

Automised Fuel Pump using Global System for Mobile Technique and user Security

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Abstract---Petroleum products are valuable and rare creations of nature. The proper use and distribution is important to survive. Our system approaches towards security of petroleum products distribution such as petrol, diesel etc. Direct Personal Computer interface for the system which facilitates the record keeping of the distributed fuel using Structure Query Language. The security code in Automatic Teller Machine cards provided to get read by the swiper machine and transmission of it to the control unit will help company to create the proper database. Also the distribution of the fuel is not possible until control unit provides the proper command to the valve in tanker unit. In short, the project we have developed is the basic attachment of all above devices; which will use to provide security to the fuel distribution and helps to keep data of the distributed fuel. The advancement of the project to large scale can help financially to the industry. The main purpose of our project satisfies the needs related to secure distribution of the industrial products. In current days fuel stations are operated manually. These fuel pumps are time consuming and require more manpower. To place fuel stations in distant area it very costly. To provide good facility to the consumers all these problem are sorted out by the use of unmanned petrol pump which requires less time to operate and it is effective and can be installed anywhere. The customer him-self go to avail the services, The payment is done by electronic clearing system. The simple and proper use of microcontroller and Global System for Mobile technology provides a total security and atomization in distribution of fuel. It has easy operated swiper system. In our system, the user swaps his card and enters his password to create authentication, the distribution of the fuel is not possible until it gets verified by the database. In short we provide secure system for fuel distribution. The advancement of this project can help industry financially.

Keywords--- GSM, SWIPER, SQL, ATM CARDS.

i. INTRODUCTION

The 21st century is aptly known as the internet age because of the increasing use of internet in the day to day activities. Examples of these applications include online banking and brokerage, cash management, tax filling, computerized petrol pump, medical field. Nowadays the number of vehicles has increased and proportionally the need for fuels also rapidly growing. Since the need for fuel increases there arises a necessity of installing the petrol bunks frequently between areas. The Indian government had taken huge number of measures to solve this problem by increasing the number of petrol

bunks. Even though there are more petrol bunks we require more efficiency, less time consuming and no man power when compared to the other countries. To overcome these problems we are designing an unmanned petrol bunk using swiper and gsm. This system can be implemented in every petrol bunks and need of manpower will be eliminated.

Existing System:

Today 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 electric pump. But still a person is required to collect the money and there are possibilities of human errors.

Proposed System:

This project aims at designing a system to eliminate this human interaction so that there is no need of workers to fill the petrol. In this system all drivers have a ATM card. At the Petrol Pump the driver swaps the card, the petrol pump is equipped with a swiper module that reads the amount in his bank account. The driver then enters the quantity of petrol that has to be filled. The corresponding amount is calculated & deducted from the bank account. The electrical pump is then turned ON according to the entered amount.

The system will consist of three units:

Two units will be placed at petrol station which will take care of customers needs & also it will continuously monitor the fuel level, temperature of fuel & any accidental situation that may happen at the petrol station. The third is the data base regarding customer's ids, passwords & will also take care of the account balance. The GSM module will act as a link between owner & petroleum industry. The software part of this project will help to keep record of all the things in short we are providing total security while distributing the fuel.

ii. AIM OF THE PROJECT

Various petroleum industries are becoming very careful about manufacturing & distribution of their products. New technology addresses these requirements, providing the foundation to allow cooperative interaction to be developed. Thus the unmanned petrol pump using gsm

is an example of new technology which will be providing the base for security of product distribution & data keeping using database. As the project is PC controlled, the project will be connected to one of the PC ports & programming languages like SQL & embedded C.

iii. PURPOSE

The purpose of this planning is to establish the scope of the project in terms of the major functions, performance issues and technical constraints. The plan will provide an estimate of the size of the product, the effort required and the duration. This plan will also consider the risk encountered during the project and the strategies for dealing with them. The plan will also discuss the detailed schedule of various subtasks within the project and also the resources needed to accomplish them.

