3d: Usability Testing Review

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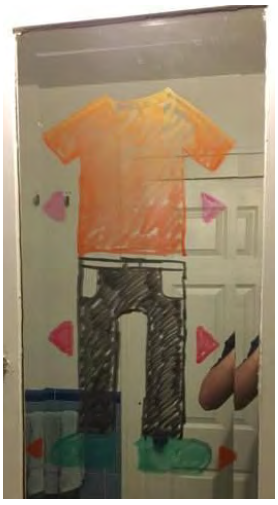
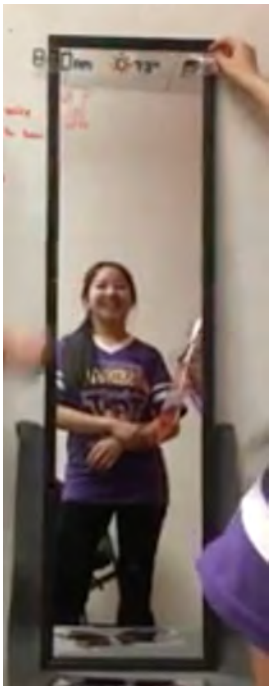
Usability Test 1

Description

In the first usability test, the participant is a 21-year-old female student in UW. We chose to do the test in the CSE building labs for convenience, especially because we had to have a full length mirror with us for the test. Our participant was chosen for her interest in the product, as well as being part of the interview process during our design research. Our primary takeaway from the testing process so far is that it is relatively difficult and should be coordinated better. During testing, Hao took notes on the process, Tong manipulated the display on the mirror, Dylan acted as the voice for jasper, and Steven recorded video. Our participant used our design to choose between three options for tops, bottoms, and shoes as a starting point. We quickly realized during testing that it was more vital than we thought to have an established tutorial for our product when our participant was unsure how to interact with the mirror. Perhaps a video demo of a person interacting with Jasper would help, especially focused on how to correctly gesture to reduce errors. We also realized that a smoother way to transition the display would benefit our testing process; our mirror requires hanging heavy sheets of plastic for an overlay, and they regularly fall down and cause issues.

Incident Table

Image	Incident	Severity	Fix	Fixed image
	**Match between system and the real world**: The arrow icon on the sides of the item is rather unintuitive and does not encourage wiping gestures from the user.	2	Scroll attire icon instead of arrow.	

	**Aesthetic and minimalist design:** The time/weather/events information on top of the mirror is confusing and unnecessary when dressing.	1	Ability to remove Time/Calendar/Weather display with gestures.	 The three dots indicate the ability to “drag” up and down the status bar, allowing the person to hide or show it.
 *“Okay so you have a job interview today.. .umm probably should look nice for that” *pauses* “Oh wait also going to the gym later”*	**Consistency and standards:** The response of Jasper is improvised and unprofessional. Since we were trying to make Jasper sound more intelligent, we used real human interactions in the prototype. The reactions given by Jasper seems to be confusing and gives out too many hints to the user.	2	Have the scripts predefined and makeup responses according to the flow chart as well as some special guidelines.	 *“Good morning Participant, the forecast is 73 degrees and sunny; you have two scheduled events: job interview at 11am and gym at 2pm”*

Usability Test 2

Description

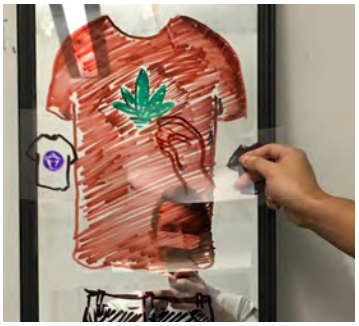
The second usability test was conducted on Sudharsan, a 22-year-old computer science student. The test took place in a small breakout room in CSE basement and lasted for 10 minutes. The team chose the breakout room because of its discretion and spaciousness, because it is relatively quiet and private – more comfortable for the test participant, and it has enough room for the usage of the paper prototype which is relatively large.

