ON DEMAND FUEL DELIVERY APPLICATION

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ABSTRACT

Effective fuel management is essential to the performance of industrial operations and building projects. Traditional manual techniques are inefficient both financially and in terms of time, especially when it comes to quickly refueling machinery. Seeing this requirement, our EPICS project presents "Fuel Friend," an Android-based program made to maximize resource usage and simplify the fuelling procedure. A gap in the market was identified by the literature review, as Fuel Buddy and other solutions were only available in certain areas, including Bangalore. Fuel Friend fills this void by serving as a smart interface between fuel suppliers and consumers, enabling smooth communication depending on the user’s unique fuel needs. The application features an intuitive user interface that guarantees a speedy and effective procedure, reducing equipment downtime and eventually saving the company significant time and costs. Fuel Friend offers a secure and convenient online payment facility, which is one of its primary benefits. This service improves the user experience overall. With the application, users can easily order fuel, track deliveries, and finish transactions, doing away with the need for paper paperwork and lowering the possibility of errors.

Keywords: Android Application, Marketing, Smart Interface, Realtime Database, Online Payment Gateway.

I. INTRODUCTION

Fuel is essential for running the machines that propel economic expansion and innovation in a variety of sectors and building endeavors. It powers the engines of progress. Fuel is a necessary element of modern life and its importance cannot be emphasized, especially in the fast-paced worlds of construction and industry [1]. This study examines the vital role that fuel plays in various industries, examining its complex significance, managerial difficulties, and prospects for creative fuel-saving measures. To achieve sustainable development and operational excellence in an era where efficiency, cost-effectiveness, and sustainability are critical, it is essential to comprehend the complex link between fuel and industrial/construction processes [2]. Fuel is essential to bus and auto rental companies and is essential to the efficient functioning of their fleets. Fuel is important in this context for two reasons: it has a direct effect on these firms’ capacity to make money, and it also has a significant impact on the general effectiveness of transportation services. Fuel expenditures are a significant part of travel companies' operating expenses as they are the main energy source for buses and autos [3]. Fuel efficiency is a crucial factor in determining the economic sustainability of the transportation sector as fluctuations in fuel costs may have a direct effect on profitability. Furthermore, keeping up with timetables, satisfying customers, and providing uninterrupted services all depend on fuel’s timely availability [4]. Consequently, travel firms are always looking for ways to maximize fuel efficiency, investigating new technology, and acquiring fuel-efficient cars in order to cut expenses and support environmental sustainability. For bus and vehicle travel firms, gasoline is really more than just a logistical need—it’s a strategic factor that affects their bottom line, operational effectiveness, and overall customer experience. In the construction business, fuel is a necessary resource since it provides the energy needed to run the machinery and equipment needed to construct buildings, flyovers, and infrastructure projects. Diesel and gasoline are two of the fuels used by heavy machinery, including excavators, bulldozers, cranes, and concrete mixers, to perform a variety of activities, from material transportation to concrete pouring [5]. In order to ensure that supplies are delivered to construction sites on schedule, gasoline is also essential for the equipment and trucks used in construction transportation. The construction schedule and operating expenses are directly impacted by fuel efficiency and availability. Due to their size and complexity, construction projects rely significantly on the consistency of fuel supply to keep going without interruption and finish on schedule. To lessen the environmental effect of fuel use in construction operations, there is an increasing emphasis on adopting sustainable practices as the construction industry develops. This includes investigating alternative fuels and technologies [6]. Fuel is essentially the industry’s engine, dictating the speed, effectiveness, and environmental impact of infrastructure.
development initiatives. Fuel is the lifeblood of machinery and equipment in enterprises, whether it takes the form of electricity, natural gas, diesel, or other energy sources. It facilitates the creation of goods and services by supplying energy for a variety of manufacturing processes, including assembly lines and heavy gear. Fuel plays a major role in the transportation of components, final goods, and raw materials [7]. Trucks, ships, trains, and airplanes are used by industries, and they all need fuel to guarantee the efficient and timely movement of commodities along the supply chain. Fuel plays a major role in the transportation of components, final goods, and raw materials. Trucks, ships, trains, and airplanes are used by industries, and they all need fuel to guarantee the efficient and timely movement of commodities throughout the supply chain [7]. Our app includes a number of important features, all of which are intended to improve user experience and expedite the gasoline purchase procedure. The cornerstone is the database collection module, which effectively maintains user profiles, order histories, and fuel supplier information. An easy way for users to enter and amend their information guarantees a smooth booking process. An additional line of communication is provided by the message alerts module, which notifies users of any pertinent changes, the progress of their fuel delivery, and their projected arrival timings. This real-time communication guarantees that users are informed at every stage of the process and promotes transparency. Through the online payment tool, customers can easily complete payments within the app on a safe and practical transaction platform. This improves the fuel booking procedure’s overall efficiency by doing away with the requirement for manual transactions [4]. Each of these modules adds to the app’s intuitive user interface by offering a complete solution that improves communication, streamlines gasoline booking, and enables safe online transactions—all of which combine to maximize the user experience during the fuel procurement process. Fuel is the foundation of industrial activity, impacting all aspects of energy supply, transportation, and manufacturing. The effective management and use of fuel resources is still essential for competitiveness and long-term success as industries change.

