CSE 440 AD
Shadman Abedin, Allison Chou, Celina Hipolito, Will Wang

3d: Usability Testing Review

First Usability Test

Our first usability test involved a 26-year-old male college student. While ideally we would have liked to find a caretaker or an individual with memory loss to perform the test, we had limited time and resources. This particular participant is not very familiar with technology and UI/UX design, so we thought he would be an acceptable candidate for testing. The test was performed at the participant's home, since the design context for the product is mainly home use.

Will conducted the test as the recorder, operator, and notetaker. The participant spoke aloud when participating in the usability test, which involved two phases: (1) scanning, reading, and displaying new medication data, and (2) alerting the user to take pills. From this test, we identified some higher level issues than the heuristic evaluations.

Second Usability Test

Our second test involved a 20-year-old female college student. Although she is familiar with common consumer technology such as a cell phone and laptop, she is not very familiar with UX/UI concepts. In the past, she has lived with a grandparent and although they did not suffer from memory loss, she is familiar with the daily routines and pain points experienced by seniors. The test was conducted at an apartment, since the design context for the product is mostly for home use.

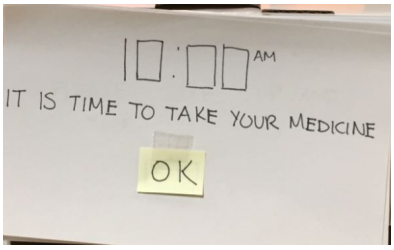
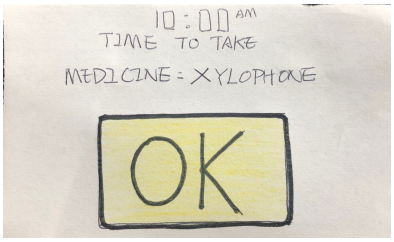
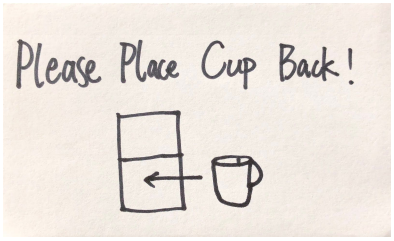
Celina conducted this test, acting as the recorder, operator and notetaker. This participant was also asked to speak aloud while interacting with the product while completing the same two tasks as the first usability test.

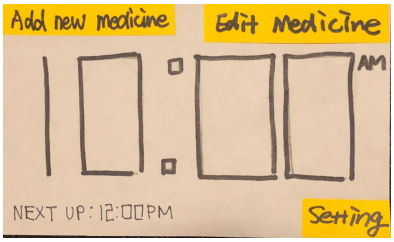
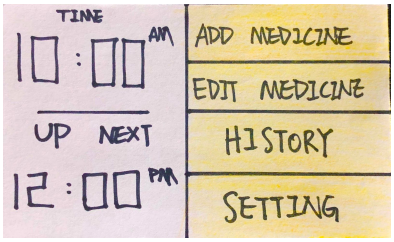
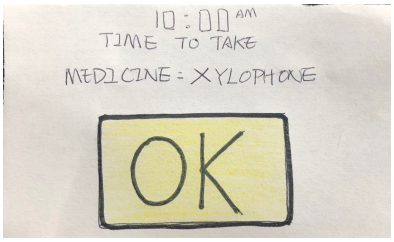
Third Usability Test

Our third test involved a 20-year-old male college student majoring in philosophy. The test was conducted at an apartment, since the design context for the product is mostly for home use. The individual is not very familiar with UI/UX design concepts, so we thought it would be acceptable to test our product on him.

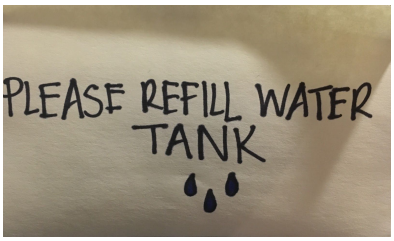
Allison conducted this test, acting as the recorder, operator, and notetaker. The participant volunteered to speak aloud while interacting with the product while completing the same two tasks as the first and second usability tests.

