Smart Dustbin

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ABSTRACT

Rapid increase in population. We see present day, many times Dust bin are placed near public places in the cities/villages are filled due to increase in the waste every day. So efficient method to dispose the waste has been designed with GSM system. If the disposal of waste is not proper done it creates unhygienic condition for the people and it creates ugliness to that place. At the same time bad smell is also spread this leads in causes some deadly diseases & human illness, to avoid such a situation we are planning to design "SMART DUSTBIN". In this proposed designed System we are providing separate bins for dry waste and wet waste, these dustbins are provided with ultrasonic sensor and load cell. Ultrasonic sensor is used to check the height of the dustbin and load cell is used to check the weight of the dustbin. If weight or height reaches the threshold limit it will sends the SMS to authorized persons with the help of GSM Modem and an immediate action can be made to clean the dustbins. To know the status of the dustbin we can check using HTML page by typing IP address.

Key words: ARM CORTEX M3 LPC 1768, GSM, ultrasonic sensor, PIR sensor.

1. INTRODUCTION

The Smart City addresses nowadays charming issue with respect to upgrading living conditions. Considering generally the situation in European Union, the EU national governments and moreover exclusive organizations are contributing every year basic proportion of their money related plans to research, headway and execution of Smart City. Thusly, the term Smart City has an extensive variety of courses how to portray it. In recurring pattern look at, this term is considered as question of How to upgrade a city on different levels?. Those levels could be related to different accomplices (i.e. government, authorities, exclusive organizations, subjects, et cetera.) and in addition diverse fields (i.e. movability, open data, essentialness profitability and low carbon plans, approach and control, misuse organization). The data examination is a commonplace base-ground for already specified issues of the Smart City thought.

An Embedded System is a mix of PC hardware and programming, and possibly additional mechanical or distinctive parts, expected to play out a specific limit. A fair case is the microwave. Moderately every family has one, and endless they are used standard, yet not a lot of people comprehend that a processor and writing computer programs are locked in with the course of action of their lunch or dinner.

This is in direct separation to the PC in the family room. It too is incorporated PC hardware and Programming and mechanical parts (plate drives, for example). In any case, a PC isn't expected to play out a specific limit rather; it can do different things. Various people use the term all around helpful PC to make this refinement self-evident. As conveyed, an all around helpful PC is a reasonable slate; the maker does not perceive what the customer will do wish it. One customer may use it for a framework record server another may use it exclusively to play redirections, and a third may use it to form the accompanying amazing American novel.

Block diagram

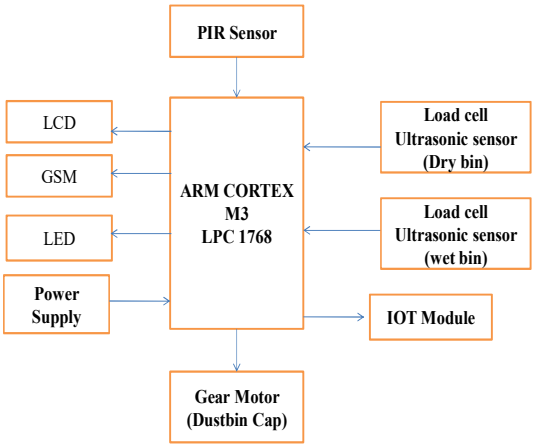


Fig 1.1 Block Diagram

2. PROPOSED METHOD

2.1 ARM CORTEX M3 LPC 1768

General description

The LPC1768/66/65/64 are ARM Cortex-M3 based microcontrollers for introduced applications including a strange condition of joining and low power usage. The ARM Cortex-M3 is a front line focus that offers system changes, for instance, updated examine features and a more hoisted measure of assistance square compromise.

The LPC1768/66/65/64 work at CPU frequencies of up to 100 MHz. The ARM Cortex-M3 CPU unites a 3-compose pipeline and usages a Harvard outline with discrete neighborhood rule and data transports and moreover a third transport for peripherals. The ARM Cortex-M3 CPU in like manner fuses an internal prefetch unit that support hypothetical fanning.

