Cab Management System

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ABSTRACT: *We in this project use a PIC controller as the main controller within a Black Box which is placed in an automobile, for example a cab/taxi. This PIC controller is interfaced with different sensors like Alcohol sensor, to record the data of alcohol content in the breath of driver while ignition. Biometric sensor, for the record of which driver is/was driving which car. And piezoelectric sensor, for the record of intensity level of the accidents, by measurement of the frequency generated by sensor during the accident. All these data are stored in a mass storage which is present in a black box. A GPS module will be interfaced to record the Latitude and Longitude of the current location of the cab. And a GSM module is also interfaced so as to send the last recorded data of any sensor when requested by the server. All these data's are displayed on LCD.*
Keywords: PIC controller, Black Box, Biometric Sensor, Piezoelectric Sensor, Alcohol Sensor, GPS, GSM

I. INTRODUCTION

With rapidly change in computing and information technologies, much of the technologies are finding way into vehicles. They are undergoing dramatic changes in their capabilities and how they interact with the drivers. Nowadays, everyone want flexibility in their lives. However, flexibility means dealing with the changes in requirements that can produce unpredictable and unsafe operations. Due to these flexibilities, accidents may occur. Thus, everyone thinks of an intelligent system that needs to be developed to overcome these mistakes. However, advanced in-vehicle information systems provide vehicles with different types and levels of intelligence to assist the driver. Although some vehicles have provisions for deciding to either generate warnings for the human driver or to control the vehicle autonomously, companies usually makes these decisions in real time with only incomplete information. So, it's important that human drivers still have some control over the vehicle. The introduction into the vehicle design has practically allowed symbiotic relationship between the driver and vehicle by providing a sophisticated & intelligent driver-vehicle interface through an intelligent information network. So a system needs to be proposed due to which mistakes done by driver are eliminated. However, most of the intelligent car systems are not affordable to everyone. So, a system needs to be developed which can be implemented in every car.This project represents the development of such a recording framework also known as Black Box, for the vehicle, which consists of a joint mechanism between the driver and vehicle for perception, recording and updating these records at server.

1.2 What is Black Box?

A Black Box is a safety and an electronic recording device that can be placed in a vehicles for the purpose of aiding an investigation of accidents and incidents. The system in which any type of automobile vehicle at any condition can be viewed in terms of its output parameters like different electronic sensors and input parameters like control instructions, without any knowledge of its internal workings, will be also referred as a Black Box. The Black Box is a device that preserves the recent history of the flight through the recording of dozens of parameters collected several times per second. It may contain many Electronic devices like a microcontroller or a mass storage device like SD Cards or Hard drives or different sensors, recorder for sounds of the environment.

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Figure 1.1: A Black Box Found In Airplanes
(Courtesy of www.science.howstuffworks.com)

1.2 Properties of Black Box:-
→Prioritization of messages.
→ Guarantee of latency times.
→ Configuration flexibility.
→ Uses "Non Return to Zero (NRZ)" coding.
→ Multitasker capabilities.
→ Distinction between temporary errors and permanent failures of nodes.
→ Error detection and signaling.

1.4 Application:-
→ Used as a Recording System to inspect the Collision of automotive vehicles.
→ Can be implemented in Robotic Applications.
→ Can also be used in large vehicles like Trucks and buses.
→ Can also be implemented in Aircraft and aerospace electronics.
→ Can be used in Passenger and cargo trains.

1.5 Objective of the Project:-
→ To establish connection between different sensors to the controller.
→ To record the data fetched from the sensors and then to record them in a storage device.
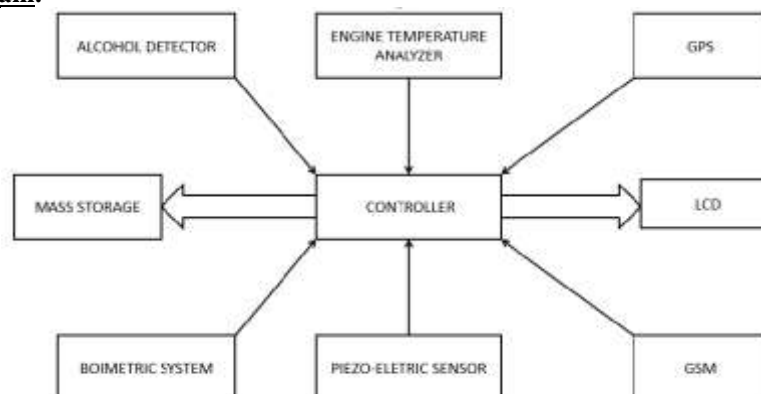
II. METHOLODOGY

2.1 Block Diagram:-

Figure 2-1: Block Diagram

2.2 Description of the Block Diagram:-

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2.2.1 Controller:-

→In this project, PIC 18F4520 controller is used. The purpose of this controller is to depict the application of the project.

