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# DRAINAGE MONITORING AND CONTROLLING SYSTEM USING RASPBERRY PI

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## ABSTRACT

In India the sewage system is one of the major issues, due to the poor maintenance of the sewage system the sewage water is flooded in the city and now and then blends in the drinking water which harms the health of individuals, to overcome this issue we are proposing the model called sewage Overflow Monitoring System. To overcome all the issues in the drainage system and inform the municipal corporation about the condition of the drainage system by sending sms, so that the officials can take the necessary action to repair the drainage system. Even the gas formed inside the drainage system due to bio wastage also detected using the gas sensor so that we can avoid explosion due to pressure inside the drainage system. If the drainage system lid is opened for long hours using tilt sensor we can detect the opening of the lid and inform the municipal corporation officials to take action on it. So our main aim of this idea is to monitor the drainage system using the sensor. If the sewage system gets blocked or water overflows or if the drainage lid is opened it is monitored using the sensor and the sensed information are sent to the nearby municipal corporation official via SMS andemail and the water overflow and gas value are stored in the cloud storage for the later analysis purpose.

## I.INTRODUCTION:

Rapidpopulationgrowth and industrialization pavedthe way for the use of advancementssuchas the Internet of Things which gave rise to the idea of passionate urban communities. [1 India is experiencingrapid urbanization. AsIndian statistics from 2011show,approximately 377 million Indians, including 31.14% of s

Tocreate 100 smart urban areas and create a brilliant city,it isnecessary to take into account many parameters, suchassmart water, net power, brilliant transport, etc. Underground foundations will be needed.Whichincludes underground water pipes, gas pipelines,intervention links, electrical flow,etc. Thecurrentpictureof infiltration in India is not innovative. Andthe 2011 Indian census [2] also indicates that only 18.1% closed drain and 33% open drain are available. Therefore, this article studies the real-time drainage system within the framework of Smart City. The vast majority of the urban areas in India have received the underground waste framework and it is the obligation of Municipal Corporation to look after tidiness, wellbeing and security of urban areas. In case there is no legitimate support from the waste framework, thenthe pure water becomescontaminated with water infiltration and irresistible diseases, for example diarrhoea, cholera can spread. Duringthe rainyseason, the drainage will become blocked and create routine problems as traffic can becomecongested,the environmentbecomes dirty and totally disrupts the public. This way, if there is a block, it is difficult to make sense of the precise area of the block. The first block alarms are not received and in this way the detection and repair of the block becomes tedious. Itisdifficult to deal with the circumstance in which thetubes are completely blocked. Dueto

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such failure of the drainagesystem, individuals face manyproblems. The sensor system has become a promising device for monitoring the physical world which can sense, process and communicate.

## II.LITERATURE REVIEW:

Many cities around the world are facing problems with the drainage system despite the use of cost effective technologies and solutions. The underground drainage system has its limits. The two main most obvious limitations are poor maintenance and contaminationof water bodies. Poor maintenance is usually related to the difficultyof identifying leaks. The main cause of leaks is clogging. High pressure due to excessive clogging can lead to minor leaks which in turn cause a serious rupture in the drain pipe. Replacing a drainage tile is another difficult process. Pullingwater-stroking trees, for example, pear, oak, willow, delicate maple and poplar,within 100 feet of the pipe will prevent your pipe from gettingstuck due to fallen leaves, congested branches and roots of these trees. Ocher for example, an iron oxide which can also turn into a worn squaretube and therefore there is a constant need to search for it.

