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LITERATURE SURVEY ON SMART REAL-TIME DRAINAGE MONITORING SYSTEM

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Abstract: ***Life in a healthy environment is a right for all people. Bangladesh and many other developing nations frequently experience flooding as a result of blocked drains, which creates unsanitary conditions. As a result, when sewage gas poisons the air, numerous health problems arise. Standing water on the road for extended periods of time is one of the main reasons Aides mosquito populations are rising. Manual tracking is challenging, as problems only surface once they are fully obstructed and the area is submerged under water.. This study proposes a warning system that uses GSM techniques and IOT to create sensed data and deliver it to the controlling authorities, preventing such incidents even before they may affect the public. Water flow is monitored by a water level sensor, sewer gas is detected by an ultrasonic sensor, and sewer distance is determined by MQ135 sensor. The authority and the general public will be able to monitor real-time data via an online website implemented with NodeMCU. If the level reaches a certain threshold, it will send a text message using GSM to report the issues mentioning which areas should be fixed with a location using GPS. The threshold values can be changed to suit the user's preferences. People in the neighborhood can live healthier lives thanks to the system, which guarantees timely notifications to the appropriate authority and displays real-time data.***

Keywords: GSM, Alert system, MQ135, Ultrasonic Sensor, Water Sensor, GPS Module

I.INTRODUCTION

Millions of people live in large cities, where drainage systems are crucial. The foundation for soil dryness from excess, wasted, and rainwater is the drainage system.Monitoring drainage conditions is necessary to keep it functioning properly. Not every locality has a drainage monitoring crew, in actuality. It results in sporadic drainage condition monitoring. The neighborhood's flooding is caused by the inflow that results from blocked drainage, which is partly due to the sporadic monitoring. Incompetent manual monitoring also exists.The sensors are used by the monitoring system. The microcontroller reads the data from the sensor and uses the GSM module to send the data to the server.The information gained is very helpful in identifying any obstructions or clogs in the drainage system.The authorities in question receive the data, which aids in their efforts to rid the system of obstructions.GPS is used to pinpoint the blockage's location for the police.

II.LITERATURE SURVEY

In their work "Smart Real Time Drainage Monitoring System Using Iot" (April 2022), Hemamalini M. and Puvaneshwari S. suggested designing an intelligent drainage system with sensors to identify obstructions, floods, and gasses. It senses dangerous gases like methane (CH4), sulfur dioxide (SO2), and carbon monoxide (CO) and produces alarms when gas levels surpass threshold values. It also attempts to identify blockages and provide location data for action. The system ensures a healthy environment and prevents waterborne infections by using Wireless Sensor Networking (WSN) technology to send sensor data to a cloud for real-time monitoring.

In his 2021 paper "Smart Drainage Monitoring and Controlling System Using IoT," Tushar Pathak suggests automating the maintenance of urban subsurface drainage systems through the use of IoT in a smart drainage monitoring and controlling system. Its objective is to continuously monitor air temperature, hazardous gas concentrations, water flow rates, obstructions, and water levels. The drainage system's clogs can be automatically cleared by the system, which is designed to detect blockages and overflow. Cleaner cities, smarter drainage management, real-time environmental condition updates, and an affordable infrastructure management solution are among the goals.

"Smart Real-Time Sewage Monitoring System Using Iot," Raakeshvarshan S. (2022).The study suggests an Internet of Things-based Smart Real-Time Sewage Monitoring System with the goal of tracking and resolving issues with sewage outlet systems, especially blockages that may cause overflows. The system makes use of a number of sensors, such as door magnetic sensors for automatic lid closure, ultrasonic sensors to locate obstructions, and gas sensors to monitor gas levels and leaks. These sensors wirelessly transmit data to a server or client for prompt action via an Arduino Uno ATmega328P chip. The system's low cost, ease of maintenance, and ability to send emails or messages when thresholds are exceeded make it ideal for improving sewage management and lowering the risk to manual scavengers.