2.2.2 Power Supply:-

→Power supply circuit will convert the AC mains voltage supply to DC voltage i.e. from 240V, 50 Hz to 5V (for all Sensors and PIC Controller) DC supply.

2.2.2 Global Positioning System (GPS):-

→The GPS is used to track the location of the cab and record its latitude and longitude to the mass storage.

2.2.4 Global System for Mobile Communication (GSM):-

→Upon the server request, this GSM module will be used to fetch the data from mass storage and send the latest/ last updated record to it.

2.2.5 Alcohol Sensor:-

→Here Alcohol Sensor is used to detect whether a driver is drunken or not and record this in to the mass storage.

2.2.6 Piezoelectric Sensor:-

→This sensor is used as an Accident Alert System for the cabs services and records the frequency of vibration into mass storage and will alert the server when any major change in frequency is observed.

2.2.7 Biometric Sensor:-

→This is used for the authentication of the driver and record the employ code in the mass storage.

2.2.8 Engine Temperature Analyzer:-

→This sensor is used to detect the engine temperature in real time and record this measured temperature in Celsius in the mass storage.

2.2.9 LCD:-

→LCD is the technology used for displays in notebook and other smaller computers. It is used to display the latest recorded status/ information regarding all above sensors and GPS.
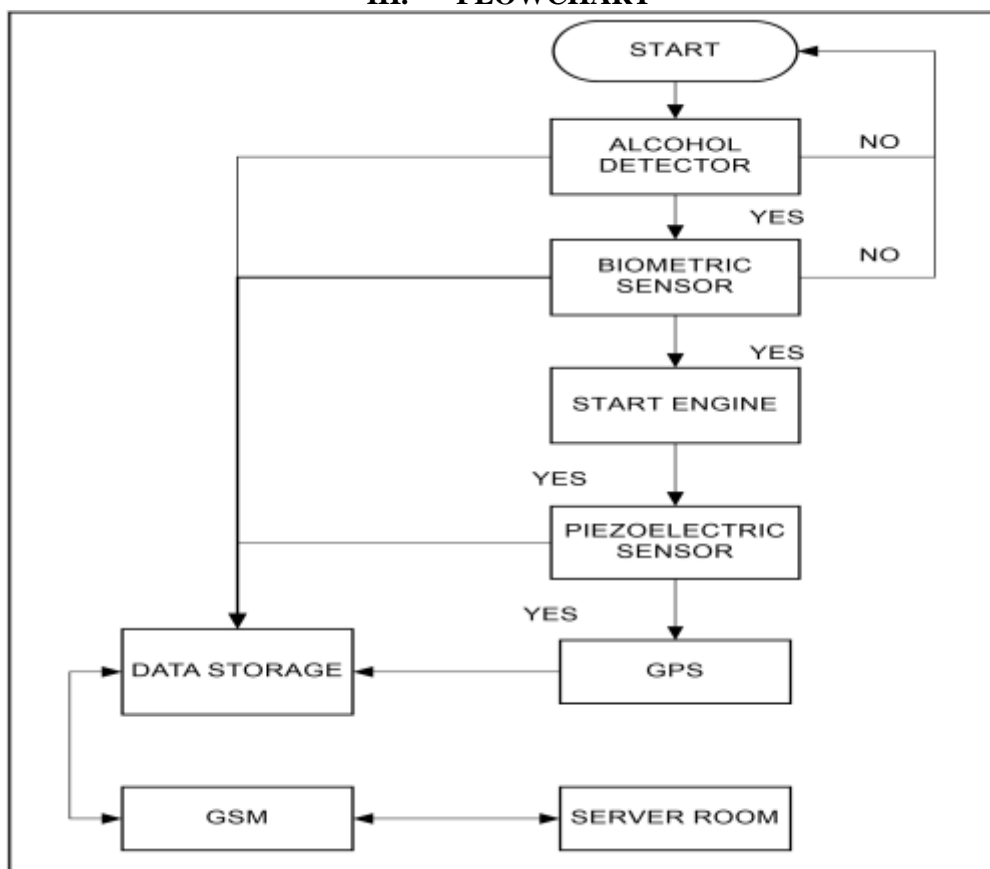
III.   FLOWCHART

Figure 3.1: Flowchart Of The Project

IV.   CONCLUSION

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At the end of the project, we would be able to implement Black Box system in cabs, which will be able to record the data from the used sensors, making the cabs system smart and easy manageable.

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