Searching for Solutions

Needfinding, POV, HMW, and Experience Prototypes

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Studio Theme: Home
Problem Domain: Efficiency Assistants

Initial Point of View

The initial POV we had going in was from Jay, a local professional.

We met Jay, a computer scientist at a local startup who cares about energy conservation. We were amazed to realize that he felt guilty for wasting water when he took longer showers while listening to music. It would be game-changing to make daily routines enjoyable while also promoting conservation.

Additional Needfinding

We interviewed Derek, an industrial engineer who lives in Boston and is on a trip to Bay Area. He is a self-regulating person who tries to keep a good relationship with his roommate. When there is friction between them, he stands in his roommate's shoes and controls his temper. He takes his responsibilities in household chores and hopes the others to treat him the same way. There's a need for sharing responsibilities in mutual living space for Derek.

In addition, we interviewed James, a security guard at the Rolex outlet at Stanford Mall. He told us about his desire for a cleaner room despite living with his family, who often comes into his room and is the source of the mess. He told us about a time when he went on vacation and came back home late at night to discover that his mom and other family members had made his room a mess. He described feelings of frustration mixed with tiredness due to being jetlagged after the vacation. James would love a way to peacefully resolve this issue.

Points of View

While our new interviews were enlightening, we decided to focus on 3 unique users that we interviewed in the first week: Jennifer, Jay (same as in our initial POV), and David. Jennifer is an extreme user with more exposure to virtual assistance technologies, while David and Jay are more similar to the average user, who has little to no exposure to AI assistants.

Our first POV is from Jennifer, who is a housewife living in Palo Alto. We were amazed to realize that she struggles daily to keep track of supplies in her house - such as the food in her fridge despite living in a heavily automated house. It would be game-changing to make supply-tracking more manageable for someone at home. We made some HMW's such as:

- How might we make an organizational system for someone to keep track of supplies in his or her home?
- How might we automatically reorder products that are in low quantity/amounts in someone's house?

Our second POV is the same as our initial one with Jay, a computer scientist at a local startup. We were amazed to realize that he cares about energy conservation because he felt guilty for wasting water when he took longer showers while listening to music. It would be game-changing to make daily routines enjoyable while also promoting conservation.

- How might we make resource conservation more interesting?
- How might we use music as a timing tool for our daily routines?

Our third POV is from David, a Stanford Housing employee. We were amazed to realize that he had gained an insight into what kinds of decorations he wanted in his house when a roommate brought a surprise pet in to live with them. It would be game-changing to make decorating easier, inspiring, and spontaneous.

- How might we show people what an apartment really feels like before they move in?
- How might we make home decoration a group experience?

Chosen HMWs:

- HMW make an organizational system for someone to keep track of supplies in his or her home? (From first POV)
- HMW make resource conservation more interesting/gamify it? (From second POV)
- HMW make home decoration a group experience? (From third POV)

Chosen solutions:

- An interactive voice enabled personal assistant to help manage grocery supplies and help in cooking. (From first HMW)
- Music as a timing tool to educate people on how long they spend on resource heavy activities like showering, cleaning dishes, etc. (From second HMW)

- Using IOT to sense the resource utilization footprint and incentivise people to conserve resources like water, electricity, etc. (From second HMW)
- **Dark Horse Solution:** A augmented reality or a virtual reality solution that invites friends to virtually work on decorating your home. (From third HMW)

Prototype #1: Home Grocery Assistant

User: Harsh, a visitor to Stanford

Our first prototype involved a personal assistant. The assistant is meant to provide the user with an easier and more intuitive way to manage groceries and other supplies- via voice. Key to this solution were the following assumptions:

- People are comfortable with using their voice to communicate a request
- People find convenience in not opening up an app to jot down a shopping list

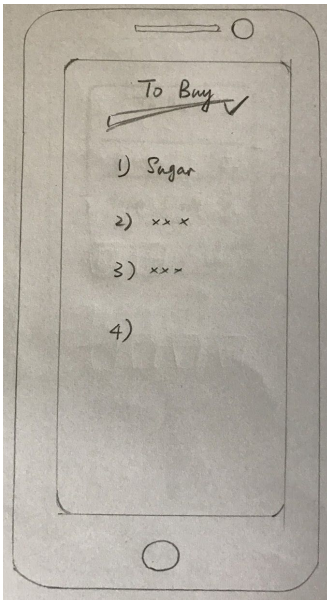
We tested this design by having the researcher play the role of the robotic assistant, Amazon Echo style. We first asked Harsh, the user, to pretend that he was at home, thinking about ingredients he might need. As Harsh vocalized desires for different supplies (such as sugar), the researcher responded in the style of “Sugar added to list 10/13/2016”.

