# IoT based Automatic Oil Dispenser

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**Abstract : -** In this Digital era, smart working culture is emerging in day to day life, everywhere. Here, we are present a smart edible Oil Dispenser using the technology "INTERNET OF THINGS". The main purpose of this project is to reduce the manpower and low cost oil dispenser for small scale industries. Here we are fabricating a system to automatic dispense the oil based on user needs and the stock information could be shared to the authority person of the industry. The load cell is used for measuring the level of the oil in the oil tank and the flow sensor is used to measure the dispensed quantity level of the oil. The Arduino controller controls the motor to open and close the oil valve when the user input is initiated. IOT helps the owner or authority person of the industry to know about the stock information in the shop. This system is in-expensive and precise oil dispensing and it eradicates the oil leaking due to the manual work of a person. With this automation, the manual operations can be removed and the owner or authority person can able to catch sight of information about the stock from anywhere.

*Keywords: Oil, Load cell, Oil level, IoT, Precision*

## I.    INTRODUCTION

Now a day we are moving toward automation but in small scale industries oil filling process is done physically. The physical filling process has many limitations like leaking of oil while filling it in bottle, equivalent amount of oil may not be filled, delay etc. This difficult faced by small industries induces us to take up this project. Our project is intended for small industries. It aims to eliminate problem faced by small scale oil filling system. Through this system that operates automatically, each process can be smooth and the process of refilling can reduce workers cost and operation time with updating the stock information to the owner/authorized person. The system operates by the program that designed to do the operation.

## II.    EXISTING SYSTEM

Nandagopal, et al., [1] were developed automation dispenser for an oil industry by using the proximity sensor, microcontroller with chassis frame to dispense oil with predefined quantity. In this automation, the bottles are detected using capacitive sensor and the oil filled when after certain rotation of the conveyor and pump the oil into the bottle with better accuracy than the manual work. Dinesh Kumar, [2] A developed an automated vending machine which provides items such as snacks, beverages, alcohol, cigarettes and lottery tickets to consumers after money or a credit card is inserted into the machine. Bhagyashree, et al., [3] developed semiautomatic fluid dispenser using microcontroller with 50ms delay. Muhammad Sidik, et al., [4] developed a water volume measuring system using ultrasonic sensor for beverage industries using arduino controller. Menaga, et al., [8] developed an alert system to indicate the fuel level goes down to the lower level by using the level sensor which is used to measure the level of any liquid

## III. PROPOSED METHOD

The operation of the system begins with scanning of the keypad. When the keypad is interrupted by the user, then the control is given to the microcontroller that drives the motor valve gets opened up-to filling the desired amount based on the timing of oil flow and the valve gets closed once it reaches the given level and the quantity of oil dispensed  will displayed in the LCD.

Once the oil is dispensed the load cell sensor initiate to measures the weight of the oil tank and the oil level and dispensed litre are uploaded in IoT cloud server , therefore the owner can view the data's about the stock from anywhere.
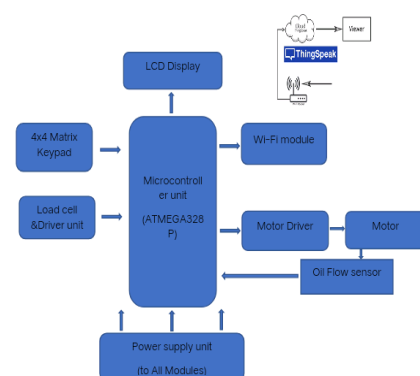


Figure.1.1 Block Diagram of Proposed Method

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*1) Arduino UNO:*



Figure.1.2. Arduino Uno

Arduino Uno is an open source for research people and students that enables user to interact with electronic modules as per their requirement with Arduino IDE. Arduino can be extended for external devices as the features. With Arduino IDE we can modify the specification of electronic devices. [6-7]

*2) Matrix Keypad:*

Matrix keypad is a Human-Machine interface and used in embedded system whenever the need to interact with machine and user.



Figure.1.3.Matrix Keypad

The keypad has keys which are the special membrane switch. Every membrane switches are connected to all other switches with conductive trace that forms the matrix grid.

