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IOT BASED AUTOMATED PETROL PUMP

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Abstract - *Almost all fuel pumps now feature a controlling device that performs activities such as managing the electrical pump, operating the display, metering the flow, and switching the electrical pump off as needed. However, someone must still collect the funds. The project's major purpose is to develop a dispensing system that can automatically dispense petrol in the amount chosen by the client. The bulk of the places we go on a daily basis, such as workplaces, bus stops, railway stations, and schools, have gasoline distribution networks. In this section, we will argue for a petrol distribution technique that is current. There have been various challenges in India as a result of the dispensing of petrol to such a big number of autos at fuel stations. The motorist must pay for petrol in cash and may be required to pay more than the amount of fuel given because the station owner does not have access to tiny change. The RFID Based Automated Petrol Pump will eliminate manual effort, build an auto-guiding system, and perform each function in turn by utilizing RFID technology. These gadgets are easy to use and dependable. RFID tags, an 8051 microcontroller, a power supply, an LCD display, a motor driver, and an RFID reader are all utilized in this project. Petroleum is a precious and unique invention of nature. It is critical to utilize and distribute these items correctly if they are to thrive.*

Key Words*: *Microcontroller, Dispensing system, Automated Petrol Pump system.

1. INTRODUCTION

There have been various challenges in India as a result of the dispensing of petrol to such a big number of motor vehicles at fuel stations. The vehicle driver must pay for fuel with cash and may be required to pay more than the amount of fuel provided owing to a scarcity of small change available from the station operator. Petrol is one of the items that we require in our daily lives, whether directly or indirectly. Currently, fuel stations are run by hand. These gasoline pumps require more time and effort to operate. It is quite costly to locate fuel stations in remote places in order to give outstanding customer service. All of these issues are addressed by the use of unmanned fuel pumps, which take less time to run, are effective, and can be located anywhere the consumer self-goes to use the services. Payment is made via an electronic clearance system.

All of these issues are addressed by the use of unmanned fuel pumps, which take less time to run, are effective, and can be located anywhere where the customer self-goes to use the services. Payment is processed via an electronic authorization system.

2. PROBLEM STATEMENT

Most people use credit or debit cards to pay at the gas pump, which is one aspect of cashless payment, but it is a good approach if you own a car. But what about How will you fill the fuel if you have entrusted your car to a driver to fill the petrol pump or if your automobile is working with a cab service firm like OLA or UBER? So we propose a mechanism in which you may make payments remotely without handing over cash to your driver. I hope this approach meets the requirements of the preceding problem.

3. LITERATURE SURVEY

The ATmega328 is commonly used in projects and autonomous systems that require a simple, low-cost microcontroller. The ATmega328 (EEPROM) has 1KB of Electrically Erasable Programmable Read-Only Memory. This feature implies that even if the power is switched off, the microcontroller can still store data and output results after receiving an electric source.

In addition, the ATmega-328 includes 2KB of static random-access memory (SRAM). The ATmega328 offers a variety of capabilities that make it the most popular gadget on the market today. Advanced RISC architecture, good performance, low power consumption, real timer counter with independent oscillator, 6 PWM pins, programmable Serial USART, programming lock for software security, throughput up to 20 MIPS, and so on are among the characteristics.

Everything is now digital. In many modern systems, nearly all petrol pumps have a controlling unit that manages the electrical pump, runs the display, measures the flow, and finally turns off the electrical pump. However, a person is still required to collect the funds, and there is always the possibility of human mistake. We may get gas at numerous gas stations managed by various petroleum corporations using this proposed Cash Less Petrol pump automation system.

3. METHODOLOGY

The major goal of the project is to create a dispensing system that can autonomously dispense fuel. The overall procedure of delivering fuel involves the following steps: making payments via an Android application, generating a random unique code, and automatic delivery of petrol. The model's unique code will be verified by the server by retrieving data from the database.

(a) Android application.

To register, the user must first log in using an application. After logging in, the user must pick the nearest petrol station offered by the application. The list was compiled using the Global Positioning System (GPS). After selecting the desired petrol pump, the user must choose the available time period and amount. The user must pay after picking a time slot and quantity. A one-of-a-kind code will be produced and saved in the database. This code will be sent to the user's registered cellphone number via SMS.