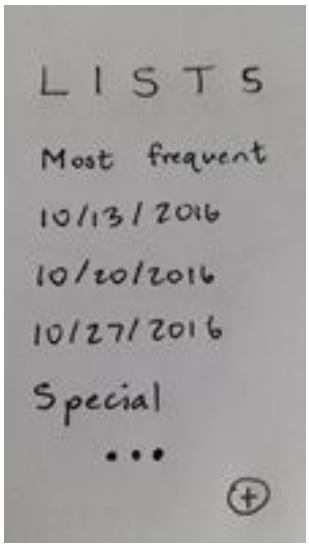
Once the user was satisfied that every ingredient they need had been added, they pulled up a ‘screen’ with different shopping lists. Harsh then selected ‘10/13/2016’ and was shown the list of ingredients he had asked for.

Harsh was particularly excited about having this app while in the United States. He liked that:

- He didn’t have to touch anything to put ingredients on a shopping list
- He could pull up the information anywhere, anytime (jogging his memory)
- The lists were fully customizable (including names, items, categories)

This essentially confirmed both of our assumptions. Harsh seemed skeptical, however, when we asked how he saw other people using the solution. When we nudged him on this, he mentioned that he didn’t really see his family using it much in India due to the necessity of a household device. He voiced unconditional support for the app’s popularity in the US, however, given that there are many more connected devices here. We were surprised by this perspective on foreign markets and made notes to consider outside views more.



Prototype #2: Music Timer

Users: Sherry, an entrepreneur at Danhua Capital, and Ray, a PhD student from Cornell University.

We then prototyped a solution that uses music as a timing tool to educate people on the amount of time resource-heavy activities take. We had the following assumptions:

- People like listening to music while doing repetitive tasks.
- People get a rough sense of time from listening to the songs they like.

To test, we handed each user the prototype before they washed dishes. The researcher asked the user to speak out the buttons they hit. After the user tapped the “Play” button, the researcher started to play songs on their phone. The researcher asked the users to say how long they spent washing dishes. When the dish washing was done, the users were handed the second paper screen showing the statistics of the resources they used.

Both users had a good sense of the time they spent on the task, which confirmed our first assumption. They also liked their menial task more while listening to music, validating the second assumption. Ray expressed his willingness to use the app while taking showers, but he was confused on how their statistics are comparable to other users. Sherry tried to tap the “Play/Stop” button before selecting the songs. We also learned that users are more willing to use the app when they are doing more relaxing activities, such as showering. The UI layout needs to follow the sequence of actions that we expect from the users. We need to conduct longer tests and on various activities.


Choose Your Task
Work
Take Shower
Play / Stop
Choose Your Playlist
Num of Songs
5
Est Time
17:00


STATS
Your Energy Score:
90
Your Water Usage
Today:
1.5L
This Week
3.5L

Prototype #3: Conservation Widget

Users: David and Marcos, PhD students from Brown University

Our third prototype involved a conservation assistant that helps the user manage their carbon footprint while at home and elsewhere. We wanted to test the following assumptions:

