An Overview of how the sensing technology is used in Accidents detection, Garbage collection and Ambulance clearance

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ABSTRACT

The Rapid growth of technology and infrastructure has made our lives easier. The developing urban area that create sustainable economic development and high quality of life by excelling in multiple key areas; Economic, mobility, environment, people, living. Excelling in these key areas can be done so through strong ICT infrastructure.it is observed that the advent of technology has also increased the traffic hazards and the road accidents takes place frequently which causes huge loss of life and property because of the poor emergency facilities. This paper will provide an optimum solution to this draw back. This paper contains three parts in which the first part illustrates about how accidents are being detected using the vibrators. Nowadays certain actions are taken to improve the level of cleanliness in the country. People are getting more active in doing all the things possible to clean their surroundings. Thus, the second part illustrates how the waste is managed using the ultrasonic sensors. The third part illustrates about how an attempt is made to solve the problem of ambulance clearance. The whole concept of this paper is about contributing towards making the city smarter, thus, making our country smarter.

***Keywords**: Ultrasonic sensors, vibrators, GSM, GPS, Arduino, Wi-Fi Module*

I.INTRODUCTION

IoT or Internet of Things refers to the network of connected physical objects that can communicate and exchange data among themselves without the desideratum of any human intervention. It has been formally defined as an "Infrastructure of Information Society" because IoT sanctions us to a mass information from all kind of mediums such as humans, animals, conveyances, kitchen appliances. Thus, any object in the physical world which can be provided with an IP address to enable data transmission over a network can be made part of IoT system by

embedding them with electronic hardware such as sensors, software and networking gear. IoT is different than Internet as in a way it transcends Internet connectivity by enabling everyday objects that utilizes embedded circuits to interact and communicate with each other utilizing the current Internet infrastructure. Since then the scope of IoT has grown tremendously as currently it consists of more than 12 billion connected devices and according to the experts it will increase to 50 billion by the end of 2020. With the advent of IoT both manufacturers and consumers have benefited. Manufacturers have gained insight into how their products are used and how they perform out in the real world and increase their revenues by providing value added services which enhances and elongates the lifecycle of their products or services. Consumers on the other hand have the ability to integrate and control more than one devices for more customized and improved user experience.

In this paper, we are going to propose a system which is a fusion of different technologies used for making the city smarter by considering some of important aspects that needs to developed or is essential to be improved for making the life easier, reducing the unexpected deaths and for keeping the city clean .The proposed system consists of three different sections. In first section the methodology of accident detection using vibrators is mentioned. In the second section the methodology for the immediate cleaning of the dustbins is explained using the ultrasonic sensors and finally an attempt is made to define a technique for the ambulance clearance.

II. Literature Survey

1)

LINK1:http://research.ijcaonline.org/accnet2016/number6/accnet2300.pdf

SMART AMBULANCE SYSTEM-Poonam Gupta, Satyasheel Pol, Dharmanath

Rahathekar, Avanti Patil the system is divided into two sub systems where one is aiming at user end and other one is aiming at server end or admin end. User end have an user interface where user can interact with the server like finding hospitals or ambulances. User location will be automatically tracked. Server end collects the information and also send back the patient's current health condition to the hospital so that the patient can be monitored while in ambulance.

2)

LINK2:http://www.irdindia.in/journal_ijeecs/pdf/vol4_iss2/12.pdf

INTELLIGENT AMBULANCE SYSTEM WITH TRAFFIC CONTROL-Gargi Beri,

Pankaj Ganjare, Amrutha Gate, Ashwin Channawar, Vijay Gaikwad

To avoid traffic congestion there is one way where the driver of emergency vehicle (ambulance) can have control over the traffic lights. The traffic lights can be controlled by the ambulance driver in case of any emergency where

the driver can usesome device which detects the nearest traffic post and turn the light green for the ambulance. As the driver presses the key a binary signal will be send to the microcontroller containing the location of the vehicle the future path. This binary signal is received by the micro-controller on traffic post and turns the traffic light green.

3)

LINK3:https://www.witpress.com/Secure/elibrary/papers/UT06/UT06031FU1.pdf

A dynamic and automatic traffic light control system for solving the road congestion problem-w.wen,c.l.yang. This model contains RFID tag attached to the vechile and a RFID reader which reads the RFID tag on the vehicle and sends information to the PDA.PDA with wireless card will send information to the backend server and store the data collected into the database server. Database is analysed and various information is being collected. Using the knowledge base collected from database it can automatically set a red and green light duration for improving the traffic congestion problem.

