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ANALYZE AND DELIVER REACTOR SAFETY HEALTHCARE POLICIES FOR VARIOUS AUTOMOTIVE IOT-ENABLED DEVICES

SIVAKAMI.R^{1*}, KANNADASAN .B² AND BHASKER PANT³

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- 1:** Associate Professor in Computer Science and Engineering at Sona College of Technology - Engineering Colleges, Salem, Tamilnadu, India
- 2:** Assistant Professor in Civil Engineering at B.S.Abdur Rahman Crescent Institute of Science and Technology, GST Road, Vandalur Chennai, Tamilnadu, India
- 3:** Professor, Department of Computer Science & Engineering, Graphic Era Deemed to be University, Dehradun, Uttarakhand, India

***Corresponding Author: Sivakami R; E Mail: shivasona07@gmail.com**

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ABSTRACT

The Internet of Things (IoT) is simplifying human existence in every way. It has incomprehensible uses. This same IoT is an elusive notion that integrates all equipment, techniques, and appliances via the Internet to transmit information with itself. IoT is used in a variety of sectors, including autonomous traffic and associated protection, safety, navigational, and fuel efficiency. This project proposes a method for achieving the desired result of having saved special human lives lost in traffic accidents. In this frame of reference, researchers recommend implementing a system, which we are currently designing and implementing, that not only prevents car crashes but also takes appropriate action when they occur. This study seeks to address the problems that lead to fatal accidents while simultaneously including reactor safety measures. It's difficult to envision life without mass transit; it allows people to travel to far-flung locations and cuts commute time in half. However, the issues that arise as a result of the increasing amount of cars on the road today cannot be overlooked. The initiative seeks to

eliminate most of the most common causes of vehicle accidents while also including post-crash procedures.

Keywords: Smart car protection; monitoring system; Iot technology; smart vehicles; Microprocessors; Reactor safety healthcare policies

INTRODUCTION

Before the invention of the steering column, rudimentary men lived in isolation from other tribes and communities. They were only able to get to work inside of the walking range. The invention of the controls revolutionized early life. With the period, his/her socioeconomic demarcation line grew as well. With time, prehistoric man progressed into a civilized ordinary person who refined the wheel's configuration. Commuting has now become an indispensable fact of life as a result of technological advancements [1].

Despite its numerous benefits and applications, we must address the major issue it brings with it, which is the loss of human life. According to Central Statistics Office (CSO) Integration, India's commercial vehicle registrations increased from 114 million in 2009 to 159 million in 2012. According to the statistics compiled by the Delhi Quantitative Hand Book, the number of total motorized vehicles increased from 0.534 million to .877 million, in the years 2014–2016, resulting in an increment in the number of traffic incidents and, as a result,

the number of fatalities corresponding increase [2].

According to data provided by the National Criminal Regional office and the Department of Road Transport and Highway, upwards of 100,000 people died as a result of road rage in 2013. According to India Spend, notwithstanding the endeavors of public service announcements, road markings, and traffic regulations, motor collisions are taken into account for 83 percent of the overall congested roads personal tragedies in 2015 [3].

The IoT is simplifying contemporary civilization in every way. It has incomprehensible uses. The Internet of Things (IoT) is an architectural concept that links all objects, tools, and technologies through the Internet to allow them to interact with each other and. Telecommunications, networking capabilities, and embedding techniques are all used. Different detectors and surveillance equipment are linked together to provide the expected results, making life simpler. IoT is used in various sectors such as intelligent automobiles and

associated comfort, protection, navigating, and energy economy [4]. This proposal proposes a method for achieving the intended result of saving valuable human lives lost in traffic accidents. We are developing and implementing a system in the developed framework that not only prevents catastrophes but also takes appropriate action when they occur.

This study seeks to address the problems that lead to fatal accidents while simultaneously including safety measures. It's hard to picture life without transportation; it allows people to travel to far-flung locations and cuts travel time in half. However, the issues that arise as a result of the growing quantity of cars on the roadway can indeed be overlooked. The initiative seeks to eliminate some of the more common causes of vehicle accidents while also including post-crash procedures. The following are the causes of automobile accidents that are being studied in this project:

The usage of seat belts is treated with casualness.

