Chapter 1 Introduction

1.1 Project Overview

'SMART CONTAINER': A smart system which will keep a track on product quantity so that one can know when product is about to end. Also system automatically searches for the product on internet using SEO.

This SMART CONTAINER aims to do advanced technology implementation and research in order to overhaul the complete container door-to-door transport chain so that it is more efficient, secure, market driven, and competitive. It systematically analyses current processes and systems, produces new innovative concepts for processes and technologies, and demonstrates all these in a set of 2 world scale Demonstrators covering 3 supply chain corridors. Its "view", analyses, and recommendations fall in the following four areas thus ensuring a fully comprehensive coverage of the call subject:

1.Innovation / Technology
2.Commercial / market issues
3.Business / organizational issues.

1.2 Scope

This system will alert us before the product is about to get completed.

Such technology can further be implemented over different products to make efficient use of commercial websites.

This System also helps to govern the accurate need of grain meticulously.

This System Entirely completes the procedure of Buying Grains ,pulses and cereals automatically without Human resource.

1.3 Objective

- To Predict the completion of cereals and grains in specific ratio automatically and placing the order too.
- To Automatically govern the cycle between human and grain ordering.
- Improvement of the traceability of Grains by autonomous monitoring of food quantity.
- Ordering of Grains Automatically through SEO concept.
- Development of shelf life models to predict quality enhancement.

- This system automatically detects the decreasing quantity of product and search's the most feasible price of respective product over different commercial websites using SEO method.
- These system also implements the smart use of Search engine through which we can get the particular product with best price.

Chapter 2 System Analysis

2.1 Tools & Technology

Software Used:

- Arduino

Hardware Used:

- Arduino UNO
- IR Sensor
- GSM Module (SIM 900/SIM 300)

Chapter 3 System Design

3.1 Flow of System

3.2 Major Functionality

- In this Project We attached IR SENSOR Over the container .This IR Sensor is attached with ARDUINO and GSM Module too.
- Further We Attached one pair of IR LED exactly in opposite to Photo Diode governing a straight line of sensor.
- These straight line depicts the IR sensor- LINE OF SIGHT .
- Now after the decrement of 70% of grains in container, it Cuts LINE OF SIGHT.
- Now When This LINE OF SIGHT gets Cut , the IR LED emits its ray and gets int contact with photodiode of IR SENSOR.
- This IR Sensor sends Signal to ARDUINO and Further Arduino Sends this Signal to GSM Module.
- Now GSM Module with the help of SIM Sends the message of completion of grain to particular added number.
- Further with the help of SEO the respected grain is Optimized over search engine and is find with the best price and best quality.
- Hence in these way the Smart container with the help of Arduino, IR sensor and GSM modules helps to detect the completion and placement of order automatically.

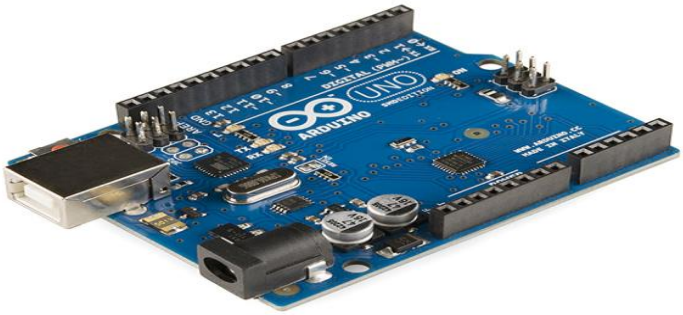
Chapter 4 Implementation

4.1 Module Specification

1. ARDUINO:

- Arduino is an open-source prototyping platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based onWiring), and the Arduino Software (IDE), based on Processing.

