Abstract:

My iPhone is paired with the Bluetooth in my wife's car. This is useful when I am driving her car, however has undesirable effects when I am not in her car because my phone automatically pairs with the Bluetooth every time her car is on near me.

Qualitative Evaluation:

I would like to evaluate my textual prototype using surveys. The textual prototype is simple to follow at the same time is detailed enough to gather and use the feedback appropriately for further enhancements. The participations for this evaluation will be chosen from family, friends, classmates through Pizza and fellow OMSCS students through the Google groups. I will make sure that the participants at least use a smartphone and are familiar with Bluetooth devices. Using surveys to evaluate my prototype will enable me to reach a diverse audience in a short amount of time. I will ask the participants the following key questions:

1) What Smartphone do you use, if any?
    a. iPhone
    b. Android
    c. Google Pixel
    d. Amazon Fire
    e. Windows Phone
    f. Other
    g. I don't use a Smartphone
2) How many Bluetooth headsets do you use with your Smartphone?
    a. 0
    b. 1
    c. 2
    d. More than 2
3) Would you be interested in specifying the order in which each of your Bluetooth devices pairs with your Smartphone? All you need to do is go to Bluetooth settings in your phone, drag and drop the Bluetooth device in the order you wish the phone pairs with those devices.
    a. Yes
    b. No
4) Your phone is paired with a Bluetooth device but you wish to pair it with another device. How would you like to do this pairing?
    a. Voice (Pair with Jabra 100)

b. Display (Go to settings and select the device that you want to pair to)

c. Both voice and display options should be available

5) How would you like to be notified that a Bluetooth device has successfully paired with your Smartphone?

a. Sound (beeps)

b. Display (message on screen)

c. Haptic (vibration)

d. Sound and display

e. Display and haptic

f. All of the above

6) You are in the middle of a task such as speaking to someone using a Bluetooth device and your phone pairs with another Bluetooth device, how would you like to be notified that the pairing was successful?

a. Sound (beeps)

b. Display (message on screen)

c. Haptic (vibration)

d. Sound and display

e. Display and haptic

f. All of the above

7) You are in the middle of a task such as speaking to someone using a Bluetooth device and your phone wants to pair with another Bluetooth device, how would you like that question be asked?

a. Audio (Would you like to pair with Jabra 100?)

b. Display (Would you like to pair to the CAR MULTIMEDIA device?)

c. Both audio and display

8) If you are in the middle of a task such as speaking to someone using a Bluetooth device and if your phone wants to pair with another Bluetooth device, how would you like to respond?

a. Audio (Yes, No)

b. Display (Push a button, options are Yes, No)

c. Both audio and display options should be available

Empirical Evaluation:

Overall, I want to test my prototype for efficiency and ease of use. Efficiency can be measured by calculating the time taken to do a certain task and counting the number of interruptions caused while performing a task. Ease of use can measured by counting the number of errors caused in using the interface. The experiments will be conducted on both the old interface and the new interface thereby generating data points for further analysis. My null hypothesis is that both the existing interface and the new one are same on the parameters chosen, i.e. one is not better than the other. The alternative hypothesis would be that the new interface is significantly better than the existing interface. I will randomly select participants and subject each of them to two treatments – new interface, existing interface. I will ask the participants to pair their phone with different Bluetooth devices. The participants will then change the order of Bluetooth devices under settings by dragging and dropping the names of the devices and I will measure the amount of time it takes to accomplish this task. I will ask the same participant to pair their smartphone with their preferred Bluetooth device manually and will measure the time it takes to do so. Assuming the users have to do the manual pairing multiple times when using the old interface, I will estimate the total time it would take it take to pair their phone with a preferred device manually and compare the same with the time it takes to set the pairing order using the new interface.

Next, I will ask the participants to pair their smartphone with the old interface with a Bluetooth device. I will then turn on another Bluetooth device thereby causing their phone to leave the current pairing mode and pair with this new device that was just turned on. This will interrupt their current task and will be counted as so. The participants will repeat the same experiment, however with the new interface. The number of interruptions caused in both the cases will be compared to determine efficiency. I will also measure the total time it takes to use both interfaces from selecting the pairing order until the user successfully finishes a task. Also, the number of errors caused in doing each task will be counted to determine the ease of use. I will perform students-t test over the data collected to assess if my Null or the alternate hypothesis is valid.

Predictive Evaluation:

I will do a cognitive walkthrough of the prototype to further evaluate the same. The overall goal is to effectively control the pairing of Bluetooth devices with the smartphone and perform tasks without any interruptions caused due to improper pairing. Specifically, the users will pair the Bluetooth devices with their phone, select the order of pairing, and perform tasks such as talking, listening to music. The users will use various operators such as the ability to drag, drop and push buttons, perceive audio, visual and haptic feedback. The users will know the above mentioned goals in advance and will try to control the pairing of the Bluetooth devices ahead of time. However, they will also learn to navigate around the interface should new options come up as they use their devices.

Preparing to Execute:

As a next step, I would like to do both qualitative and predictive evaluation on my prototypes. At this point, I don't think my prototype is complete and ready for empirical evaluation. Also, I feel like it can be improved, therefore the feedback I get from both qualitative and productive evaluations can be used to enhance my prototype.