Issues Identified From Usability Test 1

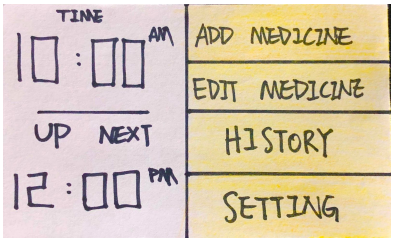
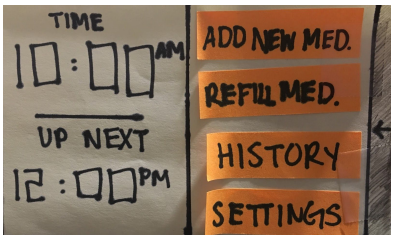
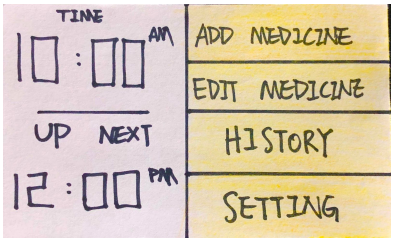
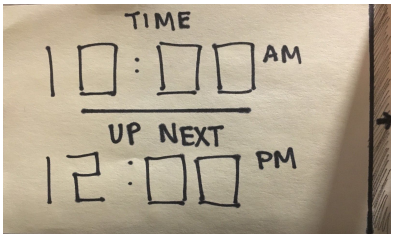
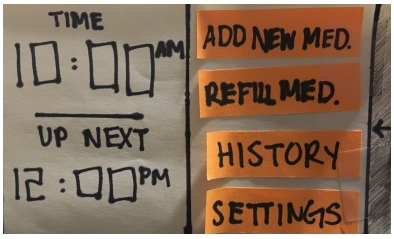
Before	Revision	Feedback from Eval (include heuristic or believability issue, severity)
		**Efficiency of use (severity 2)** Currently, some of the buttons and font sizes may be too small for seniors to read. This is can be easily fixed by making them larger.
		**User control and freedom (severity 4)** Despite the machine telling them to return the cup, the senior may still forget to place the cup back or want to remove the cup to wash it. Without the correct cup, the user cannot take the pills next cycle. Notifications to place cup back should be more prominent.
Currently, the system speaks out instructions but does not accept voice commands as input.	Make spoken instructions into a simple VUI that can help user set up and edit medicines.	**Flexibility of use (severity 2)** Some people may prefer speaking commands rather than trying to figure out a graphical interface. A simple VUI should be implemented for those users.

		**Recognize and diagnose errors (severity 3)** Caretakers may want a record of which pills were dispensed when, just in case. This feature will be added to the GUI.
		**Visibility of system status (severity 3)** Although our research found that many seniors stay on one floor within their own homes, there is a chance that they still may not hear the notification. Notifications to take the medicine should be more prominent.
n/a	While this is a great point to consider, addressing it directly would be a level 1 difficulty.	**Flexibility of use (severity 4)** Some seniors may want to have the pills taken to them, rather than having to find the machine to use it.

Issues Identified From Usability Test 2

Before	Revision	Feedback from Eval (include heuristic or believability issue, severity)
n/a		**Help and documentation (severity 3)** A concern was brought up that the user would not know when to refill the water tank when it is empty or close to being empty. To fix this issue, we added a message that alerts the user when the water tank is getting low and needs to be refilled.