Features

- ARM Cortex-M3 processor, running at frequencies of up to 100 MHz. A Memory Protection Unit (MPU) supporting eight zones is joined.
- ARM Cortex-M3 worked in Nested Vectored Interrupt Controller (NVIC).
- Up to 512 kB on-chip streak programming memory. Enhanced glint memory stimulating operator enables quick 100 MHz undertaking with zero hold up states.
- In-System Programming (ISP) and In-Application Programming (IAP) by methods for on-chip bootloader programming.
- On-chip SRAM consolidates:
- 32/16 kB of SRAM on the CPU with neighborhood code/data transport for world class CPU get to.

2.1.1 Pin diagram

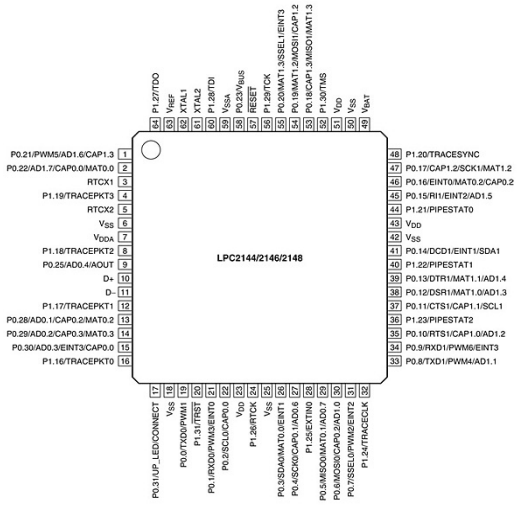


Fig 2.1 Pin diagram of lpc1768

2.2 PIR SENSOR

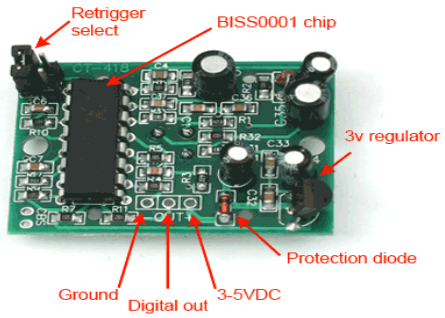


Fig 2.3 PIR Sensor

These points of interest are for the PIR sensor in the Adafruit shop which is especially like the Parallax one . All PIRs will have to some degree one of a kind particulars, regardless of the way that they all for all intents and purposes work the same. If there's a datasheet, you'll have to insinuate it

- Size: Rectangular
- Price: $10.00 at the Adafruit shop

Output: Digital pulse high (3V) when enacted (development perceived) propelled low when sit (no development distinguished). Pulse lengths are controlled by resistors and capacitors on the PCB and differentiation from sensor to sensor.

2.3 LOADCELL

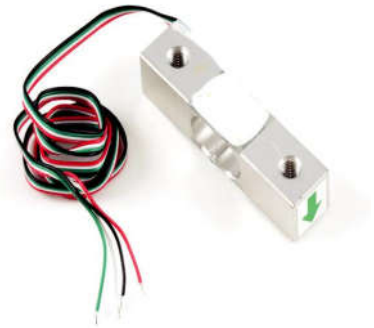


Fig 2.4 Load cell

Micro Load Cell (0-5kg) - CZL635

Littler scale Load Cell (0-5kg) - CZL635

What do you have to know?

A load cell is a power recognizing module - a carefully arranged metal structure, with little parts called strain measures mounted in correct zones on the structure. Load cells are proposed to measure a specific power, and nonchalance diverse forces being associated. The electrical banner yield by the stack cell is close to nothing and requires particular improvement. Fortunately, the 1046 Phidget Bridge will play out all the improvement and estimation of the electrical yield.

Load cells are expected to check force one way. They will frequently measure drive in various ways, yet the sensor affectability will be exceptional, since parts of the store cell working under strain are at present in strain, and the a different way.

2.4 GSM MODEM

The words, "Compact Station" (MS) or "Adaptable Equipment" (ME) are used for versatile terminals Supporting GSM organizations.

