Vehicle Tracking System Using IOT

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ABSTRACT

A vehicle tracking system is an electronic device installed in a vehicle to enable the owner or athird party to track the vehicle's location. This paper proposed to design a vehicle tracking system that works using GPS and GSM technology, which would be thecheapest source of vehicle tracking and it would work as anti-theft system. It is an embedded system which is used for tracking and positioning of any vehicle by using Global Positioning System (GPS) and Global system for mobile communication (GSM). This design will continuously monitor a moving Vehicle and report the status of the Vehicle on demand. A GSM modem is used to send the position (Latitude and Longitude) of the vehicle from a remote place. The GPS modem will continuously give the data

Keywords:– GPS Module, GSM Module,ESP8266Microcontroller,SOS Button, LED, Switch

1.INTRODUCTION

A vehicle tracking system is a technology that enables tracking, monitoring, and management of vehicles in real- time. It typically involves GPS technology to pinpoint the location of vehicles, along with various sensors and communication systems to relay data back to a central server. Vehicle tracking systems offer benefits such as improved fleet management, increased security, better route planning, and enhanced efficiency in logistics operations. They are widely used in transportation, logistics, delivery services, and fleet management industries.

Vehicle tracking system main aim is to give Security to all vehicles. Accident alert system main aim is to rescuing people in accidents. This is improved security systems for vehicles. The latest like GPS are highly useful now a days, this system enables the owner to observe and track his vehicle and find out vehicle movement and its past activities of vehicle. This new technology, popularly called vehicle Tracking Systems which created many wonders in the security of the vehicle. This hardware is fitted on to the vehicle in such a manner that it is not visible to anyone who is inside or outside of the vehicle. Thus it is used as a covert unit which continuously or by any interrupt to the system, sends the location data to the monitoring unit. When the vehicle is stolen, the location data from tracking system can be used to find the location and can be informed to police for further action. Some Vehicle tracking System can even detect unauthorized movements of the vehicle and then alert the owner. This gives an edge over other pieces of technology for the same purpose. The Internet of Things (IoT) technology represents a paradigm shift in how we interact with the world around us. By connecting everyday objects and devices to the internet, IoT enables the seamless exchange of data and communication between physical and digital systems. Through the

integration of sensors, actuators, and network connectivity, IoT devices can collect, analyze, and respond to real-time data, enabling a wide range of applications across various industries. From smart homes and cities to industrial automation and healthcare, IoT technology is revolutionizing how we live, work, and interact with our environments. By harnessing the power of IoT, organizationscan unlock new insights, optimize processes, and enhance efficiency, ultimately driving innovation and shaping the future of interconnected systems**.**

2.LITERATURE SURVEY

1. **GPS based vehicle tracking and monitoring system- A solution for public transportation**

The author of the study offers a method that makes use of gadgets like the Raspberry Pi and GPS Antenna to track and keep an eye on public transit vehicles. The processing board for the Raspberry Pi can be used to receive values and output the results. This technique can discover a means of tracking the moving object from its location source to its destination. In this study, a GPS receiver module is used to continuously receive the latitude and longitude values of the vehicle's current location. Between the source and destination locations, a car passenger will provide the system with several locations. The Raspberry Pi database will save these values, and the Raspberry Pi CPU will compare them to the current location of the vehicle.

2. **Real-time GPS vehicle tracking system**

In this study, an Arduino-based real-time GPS tracker system was implemented and designed. This approach worked. For private driver safety, salesmen tracking, and car security. The paper's author also made an effort to address the issue of owners of expensive cars who want to watch and track their vehicles in order to learn more about their movements and previous actions. The device has Arduino MEGA-controlled GPS/GSM devices installed inside the vehicle. Every time the car travels, the position will be updated. The user will receive the coordinate location after sending an SMS to their registered number. The data will be continually stored on the SD card at the same time. Users will have system access to the place.