"Case Study Of Smart Real-Time Drainage Monitoring System," by Rohit Shende (2020).The study suggests a clever, real-time drainage monitoring system for large cities that makes use of Wireless Sensor Networks (WSN). It looks for rising water levels, dangerous gasses, and obstructions between manholes. The system consists of modules with NRF for communication, flow sensors, gas sensors, and Arduino microcontrollers. This configuration enhances worker safety and system maintenance by giving authorities access to real-time information so they can respond promptly.

Aditya Patel, "IoT-Based Drainage Monitoring System" (2020).The study uses an interconnected web of several sensors to provide a real-time alerting system for monitoring manholes and subsurface drainage in metropolitan areas. This system monitors water levels, temperature, and hazardous sewage gasses in an effort to offer safe working conditions and safety measures for cleaners. To help with smarter city management, it also has a notification system to notify government authorities about obstructions, leaks, or high water levels.

"Smart Drainage System," by Vaibhav Thate (2021).The "Smart Drainage System" that is suggested in this paper monitors the subsurface drainage system with the goal of enhancing city cleanliness and safety. It monitors the drainage system's status in real time using a variety of sensors, such as temperature sensors, gas sensors for hazardous gas detection, and ultrasonic sensors for blockage detection. The technology notifies local officials in advance of obstructions and other problems, enabling prompt intervention. This idea, which aims to improve drainage system management's dependability and efficiency, is especially suited to urban areas and smart cities..

"An Iot Based Smart Drain Monitoring System With Alert Messages," by Samiha Sultana (2021).An Internet of Things-based smart drain monitoring system with an alert system is proposed in this study. It makes use of sensors like the MQ135 to detect sewer gas, an ultrasonic sensor to measure the distance between sewage and water, and a water level sensor to track water flow. When thresholds are crossed, it uses GPS to pinpoint the location and sends a text message to authorities via GSM indicating which areas require attention. In addition, a NodeMCU-implemented online website provides real-time data access, enabling public and official monitoring of circumstances. In order to promote community health, the system attempts to promptly alert authorities and give real-time data.

"Iot Based Underground Drainage Monitoring System," G. Chandhini (2020).In order to monitor harmful gases in sewage and notify manual scavengers when gas levels above predetermined thresholds, the article suggests an Internet of Things-based subterranean drainage monitoring system. It uses six sensors to identify gasses, and the Node MCU serves as the system's central controller and internet link. By enabling pollution monitoring on mobile devices and displaying the system's outputs via a smartphone app, pollution worker deaths can be avoided.

"Iot Based Underground Drainage Monitoring System," Pavithra M. (2022).To maintain the city clean, the report suggests a clever Internet of Things-based system for tracking drainage water levels and obstructions. Sensors are used to gather data, which is then transmitted to a Raspberry Pi3 controller. The drainage water level, gas, and humidity levels are graphically shown on an LCD screen and a web page, respectively, based on the controller's output. When the water level surpasses a predetermined threshold, the device additionally sounds an alarm. Real-time services and amenities are offered by this technology to enhance city growth and management.

"Smart Real-Time Drainage Monitoring System Using Internet of Things," by Gaurang Sonawane (2020).The study suggests a clever real-time drainage monitoring system that makes use of a variety of sensors, including gas, obstruction, and water level sensors. The system's objectives are to improve flood detection in the early stages, monitor dangerous gas concentrations for worker safety, and identify obstructions in sewer lines to generate early cleaning alerts. With the aim of maintaining the city safe, clean, and healthy as well as minimizing manual drainage monitoring for the protection of sewer workers, it makes use of Wireless Sensor Networking (WSN) technology to gather and send data to a cloud for real-time monitoring.

"Cloud-based smart system for managing and monitoring drainage using IoT," Bhanujyothi (2020).The Internet of Things (IoT) is used in this paper's proposed cloud-based smart drainage monitoring framework to autonomously monitor drainage systems. It uses sensors to monitor water flow rates and identify potentially dangerous gasses. Sensors record and analyze data in the cloud when they identify values that are higher than the threshold. The Blynk server sends alerts to the municipal office via SMS, and a buzzer is set off to signal for quick action. The system intends to enhance urban drainage system management and alleviate problems encountered by locals who live close to drainage systems.

