Balance
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3d: Usability Testing Review

Usability Test #1

Our first usability testing participant, Mary, was an undergraduate student in Computer Science major in the University of Washington. We were under a time constraint and it was easier to find someone from our major. Mary has a busy schedule and we think she can represent our target users. The Usability Test was conducted in the HUB cafeteria because that can be a place where our target users would likely take a break and check their schedules. We first explained our design and how paper prototyping works, then we asked her to do the following tests:

1. Check the records of current balance of time for this week.
2. Cancel the notification of lunch at 11 am.

Mary was able to perform each task successfully and intuitively, however she could not tell which section of the pie chart went to which category. Mary also had some issues understanding how to find menus. We decided to extend our home screen to have multiple pages and Mary was able to easily navigate to it. During the Usability Test, Ryan was the greeter, Chad was the facilitator, Alex was the computer and Jia was the observer.

Usability Test #2

Our second usability testing participant was Ryan, a data visualization researcher at the University of Washington. As both a student and a researcher, Ryan manages many different responsibilities. We conducted our usability test at Ryan's home where he has the most control over his time management, with team member Chad as the computer and team member Ryan as the facilitator. Our participant Ryan has both classes and meetings with his research group that keep him on campus, but consistently waiting on people. We wanted to focus on how Ryan chose to use his free time, since good use of his free time seemed to be his biggest challenge. We conducted our testing by having Ryan fill in his free time with different activities to try and keep the balance.

As a data visualization expert, Ryan gave us a lot of good feedback about how we displayed a user's time records and how we compared them with the user's personal goals. This helped us come up with the more robust "Records" screen that replaces

clunky drop down menus with hand gestures and lets the user quickly switch between the "Ideal Balance" and their actual records.

Usability Test #3

Our third usability testing participant was Jerry. Jerry was chosen because he is not a college student, and because he is trying to balance his time with his family and himself. He also regularly has many unplanned events that interrupt his normal day. The usability test was conducted in his own home after work with team member Ryan as the computer, and Alex as the facilitator.

The tasks we mainly focused on during this test involved the schedule shifting. Since Jerry was constantly moving his schedule around to meet the needs of his family, we decided to focus our tests on how our prototype would handle it. Jerry said that the prior day was a good example, so we choose to replicate it. The first thing that was brought to our attention was the inability to undo his changes when his family changed their minds back and forth. He couldn't find a way to re-enable a task. He also couldn't find a way to snooze a task for just a few more minutes while he finished up his previous task. We learned our prototype would need some of these features easily accessible to keep up with his schedule. He would also like to choose which categories to display as our predefined selection did not work for him, so we determined that it could be something he could select when he loads his calendar in. Furthermore, choosing to replicate his previous day was a good revision to our testing protocol.

Critical Incident #1: No Interactivity in the Schedule Scroll
[Severity: Very High]

Users expected a lot more functionality from our initial schedule screen, which was just a scroll that displayed the user's schedule for the current day. They tried to tap or hold specific schedule items to edit them. At first we were hesitant to allow users to edit their schedule in any way because of the difficulty of inputting text or choosing specific times using the smartwatch's small screen. Then we realized that we could actually add two useful features without any kind of text or time entry. The first was to allow users to change the category of scheduled activities in advance by tapping on them. We actually just reused the existing menu for changing the category of the current activity for future activities. This added a lot of flexibility while keeping the input method consistent. The second new feature was allowing users to add and remove notifications from the schedule by toggling an alarm icon next to each schedule item. These simple icons allowed users to put a notification on any item and to see their notifications in a more visual way.

Old: **New:**
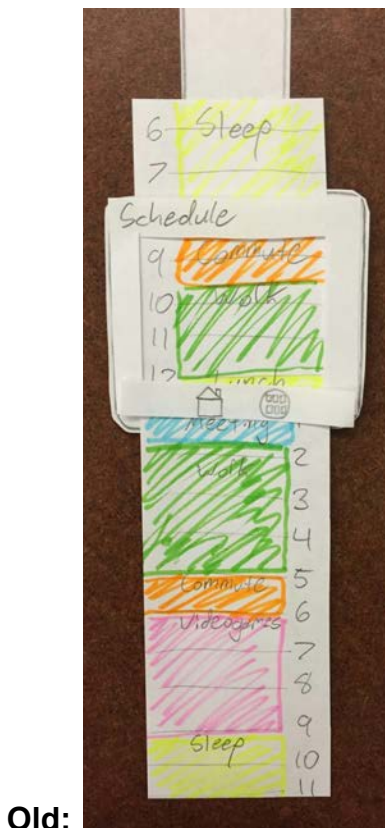
Critical Incident #2: Drop Down Menu Targets
[Severity: High]

      Users had no trouble using the drop down menus on the records page on the initial prototype because it was unnaturally large. However, when we made the prototype a more realistic size, it suddenly became difficult to use the drop down menus. We realized this was a problem when users said out loud which part of the drop down menu they had pressed instead of just pressing it. They were doing this because they didn't want to show that they actually couldn't use the tiny drop down menus even though it was something they had the right to vocally complain about. We decided to bypass this problem entirely by replacing the multitude of drop down menus with simple swipe gestures. Changing between records for the past day and week, which used to take two taps on very small targets, became one swipe anywhere on the screen.

