Assignment 5

1 Aim

Evaluate an interface using usability evaluation technique.

2 Objective

To be able evaluate the usability of a system interface using some evaluation method.

3 Outcome

Students will be able to provide interface evaluation and suggestions to improve the system's design

4 Theory

The purpose of evaluation can be to improve the usability of the product as part of design/development (formative evaluation), or to assess the extent to which usability objectives have been achieved (summative evaluation) Some techinques are:

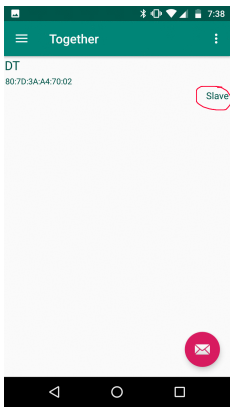
- Cognitive walkthrough
- Heuristic evaluation
- Review based
- Model based
- Experiment
- Interviews
- Questionnaire
- Think aloud
- Protocol analysis

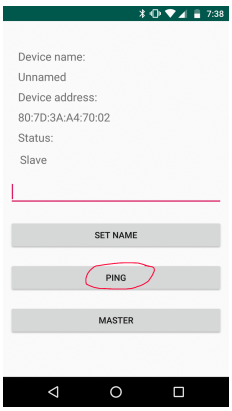
- Post-task walkthrough
- Eye tracking
- Physiological measurement

4.1 Heuristic evaluation

Using Heuristic evaluation method to Evaluate User interface. Taking reference of 10 Heuristics proposed by Jacob Nielsen

- Visibility of system status
  The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.
  The current system maintains visibility through the following features-
  - The mobile application shows the band status i.e, Master or Slave
  - The band displays whether the group has been formed and if the device has been assigned a name or not
  - The Master device is able to see all nearby bands in its group on the application
  - The Slave device is able to know if they are in the range of the master device directly or through another group member.
  - The phone application can be used to check if a band is still in the group by pinging it.





- Match between system and the real world
  The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order.

The system makes information appear more naturally to users by converting internal device states 0-4 to sentences in plain English i.e, Direct link, Indirect link, Looking for member, etc.

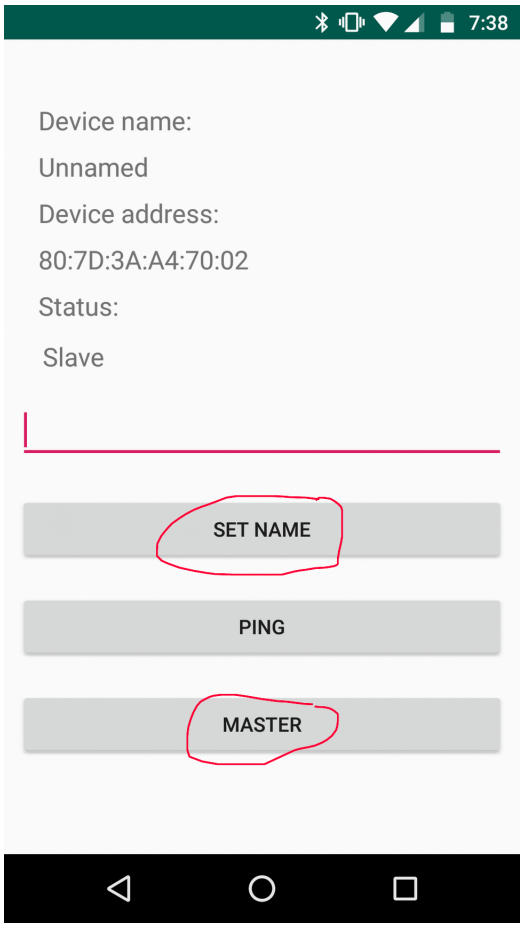
- User control and freedom
  Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.
  The system allows the group coordinator the following controls and freedom in the application