Test protocol includes a brief greeting, overview of the design, introduction of tasks, testing, and debriefing. It is worth noting that our testing strategy has improved significantly from our first participant. We implemented a tutorial, started using pre-typed scripts spoken by a computer, more reliably attached images onscreen, and had a more streamlined experience overall. For this test, Dylan played the role of the Jasper's screen, Tong controlled its voice with text to speech software, Hao took notes, and Steven recorded video. First Sudharsan was introduced to the team, and then our current iteration of Jasper, now with a start screen. Sudharshan was able to use some voice commands and recognized left/right hand gestures, but had issues changing and confirming the selected article of clothing. Jasper's overall functionality was not specific enough for him to be able to clearly distinguish its limitations and supported functions, and it was difficult to even remember the few commands mentioned in the tutorial. Despite the confusion, locating the item was a quick and successful task.

We decided to make some simple changes to Jasper to improve its ease of use and reduce user confusion. We added a hand icon that appears after Jasper is idle, and politely indicates available gestures by swiping around. The start screen had example voice commands added to demonstrate use possibilities, and the user's voice input is displayed back on screen to reinforce recognition of voice commands.

Incident Table

Image	Incident	Severity	Fix	Fixed image
(No image as no onboarding screen existed prior)	**Help and Documentation:** He did not fully understand the coverage of Jasper's functionalities. "Does it do everything?"	2	An onboarding screen displaying briefly major commands and functionalities, and a microphone image that suggests voice input.	

(No image as no command text existed prior)	**Recognition rather than recall:** He could not quickly recall the voice commands at each stage, because they were only given at the beginning of the test but not reminded in progress.	2	Display and visualize user's voice input, thereby reinforcing the recognition of voice commands.	
	**Recognition rather than recall:** He did not understand how to switch between categories of items and process to the next step. Up/down hand gestures were not mentioned or hinted to him.	4	When there is no user input for a period of time, an overlay image of a hand appears and moves around to suggest available gestures.	
	**Visibility of system status:** When the ringer was activated on an item, he was not sure if it was the specific item he chose or if he chose the right item.	2	When an item is selected and its ringer is being activated, an indicator appears on the mirror specifying which item it is.	

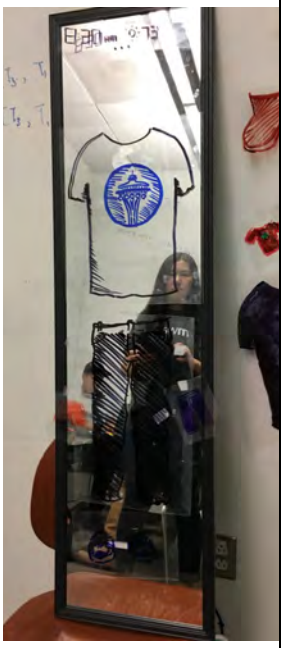
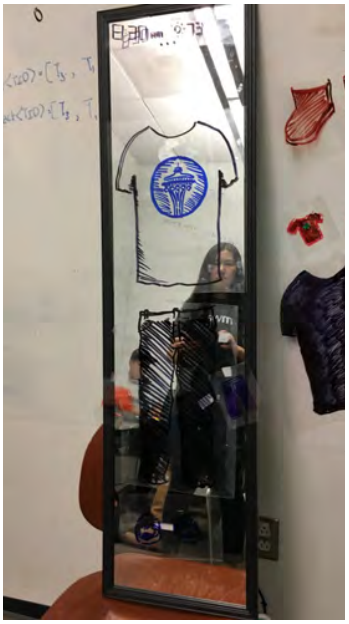
Usability Test 3

