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IOT Based Logistic Vehicle Tracking, Theft Detection And Fire Safety System

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Abstract: To be able to increase the effectiveness of logistics operations and guarantee the security of people and assets, the paper suggests an Internet of Things (IoT)-based Logistic Tracking, Goods Theft, and Fire Safety System. The system monitors the logistics process and looks for fire hazards and probable theft of items using a network of sensors and smart algorithms. The car tracking system has the ability to locate the vehicle, detect gas leaks, spot fires, and report vehicle accidents while simultaneously sending an SMS alert message to the owners of the vehicle over a GSM network. This system can be built as a backup compartment inside the vehicles to deter theft, make it simple to locate them, and guard against other disaster-related problems. The device's primary methodology is using the Internet of Things to track the movements of vehicles, detect fires, and respond quickly with a goods theft detection system.

Index Terms - Logistic vehicle tracking, Goods Theft, Fire safety ,GPS, GSM, IOT.

I. INTRODUCTION

People wanted to know the locations of each vehicle all times, hence vehicle tracking systems were originally used in the shipping sector. However, with technology advancing quickly nowadays, there are several ways to track and provide real-time car whereabouts using automated vehicle tracking systems. In order to offer users a better service and a more affordable option for tracking their vehicles and cargo, this paper suggests a vehicle tracking system that uses sensors and a smartphone application.

The availability of many different applications to fulfil the demands of various users is the primary factor for this increased development in Smartphone usage. In our project, in addition to the in-vehicle tracking gadget, we also designed a Smartphone application.

Theft of items is detectable, and anytime a fire is detected, an automated water sprinkler system in the car is turned ON and a warning is delivered to the owner ..The users may track the positions of their vehicles in real-time thanks to the GPS, which provides the most convenience. with effective anti-theft technology and a fire extinguisher system.

II. LITRATURE REVIEW

Literature review includes some of the works which arepublished previous with IEEE guidelines. Some of theseworks are mentioned below:

A. Design of an anti-theft alarm system for vehicles using IOT.

Automobiles have become one of the most sought after targets for criminals due to their worldwide popularity. Crime is reflected in the statistics, which show that over the years, the crime rate of vehicle theft has been on the rise. As part of the fight against this crime, the vehicles come with certain systems incorporated to avoid this type of situations; obtaining many outstanding results. In this research project, a mechanism that permits via the application was created. of the Internet of Things (IoT).

B. Microcontroller-based Employing a GPS and GSM module, an automotive tracking system with audio surveillance

To establish a system that can track the whereabouts of cars and to offer an alternative solution to security issues faced by car owners, an automobile tracking system with audio surveillance is being developed utilising GPS and GSM modules. We utilise a GSM, GPS, and microcontroller device. The concept is an embedded programme that will track a moving vehicle continually and provide status updates as needed.

C. Using GPS and GSM technologies, a real-time vehicle tracking system

An electronic device put in a vehicle that allows the owner or a third party to follow the whereabouts of the vehicle is called a vehicle tracking system. This study suggested developing a GPS and GSM-based car tracking system, which would be the most affordable method of tracking vehicles and serve as an anti-theft system. It is an embedded system that uses the Global Positioning System (GPS) and the Global System for Mobile Communication (GSM) to monitor and locate any vehicle.

D. Using a microcontroller to design and prototype a sensor-based anti-theft security system.

A microcontroller-based solar-powered anti-theft automated security system with arrays of sensors to detect potential entry occurrences is designed to address the safety of the house or other facility. Based on information from its interfaced sensors (Motion Sensor, Fire Sensor, and Glass-break Sensor), the developed system generates three different alerts (Buzzer, bi-color LED, and SMS) with a security breach warning through an LCD. At mega8 is the microcontroller that manages every element of the system.

E. Using a microcontroller and gsm technology, design an anti-theft/cable cut real-time alarm system for copper cables

Using a microcontroller and GSM technology, a real-time alarm system against theft and cable cuts was designed. The electrical circuit wire connection is used in the detection phase to measure the voltage drop of the cable inside the digital input port of the microcontroller. The authority mobile phone receives the position of the cable severed immediately from the GSM wireless modem. The wireless modem and the detecting device are controlled by the microcontroller SK40C with Microchip PIC16F887. Bi-color LED, a buzzer, and SMS.The gadget can locate a cable cut and show its location on the LCD screen in addition to wirelessly communicating the location of the cable break to the authority cell phone through SMS.

