ISSN (online): 2250-141X
Vol. 8 Issue 1, March 2018

FOOD WASTE MANAGEMENT SYSTEM USING LOAD CELL

Naga Sivarao Kodi[1], Mohan Venkata Siva Prasad Chandaluru [2], Jagadeesh Babu Bokka[3]

[1,2]ECSE Department, Koneru Lakshmaiah Education Foundation, Vaddeswaram, Guntur, Andhra Pradesh,
[3]ECE Department, Aditya Group of Educational Institutions, Kakinada, Andhra Pradesh, India.

Abstract

Waste management system is one of the present major issues in the current society. One such waste management system is FOOD WASTE MANAGEMENT SYSTEM. In many industries employees are wasting the victuals. People who are preparing the pabulum can't detect the wastage congruously and due to the incongruous way of communication of detecting the victuals waste amount of aliment is getting wasted in the scenario. To eschew such circumstances we are proposing a system which weighs the wastage of victuals daily and notifies the wastage of pabulum so that people can take some measures to evade such immensely colossal wastage of victuals. In the proposed system load cell sensor is utilized to sense the weight placed on it and calculates the weight and it is exhibited on the seven segment exhibit. By this project the amount of waste can be reduced. Cost is less and the proposed system is utilising amicable.

Keywords---- Arduino-uno, HX711, Load cell, seven segment display, waste management.

INTRODUCTION

Preparing victuals is not an issue. Afore going to prepare the aliment, getting the raw materials required or the ingredients needed to prepare the aliment is the astronomically immense issue. So much of struggle is abaft the pabulum. People now a days are very temerarious regarding the victuals. Wastage is more in the society. Food is getting wasted in many organisations, schools, colleges, hotels and lot many places. In order to manage the victuals waste a waste management system is implemented in this paper which weighs the wastage and exhibits the weight. The pabulum waste will engender methane gas. It is a natural gas. This methane gas is more perilous to human beings and it is the major factor for ecumenical warming. It gives suffocation quandaries which includes arduousness in breathing. From past few years regime conducting campaign programs in order to provide the compulsory vigilance in the current society.

In the existed squander administration framework government gave a few vans which are setting off to each road and gathering the wastage yet the issue with this system is measuring, the correct

ISSN (online): 2250-141X
Vol. 8 Issue 1, March 2018

weight of the wastage can't be anticipated in light of the fact that there are no such measuring machines which measure the correct weight of the wastage.[1] The sustenance misuse issue is affected by biological elements, (for instance, natural change and contamination of air, water and land) and social factors (checking the already said masses advancement and new examples in consumerism). Along these lines, sustenance wastes impacts on society, the earth and the economy in both making and made countries. The support misuse issue is impacted by common variables, (for instance, natural change and corrupting of air,water and land) and social parts (tallying the already said masses improvement and new examples in consumerism). In this manner, support waste effects on society, the earth and the economy in both making and made nations [2].

Literature Review

Varsha Jain penned in [3] that e-Bin is a social persuading structure to motivate reflection and behavioural change in the support squander and reusing inclinations for energetic adults, especially in living arrangement understudy's mayhem circumstance for making and youthful countries. This paper gives another robotized evaluating and accounting system, which discovers floats in food wastage by interfacing the sustenance wastage with various parameters like number of people making that sustenance, day of week and time of day. Another bit of this structure presents accommodating bits of learning from the data we assemble to the understudies eating in the confusion, to enable a change in their lead. This part includes a Driven demonstrate that displays the gross sustenance waste that has been delivered, related cost of the sustenance being dumped and an online section wherein people can get more clear information using direct charts and diagrams.

Tarandeep Singh , Rita Mahajan, Deepak Bagai clarified in [4] as follows In most by far of the spots, the waste holders are not cleaned at honest to goodness time between times which achieves flooding of refuse realizing neatness issues, arrive defilement; furthermore it makes abnormality to that place. This demonstrates the prerequisite for a structure that screens the status of the junk compartment and offers information to the concerned authorities to manage the gathering intervals for cleaning the holders. A response for this issue is proposed in this paper in the casing of a 3 level waste organization system: Intelligent repository, portal, remote base station. The parameters of the compartment watched are transmitted through a portal to remote base station to be secured in a database.

