lumenary.

Assisted Living, Assistive Technology

Introduction

This product is for patients with mild Alzheimer's Disease and their informal caregivers. Our goal is not to cure Alzheimer's but to help both the patients and their caregivers live comfortably with the disease.

Design Problem

Our project idea is to create an iPad application for patients with Alzheimer's disease and also their family members (informal caregivers). Maintaining their standard of living prior to contracting the disease is the core of what we want to accomplish.

User Research and Findings

Secondary research has been instrumental in forming a more educated perspective on the landscape of problems caregivers and patients afflicted with Alzheimer's disease face. In our research we found informal caregivers can benefit from various kinds of ICT intervention. We also found some statistics about the demographics of caregivers and people suffering from dementia. We also learned a bit about formal caregivers in assisted living homes, and some potential issues we could address with our application.

Competitive product survey helped find problems patients face such as trouble reading small fonts, wandering and forgetting to take medication. We used this to ensure that our application will be able to maintain the patient's standard of living.

Interviews with informal caregivers were used to get direct feedback on our ideas. We were able to interview four individuals composing of formal and informal caregivers. Using the Zarit Burden Interview, we were able to quantify the burden of informal caregivers. We were able to more accurately evaluate our functionalities for real world use, and get potential user opinions on how the application may change the burden. We also addressed whether or not the patient themselves should have certain functionalities, and found almost all of them should be accessible to the patient. The interview method went very smoothly, and we were able to gather a lot of data through using both structured and open ended questions. The only difficulty with the interview method was when we used open structure of asking questions about the functionality, we still had to guide the interviewee through what we were expecting from the functionality, otherwise they gave vague and unhelpful answers. In the future, it may be beneficial to include a more detailed description for the caretaker before we ask open questions.

Design and Justification:

- **Simplicity**- Due to the fact that our primary user base is mainly made up of seniors, it was important to us to keep every designed element as crisp, clean, and simple as possible. Keeping that in mind, we designed every task in such a way that it would take a user no more than 3-4 steps to complete.

- **User control**- After getting feedback from the low fidelity prototype, we wanted to make sure that we catered to the patients increased sense of curiosity and paranoia by giving the users a visual representation of system status every step of the way. We did this firstly by ensuring that the user was oriented with the current date and weather information when they first open the app and also by making sure that every main page had multiple entry points, i.e. using the side panel and also having the ability to click the symbols in footer; giving the user an elevated sense of control.
- **Familiarity**- Our focus is on making sure that the users feel very little cognitive load- if any- when using our application. We designed our boards and pages to be consistent with other native applications like phone and photos on an iPad- our platform of choice. Furthermore, we wanted our application to be simple enough to learn without any tutorials. Using familiar designs and conventions helped us solve this.
- **Discarded functionalities**- During the early stages of Alzheimer's disease patients like to wander and we decided to add a GPS tracking functionality. In each user interview, we found that having this functionality was not useful and discarded it. More discarded functionalities backed by user research were, Permission-based viewing and Specialized checklist. There was no need to have any of these functionalities because if we needed permissions, a user would just not use the application. Following our user tests, we chose to not include editing and deleting ability for the "people/places" portion of our app. The is because editing can be just like deleting- if a user were to edit all fields of a contact/place entry, then it's equivalent to deleting that entry and we wanted to make sure that no deletion happened accidentally. The only way to edit a people/place entry is through the caretaker version of the app.

Heuristic Evaluation and Findings

During the heuristic evaluation of our project, we were able to find interesting designs impact in our prototype through the feedback of other fellow classmates. In summary they gave us a list of the most prominent design aspects they were able to notice in our app.

- Pros
  - Easily visible buttons. Designed with user in mind.
  - Extremely intuitive, minimal, and satisfying.
  - Consistent, clean, clear, and modern.

- Cons
  - Add a "completed" task tab instead of the task just disappearing.
  - Setting a journal picture to default is unclear.
  - Navigation to add people is hard.
  - Unnecessary add symbol on the page of specific location.
  - Some labels on header in page memory are wrong.

