



EFFICIENT MILK QUALITY DETECTION SYSTEM WITH IOT MODULE

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Abstract: Agriculture is one of the major sectors of India and dairy Business is combined profit for the Indian business or the economy. The various factors like FAT, Classification of cow milk or Buffalo milk generating the desired rate for the amount of fat calculated in the milk. So, the system calculates these parameters and simultaneously the payment is done automatically. The system has two major parts of module; one is kept at milk storage centre and other is at Billing counter. The sensors are coherence with microcontroller. Cost of the system is also low to detect fatness in the milk sample, Using the IOT process, the industry can take real time readings of milk and rate to the government which helps to stop the illegal things happening nowadays and getting fair price to the farmers.

Keywords: LCD, TCS3200, Gas Sensor, IDR sensor and LM35 Sensor

I. INTRODUCTION

Depending upon the time and situation there is a need to change the working system of the old modules like dairy farming or it may be agriculture. Firstly, it is required to calculate the amount of fat present in the milk. Manually testing of fat and quantity is time consuming. Secondly, some Dairies in villages don't have good milk Testing milk testing equipment's. In such condition the milk sample can be tested once the milk free from fat which can take one to two hours.

By that time the milk packed in a plastic bags or bottles leads to unhealthy. Another reason is since the process is done manually that can

results to mistakes which is biggest loss to farmers. Therefore, to decrease the 2 manual work and to get better result there is a need to replace the existing

System can be measured automatically and in low cost. As a result, huge number of farmers is supplying their milk to the dairy. It's a responsibility of the dairies to get the quality of milk from each farmer and give fare amount to the farmers.

II. PROPOSED SYSTEM ARCHITECTURE

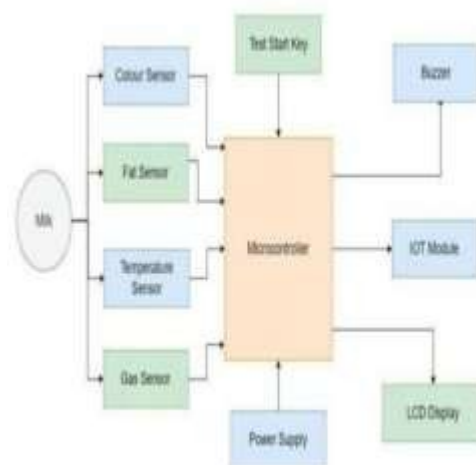


Figure II-1 architecture shows the efficient milk quality detection system with IOT module followed in our project.

LDR Sensor whose resistance decreases when the incident light gets increases. Based on the difference of absorption thickness is determined. Color Sensor TCS3200 module is used to detect whether the milk sample given under test is Buffalo

Or cow's milk, by checking its color intensity. Gas sensor(MQ03) is used for detecting parameter of milk and temperature of milk. Finally, the obtained data are displayed on LCD monitor and updated on Blynk cloud IOT platform, where data can be monitored through internet itself. Whenever there is change in parameters, Buzzer beeps. All the parameters can be viewed on LCD.

III. MATERIALS

A. Gas Sensor(MQ-xx)

It is a device detects the presence or concentration of gases in the atmosphere. Based on the concentration of the gas the sensor produces a corresponding potential difference by changing the resistance of the material inside the sensor. The type of gas the sensor could detect depends on the sensing material present inside the sensor.

B. TCS3200 Color Sensor Module

It has four types of different types of filter covered diodes. In the 8*8 array of photodiodes, 16 photodiodes have Red filters, 16 have blue filters, 16 have green filters and the rest 16 photodiodes are clear with no filters. Since each photodiode is coated with different filters each of them can detect the corresponding colours.

C. LDR Sensor

An LDR or light dependent resistor is also known as photo resistor, photocell, photoconductor. When light falls on the resistor, then the resistance changes.

D. Temperature Sensor (LM35)

A temperature sensor is a thermocouple or a resistance temperature detector(RTD).

E. LCD Display 16X2

A liquid crystal display is a thin, flat display device made up any number of color or monochrome pixels arrayed in front of a light source or reflector.

IV. METHODS

Milk tester is a method, which gives the result that is fat based on the light scattered by the milk. A device called photo resistor whose resistance decreases when the incident light gets increases. It's a semiconductor material having high resistance. It works on the principle of photo conductivity. When the light is fallen, the greater number of electrons are released, which leads to increase in charge carrier those are holes. Thus, the results can be analyzed by the change caused in resistance that is fat

content in milk. For Buffalo's milk the fat present is 6-7 percent and for cow milk it is 3-4 percent. Gas sensor is used is used for detecting parameter of milk and temperature sensor is updates current temperature of milk.

Buzzer

The buzzer will only generate sound when it will be electrified. It generates sound at only one frequency. This buzzer operated at an Audible frequency of 2KHz.

F. Arduino Uno Microcontroller

Arduino Uno is a microcontroller board based on 8-bit ATmega328P microcontroller. Along with ATmega328P, it consists other components such as crystal oscillator, serial communication, voltage regulator etc.

G. NodeMCU (Wi-Fi Module)

NodeMCU is an open source based firmware for the ESP8266 wifi SOC from espressif and uses an on flash-based SPIFFS file system.

Software Application:

ARUINO IDE:

It is an open source software that is mainly used for writing and compiling the code into the Arduino Module. It is an official Arduino software, making code compilation too easy that even a common person with no prior technical knowledge can get their feet wet with the learning process.

The firmware was initially developed as is a companion project to the popular ESP826 based NodeMCU development modules, but the project is now community supported and the firmware can now be run on any ESP module. The ESP8266 Integrates 802.11b/g/n HT40 wifi transceiver, so it can not only connect to a WiFi network and interact with Internet, but it can also set up a network of its own, allowing other devices to connect directly to it. This makes the ESP8266 NodeMCU even more versatile.



Figure IV-1 Hardware Circuit Prototype

v. RESULTS

The main code, also known as a sketch, created on the IDE platform will ultimately generate a HexFile which is then transferred and uploaded in the controller on the board. The IDE environment mainly contains two basic parts: Editor and Compiler where former is used for writing the required code and later is used for compiling and uploading the code into the given Arduino Module.

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