Traffic Info and Real Time Pothole Detection System

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***Abstract*: In today's world, there is be a boom in street mishaps because of the irregularity maintained on roads, mainly in nations like India. Especially in the rainy season, the street becomes slippery and additionally, there will be a sudden hike in the number of potholes. This paper aims to construct a pothole detection system, which will assist and rectify the irregularities. This will subsequently assist the user and keep them away from sudden road accidents due to potholes. The standalone system will direct the person to the most secure direction according to the minimum number of potholes and traffic. This system helps the user to reach their destination faster and in a minimal time. This system also works toward rectifying the irregularities or potholes by sending an electronic mail to the concerned authorities about the same. This paper is geared to satisfy the wishes of the customers who discover it inconvenient to recognize the street issues and the traffic. The final scope of this paper can be to construct a general, smooth and, flexible machine to stumble on the potholes and other irregularities and warn the person accordingly.**

***Keywords: Pothole; Road Surface Monitoring; Accelerometer*.**

I. INTRODUCTION

Road monitoring is important for municipal companies to quickly locate and maintain potholes. If such details of all the routes are placed on a central server that can be accessed by anyone freely, drivers will choose the most powerful route possible from the feed to your destination. Road areas can be divided into completely different categories such as swish lanes, potholes, ridges, shrinkage joints, manholes, enlargement joints, etc. Areas where a person finds himself blocking his or her speed limit pits and bumps (also known as speed breakers). Therefore speed bumps and shifts on the server will give us the ability to erase previous road information so that they can be prepared to see exactly what time it will take to complete the journey. Currently, street viewing is done manually with the suggestion of using people for this purpose only, or by volunteer drivers who receive any explosions and report to the relevant authorities. However, this approach to road traffic is slow and costly. various current methods where there is 2nd place to automatically detect holes, one can be a responsive system and the other a non-responsive method. The non-responsive system uses optical and acoustic sensors. These local sensors are expensive and collectively would like complex algorithmic law to detect holes. Vehicles with special purpose will be rented because the devices must be placed above the vehicle, so the condition of the road is noticeable. Another way is a responsive system that uses mechanical sensors (such as measuring instruments and a gyroscope) to access and analyze incorrectly. This street view service will work on devices running robot OS. The OS is the most widely used system that makes our system attract more volunteers for high-street viewing. This project discusses how to view the built-in android measurement tool, which records 3-axis acceleration. the information obtained by the accelerometer is processed in an appropriate manner to inform the type of event of its severity. Location link where chuckhole or breaker has been found with the android constitution GPS system.

II. RELATED WORK

Keeping the same concern in mind many developers have come up with innovative applications. A few of such applications are as follows:

A. *A Novel System for Road Surface Monitoring using an Inexpensive Infrared Laser Sensor[1]*

Detects cracks and potholes and Defects in pavement by using IR,RGB,Depth images. It is an Achievement for autonomous cost-effective condition assessment of roads and transportation systems. This system is remarkably inexpensive.

B. *Design and development of GPS-GSM based tracking system with google map based monitoring [7]*

It is a tracking system that controls the theft of a vehicle.Making vehicles more secure. The system is not limited to find the location of the target but also calculates

the distance traveled b/w two stations. But it does not provide the time to travel between the stations.

C. *Automatic Detection and Notification of Potholes and Humps on Roads Using IoT[2]*

Potholes and Humps are detected using Raspberry Pi via camera. Ultrasonic sensors are used to identify the potholes and humps and also to measure their depth and height respectively.It provides timely alerts about potholes and humps.This method is expensive.

D. *Real-Time Pothole Detection using Android Smartphones with Accelerometers[6]*

Detect Road irregularities using a mobile sensing system. The system should be able to detect events (potholes in our case) in real-time. The collection of raw data for off-line post-processing is classified as an additional feature.The system running on a smartphone should be able to perform its native communication tasks at an adequate quality level. This method does not provide a way to rectify potholes.