II. LITERATURE REVIEW

This study incorporates that Fuel Buddy is a cutting-edge online platform that places a premium on the safe, dependable, and effective delivery of fuel straight to consumers’ homes. Through specialized Refuellers, also known as Fuel Buddy Tankers, consumers can effortlessly buy fuel online and receive timely deliveries at their desired schedule. With the help of many clients, Irison Technology has created and tested a Remote Gasoline Line Distribution Automation System to address issues with refueling efficiency [8]. The system is designed with the needs of the user in mind, making remote gasoline distribution safe, efficient, dependable, and financially sustainable. The approach used by Irison Technology represents a significant improvement in using the Industrial Internet of Things (IIoT), which is a merger of Operational Technology and Information Technology in industrial applications.

The purpose of this study is to investigate the features and user interface of this mobile application to assess how well it works as a tool for providing farmers with timely information and streamlining transactions in the agriculture industry. This smartphone application, written by Pranav Shriram and Sunil Mhamane, is intended to act as a quick and current information distribution system specifically for farmers. The program integrates native language support to streamline transactions and improving accessibility for farmers [9]. Serving as a platform for both buyers and sellers, it incorporates several filters to streamline the browsing experience and make it easier for farmers to search through a wide range of items for their farming requirements.

The food cart application’s features and user experiences will be further investigated in this study, along with how well it works to give residential students access to a quick, affordable, and diversified mealordering service. Shahirah Mohamed Hatim and Norhaslinda Karimuddin’s eFoodCart app offers residential students at the UiTM Perak Tapah Campus a convenient method to buy meals from wherever on campus. The service offers several possibilities, saving users time and money while providing them with a multitude of choices. eFoodCart has drawn inspiration from well-known food ordering services like Pizza Hut, Just Eat, Food Panda, and Lazada to make ordering simpler for students at UiTM Perak Tapah Campus [10].

The purpose of this literature review is to examine previous studies on payment gateways and assess their overall effectiveness in enabling safe electronic transactions as well as their features and security protocols. The World Wide Web (WWW) is used by authors Aiyia Izhar and Wajeeb Javed to facilitate smooth transactions between banks, retailers, and customers. Payment gateways are crucial e-commerce application service
The vital function that payment gateways play in protecting consumer payment information and purchases during transactions is examined in this study. Payment gateways emphasize the security of sensitive data, including credit/debit card information, and use encryption techniques to guarantee safe information transfer between clients and payment processors.

The study's latter portions provide important new information to the area by delving into the complexities of tokenization, PAN binding, and safe payment authentication. In their work, Wenzheng Liu and Xiaofeng Wang outline a thorough methodology, dividing their investigation into three main parts: tokenization, PAN (bank card Primary Account Number) binding, and safe payment authentication [12]. Bank card binding is the first step, which is different from traditional systems that forbid keeping PANs on mobile payment provider servers or phones. It also prohibits PANs from being frequently sent across unsecure networks. As such, a token takes the role of the physical PAN, guaranteeing an elevated degree of security during this procedure [13]. The first step in developing the On-Road fueling suggestion application is to outline in the specs the features that will be available to users, gas stations, and administrators. The next step is system design, which involves outlining the architecture using Angular JavaScript for frontend development and MySQL as the backend database. Features like online gasoline booking, search, and registration are added to the user module [14]. The admin verification, registration, and branch administration features are all integrated into the gas station module at the same time. The administration module manages all users and gas stations more efficiently. To guarantee a constant user experience, the application's interface is designed to be responsive, and integration ensures that the frontend and backend communicate seamlessly. After extensive testing and successful results, the application is placed in a hosting environment that can support its growth.

### III. METHODS

This section primarily covers the technique and design of the On-demand fuel delivery application.