4)

LINK4:http://data.conferenceworld.in/ICITSEM5/P200-204.pdf

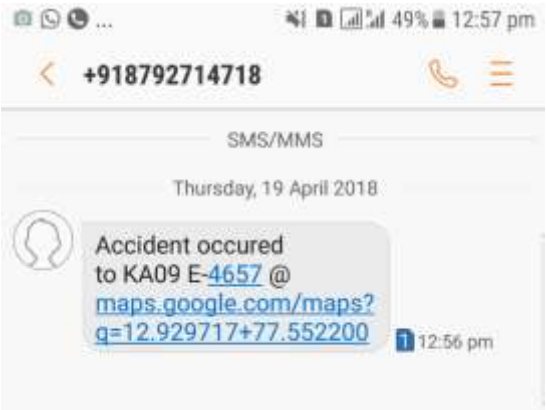
A Review on Smart Garbage Monitoring System Using This system using Arduino Microcontroller, wifi module for sending data and GSM module for sending the data to the concerned department and Ultrasonic sensor to measure the height of the garbage level. User interface is designed for monitoring the garbage bins (level of waste in the garbage bins).

III.METHODOLOGY

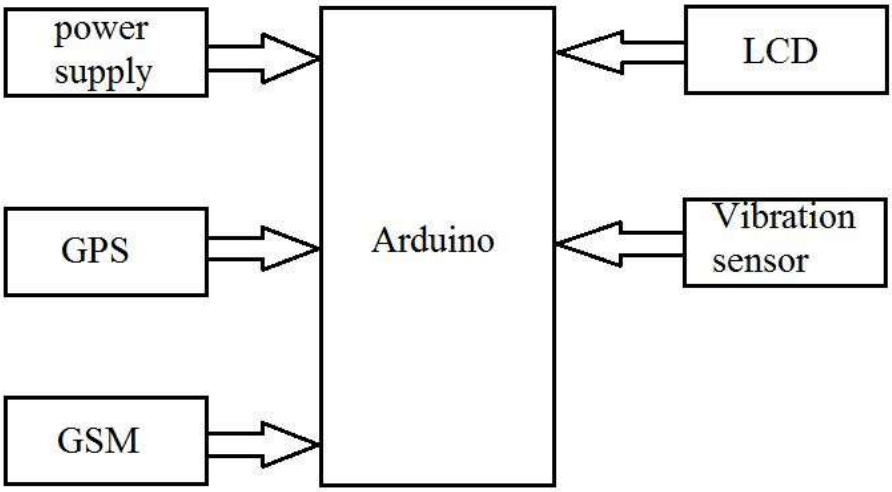
The system which is been proposed consists of three sections and all the three sections are explained below

A)

The main aim in the first section of the project is to detect Accidents and have a Messaging System in order to inform the Hospital (Ambulance) about the accident site and arrange for necessary steps for further process. This system is not only efficient but also worthy to be implemented. The Accident Detection and Messaging System can be fitted in the vehicle and Hospitals and Police people are informed about any such untoward incident at the go.



Screenshot of message sent which is sent through GSM



Accident Detection and Messaging System execution is simple as the system makes use of GSM and GPS technologies. GPS is used for taking the coordinates of the site of the accident while GSM is used for sending the message which includes location to cell phones. To make this process all the controls are made using Arduino whereas a LCD is used to display that whether the accident is occurred or not.

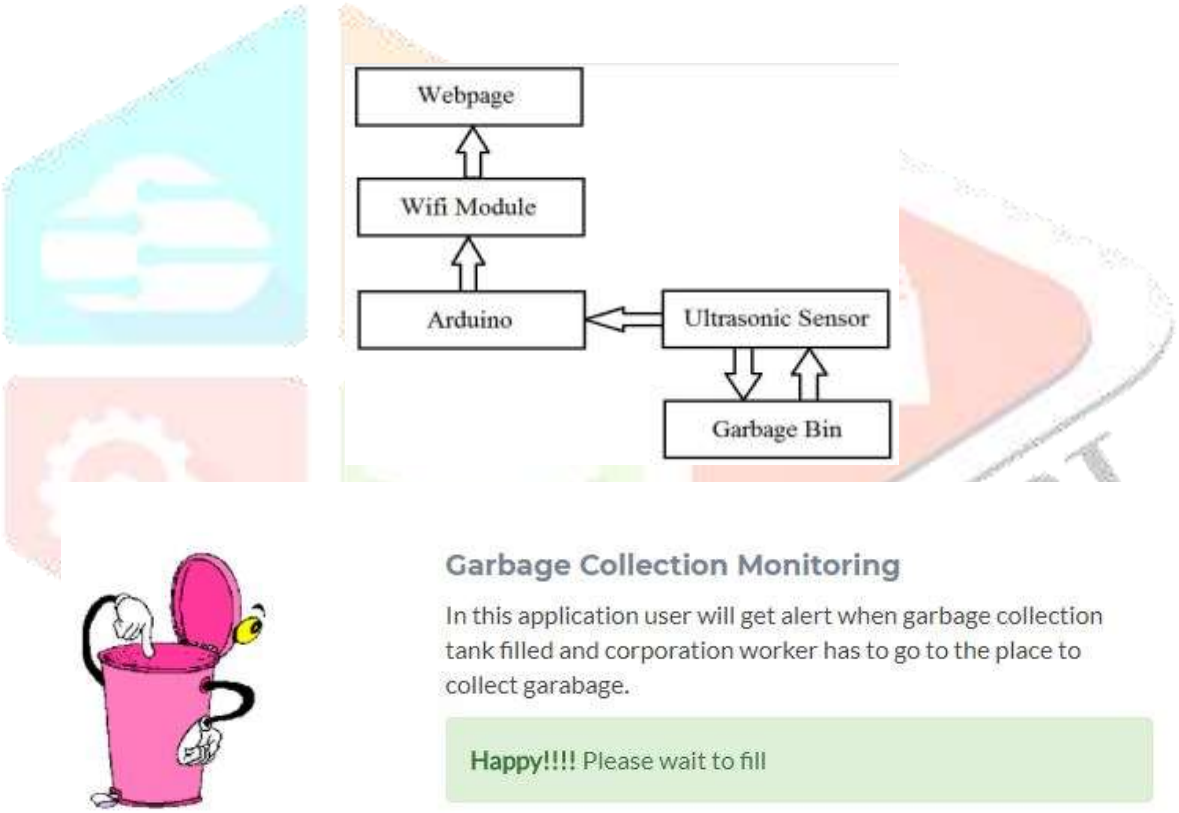
How exactly it works:

Accident Detection and Messaging System is easy and the components used are Vibration Sensor, which detects the accident and in turn sends the signals to Arduino. At this point the Arduino takes control and starts collecting the coordinates received from the GPS which are later sent to the Emergency mobile number using the GSM Module.

B)

As dustbin is considered as a basic need to maintain the level of cleanliness in the city, so it is very important to clean all the dustbins as soon as they get filled. Thus, the system proposed uses the ultrasonic sensors. The sensor will be placed on top of dustbin which will help in sending the information to the corporation's office, that the level of garbage has reached its maximum level indicating that the bin should be emptied as soon as possible. The concept of IoT when used in this field will result in a better environment for the people to live in. No more unsanitary conditions will be formed in the city. With the help of this system minimal number of smart bins can be used around the whole city and the city will still be much cleaner.

Web page is developed for the same, so that when the bin is full then the indication will be shown on the web page so that action can be taken by the concerned department.



Screenshot of webpage when the bin is empty

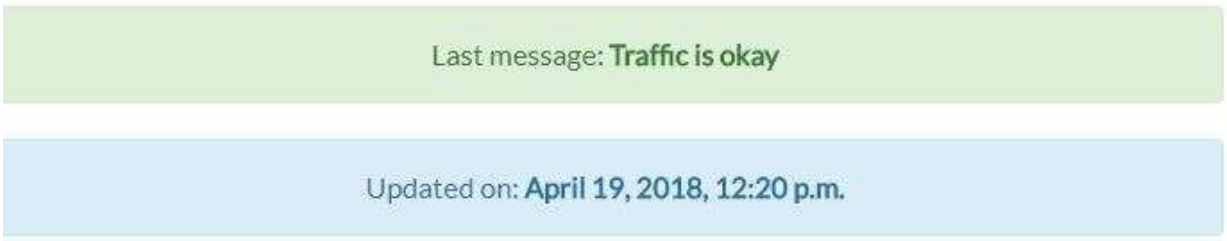
Screenshot of webpage when the bin is full

C)

Ambulance clearance system, in this system ambulance will have a pre-installed remote to control the traffic signals. So that when the ambulance is in hurry with a patient or to pick a patient then the driver can use the pre-installed remote in the ambulance and control the traffic signals. He can change the traffic light from red to green on his way. For example: If the driver is travelling towards north and when he press the north button in the remote which is present in the ambulance then the traffic light in the north direction turns into green, then the ambulance can easily pass the signal and can reach the hospital or the accident point in the minimum time and the signal operator at the signal can reset the signals and the normal cycle takes place.

When driver operates the signal it will resulted in the webpage developed, the webpage indicates the direction of emergency and the time at which it is updated.

This helps in increasing the life rate, because most people who die in accidents are due to late arrival of the ambulance or reaching late to the ambulance, this is due to traffic in the city at the signals, so to avoid death due to time constraint ambulance clearance system has been developed.



Screenshot of webpage when the traffic is OK

Screenshot of webpage in Emergency

V.CONCLUSION

The main objective of the project is to manage the accident detection and messaging system, maintain the level of cleanliness in the city and an attempt is made for ambulance clearance by controlling the traffic signals.

By using the proposed system we can constantly check the level of the garbage in the dustbins which are placed in various parts of the city. If a particular dustbin has reached the maximum level then the employees can be informed and they can immediately take certain actions to empty it as soon as possible. The employees can check the status of these bins anytime on their webpage. This can prove to be a very useful system if used properly.

Secondly, the proposed Vehicles accident detection system can track geographical information automatically and sends an alert SMS regarding accident. An attempt is made to get the more accurate and efficient results.

Finally, Ambulance clearance system, here the traffic signals turns green by using the remote which is attached in the ambulance, driver can change the signal into green on his desired direction that is in the direction of hospital or in the direction of accident place.

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