Description

The third usability test was conducted on John, a UW student and an acquaintance of one of our team members. We also conducted this test in a CSE labs breakout room, the same setting described in our second usability test. Our team decided to maintain the same testing roles from test two, as we had become more accustomed to them, and we were also performing the third test immediately after the second one. John recognized availible hand gestures right away, and was very conscious about using the keyword "Jasper" when issuing voice commands. John's intuition for the gesture based interface made us notice another issue: voice confirmation to change selected clothing type is unnecessary and disruptive. Asking for confirmation reduced the fluidity of interaction, which would certainly get more annoying as you become more familiar with the interface. John also was not aware that Jasper actively curates clothing

options based on the current selection, so he often asked “what should I wear” when switching to new articles of clothing. In response, we made slight tweaks to the dialogue to suggest this was occurring, such as “now showing matching pants”. There was also an issue with moving back to previous items. Once John had confirmed an item and moved on, he did not know if he could move back or not. This confusion was another factor in our decision to remove audio confirmations from Jasper.

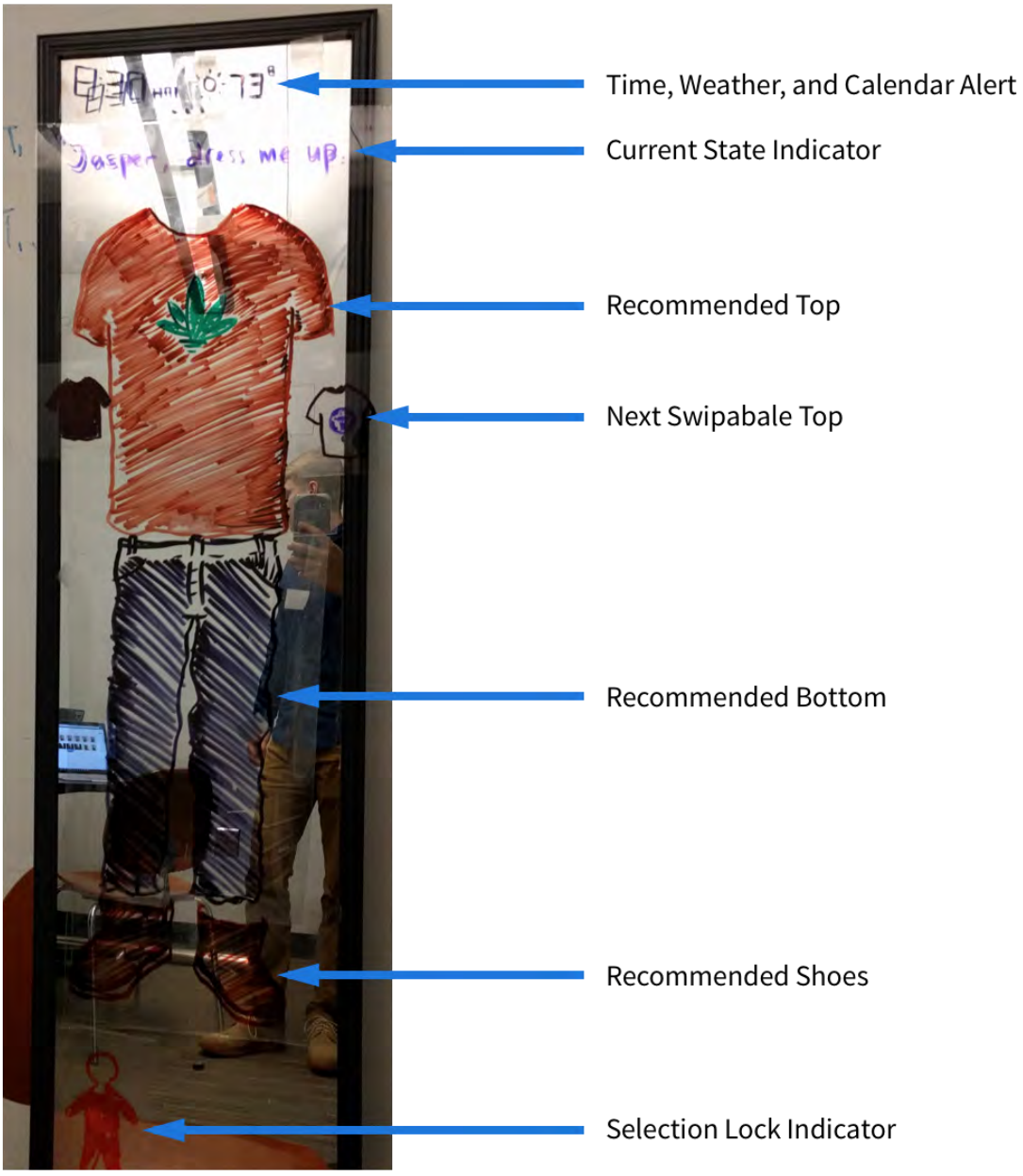
Incident Table

Image	Incident	Severity	Fix	Fixed image
	**Aesthetic and minimalist design:** Voice confirmation is unnecessary and distracting. When he has decided on one of the T-Shirts, he swipes up and starts to choose bottoms. And Jasper says, “Are you satisfied with the T-Shirt?”. He thinks he has already confirmed the top by swipe up so there is no need to confirm again.	1	Eliminate audio confirmations and assume he has decided on the item when he swipes over an item.	
