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.

Surveys:

The survey results indicate that more than 60% of the users use Bluetooth devices with a smaller subsect owning at least 2 devices. In addition, about 65% of the users have an automobile with a Bluetooth. Moreover, the users use Bluetooth significant amount of time to either speak or access multimedia, in some cases more than 3 hours in day. Considering such high usage, more than 75% of the users reported that they would perceive an automatic pairing of their Smartphone with a Bluetooth as an inconvenience, if that interrupts their current task. However, when asked to rate their overall satisfaction with Bluetooth devices 80% of the users reported at least a neutral feeling or better. My biggest take away from these results is that there is a viable opportunity to further investigate an interface that gives the users more control of how their Smartphone pairs with the Bluetooth devices. I tried to avoid confirmation bias by carefully crafting the questions and surveying many users. In addition, in asking about the time spent on different activities I referred to a recent timeline – past day, thereby avoiding recall bias.

Interviews:

First, I asked the users about their motivation in using multiple Bluetooth devices to find out that they keep one device in the car, one at home or work. Also, in some cases the users had an automobile that had a Bluetooth as well. Though the users felt that the automatic pairing of those devices was helpful, they perceived it as an inconvenience if it happened in the middle of their current task. The users also felt that it would be embarrassing if they were on a business call and suddenly their phone paired with another device just because someone turned it on. My biggest take away is that users felt that the automatic pairing was more random, in the sense that sometimes their phone automatically paired with the Bluetooth device and sometimes it required manual pairing. They favored a Smartphone interface that was more consistent in how it paired with Bluetooth devices. In asking the interviewees many questions, I made sure that my reaction to their answers didn't show any bias thereby preventing them from tailoring their answers to suit my reaction.

Think-aloud or post-event protocols:

The participants were requested to think aloud about the various steps involved in pairing a Smartphone with a Bluetooth device. In addition, scenarios where the Smartphone automatically pairs with the Bluetooth in an automobile while being used in a handheld mode away from the vehicle were discussed. The results, indicated that the participants were frustrated over the inability to predict the pairing with Bluetooth devices. The sessions were then focused on what possible solutions would help alleviate the problem. Some participants preferred that their smartphone either vibrate or beep to indicate that it had paired with another device automatically. A few other participants preferred an interface that would prevent pairing with any device if the phone is currently being used. My biggest take away is that the participants experienced diverse issues with Bluetooth devices not just the accidental pairing. In

fact, some participants felt that their Smartphone requires manual pairing with Bluetooth devices often. By following the post-event protocol, I made sure that thinking about the task deeply doesn't affect the way they perform that task. Another bias that was avoided is recall bias, because the participants experienced the event first and thought aloud right after that, ensuring that the activity stayed fresh in their minds.

Data Inventory

1) Who are the users?

A user is anyone with a smartphone between the ages of 18-70. In addition, I would further qualify a user as someone that has an automobile equipped with Bluetooth or plan on acquiring one in the next few weeks or months.

2) Where are the users?

The users can be anywhere where the Smartphone and Bluetooth technology is prevalent. For the purposes of this study only users in North America were chosen.

3) What is the context of the task?

The users are using their Smartphone either with or without a Bluetooth device. They could be talking, watching videos, listening to music, playing games. If they are using a Bluetooth device they could be multi-tasking i.e. speaking on their phone and making coffee.

4) What are their goals?

The users use a Bluetooth device so that their hands are free to do anything else. Their goal is to seamlessly do their task of speaking or accessing multimedia without being interrupted because of pairing or any other technical glitch.

5) What do they need?

The users need a smartphone and a Bluetooth device that is functioning well. They expect their device to pair automatically but at the same prefer to have control over the pairing. Also, the users prefer that once paired it stays that way irrespective of software updates etc. To add, they need to be able to acquire Bluetooth devices with all the appropriate features at a competitive price.

6) What are their tasks?

The main tasks that they perform involve using the smartphone with a Bluetooth device. The tasks include but not limited to: speaking on the phone, listening to music, watching videos, playing games.

7) What are their sub-tasks?

Many users usually multi-task while performing the above mentioned tasks using a Bluetooth. For example, they cook or exercise while talking on the phone or listening to music. In addition, some times the users drive while performing these tasks which requires a higher cognitive bandwidth.

Defining Requirements

The interface must give the user more control in terms of pairing with a Bluetooth device. The control can either be in the form of a feedback when an automatic pairing occurs with options for the user to override such pairing quickly. In addition, such an interface should be able to use easily by both novice and expert users, thus learnability and efficiency goals should be addressed. The success of such an interface can be measured by counting the number of times the pairing activity interrupts the current task. Also, the efficiency of the interface can be measured by counting the number of clicks required to override automatic pairing.

Continued Needfinding

In the next needfinding exercise I would like to focus on possible solutions and the different features required in each. In addition, I would like address the feasibility of each solution and gauge the user's preference accordingly. Also, I need to understand if potential solutions might cause performance issues somewhere else - what if a better interface drains the smartphone battery quickly, would the users be willing to accept such trade-offs. Moreover, I would like to find out if the users would be willing to pay for an app that guarantees better control with their Bluetooth devices. If so, how sensitive are they to different price ranges.