Survey paper on "Accidental Area Precautionary System"

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Abstract

To date, there are a lot of projects about predicting a vehicle accident but there has not been an application withstand gives you precautions while driving. In this paper, we propose to warn users and overcome the accident. Understanding techniques that are contributed in the curb of accidents especially by giving precautions to the user, is the objective of this paper. Different proposed methodologies involving various techniques are studied, for the stages involved along with their advantages and disadvantages is done which can be helpful in the determination and appropriation of an efficient accident area marking system. We proposed system specifications based on an analysis of existing projects.

Keywords

Accident, Precaution, Location, black-spot, API, JSON

Introduction

We see around us there a is the huge number of vehicles growing. With this the number of road accidents is also increasing. Road accidents is among the unwanted things to happen, though they happen quite often. About 1.2 million people fall prey to road accidents every year, according to the World Health Organization (WHO).

There are just 1% of the world's vehicles in India. India is responsible for 16% of all road accident deaths. In India, there occurs 17 deaths every hour due to road accidents, and hundreds of people get Injured. A report was published by a leading newspaper, 2018 had the highest road accident death count till now, had 1.51 lakh fatalities, which is 3,500 more deaths than in 2017.

The state of Uttar Pradesh had the most road fatalities, followed by Maharashtra and Tamil Nadu. These days, we see many people die on the road due to unnoticed warnings or precautions. Especially, this is common at night time, when we cannot read the road hoarding much clearly. Due to increased vehicles, road accidents are on a rise without a corresponding increase in the road infrastructure needed to support them. It's not in our hands to avoid the injuries that will cause, but we can at least give them precautions or warnings. Accidental area marking is useful in such situations, which will be helpful for others too. As responsible human beings living in modern society, we need solutions like this to reduce such event

Literature Survey

1) **"Identification of accidents and alerts using IoT based system"**

   This paper describes identification of accidents which was made possible by using IoT technology. For tackling the problem of location, GPS was used. Hardware such as sensors, actuators,micro-controllers, RF transmitters, vibration sensors, and LCD screens. They were all connected to one or another vehicle parts. The prime work was of vibration sensor. The function of the sensor was to detect unusual vibrations. Based on the unusual vibration, which mostly occurs in accidents, an alert message is sent to a family member of the user and with the help of GPS the location is tracked. For fetching the live location of user, Location API was used there.

2) **"Accident Alert and Detection System"**

   In this paper, technology used primarily is IoT. Just like the previous paper, it also uses Hardware such as sensors, actuators,micro-controllers, RF transmitters, vibration sensors, and LCD screens. For tracking down the location of using the GPS is used. Suppose if the accident occurs then based on the vibration sensor, an alert will be sent to family members as well a nearby hospital will also be alerted. So that immediate medical aid should be provided. The application also keeps additional information about users like blood group, medical history, etc.This thing is an extension to previous paper.

3) **"Accident Black-spot validation using GIS"**

   With this paper we come to know about the Geographic Information System (GIS). It is used to collect, analyze, manipulate, manage and display all types of geographical and spatial data and information. Here we'll see a term called black-spots, which is referred to points that are used to indicate accidental points.The paper also talks about the validation of these black-spots.
   For a place to become a black-spot, the place should have a specific weight. Here the weight refers to how bad accidental point the place is. With this weights we can analyze and classify the data.

4) "Identification and Analysis of Accident Black-spots Using GIS"

One of the primary technologies used here is GIS i.e., Geographic Information System. Here it is used for analysis and identification of black-spots. It defines black-spot as "An accident black-spot is a hazardous or high-risk location where several accidents repeatedly occur". It suggests to reduce accidents at such spots using the GIS. GIS stores information using spatial indices that allows identifying a specific spot. Some data can be spatial(locations on the earth), coupled with tabular data(attribute data).

Proposed System

The prime purpose of our project is to mark the accidental and hazardous places on the road and make them visible on the map in real-time. Our aim is not to let people fall prey to road accidents, and with our application, we hope to reduce the number of accidents at least to some extent. A user may register the accidental spot on the map. The application has two sorts of logins i.e., user login which is naive, user, and other is authority side login which has more privileges than the naive user. Based on the complaints raised by users, authorities can take further action. As mentioned earlier authorities will have more privileges to update the map. The map that we provide will show the accidental area marks in real-time, providing safe passage for users. We can create a web app that can be used on mobile. As we use react js, our app will work more efficiently than other apps that are built using other technologies. We also plan to use next js as it is way much faster than react js and ih has a lots of new features as well. The application works on any device as we mentioned, the user need to login first. After that user can search for the destination by searching it, set the source as current location or any other location. Now when you hit search, you will see all black-spots from your source to your destination. The black-spots that you will see on the map now, will be verified black-spots. Hence the user can gain information about the black-spots on the way and take precautions. Following is the figure regarding the proposed system.

