

IOT BASED LEFTOVER FOOD NOTIFICATION AND MONITORING

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Abstract : Leftover food is regularly thrown away from functions/hotels/restaurants in dustbins. However this leftover food can still be used to satisfy the hunger of poor people. We are developing the system to notify available leftover food from functions/hotels. Our goal is to develop an android application to allow willing food donors to notify availability of leftover food through Google Maps. If a donor intends to donate leftover food, the application will record his/her pickup location (i.e. in the form of <latitude, longitude> through GPS). Once the pickup locations of donors are recorded in database, we can plot them on Google Maps in the form of markers. This map can then be used by various NGOs to collect leftover food from their respective destinations and then distribute it among poor/unprivileged people. NGO people will check the quality of food using our kit which contains different sensors. Then these sensor values will be sent to the android application using wifi module. Then android application will check the values of all sensors and according to the values it will accept or reject the food. . After accepting the food these sensor values and the pickup location will be sent to IOT server for keeping record.

IndexTerms - — Temperature, hotels, Methane gas,CO₂, gas,humidity

I. INTRODUCTION

The sharp increase in the amount of wastage in terms of food makes the need for charity in terms of donation. This paper presents a new internet-based application that provides a platform for donating leftover food to all needy people/organizations. It provides information about the motivation to come up with such an application, thereby describing the existing donation system and how the proposed product works for the benefit of society. The product is shown to be an effective means of donating things to organizations, etc. over the internet. It shows the potential for avoiding the wastage of food.

Many people throw away leftover food from functions/hotels/restaurants in dustbins. However, this leftover food can still be used to satisfy hunger of many underprivileged people. This food can surely be used to meet the hunger of many poor people. Partnership with different NGOs will help us serve the community in a better way. Building a platform to establish the link between NGOs and the food donors in the most efficient and easy way is a primary goal. Thereby, an Android application has been developed through which people can donate food items instead of throwing the food into the trash. Presently, to reduce the wastage of leftover food many NGOs like Feeding India, Samarpan, Rotibank, Arham Yuva Group etc. are working to collect and distribute it among needy people. The system that most of the NGOs are currently using is a helpline based system. The donor has to call the NGO on their respective helpline number and notify availability of food. The NGO records donor's address. Using this address they go out to spot the donors and collect leftover food from them. Since the amount of food collected from households is in very less quantity, the NGOs usually collect leftover food from places like hotels, banquet halls, marriage functions from where more quantity of food can be collected. This project presents a Software Solution to help notify available leftover food from our households. Our goal is to develop an Android application to allow the NGO people to check the quality of leftover food to be delivered to the unprivileged people.

II. LITERATURE SURVEY

1. **Paper Name-** Food Wastage Reduction through donation using Modern Technological Approach.

Journal-IJAR CET

Author & Year- Komal Mandal ,Swati Jadhav, Kruti Lakhani 2016

Description- The product aims at satisfying the requirements of needy organizations through donations over the net. The application shall ask the user/donor to register his/her details into the system and then he/she can login and put up items to donate. Similarly organizations can register in the system and then put up their item requirement.

2. **Paper Name-** Android Application for notifying leftover food.

Journal- IJAR CET

Author & Year- Shubham N. Asolkar Prof. Deepthi

Description- The paper's goal is to develop an Android application to allow willing food donors to notify availability of leftover food through Google Maps API. .If a donor intends to donate leftover food, the application will record his/her pickup location (i.e. in the form of <latitude, longitude> through GPS).

III. IMPLEMENTATION

A. MQTT

MQTT is an IOT application open source which can store and retrieve data from sensors or things using local area network(LAN) .

B. Basic4android

Basic4android is the tool for android app development.

