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Unified Gas Dispersal Management System

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Abstract –

The primary purpose of this project is to create a frontend that allows a governing authority to monitor the state of its distributors, address feedbacks and complaints, the distributors to monitor the state of refills requests their geographical location and customer data, and customers to book a new connection, a refill and to register complaints. The main aim is to provide a unified portal that is both simple enough to be used by people at all management levels as well as novice users and comprehensive enough to have all the information and tools necessary to provide on ground service and perform analytics. The functionality is extended through a robust backend that is both fast and stable to handle a large number of simultaneous connection requests and serve database queries instantly and concurrently to provide service and store information for further analytics and use.

Index Terms – Web Interface, Dispersal Management, Resource Distribution, MySQL, XAMPP.

1. Introduction

1.1 Problem definition

The project will involve the development of a user-friendly, secure, and efficient web portal that provides a centralized platform for all stakeholders in Gas Booking scene to interact with each other.

1.2 Relevance

Such a portal can help streamline the process of gas booking and delivery, making it more efficient and transparent. By providing a centralized platform for all stakeholders to interact with each other, it can reduce the need for manual intervention and improve the overall quality of service. Consumers can benefit from the convenience of booking a refill from anywhere, at any time, and making secure and easy payments for their gas refills. Distributors can benefit from the ability to manage their inventory, track the status of their orders, and monitor the distribution of gas cylinders. Administrators can benefit from the ability to gain insights into the gas distribution system, which can help them make data-driven decisions. Furthermore, a unified web portal can help reduce the chances of fraud and corruption by eliminating the need for middlemen. Overall, a unified web portal has the potential to revolutionize the gas distribution system in India by making it more efficient, transparent, and customer friendly.

1.2 Scope of the project

The web portal should provide a centralized platform for all stakeholders to interact with each other. It should allow consumers to book a refill from anywhere, at any time, and make secure and easy payments for their gas refills. It should also provide a platform for consumers to raise complaints and grievances, which can help improve the overall quality of service. Distributors can use the portal to manage their inventory, track the status of their orders, and monitor the distribution of gas cylinders. Administrators can use the portal to gain insights into the gas distribution system, which can help them make data-driven decisions. The web portal should be user-friendly, secure, and efficient. It should have a simple and intuitive interface that is easy to navigate. It should also have robust encryption and authentication mechanisms to protect sensitive data. It should be scalable, with the ability to handle large volumes of traffic and users. It should be customizable, with the ability to adapt to the changing AIT– 2023-24 6 needs of the gas distribution system. It should also have fast response times and minimal downtime.

2. LITERATURE SURVEY

2.1 Current Gas Booking System in India:

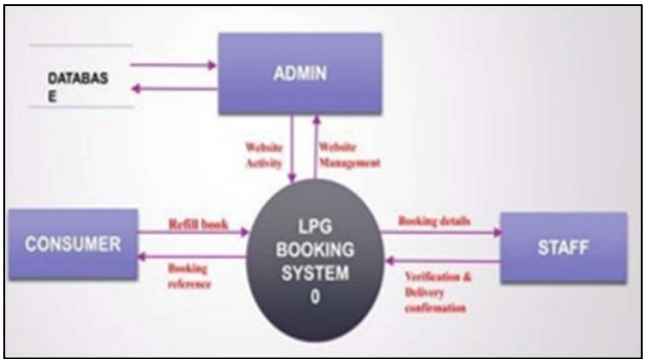
The current system of gas booking and refill in India involves either calling the LPG agency, visiting the gas agency, or booking the cylinder through their app or portal. Indane gas, owned and developed by state-owned Indian Oil Corporation, has introduced a new universal IVRS/SMS as well as a WhatsApp number to make the process more convenient. Customers can book their LPG refills through the UMANG (Unified Mobile App for New Governance) app or the Bharat Bill Pay System apps and platforms. Additionally, customers can book their refills and make payments through popular e-commerce apps such as Amazon and Paytm.

2.2 Limitation of existing system:

The current system of gas booking and refill in India has several limitations. Firstly, it can be time-consuming and may require manual intervention. Customers have to either call the LPG agency, visit the gas agency, or book the cylinder through their app or portal. Secondly, it can be inconvenient for customers who are busy working and cannot get their refill cylinders as they are not home to pay for them. Thirdly, it can be prone to fraud and corruption by middlemen. Fourthly, it can be difficult for administrators to monitor the distribution of gas cylinders and ensure that they are delivered on time. Finally, it can be challenging for consumers to raise complaints and grievances, which can lead to a poor quality of service.