3. **Android app based vehicle tracking using GPS and GSM**

The author of this paper describes an embedded system that uses GSM technology to determine the location of the car plus GPS. The system requires a microcontroller and a GPS and GSM module that are closely coupled. The GPS unit's built-in satellite receiver will initially download the vehicle's location from a satellite and store data in a microcontroller's buffer. The registered mobile device's location can be tracked. The location will be delivered as an SMS to the mobile number after the number sends a request, and authentication of the number has been completed. Then GPS is turned back on and GSM is turned off. The latitude and longitude values of the vehicle are included in the SMS. An Android app can be used

to display the value received in the SMS, and the coordinate will be plotted automatically in the application.

4. Survey paper on vehicle tracking system using GPS and android

In order to assist organisations in identifying the addresses of their vehicles and locating their positions on mobile devices, this article proposes a GPS-based vehicle tracking system. According to the author, the system will display both the precise location of the vehicle and the user-vehicle distance. The system will include a single Android smartphone, GPS, and GSM modems, as well as an in-vehicle processor. When once the vehicle is turned on and going, a server will get regular updates on the vehicle's location. To check the location of the car, the monitoring unit will connect to the server's database. On the monitoring device, Google maps will be used to depict the location data from the database.

5. Review of Accident Alert and Vehicle Tracking System

The author of this paper has provided a description of the system that can track a moving object and identify collisions. Using piezoelectric sensors or vibration sensors, traffic incidents will be automatically detected. This sensor will initially detect the occurrence of an accident before providing the microcontroller with its output. The GPS module will identify the latitude and longitudinal position of a vehicle as soon as an accident occurs. The ambulance that is nearby receives the latitude and longitude position of the car via the GSM module. An alert message may be sent to the central emergency dispatch server as a result of this message-sending process being carried out automatically. This system is capable of detecting movement using a vibration sensor, a Raspberry Pi, GPS, and GSM modules.

3.PROPOSED SYSTEM

The proposed system for vehicle tracking using IoT integrates cutting-edge technologies to provide comprehensive monitoring and management capabilities.It involves deploying IoT-enabled GPS tracking devices in vehicles, equipped with sensors to collect data on location, speed, vehicle diagnostics, and driver behaviour. These devices leverage wireless connectivity, such as cellular networks or satellite communication, to transmit real-time data to a cloud-based tracking platform. Here, fleet managers can access a user-friendly dashboard to visualize vehicle locations, routes, and performance metrics. Advanced analytics, including machine learning algorithms, offer insights for optimizing routes, predicting maintenance needs, and improving operational efficiency. Geofencing features enable the definition of virtual boundaries and trigger alerts for specific events like speeding or unauthorized vehicle use. Integration with mobile applications empowers both managers and drivers to access tracking data, receive alerts, and report These devices leverage wireless connectivity, such as cellular