- Operating a motor vehicle when inebriated.
- Drowsy driving (distracted driving).
- Notification of the event to family and friends is a post-accident step included in the project.

The following are the objectives of the planning application:

- Use a gas sensor to ensure the driver is inebriated before turning on the ignition. Only because the driver is not inebriated will the engine start.
- Eye-blink sensors are installed in the vehicle to guarantee that the driver is not sleepy.
- To avoid a collision, a closeness sensor is used to measure an obstruction in the route the adds great value to the vehicle.
- To guarantee post-crash safety, a GPS-based alert system is used to determine the geographic position of the wrecked car, which is then transmitted to an accountable and authorized person. The event is discovered thanks to the usage of a sensor module.

Literature Survey

The focus is on creating a monochromatic vision, self-contained automatic model using the Raspberry Pi as a processing microprocessor [5]. To provide basic related to the current world to the car, a slightly elevated camera and an ultrasonic sensor were used. The vehicle is designed to safely and completely complete the task at hand, eliminating the risk of human error. Several current computations, such as route identification and obstruction location, are

combined to provide the auto productivity and boost [6]. The article focuses on the Raspberry Pi as a platform for implementing the system because of the computer's perception.

In [7] suggested the advancement of an accident prevention system based on accelerometers. The Raspberry Pi (ARM11) is used to rapidly acquire the management and the accelerometer is used to find events in this architecture. If an incident happens, a notification is delivered to authorized people so that they may respond quickly and effectively to preserve lives and minimize damage. Because the system only includes one component and ignores the other fatal causes, the suggested model is ineffective and insufficient. The study [8] presented a convincing method for a vehicle's collision avoidance configuration to detect the obstacles present in the car's front and blind area. Because as the separation between the car and the barrier decreases and is represented on a computer display, the driver is alerted by a buzzing and a Light Emitting Diode sign.

If the item is moving or motionless about the car, the ultrasound sensor detects this. This technology is useful for detecting cars, bicycles, motorbikes, and people who cross in front of the car on the lateral side.

The suggested system is implemented in the article utilizing a Pic Microcontroller as the microprocessor, although functionality is limited out of the box.

The author [9] presented a reliable vehicle accident avoidance system that includes alcohol detecting. This device is capable of alerting the driver to the quantity of alcohol ingested and displaying the information on a Digital display [10]. It also emits a warning through a siren to ensure the motorist is aware of his or her predicament as well as to alert those in the surrounding zone [11]. The safety feature suggested by this architecture is that a driver in an exceptionally abnormal condition of inebriation is not permitted to operate a vehicle because the start system will be turned off [12]. This technique works by instilling fear in the motorist over his situation, which is hilarious since the person will be too distracted to do anything about it. The concept is innovative, but it is unworkable in practice [13-14].

Throughout an accident, the present system displays a method for collecting the vehicle's location coordinates. This existing framework also allows for the detection of which was before with an element. However, it does not address the motives that lead to these tragic incidents. It does not address

damage induced by driving under the influence using an alcohol/gas sensor, nor does it address the failure to wear seat restraints. Furthermore, these frameworks do not ensure whether the driver is fully alert or sleepy. For the very same reason, no eye-blink sensor is used. Furthermore, the present structure needs human intervention. The interventions to address, on the other hand, are fully automated and address the limitations of the present approach.

Proposed Model

An automated process based on cloud Computing of Information (IoT) and the Communication Module like GSM is used in the suggested system

[7] Whenever the device is turned on, a pressure sensor checks the seat belt to

prevent an accident. The engine is switched off if the operator is not wearing seatbelts. The alcohol sensor then comes into action, checking for alcohol use and turning off the engine if it is positive. Following these two primary duties [8] the eyeblink detector, vibrating detector [9], and thermal imaging (IR) sensor [10] are used to monitor for fatigue, collision, and obstructions. If there is an accident and the accelerometer is turned on, a message is delivered to the specified contact. The buzzer sounds to alert the driver whether there's an impediment present [11]. The eye movements sensor detects sleepiness or drowsiness in the driver and turns it off engines [12].