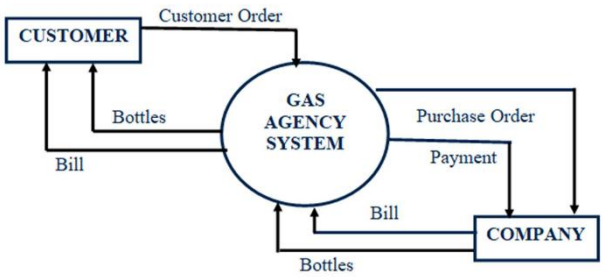
2.3 Need for a unified portal:

An online gas refill and booking system can eliminate the need for customers to visit gas offices or follow up with distributors, saving them time and effort. It can also provide a secure and easy payment method, which is especially useful for those who are busy working and cannot get their refill cylinders as AIT– 2023-24 8 they are not home to pay for them. Furthermore, a unified web portal for administrators, gas connection distributors, and consumers can provide a centralized platform for all stakeholders to interact with each other, reducing the need for manual intervention and improving the overall quality of service.



3. BLOCK DIAGRAM

3.1 FLOWCHART



3.2 Hardware and software tools used:

1. XAMPP
2. Apache Server
3. MySQL
4. Web Browser
5. VS Code
6. Text Editor
7. MySQL Module for XAMPP
8. Apache Module for XAMPP

4. METHODOLOGY

This full-stack web application which provides an easy interface for consumers, distributors as well as Administrators. By provided credentials, consumers can book new refill and distributor can manage the list of consumers and their orders. Administrators can manage the distributors and can also look at various complaint/feedbacks which are made by consumers.

5. EXPERIMENTATION

The creation and implementation of a unified web portal for administrators, gas connection distributors, and consumers is a long process, the methodology for the same can be divided into the following categories.:

5.1. Requirement Gathering

The first step is to gather the requirements for the web portal. This involves identifying the needs of all stakeholders, including administrators, gas connection distributors, and consumers.

5.2. Design

The next step is to design the web portal. This involves creating wireframes, mockups, and prototypes of the portal. The design should be user-friendly, secure, and efficient.

5.3. Development:

The third step is to develop the web portal. This involves writing code, integrating APIs, and testing the portal for bugs and errors.

5.4. Deployment

The fourth step is to deploy the web portal. This involves hosting the portal on a server and making it accessible to all stakeholders..

5.5. Maintenance:

The final step is to maintain the web portal. This involves fixing bugs, updating the portal with new features, and ensuring that it is secure and efficient.

6. IMPLEMENTATION

6.1. Writing the code for the implementation of the decided design

- The primary tool used for the design in the frontend was the bootstrap framework which is a CSS and Javascript framework.
- Vanilla CSS and Javascript were used in conjunction with HTML to give structure to the website.
- The server side scripting was done through PHP and the backend database was managed through MySQL
- To manage the modules, XAMPP control center was used.
- The project tree was managed and worked upon using Visual Studio Code.

6.2. Creating the database and managing it using PHPMyAdmin

- The consumer and distributor database was populated with entries from the sign up page.
- The consumers were allotted a distributor and their corresponding ID.
- The admin portal remained separate from the individual tables.
- The relation and interconnection can be viewed through the ER diagram attached below.

6.3. Intended Workflow of the system

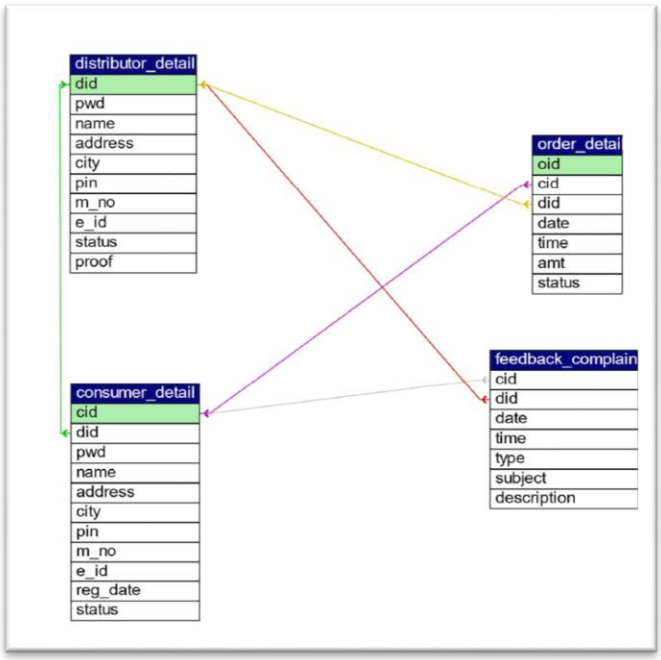
- The distributors get listed through sign up page and get allotted a Distributor ID.
- The individual customers list themselves through the customer sign up page.

