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CSE 440AB (Cleaning and the Internet of Things)
Assignment 2f: Design Check-In

Setting Time Aside for Cleaning:

Jane is 23 years old graduate student in UW. She lives with three male roommates, and the apartment is always a mess. She tries to be organized as much as possible, but school work is taking all of her time. After a few days, when she finally finds some free time for herself, she starts cleaning instead of actually having fun with friends or going to the movies, which makes her even more stressed out and frustrated. One of the solutions she comes up with is setting a reminder on her phone every night at 11 PM right before she goes to bed to remind her to clean-up. However, most of the time, she rarely cleans because she's too tired and thinks that she might do it the next morning, but she never does. She is looking for a way to set aside time dedicated to cleaning during the day. Setting aside time during the day will allow her to be more conscious of when she needs to clean as well as avoid procrastinating on cleaning chores. With a fixed time-frame on a regular basis, she will be able to see cleaning as a part of her daily routine and acquire the habit for cleaning.

Hidden Maintenance Tracking:

Melissa is 28 year old content strategist at Hautelook, the online Nordstrom retailer. Recently, Melissa purchased a two bedroom condo in Ballard. Unfortunately, after 10 months of living there, her portable air conditioning unit started malfunctioning. Every couple of nights, the unit would start leaking water and she did not know the reason. This was not a cheap unit as she spent over \$500 dollars when she bought it and was not looking forward to replacing it or having to deal with the manufacturer to fix it. Then, she discovered that she needed to clean the filter of the unit and that may be the cause of the spilling. After the incident, Melissa realized that there were some appliances around the house that needed routine maintenance. She is looking for a quick and invisible solution so she can keep track of the last time she performed maintenance on each appliance and weather to determine if she should perform some maintenance very soon.

External Triggers:

Mario is a software developer at Zillow renting a beautiful ocean view condo in Belltown. He has a great view of the Olympics and the Puget Sound. However, he is not one of the most clean and organized people out there, so he sometimes feels that the mess in his apartment detracts from his modern furniture and the beautiful view. Mario has a great place, but he finds himself unable to bring friends and visitors over because his place is messy all the time and the messiness prevents him from feeling proud of it. He has tried to clean before the guests arrive but he remembers that people are coming over when there is not enough time to clean properly. Mario wants to find a way to have a clean apartment when people are coming over without having to dedicate a lot of time and effort to it.

Tracking Cleaning History:

Vish is a pre-med student at the University of Washington living in an apartment in Belltown. He is naturally a clean person and even has an app on his phone, Tody, to help him organize his apartment cleaning. The app gives details about chores, separated by rooms, and shows progress on a particular a cleaning task. However, Vish is also a very busy student and often cleans his home whenever he can spare a few minutes. This means that he does his cleaning in short bursts spread throughout the day at his house. Consequently, he often forgets when he last cleaned an area. He has expressed a desire to be able to track a history of cleaning activities so that he can target the areas that he has neglected with whatever time he has.

Generating Reminders:

Vish, who is mentioned in the previous task also brought up the idea of maintaining a cleaning regimine. However, the aforementioned problem of forgetting when he last cleaned an area hampers his efforts to maintain a regimine. Currently, he tries to keep tabs on what he has cleaned in his mind and this does not always work out. When he notices 2 weeks have gone by since he last vacuumed his room, he makes a point to vacuum. The trouble is, that when he forgets, he has no way of knowing if he should or should not vacuum. He indicated that a way of generating reminders based using his cleaning history would help him avoid this problem. For example, if he were to set his preference for cleaning his room every two weeks, then based on his cleaning history, a reminder could be generated once that time has elapsed.

