Vehicle Fuel Monitoring and Credit Management Using Web Based Application

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Abstract - *The Pump owner must manually complete all records and actions at fuel stations under the current system. In the existing system, a token is given to the truck driver by the truck owner which has to be shown to the petrol pump attendant, this token can be duplicated. Anyone with the duplicated token will take fuel under the name of the transport company owner, this can lead to fraud. Or the driver can ask for more than the specified amount, thus illegal transactions may take place.*

Today, automation of transactions held on petrol pumps is very necessary. The automation helps in minimizing the frauds. The main aim of this project is to provide 24 x 7 automated service that runs all the operations smoothly. The system maintains all the transaction data securely. As the system is automated and maintains data, it will minimize frauds.

The project deals with the development of the computerized system for maintaining the regular records and activities in the petrol pump are manipulated systematically. The quantity of various fuels, such as petrol and diesel that are imported in a given month can be added by the system administrator using this software, as well as information about fuel sales on a daily, monthly, and annual basis.

Admin can also manage the credit amount given to various transport companies.

Key Words: Petrol Pump Credit Management System, Fuel station, Information Technology, Control System, Management.

1. INTRODUCTION

Because the current method is manual, keeping track of transactions is challenging. Additionally, data editing can result in scams or illegal transactions. A token, which can be copied, is now issued to the truck driver by the owner of the vehicle and must be presented to the attendant at the gas station. Anyone with a duplicate token will be able to purchase fuel in the owner of the transport company's name, which could result in fraud. Alternatively, the driver can demand more than the agreed-upon sum, which could lead to illicit transactions.

In the existing system all the records and activities at petrol stations are done by the manager manually. The project deals with the development of the computerized system for maintaining the regular records and activities in the petrol pump are manipulated systematically. By this software system Pump Owner can add the quantity of different fuels like petrol, diesel which is imported in that particular month and sales detail of the petrol based on daily, monthly, yearly. Pump Owner can also manage the credit amount given to various transport companies.

1.1 Study of Existing System:

The manual fuel pump management system that is now in use is slow, inaccurate, time-consuming, and poorly structured. All report work is done manually in this system. Pump Owner must manually review each transaction. Understanding the system's current state for the developer is a crucial component of the system analysis. All records are kept in the register under the current system, which needs to be changed to an automated one.

All the Problems occurred in Existing System are,

- Lack of privacy and accuracy. Accuracy is not guaranteed in the system.

- Lack of transparency between the owner and customer.

- Risk is manipulation of data without Pump Owner permission.

- Lack of Co-ordination between Owner and Attendant.

2. LITERATURE SURVEY

2.1 Paper Name: A Comprehensive Automation Petrol Bunk Management System Using RSA Algorithm.

Author Name: Kajal Jadhav, Kalyani Shinde, Vaishnavi Bodul, Prof. Pradip Shewale, Prof. Deepa Mahajan

Description:The administrator of this system may monitor the volume of fuels like petrol, diesel, and compressed natural gas (CNG) sold on any given day, week, or month. Additionally, the administrator may see which employee

sold how much petrol or diesel by using the sales module. Additionally, it may examine the quantity of fuel purchased overall, employee attendance, and the day's performance at the petrol station. The administrator of this system may monitor the volume of fuels like petrol, diesel, and compressed natural gas (CNG) sold on any given day, week, or month. Additionally, the administrator may see which employee sold how much petrol or diesel by using the sales module. Additionally, it may examine the amount of fuel purchased overall, employee attendance, and the day's performance at the petrol station.

2.2. Paper Name: Web Service Adaptation

Author Name: Guadalupe Ortiz, Alfonso García de Prado

Description: In this paper, they have motivated the need of adapting Web services in multiple scenarios and discussed how current approaches focus on the adaptation of the client-side implementation. They propose the adaptation to be done on the service-side, therefore saving client resources.