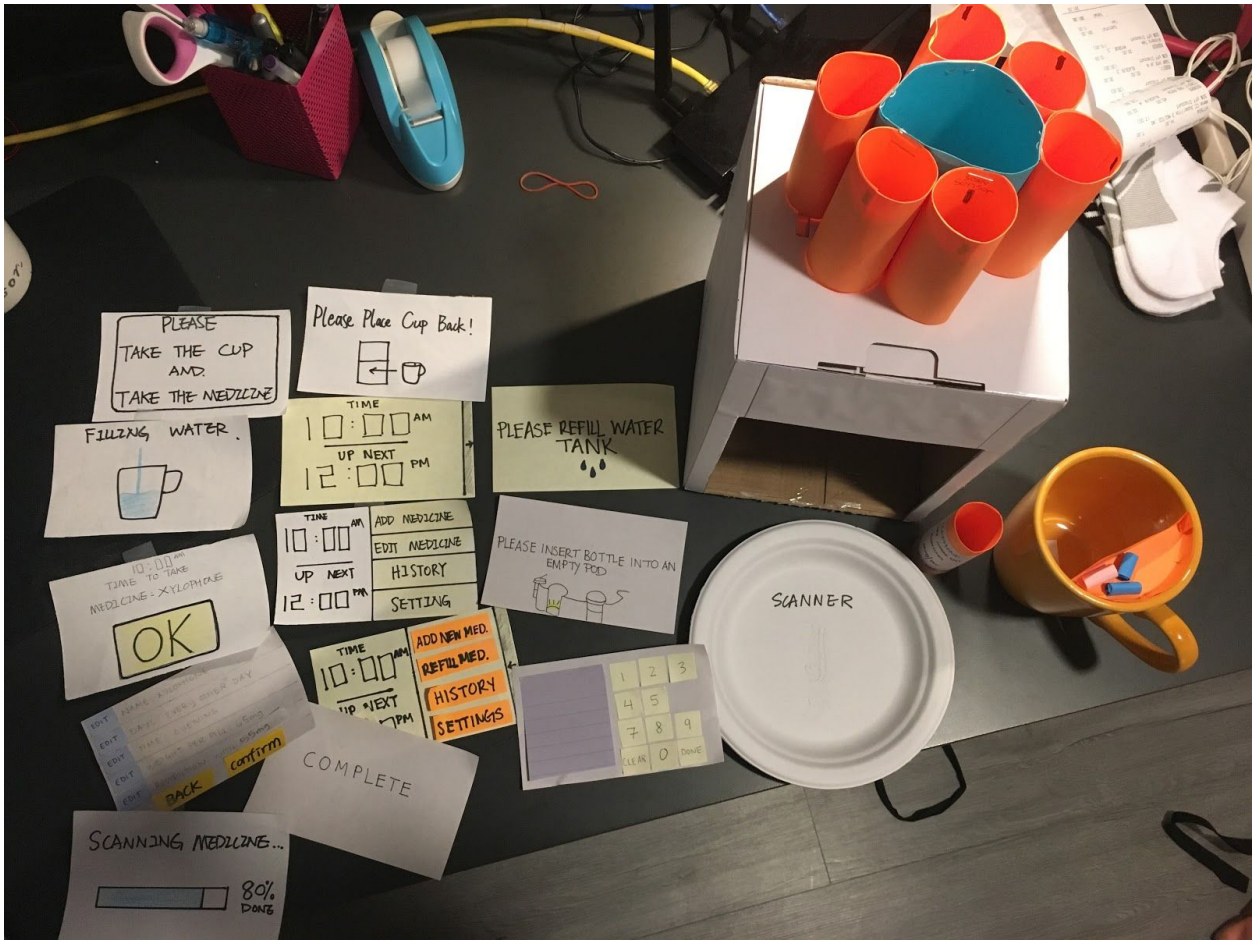
Issues Identified From Usability Test 3

Before	Revision	Feedback from Eval (include heuristic or believability issue, severity)
		**Match between system and the real world (severity 2)** The participant mentioned that the buttons were still confusing and could be condensed. They also mentioned that there is no intuitive way to refill medication. Therefore we changed the buttons to “add new med(icine)”, “refill med(icine)”, “history”, and “settings”. All the information previously in “edit medicine” are now under “settings”.
	 	**Error prevention (severity 3)** One issue that was brought up was that the senior might accidentally hit buttons on the home screen, become confused, and unknowingly mess up the system. To fix this, we added a general home screen that displays the time very prominently. This is what the senior will usually see when looking at the system. There is now a small arrow on the right side of the screen that is meant for the caretaker to