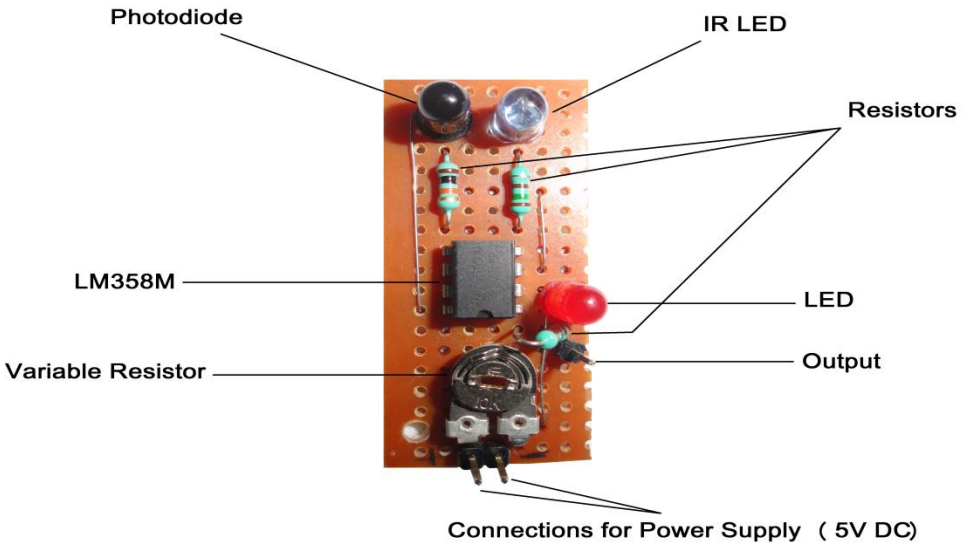
- The Arduino Uno board is a microcontroller based on the ATmega328. It has 14 digital input/output pins in which 6 can be used as PWM outputs, a 16 MHz ceramic resonator, an ICSP header, a USB connection, 6 analog inputs, a power jack and a reset button. This contains all the required support needed for microcontroller. In order to get started, they are simply connected to a computer with a USB cable or with a AC-to-DC adapter or battery. Arduino Uno Board varies from all other boards and they will not use the FTDI USB-to-serial driver chip in them. It is featured by the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.



2. IR SENSOR:

An infrared sensor is an electronic device, that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion.These types of sensors measures only infrared radiation, rather than emitting it that is called as a passive IR sensor. Usually in the infrared spectrum, all the objects radiate some form of thermal radiations. These types of radiations are invisible to our eyes, that can be detected by an infrared sensor.The

emitter is simply an IR LED (Light Emitting Diode) and the detector is simply an IR photodiode which is sensitive to IR light of the same wavelength as that emitted by the IR LED. When IR light falls on the photodiode, The resistances and these output voltages, change in proportion to the magnitude of the IR light received.



COMPLETED CIRCUIT BOARD

maxEmbedded.com

3. GSM MODULE:

GSM/GPRS MODEM is a class of wireless MODEM devices that are designed for communication of a computer with the GSM and GPRS network. It requires a **SIM (Subscriber Identity Module)** card just like mobile phones to activate communication with the network. Also they have **IMEI**(International Mobile Equipment Identity) number similar to mobile phones for their identification. A GSM/GPRS MODEM can perform the following operations:

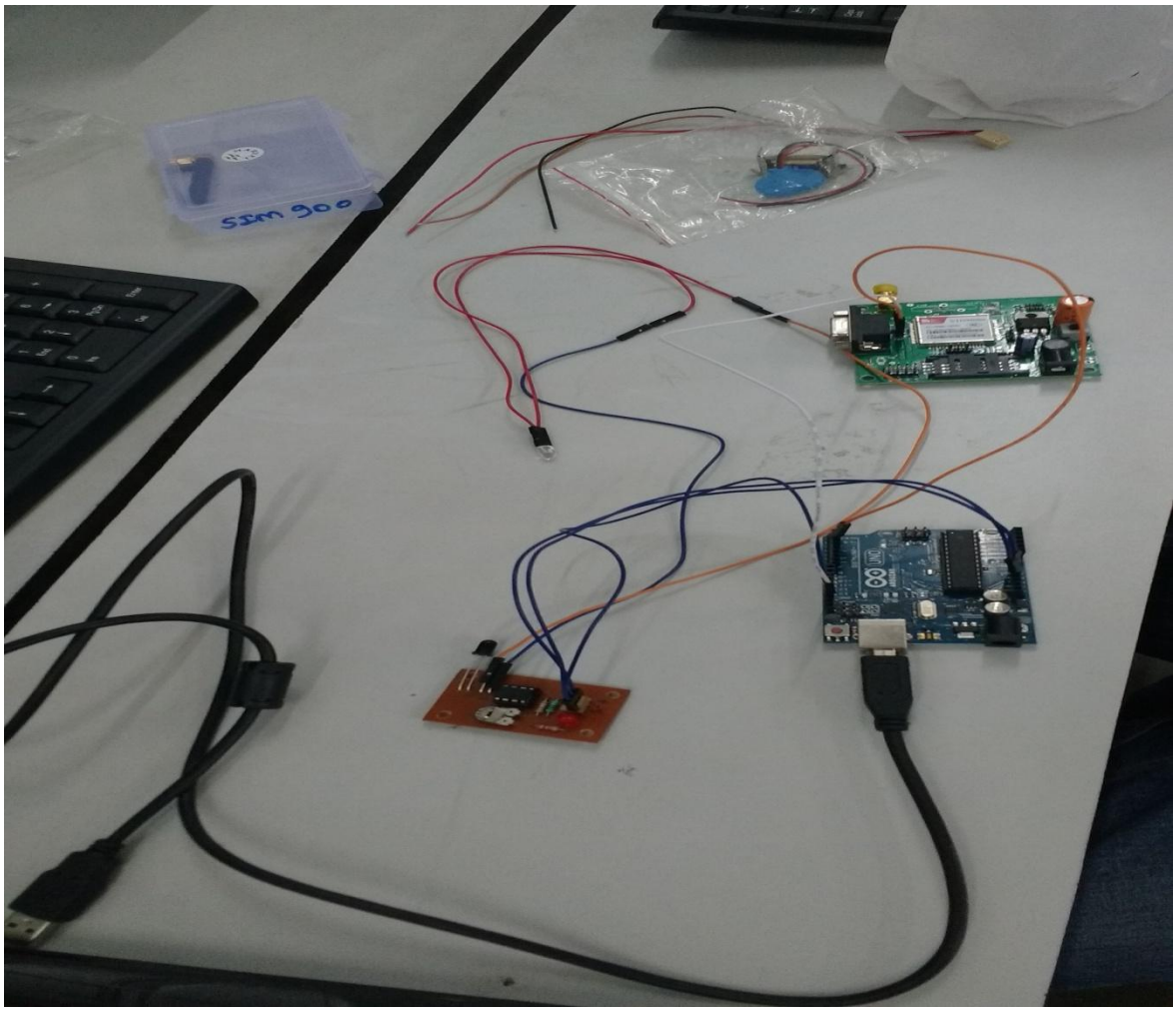
1. Receive, send or delete SMS messages in a SIM.
2. Read, add, search phonebook entries of the SIM.
3. Make, Receive, or reject a voice call.

4.2 Coding Standards

```
int timeTosend=1;
int count=0;
char phone[]=" ";

void setup() {
  // put your setup code here, to run once:
 pinMode(13,INPUT);
 pinMode(12,OUTPUT);
 Serial.begin(9600);

//gsm code
delay(1000);
Serial.println("AT+CMGF=1\r");
delay(1000);
```

```
}

void loop() {
  // put your main code here, to run repeatedly:
int a = digitalRead(13);
    if(a==1)
     {
       digitalWrite(12,HIGH);
       Serial.write("send message ");
       delay(2000);

     //gsm code

     while(count<timeTosend)
{
delay(1000);
Serial.print("AT+CMGS=\"7878558965\"\r");
Serial.print(phone);
Serial.print("\"");
while(Serial.read()!='s')
    {
Serial.println("Hello");
delay(500);
Serial.write(0x1A);
Serial.write(0x0D);
Serial.write(0x0A);
delay(500);
     }
count++;
}

     }
}
```

4.3 Snapshots of project



Chapter 5 Constraints and Future Enhancement

Constraints:

- The system needs power continuously so that it can keep tracking contain in the container.
- The system must be attached with the container which will increase the weight of the small containers.
- The system is not very affordable because for every container we require new system.
- The product must not be liquid with low density because it will not detected by the system.

Future Enhancement:

- Instead of sending just an alert message, the system will send an alert message and check online for the same product and it will show best three prices of the product over different websites using SEO.
- Multiple containers uses a single system which will make system affordable and can be used in day to day life.
- We can keep a clock in the system so that when the product inside container is not used generally at that time system will go into power saving mode.

Chapter 6 Conclusion

At the end of this project we learn how to do coding for hardware using Embedded C programming language. Also we got experience of working with hardware like Arduino UNO, IR Sensor and GSM Module (SIM 900). We learn how to assemble the hardware using wires. We learn basic knowledge related hardware components and their internal working.

References

https://www.arduino.cc/

http://www.engineersgarage.com/sites/default/files/styles/normalimages/public/circuitdiagram/Interface%20GSM%20Module%20with%208051%20microcontroller%20(AT89C51)%20using%20PC%20circuit.gif?itok=9SP-8ep8

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