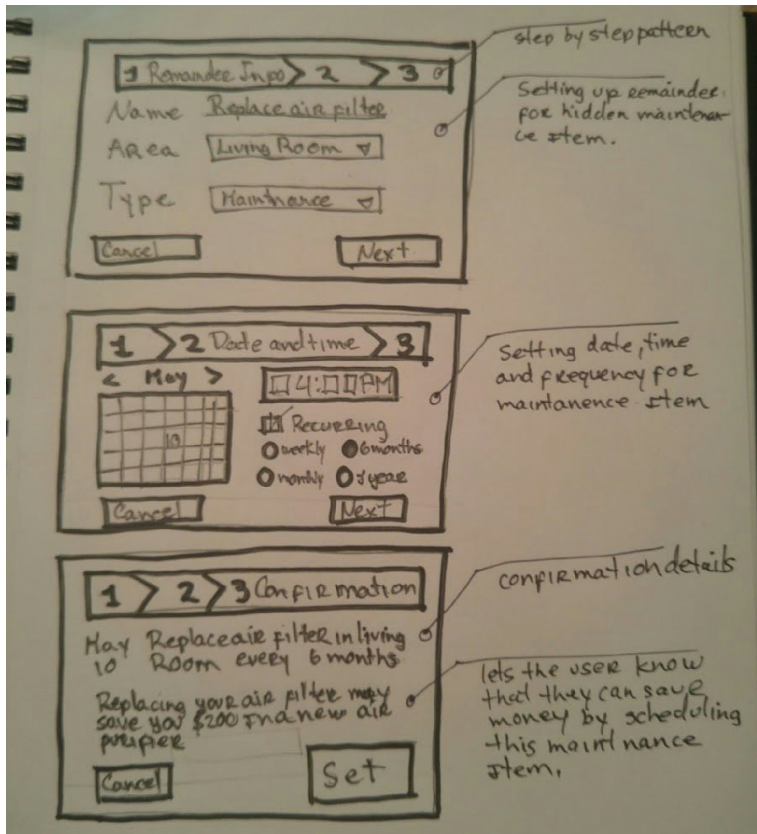
Assigning Time Estimates to Cleaning Tasks:

Ashwin is a graduate student at the University of Washington living in an apartment in U-District. He describes himself as average when it came to cleanliness and remarked that he would like to “use cleaning as a study break”. The trouble is that he doesn’t know how much time he will have to spend is unwilling to start a task only to break halfway because he has to get back to studying. Ashwin would like to be able to have data about time estimates so he can know how long he has to clean and to help him prioritize the tasks he needs to accomplish.

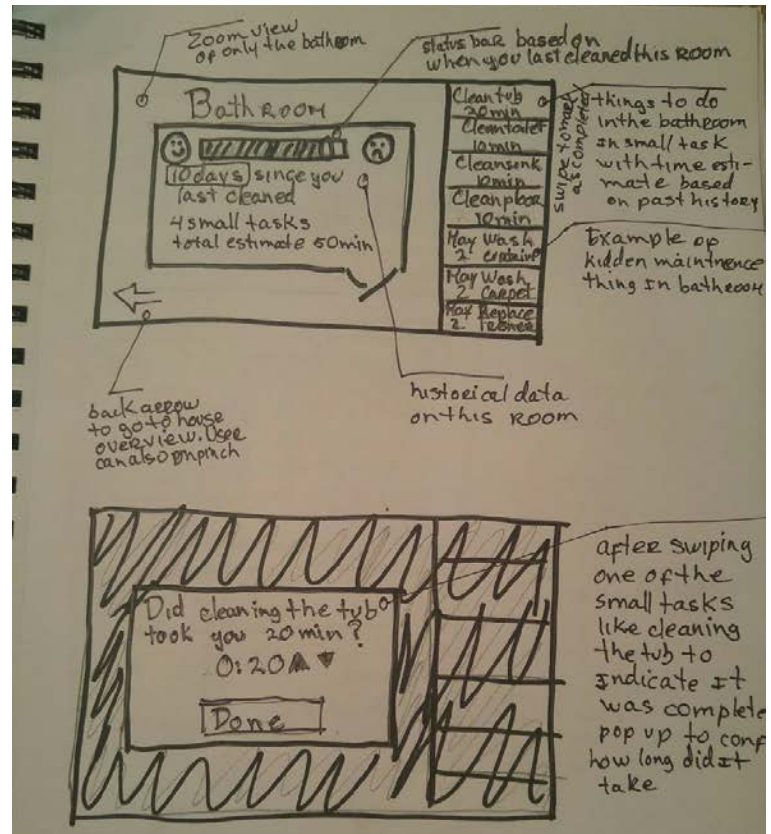
Design 1 House status in context



1-a tab design shown in context



1-b Entering a maintenance reminder



1-c Showing room status and marking task as completed

Our first design is very focused on using a centralized dashboard that provides a comprehensive view of home. The dashboard allows the home to be broken up by individual rooms where more detail concerning tasks tied to a certain area can be viewed. In addition, the dashboard main menu shows notifications and includes the option to create new tasks (recurring or not).