A call from a GSM compact station to the PSTN is known as an "adaptable begun call" (MOC) or "Dynamic call", and a call from a settled framework to a GSM adaptable station is known as a "compact Finished call" (MTC) or "moving toward call".

Fig 2.5 GSM Modem

2.5 ULTRASONIC SENSOR

Fig 2.6 Ultrasonic Sensor

A manual for using the Arduino Ultrasonic Range Detection Sensor in view of Arduino keeping the ultimate objective to figure partitions from objects. For this circumstance I'm furthermore changing the yield of a LED with PWM as shown by how closed a challenge is to the sensor. So the closer you are the brighter the LED. So if we start with the Arduino Ultrasonic Range Detection Sensor, it's an IC that works by sending a ultrasound beat at around 40Khz. It by then sits tight and tunes in for the beat to resonate back, learning the time taken in microseconds (1 microsecond = 1.0 x 10-6 seconds). You can trigger a pulse as speedy as 20 times each second and it can choose dissents up to 3 meters away and as close as 3cm. It needs a 5V control supply to run.

3 .FLOW CHART of the proposed method

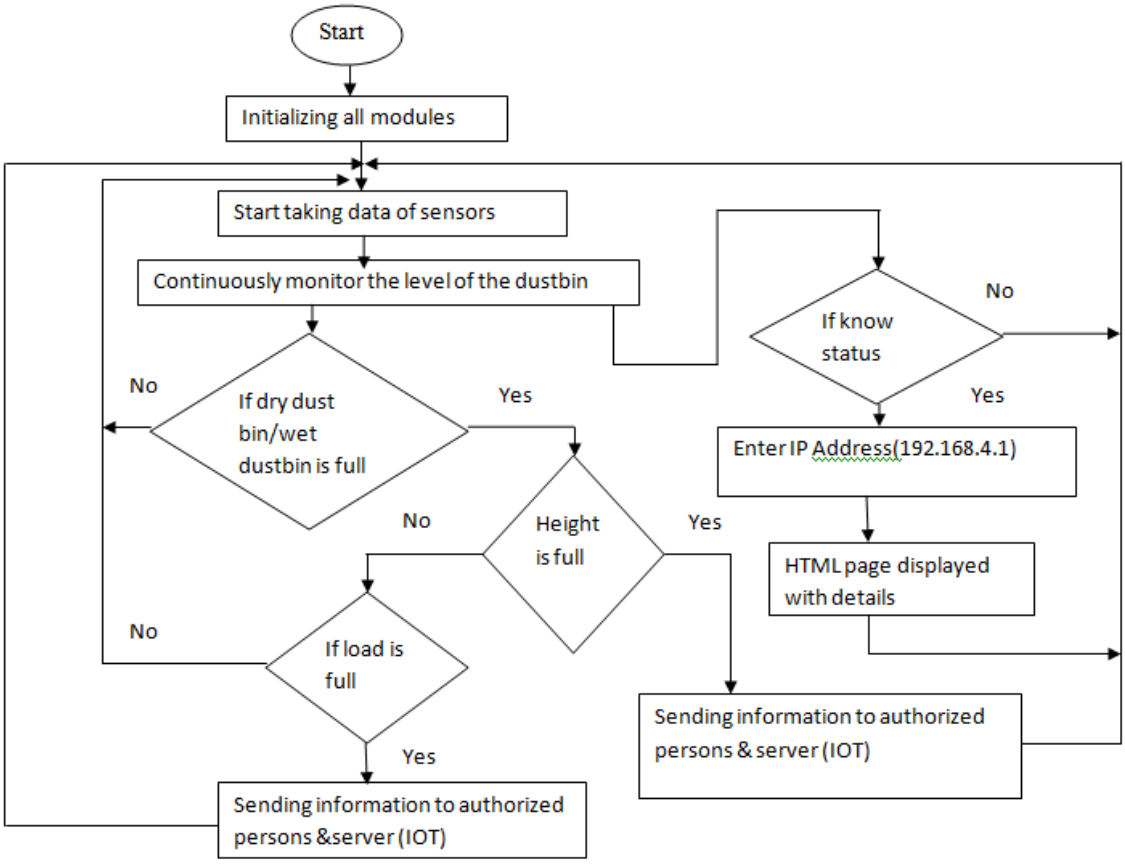


Fig 3.1 Flow chart

As with every system, the initial stage is to visualize the hardware modules,inputs,outputs and interrelations among them; This can be effectively done using a flow chart,above is a graphical representation of the proposed system. It as shown in Fig 3.1

