

## **In-Home Demonstration and Deployment Interview**

**Duration:** ~ 45 - 60 Minutes

Our next site visit serves both as a technology demonstration of our visualization and annotation interfaces, as well as a standard participant interview in order for us to gauge participants' knowledge and comfort with the deployment. For this interview, we should have the primary participants present, along with any older children. Our visit is organized into the following categories:

### **A. Interface Workshop**

Introduce our tablet interface and show participants their previously-collected data, with a focus on having the participants be the drivers (i.e. we demonstrate once and have them do the rest, but help them know what to do). We use this exploration activity as a means of teaching interaction techniques and educating users to navigate their data.

### **B. Data Literacy**

While exploring data, use this opportunity to engage participants and discuss/determine their comfortability with and knowledge of what this data represents. Inform them that they should not interpret health risks from any recorded measurements as their system is equally sensitive to water vapor as other irritants. Further discuss time series curves, scales, etc.

### **C. Reflection**

After participants are comfortable navigating the interface and are shown (or told) sufficient information on what the data means, proceed with a small exercise (series of data exploration tasks) to have them reinforce this knowledge.

### **D. Annotation**

Raw time-series data is not very important without contextual knowledge of what may have contributed to this behavior. Annotation is key to providing and preserving this context. Here, we introduce the importance of annotation, as well as discussing possible modalities:

- A. Pen & Paper: Offer to leave notebook to support activity capture, spike labeling.
- B. Tablet: Show how annotation works on tablet device.
- C. Voice Annotation: Using Google Home, show how families can annotate via voice commands
- D. Text Annotation: Allow users to send a text and have it show up on the tablet
- E. Pre-emptive annotation: Show mini-demo where we generate some type of PM spike and receive a text from PRISMS asking what happened.

Let participants choose which ones they want, and which ones to opt out of.

#### E. **Troubleshooting**

Demonstrate how to re-start visualization interface in the event of power loss, app crashing, or tablet reset. Leave Participants with a troubleshooting guide for easy reference, along with Jimmy's contact information (e-mail and/or phone number) as point of contact for further technical support.

#### F. **Wrap - Up**

After hardware and annotation demonstrations, provide a high level overview and wrap up with general questions.

## **Interview Questions**

Our hardware demonstration lends itself to interjecting a handful of category-relevant questions for each of the above sections. These help capture participant's initial reactions, thoughts, and opinions which will be important in our future analysis.

### **Introduction**

Today I'm here with some visualization equipment, and we're going to use this to explore your Dylos data and take the opportunity to explain the interface. The interview has a couple of purposes: One is to help you get comfortable with the visualization displays and practice using different settings, and the other purpose is to think through your preferences for data annotation and display. The interview usually takes about 30 to 45 minutes, and you can ask questions or revisit topics at any time, or slow down or skip any questions you don't want to answer.

Hand off tablet interface and together with the participant explain the layout and five main interaction methods:

Layout: Timeline view, Main view, Legend, subset buttons, and annotation strip

Interactions: Time-range buttons, click/dragging on the timeline view, toggling monitor time series display, and annotations.

As we explore each of these points, incorporate the following questions:

### **Interface Workshop**

#### Questions / Tasks:

1. [Brush overview] How many day's worth of data is included in this visualization?
2. [Resolution buttons] How would you show the previous week's worth of data, starting from today?
3. [Subsetting and brushing] Show a 2 day period period Including tuesday, July 4th.
4. [Legend manipulation] How can you change the plot lines to show only the outdoor monitor?
5. [For Interviewers] Demonstrate two ways of using the brush view: touch to re-center on a region vs. click and drag to scrub through overview

As we proceed with data exploration, add in the following questions:

### **Data Literacy**

#### Questions / Tasks:

1. What do the peaks in this graph represent?
2. How are the three monitors at your home represented on the graph?
3. What information does the plot line tell you for each monitor?
4. How is time displayed in this graph?

Now we'll have a quick exercise to pose some questions which could come to mind when using this interface:

### **Reflection**

#### Questions / Tasks:

1. What is the highest peak value on the plot?
  - a. What is its value? When did it occur?
2. Can you find a PM spike which occurs outside, but not inside?
3. Can you find a PM spike that is only detected by one of the indoor monitors?
  - a. By all three monitors?
4. Do more peaks happen inside or outside?
5. Looking at the inside monitors, do you recall the cause of any of these spikes?
6. What is the oldest spike you can remember the source of?

Introduce the idea of annotation, explain how it can help aid recall and increase data usefulness. Show how to annotate data on the graph (if not discussed already), and introduce Each method we've prepared for the participant:

- Notebook, texting, tablet, google voice.

Now we have some questions to gauge your interest or preference for each of these methods.

### **Annotation**

#### Questions / Tasks:

1. Notebook: How likely are you to write down your activities or sources of spikes after the fact? [5 point Likert Scale]
2. Which annotation modality seems the most convenient to you? [Alt: rank on likert scale]
3. Which seems the least convenient? [Alt: rank on likert scale]
4. Would you ever choose to annotate an event which did not have a corresponding air quality impact (i.e. washing dishes)?
  - a. Would you be more motivated to capture this information from activities which surprised you (i.e. you expected a strong response and there wasn't, or vice versa).

5. Compared to receiving a text, would you prefer an automated voice prompt from Google Home to tell you that a spike has occurred and to ask for your annotation?
  - a. What would you think about that? Would this be too intrusive? Annoying?
6. We have developed some annotation tools to assist with capturing events. If you chose to use them, how often would you want to be alerted to provide annotations for detected air quality spikes in your home?
7. Does your preferred frequency change if the alert mechanism was done via text vs. a voice alert? Are these different? If so, why?
8. What times of day would be appropriate to receive these alerts? Are they different for text or voice? Why?
9. Which Annotation options would you like to receive? Are there any you would like to opt out of?
10. Currently, how likely are you to look at your old data? And how far back are you most likely to look?
11. Would using/having annotations affect this?

#### Remind Users that they should....

1. Only annotate if they want, and only in the ways that make the most sense / are most convenient for them.
2. Feel free to provide any additional comments on the annotations they make
  - a. expectations of the result, surprise, or any other details they feel are useful to capture for themselves, or for our understanding of the event.

### Troubleshooting

#### Questions / Tasks:

NA

### Wrap Up

#### Questions / Comments:

3. Are you surprised by how your data looks? (Is this what you expected it to look like?)
4. Did any initial questions come to mind when seeing your data this way? (For example: "what are these peaks about?" "Can I see when I cook?")
5. What aspect of your data seems the most interesting to you? Does anything stand out?
6. [Retrospective] Now that you can see your past data, is there any time you can think of where you would like to re-visit to inspect? What were you doing and why would you like to see it? What do you expect to see? [return to annotation activity and have them make an annotation?]
7. [Anticipatory] Now that you have this visualization tool, are there any future events you anticipate using this to monitor?
8. For you personally, how do you expect to use this system most? And how often?
9. How much old data do you wish to see from before this site visit, if any?