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Smart Transportation System Monitoring using GPS

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ABSTRACT-*we have a tendency to introduce a physical web design for food distribution networks with the goal of meeting the key challenges of maximizing the freshness of the delivered product and minimizing waste. The physical (PA) design relies on the elemental assumptions of infrastructure sharing among numerous parties, standardized addressing of all entities and modularized operation. we have a tendency to enhance the PA design as well as a freshness metric and therefore the space-efficient loading/unloading of heterogeneous putrescible product to the trucks looking on their delivery necessities projected a combined resolution to stay track of the security of truck and therefore the environmental conditions of the food that is transported into it. Transportation of food via vehicle involves many challenges. The foods like milk or meat product ought to be keep during a specific condition. It ought to be transported from one location to a different during a predefined temperature and wetness. Otherwise it is often contaminated and should simply threaten human health. so monitoring the environmental conditions of the place within which food is unbroken is important. In this paper, the key characteristics of this projected design at the employment of a freshness quality parameter for economical loading of multiple food product on the trucks and therefore the planning of food trucks per the delivery necessities of individual packages were analyzed. we have a tendency to additional increased this design with mechanisms to scale back the driver's away-from-home time whereas maintaining associated degree end-to-end contemporary delivery of the food packages.*

Keywords *-Tracking, Food protection, Transportation, Packages.*

I. INTRODUCTION

Transportation of food via vehicle involves several challenges. First of all, foods such as milk or meat products should be stored in a specific condition. It should be transported from one location to another in a predefined temperature and humidity. Otherwise it could become contaminated and endanger human health. Hence it is necessary to measure the environmental conditions at the place where food is stored. Second challenge is to improve the safety of the driver throughout his trip in case of potential accidents. Accidents may result in deaths, severe injuries, and loss of income to the impacted families. Accident detection and prevention is a keystone in improving driver safety. In this paper, we propose a combined system to measure and report environmental conditions. Product vulnerabilities to climate-induced changes could, amongst others, relate to the degree of direct exposure of a product to those changes, the level of intrinsic risk of microbial contamination, the amount and type of processing used to inactivate microorganisms, and the manner in which things are packed, processed and delivered. It could enhance a product's quality or value, offer greater convenience, or provide tampering and theft-resistance. Regardless of what has happened or has not happened to commodities on their way from locally sourced, the final typical pathway involves processing, preparing, and serving at potentially unsafe storage temperatures that enable the growth of low pathogens rates. Economic changes and growth in developing pathogens challenges entire food safety control systems and affect the capacity and preparation of the industry to handle, implement and monitor food safety within developed process improvement systems and chains. A major concern for food producers and suppliers is the prevention of product health and quality during packing, storage, transportation

II. LITERATURE REVIEW

1. Kong Xiansheng and Sun Jingintroduces -2019 - Near Field Communication and comprises a pH sensor and an external interrogator that interact to provide information on the quality of food products. Further the pH sensor is split into electrodes and resonant circuit. The electrodes of the sensor are coated with hydrogel; a hydrophilic polymer which acts as an electrolytic solution where the electrodes interact. The resonant circuit consists of an inductive coil and sensor electronics.

2. Vassiliss. Kodogiannis&Abeer, Alsahejari-July 2018 introduce A Fuzzy-wavelet neural network model for the detection of meat spoilage using an electronic nose. This provides the information of the food based on the temperature and humidity using temperature and humidity sensor.

3. Phurnvirachongthanasphisut, Tharaseesaared, Teerakiratkerdcharoen-Aug 2018 introduce Monitoring of microbial canned food spoilage and contamination based on e-nose for smart home. This system Senses ammonia in canned foods by the principal of component analysis(PCA) and it produces the current status of the canned foods.

4. SharmithaBhadra, Douglas.J, Thomson-July 2019 present a new CO2 sensor based on a hydrogel pH-sensitive electrode pair. This sensor provides a useful measurement of voltage depending on concentration of CO2 in the atmosphere around. We incorporated this sensor into a chip less near-field RFID tag.

