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IOT BASED VEHICLE HEALTH MONITORING SYSTEM

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ABSTRACT- An IoT-based vehicle health monitoring system is a technologically advanced solution that aims to monitor and analyze the health and performance of vehicles in real-time. This system utilizes a combination As a result of sensors, networking, data analytics, and remote monitoring, proactive maintenance made possible , and performance is improved.The system uses a number of sensors, including OBDII sensors, GPS sensors, ac celerometers, and temperature sensors, to gather information on vital aspects of the vehicle, such as engine per formance, fuel economy, tyre pressure, and battery life.Then, this data is wirelessly sent to a central server or c loud-based platform via communication technologies like Wi-Fi, cellular networks, or Bluetooth.
The gathered data is processed and analysed in real-time using data analytics techniques and algorithms.
This analysis assists in finding trends, spotting anomalies, and and provide valuable insights into the overall health and performance of the vehicle. Machine learning algorithms can also be employed to predict potential issues and recommend maintenance actions based on historical data patterns. Vehicle owners or fleet managers can access the system's user-friendly dashboard or mobile application to monitor the health and performance of their vehicles. Real-time data visualizations, alerts, and notifications are provided to keep them informed of any abnormalities or maintenance requirements. Additionally, the system can schedule preventive maintenance tasks, assist in diagnosing vehicle issues by identifying error codes, and even offer remote control functionalities for certain vehicle functions.

Index Terms- Internet of Things (IOT), Climate control, health monitoring system, Wi-Fi, GPS sensors, data analytics.

I. INTRODUCTION

An Internet of Things (IoT)-based vehicle health monitoring system is made to gather and examine real-time data from automobiles to evaluate their performance.This system uses a variety of sensors, communication technologies, and data analytics to track a number of vehiclerelated metrics, including battery life, tyre pressure , engine performance, and more.

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An alternative that can be utilised to assist patients with chronic diseases is the system designed for patient moni toring that is based on the Internet of Things

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1.1 PROBLEM STATEMENT

The absence of realtime visibility and proactive management of vehicle health and performance the issue that an IoT-based vehicle health monitoring system attempts to solve.

Manual inspections or routine maintenance regimens are the foundation of conventional methods of vehicle heal th monitoring, which can be ineffective, time-consuming, and prone to overlooking possible problems.

This reactive method frequently results in longer vehicle downtime, expensive repairs, poor safety, and reduced overall effectiveness.Furthermore, a more sophisticated and intelligent system to track and assess vehicle health metrics is required due to the complexity of modern cars and the rising demand for optimised fuel efficiency.

II. OBJECTIVES

Realtime Monitoring: The system's main goal is to continuously track condition and efficiency of moving objects.This entails gathering data from a variety of invehicle sensors and sending it to centralised platform for evaluation and visualisation.Early Fault Detection: The system seeks to identify potential vehicle problems or malfunctions before they become serious.

It can spot trends or abnormalities that point to potential problems and offer early warnings by analysing sensor data and using machine learning techniques. or alerts to vehicle owners or fleet managers. Proactive Maintenance Planning: An important objective is to enable proactive maintenance planning based on the collected data and identified vehicle health conditions. By predicting maintenance needs and recommending maintenance actions, the system helps prevent breakdowns, reduce downtime, and optimize maintenance schedules, resulting in cost savings and improved vehicle performance.

Performance Optimization: The system focuses on optimizing the performance of vehicles by monitoring key parameters such as fuel efficiency, engine performance, and tire pressure. By providing real-time insights and recommendations, it helps vehicle owners or fleet managers take necessary actions to enhance performance, reduce fuel consumption, and ensure compliance with environmental regulations.

III. METHODOLOGY

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3.1 Block Diagram: -

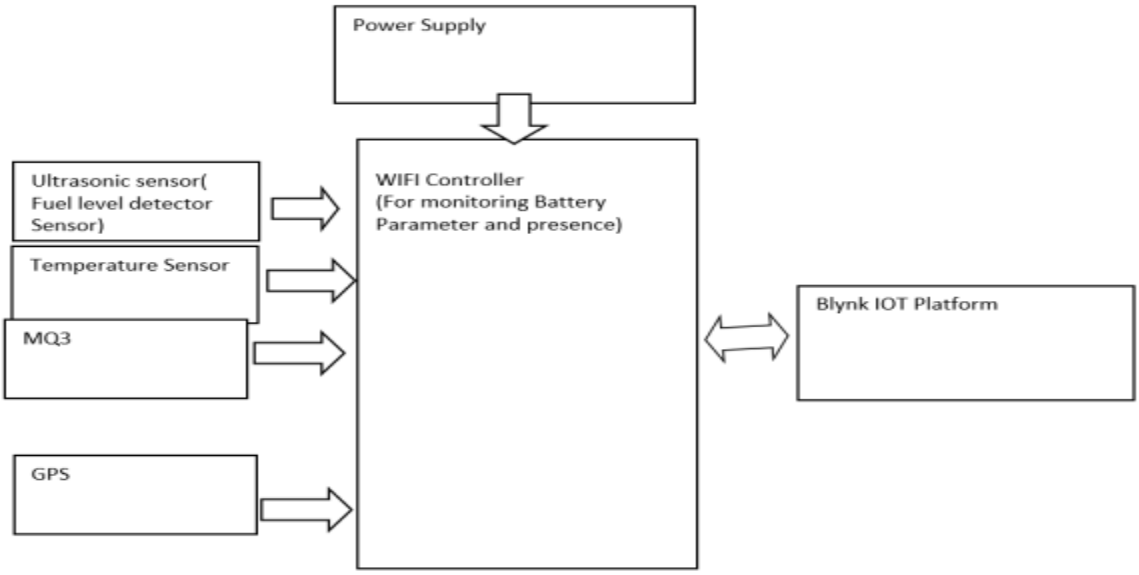

Fig.No. 1 Block Diagram for Proposed System

Sensors placed in the car include OBDII sensors, GPS sensors, accelerometers, temperature sensors, and fuel level sensors, among others.They gather information on the condition of the battery, the tyre pressure, the t yre efficiency, and other pertinent characteristics.Data Collection and Transmission: WiFi, cellular networks, or Bluetooth are used to wirelessly communicate the data that the vehicle sensors have acquired to a cloudbased platform. This guarantees a steady stream of information from the car to the monitoring system. Cloud-Based Platform: The cloud-based platform is where the data sent from the vehicle is received and stored.
It acts as the main hub for data processing, analysis, and storage.
Scalability, dependability, and accessibility of the data are all provided by the platform. Data Storage and Management: The received data is stored in a database or data storage system within the cloud-based platform. This component manages the organization, security, and accessibility of the collected data for further processing and analysis. Data Processing and Analysis: The collected data undergoes processing and analysis using data analytics techniques and algorithms. This step involves identifying patterns, detecting anomalies, and deriving meaningful insights about the vehicle's health and performance. User-Friendly Interface: The system provides a user-friendly interface, such as a dashboard or mobile application, to present the analyzed data.

IV. CONCLUSIONS

IoT-based vehicle health monitoring systems, in conclusion, provide important benefits in terms of real-time monitoring, early fault detection, proactive maintenance, increased safety, cost savings, performance optim isation, remote monitoring and control, datadriven decision making, integration with existing systems, scalabilit y, and adaptability.These technologies make it possible for fleet managers, vehicle owners, a service personnel to track the performance and health of their fleets in real
time, identify potential problems before they become serious, and schedule preventative maintenance.
These technologies promote data-driven decision making, optimize

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