4. SYSTEM HARDWARE

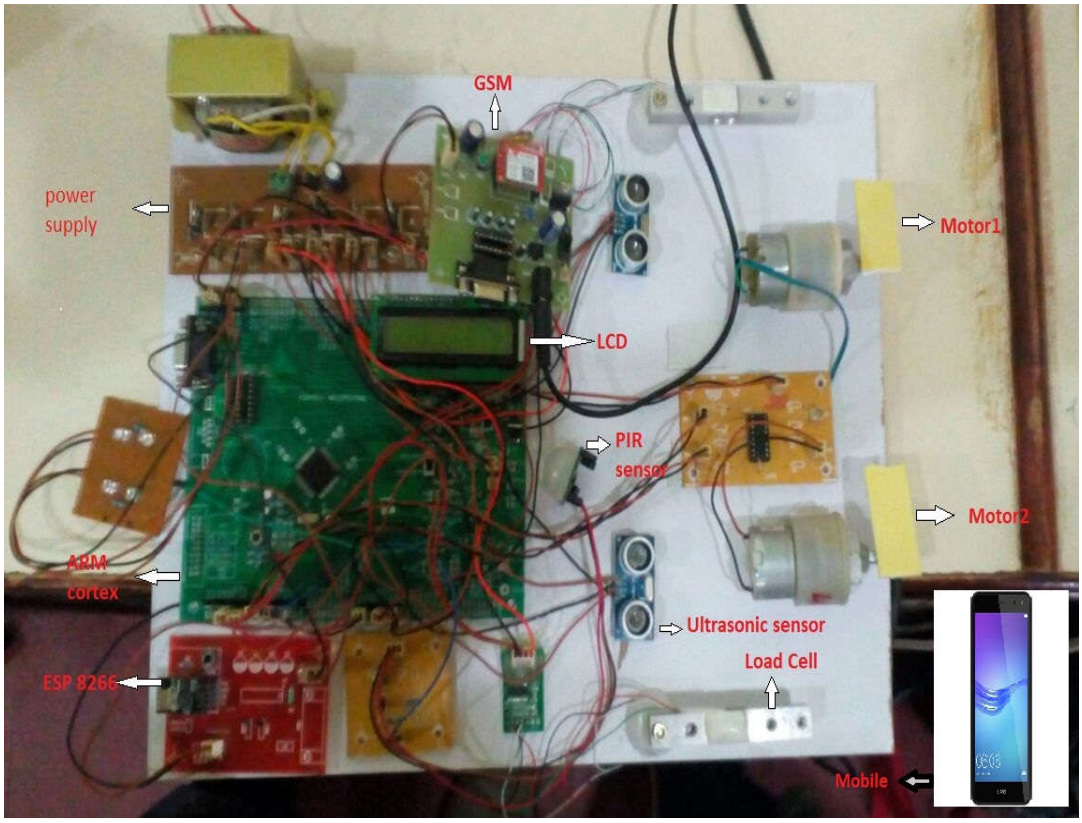


Fig 4.1 Hardware implementation of proposed system

4.1 Algorithm

Step 1. Initialization of devices.

Step 2. Initialization of ARM CORTEX M3 micro controller, GSM modem and all sensors.

Step 3. Initialize the SIM in GSM modem , when the SIM registered then ESP8266 is enabled.

Step 4. When it provides Wi-Fi, mobile is connected through the IP Address.

Step 5. If height or weight of the garbage bin full, then it will sends the message to authorized persons through the GSM.

Step 6. If you want know the status type the IP Address in HTML page, then it will shows.

Step 7. It monitors continuously.

