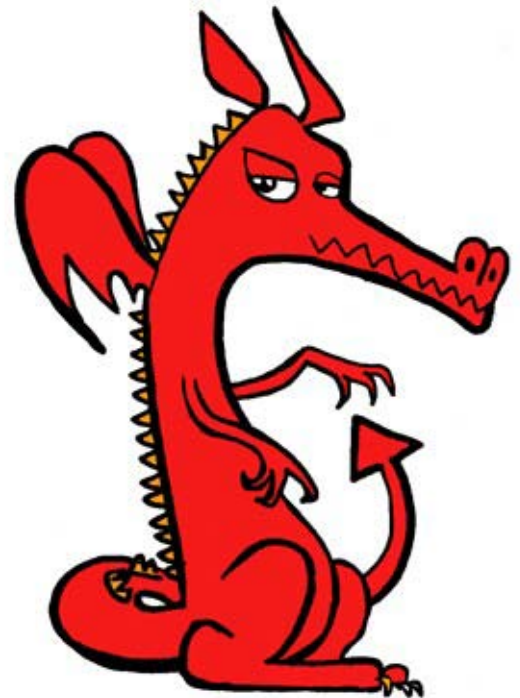


Mirror Map: Beneficial Awareness

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Personas

Joanne Johnson



<http://www.flickr.com/photos/elizabethannephotography/3222226022/> on 10/14/09

Joanne is thirty-eight years old. She is married to Jordan, who is forty-two years old. They have three children, James (12), Andrew (15), and Courtney (17). Joanne and her family live in Phoenix, Arizona. While Jordan is an NFL athlete representative, Joanne is a stay at home mom. She takes care of the house and the kids. The Johnson family lives in a big house with many large TV's (including one in the bathroom downstairs). They have a nice pool and sometimes entertain guests and athletes. The family has three cars, one each for Jordan, Joanne, and Courtney. Joanne has a very good relationship with her husband and children. Three times a week Joanne either drops off or picks up the neighborhood kids from school. Joanne drives them to their extracurricular activities after school. The family tries to take as many ski trips together as possible, but Andrew hates going. Jordan is often away on business, visiting his clients and recruiting, so he and Joanne use their cell phones frequently to check in with each other. In her spare time, and while the kids are at school, Joanne likes to host a bi-weekly book club at her house. She is currently learning to knit and likes to keep her house tidy. Joanne often goes out shopping with her girlfriends during the day and she likes to stop off at the local coffee shop for a cup of mocha.

Stephanie Monroe



Image: Dave Jacquin <http://www.flickr.com/photos/davejacquinphotography/3872500841/> on 10/18/09

Stephanie Monroe is twenty-nine years old. She has a four-year-old daughter (who attends day care) and is currently 2 months pregnant. Stephanie and her daughter Katherine survived a bad car wreck, but Stephanie's husband (Katherine's father) did not survive. Stephanie is now engaged to be married in two months to a man named Steve Fischer who she met at a conference. Stephanie recently left her job as an executive brand manager at Killian and Company to focus on her upcoming wedding and family. She currently lives in the Lakeview neighborhood of Chicago, Illinois. Stephanie made a very good living at her previous job and her late husband left her a small fortune. She is a coinsurer of fine wines and foods. In her spare time Stephanie likes to cook and host parties.

Research

Primary Research

To help us develop our core we took a trip to Crate & Barrel and did an ethnographic study. We assessed the people who shop there and the items they carry. We found great insights being a part of the atmosphere and observing customer and sales associate interactions.

Secondary Research

As our design concept developed Mirror Motive, an interactive mirror located in the Ethos house on campus, was brought to our attention. Mirror Motive allows people to get information on community happenings. It is activated by a waving gesture.

Project Natal is a new gaming platform being developed by Microsoft. It allows interaction and control of games through hand gestures without physical objects.

Design Overview

Mirror Map

Our design concept is a large decorative wall mirror that also functions as a locating device for family members. Once the mirror changed into a locating device the reflective characteristics of the mirror would turn off. It allows users to locate people, view detailed information about people's locations throughout the day, as well as details about specific venues. People interact with the map via large gestures.