2.3. Paper Name: Vehicle Fuel Monitoring and Management using RFID authentication and Telematics Notification

Author Name: Md. Badiuzzaman Pranto, Md. Mahidur Rahman, Zunayeed-Bin-Zahir

Description: The system includes mobile application and automated fuel disposal pump with RFID technology which makes the system more efficient, secure and user friendly. It also keeps a record of data.

2.4. Paper Name: A New Automation Approach for Fuel Station Management System

Author Name: Ali Newaz Bahar, Nazrul Islam1, Shougat Hossain , Ruhul Amin Sujon

 Description: In this paper, they have developed an automated fuel management system that can maintain the account of the fuel stations. The results of this experiment print a receipt automatically after every transaction and can monitor the transactions from remote place via Internet. Additionally, this management system makes fuel stations faster and more efficient.

3. PROPOSED METHODOLOGY

3.1 SYSTEM ARCHITECTURE

The system's various components, such as registration, login, adding new customers, transactions, daily transactions involving petrol and diesel, etc., are illustrated in the figure below, System Architecture of Petrol Pump Credit Management System. When registering, a username and password are provided and are required to access the

login page or log in. The unique username and password are immediately saved in the database of the fuel system after a successful login.

The second part of it, Add New Customer, enables us to create new entries for clients who have made payments for certain amounts of petrol or diesel. Additionally, a drop-down list with all the details about a specific customer as well as daily in and out a consumer is there.
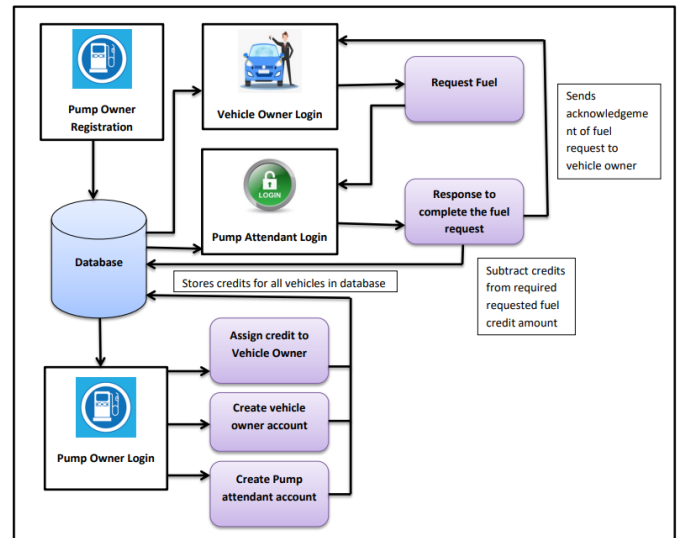

Figure 1: System Architecture of Petrol Pump Credit Management System.

All money transactions, including credit and debit transactions, are completed in the transaction area and are automatically stored and updated in the system's database.

3.2 PROPOSED SYSTEM

The database used by the Proposed System is MongoDB. As owner, you are able to monitor every transaction. Now, the proprietor of a fuel station may easily add or delete employees and customers.

The owner can analyse transactions, customer credit, sold fuel, etc. in this. Only the owner of the fuel station can update or modify the system's data since only authentic users have access to the owner account in the system. Owner can examine the amount of fuel sold from his monitor. The owner can also monitor the fuels that were sold over the course of a day or a month.

3.2.1 Project Modules: -

1. Admin: -Define Pump Owners –

(i) Admin will create account for pump owner.

(ii)Pump owner can only login

2. Pump Owner: -

(i) Define Pump Attendants- Only pump owner can create account for pump attendant.

(ii) Define Customer-Only pump owner can define customer.

(iii) Assign Credit to customer – Only pump owner can assign credit for vehicle owner and vehicle owner cannot made changes in credit due to which fraud rate will be reduced.

(iv) Renew Credit

3.Vehicle Owner:-

(i) Create Fuel fill request –Vehicle owner creates the fuel request for their vehicle and the price for the petrol for filling fuel each time is deducted from the credit amount.

