1. Executive Summary:

Pills on Track is meant to combine both delivery of the correct medication and providing reminders to take it at the right time. We aim to target a specific population of older adults (aged 60+) by providing them with an app that can assist them with ensuring the timely delivery of medicines, reminders to consume the medicine and allowing users to inform the app that the correct medication has been taken. Details for medicines to be delivered will be taken care of by the Doctor's clinic and pharmacy in-charge, and the app will provide reminders to users based on their mode of preference between calls, messages, alerts on the phone and a wristband-based reminder. Additionally, the app provides optional monitoring to ensure that the user has consumed the right medication and this is done via video proctoring.

2. Key Requirements/Constraints:

Requirements:

1. Users have basic knowledge of interacting with a smart phone for simple processes like clicking a button.
2. The app should have a straightforward and user-friendly interface, with prominently legible text and buttons, while also incorporating capabilities for voice commands and other accessibility functions.
3. Apps should allow users to distinguish or be informed about detailed information about their medications, including dosage instructions and name of the medicine, and detailed time to take the medicine.

Assumption:

1. User has Health insurance
2. the user has basic tech proficiency to interact with a doctor/ pharmacy through an app.
3. The user has signed up & set up for the app, entering user specific medicine schedules has been done by the pharmacy/doctor and the medicines have been delivered to the users.
4. Users agree with our information privacy policy and trust we would protect their information.

Constraints:

1. **AccessibilityProblem:** Elderly people may only have little understanding about using smartphone apps due to limited tech proficiency.
2. **Cognitive limitation:** Elderly people may have troubles when trying to read or interact with the app.
3. **Medication Complexity:** The description and functions of medicine could be very complex, elderly people may have trouble distinguishing the correct dosage.

4. **Data and information privacy:** If we are trying to use approaches such as voice confirmation and recorded video about our customer, we need to be very careful about their information security, especially for elderly people.

3. Concepts of Operation / Solution Options:

Main Design Goals - How do we assist older adults to take their medication on time via simplified technology?

Possible solutions:

Solution options to remind about medicine consumption:

1. The user receives reminders via call, text, app alerts, voice reminders on the phone or wristband based alerts. The user can choose a suitable option and the alerts are descriptive about the shape and color of the medication.
2. The user receives reminders via integrated smart systems in the home like alexa/ google and can have an interactive conversation with the AI bot.
3. The reminders are purely phone call based to assist the users without incorporating complex technology and there is no app. Just a customer care contact.

Solution options for the user to respond to the reminding system that the right medicine has been taken:

1. Video proctoring is enabled if the user has provided consent for it. When the user responds to the reminder, the user holds the medicine in front of the phone screen for a few seconds before consuming it, and clicks on the OK button after the medicine has been consumed. If the user hasn't consented to video proctoring, we only take the responsibility of reminding the users to take the medication, and don't verify if the right medicine has been taken.
2. The user responds to the reminder by entering in a code which is tagged on the bottle of the medicine that has to be taken. On the basis of the code verification we can identify if the right medicine has been taken.

Solution options for the user helpline:

1. Provide a helpline button within the app that automatically triggers a phone call to the helpline
2. Provide a helpline contact number that needs to be dialed explicitly.

Solution options for user's accessibility:

- **Pills on Track App** with the following features integrated:
    - Wearable technology (e.g., watch)
    - Notifications from the app (e.g., voice, text with different language settings)
    - Potentially synchronized with smart system in home, if applicable
    - The app will auto-open and blink with lights - "Please take [description] medicine."
    - Visual aids like images and description of the medication
- Alexa-integrated home systems: Home automation platforms like Amazon's Alexa can be integrated with the "Pills on Track" app. With voice commands on their smart devices, users may get information and medicine reminders. This solution makes use of voice-activated technology, which makes it convenient for those who would rather not use their hands. However, more setup and upkeep of smart home appliances could be necessary.
- No App, Just Reminder Calls to users: Medication reminders can be sent to users just via phone calls; no specialized app is required. Periodically, users would get phone calls from a contact center or automated system with spoken reminders regarding their prescriptions. During these conversations, users can confirm that they have taken their prescription. This strategy makes using technology easier and accommodates others who might not be as tech-savvy. However, it doesn't have the visual aids or comprehensive medicine information that an app might offer, which would make it less educational for consumers.

How might we get older adults to inform the app that the correct medicine has been taken?

- Have a code written on the cap and the bottle to input on the app to check if the user is going to take the right medication
- A real person "proctors" or "observes" the user taking the correct medicine

4. Selection Criteria, Approach, and Preferred Solution(s):

Selection Criteria:

- ➢ **Usability for Older Adults:** As they may not be as tech-savvy as younger generations, senior citizens should be able to grasp and utilize solutions with ease.
- ➢ **Verification of Medication Accuracy:** To guarantee safety, the selected solutions should provide a trustworthy way to confirm that the right drug has been consumed.
- ➢ **User Preferences:** It is important to be able to customize the solution to meet each person's demands and preferences for reminder techniques.
- ➢ **User Support and Assistance:** To resolve queries and issues, it is imperative to have access to user support.

Approach:

Our approach for determining if each potential solution is appropriate requires in-depth study based on scenarios and usability assessments.

- ➢ **User testing:** To assess older adults' comfort and competency with these solutions, we would do user testing sessions with them.
- ➢ **Trials for medicine Verification:** Considering possible constraints, we would assess the precision of medication verification in both the systems.
- ➢ **User Preference Surveys:** We would find out what people think about these solutions and what worries them by asking them about their preferences.

Preferred Solution(s):

The following solutions would probably not be included in the chosen solution, depending on the selection criteria and approach:

- **Alexa-integrated home systems:** This solution could be complicated for older adults to utilize, which could cause usability problems. Concerns around privacy and data security may also surface when interacting with external smart technologies.
- **No App, Just Reminder Calls:** Although making phone calls is a simple solution, it lacks the customization options and user-friendly interface that applications provide. It could not provide the medicine information and visual assistance that are necessary for medication management.

Our recommended solution based on a user-centric approach is a **Pills on Track App** that can cater to the needs and limitations of the target population (older adults). This app should consist of following features:

- ➔ **Wearable Technology Integration:** To offer discreet medicine reminders, the app synchronizes with wearable technology, such as activity trackers or smartwatches. Wearable technology enables users to discreetly receive alerts, guaranteeing they never miss a dosage.
- ➔ **Notifications from the App:** There are many notification settings available inside the app. Reminders can be sent to users via text and audio alerts. Users can receive reminders in their favorite language or dialect using adjustable language options.
- ➔ **Visual assistance:** The app includes visual assistance to improve medication management. Within the app, users may view pictures and descriptions of the medicines they are prescribed. This feature helps older adults recognize and comprehend the dosing instructions for their medications with ease.
- ➔ **In-App Helpline and Contact Number:** The app gives priority to user support and help. It has an in-app helpline option that users may use to get prompt support or information about their prescription. Users can also phone a special hotline in case they have any inquiries or complaints.