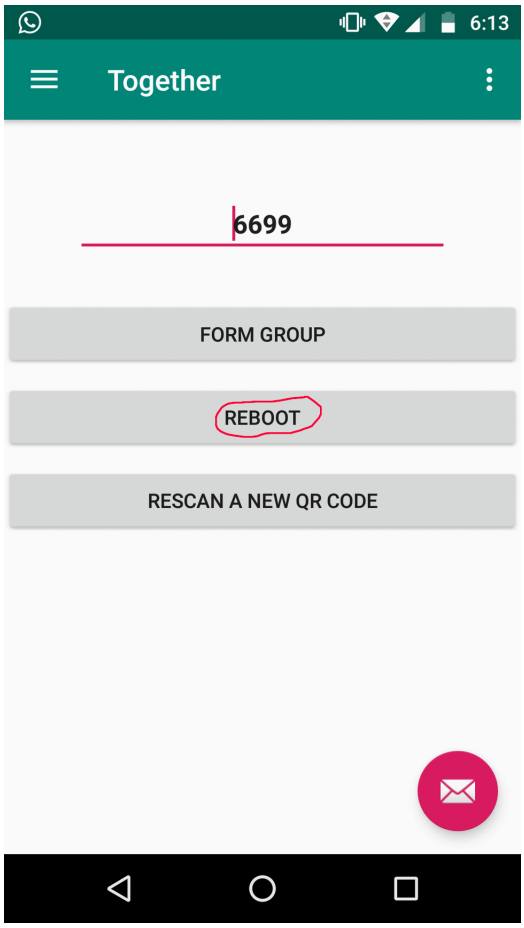
  - Choosing which band to make master
  - Naming the devices
  - Rebooting a chosen device

  The bands have the following controls and freedom

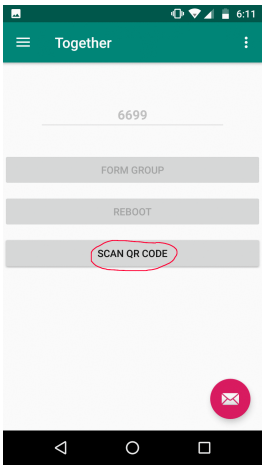
  - Help button to request help from devices nearby
  - All bands can act as master or slave

  The slave bands are, however, constrained to perform only certain functionalities.

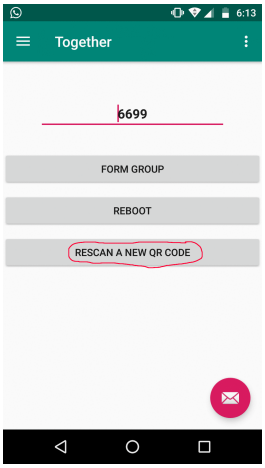




- Consistency and standards
  Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.
  The system meets this heuristic in the following manner
  - Red Color Help button with an exclamation mark
  - On opening the mobile application for the first time, users get to see the following screen



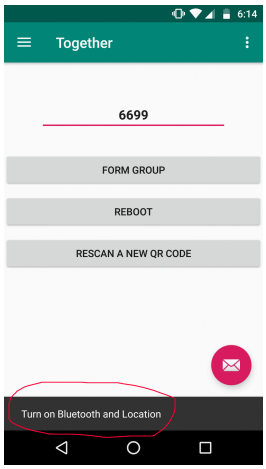
Once the QR code has been scanned, however, the text on the button changes to



to prevent confusion.

- Error prevention
  Even better than good error messages is a careful design which prevents a problem from occurring in the first place. Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action.
  The system prevents errors in the following manner
  - The application prompts the user to turn on the Bluetooth and GPS

as soon as it is launched in order to prevent the app from crashing later.

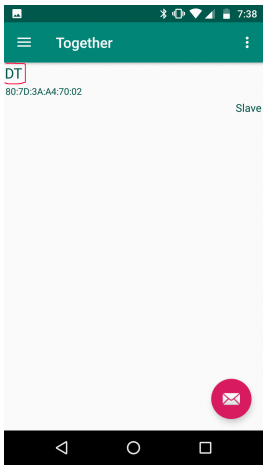


  - The application gives a warning when none of the devices in the group are a Master device.

  The system lacks in the aspect that any errors on the band are not effectively handled- the device simply keeps rebooting on a crash.

- Recognition rather than recall
  Minimize the user's memory load by making objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.
  The system meets these expectations in the following manner

  - Instructions displayed on opening the application for the first time
  - Added names to slave bands so that the teacher doesn't have to remember which band is whose



The system lacks in the following ways

  - Not all information can be shown on the OLED screen at a time, user must cycle through cards.
  - On reboot of devices, names must be reassigned

- Flexibility and efficiency of use
  Accelerators — unseen by the novice user — may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.
  The system tailors the experience for different users in the following ways

  - Button on slave to see details nearby which novice users may not use.
  - Auto Save names of devices.

- Aesthetic and minimalist design
  Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.
  The system maintains a minimalistic design by

  - Displaying only required information on slave device
  - Extra details e.g. RSSI values are not shown, direct distance information is conveyed to master device.

- Help users recognize, diagnose, and recover from errors
  Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.
  The system helps users to recover from errors in the following ways

  - The application prompts the user to turn on the Bluetooth and GPS as soon as it is launched in order to prevent the app from crashing later.

  - The application gives a warning when none of the devices in the group are a Master device.

- Help and documentation
  Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large. Our current system has no documentation provided.

5 Conclusion

Through this assignment, we have understood how to evaluate a systems user interface