

RFID BASED PETROL PUMP AUTOMATION SYSTEM

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ABSTRACT

This paper is a review on monitoring of petrol pump automation system. Everything is digitalized. In many conventional systems, almost all petrol pumps have a controlling unit to perform the tasks like managing the electrical pump, drive the display, measure the flow & accordingly turn off the electrical pump.

But still a person is required to collect the money and there is card to access petrol at different petrol stations of different petrol companies across the country and here, we are connecting all these petrol stations using single server. This server access is secured by an API Keys which is known only to the admin.

If we want to fill the tank from the petrol pump stations, we just have to place the RFID card near the RFID reader.

Keywords—RFID Technology, GSM Technology, RC522 RFID Reader, I2C LCD Display, Buzzer, Fuel station, Android App

INTRODUCTION

Petroleum is the foremost and mainstay of modern civilization. It is nature's rare and valuable creation. Petroleum formation takes millions of years which insist proper utilization of the resource.

At present petrol pump stations are operated manually which consist a controlling unit to perform various tasks. The traditional petrol pump stations consume more time and requires substantial man power.

It lead to malpractices and higher probability of human initiated errors. These limitations restrict installation of fuel stations in distant areas (especially in large and crowding area. The main aim of this project is to deal with all stated problems by developing an automated petrol dispensing system using RFID technology. Such a system provides user to use a RFID based prepaid

card to access petrol at petrol stations.

If the user wants to fill or dispense petrol tank from the petrol pump station, user has to enter the amount first and then place the RFID card near the RFID reader. The microcontroller manages to read the data from the RFID reader and perform action according to the customer requirements as well as the amount deducted from the user's cards.

LITERATURE SURVEY

Monitoring Customer data using web server [1] In this study, a RFID based fuel dispensing System was proposed which involved controlling the customer database using web server. Here a database created using MYSQL contains all data of the customers. Customers using this system for the first time has to create an account where the admin has to store the data of customer including the Vehicle Id, Customer name and their unique id which will later be utilized by RFID reader in bunks.

Fingerprint based RFID [2] In this Study, Self-service petrol bunk with a Fingerprint based RFID technology was proposed. Here the customer has to set the fingerprint on the module, after that complete identity of the person is stored in database along with his/her fingerprint as unique identity. So unauthorized personals can be halt from usage also the amount of petrol inlet and outlet along with money can managed.

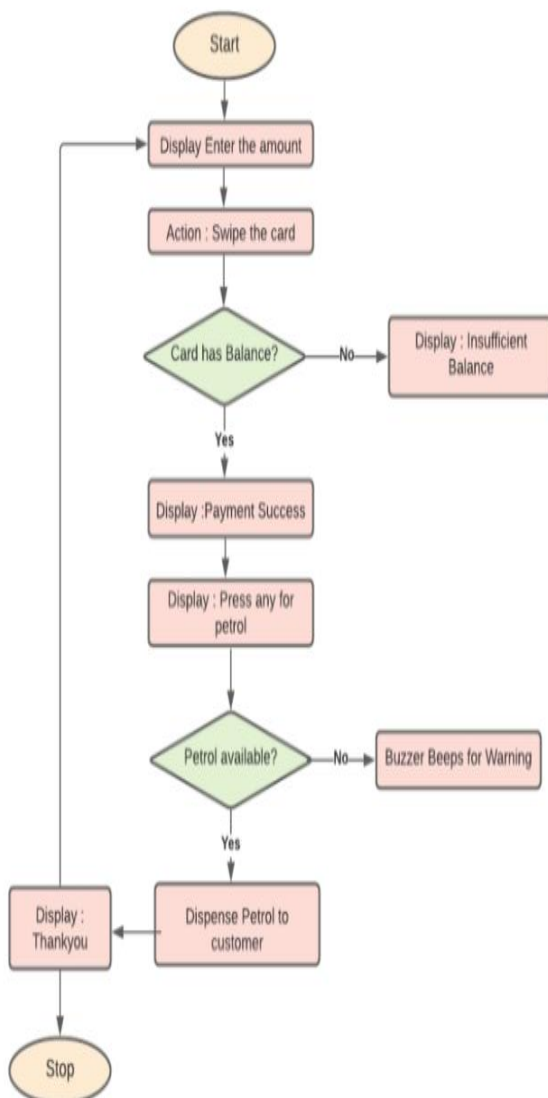
RFID & GSM Technology system [3] In this Study, a smart petrol pump which uses RFID and GSM technology was proposed. Here every customer will be given a PF Card called Petrol Filling card, they have to swipe that card in order to proceed further. The incorporated LCD Display will prompt the user for password. If user enters wrong password, "WRONG PASSWORD" will be displayed else LCD will prompt the user for amount. If there is low balance in user cards, "LOW BALANCE" text will be displayed on LCD.