Old:

New:
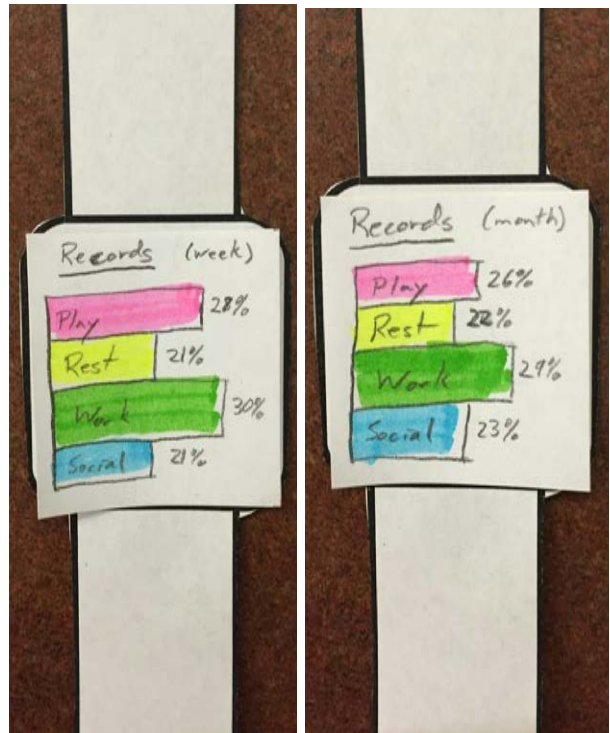
**Critical Incident #3: Ease of Changing Category**
[Severity: Low]

In the initial prototype, there was a small "Change Category" button that allowed users to change the category of the current activity. Besides this small button, there were two other problems that users pointed out. First, there was no way to cancel out of changing the category. Users had no choice but to select a different category once they had pressed the "change category" button. Second, there was no way for to see what the category already was. In the new paper prototype, we fixed both of these problems with a relatively simple addition. We added the current category to the category selection menu as a sort of back button and we put a small arrow on it to indicate that it is already selected.

Old:

New:
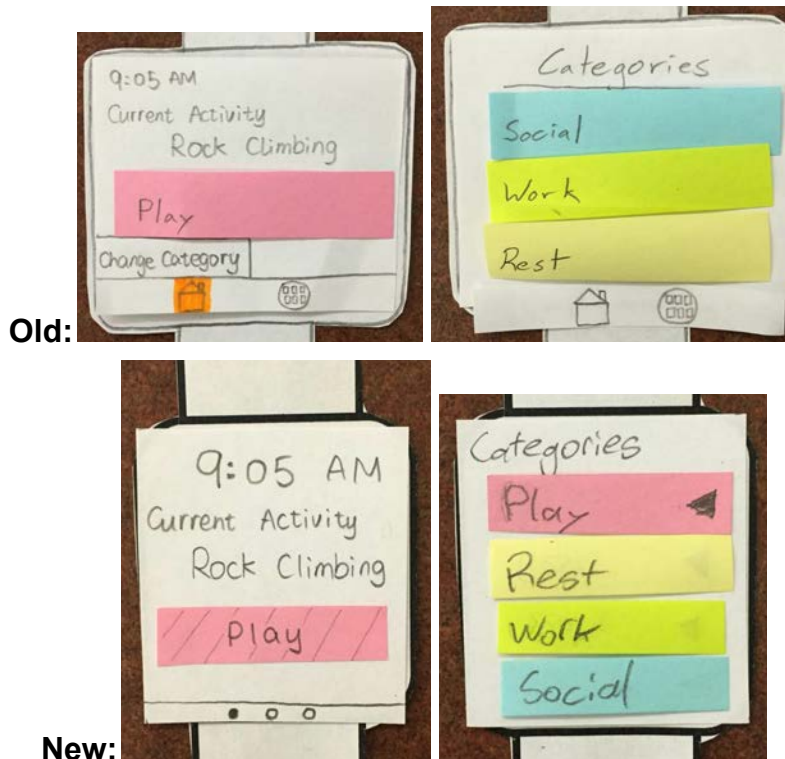
**Critical Incident #4: Undo Button After Removing Notification**
[Severity: Medium]

In our initial prototype, notifications could only be dismissed once before they were gone forever. There was no undo button or any way to add a new notification. This was a critical error because users could accidentally dismiss notifications and be unable to recover them. In the new prototype, new notifications can be added, but we also included a "undo" button for notifications. Instead of disappearing entirely, notification are grayed out and only removed once the activity they are associated with has passed. Any dismissed notification can be re-enabled from the notifications screen.