(No image as audio existed prior)	**User control and freedom:** System display (progress avatar) and voice always prompted for confirmation of the current item and moved to next items. He did not know if he could come back and change previous selected items.	3	Eliminate audio confirmations and add instructions on how to move back to previous item selection.	
(No image existed prior)	**Consistency and standards:** User did not realize that the default section was already based on the most recommended	3	Added audio guidelines every time he decided on something and moved on to another selection.	(Audio guidelines)

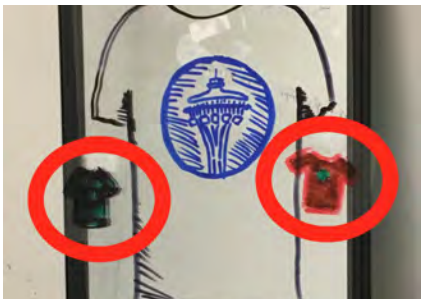
	selection, and instead actively prompted for “What pants should I wear?”. The system was not prepared for such inquiry.		For example, Jasper says: “Now showing all bottoms matching this T-Shirt after he decides on one top.	

Finalized Paper Prototype

Overview



Task 1: Outfit Visualization and Selection

 **Top (T-Shirt) choice selector** The person has the ability to change tops by swiping left or right with their hands.	 **Bottom (pant) choice selector** Following shirt selection, the person can swipe down with their hands to begin choosing bottoms. The person can choose bottoms with the same motion as they chose their top: with a left and right hand swipes	 **Outfit completion indicator** In order to indicate that different "areas" of the outfit have been chosen through voice commands, we've included an icon indicator. If the top attire has been chosen, the middle of the figure's body will be shaded. If the bottoms have been chosen, the bottom of the figure is shaded, and so on with the shoes.

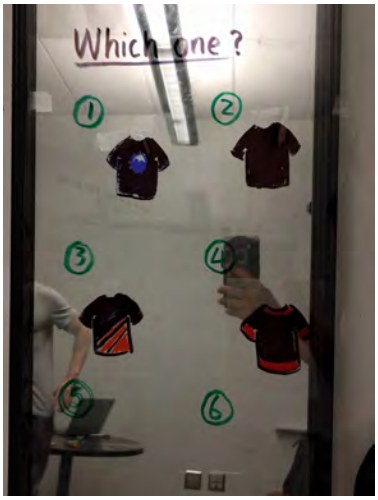
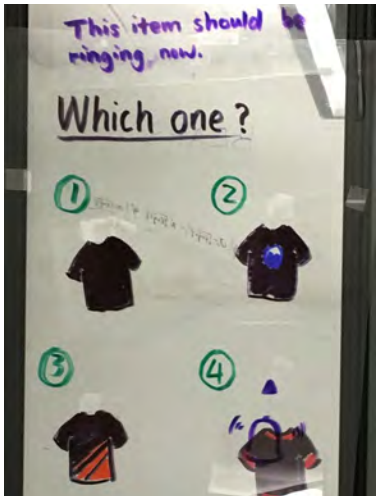
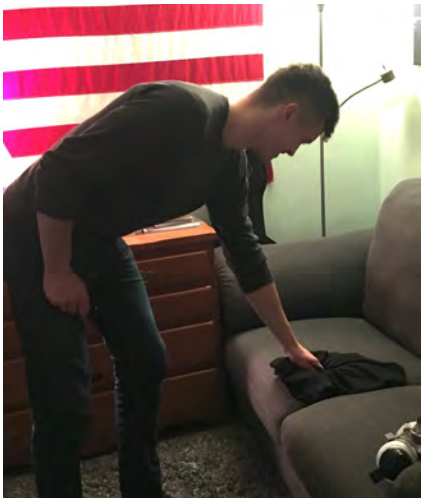
Task 2: Item Location