C. System Design

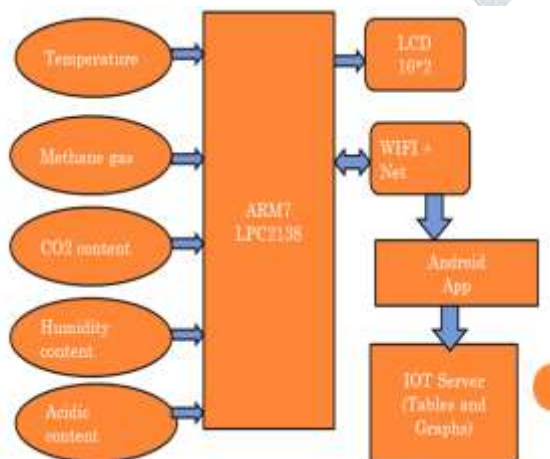
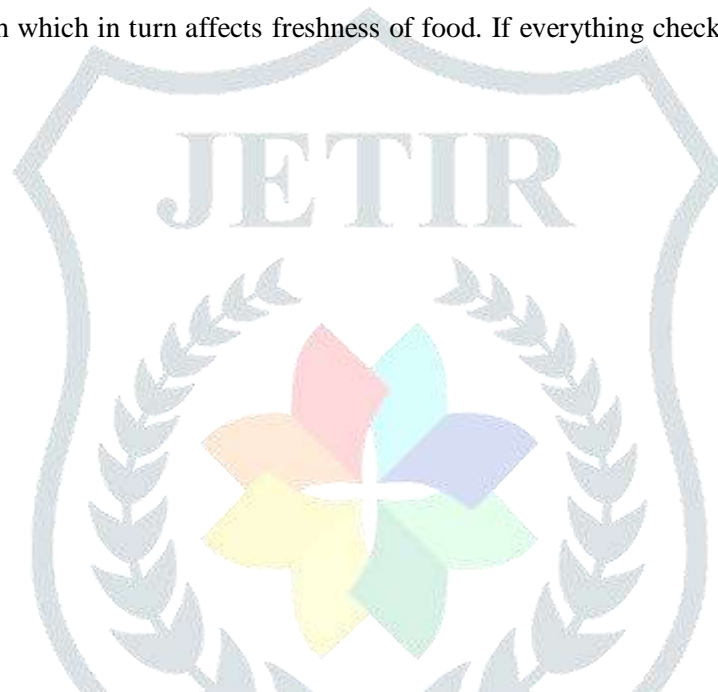


FIGURE 1. LEFTOVER FOOD MONITORING SYSTEM

In the whole World large amount of food goes to waste. To solve this problem we are proposing a system in which whenever any food institutions such as hotels, restaurants or marriage functions have extra food left over, they can intelligently inform our system using Whatsapp and Google Map. Whenever such a notification is received the user will physically go to the location to pick up the food. The main concern is that the leftover food must be good enough to eat. So to tackle this issue we are using series of sensors which will detect the freshness of Food. For this we have interfaced a series of sensors to our system.

When the food is spoiled or if it is kept for long time like for 2 to 3 days it emits methane gas . We are checking this using methane gas sensor. We have also interfaced electrode sensor which will detect the acidic levels in FOOD. So, if the food is found to having Methane gas emission or PH level is too high or if the acidic levels are very high then the food will be rejected. Also we have interfaced a temperature sensor to check the environmental conditions. If the Temperature is low (Cold condition) then the food s preserved for a longer time as compared to when the temperature of environment is high. Also we are checking for other environmental conditions such as quality of air in which food is kept for this we are checking CO2 content and humidity of surrounding environment. If food is kept in the humid air then that food may not be good. The humidity and CO2 level affect the way the food bacterial growth which in turn affects freshness of food. If everything checks out then the food is delivered to proper authorities.



D. Circuit Design

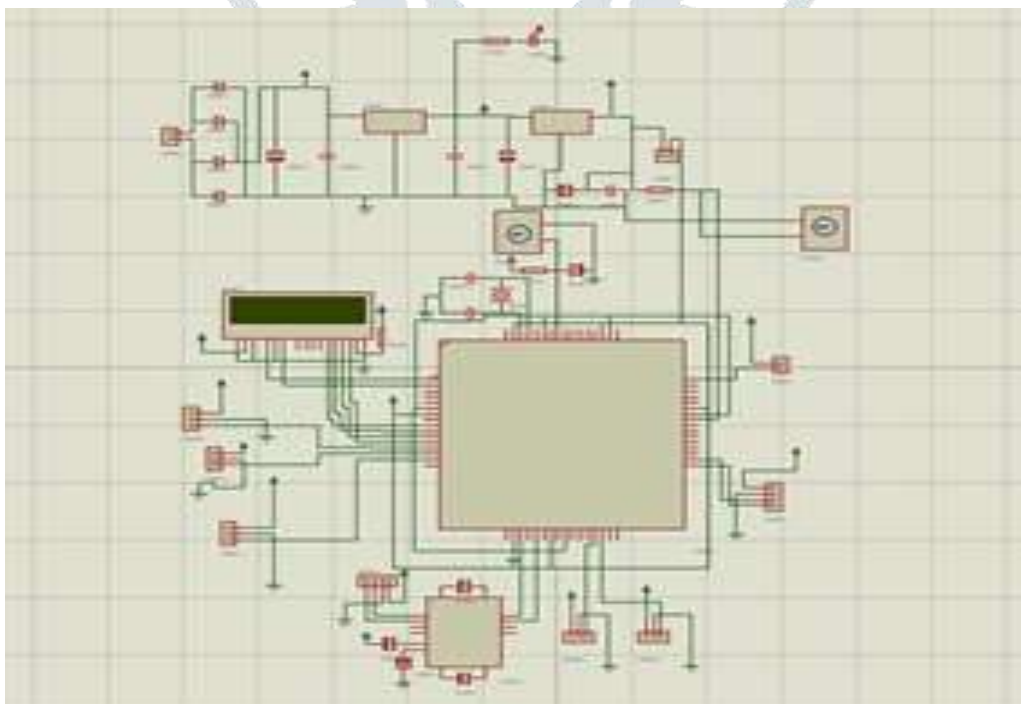


FIGURE 2. PROTEUS DESIGN

E. Specifications

Project Specifications:

1. Project board- 10cm x 10cm
2. Project Enclosure- 1feet x 1 feet
3. Project supply- 230V, 1Ampere
4. Power specifications- $12V \times 500ma = 6 \text{ Watt}$

Hardware Specifications:

1. Microcontroller:
LPC2138 ARM7 Microcontroller(16/32 bit), 32K RAM & ROM, 40 I/O, 2 serial Ports
2. Sensors:
LM35 - Temperature
MQ6 - Methane gas
MQ2- CO2 Gas
Humidity (DHT11)- Air humidity
3. Display- LCD16*2, Voltage5V, Current10ma
4. WIFI Module- ESP8266

Software Requirements:

1. Compiler- uVision KEIL3
2. Programming Language- Embedded C
3. Programming Platform- Flash Magic
4. Android Development Platform- Basic for Android
5. IOT Server - MQTT based IOT server



IV. RESULTS:

In this project we are solving the issues related to the leftover food. The Embedded hardware will be able to save the leftover food in great quantity by satisfying the hunger of unprivileged people. Also we are checking the quality of food which will ensure the health of all the people who will consume the food.



FIGURE 3. DATA RECORDING ON MQTT IOT SERVER

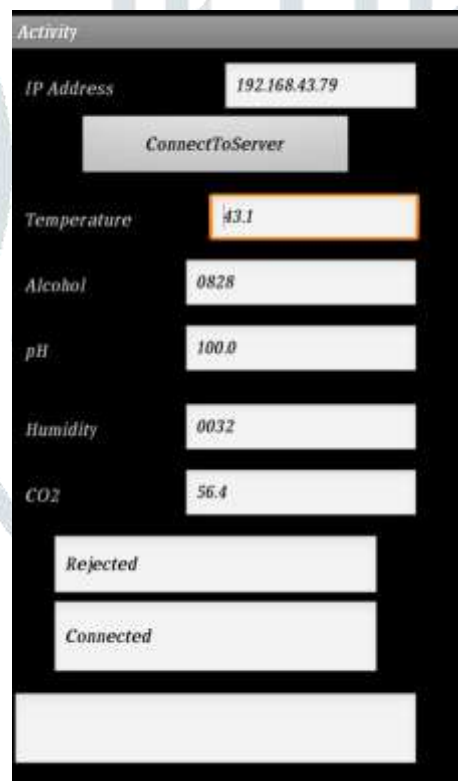


FIGURE 4. ANDROID APPLICATION

V. CONCLUSION

Nowadays Hunger and poverty are becoming major issues. In many of the metropolitan cities large amount of food goes to waste. To solve this problem we are proposing a system in which whenever hotels, restaurants, marriage functions have extra food left over, they can intelligently inform our system by sending their location on whatsapp. Whenever such a notification is received the NGO people will physically go to the location to pick up the food. The main concern is that the leftover food must be good enough to eat. So to tackle this issue we have designed a System having series of sensors which will detect the freshness of leftover food. For checking the quality of food we are using methane gas sensor, acidic content sensor, humidity sensor, carbon dioxide sensor, temperature sensor. Leftover food accepted by the app will be delivered and its record will be kept on IOT server.

VI. ACKNOWLEDGMENT

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VII. REFERENCES

- [1] “Malnutrition in India Statistics State wise”[Internet],June2016,Available from : <https://www.savethechildren.in/articles/malnutrition-in-india-statistics-state-wise>.
- [2] Komal Mandal ,Swati Jadhav, Kruti Lakhani “Food Wastage Reduction through Donation using Modern Technological Approach: Helping Hands”, International Journal of Advanced Research in Computer Engineering & Technology, Vol 5, Issue 4, April 2016,.
- [3] Pankti Doshi, ,Pooja Jain, Abhishek Shakwala “Location Based Services And Integration of Google Maps API in Android”, International Journal of Engineering and Computer Science, Vol 3 Issue 3, March 2014.
- [4] www.epa.gov/recycle/reducing-wasted-food-home
- [5]<http://www.youthkiawaaz.com/2014/09/innovative-trick-dabbawalas-mumbai-feeding-many-hungry-children-city/&cat=General&ip=192.168.3.93&user=-&reason=Group>
- [6]www.indiaactivities.com/caring-activities/donate-leftover-excess-food/