E. *Walking GPS: A practical solution for localization in manually deployed wireless sensor networks[4]*

The deployer (either person or vehicle) carries a GPS device that periodically broadcasts its location. The sensor nodes being deployed, infer their position from the location broadcast by the GPS device.It has very little overhead and it is cost-effective. It only give the position which can be further used in our project.

III. PROPOSED APPROACH

We are developing an app for traffic information that additionally detects potholes and acts as a warning system. The user 1st selects the mode of transportation and specifies the source and destination. there's an associate degree possibility for the user to specify the gap within that he desires to understand the traffic information. GPS then offers a route and the application displays the segments containing the traffic density of various transportation on the trail. the common speed of the vehicles in this explicit path is additionally displayed. This helps the user to pick an associate degree optimum path with low traffic. The information relating to the traffic is updated often.

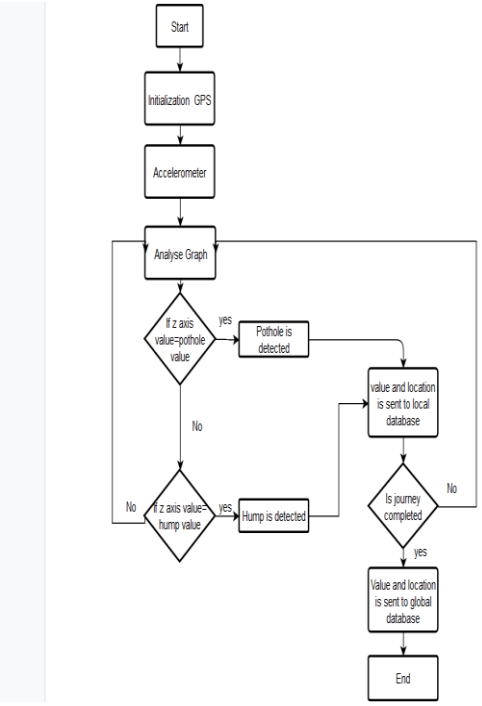
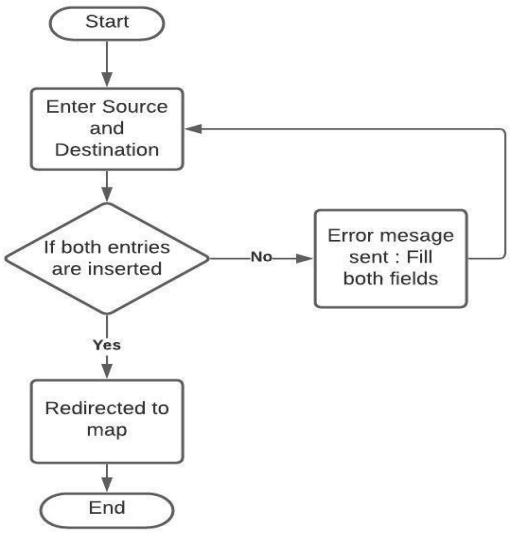


Fig 1: Data flow diagram

The user first selects the mode of transportation and specifies the supply and destination.Traffic density additionally depends on an undone mess like potholes. Whenever a vehicle passes over a pothole, the measuring system senses the vibration and if the vibration value is adequate the one in the code, the latitude and longitude value of the pothole is held as the information. The information stores all values of the potholes detected. If a pothole is detected thrice by the user then a mail is sent to the Corporation mechanically by the system concerning the situation of the pothole and therefore the same is updated to the global database. Once the matter is corrected, potholes' values are removed from the global database.
The application has three modules