#### A. Architecture

![Figure 1. System Architecture](image_url)

Figure 1 represents the system architecture model of the application. To register as a user, you must provide some information, such as your name, email address, cellphone number, and password. Users may access their accounts after registering, guaranteeing a safe and customized experience. After logging in, customers may easily place an order by choosing their desired fuel type, quantity, date, and time. Users are sent to the payment page to finish the purchase over a secure payment channel after verifying these data. Users get a real-time update.
notification with a detailed overview of their order data after their payment is successful, which improves their overall experience. The order data is simultaneously safely stored in the Firebase database to guarantee data accessibility and integrity. Transparency and ease of use are promoted by users’ ability to easily see and trace their order history on the history page specific to their account. Whenever a consumer completes a payment, the administrator is instantly informed, which streamlines order administration. When the administrator clicks on the message, they instantly have access to comprehensive client data, which makes order fulfillment more effective. To ensure timely delivery, the admin then notifies the assigned driver of the pertinent order details. Furthermore, the administrative assistant keeps a close eye on gasoline expenses, guaranteeing prompt modifications and well-informed choices to maximize both operational efficacy and financial viability. For long-term operational success, our all-inclusive solution guarantees a productive order processing system, proactive administration, and a flawless user experience.

B. Methodology

The methodology provides various kinds of modules. They are:

- User Registration Module
- Fuel Ordering Module
- Payment Module
- Notification Module

1. User Registration Module:

In this module, users access the platform through the Login/Register page of an on-demand fuel delivery application. In addition to a Register area where new users can form accounts, it has a Login section for current users that asks for their registered email address, username, and password. Users create a strong password and enter required information during registration, including name, email address, and phone number. The application uses hashing and encryption algorithms to protect sensitive data while safely keeping this information in a database. Robust authentication methods are in place to manage access to saved login details, guaranteeing that only authorized users possessing valid credentials can access their accounts.

2. Fuel Ordering Module:

An on-demand fuel delivery app's home page acts as the hub where users place fuel orders by providing information such as the type of fuel, the date and time of the delivery, and the delivery location. Past orders may also be kept in the database to customize the Home page experience, showing fuel types that are frequently ordered or preferred locations. The confirmation button is the last step for registered consumers to verify their order information before the delivery is made. The entered order details, including the type and
quantity of fuel required, the delivery location, and any other instructions, are assembled when a customer clicks the “Confirm Details” button. After that, this data is safely transferred to the app’s backend for processing and validation. This data is received by the backend database, which safely saves the order details. Usually, it entails adding a new entry with all the order-specific data, delivery instructions, client information, and timestamps for documentation purposes to the database. The app may notify the user that their order has been received and is being processed by displaying a confirmation message after the order details have been successfully entered into the database. This confirmation button guarantees that the fuel delivery service has correctly logged the customer’s request and is prepared to fulfill it.

3. Payment Module:
The payment options screen in the fuel delivery app uses Razorpay as a third-party payment gateway, which usually provides several safe ways for users to finish their transactions. Users can safely enter their credit or debit card information within the app. Customers can select the UPI option, which involves attaching their UPI ID or scanning a QR code to start the payment transfer. Alternatively, the information is encrypted and forwarded to Razorpay for processing. Through Razorpay’s secure net banking interface, consumers can choose their bank and proceed with the payment straight from their bank account when using the Net Banking option.
The software securely transfers the user's information to Razorpay's system for processing after they choose their preferred payment option and supply the required details. The app receives confirmation from Razorpay that the payment was successfully processed, signifying that the transaction was finished. After the order is marked as paid by the app, the fuel delivery service completes the order fulfillment.

4. Notification Module:
Notifications are sent to the admin and the consumer following a successful payment made by the customer through an on-demand fuel delivery app. A notice verifying the successful payment is sent to the customer. It provides the customer with peace of mind by confirming that the fuel delivery is underway and includes crucial information like the type and quantity of fuel purchased, the payment method (Card, UPI, Net Banking), the total amount paid, and a transaction ID or reference number for their records.

A notification with the customer's details is sent to the admin. This could contain the name, phone number, delivery address, and order details of the client. It guarantees that the gasoline delivery crew or the administrative staff has all the information they need to process the request quickly and efficiently. Notifications are essential for both coordination and communication. It provides the admin or delivery crew with the information they need to accurately and promptly fulfill the purchase, while it validates for the consumer that the payment and order placing were successful.
The Fuel Friend mobile application aims to revolutionize fuel delivery services for industrialists, providing a seamless and efficient solution. Key features include real-time location capturing for precise deliveries, a tracking system offering live updates on delivery status, and a user-friendly feedback and rating system for continuous service improvement. The app uses data analytics to give businesses real-time fuel consumption recommendations based on past data, and it integrates daily deals to draw users in. Google Maps integration makes it simple for users to follow their orders. User account management, customer service, secure payment methods, and sustainability programs are essential elements, and marketing plans and loyalty schemes improve user interaction. FuelFriend continues to be a dependable and cutting-edge platform for industrial fuel needs, encouraging higher efficiency and profitability, thanks to frequent improvements and attentiveness to user feedback.

V. REFERENCES