Core of the Problem

The Wesley clock, Google databases, and GPS were our points of inspiration for our assignment as well as our focal points of research. When taking these inspirations into consideration we loosely defined our problem space as location. From this problem space we started generating a list of ideas around location. After that, we began to eliminate elements to understand what was most important within our problem space. It was through this process of elimination that we brought up our target audience and personas. After considering their needs, we narrowed down the problem space and reached our core problem, keeping track of people.

Core of the Design

When doing the Ethnographic study at Crate & Barrel, we did research on our target audience, 25 to 40 years old affluent mothers, and the dynamics of the environment. Then we generated our design concept, which are large gestures. This is a new way to interact with a device and we utilized these gestures on the platform of large decorative mirror. This new way of interaction with technology is useful for mothers and easy to use.

Original Design Rationale

Interacting with Device (Large Gestures)

Turn On and Off

To turn the Mirror Map on and off the user would simply walk up to the device and wave. We found that this gesture was natural and intuitive to users.

Zoom

The mirror map has the capability of zooming in or out. To zoom in, the user would hold both hands next to one another and then pushing them away from one another. In order to see a more expanded view, the user could space both hands out and bring them together. Both of these motions resemble the touch screen expansion and collapse gestures.

Pan

The mirror map has the option of panning in any direction (north, south, east, or west). The user would simply slide one hand in any direction and the Mirror Map would pan in the appropriate direction.

Cursor

We wanted to provide a way to show how the screen is interpreting the hand gestures' of the user, therefore, we introduced "the hands" as cursors to mimic the users hand gestures.

Grab and Pull

When a user wants to get more information on a person or place displayed they would simply grab the object of interest and then pull it towards them. We felt that this gesture closely mimicked the real world in that it was a natural means of selection.

Grab and Throw

Once an image is "grabbed" as mentioned above the user could then discard the unnecessary information by throwing it; this is the motion of throwing an object into a trashcan. This throwing motion would be an intuitive way to discard any additional information.

Frame and Security

Three cameras would be embedded within the frame of this large decorative mirror (two at the top and one in the bottom center). For security purposes these cameras would be equipped with facial recognition in order to keep unidentified individuals from accessing family members' locations.

Usability Testing

Objective

The goal of our usability testing is to determine whether the gestures we designed serve an adequate consistency with the users' natural movements when interacting with the mirror map. Tasks were created based on the main interactions in which users were supposed to achieve certain goals using the device. Participants were asked to try to complete these tasks via the life-size prototype.

Process

There was an introduction to the mirror map and the testing when participants were recruited at IU Library and Informatics Buildings. A script (Appendix A) was referred to in order to bring consistency to the testing. It was emphasized that the testing was given to evaluate the design rather than the participants. They were encouraged to speak out loud any their thoughts during the test. They were also told that both positive and negative comments were useful and highly appreciated.

We had one facilitator who read the script out loud and helped the participants understand the tasks. One member took responsibility for the device reflections of hand gestures, two tracking hand-shape cursors. One member changed the screen of the prototype. The forth member recorded video and took notes.

We conducted the test in the following format:

- Introduced the background of the test and the main purpose of testing gestures

- Introduced the Mirror Map
 - The participants were informed that the mirror was a mirror as well as a tracking device similar to a GPS system. We stressed that the three cameras could recognize big hand gestures and encouraged the participants to do any movements that they thought would work.
- Set the participants in scenario and began tasks
- The participants worked through one task at a time
- They were told that they were in a scenario where they wanted to track their family members James and Jordan
- They were asked to:
 - Switch the mirror to a tracking device with certain gestures
 - Zoom in to the family with gestures
 - Zoom in to James with gestures
 - Get Jordan who was out of the screen into view
 - Get more information about Jordan on the screen
 - Get detailed information about the location (Café)
 - Get rid of the information about Jordan
 - Turn the map back to mirror
- We asked the reason for doing the gestures they did after each task
- We asked feedback for the overall design
- We thanked them for their participation

We recruited six participants in the test. Most of the tests were completed quickly and easily. All the participants appreciated the design. They gave high rates for its simplicity and satisfaction. For the main purpose of testing gestures, we got good results.