iv. BRIEF HISTORY

In starting days the petrol pumps were distributing petrol using manpower to respective customer vehicles and was totally depends on man's loyalty who was doing this job. Nowadays industries are becoming very careful about these things and trying to centrally control all the production and distribution of products. For the secure distribution of products, industries trying to develop the new advance security system to achieve their goals. However today petrol distribution system is has some disadvantages regarding with stealing of petrol, unauthorized petrol selling & wastage of manpower etc.

v. LITERATURE REVIEW

According to [1], the customer who wants to use unmanned petrol pump will need to register his/herself to corresponding petroleum industry with an initial amount to recharge their balance. Customer demanding fuel from petroleum industry will first message to the GSM no. of nearby petrol pump. The password will be provided to the user via his mobile phone by the petrol pump GSM customer has to enter this password on the LCD provided by the fuel station which will help the petrol company to create authentication for user. This system suffer at remote area where there is problem with GSM range.

According to [2], the customer demanding the fuel from the petroleum industry will use his RFID card and mobile phone to convey the requirement. Company will send the fuel via tanker to the petrol pump. Again this system suffer at remote area where there is problem with GSM range and also the attack from hackers would create problem.

According to [3], shell is the only energy company to offer a global fuel card/fleet card. With it comes a range of global services and all the expertise of over years' fuel card experience. This includes a dedicated international account team to look after you and centralized reporting that gives you a uniquely clear picture of your entire business on the road. But There was a discussion on Shell pump charges twice for the same bill within Street Experiences, part of the Street and Travel Experiences category. But having a

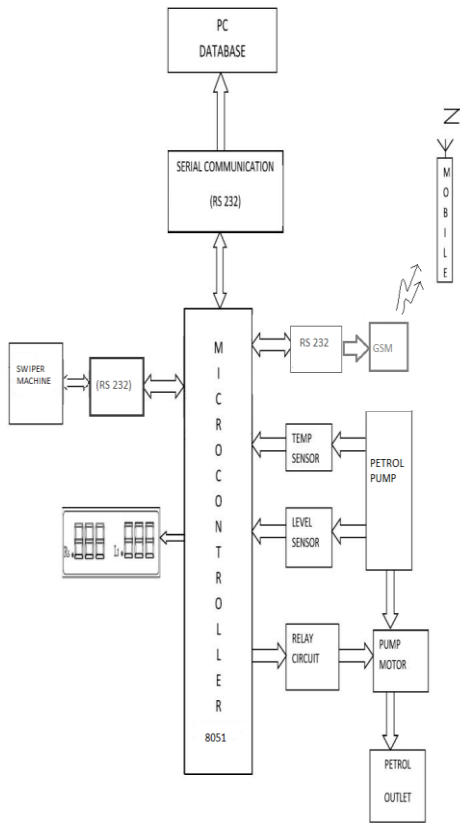
independent fuel cards and getting registered to specific petroleum industry was difficult.

vi. THEORITICAL DETAILS & ANALYSIS

In our project customer who wants to use unmanned petrol pump will need to register him/her to corresponding petroleum industry. Customer demanding fuel from petroleum industry will first swipe his ATM card. Now, our system comes into existence in three parts. The first part is the customer part, in this part customer will enter his password for authentication & then the corresponding amount of petrol will be available to fill in his car. The second part is the data base, this will contain the customer's used id their banks accounts summary (balance). This message will be received at petrol pump GSM which in turn sends it to the data base in control cabin via microcontroller.