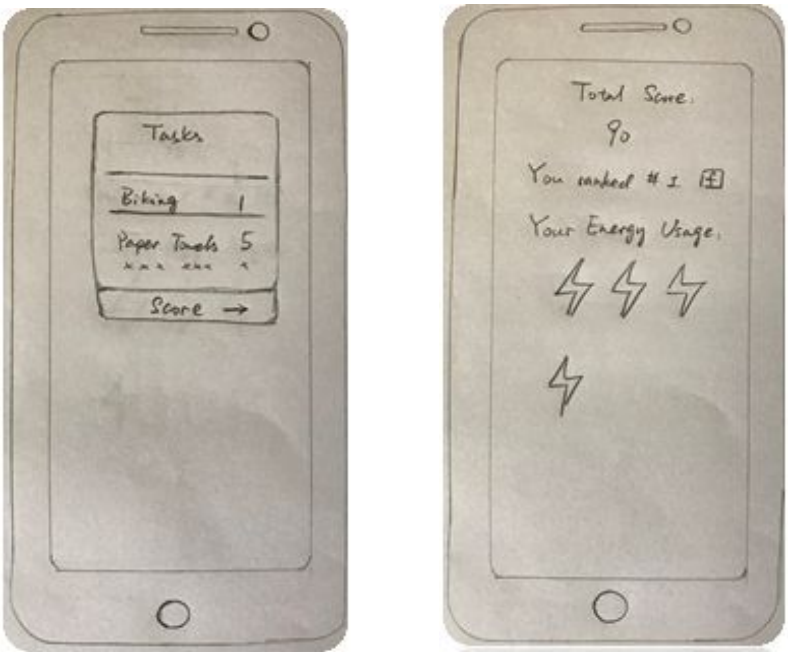
- Users are interested in conserving resources (with or without incentives)
- People will keep track of their resource usage if we make it easy to do so

We tested this design with two PhD students visiting Stanford for a conference. They played around with the paper widget sketch we designed, viewing the pre-made tasks that were on the dial. Then, they moved to the screen that automatically pops up at the end of the day with an Energy Score, signifying the user's savings for the day.

While Marcos was enthusiastic about the proposed design, David was a bit more wary of the idea. They both liked that the solution involved:

- A widget prominently displayed on a home screen
- Intuitive dial that is easily customizable

However, David had serious concerns about the motivation behind a user downloading and using the application. He didn't see it being used except by a very small minority of people who are already environmentally-conscious, unless there were incentives involved. David also pointed out various elements that we could do to make the interface easier to work with, such as displaying the number of trees saved or amount of electricity saved instead of some arbitrary point system. Both believed that some kind of utility discounts or other incentives could be used to overcome the first issue. In the end, we learned quite a bit from David and Marcos, especially about what incentives might motivate people to use the application more often.



Conclusion

After we conducted all the interviews, we decided on the home grocery assistant as our best solution. The prototyping went very well for that particular design - our user said that the prototype experience felt extremely organic and enjoyed not having to open an app - and we see a huge amount of potential for additional features moving forward. We found issues with the third prototype (conservation widget) involving incentivizing users, while the second prototype would likely require a significant amount of research to figure out the market size. Additionally, though we have selected a solution, we have also decided to keep the Dark Horse Solution (the one involving Augmented Reality home decoration) as a possible backup in case we need a more novel design. In the end, we gained incredibly useful information that will help us as we move forward with our primary design.

Appendix

Additional Needfinding:

Picture of James, the security guard who we interviewed for additional needfinding:

Picture of Derek, the industrial designer we interviewed for additional needfinding:

Additional POVS

Sriram:

We met Sriram, a student sharing his apartment
We were amazed to realize, communications between roommates can be hard
It would be game changing to make awkward conversations between roommates better without straining relationships

We met Sriram, a busy student
We were amazed to realize his sleep gets disturbed every morning because of open blinds
It would be game changing to make sure students get good sleep

We met Sriram,
We were amazed to realize people think home is about friends but also need privacy

It would be game changing to strike a balance between friends and privacy

We met Daniel, a worker at Best Buy,
We were amazed to realize that he struggles to find his remote in his couch with the same color
It would be game-changing to make it easier for Daniel to find extremely important items in his house wherever it is

HMWs:
Jennifer:
HMW make an organizational system for someone to keep track of supplies in his or her home
HMW alert people well before they run out of a highly demanded item in their house
HMW automatically reorder products that are in low quantity/amounts in someone's house
HMW give information about a product that's most relevant to the given person as they are using it in their home
HMW curb the use of supplies
HMW remind people how much of any given material or product they're using in a task
HMW allow people to plan for future use of supplies so they can obtain more early on
HMW link 'smart' sensors to existing systems (e.g. NEST) that can predict low supply count
HMW alleviate the stress associated with missing highly demanded products
HMW make supply tracking fun

David:
HMW show people what an apartment really feels like before they move in
HMW motivate someone to decorate their house
HMW help a user decorate his or her house
HMW turn an unexpected surprise in a home into a positive experience
HMW provide a new aspect to the home to enhance the social atmosphere
HMW make decorating a home exciting
HMW match a home decoration to a user's style with minimal information about the user
HMW learn good decorations based on a few of the user's preferences
HMW give a user more control over the decor in their home
HMW minimize the number of negative surprises and maximize positive surprises a person has in their home
HMW make home decoration a group experience
HMW easily decorate home differently everyday