Furthermore they indicated that the app was very easy to navigate and intuitive, but were also concerned with some aspects of the app like the animation used for the "Word charades" feature, security and missing documentation inside app.
This information gave us a set of task we can improve on following iterations of the project.

User Testing and Findings

Reminders	• Completed section for ticked off reminders
Journal	• Having the ability to delete or make a photo default from the viewing gallery • Need title in edit mode for picture section • In edit mode, Show what information is required to be filled out • Main picture in journal entry should look more clickable • In edit mode, the date section should have a scrollable date chooser
Main Page	• Make the big circle clickable that takes you to a page like the weather app • Having a link where the patient can click to find out what this app is about in case, they forget that can incorporate a tutorial.
Memory Prompt	• Make the word search button look more like a button leading to the gallery • Shouldn't be able to edit or delete any contact or location because this information is very important and still shouldn't be able to jeopardize this info • Should be able to click on a picture in the carousel and go to their contact info
Miscellaneous	• 3D touch for showing options/things that can be done anywhere in the app • Ability to change the color scheme • Support multiple languages • Make it easy for users to know where things are • Have a search bar

Recommendations for Next Iteration of Design

Gathering information through heuristics and user feedback, we have found several areas of improvement needed.

Increase Intuitiveness of Our Application: Through our user tests, we were able to see how icons and buttons may seem from different perspectives. The page causing the greatest misunderstanding was Memory Prompt. This functionality included the patient's contacts and memorable places, which would be very hard to connect to Memory Prompt. As such, we may separate Contacts from Memory Prompt, which could contain only the voice activated feature of finding missing words. The other concern about intuitiveness arose through the editing/adding of the journal. Our application was missing key, small features that would've lead our users to understand: if a picture was clickable, if fields were required to fill in, and if there were different ways to edit journal entries. The next iteration would include small icons by pictures, indicators of whether or not a picture led to a different page, and asterisks for required fields in addition to

grey text indicating to type information. For the last issue we would increase the different pages in which the user may enter the Edit Journal page, increasing flexibility and ease of use for different types of users.

Adjust Flexibility and User Control: Our users stated that they would not use our application due to one main reason; the fact that our application did not support other languages. As such, implementing multiple languages in our app would increase the global range and allow people of different cultures to use our app with ease.
Another flexible feature that would be easily implemented in the next iteration would be to allow different themes, instead of the purple provided in the prototypes. This personalization would give more control to the user and allow them to feel more at ease using our application. Lastly, in regards to User Control, we want to ensure that our users cannot accidentally delete information. Hence, we introduce for journals and reminders a subsection of each which will contain delete entries for up to a number of weeks.

Orientation: With the main screen orienting the patient, it is of greatest importance that it provides a welcoming experience and the expected functionality that a patient may need. As such, from our user feedback, we may create our welcome page to include links, just as how our previously discarded Information Portal functionality would've included. An example could be, instead of "Welcome Back User", "Hi Dave, This is your Alzheimer's App Assistant" and provide a way if they want to know more about Alzheimer's, or a walkthrough for the app. This way, it will help increase our target audience to not just patients with mild Alzheimer's but also up to moderate Alzheimer's Disease, by consistently providing the patient with a walkthrough if required plus necessary information that the patient may want.
Another aspect of the main page that may be changed for the next iteration would be our weather portion. Consisting of the temperature, date and location, we may have the "Sun" act as a button that can bring more weekly information about the current weather similar to the weather application on phones.

Conclusion

Through the User Centered Design process, we were able to create a working prototype for our stakeholders; more specifically, for the benefit of patients suffering from Alzheimer's Disease. Mainly focussing on sharpening our functionalities to be as inclusive as possible, we found from each iteration as we received feedback from Lorans Alabood, our Teaching Assistant, and our users, the importance of balancing simplicity with functionalities, especially in an application designed towards older generations. Pressing forward with this idea and our growing knowledge concerning symptoms and traits of patients, we found that it is best to provide ease of use over the ability to manage and edit aspects of the application. This was shown mainly through our Reminders page: having the ability to delete may be detrimental to the patient in certain state of minds caused by paranoia and memory loss.