- Melissa wants to be able to attend to the maintenance of her appliances. If she knows that she needs to change the air filter on her portable AC unit every 3 months she hits the “add notification” button on the main screen. From there she follows the steps to set up a recurring reminder. She first titles the task, ties it to an area of the house and specifies a type. Next she sets a date/time and indicates whether it should be a recurring notification. She will get a confirmation at the end and the task should now appear in her “living room” section.
- Vish wants to be able to remember when he last cleaned his bedroom. From the main dashboard, Vish navigates to his bedroom by touching his bedroom on the digital bedroom. From here, he can touch a particular cleaning task on the right pane and gather more details including information on when he last cleaned his bedroom.
- Vish also wants to be reminded when it’s time again to clean his bedroom. Based on the frequency that he sets when he first created task “clean bedroom” the notification will

automatically pop up in the right pane in the main menu of the dashboard. In addition, when viewing his bedroom in the dashboard in the detailed view, visual feedback will indicate whether its getting close to time to clean the bedroom again.

- Mario wants his living room to be clean when his guests arrive tomorrow. He has scheduled this by creating a new one-time notification in the right pane of the menu menu as discussed before. However, Mario has to finish his taxes and wants to know how much time he has to spend so that he can make a good impression on his guests. He does this by navigating to the living room from the main overview of his house. He is then presented with the tasks that require his attention and the time estimate associated with these tasks. This estimate has been customized for him based on his cleaning history.