The item location task can be triggered from two different situations while interacting with Jasper:

1. During the outfit selection process--the user can't find an item that Jasper recommends
2. Ad-hoc clothing locating without getting dressed (i.e.: locating a rain jacket midday after you are already dressed)

Item location from option #1 (outfit selection process) is initiated from the end of Task #1, so we will not show images.

Option #2 (Ad-hoc clothing locating):

		
Step 1 The person says "Jasper, please located my black T-Shirt." Since the person's inventory consists of multiple black shirts, Jasper presents options of the person's black shirts for clarification selection. The person replies with "Shirt #4 please."	**Step 2** Jasper begins locating the item by ringing the clothing attire item's tag. The tag makes a ringing sound so the person can find the item. The display also provides label message and a ringing icon above the selected shirt, providing another indication of the ringing process.	**Step 3** The person finds the item in their bedroom (or wherever it may be in their house). The person puts on the piece of clothing and heads out the door.

Discussion on Most Salient Revisions

The first important revision derived from the usability test was the **top/bottom/shoe swipe selector feature**. Prior to the usability test, the participant would change their top by swiping with their arms left or right, change their bottoms by swiping with their knee, and change their shoes by shaking their feet. We initially chose this method because it was simple and fun; it didn't require an extra step of "selecting" the area of clothing one would like to change. Following feedback from peers and the usability tests, we found these body movements, especially with the knees and feet, to be awkward and uncomfortable for the participant to perform. Realizing this probably wasn't the best action to change the area selector, we began brainstorming new ideas. Working with one of the TAs, we decided to keep elements of the swiping process--but we ultimately decided to scrap the knees and feet swiping and elected to use only hand motions for swiping. The new area selector involved swiping left and right normally, but to change the area selector, the participant would swipe up and down. The selector starts for the top attire. For example, if the participant would swipe down, the area selector would change to the bottoms (pants). If the participant would then swipe up, the selector would change back to the tops. We tested this new method on our last usability test participant, which was received very positively. The participant stated that "the process felt

natural and smooth," compared to previous participants who felt the bottom and shoe changing motion was awkward.

The second theme in our revisions was centered around **user help**; we noticed confusion in our test participants during certain times in the dressing process, and sought to correct this by offering unintrusive, helpful features. Although, people can simply ask Jasper for help at any time in the selection process to hear about available functions. The most noticeable change is the tutorial startup screen for newer users. The screen shows example use phrases, while Jasper explains its primary functions and briefs the person on how to interact with it. We observed it was particularly difficult for participants to begin interacting with the mirror, so the tutorial served to jump start their understanding to be able to use the core features of Jasper very quickly. To improve clarity while people are issuing voice commands, the person's command is displayed in text on Jasper to indicate that it was received. Another improvement we made to help users interact with our design essentially detects confused users who have stalled without making outfit changes for a certain time. Whenever this happens, a small hand icon is overlaid on screen which gestures to the available directions the user can swipe to. Fixing these issues was so crucial to our design because it will improve not only the usability, but also fluidity of use. People Interacting with Jasper will be better informed on its functions, and also see feedback on the commands they are issuing in real time, ensuring that they can interact as quickly and smoothly as possible.