Old:

New:
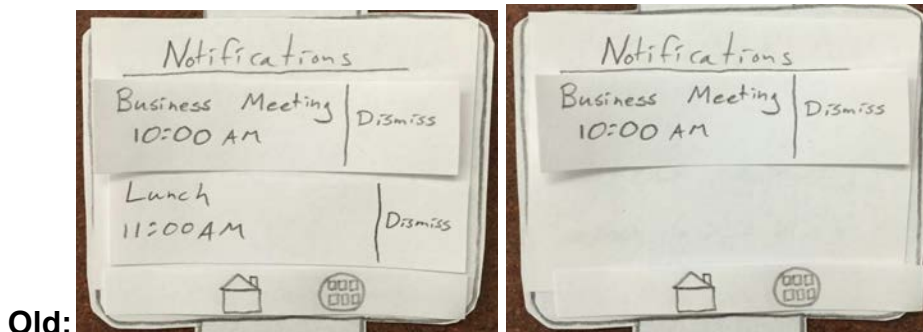
Overall Design:
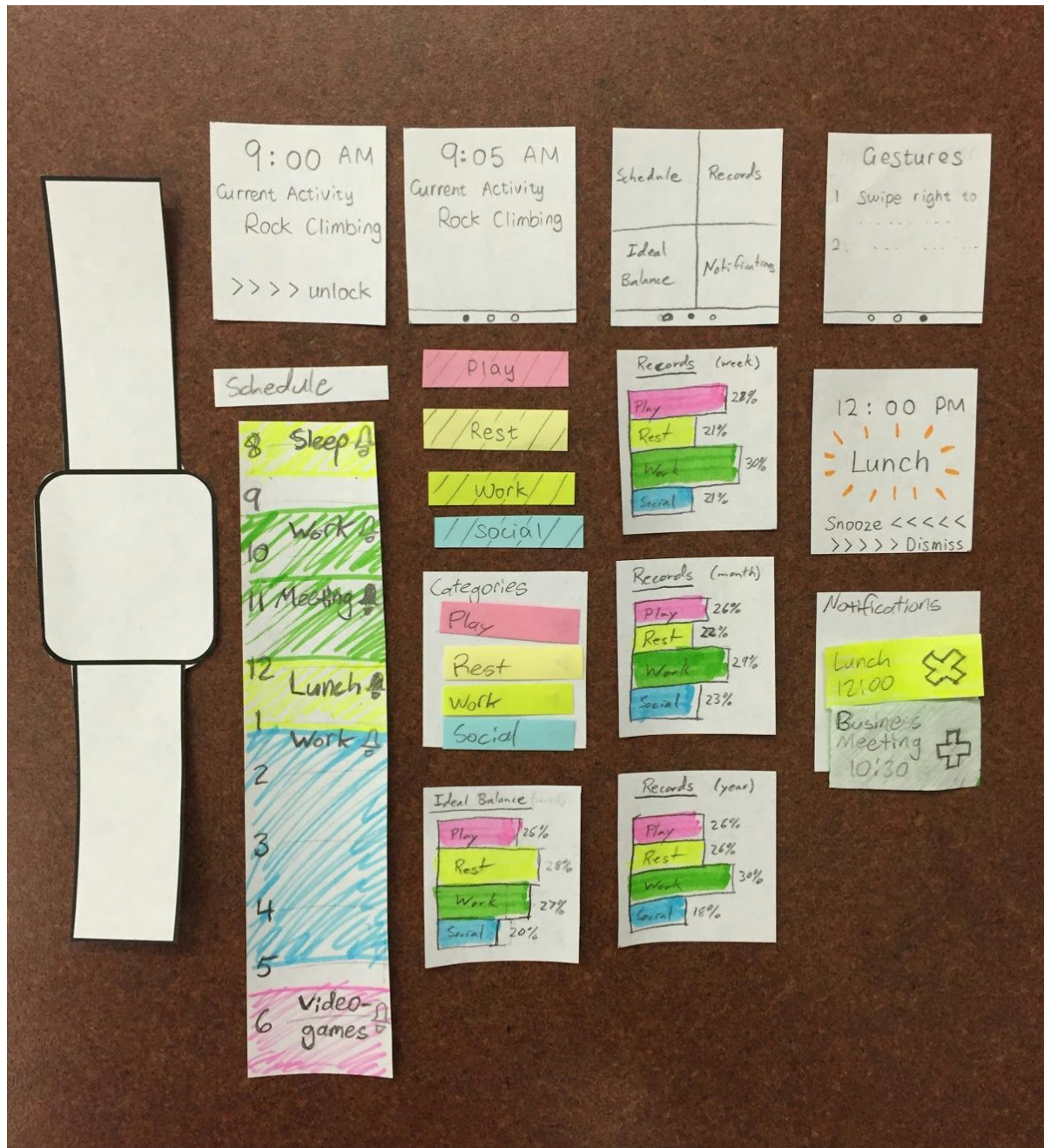
Revision #1: Replacing Buttons With Gestures

