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IOT BASED DRIVING LICENSE DETECTION

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Abstract: In today's world, obtaining a driving license is a crucial milestone in every adult's life. However, ensuring that only competent and responsible drivers receive a license is essential for road safety. Many road accidents occur due to driver negligence, lack of awareness, or impaired driving, highlighting the need for a stricter and more efficient licensing process. This project presents an IoT-based Driving License Detection and Safety System designed to evaluate the knowledge, mental awareness, and responsiveness of a driver before issuing a license. The system aims to enhance the standard of the licensing mechanism, reduce road accidents, and improve public safety by integrating smart technology into the evaluation process. The proposed system integrates NodeMCU, an IoT-enabled microcontroller, with multiple sensors to monitor various driving parameters. These sensors assess driver alertness, reaction time, alcohol influence, heart rate, and adherence to safety protocols while operating a vehicle. Additionally, the system includes a real-time monitoring framework that detects unsafe driving behaviors, such as drowsiness, excessive speeding, or erratic steering. If any violations are detected, the system can immediately alert authorities or automatically disqualify the driver from obtaining a license

Keywords*: Driving License, IOT, Node MCU, Sensor, Cloud-Computing, Arduino, RFID, GSM module, GPS*

I.INTRODUCTION

In this project to develop the system driving license detection and safety system. The system is done by interfacing Node MCU Board with number of sensors. In this project we are using Node MCU Microcontroller. When the RFID tag is swapped the motor will on and off. The alcohol sensor, to detect the drink and drive and voice module to produce a deep sound If the person is drunken so send the message to person and to change the driver. It is a voice interactive system. RFID reader to read the tags. The Alcohol level and license name and number will be displayed on the LCD, web application and Android application. This is an effective method to manage traffic management system. With rapid advancements in technology, the world is heading towards connectivity in all fields. Such technology that provides communication among anyone at any place or any time is Internet of Things (IoT). The IoT may is considered as the Internet of future that will enable machine-to-machine learning. The main idea behind IoT is to have self-governing connection that secures and allows exchanging of data between real world and physical devices and real time applications. The sensors and the methods we use here are easy to implement and is cost efficient. Unlike other methods our prototype does not have any wires or sensors which has to be attached to the driver's body, our system is equipped with MQ sensors, alcohol sensor which is placed inside the car near to driver seat to detect the presence of alcohol and an alarm is produced if the presence is detected. To reduce road accidents, we need to analyse the reasons behind the accidents. If we see the records it is found that many accidents take place because of rash driving caused by the alcoholic state of drunken drivers. Driver loses their driving control once drunk. Second type of accident occurs due to fatigue condition of driver while driving a long distance at a stretch or driving at night without taking proper sleep. This paper presents very effective solutions to reduce the road accidents and other post accidental medical help. It provides eye blink monitoring system, accident site locator, alcohol detector and safe distance monitor and control system. It detects the drowsiness and provides alarm signal to the driver. Even after the alarm signal the driving condition continues the brake mechanism of the vehicle is activated and the further movement is restricted.

II LITERATURE SURVEY

Software development methodology

This application comprises mainly of two parts:

1. Hardware configuration of proposed system

The system consists of a RFID reader which operates on radio waves for analyzing items people, along with a ARDUINO, which is a processer to the system. The system also contains a GPS for tracking purposes and GSM for transmitting messages/signals. An android application is also used for tracing & tracking the vehicle and the driver through mobile phones from respective place. [19]

The system containing RFID reader as a Driving License, inserted into the holder of the vehicle, contains all the necessary information like unique id number (U.ID) vehicle number, location, and all get stored in the cloud (acting as a server), and that information could be viewed/checked through the web portal/mobile application, which could be handled by the owner of the vehicle as per his/her need. The point which needs attention is that designing the mechanism for SMART DL is the vehicle starts only when the

SMART DL is the vehicle starts only when the Driving License is the vehicle starts only when the Driving License as a card is inserted into the holder, so that no one driving the vehicle could leave their respective DL at home & hence could be easily tracked, no heavy challans, no frauds, no thefts and no terrorism and every information could be retained if needed. analyzing items people, along with a ARDUINO, which is a processer to the system. The system also contains a GPS for tracking purposes and GSM for transmitting messages/signals. An android application is also used for tracing & tracking the vehicle and the driver through mobile phones from respective places.

In recent years, the integration of Internet of Things (IoT) technology in the transportation and licensing sector has gained significant attention due to its potential to improve safety, transparency, and efficiency. Several studies and projects have explored automated driving test systems using sensor-based

technologies to reduce human bias and errors. Researchers have proposed the use of GPS, ultrasonic sensors, and accelerometers for real-time tracking of vehicle movement, obstacle detection, and driving behavior analysis. For instance, projects like "Smart Driving Test System using Arduino and IoT" demonstrated how sensor data can be used to assess a driver's performance without human intervention. Another study focused on the use of cloud computing and mobile applications to provide examiners with real-time insights and performance reports. Furthermore, government initiatives in countries like India have encouraged digital solutions for driving tests, making the concept of IoT-enabled testing systems highly relevant. These previous works highlight the feasibility and benefits of such systems, forming a strong foundation for the development of this IoT-based Driving License Project.