III. WORKING PRINCIPLE

The proposed overall system is included with its main stages, hardware/software components, the cloud infrastructure used, any third party libraries utilized, proposed algorithm, and how the overall proposed system works. The study also focuses on discussing how data are acquired using temperature, humidity, accelerometer and gyroscope sensors and how the acquired data are filtered using complementary filter and how the filtered data in terms of roll, pitch are calculated and used to identify vehicle rollover. Our system aims at solving 2 important problems. Monitor the environmental conditions by measuring and periodically reporting the temperature and humidity levels. Second is monitoring unwanted gas, moisture level. The block diagram of the smart transportation monitoring system is shown in the **Fig.1.**

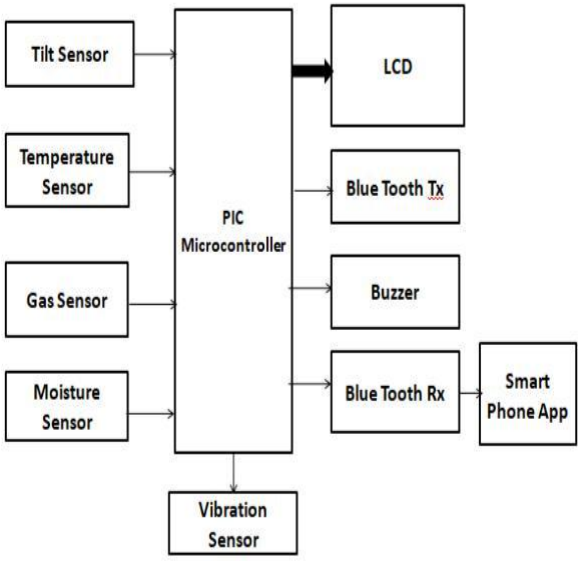

Fig.1-Block diagram of smart Transportation Monitoring System

IV. COMPONENTES DISCRIPTION

4.1 TRANSFORMER

The transformer works on the principle of Faraday's law of electromagnetic induction. The core is composed of thin laminations isolated from one another in order to minimize the eddy current loss. The winding is unguarded, both from one another and also from the treatment. The winding bound to the load is termed the secondary winding on the opposite side of core of sampling, but in reality they are distributed on both sides of the core. The high voltage winding encloses the low voltage.

4.2 7805 VOLTAGE REGULATOR

78XX series are seven output voltage options available such as 5, 6, 8,12,15,18 and 24V in 78XX the two numbers (XX) indicate the output voltage. The voltage of the AC line stepped down one cross per half of the centre tapped transformers. Full wave rectifier and capacitor filter need to provide the voltage regulator with an unregulated DC voltage with AC ripple of a few volts as a input to the voltage regulator. The 7805 of IC provides an output of +5 Volts D.C.

4.3 PIC 16F877A

PIC Microcontrollers are used for more specific applications. PIC16F877A shown in **Fig.2** is widely used because of various reasons like its large memory capacity and adequate input/output ports etc. It consists of 44 pins and it is a dual-in-package 8 bit processor. It has high performance RISC CPU and single word instructions to learn and also possess direct, indirect and relative addressing modes. The watch dog timer is enabled with its own on-chip RC Oscillator for reliable operation. It is employed for commercial, industrial and extended temperature changes.

Fig.2-PIC16F877A Microcontroller

4.4 BLUETOOTH HC05

The HC-05 module is a quick-to-use Bluetooth SPP (serial port protocol) module designed to provide transparent serial wireless communication. Bluetooth V2

EDR (Enhanced Data Rate) 3Mbps modulation with maximum 2.4GHz ratio and baseband transceiver. It Uses CSR BLUECORE 04-external Bluetooth single chip device with CMOS technology and also with AFH (Adaptive Frequency Hopping)

4.5 LCD Display

LCD Display as shown in the **Fig.3** module is Liquid Crystal Display screen. It is available in wide range and is preferred inspite of the other seven segment displays and the other multi segment display LCDs. A number of commands have to be provided to the display before inputting the data. It is user friendly in case of data and commands. By using the serial port, the dual transmission of data is done to the LCD display and the GSM/GPRS module.