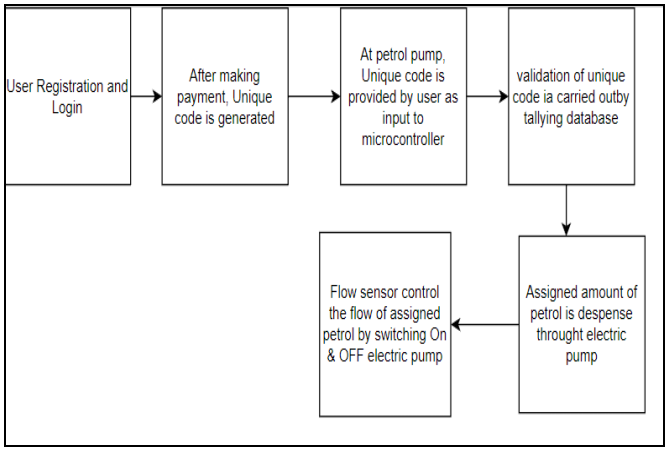

FIGURE I: Flowchart

(b) Hardware

The ATmega8 is a low-power 8-bit CMOS microcontroller based on the AVR RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega8 achieves throughputs approaching 1 MIPS per MHz, allowing the system designer to balance power consumption versus processing speed. We will utilize the ESP 12 as a WIFI module to connect to the internet. The ESP8266 WIFI Module is a self-contained SOC with an integrated TCP/IP protocol stack that allows any microcontroller to connect to your WIFI network. The ESP8266 may run programmers or offload whole Wi-Fi networking activities from another CPU.

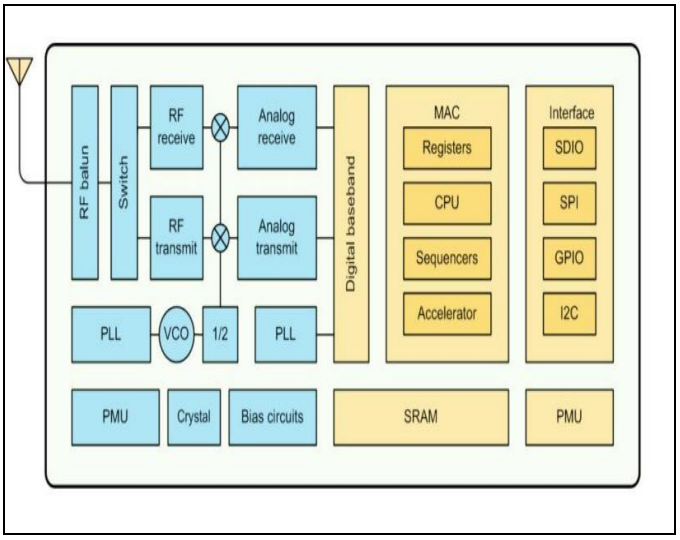

FIGURE II: ESP8266EX Block Diagram

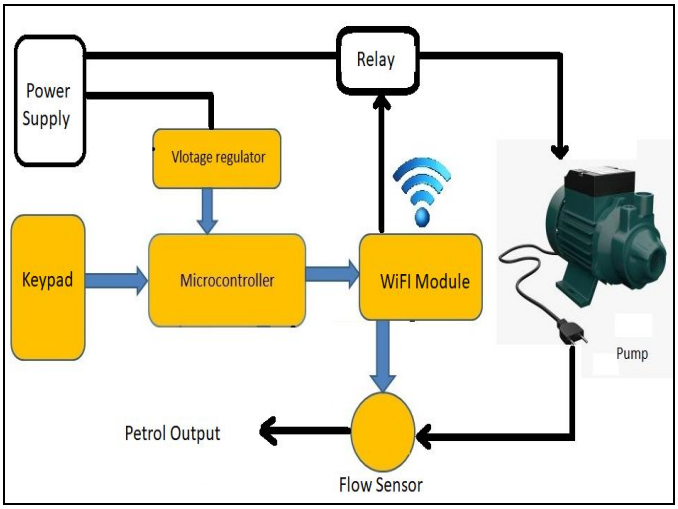

FIGURE III: Hardware Flowchart

Hardware requirement:

- At mega 328 Microcontroller
- Wi-Fi module
- LCD Display
- LED's
- Power Supply
- Keypad 4X3
- Resistors
- Capacitors
- Relays
- Pump

Software Specifications:

- Arduino Compiler
- SQL database management System

5. Working

(a) Android application.

The user must sign in using the "Prepaid Petrol Pump" application. If the user has not already registered, he must do so by supplying information such as his email address, mobile phone number, and so on. Figure IV illustrates the user login and registration interface.