Design 2 Minimizing user input

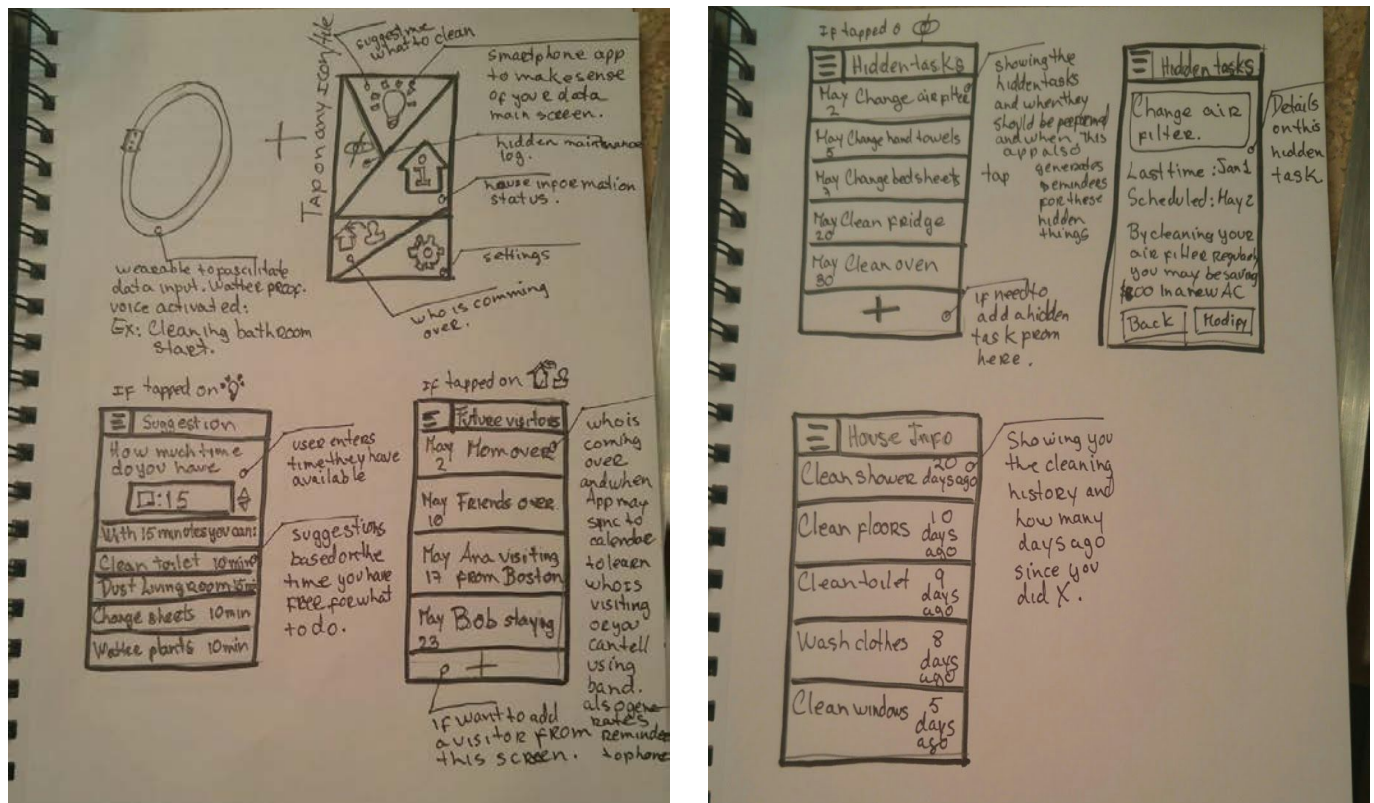


Figure 2-a: Wearable Tech + Smartphone App Overview

Our second design is focused on tracking cleaning chores in a manner that requires minimal input from the user. If data input from the user's end is simplified when compared to the dashboard design, it will lower the barriers to the use of the design. We use a waterproof wearable concept that communicates to a smartphone application that allows users input data simply through their voices.

- Vish wants to remember to change the batteries in his smoke detector every 6 months. As a busy student that doesn't spend too much time in his apartment he forgets about this. To track this, Vish opens the app and taps on the hidden maintenance section.

From here, Vish can add this task and set recurring reminders so that he will be notified when it is time again to change the batteries in the smoke battery.

- Ashwin wants to keep track of cleaning history. To create this history, when Ashwin is cleaning, he will wear the wearable and indicate that he is starting to clean his bathroom by “talking” to his wearable. Then, when he finishes he will again “talk” to his wearable. The changes and time spent would automatically be updated in the app and the history would be created. To view the history, Ashwin would navigate to “House History” from the main screen to view a breakdown of history.
- Melissa has her knows her parents are coming over but she doesn’t remember when. To view when this information she has to tap “Future Visitors” to be presented with a list of guests scheduled to come over. Because her parents are coming, this particular is tied to kitchen, living room and bedroom and touch this task will give her more information on the tasks she needs to complete and the time needed.
- Mario has 30 minutes to kill before his friend comes over to pick him up for a concert. He decides to spend this time doing a little housekeeping. He also wants to get the most cleaning bang for his buck. To find out the best way to use these 30 minutes, he taps on the “Suggested Cleaning” button. From here he can input the time he has available and the app will suggest cleaning tasks based on time estimates gathered from an aggregation of the cleaning data and will prioritize those tasks which are due soon.