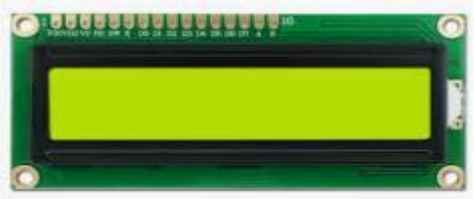

Fig.3-LCD Display

5.6 TEMPERATURE SENSOR

The digital temperature sensor LM35 as shown in the **Fig.4** is a composite sensor that contains a calibrated digital signal production of temperature and humidity. The development of a dedicated digital modules array and the temperature and humidity sensor systems was introduced to ensure the product has high reliability and excellent long–term stability. The sensor has a resistive sense of wet component and temperature measuring tool, and is coupled with a high-performance microcontroller.

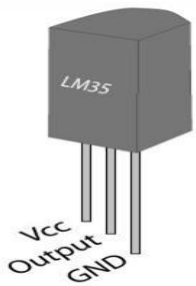

Fig.4-Temperature sensor

4.7 THERMISTOR

A thermistor is a type of resistor whose resistance is more than standard resistors, varies significantly with temperature. The thermistors are commonly used as inrush current limiters, self resetting temperature sensors over current protective devices and self-regulating components.

4.8 VIBRATION SENSOR

The vibration sensor is used to measure the speed of wave that strikes. When the vibration goes beyond their extent, the two poles are connected so as to judge the shock is occurred or not and also it detects any unnatural vibration occurred in the boat. The output signal of Vibration sensor is digital signal. The operating voltage ranges from 3.3V to 5V. It uses a wide voltage LM393 comparator.

V. RESULT AND DESCRIBTION

The solution we are providing for food distribution by using internet facility with GPS through which the consumer can see to the freshness of the food from being spoiled. This also provides notification for the consumer if any problem or vibration happens over the truck. Normally it is provided with sensors for detecting the changes in temperature, vibration, humidity so that we can ensure about the food safety before its delivery. The sensors are set by standard values. If any spoilage occurs during transportation, the sensors will be activated. If spoilage continues to contaminate the food we can obtain information by getting messages and notification in the mobile as shown in the **Fig.5** and the sensors that are kept inside are usually based on normal atmospheric pressure and temperature. If it changes from actual value then it buzzes with alarm and also sends notifications to customer.

Fig:5-Message through Bluetooth

The overall hardware module (smart transportation monitoring system) is shown in the fig.6.

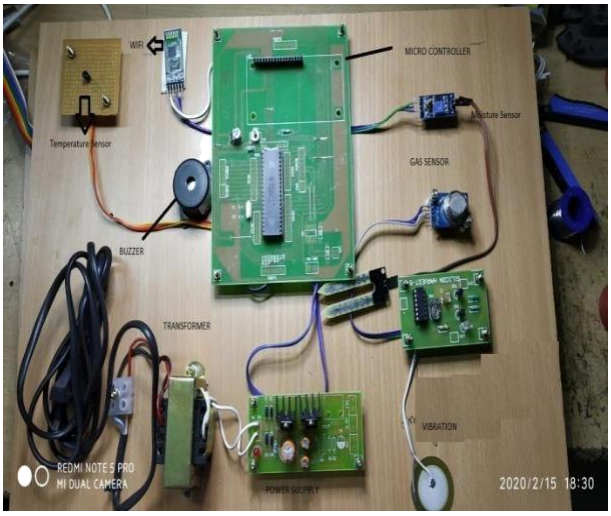

Fig.6-Hardware module

VI.CONCLUSION

In this study, we have proposed a combined solution to keep track of the safety of vehicle and the environmental conditions of the food which is transported into it. Utilized hardware/software components, system architecture and proposed algorithm's details have been presented.

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