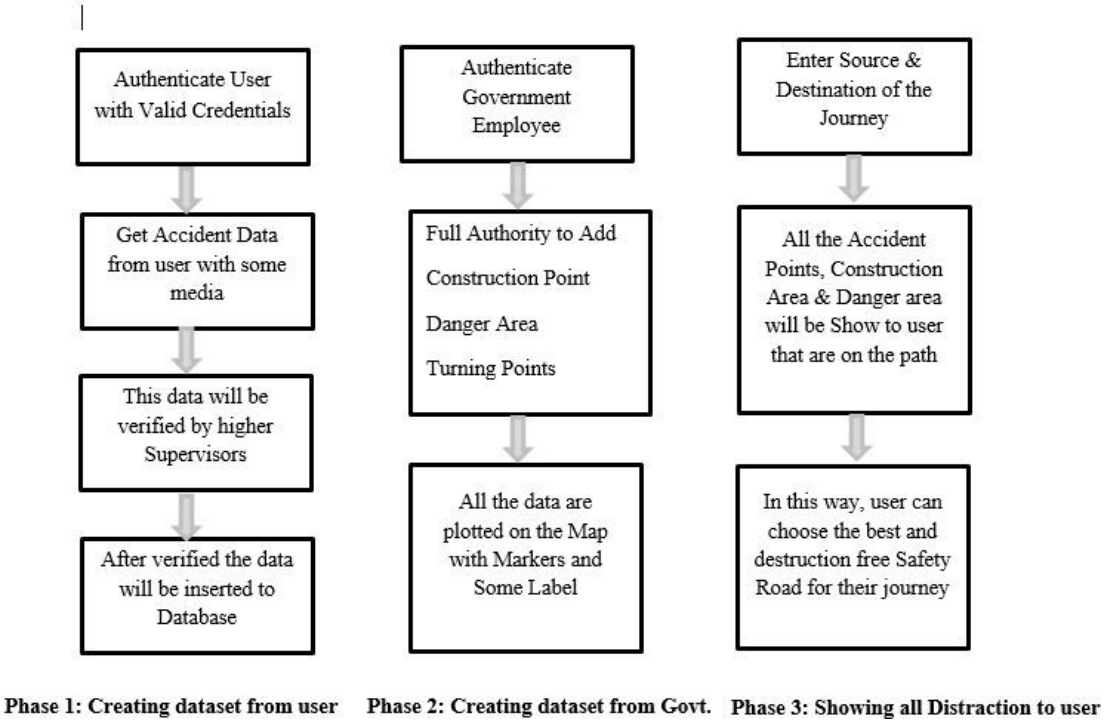

Figure No. 1 : Proposed System

As we see the above figure, we come to know there will be more than one side of the application. It means that functionalities will vary between a normal user and an authenticated government employee. They will have some privileges to make changes. It can be achieved by creating different logins for users and government employees. Following is another figure representing the flow of the data throughout the process of different parts of the application.

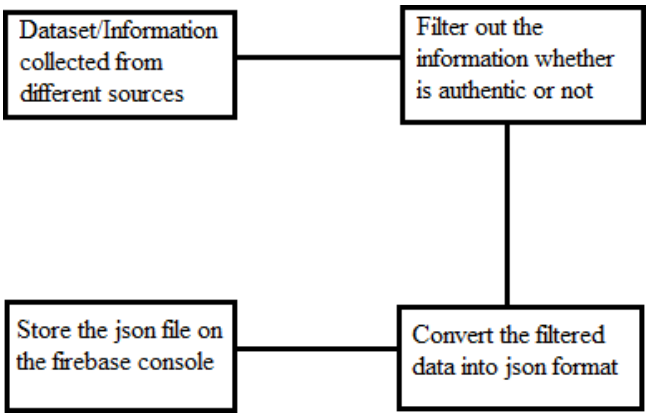

Figure No. 2 : Data Flow Diagram

We will be using JSON files to be stored in our database due to their flexibility and ease of access through JSON servers. JSON is simple text, it is safe for transferring across platforms and operating systems. Comparatively size of JSON is less than XML files.

Conclusion

Thus, in this paper, we have discussed the different methodologies which had made a contribution to the innovative advancements in the road accident precautionary system and attempting to make use of the study on various researches and proposed systems along with addressing the different technologies involved, with their advantages and drawbacks which can be helpful in the selection and adoption of the appropriate up to date techniques in the future.

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