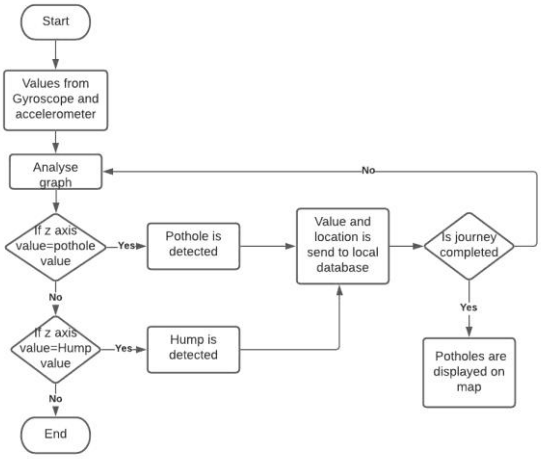
A.User

There will be a notification to turn on the GPS before entering into the app. User needs to enter source and destination and click "START" button to start their journey. Users can view the map and potholes from the source to the destination.



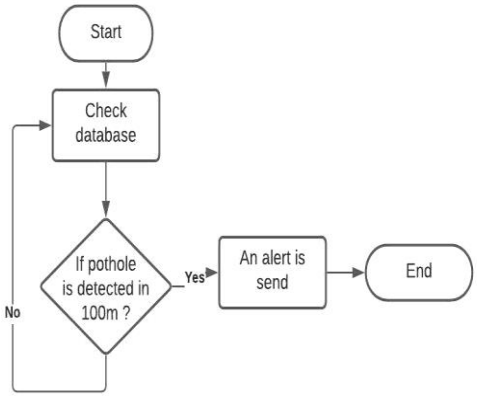
B. Server

This module consists of two parts; the android device and the database. It acts as an intermediary layer between the user module and the mobile application. whenever a pothole is detected pothole information like severity and longitude and latitude of the pothole is stored in the database. If the same data is repeated thrice an email is sent to the authority.



C. Web Application

This module is enforced as an associate robot application that's put in on the vehicle driver's mobile phone to supply timely alerts about the presence ofholes and also the appunendingly runs within the phone background. It1st captures this geographic positions of the vehicle then accesses the locations of holes and speed breakers stored in the server database. The space between the vehicle position and the hole position stored in a database is computed. If the distance between the 2 is inside ahundred meters, an alert message pops up on the mobile screen. This message is in the courseof associate audio beep so that the driver can differentiate it from other flash messages.



IV .EXPERIMENTAL RESULTS

To evaluate the delineate algorithmic rule the writers have gone through the subsequent route.

1.Enumeration the holes physically and recordingtheir positions.
2. Navigate through a four kilometers road.
3.Checking the information for the perfection.

The chosen road is of 4 Kilometers over that the check was completed. An automaton phone running an app made for this identicalobjective was unbroken in an exceedingly automobile on the plane surface. when the end of the journey the no. of holes and humps determined throughout the journey were calculated by wanting into the information. The given tablesdepict the holes and humps recorded by the app.

TABLE I: NO OF HOLES AND HUMBS

Severity	Hole	Hump
1	18	2
2	6	2
3	0	2

TABLE I: NO OF HOLES AND HUMBS

Severity	Hole	Hump
1	16	2
2	6	2
3	0	1

Table I and Table II explains the planned self operating actions get higher results as compared to physical examination. The accuracy of the planned procedure comes resolute be 94.10%.

The planned procedure has been identified with the certain obstacles as given below :
i) planned technique has been demonstrated on an android phone placing the phone in a vehicle
ii) Phone is unbroken on a plane surface, implicit

alignment would be thoughtabout as an additionalcharacteristics.
iii) planned methodology uses real time measuring system sensor information for the process and capturing of actions.

V.CONCLUSION AND FUTURE SCOPE

This paper addresses the significance of paved surface monitoring in terms of safe and security required by passengers. A shaking based technique has been given that mechanically discovers the hole and hump with their severity . This technique may be beneficial for safe moves, particularly in unrevealed road status. The plannedtechnique may be simply used on any automaton primarily fixedsmartphone. The outcome of the paper shows the approval of the planned technique. In the subsequent time, the formula may be tried over completely distinct road conditions for additional complicated possibilities.

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