5. RESULTS

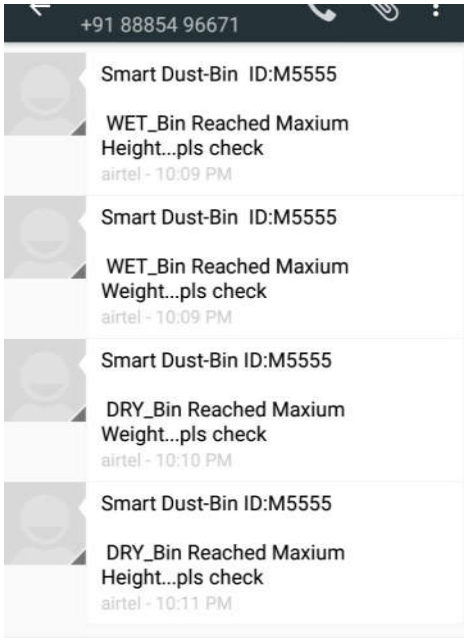
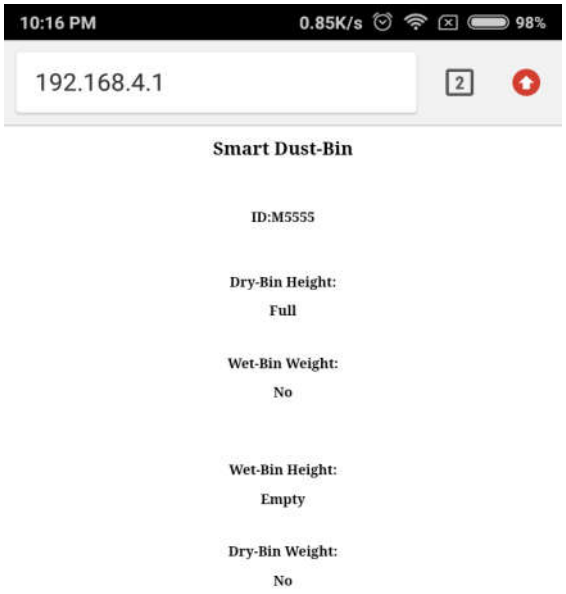


Fig 5.1 Result of messages

When height/weight of the Dry Dustbin/Wet Dustbin is reached maximum limit, then it will sends the message to authorized persons through the GSM modem.