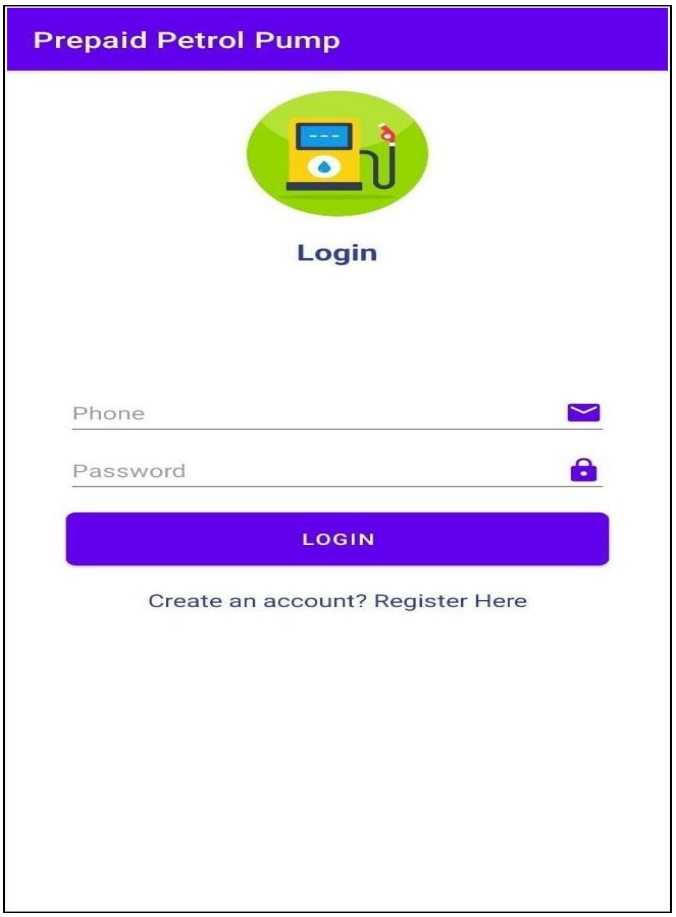

FIGURE IV

After registering/logging in, the user must provide GPS access to the application. The application will identify all local gas stations based on the user's GPS position. gas pumps must be manually entered into the database with their exact coordinates, so that the application may display a list of nearby gas pumps depending on the user's location.

Figure V illustrates the output of the specified fuel pumps when used. The user must pick the nearest gas station based on his or her convenience from the list supplied.

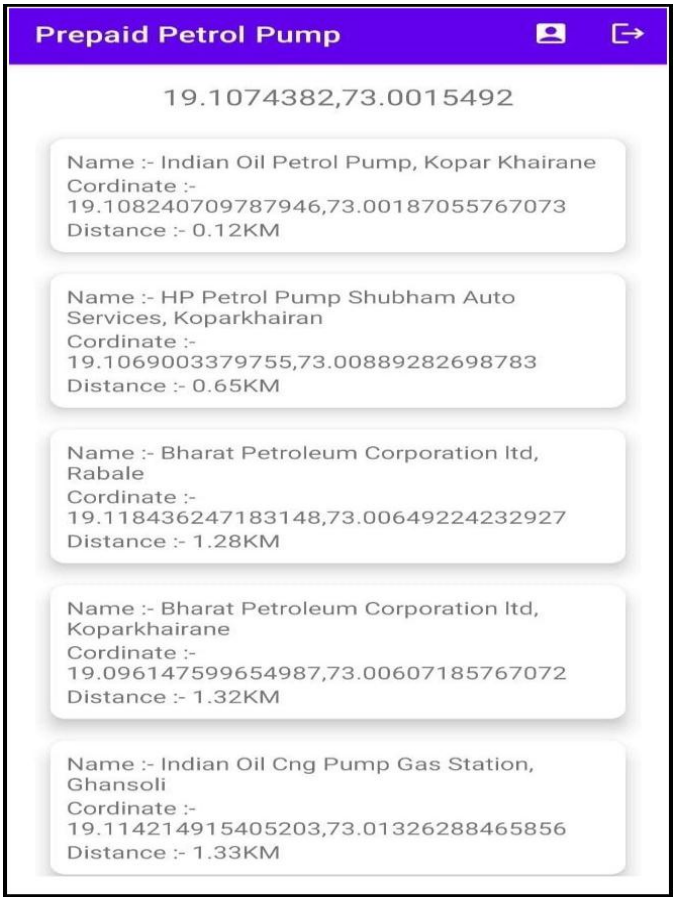

FIGURE V

After selecting the fuel pump, the user must input the date and desired time slot to view the waiting list for that time session. After entering a date and time, the application will check the waiting list for that time slot and report the results to the user. After selecting the day and time, the user must pick the needed fuel PETROL or DIESEL and input the required amount in liters before proceeding to the payment procedure. Figure V shows the result after selecting a petrol pump.

