

SMART BIN MANAGEMENT SYSTEM USING INTERNET OF THINGS

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ABSTRACT - Over the years food wasted by people is not measured to reduce the wastage of food. Smart Bin System using Internet Of Things is to develop an intelligence bin which can monitor food waste through sensors and gives the information in detailed which are connected to internet. Sensors will measure and calculate the amount of food waste disposed by every person and stores it in the database .. Connecting embedded electronic device through a medium internet is called internet of things. It can be Implemented with four steps Computing, Programming, Interfacing and Networking. RFID Card is the object used by every user for individual identification. RFID Card Reader is used to sense the RFID Card. After Successful detection of RFID Card bin will be opened for the user to dispose the food waste. Load cell is used to measure the food waste disposed by the particular user. It is connected with power Supply. Arduino board connections are used for connection to the Personal Computer for Storage. Things speak with the user id (cea0524).In the Things speak the flowchart about the food wastage can be seen and also it allows to download the data about food wastage. LCD Display is used to display the user id and food wastage details. For Power Supply DC Motor is used. Once the bin is full, Information about that will be passed to the Authorities.

Key Words: Internet of Things, Intelligence bin, food wastage, identification

I. INTRODUCTION

The Internet of things, or IOT is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provide with unique identifiers and the ability to transfer data over a network without the help of human to human or human to computer interaction. A Thing in the internet of things can be a person with heart or farm animal with a biochip transponder or an automobile that has built in sensors to alert the driver when the pressure I slow or any other natural or man made object that can be assigned an IP address and is able to transfer data over the network. Organization in a variety of industries are using IOT to operate more efficiently. It improves decision making and increase the value of the business.

II MODULE DESCRIPTION

a) Detecting RFID Card and Generating Unique Id

Person who uses the dustbin for disposing the food waste has some unique RFID card with them. Person who has that Particular card can only access the bin. Whenenver the user needs to dispose the waste of food they need to show the RFID Card in front of the RFID Card Reader which detects the card and generate the unique id for that Card. RFID Card reader is mainly used to Sense the RFID Card. It uses the radio frequency to identify the users. After Detection LCD display show the user id in it. RFID is also used for Security Systems in Homes. It is cheap and easier to use.



Fig 2.1 RFID CARD

b) Bin Opens Up to Deposit the Food Waste

As soon as the RFID card is detected the bin will be opened up for the particular user. Then the particular user should dispose their food waste. After disposing the food waste bin closes automatically. Then the Load Cell connected with the DC motor is used to measure the waste disposed by the particular user and stores it in the database in that particular user's id.

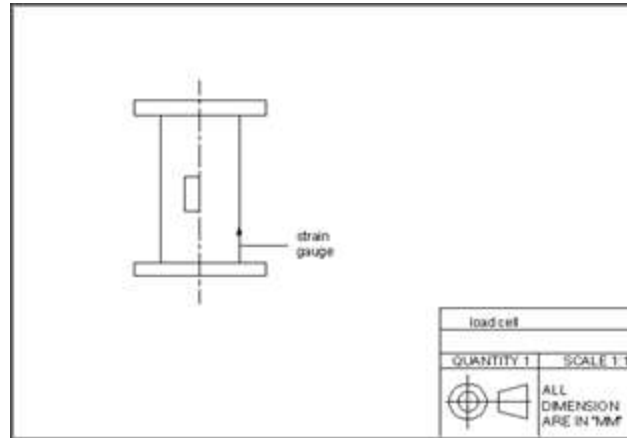


Fig:2.2 Load Cell to measure the Food waste

c) DC Motor

A DC motor is an electric motor that works on direct current power. In any electric motor, operation is dependency of simple electromagnetism. It provides excellent speed control for acceleration and deceleration. It gives easily understandable design it is cheap and easy to use.