IoT-Based Smart Sewage Monitoring System with GSM and Wi-Fi Module, Priya Tiwari (2021).In order to identify clogs, stink gas, and temperature in sewage systems, the article suggests an Internet of Things (IoT)-based smart sewage monitoring system that makes use of

sensors and communication modules. An LM35 temperature sensor checks the temperature inside manholes, ultrasonic sensors track water levels, and a MQ-2 gas sensor identifies dangerous gasses. The system uses GSM to send warnings to a registered cellphone number and transfers data to the cloud for graphical representation. Its goals are to increase the safety of sewage workers, operate subterranean systems more effectively, and offer a time- and money-efficient solution that requires no human involvement.

"Intelligent Human Free Sewage Alerting and Monitoring System," Parameshachari Bd (2021).The study suggests an automated Internet of Things (IoT) system for developing nations' Underground Drainage Monitoring System (UDMS). It automatically senses and updates physical characteristics, such as temperature, water level, humidity, flow rate, and blockage, using sensor networks. The system can be expanded to agricultural areas or other environmental applications, and it can be customized for environmental monitoring, including the detection of floods and volcanic activity. The platform structure, compliance, renewability, enhancements to sensor nodes and interactions, errors in interactions and functions, service availability for diverse needs, and user server dependability in connection with IoT applications are some of the characteristics of the sensor network.

"Iot-Enabled Underground Drainage Monitoring System Using Water Flow Sensor," by Dr. Gunasekaran M (2021).The study suggests employing a water flow sensor to create an Internet of Things-enabled subsurface drainage monitoring system. This system uses an Arduino, water flow sensors, and GSM technology to update the Internet of Things (IoT) in order to administer and monitor subterranean systems in real-time. It is intended to assist in identifying drainage obstructions, cutting down on water waste, and averting illnesses brought on by tainted water. Real-time updates over the web are made possible by the technology, which helps to keep the drainage system in good condition and free of risks.

IoT-Based Waste Management and Drainage Monitoring and Alert System for Smart Cities, Aarthi M (2021).In order to remotely monitor drainage depth, gas level, and temperature, the study suggests a system made up of an ultrasonic sensor, a gas sensor, and a surface sensor. Its goal is to use the Internet of Things (IoT) to construct autonomous, low-cost waste and wastewater management solutions. The system has an enhanced graphical user interface for remote access, a network coordinator, and cloud storage for the GPS sensor node. By gathering physical parameter readings and transmitting the information through the Blynk server, the sensor node supports smart system applications.

III.Drawbacks Of Existing System

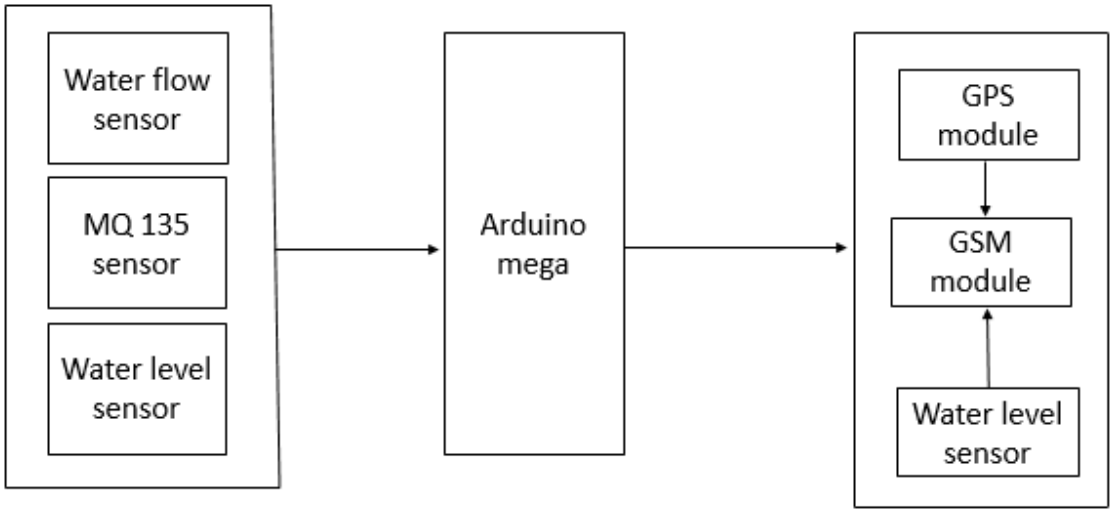
- Today’s drainage machine isn't always excessive-tech. So, each time there's Blockage, it is tough to find out the precise area of the blockage.
- Early indicators of the blockage are not received.
- Detection and repairing of blockage is time consuming.