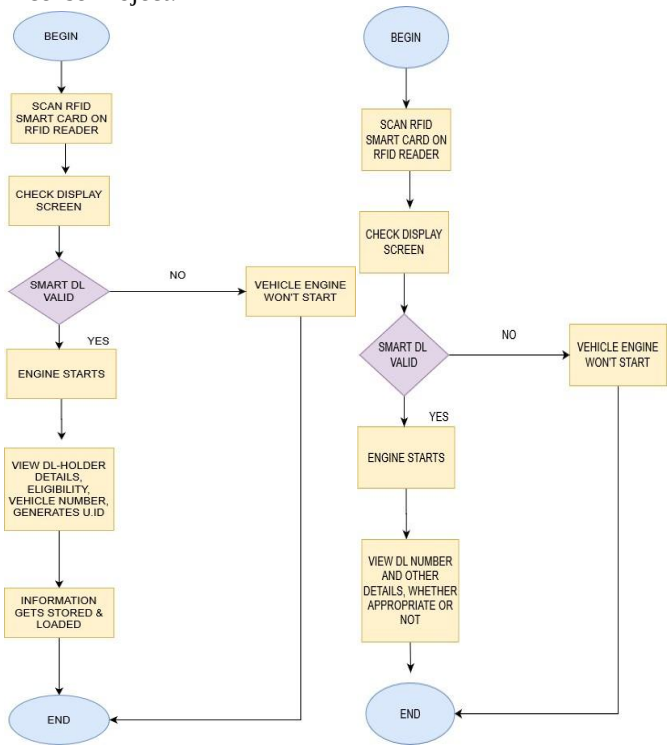

Fig.2. Flow for viewing driving license (DL) and DL-holder details

2. Software configuration of proposed system

The Driving License system is an IoT-based system using it as a technology for its implementation and also using cloud computing as another necessary implementational technological model for the proposed mechanism of Driving License.

In the proposed mechanism model for Driving License, RFID reader as a SMART DL, when insert into a vehicle holder containing all the information of the DL holder, vehicle, vehicle owner, location gets transmitted to the processor (ARDUINO) and the cloud (server) as well. The android application/web portal is also containing data, linked to the server (cloud) about DL holder, vehicle, location, owner. When the database stored in CLOUD, matches appropriately to the information from the RFID reader, the engine of the vehicle starts & if not, it doesn't start. Hence, a valid DL-holder, and the valid details of vehicle should get matched for starting a vehicle. For tracking purposes, GPS sends the live location for security purposes.[23]

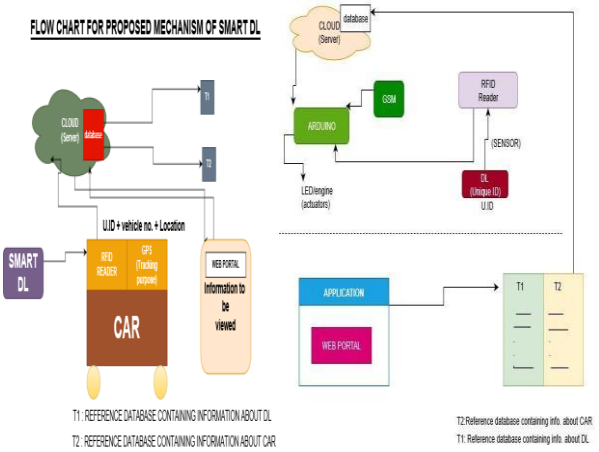

Fig.3 Flow Chart for Proposed Mechanism of Smart Driving License

IoT:

IOT abbreviated as 'Internet of Things' also referred to 'industrial internet' has occupied a distinctive position as current technology paradigm, visualized as a network existing globally for several devices & machinery, capable of associating with each other through various inter-connection. The IoT is acknowledged as one of the influential technologies in future aspects and attaining huge attention from a wide variety of industries, with various business application, logistics, analytics, information sharing & collaboration and enterprise-applications. All this has resulted in internet for communication and attaining different services over devices, and all such technological developments have made it truly possible for all of us today. result for handling large data streams and process them for various unique number of IoT devices in real-time. This technology has been increasingly incorporated via different companies as cost effective way for making resources and services available continuously when required. Through, as a consequence of service & halts at cloud provides, attaining operational reliability for resources is a major breakthrough of cloud computing.