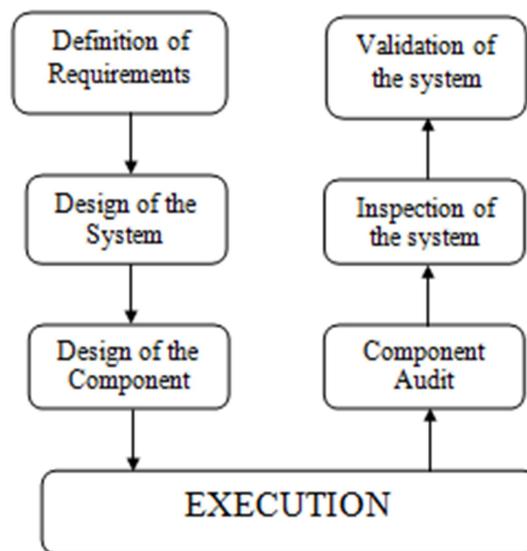


Figure 1: Proposed Framework

- 1) To send position coordinates, the system uses GSM technology to communicate a coding pattern.
- 2) The structure is predicated on an Arduino Uno.
- 3) The solution should be designed to communicate even when it is physically separated.
- 4) An infrared detector, accelerometer, liquor sensor, ocular detector, and pressure gauge are all used in the system.
- 5) The composition of different technology is as indicated in Figure 1 to put all of the elements together again and implement them.

Iterative growth is the application system paradigm that will fit the operation and connects with this project's requirements. Figure 2 depicts the processes involved in adopting the Agile development paradigm in a block diagram. The whole requirement list is split down into several builds under the Agile development methodology shown in Figures 3&4 respectively. Various development phases take occur here, resulting in a stepwise waterfall development cycle. It was broken down into smaller chunks, creating them simpler to manage and execute. Strategy, requirements analysis, design, implementation or construction, and testing are all phases that each module goes through. We obtain a functioning model early

in the product development cycle since we get a running description of the scheme at the end of the primary iteration. Each iteration adds new modules to the model, allowing it to integrate more functionalities than the previous one.

This process is repeated until the entire system is created. Those repetitions would stay sealed till the ultimate prototype of the software is enhanced as well as the intended outcome is attained. The results will then be used to conduct the required actions, that are subsequently power can be transmitted into to the program to offer a suitable reaction to following occurrences since the project employs a real-time checking and management systems. The operation is repetitious and continuous, so it takes place every time a driver takes into the car.

Design and Analysis

Underneath the title system design, the organization of the concept to execute the performance specifications is explained. The network architectural part of this research proposal elucidates the organization of the concept to execute the non-functional needs. The following are the critical functional criteria for achieving the project's goal:

- 1) The vehicle's computer solution should be designed to tell if the driver is wearing his or her safety harness.

2) The installed technology having the capability of determining not if the driver has ingested alcoholic.

3) The automobile solution should be designed to detect the driver's thinking capacity and decide whether or not he is drowsy.

4) The vehicular solution should be designed to detect if the car is approaching the automobile in front of it too closely.

5) The automobile system should be able to detect if an occurrence has indeed occurred and if so, should be able to transmit the location information of the occurrence to a respectable citizen using GSM technology.

