

IOT BASED AUTOMATIC PETROL PUMP

Ms. Venissa Prakash Dsouza¹, Ms. Shruti Rajaram Patil², Ms. Vaishnavi Jeevan Mane³, Mr. Nilesh Yadav⁴

1. Student, Department of electronics and telecommunication Engineering, AGTI's Dr. Daulatrao Aher College of Engineering, Karad, Maharashtra, India
2. Student, Department of electronics and telecommunication Engineering, AGTI's Dr. Daulatrao Aher College of Engineering, Karad, Maharashtra, India
3. Student, Department of electronics and telecommunication Engineering, AGTI's Dr. Daulatrao Aher College of Engineering, Karad, Maharashtra, India
4. Professor Guide, Department of electronics and telecommunication Engineering, AGTI's Dr. Daulatrao Aher College of Engineering, Karad, Maharashtra, India

Abstract: The idea of an IoT based automatic petrol pump using RFID technology is to reduce human intervention and minimize the difficulties faced by drivers while refueling their vehicles. In India, the number of automobiles on the road has led to severe traffic congestion and long queues at petrol pumps. Additionally, paying for fuel with cash can be inconvenient for drivers, and they may end up paying more than the actual price due to a lack of change. To solve these problems, the proposed system utilizes a controlling unit to manage the electrical pump, display, and measure the fuel flow, thus eliminating the need for human intervention. The use of RFID technology allows drivers to access fuel at different petrol stations across the country, without the need for cash or manual intervention. This system can significantly reduce errors and the possibility of disloyalty by car drivers towards car owners. Overall, the IoT based automatic petrol pump using RFID technology can make the refueling process more efficient and convenient for drivers while minimizing the need for human intervention.

Keywords: AUTO GUIDED PETROL PUMP, GSM

I. INTRODUCTION

The following text discusses RFID-based automatic petrol pumps and IoT-based automatic petrol pumps. These systems aim to reduce human work, implement an auto-guided mechanism, and minimize human errors, making them highly reliable and less time-consuming. The rise in the number of cars in India in recent years has led to congestion and traffic jams in almost all cities of India. This has created many difficulties in supplying fuel to the enormous number of automobiles at fuel stations. Drivers have to pay for fuel with cash and may sometimes pay more than the fuel's actual cost due to the lack of small change available with the station worker. An IoT-based automatic petrol pump addresses these issues by allowing drivers to pay for fuel using electronic means, and the system provides continuous tracking of the fuel balance, updating the owner of the car with message notifications. The project focuses on designing an RFID-based automated petrol pump that reduces human roles and develops an auto-led technique by using RFID technology. The radio frequency technology has improved the old-style methods of data collection. The UHF band RFID technology has been commonly accepted due to its large read range and low-cost tags. The major components used in this project are ESP32, RFID module and tags, GSM module, power supply, AC pump, and a 20x4 LED display. The antenna designer must study the performance, integration environment, and real requirements in terms of space and cost to meet the customers' conditions.

II.

LITERATURE REVIEW

1. Tanishk Jharwal*2, Vibhor Sharma*3, Vyom Sharma*4, Yash Kumar Sharma*5:

An RFID Based Automatic Petrol Pump is designed to minimize human efforts and implement auto-guided mechanisms through the use of RFID technology. These dispensing systems are highly reliable and consume less time. The major components used in this project include ATMEGA8A- PU Microcontroller, RFID tags, power supply, a motor driver, an LED display, and an RFID reader.

2. AMonitoring Customer data using web server : According to Fawzi Mohammed Munir and Mohannad M Hasan (2015):

In this study, a fuel dispensing system based on RFID technology was proposed. This system involves controlling the customer database through a web server. A database was created using MYSQL to store all customer data. Customers who are using this system for the first time need to create an account. The admin then stores the customer data, including the vehicle ID, customer name, and a unique ID that will later be used by RFID readers in fuel stations.