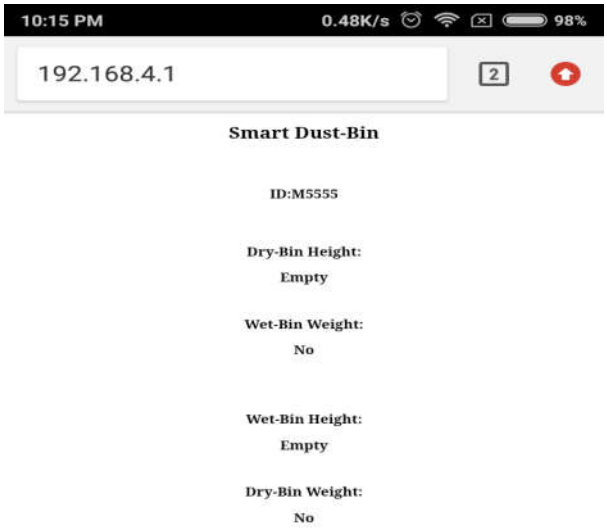
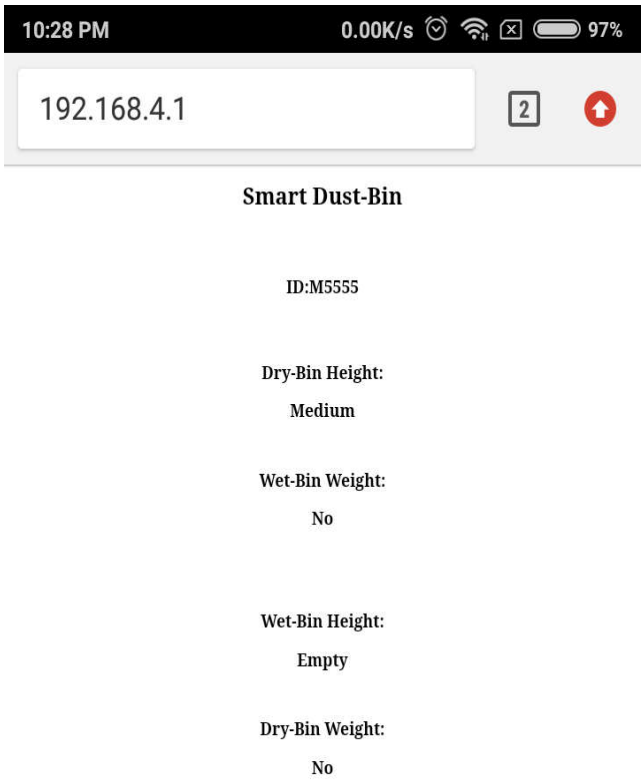
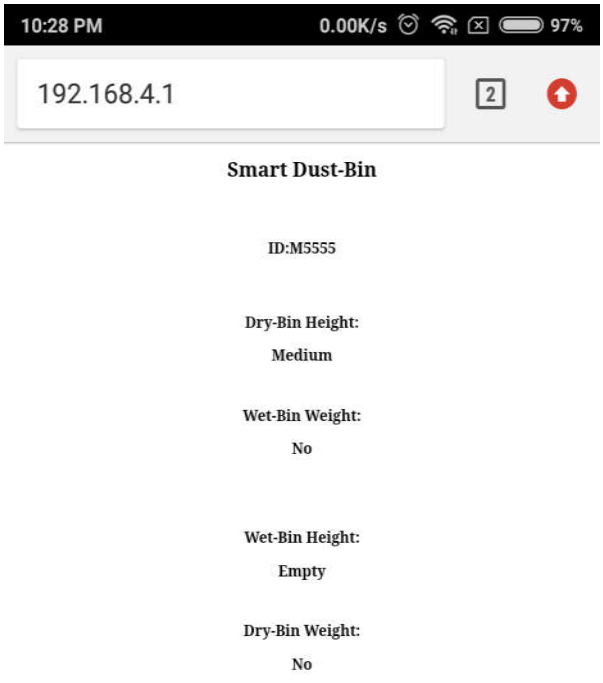
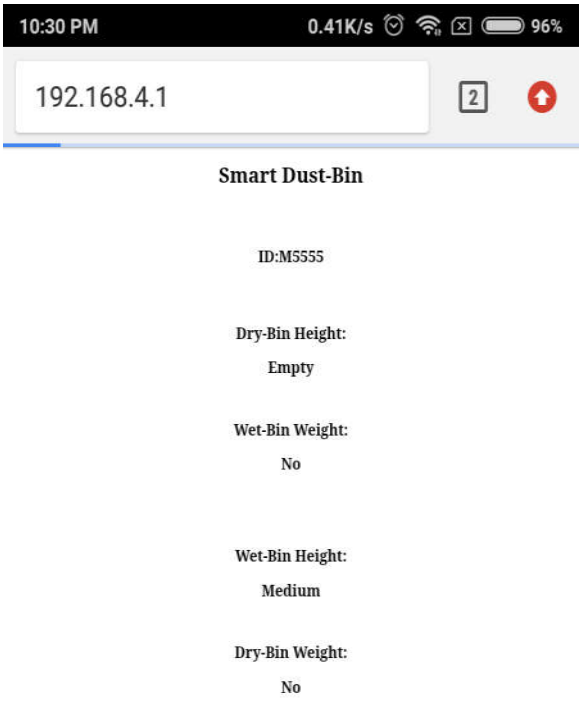
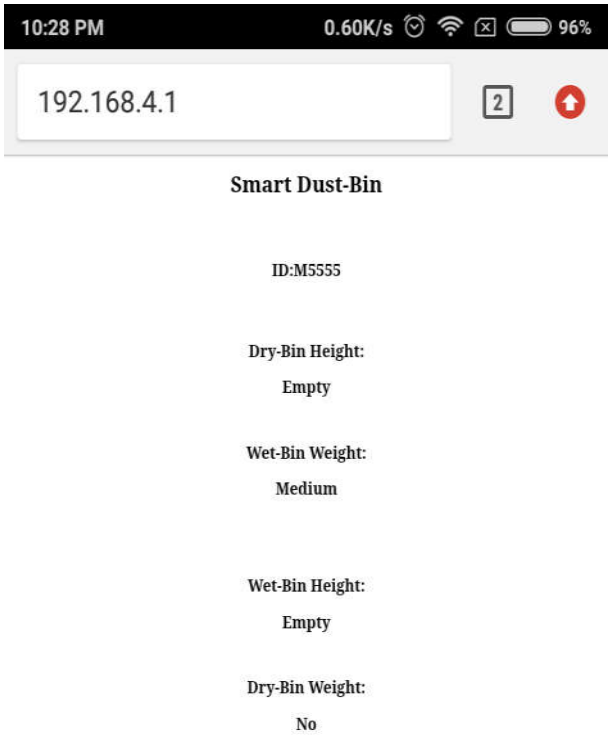