Hitesh V. Raut, Swapnil R. Rajput, Dhananjay B. Nalawade, Karbhari V. Kale in [5] briefly explained about the mobile based concept for food waste. This is the client server GIS and Cell telephone application for the craving free city. At the client side App offer office to offer support to the magnanimity for the help of hungry people. Suppliers enter fundamental information like measure of waste support and sort of waste close by degree and longitude regard and contact number.

ISSN (online): 2250-141X
Vol. 8 Issue 1, March 2018

Philanthropies can get that waste support and pass on sustenance to hungers. Establishments can mapped onto Google depict the help of GIS region based organizations using GIS orchestrate (extension and longitude) regard. Satisfaction of enrolment will put onto server database where philanthropies can store the sections of patron in table association and exhibits the perfect route between giver regions to nearest magnanimity close by heading. So wastage sustenance can without a lot of an extend pass on to hungry people inside a period.

In [6] Squander organization has been a dire issue to be considered. This paper is an approach to manage accomplish this extraordinary motivation. In this paper, sharp holder relies upon a microcontroller based stage Aurdino Uno board which is interfaced with GSM modem and Ultrasonic sensor. Ultrasonic sensor is put and no more critical motivation behind the dustbin which will check the stature of the dustbin. The purpose of restriction stature is set as 10cm. Aurdino will be altered in a way that when the dustbin is being filled, whatever is left of the range from the edge stature will be showed up. Once the waste achieves the most extreme level ultrasonic sensor will trigger the GSM modem which will constantly alert the required power until the point when the rubbish in the dustbin is squashed. Once the dustbin is squashed, individuals can reuse the dustbin. At standard interims dustbin will be squashed. Once these wonderful compartments are acknowledged on a general scale, by supplanting our standard holders exhibit today, waste can be managed enough as it keeps up a crucial partition from inconsequential lumping of abuses on roadside .Foul smell from these demolished squanders that stay untreated for quite a while, because of rudeness of powers and hurriedness of open may actuate entire arrangement issues. Raising of repulsive little creatures and mosquitoes can influence irritation around advancing unclean to condition. This may despite accomplish accursed maladies. Between provider zones to nearest generosity close by heading. So wastage support can without a doubt pass on to hungry people inside a period.

In [7] the creators given that Squander association has been a sincere issue to be considered. This paper is an approach to manage accomplish this wonderful motivation. In this paper, savvy holder relies upon a microcontroller based stage Aurdino Uno board which is interfaced with GSM modem and Ultrasonic sensor. Ultrasonic sensor is put and no more amazing motivation behind the dustbin which will gauge the stature of the dustbin. The most distant point stature is set as 10cm. Aurdino will be altered in a way that when the dustbin is being filled, whatever is left of the range from the edge stature will be showed up. Once the junk achieves the most extreme level ultrasonic sensor will trigger the GSM modem which will constantly alarm the required power until the point that the rubbish in the dustbin is squashed. Once the dustbin is squashed, individuals can reuse the dustbin. At standard between times dustbin will be squashed. Once these mind blowing holders are acknowledged on a general scale, by supplanting our standard storehouses show today, waste can be

ISSN (online): 2250-141X
Vol. 8 Issue 1, March 2018

coordinated satisfactorily as it keeps up an imperative division from pointless lumping of abuses on roadside .Foul smell from these demolished squanders that stay untreated for quite a while, by virtue of absence of respect of powers and carelessness of open may prompt entire arrangement issues. Raising of alarming little creatures and mosquitoes can influence disturbance around advancing unclean to condition. This may despite accomplish loathsome defilements. Between advocate territories to nearest magnanimity nearby bearing. So wastage sustenance can without a lot of an extend pass on to hungry people inside a period.

The creators in [8] clarified keen receptacle depends on a microcontroller based stage Aurdino Uno board which is interfaced with GSM modem and Ultrasonic sensor. Ultrasonic sensor is set at the most elevated purpose of the dustbin which will measure the stature of the dustbin. The edge stature is set as 10cm. Aurdino will be redone with the end goal that when the dustbin is being filled, whatever remains of the range from the edge stature will be appeared. Once the junk accomplishes the edge level ultrasonic sensor will trigger the GSM modem which will industriously alert the required pro until the point that the waste in the dustbin is squashed. Once the dustbin is squashed, people can reuse the dustbin. At predictable breaks dustbin will be squashed. Once these sharp containers are realized on a far reaching scale, by supplanting our customary repositories indicate today, waste can be regulated successfully as it keeps up a key separation from pointless lumping of misuses on roadside.

