

ABSTRACT

The development of a web-based vehicle monitoring system is essential to enhance vehicle safety and ease of maintenance. This final project aims to build a monitoring platform that displays real-time information on brake pad thickness, tire thickness, tire pressure and temperature, and tire identification. The system integrates four main sensors: TPMS, LIDAR, RFID, and brake pad sensors, with the ESP32 microcontroller as the data transmitter. Data is sent using the REST API protocol and managed within a MySQL database. The monitoring website was developed using Node.js for the backend and React.js for the frontend, secured with JWT Token authentication. The methodology includes system requirements analysis, system architecture design, REST API implementation, and system performance testing using Postman Collection Runner. Test results show that the API can handle up to 100 users with an average response time between 3.93 and 9.19 milliseconds without data transmission failures. The system successfully provides a real-time vehicle condition monitoring solution and improves the efficiency of vehicle component inspection.

Keywords: Remote Monitoring System, REST API, Vehicle Sensors, Vehicle IoT, Website Monitoring