Automation Petrol Bunk Management using Postpaid Cards

L.Sujihelen, C.Senthilsingh, M.PavithraJyothi

Abstract: This paper shows the improvisation of manually operated petrol bunks, as of this process the automated petrol bunks using cloud communications and Arduino along with RFID reader is proposed. Every step is made user friendly, where computerized RFID reader is installed at the bunk and postpaid cards are issued to every person along with vehicle registration certificate. It is that when the user approaches the petrol bunk and swipes the card at the RFID reader, it shows respective user details. Then, after verifying the details and password is entered just to verify the user and then the required amount of fuel is entered, then the relay sensor gets activated and fuel gets released. When the quantity assigned is filled, the filling gets stopped automatically, after this process the message of transaction details is automatically sent to registered mobile number of the user.

Keywords: Arduino, python, RFID, cloud communications, Arduino.

I. INTRODUCTION

Now-a-days petroleum products made an impact by performing a very important role in this world[1]. The cost of demand is very high. The day-to-day analysis describes the demand of fuel kept increasing but no other alternatives have been found. This is a step taken that has been initiated to control the consumption of fuel as well as to decrease the cost of demand[7]. In exception when it's get implemented, it somehow helps in controlling the traffic and pollution as well rarely but surely. Automation of petrol bunk manageable system is a project based on micro controller which controls the entire assembly system i.e., smart card, relay, and motor. The main attraction of this project is that it eliminates human interaction and avoids matters of black commerce once there's no man. In this, Arduino act as a master device while smart card acts as slave device[6]. On completion of transaction, when the filling gets completed i.e., the fuel is filled on a particular amount of requirement as per the client and at the very end of the transaction the quantity of fuel filled is registered and getsadded with the old transaction amount and billing is made for the scheduled time for payment, transaction cannot complete and respective message is cannot complete. Every time fuel gets dispensed, a bill is scheduled to be generated with the details of the particulars which has been used, and will be added to the records of billing and the bill will be generated at the end of scheduled time for payment and the bill be sent as an SMS/email to the concerned address. In this case, Cloud communication playing a vital role in sending notification to the user or client. In this manner several concepts are projected to get automated gasoline bunk.

Revised Manuscript Received on November 05, 2019.

L.Sujihelen, Department of C.S.E, School of Computing, Sathyabama Institute of Science and Technology

C.Senthilsingh, Department of E.C.E, Shadan Women’s College of Engineering, Hyderabad

M.PavithraJyothi, Department of E.C.E, Shadan Women’s College of Engineering, Hyderabad

II. RELATEDWORK

Here we are making a move in saving fuel and time being consumed, it is a procedure of E-pay and automation of petrol bunks. The Ministry of Petroleum and Natural gas made an initiative in this process, under which some of the petroleum and oil corporation limited sectors has been instructed to automate the petrol pumps[8]. It was not such a easy procedure, so made a move in prepaid method, that is there will be RFID cards has been issued to the users, they have to recharge these smart-cards they can use the cards after recharging and when the balance or credit gets cleared, they have to recharge again this was the procedure that was being followed in the automated petrol bunks at present. In our process it is that to introduce postpaid procedure, that well set some limit for fuel relay, then different limits set for different vehicles, suppose two wheeler, four wheeler and government vehicles and others tours and travels. Here the process is that can use the fuel till it reaches limit without any other extra charges. But the limit may get exceeded, and then there will notification sent through gmail/SMS and it notifies that it will be charged additional percentage of cost as per the count of transactions after the limit[9]. RFID cards are almost smart cards, they are used in so many places for example, ATM cards, IT sector ID cards, etc[10]. These cards are so portable so that they can be held in the wallets. These cards work on radio frequency, and they hold the data that are stored in them. In previous works ATM cards were the case which was referred, they have those account details of the client that are stored in the cards and they can be accessed only with pin details[2]. Here also the same case has been undertaken, the details of the user are filled with encryption, and when the card is used, the details which are encrypted will be decrypted with the pin details for the temporary usage. Arduino is used as the heart of the whole module of Automation process. Hardware used id ardino, RFID [3], level sensor, smoke sensor, keyboard, LCD display. Software used is arduino C, Arduino IDE along with python[11][12]. The above mentioned concepts are the related work of the project which is undertaken, so it is that we have a postpaid procedure, and it is that we save fuel and other illegal business enrichment's. The main aim is to style a system that is capable of mechanically deducting the quantity of gas distributed from usercard supported RFID technology. Liquid dispensing systems are quite usual found in our existence in several places like government offices, government Bus stands, railway stations and gas pumps. Here we are going to present modern era petrol filling system which is meant to be operated with prepaid or postpaid card using RFID technology. The project the main aim is in planning apsidcard forgasbunksystem and additionally gas dispense system victimization RF ID technology.
In current days the gas stations are operated manually. These gas pumps are time intense and need a lot of man power. To place gas stations in distant space is extremely pricey to produce glorious facility to the shoppers. All these kind of problems can be sorted with such a kind of unmanned fuel filling stations.