Proposed System

In this paper an incipient system is proposed FOOD WASTE MANAGEMENT SYSTEM UTILIZING LOAD CELL used to manage the pabulum wastage. The wastage is weighed and the weight is exhibited in the seven segment exhibit. In this project the output is optically discerned first in serial monitor and then the controller is interfaced with the seven segment exhibit. The proposed system is utilizer amicable and consumes less power and withal low cost.

The system, equipment and the product required for executing the task are talked about as takes after.

Methodology

The system, equipment and the product required for executing the task are talked about as takes after.. Hardware components required are ARDUINO-UNO board, LOAD CELL sensor, HX711 amplifier, SEVEN SEGMENT EXHIBIT and software used is ARDUINO-IDE. As I already discussed that first the output is visually perceived in the serial monitor of ARDUINO IDE and then a seven segment exhibit is interfaced with the micro controller to optically discern the output in seven segment exhibit.

The brief note on each of the components required is discussed in the coming sections.

ISSN (online): 2250-141X
Vol. 8 Issue 1, March 2018

Arduino-Uno

Arduino-Uno is a development board of embedded systems. It is a micro controller board. Atmega 328P is the controller present in the Arduino-Uno board. The controller is manufactured from Texas Instruments. It has 14 digital input output pins. Among them 6 pins are utilized as PWM pins and 6 analog pins are additionally available. A quartz oscillator of 16 MHz is additionally available on the board. Power jack is present to give the external power supply. C and C++ languages are flexible to utilize for this board. Arduino coding is much simpler compare to other development boards.

Load cell

Load cell is a sensor utilized for weighing applications. Most of the weighing and quantifying instruments involves this load cell mechanism. Load cell is a transducer type of instrument. Transducer is a sensor which converts one form of energy into other form. Load cell converts the pressure applied in to an analog voltage signal. 4 wires are elongated out from the load cell sensor. 2 wires are for excitation and other 2 wires are for providing output voltage signal. Load cell works on the principle of Whetstone Bridge.

HX711 Amplifier

Hx711 amplifier board is an analog to digital converter. For the purport of displaying in the seven segment exhibit requires a digital signal. We require to convert the analog form into digital for that this amplifier board is utilized. Since the output of the load cell is in few micro volts. To drive the low voltage signals to the controller board is not possible. Amplification is must. Programmable gain amplifier which is inbuilt in this HX711 board first amplifies the low voltage signal and then conversion takes place. Figure 1 shows the HX711amplifier board.

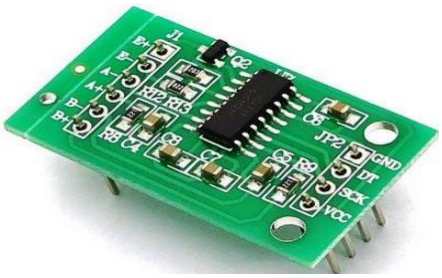

Figure 1: HX711 Board

Seven Segment Display

Seven segment exhibits is utilized to exhibit the alphabets and withal numerical digits from 0 to 9. Seven segment exhibit has seven segments. Each segment has an led and a dot is withal present. An led has anode and cathode terminals. There are two types of seven segment exhibits one is prevalent anode and other is mundane cathode.

Common Anode: All the anode terminals are connected together in the seven segment and called as prevalent anode configuration.

Common Cathode: All the cathode terminals are connected together in the seven segment exhibit and called as Mundane cathode configuration.

ISSN (online): 2250-141X
Vol. 8 Issue 1, March 2018

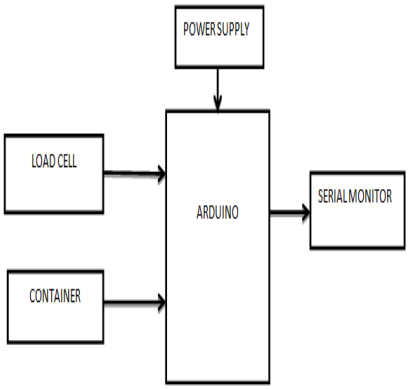

Figure 2: Block Diagram I

The above block diagram represents the victuals waste management system utilizing load cell and the output is exhibited in the serial monitor.