4. Pump Attendant:-

(i) Complete fuel fill request – Pump attendant fills the fuel as per requested fuel from the vehicle owner and the amount will be deducted from credited amount.

3.3 ADVANTAGES OF PROPOSED SYSTEM

- To offer automated service around-the-clock.
- Complete all tasks without a hitch. To minimize frauds and securely retain transaction data.
- The computer will automatically do any manual sale calculations or money management tasks.
- The application's cloud storage capacity is substantial. The computer runs at an extremely high speed.
- Any problems we encounter are simple to fix.
- A database application can be successfully stored in the cloud. It is really simple to use and handle.
- It is simple to use: Therefore, handling this project won't cause too much distortion. Additionally, using this software does not need first studying it.
- Cost-effectiveness: Because no hardware equipment is needed, this project is incredibly affordable. This significantly lowers the cost.
- Simple to backup: This project's backup is a breeze to manage. Additionally, if a record is accidentally erased, it can be easily recovered.
- Data Security: The application's server limits unauthorized access to write, remove, and create actions. Access to read content is unrestricted.

4.RESULT ANALYSIS

The currently proposed system is more modern and automated than the currently used system. The project offers several characteristics that are simple to operate, such as a user-friendly system that is also cost-effective, backup-friendly, supported, and secure for data. The manual nature

of the system made it challenging for the administrator to maintain records in the register, a daily task that took a lot of time and effort. So, in order to work efficiently, we created a system to computerize all staff and fuel records at gas stations. Which meant that this system made it simpler for the administrator to keep a daily record. Figure 3 illustrates how the suggested approach is significantly superior than the current system.
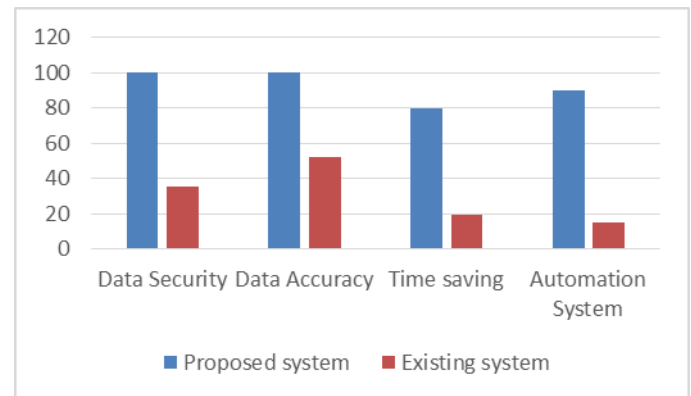
4.1 Comparison between existing system and proposed system

- The suggested system is user friendly, whereas the existing system was not.
- In comparison to the present method, the solution greatly simplifies and increases flexibility in overall project management.
- Unlike the current system, which is only available manually, the proposed system may be accessed anytime, anywhere online.
- There is zero chance of data mismanagement in the suggested system, while there is a high risk of data loss and security in the current system because anyone can simply change data without the knowledge of the administrator.
- It provides a high level of security using a variety of protocols, like https, which the outdated system cannot achieve because it is a manual system.

5. CONCLUSION

The current method requires attendants to manually complete all records and actions at the petrol station. The project focuses on the creation of a computerised system for maintaining regular records and manipulating activity at the petrol station. By using this online application, the owner can add credits for various bulk clients that are imported within a given month, as well as credits information for petrol based on a daily, monthly, or annual basis. The credit amount paid to various transport firms can also be managed by the pump owner. The pump owners' current method is vulnerable to fraud and illicit transactions; the suggested system will keep track of every transaction and improve communication between pump owners and customers.

6. FUTURE SCOPE

Given that it is an automated method for managing petrol pump credit, the system has a significant chance of advancement in the future. Profit and Loss Statement for the customer (petrol pump owner).

- Display of Balance Sheet, Data export in format (excel, pdf)
- Attendance of the attendant in Biometric form.
- Customer security deposit account management.
- Scanning of vehicle with photo integration/ RFID and QR code.

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