3. Fingerprint based RFID : According to Anjali et al. (2020) :

A study proposed the use of a self-service petrol station that utilizes a fingerprint-based RFID technology. The customer needs to place their fingerprint on the module, which stores their complete identity in the database along with their fingerprint as a unique identifier. This helps prevent unauthorized individuals from using the station, and also allows for the management of the amount of petrol dispensed and the corresponding monetary transactions

4. RFID & GSM Technology system : According to Naresh Jogi et al. (2012) :

A smart petrol pump that utilizes RFID and GSM technology has been proposed in a recent study. In this system, every customer is provided with a PF card, known as a Petrol Filling card. To proceed with the fueling process, customers are required to swipe the card. An LCD display is incorporated into the pump, which prompts the user for a password. If the user enters the wrong password, the message "WRONG PASSWORD" is displayed on the LCD. If the user enters the correct password, they are prompted to enter the desired amount of fuel. If there is insufficient balance on the card, the message "LOW BALANCE" is displayed on the LCD.

5. Automated petrol pumps using Node MCU and Arduino Mega: According R.Deepa et al. (2019):

In this study, a petrol pump based on RFID technology was proposed. The pump uses Arduino Mega and Node MCU to monitor and maintain petrol.

III.

PROPOSED WORK

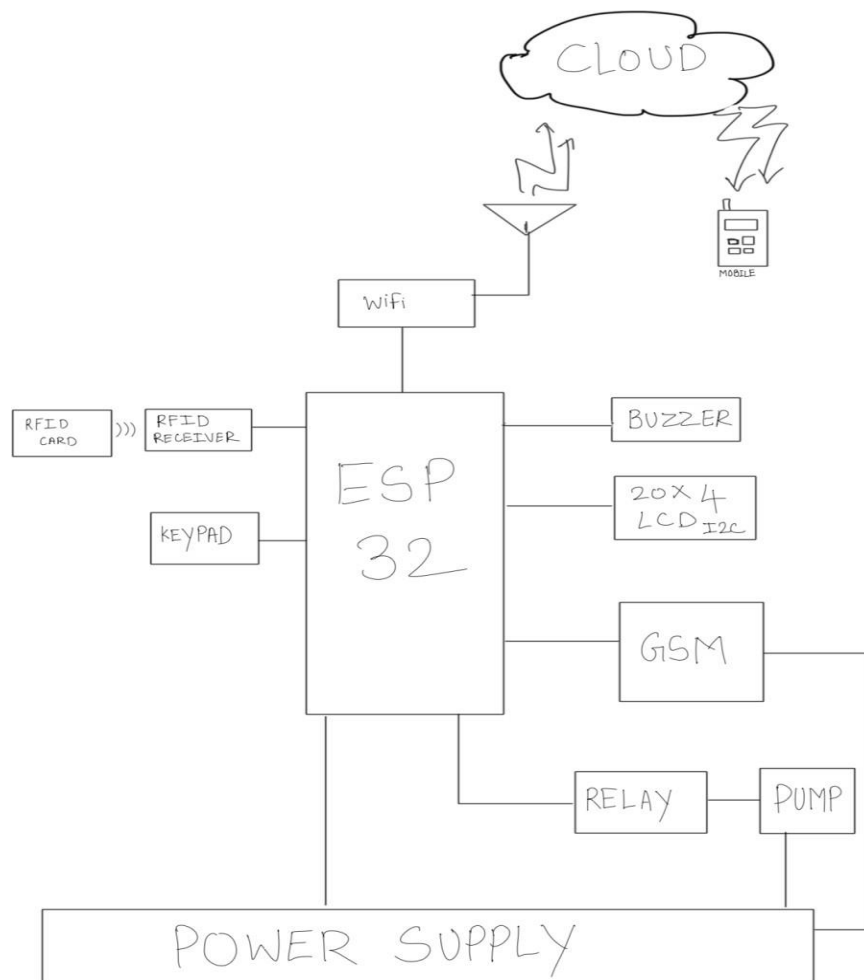
- a. To build a model that interprets totally auto guided petrol pump
- b. To create a model that will offer security and attenuation
- c. To create a model which avoid robbery of cash and petrol
- d. To build a model which offers us completely transparency in petrol dispensing and payments
- e. To create a model that will reduce labors and cost

IV.

