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Cab Management System

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***Abstract*—In this paper, we propose a model aims to significantly improve passenger safety within the cab industry by developing a comprehensive vehicle accident detection system combined with an alcohol detection mechanism. The primary goal of this initiative is to tackle two major issues: the prevalence of accidents and the dangers associated with driving under the influence of alcohol. By leveraging technology, this system integrates a series of components, including switches, GPS, GSM modules, and alcohol sensors, all managed by an Arduino microcontroller. The ultimate objective is to create a smart solution that not only addresses immediate safety concerns but also encourages responsible driving habits among cab drivers, thereby fostering a safer environment for passengers. The innovation of this project lies in its ability to combine multiple safety features into a cohesive system that can actively monitor and respond to potential hazards. The GPS component aids in navigation and tracking, while the GSM module facilitates real-time communication, further enhancing the system's responsiveness. One of the key components is the alcohol sensor, designed to detect the presence of alcohol in the driver's system, which acts as a preventative measure against impaired driving. By integrating these technologies, the project seeks to mitigate the risks associated with alcohol-related incidents, ultimately contributing to a safer travel experience for passengers and promoting a more accountable approach to driving within the cab industry.**

***Index Terms*—Limit Switch, Alcohol Sensor, GSM, GPS, Arduino.**

I. INTRODUCTION

The Cab Management System focused on public safety represents a significant advancement in the rideshare industry. While modern vehicles are increasingly equipped with accident detection and alcohol monitoring technologies, these features have yet to be widely adopted in cab services. The vision of incorporating such systems into cabs is not only about enhancing safety for passengers and drivers but also about fostering a culture of responsibility within the transportation sector. By integrating these proactive safety measures, we can significantly mitigate risks associated with accidents and impaired driving, ensuring a safer travel experience for everyone involved. This ingenious Cab Management System would utilize cutting-edge technology to monitor driving conditions in real time. By incorporating switches and GPS tracking, the system can instantly detect accidents, alert emergency services, and notify relevant authorities, thus reducing the response time during critical situations. Additionally, integrating alcohol detection technologies, such as breathalyzers, would prevent intoxicated drivers from starting their vehicles, addressing a key concern in public safety. Such measures would not only protect passengers and drivers but also serve as a deterrent against reckless behaviour, establishing a safer rideshare environment. Currently, platforms like Ola and Uber provide robust web applications for passengers, focusing on convenience and user experience. However, the introduction of a comprehensive safety system within cabs could enhance this experience by minimizing delays associated with accidents or driver impairment. By ensuring that only qualified and sober drivers are on the road, the system would significantly reduce incidents that lead to disruptions, allowing for a smoother and more reliable ride for passengers. This commitment to safety and efficiency could give cab services a competitive edge in an increasingly crowded marketplace. The Cab Management System employs a three-strike rule to track safety issues like drunk driving and accidents, storing this information in a database. If the alcohol sensor detects that a driver has been drinking, it prevents the car

from starting and sends an alert to the owner with the driver's exact location, helping to avert dangerous situations. In the event of an accident, the system checks on the driver; if there's no response within a set time, it automatically alerts the owner and emergency services with the vehicle's location. Additionally, the app features an emergency button that allows passengers to quickly signal for help if the driver behaves inappropriately, without needing to navigate complicated menus. By integrating these various safety measures, the system significantly enhances cabs safety, encourages responsible driving, and helps passengers feel more secure when using cab services.

II. LITERATURE SURVEY

Paper1: Vehicle Accident Prevention System Embedded with Alcohol Detector, Mohamad et al. developed a vehicle accident prevention system using an MQ-3 alcohol sensor and a PIC 16F876A microcontroller to detect alcohol levels in a driver's breath. The system categorizes alcohol content into three levels: "intoxication" (130-260 ppm) triggers a notification, "slightly drunk" (261-390 ppm) activates an audible alarm, and "drunkenness" (391-650 ppm) disables the vehicle's ignition while sounding an alarm. The researchers validated the system's effectiveness using whisky to simulate various alcohol concentrations, demonstrating its potential to prevent intoxicated driving while allowing minimal alcohol exposure [1].

Paper2: Design and Development of an Artificial Intelligence-Based Alcohol Detector System for Vehicle Accident Prevention, A developed an AI-based alcohol detector system aimed at preventing vehicle accidents caused by impaired driving. The system integrates an MQ-3 alcohol sensor with a PIC 16F877A microcontroller to detect alcohol levels in a driver's breath. It provides real-time alerts through a buzzer and a liquid crystal display (LCD) when alcohol is detected above predefined thresholds. The system is designed to minimize false positives by incorporating AI algorithms that distinguish between genuine alcohol consumption and incidental exposure. This innovative approach not only enhances road safety but also addresses health risks associated with manual alcohol detection methods, particularly in the context of the COVID-19 pandemic [2].

Paper3: Alcohol Detection and Accident Prevention, Dhayarkar et al. presented an Arduino based alcohol detection and accident prevention system that addresses multiple safety factors. Highlighting that 75% of road accidents are due to drunk driving, the system features an alcohol sensor on the steering wheel and an ultrasonic sensor to ensure seat belt usage. It incorporates GSM technology to alert vehicle owners of violations and utilizes IoT functionality for real time monitoring of vehicle parameters. This integrated approach aims to reduce accident rates by addressing multiple risk factors and promoting accountability among drivers [3].

III. CONCLUSION

Cab Management System marks a crucial step forward in the transportation industry by enhancing safety with features like real time accident detection, alcohol monitoring, and a three-strike rule. This system fosters responsibility among drivers while integrating user friendly safety measures, such as an emergency button for passengers. By minimizing risks related to impaired driving and accidents, it not only improves the travel experience but also gives cab services a competitive edge. As the industry continues to evolve, emphasizing these safety innovations will be essential for maintaining a secure transportation environment.

IV. REFERENCES

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