- The customers then chose their distributors.
- From the their dashboard the consumers are able to book an order, track it and request for a refill.
- An urgency tag can be attached to the order at an extra cost to the MRP for faster processing of urgent orders.
- Once the order is placed, it goes to the Distributor.
- The distribution upon verifying the order details, approves the delivery upon which the order is then dispatched.
- Once the customer receives the order, the order is marked as fulfilled and the customer can now provide feedback or issue a complaint.
- The feedbacks and the complaints go the respective distributor as well as the admin who oversees the entire distribution statistics.
- The distributor can manage the list of consumers, and are themselves in turn managed by the admin.

6.3.1 Special features for a smoother operation

- If a customer has not placed an order for an extended period of time, he/she is automatically marked as deactive and subscription is suspended.
- If a distributor has not fulfilled his last 10 orders, he is prohibited from accepting new orders.
- The distributors can be delisted by the admin if multiple complaints are registered against them.
- The process of booking an order can be further automated using either of the following two methods
- Subscriptions based service – For institutions with a regular influx of customers like hotels and restaurants, orders can be automatically issued based on subscription tiers.
- Weight based tracking – For individual owners and businesses with fluctuating demands, the gas can be monitored with a load cell sensor and once the weight falls below a certain threshold, an sms can be sent to the distributor for a new order. This SMS can then be parsed and an database can be populated with a fresh order entry. The IoT device can then be reset once the cylinder is replaced.

6.3.2 ER Diagram Detailing the relation between the records in the backend database.



7. LIMITATION

Following are the limitations of the currently built portal-

1. The database is currently not normalized
2. Current implementation cannot handle simultaneous requests on a large scale
3. The site is susceptible to DDoS attacks
4. Currently not linked to an IVR system
5. Multilingual support is missing

8. CONCLUSION

In conclusion, the Online Gas Refill and Booking System has the scope to be a game changer in the field of management and unification. The benefits of such a system are numerous. Firstly, it eliminates the need for customers to visit gas offices or follow up with distributors, saving them time and effort. Secondly, it allows customers to book a refill from anywhere, at any time, making it more convenient. Thirdly, it provides a secure and easy payment method, which is especially useful for those who are busy working and cannot get their refill cylinders as they are not home to pay for them. Fourthly, it reduces the chances of fraud and corruption by eliminating the need for middlemen. Finally, it is an eco-friendly option as it reduces the need for paper receipts and other documentation. Overall, an online gas refill and booking system is a win-win for both customers and the environment. A unified web portal for administrators, gas connection distributors, and consumers can further streamline the process of gas booking and delivery. Such a portal can provide a centralized platform for all stakeholders to interact with each other, reducing the need for manual intervention. For example, administrators can use the portal to monitor the distribution of gas cylinders and ensure that they are delivered on time. Distributors can use the portal to manage their inventory and track the status of their orders. Consumers can use the portal to view their booking history, track the status of their orders, and provide feedback on the quality of service. By providing a common platform for all stakeholders, a unified web portal can help improve transparency, accountability, and efficiency in the gas distribution system. This can lead to a reduction in the number of complaints and grievances, and ultimately, a better experience for everyone involved.

9. FUTURE SCOPE

The future scope of a unified web portal for administrators, gas connection distributors, and consumers is vast. Such a portal can be used to provide realtime updates on the availability of gas cylinders, which can help reduce the waiting time for customers. It can also be used to provide information on the quality of gas being supplied, which can help customers make informed decisions. Additionally, the portal can be used to provide information on the latest government policies and regulations related to gas distribution, which can help distributors and consumers stay up-to-date with the latest developments. Furthermore, the portal can be used to provide a platform for consumers to raise complaints and grievances, which can help improve the overall quality of service. Finally, the portal can be used to provide analytics and insights on the gas distribution system, which can help administrators and distributors make data-driven decisions. Overall, a unified web portal has the potential to revolutionize the gas distribution system in India by making it more transparent, efficient, and customer-friendly. A unified web portal for administrators, gas connection distributors, and consumers can be a good solution and a replacement for the current IVR system if it is designed to be user-friendly, secure, and efficient. Firstly, the portal should be easy to navigate and use, with a simple and intuitive interface. Secondly, it should be secure, with robust encryption and authentication mechanisms to protect sensitive data. Thirdly, it should be efficient, with fast response times and minimal downtime. Fourthly, it should be scalable, with the ability to handle large volumes of traffic and users. Finally, it should be customizable, with the ability to adapt to the changing needs of the gas distribution system. By incorporating these features, a unified web portal can provide a seamless and hassle-free experience for all stakeholders, making it a viable alternative to the current IVR system..

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