

# A Survey on CNG Pump Appointment System

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**ABSTRACT**—A model is presented in this system for CNG pumps. The model was developed under the assumption that there are many customers having requirements of fuel for uninterrupted working of their vehicles and a limited number of gas outlets in working conditions at every CNG pump (service providers) which provide gas to fill the cylinders of vehicles. The heavy rush at CNG pumps motivates the people to move for other fuels like petrol, diesel etc which increases the level of pollution in the atmosphere in India. Studying this situation in many CNG pumps I realized that people are ready to switch from other polluting fuels to CNG but the long queues at CNG pumps demotivates them. As per the latest survey of Times of India, it was observed that long queues of vehicles waiting outside CNG pump stations led to traffic congestion on service lanes or even main roads. It was also observed that haphazardly parked cars and autos can also lead to accidents. For each CNG center it is a challenge to decrease the waiting time for environment friendly fuel and to improve the customer's satisfaction

Keywords: cngpump,fuel,waiting time

## ➤ INTRODUCTION

There is a regular heavy traffic block outside the CNG filling station in every area on the nearby roads. The whole road is occupied by vehicles waiting to fill fuel. They queue up in 2-3 rows which take away a major portion of the road. Besides, there is other traffic also near the CNG station and it is a nightmare to drive through these roads many times. Heavy rush at CNG stations is a

major problem in our country in the current scenario as this is the best fuel for having pollution free transportation. The demand of fuel at CNG pumps is increasing day by day but the capacity of CNG pumps is not in the same ratio. Delays in the availability of fuels may cause drastic outcomes for customers as well as for surroundings. CNG Pump's performance in terms of customers flow and of the available resources can be studied using the Queuing Theory. CNG stations can be regarded as a network of queues and servers where customers with their requirements of fuel in respective vehicles arrive, wait for a service, get the fuel tank i.e. gas cylinder filled and then r or leave the station.

## ➤ LITERATURE REVIEW

CNG (Compressed Natural Gas) is a low-cost, environment-friendly and safe alternative to traditional fuels such as petrol and diesel. CNG pumps are the refuelling stations for vehicles running on CNG. The demand for CNG pumps is increasing globally due to the increasing adoption of CNG as a fuel for vehicles. In this literature review, we will discuss the various studies and researches conducted on CNG pumps.

"A review of CNG refuelling station design and operation" by O.S. Agbo, et al. (2017)

This paper presents a review of the design and operation of CNG refuelling stations. The authors discuss the different types of CNG stations, such as fast-fill and time-fill stations, and the challenges associated with their design and operation. The paper also provides a detailed analysis of the safety measures that must be implemented in CNG stations to prevent accidents.

"Simulation of CNG station performance using ASPEN HYSYS" by V. Sankaranarayanan and S. Srinivasan (2015)

This study presents a simulation of the performance of a CNG refuelling station using the ASPEN HYSYS software. The authors analyze the effect of different variables, such as pressure, temperature and flow rate, on the performance of the CNG station. The study provides valuable insights into the optimization of CNG station performance.

"Economic analysis of CNG station development in China" by J. Yuan, et al. (2016)

This paper presents an economic analysis of the development of CNG stations in China. The authors discuss the cost-benefit analysis of CNG stations and compare the economic viability of different types of CNG stations. The study provides useful information for policymakers and investors interested in developing CNG infrastructure in China.

"A review of CNG infrastructure development in India" by S. Agarwal and R. Agarwal (2016)

This study presents a review of the development of CNG infrastructure in India. The authors discuss the challenges associated with the development of CNG stations in India and analyze the policy measures implemented by the government to promote the adoption of CNG as a fuel for vehicles. The study provides valuable insights into the CNG infrastructure development in developing countries.

The literature review suggests that the development of CNG infrastructure is crucial for the widespread adoption of CNG as a fuel for vehicles. The design and operation of CNG stations must be optimized to ensure safe and efficient refuelling of CNG vehicles. Economic viability analysis and policy measures are also essential for the development of CNG infrastructure. The studies and researches discussed in this review provide valuable insights

into the challenges and opportunities associated with the development of CNG infrastructure.

#### ➤ **PROBLEM DEFINITION**

For each CNG center it is a challenge to decrease the waiting time for environment friendly fuel and to improve the customer's satisfaction. Long waiting times are the most important problem in customer's satisfaction. We have discussed many customers and the most frequent issues are about the waiting time which is too long and the number of less outlets. To manage these situations we will use queuing models which can provide reasonably accurate evaluations of our system's performance. The results of this study can help us to understand the broader problem, the relationship between resources and waiting times, and to provide a method for understanding and providing a better solution to face the daily crisis at CNG pumps.