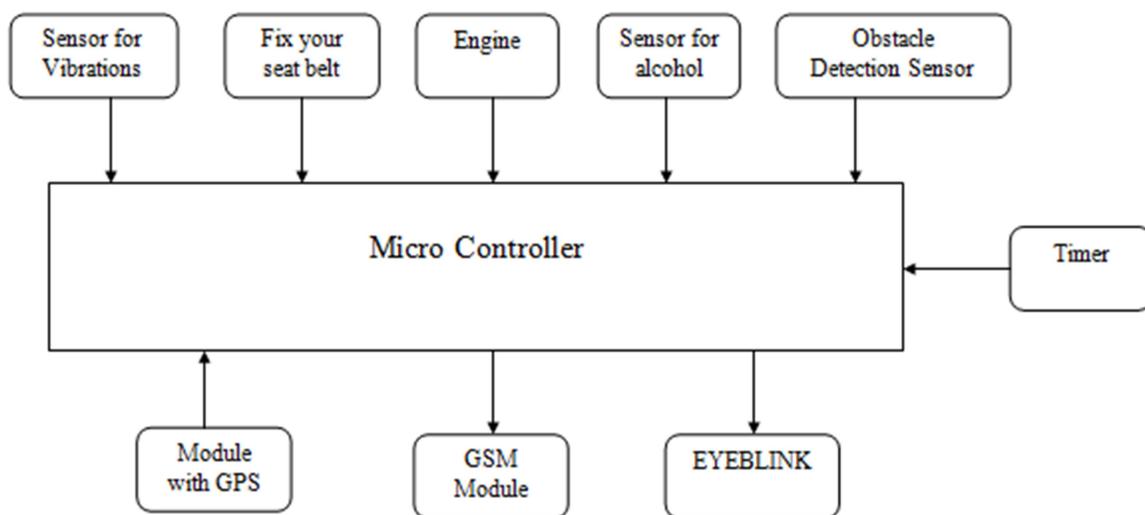


Figure 2: Proposed Architecture

This initiative focuses on issues that lead to accidents and tries to prevent them. This study looks into the different factors that contribute to deadly accidents. Highways are unexpected, and there may be deadly catastrophes at every bend of the road, and one cannot depend on the functioning judgment of other vehicles or pedestrians. It is necessary to be the personality of the surrounding surroundings and cars. So that every life has worth, the motorist should take

all measures and be aware that there are people on the road.

Accidents are often caused by the driver's loss of focus on the road as a result of some preoccupation or sleep deprivation. The methods described are intended to be provided by the product: (a) External influences should not cause the system to be damaged. (b) The architecture would have to be sensitive enough to detect and find issues with the components explicitly. (c) The

identified problem should be notified to the system.

The expectations and assumptions are defined right from the start to provide us a clear picture of how the product will be implemented: (a) A suitable GPS module is required to provide precise geographical

position coordinates. (b) The motorist should just be wearing glasses that have an eye-blink sensor built-in. (c) The device should have been linked to the Internet at all times. (d) Numerous laser scanners may be strategically placed.