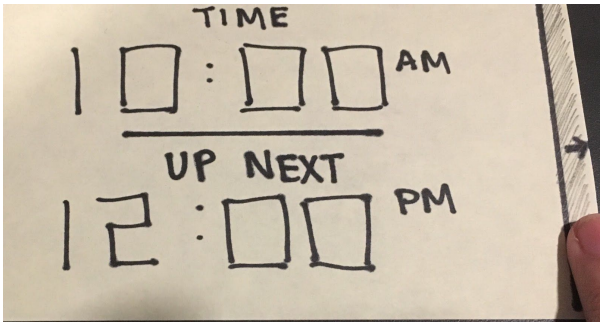
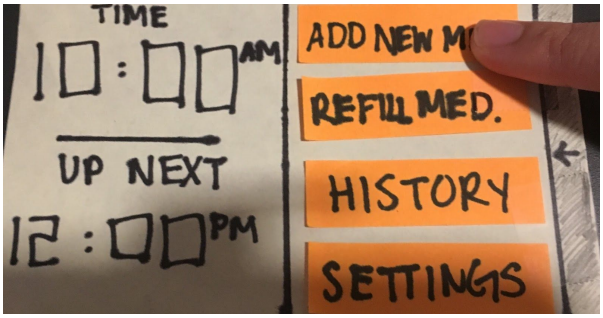
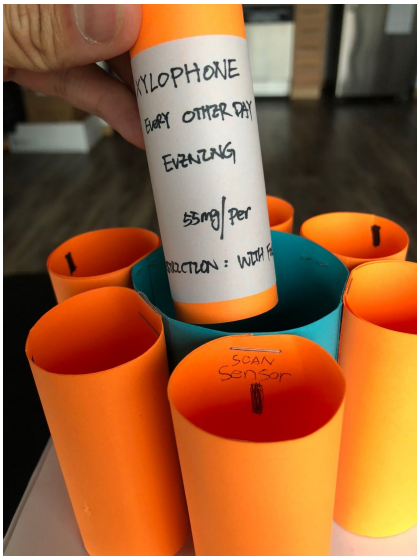
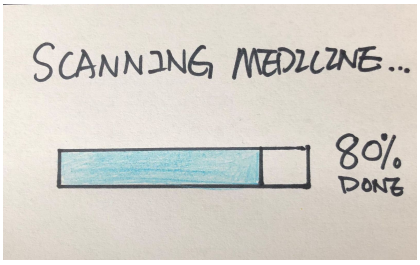
		edit information on the system. The caretaker can toggle between the two screens via the arrow button on the right side of the screen. This will hopefully minimize the amount of accidental errors from the senior.

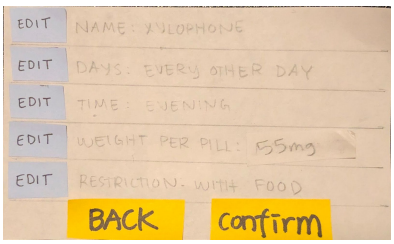
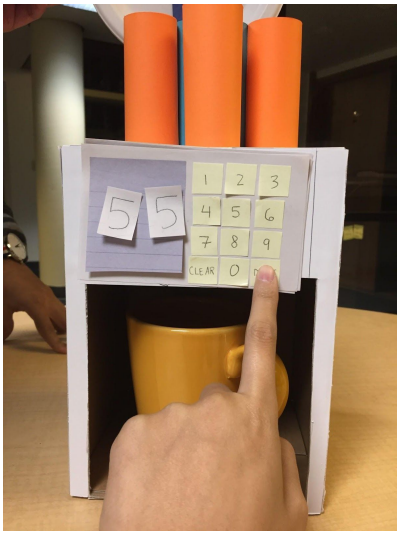
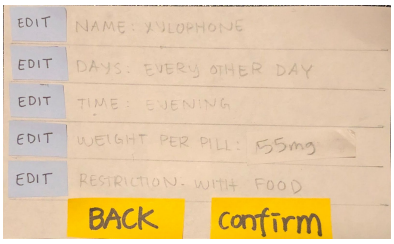
Upgraded Paper Prototype

