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Smart Automated IOT Based E-Petrol Pump

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ABSTRACT: In this project we are going to built automated petrol pumps systems for remote areas. With this smart petrol pumps there were no need to put physical person for distribution of petrol. This petrol pumps works with the IoT connectivity so that owner of Petrol pump will have overall control of this petrol station. When user needs fill the petrol in his bike firstly he checks for pricing online in that specific portal designed for this petrol station. Then he will select the nearby stations and pay for petrol amount after that he needs to go there for filling purpose. In the console of pump, he needs to show the RFID card in this petrol pump console. After that pump motor starts for appropriate time and user will get the petrol.

KEYWORDS: RFID Tags, IOT, Petrol pumps, motors, LED, Arduino nano, LCD Display.

I. INTRODUCTION

Based on RFID technology and system automation technology we aim to electronically upgrade the traditional. The LCD display unit will show the values that are entered through keypad which will help the user to confirm electrical pump operation display unit and the keypad unit. The microcontroller unit controls the measuring by operating the pump for precise amount fuel stations. Petrol pumps nowadays generally have a microcontroller unit which controls the operation of time but still we need worker to enter the amount and collect money. Our proposed system is fully automated so that there is no manpower required to maintain the pump. Ease of transaction, transparency and safety is assured to the users too. Our aim is to reduce the working manpower and to upgrade the current fuel stations to a whole new level using technologies. The RFID cards will be given to the customers, now the whole process of fuel dispensing is done by the user itself with the help of automated system for refueling.

Existing System

In the existing system of all the petrol pump with our technology can be possible to operate all the time without help of manpower. When using RFID prepaid cards it has money limit and should be recharged again and again.

Disadvantages:

In emergency situations if he forget to recharge prepaid cards he is unable to buy petrol from petrol stations.

Proposed System:

First of all the petrol pump with our technology can be possible to operate all the time without help of manpower, In this project there will be a centralized server having the database of the customer like Customer Name, Card No, After paying the cash the balance can be increased and depending upon the use of the card for purchase of petrol the balance will be deducted.

When RFID card or tag comes in the range of RFID reader, the RFID reader reads the ID number of the RFID card and sends to the Arduino Mega 2560 microcontroller. Where we are already stored the ID numbers of the RFID cards in the microcontroller.

The microcontroller verifies whether this RFID card is authorized or not. If RFID card is authorized than microcontroller displays RFID card is authorized on the LCD screen, otherwise it displays RFID card is unauthorized



and initiates the buzzer. · If RFID card is authorized than microcontroller gives the access to the customer to enter the amount of the petrol using keypad and it is displayed on the LCD screen.

Advantages:

- It is useful to bike and cars.
- It is very useful to night riders.
- It reduces man power and give accurate data.

II. RELATED WORK

Inference on RFID with IOT:

This paper emphasis on designing a system which can spontaneously dispense the fuel and deduct the amount from prepaid RFID card. Here, all users will have their own RFID cards which are recharged by prepaid amounts. The dispenser in the fuel station is installed with RFID reader which reads the RFID card and displays the available balance on LCD display unit. The user will enter the desired amount of fuel using the keypad, the system will calculate the time of operation for the electrical fuel pump and initiates the operation of fuel dispensing. The system will automatically shuts down the pump after reaching the user's desired value. It is combined with raspberry pi module which sends notification to the user through mobile application. Added to that, this system has fire sensor to detect fire accidents and purity sensor to check the purity of the fuel. Hence this work will make the petrol bunk management system with no boundaries and reduced manpower.

Inference on Petrol Bunk Management:

In class rooms or in offices we can see lot of energy is wasted because the people are switching on the Fans and lights and leaving them switch on. In our project we are implementing novel system to save the power loss. We are allotting a campus card to every student and whenever they entered into class we are going to read their number and count is going to increase and at the same time whenever they are leaving the class room the final count is going to reduce. In addition to the count we are inserting sensors in the class room to detect where the person is sitting. When the count is valid then we are switching on light and fan at particular position where the person is sitting and we are going the save power by switching off the remaining electrical appliances. To detect the person we are going the place the IR based trans-receivers. They are going to detect the where person is sitting. Since we already know how many people are there in the room and we also know where they seated and it is very easy that where we have switch on the fan and light's. If all the persons leave the class room then we can switch off all the electrical appliances in the class room. With the help of this system large amount of energy can be saved.