III. EXISTING SYSTEM

Utilizing the logistic maintenance system (LMS) as a tool to create, share, monitor, and manage the vehicle's position using GPS to send coordinates. The most important technology that is projected to significantly change many aspects of the future is the Internet of Things (IoT). We provide a framework for an IoT-enhanced LMS of the future in this paper. We go over several aspects of LMS functionality that will be influenced by IoT as well as the predicted enhancements and changes that IoT will make to LMS functionality.

IV. PROPOSED SYSTEM

A controller, a fire sensor, a water pump, a pressure sensor, a GSM system, and a GPS system make up the vehicle unit. Each and every car should have a vehicle unit placed in it. A controller, fire sensor, water pump, GSM, and GPS system make up the vehicle unit. If the logistics management authority kept their phone in silent mode, we would also play a customized voice message, at which point the owner could ask to determine where exactly the fire accident region and only water would be automatically sprayed. The vehicle unit installed in the vehicle detects the fire attack on goods and sends an alert message to the authority as fire detected.

If the logistics management authority's phone was in quiet mode when the gas attack occurred, we would also play a personalized audio message. The gas attack in the vehicle then sends an alert message to the logistics management authority as gas leakage detected. The vehicle's pressure sensor will constantly scan for any significant drops in pressure. The controller receives the sensed data, and if the pressure falls below the threshold, a message stating that goods theft has been detected is sent to the appropriate authorities along with the prompt activation of a buzzer.

The GPS module determines the vehicle's present location the accident site and provides that information to the IOT device. The system consists of tracking devices mounted on vehicle

V. BLOCK DIAGRAM & WORKING

The connection and necessary elements for a comprehensive architecture are shown in the image below. GPS, GSM, IOT, any gas sensors (depending on the goods or gas that logistics vehicles carry), load cell, fire sensor, water pump, buzzer, and goods theft prevention are all related to the tracking of logistics vehicles. These components go into creating this prototype.

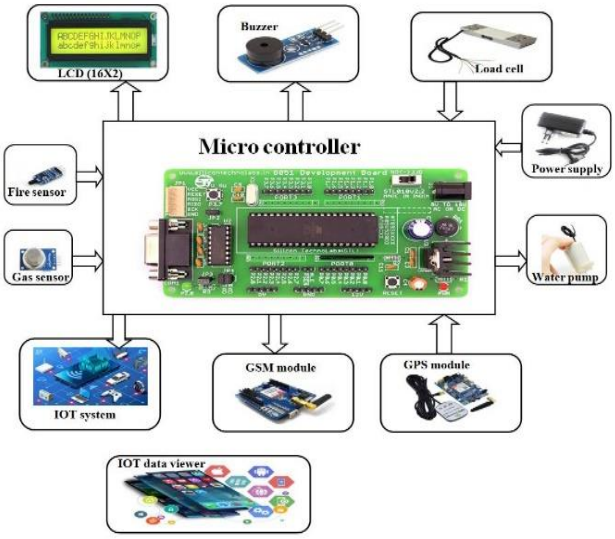

Figure 1. Architecture of the system

LCD 16*2:

With a 16x2 LCD, there are 2 lines that can each display 16 characters. Each character on this LCD is presented using a 5x7 pixel matrix. The 224 different characters and symbols that can be displayed on the 16 x 2 intelligent alphanumeric dot matrix display. The Command and Data registers on this LCD are its two registers.

Buzzer

Buzzers are electric sound-producing instruments. They can be divided into two categories: Piezo buzzers and magnetic buzzers. DC voltage typically powers them. They have various designs and functions, and as a result, they may make a variety of noises!

Load cell

Many different industries that require precise measurements use scale load cells or load cell sensors. Tanks, jars, hoppers, and conveyors' weights are precisely measured by load cells. Load cells are designed to resist the rigors of numerous demanding industrial applications.

Power supply

Both the power usage and the gadget performance are increasing. Built-in batteries are just unable to keep up. What about further smart devices? Some smart home appliances have power-grid plugs. These include things like network routers, security cameras, metering and control equipment (heating, lighting, etc.), and more. However, a lot of IoT gadgets aren't built to connect to the power network. They must make use of independent power systems.

Water pump

Small water pump for a garden fountain. This compact, inexpensive submersible pump motor can be powered by a 3 to 6V power source. It has a maximum flow rate of 120 liters per hour and uses relatively little electricity (220mA). You only need to attach a tube pipe to the motor output, submerge it in water, and then power it. Make sure the motor is never submerged beneath the water. Dry running will make noise and may cause the motor to heat up.