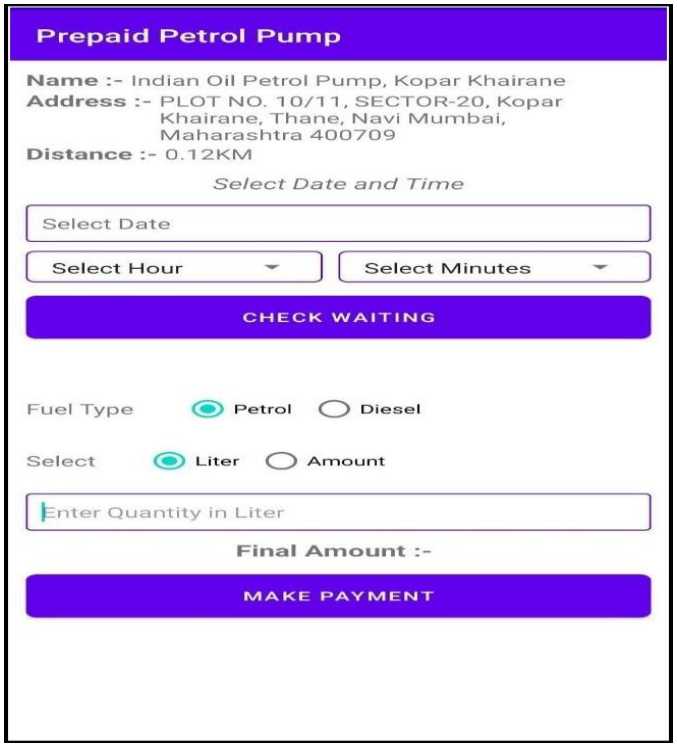

FIGURE VI

Following payment processing, the application will display a payment window where the user must input the card number, card name, and any other payment requirements.

FIGURE VII

Following payment, the customer will get an RUC (Random Unique Code) on their registered cellphone number. To obtain the allotted quantity of fuel, the user must enter this code.

(c) IOT Model

The user must input the cellphone number used to make the booking as well as the code obtained after the booking. All of the primary operations are performed by the ATMEGA 328 Microcontroller. The credentials entered will be sent to Node MCU, which will establish a connection with the server and confirm the input credentials. The server will send a response to the Node MCU, which will then be sent to the ATMEGA 328 microcontroller. The ATMEGA 328 will do the needed job based on the response.

FIGURE VIII

The user must input the generated code at the gas station. When the user inputs the code, the hardware device will contact an internet server and obtain the amount of fuel chosen by the user. Following that, the pump will discharge the specified amount of fuel for that user. The flow sensor will be used to compute the amount of petrol to be dispensed, and relays will be utilized to start and stop the pump.

The countdown will be displayed on the display, and when the countdown is complete, the pump will be deactivated.

4. ADVANTAGES OF PROPUSED SYSTEM

This solution will allow the petrol pump to function indefinitely without human intervention. The monetary function of the system will be handled by a centralized server with a database of the customer's details such as name, random code, and so on. The programme brings to reality the concept of a cashless India. This process can be automated in the sense that the consumer pays money online through a portal, following which the system creates a random code and sends it to the client. Smart petrol pumps are automated petrol machines that address all of the faults of the current system. A self-contained smart fuel pump has a manual interface. The smart gasoline machine recognizes the quantity entered by the user using a unique algorithm.

5. CONCLUSION

This project is intended for security systems that only trusted authorities have access to. The appropriate amount is computed and debited from his gas card. The electrical pump is then activated based on the quantity input, fills the tank, and then shuts off automatically. Our electronic system worked as it should. We were able to carry out all of the functions outlined in our proposal. The most difficult challenge with this project was integrating the microcontroller with the hardware components. We believe that this electrical system is extremely marketable owing to its ease of use, low power consumption, and great reliability. This project allows you to create a secure system. The user will provide their cellphone number and password to access the online platform. After logging in, he will enter the amount of fuel in liters, which will be subtracted automatically, and he will be given a secret code. He must input that code at the petrol pump, after which the hardware unit will contact an internet server to obtain the amount for the petrol pump for that user and release that quantity of petrol for that user. Each user will have their own private key. The flow sensor will be used to compute the amount of petrol to be dispensed, and relays will be utilized to start and stop the pump.

6. FUTURE SCOPE

Over the years, an unmanned fuel station was necessary to meet the needs of consumers across a vast region. The notion of an unmanned petrol station is not restricted to gas stations, but it may also be applied to the availability of food grades over a wide region. The usage of plastic money can protect humans from robbery, fraud, and other undesired incidents. The project's major goal is to minimize waiting time and give a more quick way to purchase gas at a petrol station. The suggested solution has been found to be incredibly helpful since it gives a safe and cashless digital system, which prevents fuel fts in the latest digital India idea.

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