Design 3: Helping find the time for cleaning by nudging

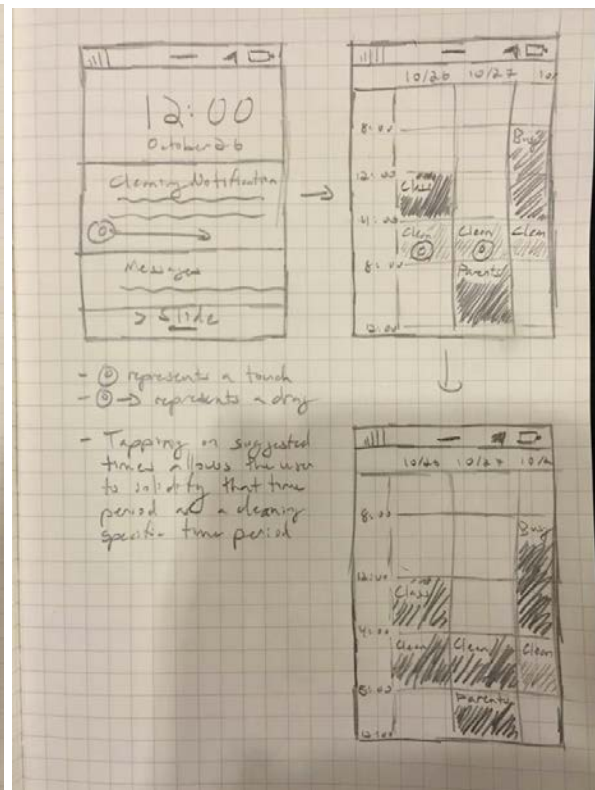
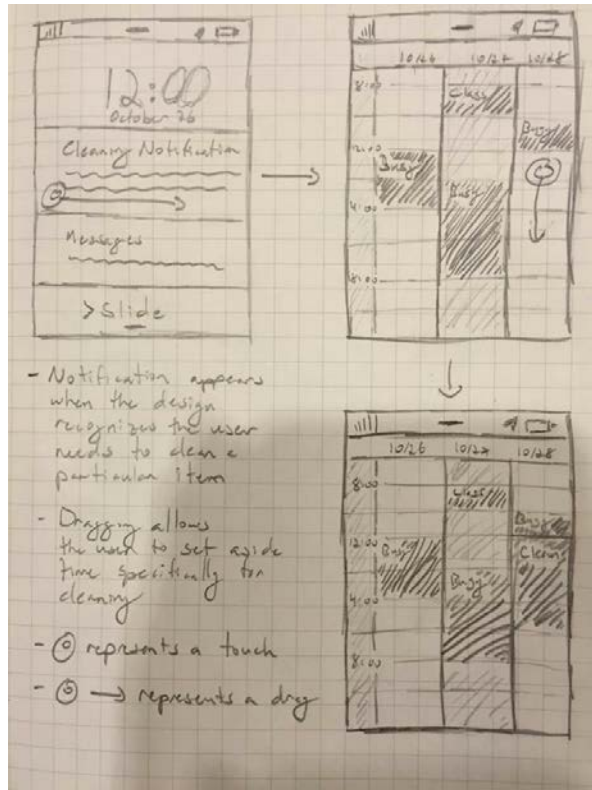


Figure 3-a: Example of Active Scheduling

Figure 3-b: Example of passive scheduling

Our third and last design is focused on planning and setting aside time for cleaning. Allowing users to plan and schedule smartly will help them accomplish their cleaning goals. Scheduling happens via two routes: active scheduling, or passive suggestions. In active scheduling, the user sees his or her schedule and decides themselves when it would be best to clean. In passive suggestions, the user sees different tailored options for when he or she could clean and simply selects which suggestion is best.

- Jane wants to be able to plan and set aside time for cleaning but she has a very busy schedule ahead of her. She gets a cleaning notification that she has been meaning to get to and wants to schedule it. Touching and addressing the notification leads her to her synced calendar where she can drag a section between her classes to schedule some time to clean her kitchen.
- Mario has forgotten his parents are coming into town during the week. Mario's apartment isn't in order, and when Mario checks his phone as he enters his house after work, he sees a notification that tells him he needs to clean his apartment living spaces soon as his parents are coming to town. He swipes right on the notification and sees times when he can schedule a cleaning session before his parents' arrival. He taps on a suggested cleaning time and is ready to take on his cleaning chores around the living room before his parents arrive.

- Vish wants to be reminded when it is time again to dust his living room. He can achieve this by setting aside a reminder for a future date and when that day comes, he will be able to actively schedule the time required for the dusting into his up-to-date calendar.
- Ashwin constantly leaves dishes in the sink and recently has hit a wall in his homework. He wants to take a study break, and as he pulls out his phone, he sees a notification that he hasn't done his dishes in a while. He swipes right on the notification and then sees that all the suggested cleaning times for his dishes last about 15 minutes, perfect for a quick study break. Instead of tapping on one of the suggested times, Ashwin drags a 15 minute window over his study block and sets about cleaning his dishes.