Overview Image

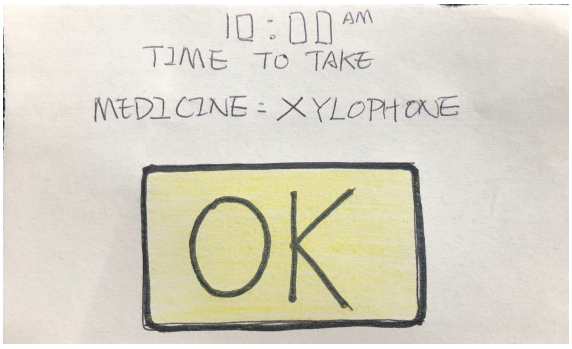


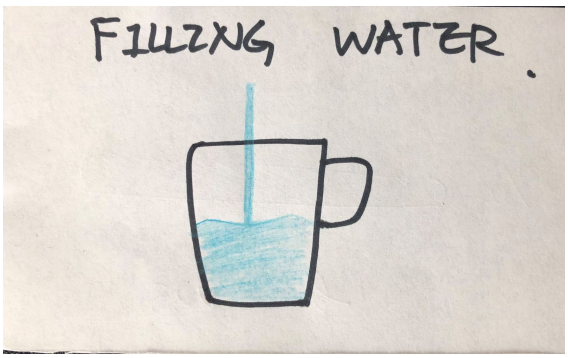
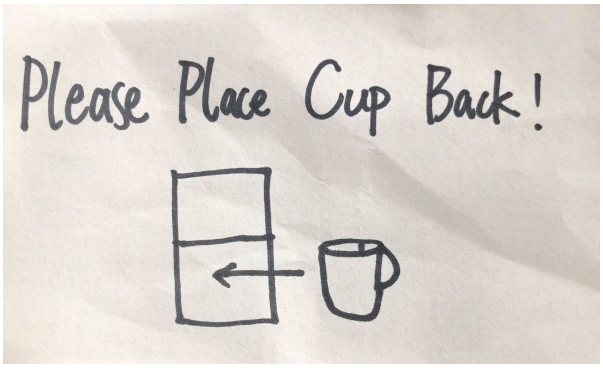
Task 1: Scanning, Reading, and Displaying New Medication Data

Task	Description
 	**Step 1** On the home screen, the user presses the button on the right side of the screen. They then are taken to the caretaker screen and tap “add new medicine”.
 	**Step 2** The lid opens and user puts the medicine bottle into a pod. A progress bar appears while the machine is working.

	**Step 3** User looks over scanned information to find any errors, or select “Back” to stop inputting. VUI will narrate the information.
	**Step 4** User can edit any of the scanned information on the screen or by voice.
	**Step 5** User selects “confirm” when all the information is correct.

Task 2: Alerting the User and Taking Pills

	**Step 1** When it is time to take medicine, the screen will flash and the voice will alert the user to take medicine. The user presses OK to begin the process.

	**Step 2** The machine will dispense the water and pills into the compartment in the cup below.
	**Step 3** The screen and voice will tell the user to take the cup and pills.
	**Step 4** The screen and voice will tell the user to place the cup back.

	**Step 5** The system informs the user that the process is complete.

Most Salient and Important Modifications

Incorporating a VUI

We realized through our testing that it is likely not enough to just have a visual UI. Many individuals with memory loss may also have failing eyesight. It is important for our group to accommodate different disabilities and to make our design as accessible to a wide range of individuals. Therefore, incorporating a VUI was a big step in increasing accessibility for our product. Now, users have the option to either read or hear what is being displayed on the screen.

Creating a Separate Caretaker Home Screen

Through our testing, we realized that it is very easy for individuals with memory loss to accidentally tap the wrong button the home screen, especially since the buttons on the screen are so big. This can lead to huge errors and the individual with memory loss taking the wrong medicine at the wrong time, which is extremely dangerous. Therefore, we tried our best to mitigate this issue by creating a separate caretaker home screen that can be accessed via a smaller, more subtle button. This way we can hopefully avoid potential accidents and confusion.

Making Certain Buttons Larger

Going off the last point, through our testing we also found that it is extremely important to make important buttons large and visible. Through our testing, we discovered that some buttons were too small for the user to properly notice. This is a huge problem as if the user does not notice an important button, they cannot proceed to the next step of the design. Larger buttons may also allow users with poor eyesight to better see critical information on the screen. Therefore, we remedied this issue by making critical buttons larger in size.

Adding Progress Bars

Finally, we added progress bars to our design. We thought this was extremely important since the user might think the hardware is broken unless they see progress bars. By adding progress bars to the UI, such as when scanning medicine, the user can feel more comfortable and have greater peace of mind since they know the hardware is actually working. They will also be able to track progress more easily and may be able to estimate when the process will be complete.