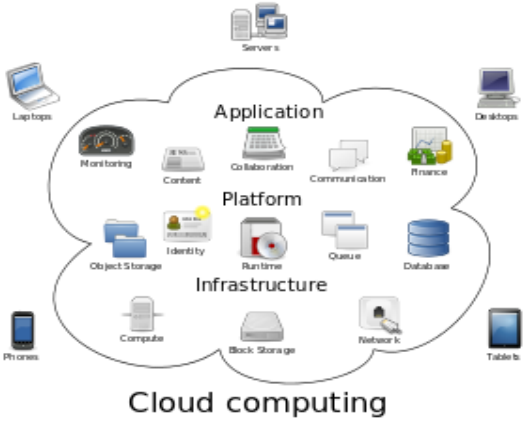

Fig.5 Cloud Computing

GPS:

The GPS stands for Global Positioning System, which is a satellite-based navigation system, used for providing accurate location, time and velocity information to many suitably equipped users. The main objective is GPS is for tracking

vehicles for security purposes. It functions by transmitting signals and uses a network of satellites which allow people with GPS receivers to track their location anywhere in the earth. It has many applications in several areas like mapping, weather forecasts, vehicle-location, equipment, military, and many other [25]

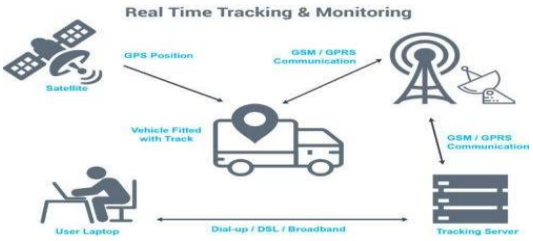

Fig.6 GPS

III METHODOLOGY

The IoT-based Driving License Project is designed to automate and enhance the process of issuing driving licenses by integrating smart technologies for real-time monitoring and evaluation. The system consists of a vehicle equipped with various sensors such as GPS, accelerometer, ultrasonic sensors, and an IoT microcontroller (like NodeMCU or Arduino). These sensors collect data during the driving test, monitoring key parameters such as speed, distance from obstacles, vehicle movement patterns, and route adherence. The collected data is transmitted in real-time to a central server or cloud platform via Wi-Fi. A web or mobile application is used by the examiner to monitor the test live and access a detailed performance report. If the candidate completes the driving test without violating predefined conditions (e.g., over speeding, route deviation, abrupt braking), [15] the system can automatically mark the candidate as passed. This methodology ensures transparency, reduces human bias, and enables data-driven decision-making in issuing driving licenses.The hardware setup is built on an embedded IoT platform, typically involving NodeMCU or Arduino Uno, interfaced with sensors and modules. The ultrasonic sensor is used to detect the distance between the vehicle and nearby obstacles, while the accelerometer monitors sudden movements such as harsh braking or erratic steering. A GPS module is integrated to track the route followed by the candidate and verify if they stayed within the designated path. The microcontroller processes sensor inputs and sends the data to the cloud using Wi-Fi or GSM modules. This setup is powered by a portable battery to ensure smooth operation during the driving test.On the software side, a cloud database such as Firebase or Thing speak is used to store and analyze sensor data in real-time. A custom-built web dashboard or mobile application is developed for examiners to track the candidate's progress. The application provides alerts in case of rule violations, such as crossing speed limits or getting too close to obstacles. Based on predefined rules and thresholds, the system calculates the performance score and provides an automated result. This reduces human error and speeds up the decision-making process, making the test fairer and more consistent. Finally, the system is tested through multiple trials with different driving candidates to ensure its accuracy and reliability. Data from each test is reviewed to fine-tune the threshold values for various parameters. The feedback from these trials is used to improve both hardware and software components. Once the system performs consistently, it is ready for deployment in real-world driving schools or transport offices. This IoT-based approach aims to modernize traditional driving tests, improve road safety, and make the licensing process more transparent and efficient. IoT-based driving license project begins with a requirements analysis to define the system's objectives, such as enhancing security, improving verification, and reducing fraud. This is followed by system design, where the architecture is established, including the IoT-enabled license (e.g., smart card, embedded chip), reader devices, communication protocols, and a centralized database. The development phase involves creating the hardware and software components, integrating them, and building user interfaces for both authorities and citizens. Testing and validation are crucial, encompassing unit, integration, and system testing, as well as pilot programs to ensure reliability and accuracy. Finally, deployment and maintenance include rolling out the system, training personnel, and providing ongoing support and updates to maintain system effectiveness and security.

IV CONCLUSION

The IoT-based Driving License Detection System is an innovative solution that automates the process of identifying and verifying driving licenses using IoT devices, Optical Character Recognition (OCR), and machine learning techniques. By leveraging image processing algorithms, deep learning models, and cloud-based validation, this system ensures fast, accurate, and secure authentication of driving licenses in real-time. This technology significantly reduces manual efforts in license verification, making it ideal for applications in traffic law enforcement, smart checkpoints, vehicle rentals, and online identity verification systems. The integration of IoT and cloud computing allows for remote verification and data storage, improving accessibility and efficiency. Additionally, security measures such as RSA encryption and MQTT communication protocols ensure that sensitive license information is transmitted securely. In conclusion, this system enhances accuracy, speed, and reliability in driving license detection, offering a cost-effective and scalable solution for modern transportation and law enforcement agencies. Future improvements could include AI-based fraud detection, QR code integration, and blockchain-based verification to further strengthen the authenticity and security of driving license validation processes.

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