Automated petrol pumps using Node MCU and Arduino Mega [4] In this study, a RFID based petrol pump involving, Arduino mega and Node MCU was proposed. In this Project, IOT technology is used to monitor the petrol and maintain them.

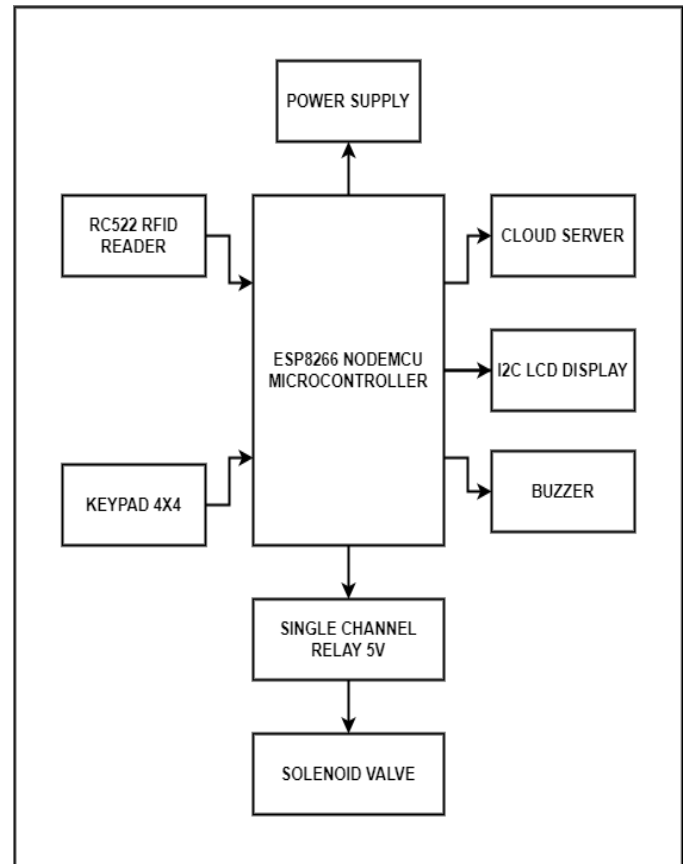
METHODOLOGY

The system comprises of ESP8266 Microcontroller, RC522 RFID Reader, 4x4 Matrix Keypad, I2C LCD Display, Buzzer Indicator, Solenoid Valve etc. The user has to bring his/her RFID Card in proximity of the RFID Reader. The reader reads the cars and if it is valid with a positive balance the user can use 4x4 Matrix Keypad to enter specific amount of petrol required. The rate of petrol can also be updated using the same 4x4 matrix keypad. The user's account is charged with the amount of petrol bought.

The solenoid valve opens in order to pump out petrol in the vehicle. An android app is made for recharge and balance check purpose.



FLOWCHART



BLOCK DIAGRAM

CONCLUSION

It is said that the above model replaces automatic pumps, eliminating all the disadvantages of manual petrol pumps. RFID is a technology that is easy to use and can be used effectively in current applications. The proposed process includes specific objectives such as ensuring gasoline/diesel delivery, eliminating all human error using RFID cards, and ensuring high customer confidence in fair sales. These automated parking lots have the added benefit of reducing the number of self-service workers. Using this simple process anyone can easily buy fuel (gasoline/diesel) at the gas station.

In addition, these machines take less time and are more efficient than conventional models. The preparation process is very good and has low energy consumption, which sets important standards for today's situations.

FUTURE WORK

This proposal has proven to be very useful as it provides security and does not use digital money in the latest strategy of digital India, which prevents fuel theft. Using the microcontrollers introduced by the , the RFID-based gas station automation model can be further enhanced with password protection.

Only the person with an RFID card can have biometric security that can be used at the entrance to the gas station.

In this case, each user will have a unique PIN or User ID or biometric number for their RFID card. If the user enters their credentials correctly, they will be prompted to enter the password/password and then further action will be taken.

On the other hand, if he enters incorrect information, he gets two more chances, if he fails, his entry is denied and a security warning is issued. This helps identify and protect users. Unauthorized users are not allowed to enter the system.

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