Prof.S A.Shaikh et al [3] proposed the monitoringof Smart City applicationsusing Raspberry PI based on the IOT. The frame includesmany sensors that collect various types of information from the sensors and move to the Raspberry Pi3 controller. Theperformanceof the controller is sent to the control room bye-mail and alsodisplayed on the PC. Yash Narale et al [4] proposed a subsurface drainagemonitoringsystem using IoT using a flow sensor, a level sensor, a temperature sensor and a gas sensor to detect water flowas a functionof speed, level of liquid and other fluids, temperature in degrees Celsius and to detect theconcentration of CO inthe air respectively. Track location using GPS and send SMS via GSM. Thiscompany talksabout various methodologies of use and configuration capabilities for the control and supervision of the underground drainage system and provides a representation of the water system and a detection method fordetecting leakage faults in the sewer pipe. Restrictive components of information entered by humans and to achieve factorsof cost, precision and simplification, IoT appeared on the basis that, without human connection, PCs had the ability to obtain information from 'objects and devices. Inthis regard, Muragesh et al. [5] proposed the automated Internet of Things for undergrounddrainage and the manholemonitoringsystem for metropolitancities. The IoT comprises real objects and communication devices connected to networks of sensorsin order toprovide correspondence and computation activities between the real world and the information world. The sensornetwork is a key influence for the IoT worldview and represents the function of implementing and designing a subsurface drainage system andmonitoringmanholes.

This structure incorporates factors, for example, minimum effort, low maintenance,rapidimplementation and high number of sensors, long service life and high level of service. Theproposed model of apparatus provides a system for observing the water level, temperature and atmospheric pressure inside a manhole and forchecking whether a manhole cover is open. Complaintsabout sewage overflow are not adequatelyaddressed or addressed. To solve this problem, Sumathy et al [6] developed themaintenanceof the level of wastewater usingthe IOT which proposes a system design comprising a sensor to detect the level, a controller to control, a network of communication to register complaints in case ofblockages and the continuousrise in the level of wastewater. The system simply monitors

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the level and triggers alarm signals via complaints to the relevant departments by mail and SMS beforethe overflow.

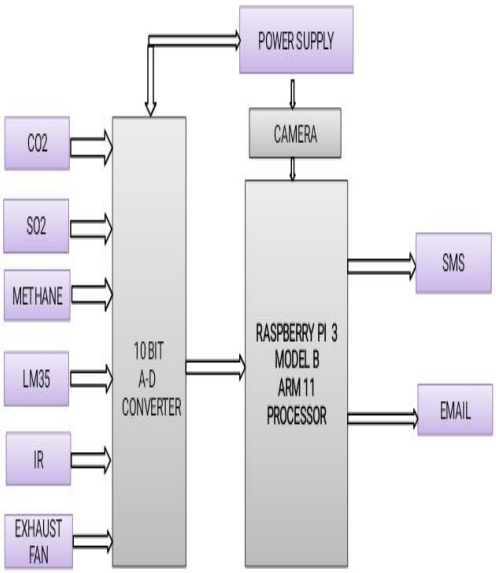
## III.EXISTING SYSTEM:

In India most of the cities has underground drainage system and the sewage system is maintained by Municipal Corporation to make the environment clean and healthy. Sometimes due to poor maintenance of the drainage system, the water in the drainage system gets mixed up with the pure water and infectious diseases may spread on the environment. Due to variations in the climate during different seasons the drainage gets blocked and makes the environment unhealthy and makes the people upset and distribute the routine life. To overcome all the issues in the drainage system and inform the municipal corporation about the condition of the drainage system by sending SMS through GSM, so that the officials can take the necessary action to repair the drainage system.

## IV.PROPOSED SYSTEM:

To overcome all the issues in the drainage system and inform the municipal corporation about the condition of the drainage system by sending SMS, so that the officials can take the necessary action to repair the drainage system. Even the gas formed inside the drainage system due to bio wastage also detected using the gas sensor so that we can avoid explosion due to pressure inside the drainage system. If the drainage system lid is opened for long hours using tilt sensor we can detect the opening of the lid and inform the municipal corporation officials to take action on it. So our main aim of this idea is to monitor the drainage system using the sensor. If the sewage system gets blocked or water overflows or if the drainage lid is opened it is monitored using the sensor and the sensed information are sent to the nearby municipal corporation official via SMS andemail and the water overflow and gas value are stored in the cloud storage for the later analysis purpose.