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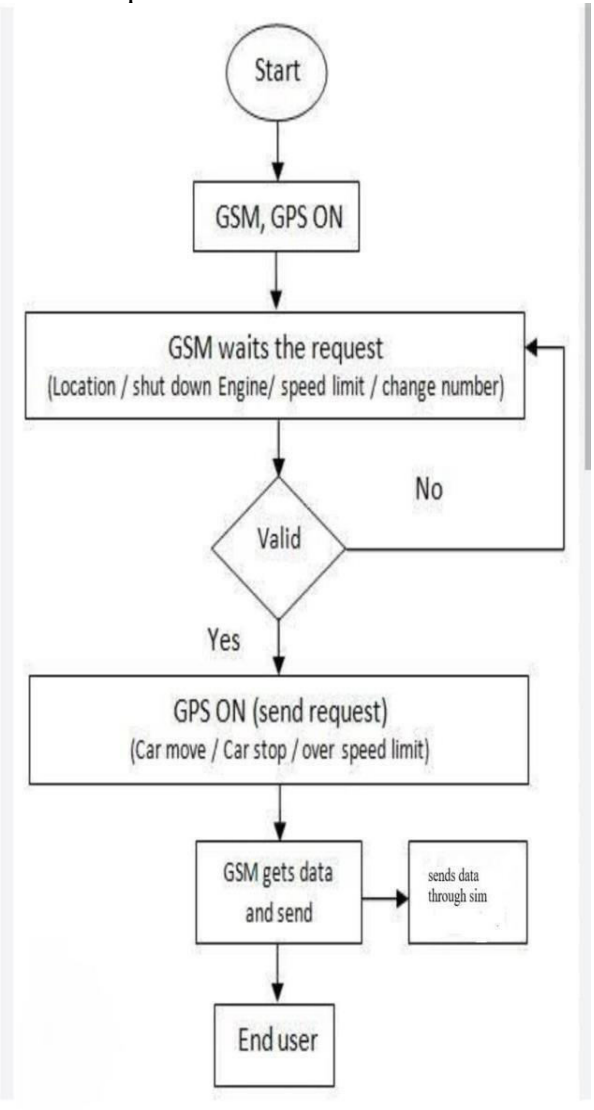
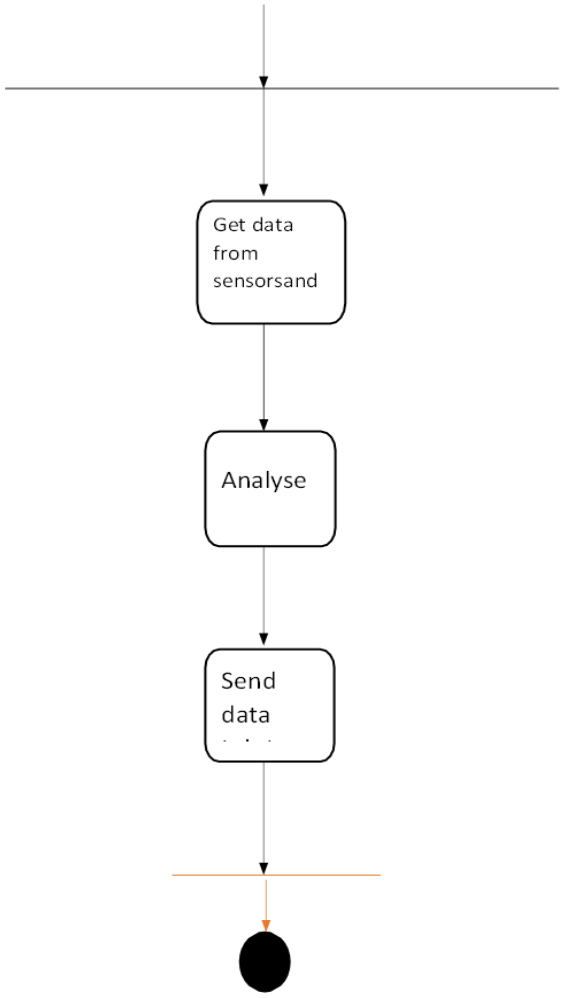
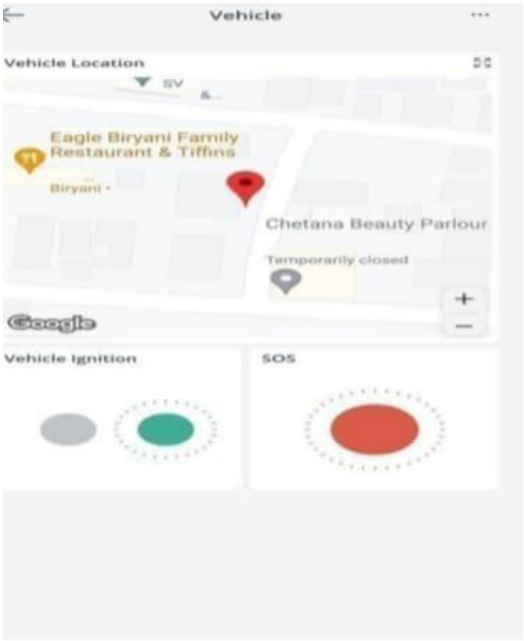