When we made our paper prototype smaller to more accurately illustrate a finished product, we realized that many of the buttons were difficult to hit and even to interpret because of their small size. We decided to fix the problem by removing a lot of the buttons altogether and replacing them with simple hand gestures. Swiping to the right replaced the menu button and allowed the user to "go back" from any screen. The

home and menu screens also became one continuous screen that the user could scroll left and right to explore. We also added a "Gestures" screen on the far right of the menu that lists and explains the various gestures because, unlike the buttons, these are not immediately visible. However, these gestures *become* visible whenever the user has a finger on the screen since dragging even slightly to the left, right, up, or down will move the screen, clearly indicating a possible gesture. This sort of tactile exploration is a lot more natural than pressing buttons because we, as humans, are more accustomed to moving objects around to learn about them.

Revision #2: Record Presentation

The first thing we changed about the records screen was replacing pie charts with bar graphs. While we really liked the aesthetic presentation of pie charts as an indication of balance (an evenly cut pie has a natural symmetry), it became clear that pie charts were not very good at displaying an imbalanced schedule. When slices were small, it became difficult to identify and compare them. We also needed to put text on each slice or place the text around the pie and provide arrows to help identify different slices. Users couldn't tell the exact percentage or number of hours in each category. We chose to replace all of the pie charts in our design with bar graphs to eliminate these problems. After this change, displaying graphs was no longer an issue because each bar had plenty of room to write the name of its category. We could also show the actual percentage as a number next to each bar.
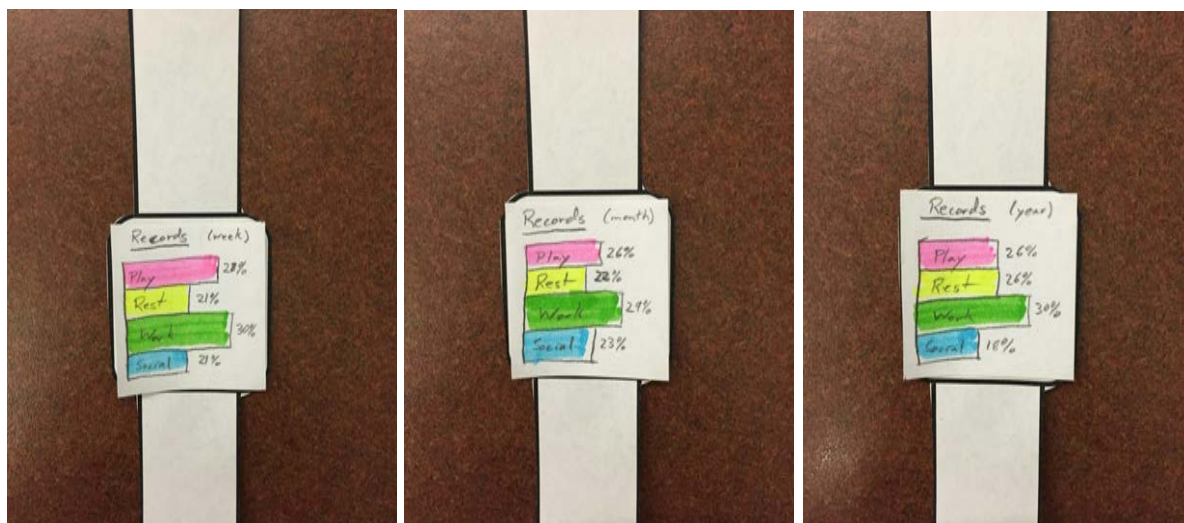
Another important change we made when revising the record presentation was to allow users to move directly between their ideal balance and their actual records. In our initial prototype, users had to go through three button presses and the menu screen to get from their ideal balance to their records. This made it difficult to see goals and performance side by side. In order to reduce the time between seeing the ideal balance

and records, we made it possible to scroll between them from the ideal balance screen. This made the ideal balance screen much better for actively tracking goals.

Revision #3: Changing Categories

We modified the current activity screen to be more interactive and allow the users to change the category of the current activity. This is done by touching on the category and selecting the new category from the menu. An arrow provides the user with the currently selected category. This proved to be a common enough task in our testing that it deserved it's own quick menu. Without this feature, users would have to exit back all the way into the schedule to make this simple change. It is important to have our design be as easy as possible to make quick changes.