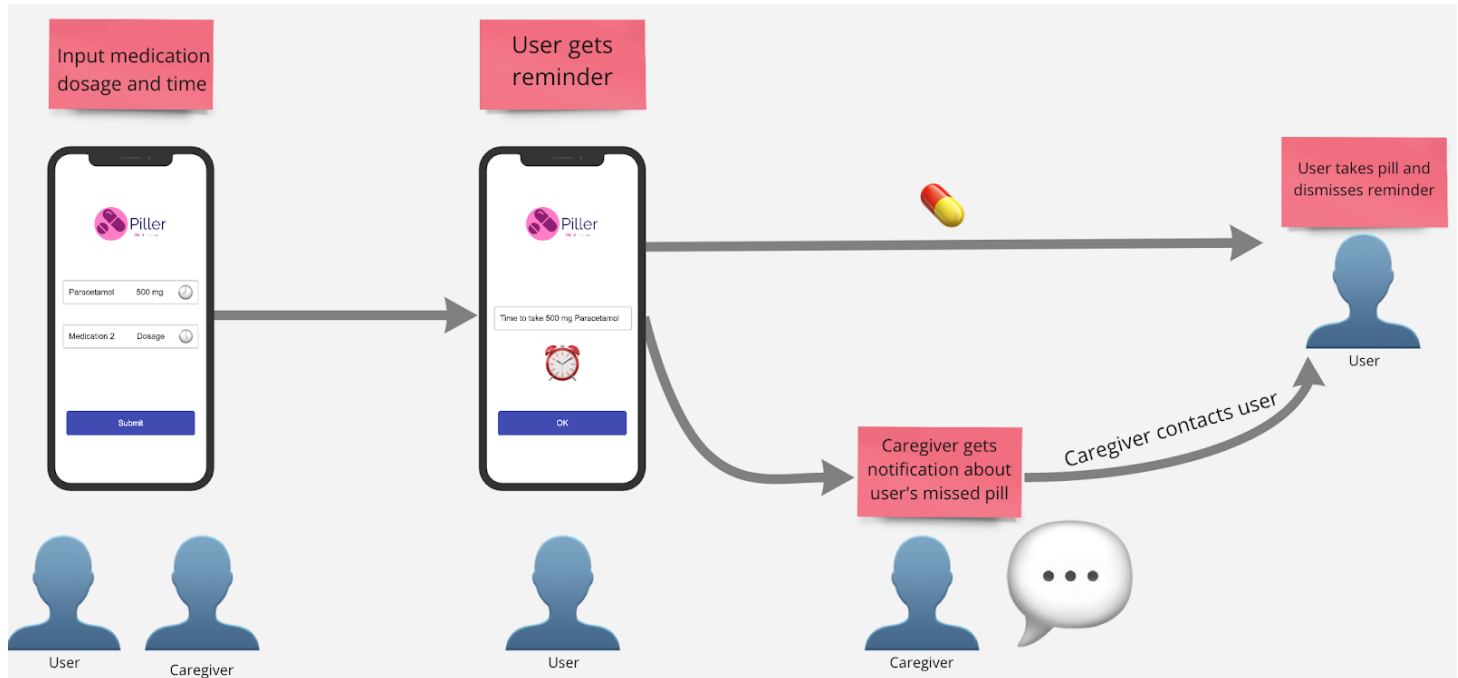


Figure 2: Vision Diagram

Some example tasks that you are thinking about

- User can authenticate, input the dosage and time of the medication to be taken
- User gets reminders through voice notifications for their medication needs (We will be creating our application as only a multimodal feedback application)
- User has the option to call the caregiver with a click of a button
- If the user does not take a dose, caregivers can be notified through a phone call or text message
- The application will also track the numbers of pills that are remaining and timely notify the user of refilling the medication

User Profiles & Scenarios

- **User Profile**

Primary Users :	Older Adults (60 +)
	Socially isolated
	Need reminders for medication
Secondary Users:	Caretakers of the older adults

Table 1: User Profiles

- **Scenarios**



Figure 3: An older adult using their mobile device

- **Scenario 1**

Alexa is 62 years old and is living alone. Due to the pandemic her caretaker is living away from her and because of this she is having difficulty keeping track of her medicinal doses. She needs something that can help her keep track of her doses and notify her whenever she must take the dose. So, she finds an application called Piller. She comes to application and is asked to create an account. Upon completing the authentication, she enters the time and dosage details for the different medicine she takes. Now, every time when it is time to take the medicine the Piller™ reminds her of it by sending in an audio notification. Once, she is reminded to the medicine she must take she clears the notification and takes the medicine

- **Scenario 2**

Mary is a 32-year-old working lady. She travels to a place 30 miles far from her home every day for her work. She has a Father Joseph, 58 years old, who often forgets to take his medications which affects his health adversely. Mary is really upset and worried for her father, as she cannot be with him 24*7 to take care of his pills. She finds the application Piller™ on the app store and creates an account for her as well as for her father. She filled out all the details of Joseph's medications in the application. The application now timely reminds Joseph by a voice notification to take his medicines. If Joseph dismisses the notification, he is good to go. If not, Mary gets notified regarding the same.

- **Scenario 3**

Lisa is a 64-year-old adult who uses the application Piller™, which tracks her medications and reminds her to take them by sending a voice notification. One day, she needed her caretaker, Janice for an emergency. She immediately opened the application, which had her caretaker's contact number as an emergency contact. In this way, Janice got notified that Lisa needs her help. She immediately went back home and called the ambulance too.

Market Research

There exist a few applications that provide pill management services but most of them require a subscription. Medisafe is one such application but it charges around (\$20.99) for all its services. Also, upon researching further we found out that there is no application that provides voice-based notifications, tracking the location, and notifying the caretakers about unusual activities. We also found that the applications out there offer too many services like drug interaction warnings, family scheduling tools, and scheduling a doctor's appointment with which some users may not want to be bothered with.

Description	Our Application	Other Applications
Application consists of only the most required services	✓	✗
Subscription Required	✗	✓

Tracking location	✓	✗
Voice Based Notifications	✓	✗
Notifying caretaker of unusual activity	✓	✗

Table 2: Market Comparison

Plan for Gathering Requirements

We plan to use the following techniques for gathering the required information:

- Interviewing the older ones and their caretakers:
We have planned to interview some of our relatives through a Zoom call. We also plan to ask some of our friend's grandparents to get some diverse ideas. We will ask them some open-ended questions to get their point of view for the application. We will also have some specific questions regarding the functionalities such as login/create account, emergency contact, etc.
- Surveying older adults and their caretakers :
We will create forms to gain their perspective about each functionality and ask them to fill it up.

Development options

We plan to create an Android based mobile application.

Individual Contributions :

Sr. No.	Name	Contributions
1.	Bhuvana Sridhara	Introduction Conceptual Model Diagram Vision
2.	Irshad Badarpura	Example Tasks Scenarios Market Research Logo for the application
3.	Shreya Shrivastava	Use Profile Scenarios Planning for requirement gathering Development Options

Table 3: Contributions