

Smart Cashless Refueling and Real Time Notifying System Using RFID

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Abstract: In the rapidly evolving world of technology, the traditional petrol pump system is undergoing a transformation, integrating smart technologies to improve operational efficiency and enhance customer experience. This paper presents a Smart Petrol Pump with a Real-Time Notifying System, which leverages cutting-edge technologies such as IoT (Internet of Things) and data analytics to streamline petrol pump operations and provide timely notifications to both customers and pump operators. This integrated approach of combining smart technology with real-time notifications at petrol pumps not only enhances operational efficiency but also provides a seamless and transparent experience for customers. It sets the stage for a future where petrol pumps are highly automated, data-driven, and customer-centric.

Keywords: Automotive; Fuel Dispenser; Intelligence; Internet-of-Things; RFID

I. INTRODUCTION

In today's fast-paced world, technological advancements continue to reshape various industries, including the fuel sector. Traditional petrol pumps have long served as critical points for fuel distribution and transaction, but the rising demand for efficiency, sustainability, and customer satisfaction necessitates a transformation in how petrol pumps operate. The integration of smart technologies, such as the Internet of Things (IoT) and real-time notifying systems, into petrol pump operations offers a promising solution to meet these demands. This paper introduces a novel concept - the Smart Petrol Pump with a Real-Time Notifying System, designed to revolutionize the petrol pump experience by optimizing operations and enhancing communication with customers in real time. The Real-Time Notifying System further enhances this smart petrol pump concept by enabling instant notifications to customers regarding their transactions and promotions. Additionally, pump operators receive notifications concerning equipment maintenance. The integration of these technologies ensures a more

transparent, efficient, and customer-centric petrol pump experience, setting the stage for a transformative shift in the fuel industry.

II. PROBLEM STATEMENT

Everything has been digitized. In many existing systems, almost all petrol pumps have a controlling unit to perform the tasks like managing the electrical pump, drive the display, measure the flow and accordingly turn OFF the electrical pump. But still a person is required to collect the money and there is a possibility of many human errors. In this proposed petrol pump automation system, we are using RFID tag to access petrol at different petrol stations of different petrol companies across the country.

III. LITERATURE SURVEY

A literature review is a text of a scholarly paper, which includes the current knowledge including substantive findings, as well as theoretical and methodological contributions to a particular topic. Literature reviews use secondary sources, and do not report new or original experimental work.

Paper name: Smart fuel dispenser using RFID technology and IoTbased monitoring for automotive applications

Author: S. Chandana¹, C. J. Dhanyashree¹, K. L. Ashwini¹, R. Harini¹, M. Premkumar^{1*}, Laith Abualigah

An innovative smart fuel dispenser system that leverages RFID technology and IoT-based monitoring to enhance automotive fuelling processes. Notably, it offers numerous benefits, such as improved accuracy, efficiency, safety, and sustainability, thereby presenting potential cost savings for fuel station owners and operators. The ongoing project is focused on automating fuel dispensing stations using RFID technology as a highly efficient tool. This approach aims to reduce the traffic congestion typically seen in front of fuel

stations by shortening the time required for fuel dispensing compared to traditional manual operations. To enhance control and monitoring capabilities, an Android application has been created. This app allows for the tracking of fuel transactions and transaction history for both customers and fuel station dealers. The system utilizes NodeMCU and the Android app as an Internet-of-Things platform for seamless communication between the system, customers, and dealers.

Paper name: Multipurpose Self Fuel Dispensing Automated Framework Utilizing RFID prepaid cards.

Author: Mrs. Thangadharsni.I Deepa.D, Deepashree.B, Deepu.N, Divya.R.P

Petrol pumps are operated manually making fuel dispensing and filling, a time-consuming procedure. This we actualized automated petroleum pump by utilizing GSM and RFID. This framework can enhance the filling procedure so as to keep it simpler, solid and secure. Here non permitted users and clients with traffic violation records would not be provided with fuel. In this framework, all users have a specific card called RFID card which can be energized by a few focuses. The petrol station is outfitted with a smart card reader which detects the amount in the card along with all the security details and will show it on the LCD. The designated amount of fuel will be dispensed according to the amount entered.

Paper name : A New Cash Register for Fuel Stations with Resistant Outdoor Conditions: Design Considerations

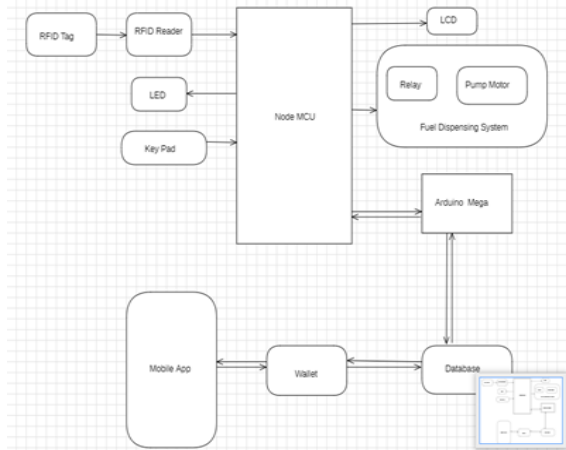
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The study's main purpose is to design and manufacture prototypes of NG PRDs and components for fuel stations in accordance with the technical guide of the HRA legislation. The main feature sought for NG PRDs is to ensure the continuity of communication between the pump and the cash register. The proposed cash register has a printer of at least 58 mm. work integrated with station automation systems, supports different payment types, contains an interface unit that enables communication with the EMRA automation system.

IV.PROPOSED SYSTEM

Most of time the driver came for refueling the cars. Also there are few numbers of caron rent. Car owners

are unknown about the exact amount of transaction happening in the petrol pump This is daily scenario of many refueling stations. We wanted to build a secure & real-time system by which a user can easily trace his/her account's info and get transaction notifications from any corner of the world.



V. METHODOLOGY

User have to register himself/herself through the mobile application. After registration, he/she will get an authorized RFID tag. On petrol pump RFID Reader scan the RFID tag on the petrol pump before refueling which is placed on user's vehicle. If RFID tag is authorized/valid, then is user ready to fill fuel. Operator is ready to enter fuel amount to fill in vehicle If the entered amount of fuel & sufficient balance are available then the pump's motor will start dispensing fuel. Through Data cable the enter amount goes to RFID Reader The transmitted amount to RFID Reader, scan the RFID Tag and debits the enter amount from users fuel wallets. After that, the user will be notified by a realtime email.

VI. CONCLUSION

Though RFID technology is being used in many sectors of security field, our system includes mobile application and automated fuel disposal pump with RFID technology which makes the system more efficient, secure and user friendly. Also with the help of wallet feature we are tracking the moment of payment. There are some regulated fuel stations in many developed countries which generates computer printed receipts. This may solve the issue of cheating activities. But our proposed design gives real-time notification. These reason can motivate the station owners to use the proposed model. therefore this

system can make a great change in socio economic sector of a country. and so no..

REFERANCE

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