Jay:
HMW alert people the time they spent while doing energy-consuming activities?
HMW reduce the time people spend on resource-intensive actions?
HMW make resource conservation more interesting?
HMW make people more aware of time when they are doing the things they enjoy?
HMW make water/energy saving a fun part of our daily routines?
HMW make daily routines less time-consuming?
HMW use music as a timing tool for our daily routines?
HMW produce energy/water resources while doing things we enjoy?
HMW allow for occasionally high moments of resource use while minimizing overall usage?
HMW encourage the masses to conserve, all at once?
HMW popularize conservation so people compete to conserve?

Sriram:
HMW make a person more considerate of their roommate
HMW notify people in a positive manner when they are disrupting their roommates
HMW ease conflict between roommates
HMW anonymize feedback between roommates

Solutions Brainstorming
Jennifer:
HMW make an organizational system for someone to keep manage supplies in his or her home

1. Notifications when food is expiring soon
2. Notifications when a typical use cycle is over for a product (user usually uses up toilet paper in 2 months; set a reminder every 1.9 months)
3. Something that keeps track of the food being made and guides user into the best way to prolong supplies
4. Something that keeps track of cooked food and continually keeps a date that the user will run out of things to make
5. Dynamically keeps a list of recipes that users may enjoy based on past food choices
6. An amazon echo like device remind and keep track of to buy lists and make orders on instacart
7. Sensor in fridge to detect rotten and expired food
8. Automatically reorder insufficient supplies

9. A dynamic table that updates based on what food you recently buy and uses a camera to determine which food is running low
10. A picture graph of the most used food. It would give a more visual way to see what is running out before going shopping
11. A scanner that automatically scans items that are put into a fridge and displays the results outside the fridge
12. Recipe suggestions based on available resources

David

HMW make home decoration a group experience

1. Post to Facebook feed whenever you buy furniture/decorations
2. Suggest art based on what your friends liked
3. Suggest decorations based on what the overall community likes
4. A VR system that invites friends to virtually work on home decoration together
5. Offer 'build a bedroom' competitions that award prizes to the teams that make the most stylish rooms
6. Connect people with similar tastes in decor over the Internet
7. Offer a color matching guide - showing new decorators what colors work best together
8. Create a guide of surprising decorations that people typically don't think of
9. Interface with popular messaging apps that easily allow sharing with close friends. Post photos and people anonymously choose what they like
10. Have a game website with a table of images. Users choose the images that they like the most. Users are given rewards e.g. Swag Bucks, coupons, etc. Could be linked with companies that provide decor
11. Crowdsource decoration designs to friends on facebook

Jay:

HMW make resource conservation more interesting/gamify it?

1. Having a count of recycled goods and giving users some points or cash to encourage recycling
2. Interface with some other popular game to provide points for the other game when a user recycles
3. Have restaurants/popular gathering places offer rewards for people with membership at that particular place that show proof of recycling. The restaurant/popular place would have some app with access to a user's camera for showing proof
4. Partner with some electrical companies that keep more accurate track of resources than utility companies would. They work with software companies.

5. Music as a timing tool to educate people on how long resource heavy activities take
6. Magically find out and give points when people conserve resources in the day to day activities and give discounts at shops
7. Dim lights based on music or mood of the room
8. Notify people of their resource usage everyday (water, paper, electricity, etc)
9. Use music to time showers and offer rewards when people use fewer songs
10. A game that keeps track of the tasks you have done to conserve resources
11. Popularize conservation by organizing competitions for people to participate in resource conservation

Reasoning for Chosen Solutions:

- An interactive voice enabled personal assistant to help manage grocery supplies and help in cooking: (From first HMW)
    - This solution has a lot of potential for future expansion with many ways to add additional features. Keeping track of things to buy is something we do everyday and is also quite painful - making the potential frequency and market size for this product quite high.
- Music as a timing tool to educate people on how long they spend on resource heavy activities like showering, cleaning dishes, etc. (From second HMW)
    - It was quite interesting for us to see that people like Jay wanted to be mindful of their resource usage. Music is something that many people listens to when they are doing other resource intensive work like washing dishes, showering, etc. We believe it can also reinforce resource frugal habits in people in a long run, saving people's money on utility bills.
- Using IOT to sense the resource utilization footprint and incentivise people to conserve resources like water, electricity, etc. (From second HMW)
    - We want to make homes energy and resource efficient. With IOT technology and smart appliances, we have the potential to change the way many people use up resources for the better. This is a problem with a potentially wide market share, though it has less pain than the others.We believe it can also reinforce resource frugal habits in people in a long run, saving people's money on utility bills.
- **Dark Horse Solution:** A augmented reality or a virtual reality solution that invites friends to virtually work on decorating your home. (From third HMW)
    - This solution is novel, but we wanted to make our 3 prototypes out of grounded ideas. This is the Dark Horse idea.

Prototype 1b: Fridge organizer

Tester: Wes, a middle-aged man we met at Stanford Mall
The fridge organizer is a system that captures food in the fridge and automatically makes orders or put items onto a shopping list before food expires or runs out.
Assumptions:

- · People want to get foods they are lacking when they go shopping
- · People want several choices in how they input data (e.g. via a camera, text, or voice)
- · People generally want to buy a certain brand every time
- · People want to see the last brand that they bought

How we made the prototype

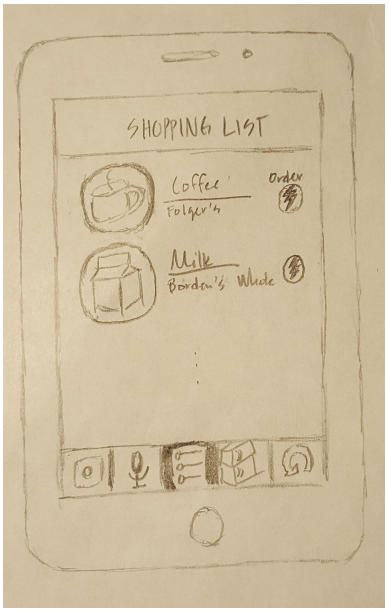
We put ourselves into the shoes of a typical user in a house that does the shopping for food in the house. We realized based on the assumptions above, this application needed to have some expected organization in relation to each functionality. This reasoning led us to 5 main tabs that appear on the bottom of the screen: one for taking a picture of the fridge or of specific food items, another for issuing a voice request, another for the shopping list itself, another for the inventory of the fridge, and the last one for order history.

We tested the prototype by talking to Wes, a middle-aged man we met at Stanford Mall who can be classified as an average user. We first asked him to imagine opening the app for the first time and taking a picture of his fridge. We then asked him to imagine using the app after obtaining food from the store.

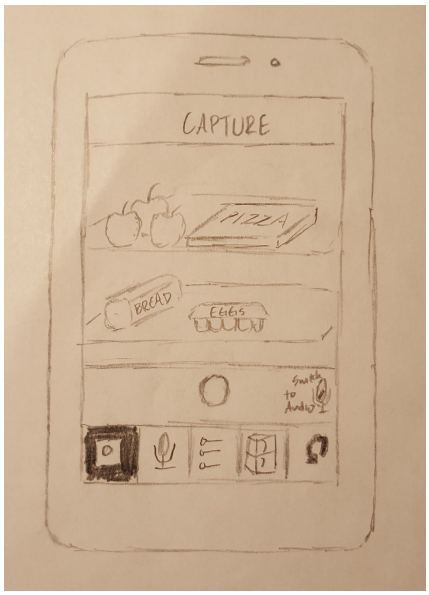
- What worked: Having images next to words, having multiple tabs at the bottom
- What didn't: No integration with messaging clients, didn't feel the need to order on Instacart
- What we learned: Users are willing to take individual pictures of foods. Users would use the app more to replace a written shopping list

The assumption about several input choices was valid as Wes requested the option to type in an answer in case the app didn't understand his accent. A new assumption we gained is that users might want integration of a user-captured image with a user-written text that could overlay the image. For example, Wes mentioned a case where he wished he could send a picture to his wife of a cereal box to buy and add that he wants the smaller box.


YOUR FRIDGE
Apples
Pizza
Eggs
Running low


SHOPPING LIST
Coffee
Folger's
Order
Milk
Borden's Whole


VOICE ASSISTANT
What food would you like to add?


CAPTURE
PIZZA
BREAD
EGGS