

Smart Manhole System

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Abstract:

Now a day's damage Manhole is the Key issue in the Urban Areas. Due to damaged manhole system there is cause of the accident and it put human life in the risk. Smart manhole system is an effective system to identify open manhole in major cities and avoid accidents .The sensors like tilt sensor and gas sensor used to detect the crack and the damage in the manhole cover and then the information will be sent to the Admin and worker and where the manhole is present. The Manhole is controlled and the maintenance of the manholes is made through Internet of Things. The system monitor all parameters like water level, gases in manhole which will show on app and proper actions is taken .

Keywords —Internet of Things (IoT), CH₄, CO , Blockage.

I. INTRODUCTION

Manhole system plays a very important role in big cities where millions of people live . Manhole system conditions should be monitored in order to maintain its proper function. In fact, not all areas have Manhole monitoring team. It leads to irregular monitoring of the Manhole condition. The irregular monitoring has contribution on the blocking of the Manhole that imply to the salutation which trigger flooding in the neighbourhood. Manual monitoring is also incompetent. It needs a lot of man power who are only able to record limited report with low accuracy.

The problem arises can cause serious issues to the daily routine of the city. Problems such as blockage due to waste material, sudden increase in the water level as well as various harmful gases can be produces if the proper cleaning actions are not taken time to time .Today's Manhole system is not

computerized due to which it is hard to know if blockage is occurring in particular location. Also sometimes due the waste in those manhole lines can produce various gases like methane (CH₄), carbon monoxide (CO), etc which are harmful and can cause serious problem if inhaled by humans in large amount and these problems are generally faced by the drainage workers due to which death can occurs .

Smart Manhole system generate the signal when the Water level and gases level are goes beyond the specified value. The signal and specified information of manhole updated on the Google cloud. The Android application is used to take the appropriate action and also gives the shortest path between the manhole.

II.MOTIVATION:

Motivation Behind Approach implementation and design function of an Underground Manhole Monitoring System for IoT applications to make human life safe.Make the city clean and smarter.

If the drainage maintainance is not proper it will create problem for routine life ,traffic may get jammed and this is chance of occurence of accidents.

If the manhole cover is not closed properly there is chance of occurences of accidents and also people or animals may get fall into manhole.

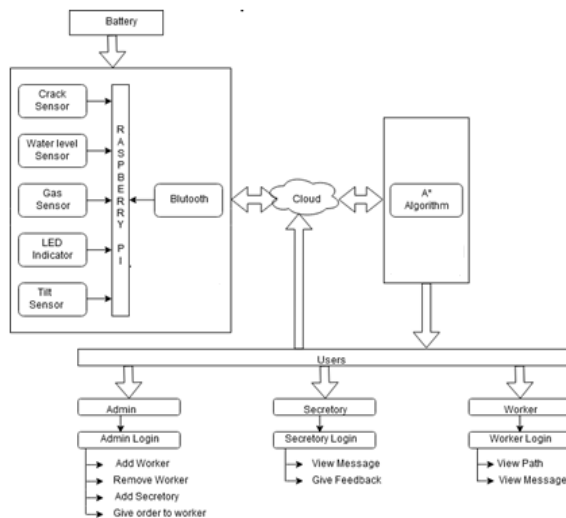
So if we have monitoring system to analyze the internal states of manhole we can solve this problem efficiently.

People dead	Region
Maximum 451 people	Pune and nashik
1 man	Worli
A two year old boy died after falling into an open manhole	Nov 10,2018 new dellhi
A 24 year daily -waige labourer died	Nagar slums in kurla
2 child	Yamuna nagar

III.PROPOSED SYSTEM

The smart Manhole system will have:

Sensors to detect blockage, flood and gases.



Sensors will identify the gases and blockage inside the drainage system and will generate message of the location and other information and updated to the app.

The system will also sense the harmful gases such as Methane (CH4), Sulfur dioxide (SO2), Carbon monoxide (CO) etc inside the mahole. As the level of such gases and water the increases the system will glow LED and send information to system

These entire data will be collectively sent by the Bluetooth and stored at the Google cloud all these data will be show on the app.

IV.WORKING

The System will glow LED when the manhole cover is Removed or slide or open. The system contains three users :

1. Admin
2. Worker
3. Secretary

- The Admin can add worker and secretary also check the status of man- hole and also the flag status over the manhole. Admin also checks the Feedback given by secretary. Admin can provide shortest path to worker.

- Admin can provide shortest path to the worker in following ways :

- 1.Shortest Path Between the manholes .
2. Shortest Path Between BMC Worker and Manholes.

- Worker check the status of manhole and also check the shortest path provided by Admin and take action regarding it.

- Secretary gives the feedback about the manhole status in that particular area of him/her.

V.HARDWARE COMPONENTS

Sensors like gas Sensor, tilt sensor, crack sensor, water level sensor connected to the Raspberri pi .Bluetooth module is also connected to the Raspberri pi which collects the data and store to the Google Cloud.

VI. CONCLUSIONS

Manhole monitoring and maintenance is a challenging problem in rainy season. This system proposes different methods for monitoring and managing underground manholes. Various parameters like temperature, gases, water level of manhole are being monitored and updated on the system app using the Internet of Things.

Which saves time and the necessary action regarding the problem are taken by admin and workers.

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