#### ➤ **PROPOSED SYSTEM**

The proposed system will provide quick and easy navigation for the users. This project is based on web system. This system is developed using Php and mysql.database using Mysql for this system. In this system there are three modules are there. admin, cng pump station, user. first module is admin in admin module admin can add the Cng pump station, admin also manage like edit and delete the Cng pump station. admin also manage users. second is the Cng pump station in this module Cng pump station can add there station address like cng pump station name, pincode, address etc. third module is user in this module user can search the cng petrol pump station by entering the pincode and also user can book the appointment for cng petrol pump. We use Data mining as area of project for Cng Pump appointment

Features:

1. User friendly
2. Easy to access

### 3. Interactivity

#### Design Concept:

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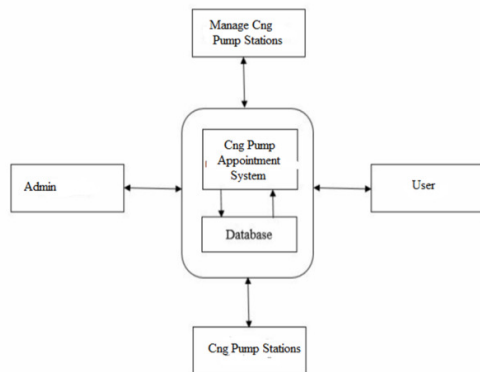


Fig.1: The System design of CNG Pump Slot Booking

#### ➤ Conclusion and Recommendation

Now after doing the analysis of the current system, we observed that there is a long queue formation at all CNG filling points i.e. servers (4 servers working in parallel) due to the high demand of CNG by CNG vehicles like autos, cars, buses etc. Since, we want to provide quick service to customer, so we need to eliminate the waiting line of customers because it gives rise to traffic problems on the roads near CNG pump station and financial as well as goodwill loss, as after observing long waiting queue or long waiting time some customer move to any other option, as

dissatisfied customers. Hence we should make this system balanced as it is necessary to turn dissatisfied customers into satisfied customers for maintaining goodwill in the market and gaining more revenue. In this regard we can increase number of servers under the financial constraints, so that no server will be idle for long duration and queue size will also be decreased with improved waiting time

#### ➤ ADVANTAGES AND DIS-ADVANTAGES

1. Quick, easy and Paperless
2. Safe, reliable and Top quality service
3. It is user-friendly
4. Easy to integrate

#### Applications:

1. This system can be useful for users who have the vehicle of cng gas.
2. This system can be use for everyone

#### ➤ FUTURE SCOPE

CNG (Compressed Natural Gas) is an alternative fuel source that is becoming increasingly popular due to its cost-effectiveness and environmental benefits. As more and more vehicles switch to CNG, the demand for CNG pumps is also increasing. To efficiently manage CNG pumps and meet the growing demand, the software can play a significant role in streamlining operations and maximizing profitability.

Here are some potential future scope for CNG pump software:

1. Real-time monitoring: CNG pump software can provide real-time monitoring of CNG pump operations, including fuel levels, pressure, temperature, and other critical parameters. This information can help operators quickly identify and address any issues, ensuring smooth and uninterrupted operations.

**REFERENCES**

2. Payment systems: CNG pump software can integrate with payment systems, allowing customers to pay for fuel using a variety of payment methods, including mobile payments, credit cards, and more. This feature can enhance customer convenience and satisfaction, leading to increased loyalty.
  3. Predictive maintenance: CNG pump software can use predictive maintenance algorithms to anticipate equipment failures and schedule maintenance proactively. This approach can reduce downtime, minimize maintenance costs, and extend the life of equipment.
  4. Analytics and reporting: CNG pump software can collect data on fuel sales, pump usage, and customer behavior. This information can be used to generate valuable insights and reports, enabling operators to make data-driven decisions and optimize their operations.
  5. Integration with fleet management software: CNG pump software can integrate with fleet management software, providing fleet operators with a complete view of their fuel usage and costs. This integration can help fleet operators identify cost-saving opportunities and improve their overall efficiency.
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In conclusion, the future scope for CNG pump software is significant, and there are many opportunities for innovation and growth. As CNG continues to gain popularity as an alternative fuel source, CNG pump software will play a crucial role in ensuring efficient and profitable operations.