## BLOCK DIAGRAM:



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## V. WORKING OF PRPOSED SYSTEM

The block diagram illustrates the monitoring of drainage pipes in the underground drainage system. The network of remote sensors for monitoring drainage has three sections: sensor nodes for monitoring drainage, the server and the mobile application. Wastewaterfrom domestic and industrial sites is dischargedwith the drainage system. During heavy rains, excess rainwater will increase the flow of water which will exceed the flow of the drainage pipe, which in turn will cause overflow. The other reason for the overflow is the clogged pipe which does not allow water to enter. This increases the level of drainage and is monitored via an IR sensor. The signal from the sensor is sent to the microcontroller where the controller controls the IoT module. The controller is programmed in sucha way that the level claim would be triggered multipletimes unless it reaches the set minimum.Increased pressure fromthe cloggedhose can cause blockage and ruptureof thehose causing leaks. In this system, we implemented gas sensors to detect the presence of harmful gases which will be produced in sewage.

## VI.RESULTS

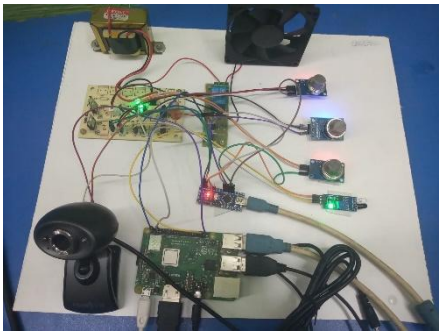
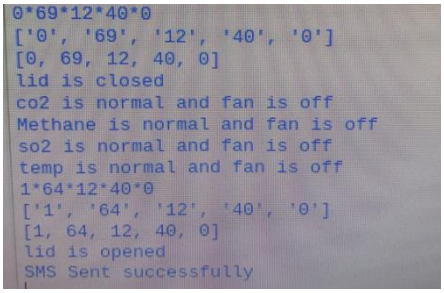


**Fig:Hardware implementaion**



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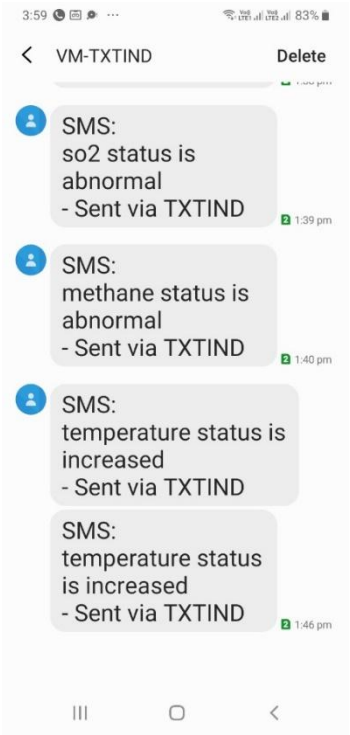


**Fig:Messages Received**


**Fig :Received mail**

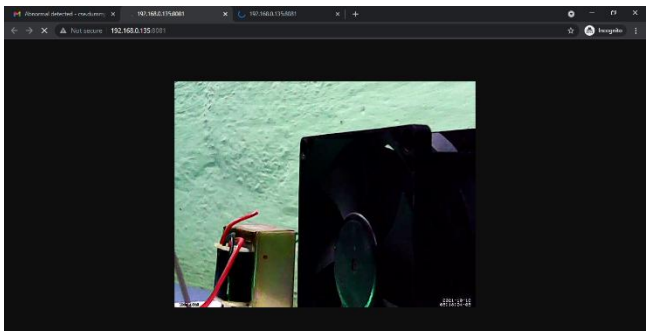

**Fig :Live moniteirng through camera**

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## VII. CONCLUSION

With IOT, detection of drainage leaks and overflows is proposed and developed using the IR sensor and some gas sensors respectively. This system avoids or eliminates the problem of overflow drainage on roads which is a vital problem in many cities. The advantage of the project is that blockages in drainage pipes can be detected as soon as they form rather than detecting them after drainage water begins to overflow into the streets, causing serious inconvenience to the public and loss. Revenuefor the government. The system also does not require human labour to detect clogging. The sensors are used efficiently and the system is designed with an idea of social relevance, so as to create an impact on cleanliness and hygiene by purely avoiding the problem of overflow on the roads and also to ensure the mandatory cleaning of theobstruction that causes drainage level to increase byrecording repeated complaints to random departments unless action is taken.

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