Today most gasoline pumps have a micro-controller to manage the electrical pump, drive the show, live the amount and consequently put off the electrical pump. But still someone is needed to gather the money. Our project is meant to eliminate this human interaction in order that there's no want of employees to fill the gasoline. Here the system explains about adding credits to smart card, this process is called as recharging. The gasoline pump is provided with a wise card reader that reads the number within the card and can show it on the liquid crystal display. The electrical pump acts as a sensor activated gadget which fills and stops automatically. In current days fuel stations are operated manually. These fuel pumps square measure long and need a lot of force. To place fuel stations in distant space it terribly expensive to supply wonderful facility to the customers of this downside are made out by the utilization of unmanned gasoline pump which needs less time to work and it's effective and may be put in anyplace the client self- going to avail the services the payment is finished by electronic clearing system. The gentle and respective use of microcontroller and GSM technology provides a complete security and automation in the distribution of fuel[4].

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, detectors 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[5]. In existing system most gasoline pumps have a dominant unit to perform the tasks like managing the electrical pump, drive the show, live the flow shut down the electrical pump. But still a person is required to collect the money and there are possibilities of human error.

### III. PROPOSED SYSTEM

In the proposed system, the consumer will have the postpaid card with an unique number which when he swipes on RFID reader, the signal will be sent to the MIC. So it checks the number whether it is correct or not and display the information like balance amount. The keyboard is employed to enter the number of fuel. In microcontroller, there will be a time for amount of fuel going to be released will be registered in advance. When the desired quantity is entered on the keypad, microcontroller which is installed to activate the relay driver activates the relay driver for scheduled period of time. When the user enters a value it should not exceed the limit. When the balance is not available the alarm is activated. The driver circuit is employed to show ON, shut down the relays. Relay output is directly connected to petrol pump. When the relay gets activated, automatically fuel will be released. Once this is done, the billing details of transaction will be sent to the user's mobile using the GSM technology shown in Fig.1.

![Fig.1 Overview of Proposed System](image-url)
Arduino is an open-source based electronic platform based on use-at-ease software and hardware. Arduino boards are capable to read inputs - a finger on a button for power on and off, light on a sensor for level sensor, or a Twitter message and turn it into an output - activating a motor, the LED turning on indicates there is something is being published something online.

MCU (micro-controller) on the board is to perform those type of actions with Arduino. Arduino programming language (based on Wiring), and the Arduino Software (IDE) may be somewhat helpful, based on Processing shown in Fig. 2.

IR sensor is applied to detect objects and then send the related information is goes to the controller. That controller is done specific task. Smoke sensor is applicable to detect the smoke in air i.e., dangerous gasses or poisonous gasses.

Flame sensor is established to identify the fire in the surrounding areas. The flame sensor is a rather simple device located at the burner assembly. The reason of the flame sensor is to confirm an alert to the system that whenever the gas valve is open, or if a fire is catching. The radio frequency identification reader (RFID reader) is a device applied to consume information from Radio Frequency Identification tag, which is applied to track individual-to-individual objects. Radio waves are to transfer knowledge from the tag to a reader. RFID which resembles bar-code technology. Cloud communications is used to send information to the authorized persons.

LCD is used to display the information, i.e., displaying datum that has been requested to be showed. Keypad is the device used for input handling, it is actually used to enter pass-code and quantity of fuel required. Relay sensor is the sensor that is used to release and lock the fuel and it is also called as open close system.

This system may be a heap of automotive and is ready to form the human life easier. In this work the RFID system dispenses the correct quantity of fuel. Systems will reduce the manpower, in case, if unauthorized card is detected, the security system will reject the card. The systems that have been initiated will allow the payment of only fuel that has been filled and most certainly there will be prevention of unauthorized sale of fuel.

IV. RESULTS AND DISCUSSION

When the RFID tag is scratched the limit is checked. If the limit exceeds, then the security system will automatically decline the card. If the limit is there then it will ask the amount is shown in Fig. 3, Fig. 4 and Fig. 5.
V. CONCLUSION

The smart petrol bunk is to monitor the limit of the consumption of the petrol. This process required sensors, motors of smaller size and required very less space. The approach sense using high wavelength light and act immediately when the limit crosses the threshold. The proposed system works efficiently and provides an automatic device to save humanlife.

REFERENCES


AUTHORS PROFILE

L.Sujihelen received the M.E. degree in Computer Science and Engineering. Completed Ph.D., in Sathyabama University, Chennai, India. Her research interest includes Image Processing, Wireless Sensor Networks, IoT.

C.Senthilsingh received the M.E. Degree in VLSI. Completed his Ph.D., in Anna University. Currently working as a Professor in Adhi College of Engineering. His area of interest includes Image Processing, WSN, IoT.

M.Pavithra Jothy received the M.E. and Ph.D Degree. Currently working as a Associate Professor in shadan College of Women’s Engineering & Technology. Her research interest includes Image processing, Wireless Sensor Networks, IoT.