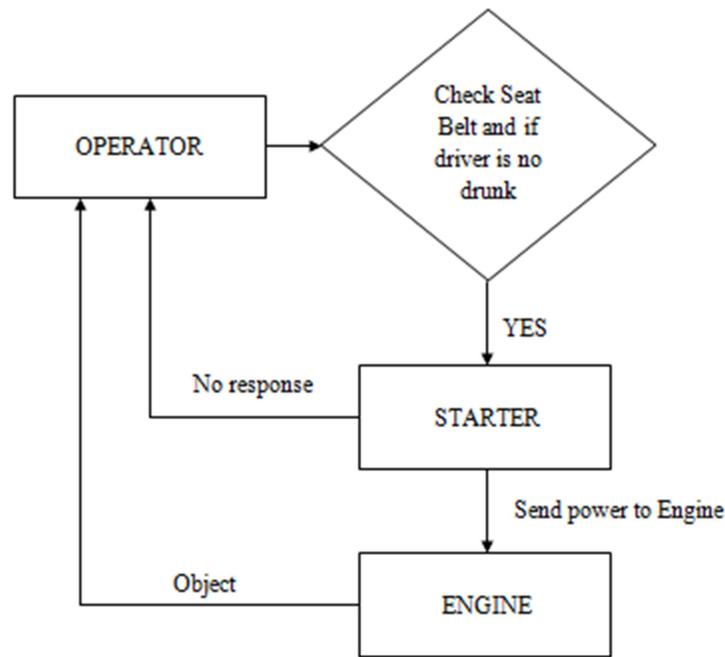


Figure 3: Work flowchart

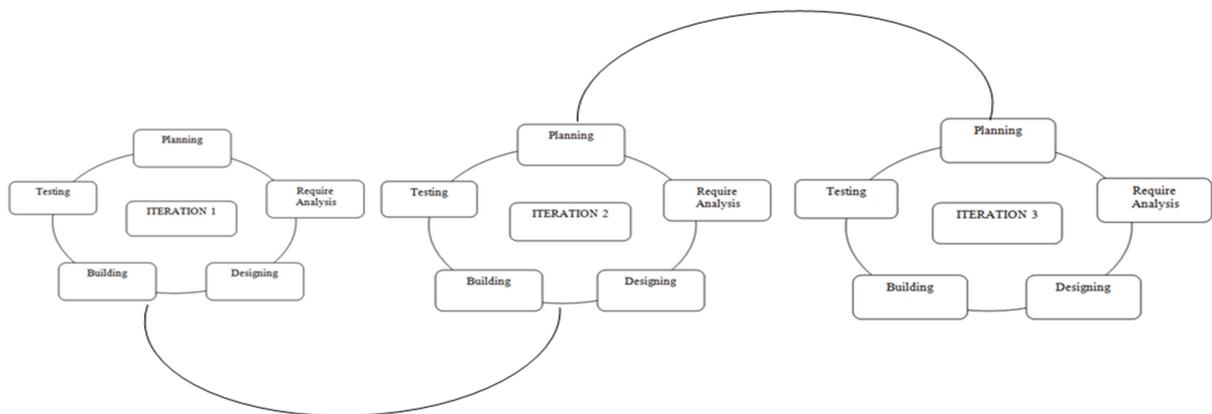


Figure 4: Agile Architecture

The mobile Application software is critical to the Smart Automotive Protection and Safety Platform's performance. The following are the structural elements used in the Intelligent Vehicles Protection and Warning System project. Uno board (Arduino): The microprocessor and microcontroller in this project are an Arduino Uno.

All of the electrochemical sensors are connected to this Arduino microcontroller, and the microprocessor accepts the data and calculating a suitable output. Worldwide vibrating detector: This research made use of a displacement sensor to detect car accidents and crashes. The information from the display is transmitted to the Microcontroller, which analyzes it and generates a corresponding outcome. In this study, a psychoactive drugs detector is employed to determine the amount of liquor in the breathing. The information from the scanners is transferred to the Micro-controller board, which analyzes this and generates a particular answer.

The sensor of eyelid blinks: An eye-blink detector is included in this application to identify the driver's tiredness. The input from the projectors is transferred to a Microcontroller circuit, that analyzes this and generates a specified result. Buzzer: The

buzzer is used in this project to notify and raise the alarm and the nearby areas. The Arduino Microcontroller sends the output to the buzzer based on the calculation. Global Positioning System component: The Global Positioning System module is used in this project to monitor the positions of the place where another project is located. The data first from the detector is transferred to an Arduino Microcontroller chip, that analyzes this and outputs a specified result. GSM module: Throughout this application, the GSM module is utilized to send the position information received by that of the global positioning (GPS). The scanner's data is transferred to the Microcontroller chip that analyzes this and generates a result. This demonstration will show you how to connect GSM technology to Toradex components.

RESULTS AND DISCUSSION

In comparison to other individual equipment, the empirical findings reveal that the recommended model offers us a superior outcome. Figure 5 (a) displays the results of the force sensibility sensor. As time passes, the output delivers additional values, as seen in this graph. Figures 5(b) and 5(c) show the proportion of crashes caused by tiredness and the explanations of accidents, correspondingly. Through using concepts of Global positioning system and GSM, a

proficient Intelligent Automobile Protection and Stability System has been developed, which includes a pressure transducer, eye-blink transmitter, alcoholic detector, capacitive detector, and motion sensor. The Arduino board is connected to the sensors.

Regions with outreach issues and poor network connection, as well as distant areas with no internet connectivity, may be problematic. As a result, the accidental notification SMS may not be delivered to the given phone number.