*3)Load Cell:*

A load cell is a force transducer. It converts the force such as pressure to an electrical signal that can be measured.The electrical signal increases with increases in applied force.



Figure.1.4. Load Cell

The most commonly used load cell is strain gauge load cell. For driving a load cell we are using HX711 module which act as ADC that converts measured changes into an electrical signal.

*4) Wi-Fi Module:*



Figure.1.5.Wi-Fi Module

The ESP8266 Wi-Fi module is device which is used to transfer the message from one place to another place. Wi-Fi module contains SOC with integrated TCP/IP protocol stack that can any microcontroller access to Wi-Fi network. With the help of thingspeak cloud service we can send messages along with Wi-Fi module.

*5)Arduino IDE:*

The Arduino IDE is the platform to modify and interact with electronic modules as per the user needs. In this proposed method, we are using a programme to control the pumping oil and stop the process as well as to update the data in the cloud server about stock information.



```
IoT_Oil_Dispenser
#include <Wire.h>
#include <SoftwareSerial.h>
SoftwareSerial espSerial(2,3);  // RX, TX
#include <LiquidCrystal_I2C.h>
LiquidCrystal_I2C lcd(0x27,16,2);  // set the LCD address t
#include "Adafruit_Keypad.h"
#include "HX711.h"
#define DOUT A0
#define CLK  A1
```

Figure.1.6.Program for oil dispenser

V. Result

The expected output from the project was taken out from various time period's and the output was observed.

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*Figure.2.1.Displaying the quantity of oil dispensed in LCD*

The quantity of the oil dispensed is displayed on the liquid crystal display during the process of dispensing oil. When the keypad is interrupted, the microcontroller processes the values and produces the output as desired oil quantity.
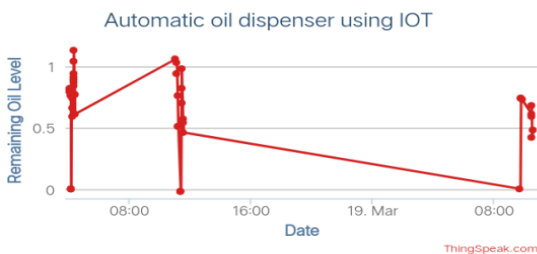


*Figure.2.2.Remaining oil level*

After dispensing oil, the load cell Measures the weight of the primary oil tank for calculating the remaining oil level and dispensed amount of oil and number of user count per day.
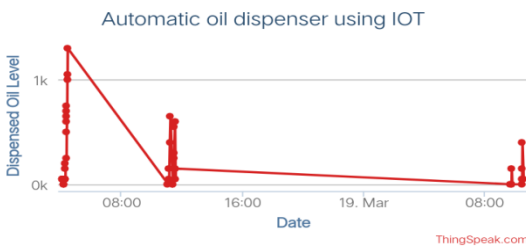


*Figure.2.3.Dispensed oil level*

The measured data are sent to the authorized Person through the Internet of things over the thingspeak server as graphical information.
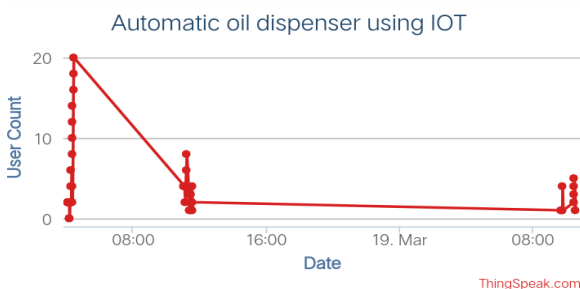


*Figure.2.4.User Count*

The user can view the data from anywhere and anytime. It could be easy to understand about the stock information in the shop.

## VI. CONCLUSION

A low cost and accurate automatic oil dispenser system with IoT was implemented and various observations were taken and the results are observed. The automated oil dispenser system can be helpful to reduce the manual work and wastage of oil. The automatic oil dispenser system will be utilized in different liquid dispensing industries. This system shares the stock hold information to the owner through IoT server, therefore they can aware about the purchase and sales even in the case of absence to the shop.

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