IV.Objectives Of Proposed Method

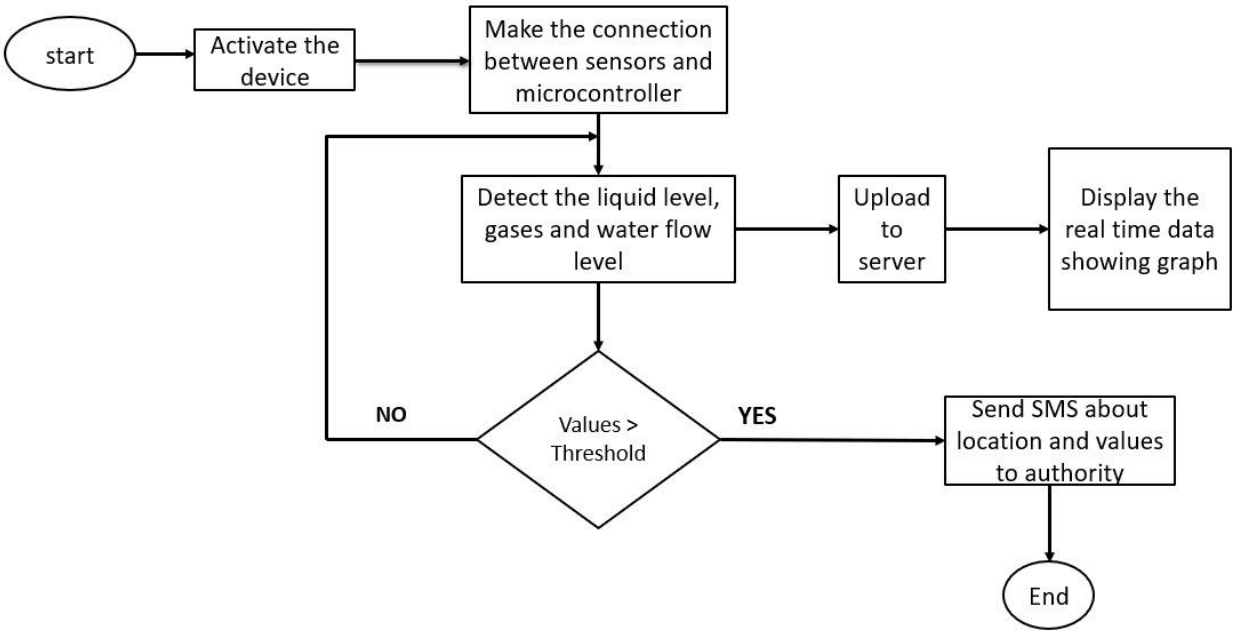
- Cleaner towns and smart control of drainage within side the metropolis.
- Checking water flow rate continuously, as well as sending automatic mail, display on the monitor if the water level is outside of an expected normal range.
- Sensing the temperature and leakage of gas and updating it in real time
- The main objective is to obtain an effective low-cost and flexible solution for condition monitoring and infrastructure management in the city

V.PROPOSED METHOD

The drainage channels are covered with manholes to operate and to clear the blocking present inside the channel. By placing the sensor node inside of the manhole it detects and transfers the appropriate sensed information about the blockage, harmful gases and conditions to detect elevated flow levels of drainage system. Using the communication modules it will communicate with the sensor nodes places at nearby manholes. This data will be then transmitted to the base station for further analysis.Sensors will monitor the water levels, blockage in drainage as well as amount of hazardous gases in real-time scenario. Based upon the data values given by the sensors in drainage system the information along with location ID will send to the Gateway and that sends to cloud (server) or concerned authority.



a) Fig 1. block diagram



b) Fig 2. flow chart

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