OBEJECTIVE OF THE PROJECT

The main objective of the project is to design a system which is capable of automatically deducting the amount of petrol dispensed from a user card based on RFID technology. Liquid dispensing systems are quite commonly found in daily life in different places like offices, Bus stands, Railway stations, and Petrol pumps. Here it's going to present a modern-era petrol dispensing system which is meant to be operated with a prepaid card using RFID technology. The project mainly aims to design a prepaid card for a petrol bunk system and also a petrol dispensing system using RFID technology. In current days the petrol stations are operated manually. These petrol pumps are time-consuming and require more manpower. To place petrol stations in distant areas is very costly to provide excellent facilities to the consumers. All these problems are sorted out by the use of an unmanned power pump which requires less time to operate it is effective and can be installed anywhere.

VII. BLOCK DIAGRAM



VIII. FLOW CHART

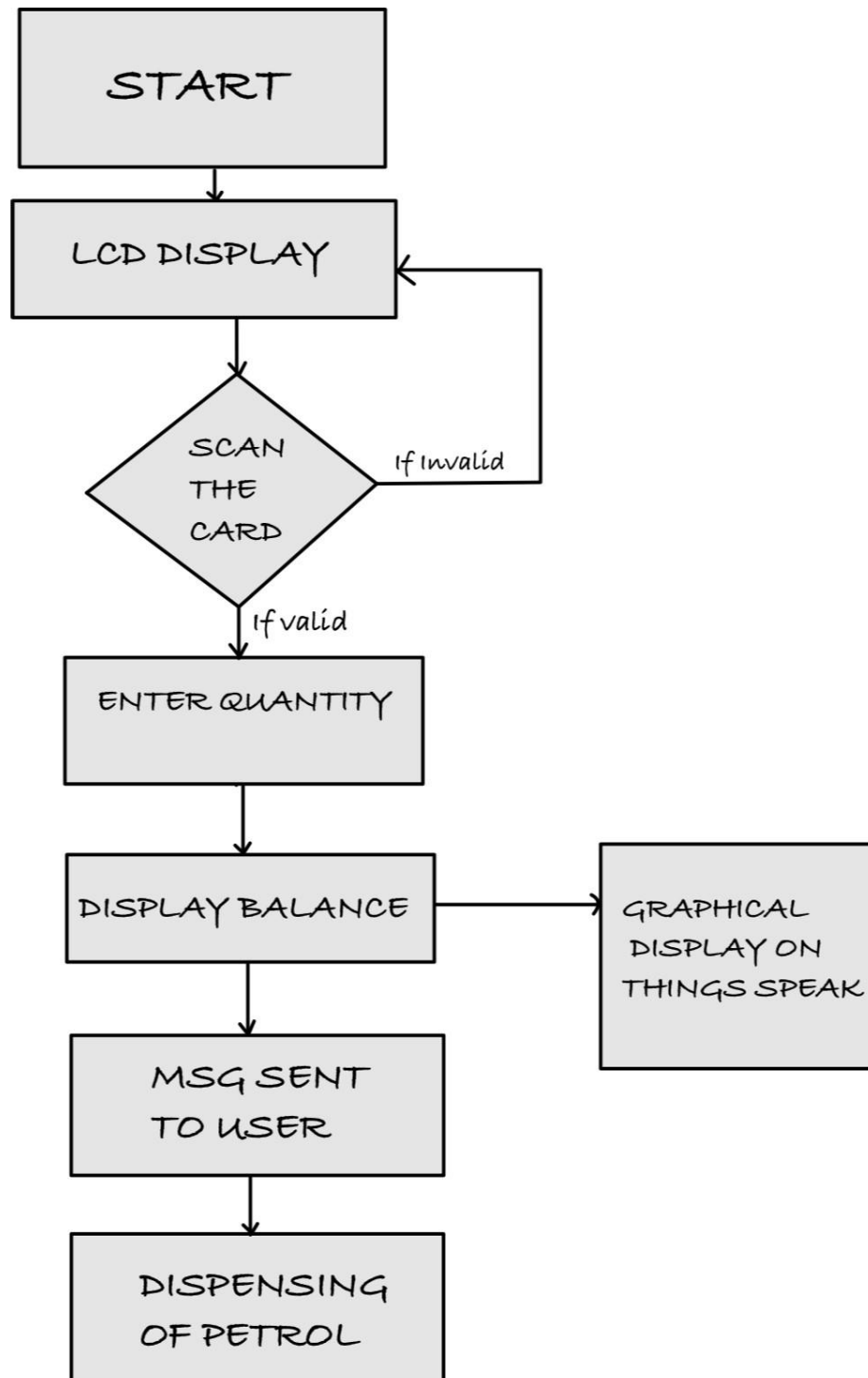


Figure:1 Flow chart

V.

CONCLUSION

The text discusses two types of automatic petrol pumps: RFID-based and IoT-based. These systems aim to reduce human work, implement an auto-guided mechanism, and minimize human errors, making them highly reliable and less time-consuming. In recent years, the increase in the number of cars in India has led to congestion and traffic jams in almost all cities in the country. This has made it difficult to supply fuel to the enormous number of automobiles at fuel stations. Moreover, drivers have to pay for fuel with cash and sometimes end up paying more than the fuel's actual cost due to the lack of small change available with the station worker. However, an IoT-based automatic petrol pump addresses these issues by allowing drivers to pay for fuel using electronic means, and the system provides continuous