Analysis

Most participants got the wave to turn on/off the map.

Most participants expanded their hands to zoom in. One of them used point to zoom in.

All the participants panned to move the map, getting Jordan into view.

We also got results on the areas that needed to be improved:

Most participants did not “grab and pull” the detail information. They used “point and click” instead.

Most participants did not understand that the different sizes of the pictures in the information window represented different amounts of time Jordan spent at that particular location.

Participants used different gestures to get rid of the information window. For example, click and throw, rub away and make a cross on it.

Redesign Rationale

Gestures

After usability testing we decided to keep the ‘wave’ gesture to turn the machine on. Nearly all of our users waved when asked to make a large gesture

to turn the machine on. We decided to change the 'grab and pull' gesture, used to select, to a 'point and click' gesture. Many of our users said this was more natural because it was similar to object selection on a computer.

Screen Arrangement

There is a screen that displays detailed information of a person, when their image is clicked. This information screen was rearranged to include a large photo of the current location and an overlay that says "current location". In addition, "today's visited location" was the phrase choice that will be displayed above all of the locations that were previously visited by that person.

Added Feature

We also added a locator toolbar to the device. The toolbar will appear on every screen and will have hot buttons to quickly locate a particular person. The buttons will be a picture of each person in the system and when clicked, the map will immediately show their location.

Future Directions

Design Devices

In the future we hope to be able to accommodate mothers in other ways. One of the ideas we have is a compact mirror accessory for on the go access. Since most women carry a mirror in their purse or makeup bag, we figured a compact mirror could be synced to the main device.

GPS Tracking

We also discussed ideas for different types of tracking devices. Although cell phones are already equipped with GPS and many people have them, this would not be an adequate tracking device for all ages—many people being tracked by their mother's will be too young to carry or operate a cell phone such as small children. We thought that tracking devices could be embedded in different things like clothes for instance. This still may not solve the problem for all children because many young children often get dirty or soil themselves during the day and have to change clothes. We thought of also embedding GPS in shoes or shoe laces. Lastly, we imagined microscopic GPS molecules in shampoo so that when people washed their hair, it would be matched with their DNA to uniquely identify them.

Appendix A

Usability Test Script

Introduction:

“Hello my name is _____. We are doing a test on a product that was made for a class. We would like to take about 5 minutes of your time to ask you some questions and really understand if you think this is a usable product or not. If you are comfortable with participating would you mind if we video recorded?” these screens are going to take time

As we mentioned, this will only be 5 minutes, and if you at any point want to stop participating you are more than welcome to end the test. Also, please think through the steps that we give you out loud so we can have a better understanding of how you are processing things.

So, what we have is a decorative mirror that has the potential to give you information on people’s whereabouts on a map. You interact with the mirror through big arm gestures.

(Loading)

You are trying to check up on your family members. And you want to see where the people in your family are.

Question:

What big gesture would you use to activate the location functionality of the mirror?

Now that you have the device on, what big gesture would you use to zoom in on your family in the west coast?

What big gesture would you do to zoom in on James?

Remember that on the previous screen, Jordan was off to the right. What big gesture would you do to get Jordan into view?

Remember that you can get more detailed information on a person’s location. Let’s say you wanted to get more information on Jordan, what big gesture would you do?

What kind of information do you see on this screen?

You see that the café is there, and you’re not familiar with it. What big gesture would you do if you wanted to get more details on the cafe?

Let’s say we go back to the previous screen where we just see detailed information about Jordan, what big gesture would you do to get rid of the detailed information of the café?

What big gesture would you do to back to the mirror?

Thank you so much for your cooperation. We have a few more questions for you:

How would you rate the difficulty of the tool, on a 1-5 scale where 1 is very simple and 5 is very difficult?

How would you rate your enjoyment while using the tool; where is 1 is dissatisfied and 5 is satisfied?

Again thank you for your time, those are all the questions we have for you.