Appendix

lumenary. -Heuristic Evaluation (Conducted by Kizum)

1. Visibility of system status
   a. Easy to see where you're navigating.
   b. Lets you know what kind of user you've logged in as

2. Match between system and the real world
   a. Pretty intuitive

3. User control and freedom
   a. Freedom to navigate to the same pages from 2 places
   b. Good that contacts can't be edited or deleted from the user's perspective
   c. Plus symbol in contact profile should not be there

4. Consistency and standards
   a. Symbols for contact list, journal, etc. are confusing

5. Error prevention
   a. After a task is completed it is immediately deleted. Have a task completed page

6. Recognition rather than recall

7. Flexibility and efficiency of use
   a. Hamburger menu has same navigation options as footer

8. Aesthetic and minimalist design
   a. VERY minimal design
   b. Animations are tiresome
   c. Design is very uniform

9. Help users recognize, diagnose, and recover from errors
   a. Recognition: Pop-ups
   b. Recovery: Choosing an option from the pop-up

10. Help and documentation
    a. Not much documentation
    b. Security and privacy settings unsure

Pros	Cons
Easily visible buttons. Designed with user in mind.	Add a 'completed' tab instead of tasks just disappearing
	Set default option for changing journal picture is unclear
	Navigation to add people is hard. Simplify by adding an add logo instead of having to go to the end of the list and adding.
	Remove add symbol when on the page of a specific location
	Wrong title for the Place page in memory, when you check the place "Home", the add place button is unexpected showing here

My Community Coach Heuristic Evaluation (Evaluation conducted by lumenary.)

Website
- Font for subsections (featured/new uploads) looks unprofessional
- Notification and sidebar font too small

1. Visibility of system status
   a. Some symbols difficult to understand the function, such as the button to view comments.
   b. Hard to understand what's clickable and what's just text in some sections/windows
   c. Easy navigate between windows/functions. Navigation bar is intuitive

2. Match between system and the real world
   a. While streaming- comment icon commonly associated with logout (should be something like a chat bubble)
   b. Search bar in the main header is aligned to the left, which goes against similar apps conventions

3. User control and freedom
   a. Not sure if to upload a video, you require all the headings. Description should be optional, and such, there should be a difference between required headers and optional that is clear to see

b. Good user control during streaming
c. Proper undo's options are given to the user when uploading/managing content

4. Consistency and standards
   a. User symbol fixed scrolling on home page
   b. Keep header fixed when scrolling in friends list
      i. Also make the messages title more clear (looks small and out of place)
   c. Pre-populate search section with suggestions/categories to make better use of space
      i. Tab animations a bit wonky

5. Error prevention
   a. Block account should be red
      i. Delimiters between tappable element

6. Recognition rather than recall
   a. Followed conventions set by other similar apps like Youtube and Instagram

7. Flexibility and efficiency of use

8. Aesthetic and minimalist design
   a. Some design features need to be changed, such as the profile picture touching border in messaging section.
   b. Text needs more contrast, as yellow on white is hard to see from afar, or from outside (on both app and website)
   c. Stream setup and uploading videos - delimiters between inputs
      i. Recommendation: shadows between
      ii. Spacing of the text could use some work as well
      iii. Back and accept icon sizes look inconsistent
      iv. Final preview video looks out of place
         1. Could get rid of user and picture and enlarge the video preview
         2. Final two buttons should be top left and right for consistency
   d. Profile pic too close to border in messaging section

9. Help users recognize, diagnose, and recover from errors
   a. When blocking a user, the system automatically unfollows said user (good shortcut)

10. Help and documentation
   a. No formal documentation/tutorials

Attachments:

Low-Fidelity Prototype:
- [Low-Fidelity Prototype (PDF)](#)
- [Low-Fidelity Prototype (Balsamiq)](#)

High-Fidelity Prototype:
- [High-Fidelity Prototype (Adobe XD)](#)

Bibliography

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