tracking of the fuel balance, updating the car owner with message notifications. The project focuses on designing an RFID-based automated petrol pump that reduces human intervention and develops an auto-led technique by using RFID technology. The radio frequency technology has improved the old-style methods of data collection. The UHF band RFID technology has been commonly accepted due to its large read range and low-cost tags. The major components used in this project are ESP32, RFID module and tags, GSM module, power supply, AC pump, and a 20x4 LED display. The antenna designer must study the performance, integration environment, and real requirements in terms of space and cost to meet the customers' conditions.

VI.

REFERENCES

- [1] Patil Aishwarya M., Phuke sayali J., Tapase snehal B., "College access and student attendance using 'RFID' technology
- [2] A. H. Jadhav, K. D. Pawar, P. M. Pathare, P. Patil and R. S. Pawar, "Multi-Automized fuel pump with user security, "International Journal of Scientific and Technology Research, vol. 3, no. 5, May 2014.
- [3] D. B. A. Johnson, P. Jaska, J. Nalla, N. V. K. Reddy and R. Tadisina, "Improved customer service using RFID technology, "Review of business Information Systems, vol. 14, no. 3, 2010.
- [4] Jaska P., Johnson D.B.A., Nalla J., Reddy N.V.K. and Tadisina R., (2010), Improved customer service using RFID technology, Review of business Information Systems, Volume 14, Iss
- [5] Jadhav A., Patil L., Sonawane A.D., (2017), Smart Automatic Fuelstation System, International Journal Of Science Technology and Management, Volume 6, Issue4.
- [6] Chetouane, (2015), An Overview on RFID Technology Instruction and Application, IFAC-Papers On Line, Volume 48, Issue3.
- [7] Nang Khin, Su Yee, Theingi, Kyaw Thiha, (2015), Fuel Monitoring and Electronics control of Dispenser for Fuel Station, International Journal of Engineering and Techniques, Volume 1, Issue 4.