R2D2 – An Interactive Dustbin

A Collaboration between CARE and DPL

Interactive dustbin (R2D2) is an android powered smart dustbin that tells you to take out the trash. Its interaction with the close environment motivates people to use the dustbin and make environment clean. Idea behind the interactive dustbin is to help maintain cleanliness. As we have observed almost everywhere that people feel free to litter anywhere, use of interactive dustbin can change human behavior in different ways.

**Technical Aspects:**

Aspects of the production and design includes both design principles and the tools used by professionals in the industry. Following are some of the design aspects adopted while interaction between the processor and the tablet attached to the dustbin

1. An interrupt signal is generated from the microcontroller when
2. a person **throw** some trash into it,
3. dustbin is **full** of trash,
4. tablet is low on battery,
5. tablet’s battery is full.
6. A charging circuit is designed to keep the battery level of the tablet optimum. Battery status is continuously exchanged between the two, so that on low battery levels the charging circuitry pulls the trigger and starts charging.
7. Six LED panels are used for décor purpose which are controlled using the microcontroller via relays. Controls signals and status updates may be communicated using these LED panels.
8. As the communication between the control circuitry and the android tablet is possible only through USB interface so a USB 2.0 protocol is adopted for exchanging data and control signals.

At the sending side, a single byte is sent via USB interface at a clock rate of 48 MHz (typical for USB 2.0 communication) whenever some event occurs i.e. following are some the byte commands which are sent for the mentioned events.

**Control Signal Event**

0x80 Trash can used

0x81 Trash can is full

0x82 Tablet is low on battery

0x83 Tablet’s battery is full

0x84 Plugged in charging

At the receiving side such as in the android application polling is used or different threads can be created which will look after each of the possible events independently.