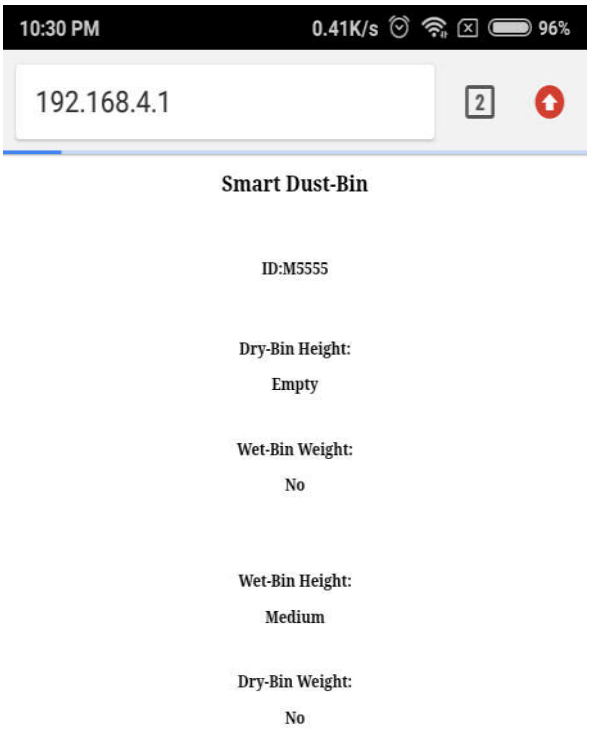
Fig 5.2 Webpage with IP Address




10:28 PM
0.00K/s
97%
192.168.4.1
Smart Dust-Bin
ID:M5555
Dry-Bin Height:
Medium
Wet-Bin Weight:
No
Wet-Bin Height:
Empty
Dry-Bin Weight:
No


10:30 PM
0.41K/s
96%
192.168.4.1
Smart Dust-Bin
ID:M5555
Dry-Bin Height:
Empty
Wet-Bin Weight:
No
Wet-Bin Height:
Medium
Dry-Bin Weight:
No


10:28 PM
0.60K/s
96%
192.168.4.1
Smart Dust-Bin
ID:M5555
Dry-Bin Height:
Empty
Wet-Bin Weight:
Medium
Wet-Bin Height:
Empty
Dry-Bin Weight:
No


10:30 PM
0.41K/s
96%
192.168.4.1
Smart Dust-Bin
ID:M5555
Dry-Bin Height:
Empty
Wet-Bin Weight:
No
Wet-Bin Height:
Medium
Dry-Bin Weight:
No

6. CONCLUSION

The main objective is to maintain the level of cleanliness in the city and form an environment which is better for living. By using this system we can constantly check the level of the garbage in the dustbins which are placed in various parts of the city. If a particular dustbin has reached the maximum level then the employees can be informed and they can immediately take certain actions to empty it as soon as possible. The employees can check the status of these bins anytime on their mobile phones. This can prove to be a very useful system if used properly.

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Author's Profile

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