The loads should be placed on the load cell and according to the wheat stone bridge principle the pressure applied on the two ends engendered a tension in the other two ends and then weight is quantified and exhibited in the serial monitor

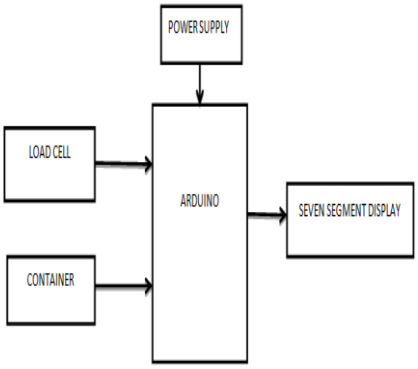

Figure 3 Block Diagram II

In second phase in lieu of serial monitor a seven segment exhibit is interfaced with the Arduino board and the weight is exhibited on the seven segment exhibit.

Experimental Results

The experimental results are embodied in this paper and snapshots of the results are included in this paper the following figures 4, 5 and 6 shows the output displayed in serial monitor and the seven segment display.

Figure 4: experimental set up

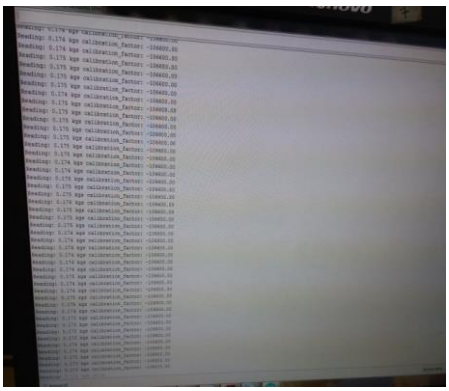

Figure 5: Display in Serial Monitor

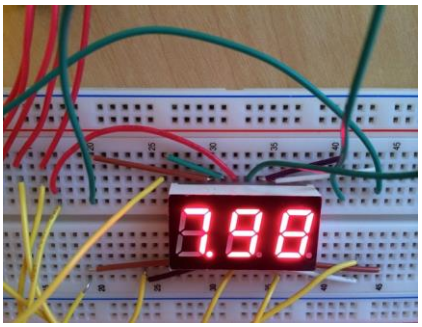

Figure 6: Display in Seven Segment Display

ISSN (online): 2250-141X
Vol. 8 Issue 1, March 2018

CONCLUSION

Food waste management system using load cell is implemented using the ARDUINO-UNO board. The Arduino board is user friendly and the programming is very simple and understandable. For beginners it is easy to use and for advancements it is simple. Load cell is used to measure the weight. Seven segment Display is used for display purpose. This project is user friendly and is used in corporate sectors schools and college in order to know the food wastage in regular basis.

REFERENCES

I. Insung Hong, Sunghoi Park, Beomseok Lee, Jeakeun Lee, Daebeom Jeong, and Sehyun Park "IoT-Based smart garbage system for food waste management", Scientific World Journal, Vol 2014

II. Guillermo Garcia-Garcia, Elliot Woolley, and Shahin Rahimifard "A Framework for a More Efficient Approach to Food Waste Management", International Journal of Food Engineering Vol. 1, No. 1, June 2015.

III. Varsha jain, "eBin: An Automated Food Wastage Tracking System for Dormitory Student's Mess", International Conference on Internet of Things and Applications (IOTA), 2016

IV. Tarandeep Singh , Rita Mahajan , Deepak Bagai "Smart Waste Management using Wireless Sensor Network", International Journal of Innovative Research in Computer vol4,2016.

V. Hitesh V. Raut ,Swapnil R. Rajput, Dhananjay B. Nalawade, Karbhari V. Kale, "Smartphone based waste food supply chain for Aurangabad city using GIS location based and google web services", International Journal of Research in Engineering and Technology,vol5, 2016.

VI. V.PurushothamVijaynaidu, T.Dhikhi, "Smart Garbage Management System", International Journal of Pharmacy & Technology,2016

VII. Narayan Sharma, NirmanSingha, TanmoyDutta, "Smart Bin Implementation for Smart Cities" , International Journal of Scientific & Research, vol 6, Issue 9, 2015,pp-787-789.

VIII. Monika K A , Nikitha Rao , Prapulla S B , Shobha G, "Smart Dustbin-An Efficient Garbage Monitoring System", International Journal of Engineering Science and Computing, 2016