Inference on Automatic Fuel Dispenser:

Petrol pumps are operated manually making fuel dispensing and filling, a time-consuming procedure. This we actualized automated petroleum pump by utilizing GSM and RFID. This framework can enhance the filling procedure so as to keep it simpler, solid and secure. Here non-permitted users and clients with traffic violation records would not be provided with fuel. In this framework, all users have a specific card called petro-card which can be energized by a few focuses. The petrol station is outfitted with a smart card reader which detects the amount in the card along with all the security details and will show it on the LCD. The designated amount of fuel will be dispensed according to the amount entered.

III.METHODOLOGY

Block Diagram:

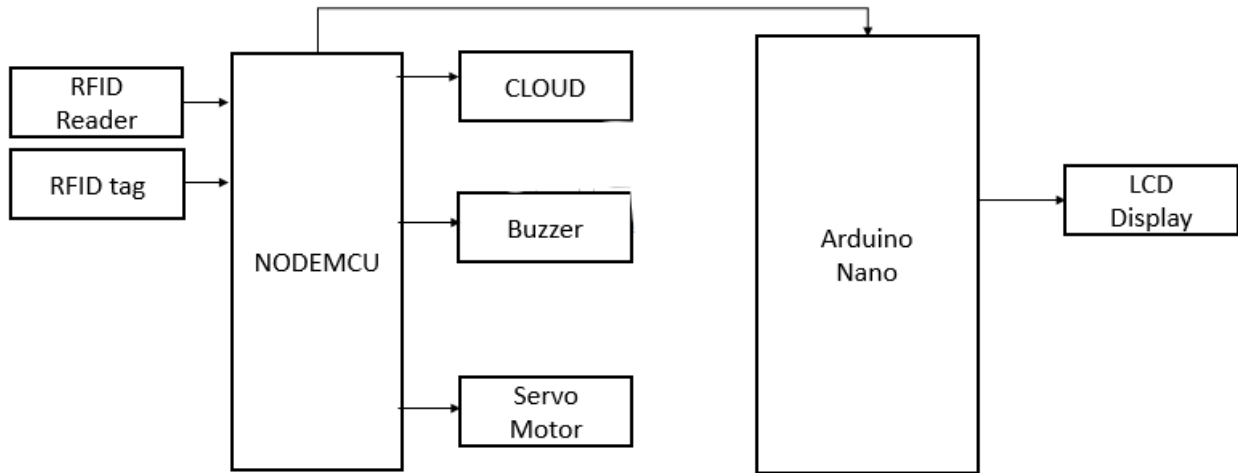


Figure no .1 block diagram of automatic e-petrol pump

First the user needs to go to petrol console website to fill the amount of petrol he needs which will be stored in cloud storage. After that the user needs to show the RFID tag in the circuit where the RFID reader reads the data of tag and sends to NODEMCU and gives buzzer sound that it readed the data of tag and checks in cloud storage. After checking from cloud it verifies the data and send signal to Arduino and servo motors. The Arduino nano displays the data using LCD Display and servo motor moves to object. With the help of IoT Concept the kit is connected to Mobile through an app via Node MCU.

IV. EXPERIMENTAL RESULTS

Hardware Output:

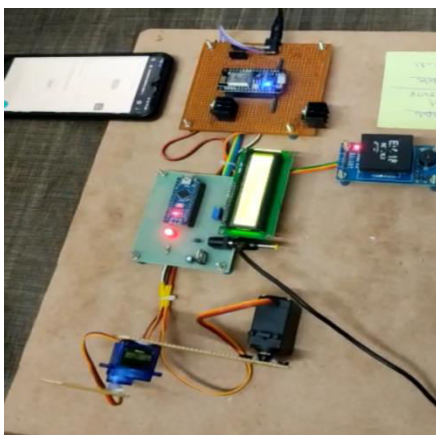


Figure no.2 output of automatic e-petrol pump

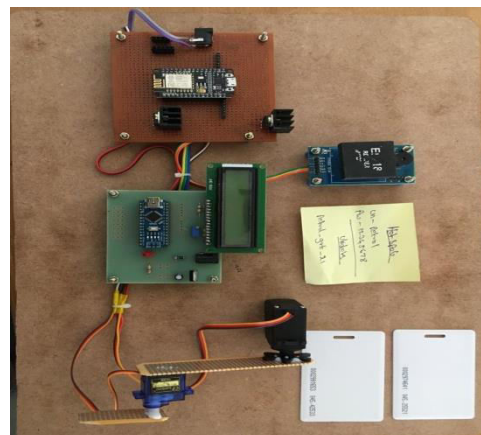


Figure no.3 hardware picture of automatic e-petrol pump

Screenshots of Mobile:

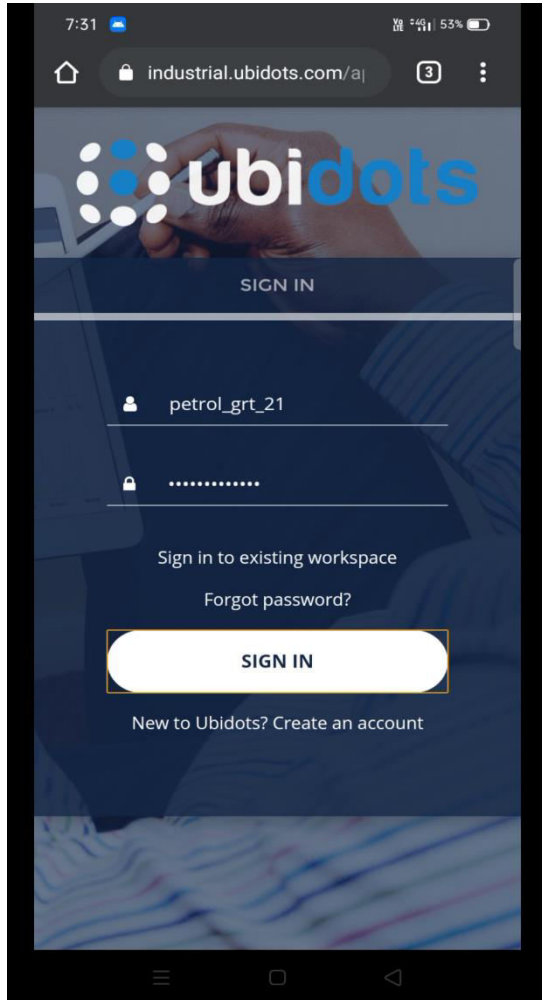


Figure no.4 login screenshot in petrol console

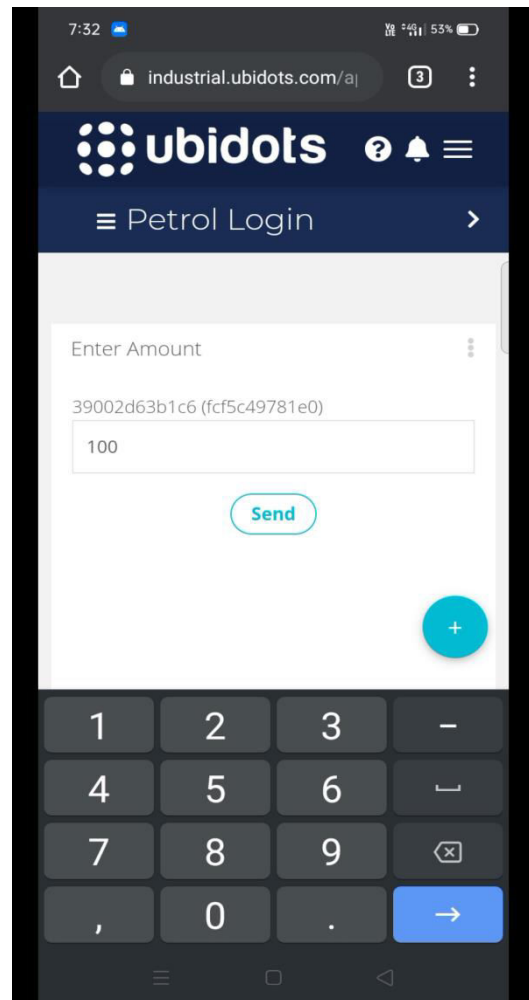


Figure no.5 amount entered in console to send

V. CONCLUSION

This system is majorly used in organization which has the very large number of vehicles, when a driver wants to refill his vehicle with petrol he has to get permission from the higher official like transport officer or anyone else, with the help of this system the driver can't cheat the organization in the name of the petrol. In this system the officer has to load the amount in the RFID using IOT, so the driver can refill his vehicle only for the specific amount and he can't refill with the same RFID for the second time.

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