One more part which will be handled with the help of the data base is the automatic payment reduction system. Here whenever user will enter a password with the help of keypad of the swiper machine & if he is an authenticated user then the corresponding coupon say _1 will be used then after microcontroller will send a +12V supply to a motor which is connected to a petrol tank with the help of relay RS232 loop circuit. For a particular time corresponding to the amount of petrol requested, microcontroller will provide the supply to the motor & then it will stop after the filling of petrol in customer's vehicle the process will get over & the status of the corresponding coupon which has been used will become _0' & also data base program is designed in such a way that it will update the account balance of the corresponding user. The next & the most important part is sensor part. In this part we are more focused on the safety & preciseness in the automation of the system. It includes three sensors, first one is the temperature sensor it will monitor the temperature of the petrol in the tank & if it exceeds a critical temperature due to any surrounding circumstances it will indicate the owner of the petrol pump before any hazardous situation happens. Second sensor is the IR sensor, it is mainly used for the purpose for avoiding the situation of the traffic at the petrol pump it will increase the count as a vehicle will arrive at the petrol pump & it will keep on incrementing the count, so in this way it will notify the owner, if at all some vehicle gets stuck in the middle of the process & rest of the vehicles stay in a queue so this IR sensor will increment the count & after exceeding the limit it will notify it to the owner via GSM message. The next sensor is the level sensor which will continuously monitor the level of the petrol in the tank, if at all the petrol level reaches to level one, then it will send the message to the petrol owner about the insufficient amount of petrol in the tank and the owner of the petrol pump refills the petrol tank. So in this way it will help the owner to know about the current situation at the petrol station to via GSM message.

BLOCK DIAGRAM



vii. INTERFACING

Basic requirements for interfacing:

1. Power supply 12V, 5V.
2. GSM module with activated SIM card.
3. DB9 connector for GSM, Swiper & PC connection with our system.
4. Ultrasonic for level sensing.
5. LM 35 temperature sensor.
6. IR sensor module.
7. SQL Database and embedded C languages.
8. A 4*4 keypad Swiper machine.
9. Relay switching circuit
10. DC Motor of 12V.
11. Program burning circuitry
12. Real term software and SQL Server management studio.

A. ADVANTAGES AND LIMITATIONS

I. Advantages

1. Easy to handle for customer since ATM cards are already an existing system and remaining work takes place automatically.
2. Eliminates the possibilities of human errors.
3. GSM system used in our project provides quick data communication over long distance.

4. SQL Server Database helps us to provide the maximum security to authenticate the user and it's on long term basis.
5. It requires very less power supply i.e. from 5V to 12V only which is easily available.
6. Also as it provides the central control on petrol distribution, thus there is no question of stealing or to change the record of distributed fuel.
7. Sensing part helps owner to keep an eye over petrol pump and be alert.

II. Limitations

1. Overall system design is quite complex.
2. Complexity may arise in case of mechanical faults.
3. Problem with GSM range can fail in updating the owner regularly.

Abbreviations

- ATM: Automatic Teller Machine.
- GSM: Global System for Mobile Technology
- SQL: Sequential Query Language
- RFID: Radio Frequency Identification
- LCD: Liquid Crystal Display
- IR: Infra Red(sensor)

B. APPLICATIONS AND FUTURE SCOPE

1. In petroleum products distribution our system looks for the control on product thefts which is the most serious problem for the manufacturing industries and reduction in manpower required.
2. It is also possible to implement the same system for milk processing industries while distributing the milk and its products to the market.
3. In day to day life we can see that water distribution in summer is also one of the problems in front of India. So it is possible to keep control on water distribution in particular area.
4. The rationing products like vegetable oil as well as kerosene and its sub products may be securely distributed to the customers using the same system we proposed.
5. Also it is possible to keep record of the distributed products in market which is commercially most important for industries.

C. CONCLUSION

In the world of electronics it is important to develop the new technology to make secure the distribution of fuel and keeping record of the same fuel with authorization of user. Our project is one idea which can change the face of today's manual system of distribution and data keeping. The total central access of all these activities provide the correct approach toward security and economical need of the industries since industry itself can control distribution as well as keep the record of the same fuel from thousands of miles seated in office. In short, this project probably can be implemented for the use of other tasks other than petrol

distribution, on large scale to achieve various goals of industries and hence is an flexible system.

D. REFERENCES

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