Fire sensor

A flame sensor is a type of sensor that responds most strongly to ambient light. This is the reason why flame alarms employ this e. When the light source's wavelength is between 760 and 1100 nanometers, this sensor can detect flames. This sensor outputs either an analogue signal or a digital signal. These sensors serve as a flame alert in firefighting robots.

Gas sensor

Electronic devices called gas sensors (sometimes referred to as gas detectors) are used to locate and classify various gases. They are frequently employed to gauge gas concentrations and identify explosive or dangerous gases. Gas sensors are used in manufacturing facilities and factories to find gas leaks and to detect smoke and carbon monoxide in residential buildings. Gas sensors come in a wide range of sizes (portable and fixed), sensing capabilities, and ranges .

GSM module

A device that employs GSM mobile telephone technology to offer a wireless data connectivity to a network is known as a GSM modem or GSM module. Mobile phones and other devices that communicate with mobile telephone networks use GSM modems.

GPS module

The global positioning system (GPS), also known as Navigation System with Time and Ranging GPS, is a satellite-based system that uses satellites and ground stations to measure and compute its position on Earth. GPS receivers are typically used in smartphones, fleet management systems, military equipment, etc. for tracking or finding location.

VI. RESULTS

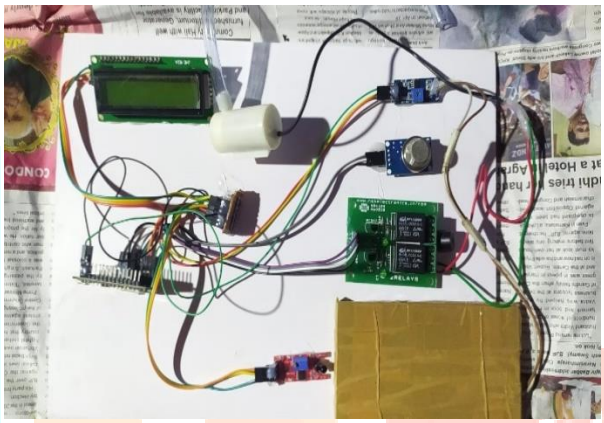

Figure 2. Model of IOT Based Logistic Vehicle Tracking ,Theft Detection And Fire Safety System

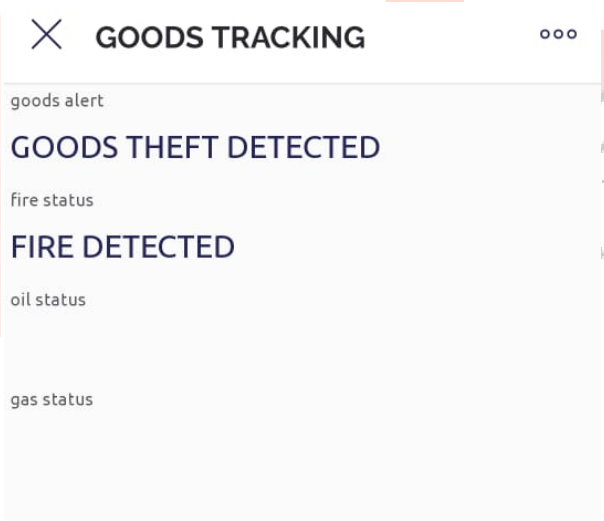

Figure 3. IOT Blynk Dashboard for Notification
Which notifies the owner the movement of the vehicle for tracking purpose.

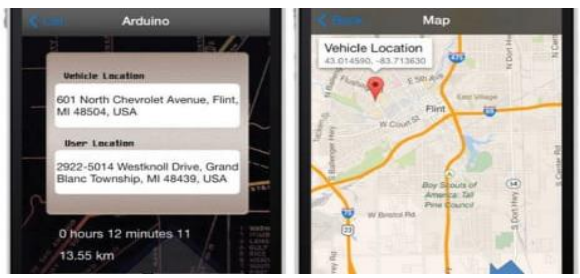

Figure 4. The GPS interface which helps the owner to locate the vehicle at real time.

VII. CONCLUSION

There are numerous issues with the periodic maintenance process, making the switch to predictive maintenance vital. However, in a field where there are many vehicle, performing predictive maintenance is rather difficult. In this study, a prototype system is developed that can assist the service manager in keeping track of each vehicle's present condition.

VIII. FUTURE ENHANCEMENT

IoT's potential in the logistics sector in the future. IoT use in the logistics and transportation sectors is anticipated to soar in the future. More remote information will be available to fleet managers and operators, and they will utilize it to cut costs, minimize human error, increase supply chain productivity, and automate end-to-end logistical procedures.

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