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.

Brainstorming Plan:

The objective is to collect ideas that can help in developing an interface to solve the Bluetooth pairing problem. Based on the results from my needfinding exercise I will brainstorm over a few days to generate as many ideas as possible. I will not evaluate any ideas during the session and will jot down ideas as they come.

Brainstorming Execution:

As mentioned above I brainstormed over two days in 30 minute sessions each day to come up possible solutions as listed below:

- Beep when the cell phone pairs with a Bluetooth device
- Vibrate when the cell phone pairs with a Bluetooth device
- Multiple beeps when the cell phone automatically pairs with a Bluetooth device while being used
- Don't pair with a Bluetooth if the phone is currently being used
- Enable the user to set the order of pairing with Bluetooth devices
- Enable the order of preference between handheld and Bluetooth options
- If the phone is being used ask the user before automatically pairing with another Bluetooth device
- The smartphone should automatically pair with a Bluetooth based on the proximity – i.e. between two devices that a smartphone has been paired to in the past, the phone should connect to a device that is the closest, assuming both devices are available.
- Hardware device that enables the users to control the pairing with Bluetooth devices.

Selection Criteria:

Of all the different ideas generated, I intend to select ideas that are flexible, relevant, tolerant and simple to the user. In particular, the proposed solution has to directly address the problem that the users are facing in addition to being flexible as the users can be both novice and experts. Furthermore, the solution has to be simple as the users don't prefer adding any more complexity to the existing

interface. Moreover, the solution has to be tolerant of any mistakes that the user might make. For example, if they are in the middle of a phone call and pressed an incorrect button to override automatic pairing with a Bluetooth device then the phone call shouldn't get dropped. The solution has to self-correct itself from any mistakes that the user might make.

Prototype 1:

When the user pairs their phone with a Bluetooth device it will be added to the list of Bluetooth devices in the order it was paired. For example, the device listed first will be the most preferred, the second one on the list will be next preferred and so on. At any time the user should be able to modify their priority list – change priorities, add and delete devices. For example, they can move the device listed last to the first position indicating that it will be the most preferred from that point on. The cell phone will maintain this priority list until the user makes any changes. Every time the user turns their phone on it should scan the list of Bluetooth devices and pair to the most preferred device that is available. If they are currently using their phone with a Bluetooth device and suddenly someone turns on another Bluetooth device that is in their priority list, the phone should check to see if the device turned on is higher or lower in priority than the one currently being used. If it is lower, then it should just continue working, however if it is higher it should ask the user if they need to pair their phone with this new device. If the user says 'Yes' then their phone should pair to this device and confirm the same with a beep. However, if the user chooses 'No', presses any incorrect key or fail to respond, then all those responses should be treated as a 'No' and the phone should continue working with the device already paired. Also, there should be an option called 'No Bluetooth' which signifies the handheld mode. I feel like this prototype meets the users requirements gathered in the needfinding exercise in the sense that it enables the users control the pairing of their phone with Bluetooth devices. However, at this point this solution doesn't help identify any tradeoffs in implementing the same.

Prototype 2: Textual

Q: Would you like to pair your Bluetooth to your Smartphone?

A: Yes, of course.

Q: Are you OK with the order of priority for all the Bluetooth devices that your phone has access to?

A: No I'd like to change that? How do I do that?

Q: You can click, drag and drop it in the order of preference. For example, if a device is first in the list, it means that you prefer that the most, makes sense?

A: Sure, let me try that.

Q: Now that you have selected the priority list, let's try something. Use your smartphone with a Bluetooth device that is not the most preferred. Also, make sure that the most preferred Bluetooth device is turned off.

A: Sure, let me do that.

Q: Good, now that you are using your phone with a Bluetooth device, turn on the device that is most preferred in the list.

A: Yes, just did that.

Q: Now, instead of automatically pairing your phone with the most preferred device leaving the current pairing mode your phone should ask if you indeed need to pair to that device.

A: Yes, just saw that question pop up.

Q: You can press Yes, or No depending upon your choice.

A: I pressed 'Yes' and my phone paired with that device. Also, I heard a beep that probably was some kind of confirmation to indicate that the pairing was successful.

Q: Now repeat the above steps and this time you can ignore that question or press 'No' and see what happens.

A: Both pressing 'No' and ignoring the question had the same effect – my phone continued in the current pairing mode. Also, I fumbled upon some keys and the interface seemed to ignore all those errors.

Q: Now let's try doing this again. This time you can use your phone with the most preferred Bluetooth device and turn on a device that's lower in the priority list while you are using the phone.

A: I did that and this time didn't see any question come up. In fact, I was able to use my phone continuously with my most preferred Bluetooth device even though the other device was turned on in the middle. I guess that's because it was of a lower priority than the device I am using right now.

Prototype 3: Wireframe/Picture

The following are various options that the users will encounter in interacting with an interface described in the previous two sections.

< Settings **Bluetooth**

Bluetooth

MY DEVICES

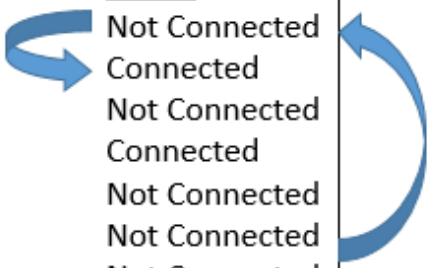
Name	Status
CAR MULTIMEDIA	Not Connected
Jabra Classic v0.5.0	Connected
Jabra STORM v1.16.0	Not Connected
Mani's Apple Watch	Connected
Motorola Boom	Not Connected
PLT_Legend	Not Connected
No Bluetooth	Not Connected

Move Priorities

< Settings **Bluetooth**

Bluetooth

MY DEVICES



Name	Status
CAR MULTIMEDIA	Not Connected
Jabra Classic v0.5.0	Connected
Jabra STORM v1.16.0	Not Connected
Mani's Apple Watch	Connected
Motorola Boom	Not Connected
PLT_Legend	Not Connected
No Bluetooth	Not Connected

New Priority List

< Settings **Bluetooth**

Bluetooth

MY DEVICES

Name	**Status**
PLT_Legend	Connected
CAR MULTIMEDIA	Not Connected
Jabra STORM v1.16.0	Not Connected
Mani's Apple Watch	Connected
Motorola Boom	Not Connected
No Bluetooth	Not Connected

If Priority of  is greater than the priority of 

Would you like to pair to the CAR MULTIMEDIA device?

Yes No

Option 1: 'Yes'

Pairing successful → beep

Option 2: 'No'

No change: cell phone continues to work with the device already paired

Option 3: No response or pressing a different key

No change: cell phone continues to work with the device already paired

Else

No change: cell phone continues to work with the device already paired