Fig:2.3 DC Motor

d) Database

After measuring the food waste, the amount of food wastage is stored in the database that is Think Speak with the common user id (cea0524) .Within this common user id there are separate id for individual user. This measurement can be downloaded at any time in the form of flat file(csv) or XSL sheets. This Database also notes the capacity of the particular bin and gives notification if the bin is almost full. It also shows the graph on the basis of amount of food disposed



Fig:2.4 Graph on the basis of amount of food waste disposed.

e)Arduino Board

Arduino is a direct source computer hardware and software company, project, and user community that designs and manufactures single-board microcontrollers and microcontrollers kits for building digital devices and interactive objects that used to sense and control objects in the physical world.



Fig:2.5 Arduino Board

f)LCD Display

LCD Display is used to display the user id after detecting the RFID card using the RFID card reader. It also displays the amount of food waste disposed by every user. Infrared transmitter is one of the LED which emits infrared rays generally called as IR Transmitter. Likely, IR Receiver is used to receive the IR rays transmitted by the IR transmitter. One useful point is both IR transmitter and receiver should be placed straight line to each other. The transmitted signal is given to IR transmitter whenever the signal is high, the IR transmitter LED is conducting through which it passes the IR rays to the receiver.



Fig: 2.6 LCD Display

g) Program Layout

- Power LED (red) and User LED (green) attached to Pin 13 on an Arduino compatible board
- A minimal Arduino C/C++ program consist of only two functions:
- *setup()*: This function is called once when a sketch starts after power-up or reset. It is used to initialize variables, input and output pin modes, and other libraries needed in the sketch.
- *loop()*: After *setup()* has been called, function *loop()* is executed repeatedly in the main program. It controls the board until the board is powered off or is reset.
- Most Arduino boards contain a light-emitting diode (LED) and a load resistor connected between pin 13 and ground, which is a convenient feature for many tests and program functions. A typical program for a beginning Arduino programmer blinks a LED repeatedly.

3) EXISTING SYSTEM

Garbage Monitoring System

The Internet of Things (IOT) shall be able to incorporate transparently and seamlessly a large number of different systems, while providing data for millions of people to use and capitalize. Building a general architecture for the IOT is hence a very complex task, mainly because of the extremely large variety of devices, link layer technologies, and services that may be involved in such a system. One of the main concerns with our environment has been solid waste management which impacts the health and environment of our society. The detection, monitoring and management of wastes are one of the primary problems of the present era. The traditional way of manually monitoring the wastes in waste bins is a cumbersome process and utilizes more human effort, time and cost which can easily be avoided with our present technologies.

Disadvantages of Existing System

- Information is sent through email.
- Single bin is connected to the server

4) PROPOSED SYSTEM

The proposed system has many advantages than the existing system. In Proposed system, user is identified individually by RFID user card. RFID Card reader is used to detect the RFID card and identify the user individually. After card detection the bin opens automatically, then the user can dispose the food waste. After disposing the food waste the bin closes automatically. Load Cell is used to measure the food waste and then the measurement is stored in Think speak with the common user id cea0524. Within that common user id there are many individual user id. Arduino board and program are used to connect the smart bin to the computer. The graph is also designed on the basis of amount of food waste. LCD Display is used to user id and amount of food waste.

ADVANTAGES OF PROPOSED SYSTEM

- Easy to use by every one.
- Gives Notification about the bin capacity.
- Wastage measurement can be downloaded in the form of flat file or XSL at any time.

5) CONCLUSION

The smart bin to check the levels of garbage in dustbin whether the dustbins are full or not. In this system the information of dustbin can be accessed by the user/authorities from anywhere. When garbage levels reached the condition details of bin will be stored to the authorities via database and this system will reduce the monitoring system of cleaner to check the garbage levels as result this will reduce the solid waste. In this system the wastage deposited by the individual can also be monitored. This maintains a clear record of the user details. The user can access the bin by using the RFID cards. This

greatly reduces the time and it also reduces the human effort. This also indicates the process that is going on in the bin.

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