3.1 FEATURE EXTRACTION

Future extraction in vehicle tracking systems utilizing IoT technology holds immense potential for advancing transportation management, safety, and sustainability. Emerging trends and research directions in this field suggest a trajectory towards more intelligent, adaptive, andeco-friendly solutions. One promising avenue forfuture development is the integration of artificialintelligence (AI) and machine learning (ML) techniques to enhance predictive analytics capabilities. By leveraging historical data collected from IoT sensors and GPS devices, AI- powered algorithms can anticipate traffic patterns, identify potential bottlenecks, andoptimize route planning in real-time. Moreover, advancements in edge computing and fog computing technologies offer opportunities to

process and analyze sensor data closer to the source, reducing latency and improving responsiveness in critical applications such as autonomous driving and collision avoidance systems. Additionally, the proliferation of connected and autonomous vehicles (CAVs) presents new challenges and opportunities for IoT-based tracking systems. Future research may focus on developing interoperable communication protocols and standardized interfaces to facilitate seamless integration and communication between diverse vehicle platforms and IoT infrastructure. Furthermore, there is growing interest in leveraging IoT data to promote environmental sustainability in transportation. By monitoring vehicle emissions, optimizing traffic flow, and promoting eco- friendly driving behaviors, IoT-enabled tracking systems



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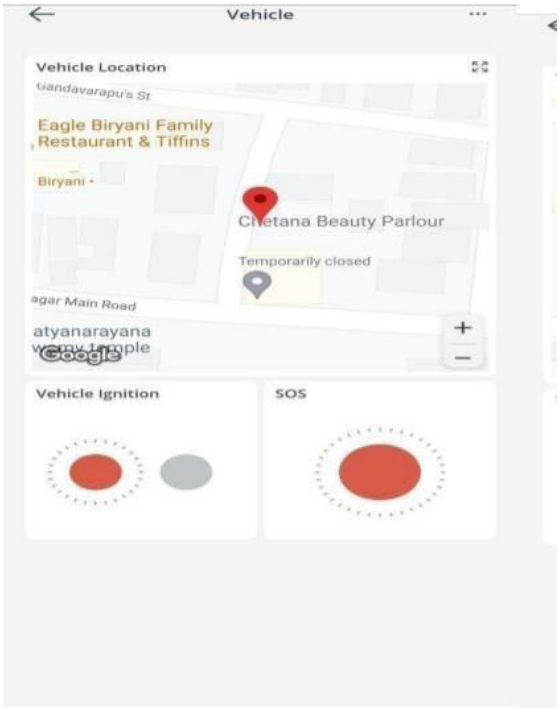
can contribute to reducing carbon footprint and mitigating air pollution in urban areas. Overall, the future of vehicle tracking systems using IoT technology lies in harnessing the power of AI, edge computing, and sustainable practices to create smarter, safer, and more efficient transportation networks

4.EXPERIMENTALRESULTS



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ADVANTAGES

Real Time Tracking.Cost Effectiveness.

Scalability.

Enhanced Security.

5.CONCLUSION

In conclusion, the integration of GPS and GSM technologies offers a powerful solution for vehicle tracking, providing accurate location data and real- time communication capabilities. By harnessing these technologies effectively and employing thorough testing methodologies, we can ensure the reliability, accuracy, and efficiency of vehicle tracking systems, enhancing safety, security, and efficiency in various applications, from fleet management to asset tracking and beyond. Vehicle tracking through GPS and GSM amalgamation ensures

enhanced safety with real-time monitoring and swift emergency responses. It boosts operational efficiency by optimizing routes.

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