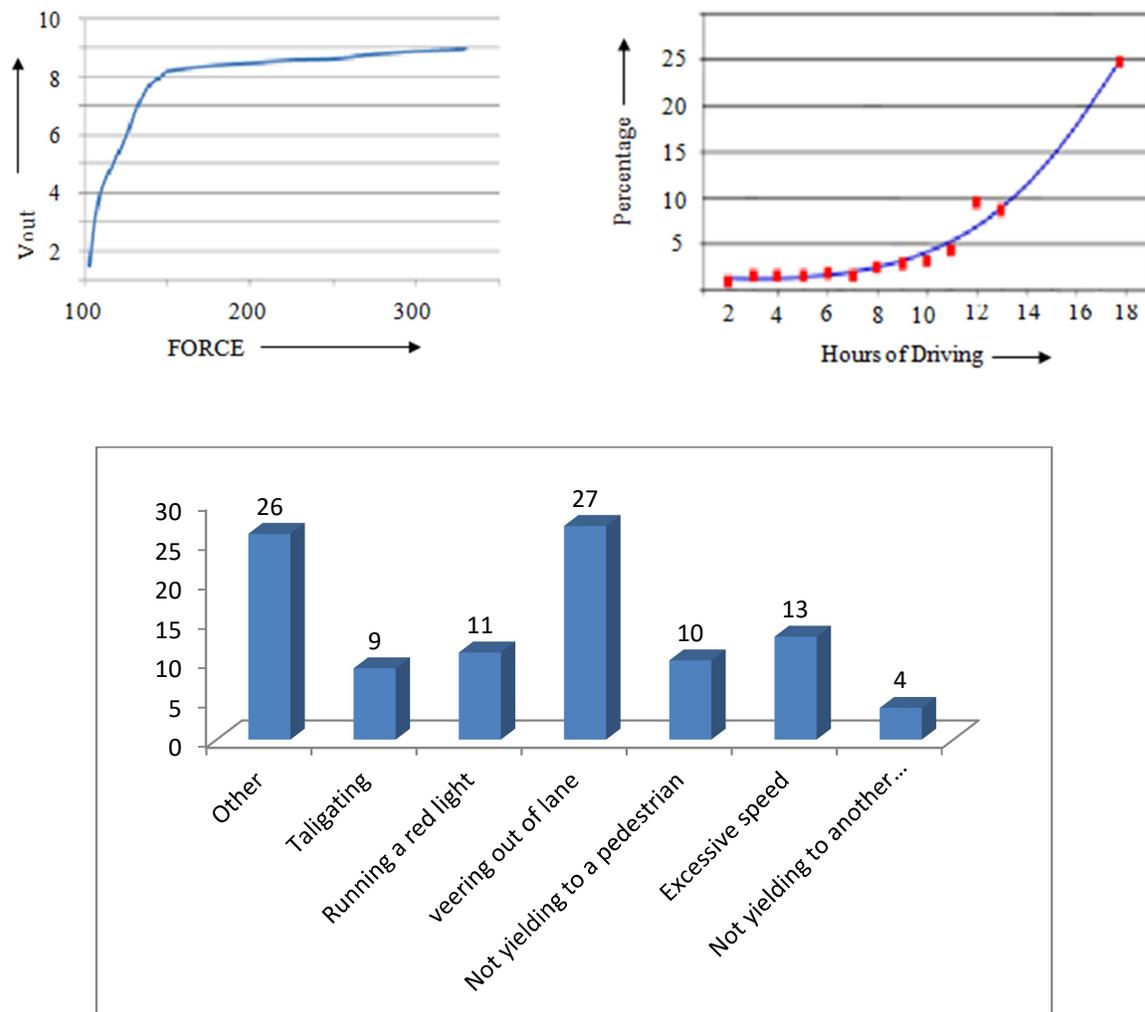


Figure 5: (a) Force sensor output and (b) fatigue propagation percentages (c) Significant factors on the crashes

CONCLUSIONS

The suggested and thus realized method may be improved and changed by using technological ideas such as large amounts of

data and Global positioning to analyze and interpret the characteristics connected with the accidents. This very same technique may be changed and applied for two wheelers at

about the same time. Furthermore, the whereabouts of the accident may be transmitted to an ambulance for prompt emergency treatment through reactor safety policies.

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