Smart Sensors and Arm Based Drainage Monitoring System

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Abstract:- Smart and subversive drainage system is an imperative element of a municipal infrastructure. It is undoubtedly forms an integral part of our daily life. Nowadays, we can see that the people are facing many problems regarding drainage system. Now we are looking forward to implementation of the smart cities. Therefore, a system which handles underground water is essential to build. This task illustrates various functions used for maintenance and monitoring of underground drainage system all over the city. Various types of sensors like flow, level, and gas sensors are intervened by interfacing with ARM7 in order to make the system as smart. This project acts as a system which is developed to monitor the water level, water flow and gases. If drainage system gets blocked and water overflows this blockage will be instinctively recognized by the sensor. Specific sensors reached to the threshold level, the problem will be indicated and displays the message on the 16x2 LCD this information is sent through GSM to the nearby municipality service for the further corrective action.

This smart drainage monitoring scheme will help to maintain the health of the people living the nearby aeras mainly during the wet season and ensure that people are safe. This monitoring also ensures that instinctive action is taken by the government personnel. The sensors do not give accurate values at times. There will be network problem in GSM when the sky is not clear.

I. INTRODUCTION

The world is growing rapidly into smart cities but the problems faced are still the ones from primitives. The modern world has a great need of modern advancements and sophistication in its planning systems. Smart cities need smart solutions where the city's infrastructure is survived by the installation of sensors to the age-old problems. The one such problem is to detect the blockage in the underground sewage system. If this problem is not acknowledged it causes some serious consequences. For initial evaluation the presented system is mounted in a number of strategic sewers. Smart sewage system uses the properties of microprocessors. This reduces the man-effort and also gives quick check over the problem. The system should be able to integrate into normal monitoring/alarm systemsso that the sewer variations can be scrutinized.

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As the world has become smarter, we don't need a work force to address this problem. Contrary to old existing systems we have come up with smart solution using sensors and ARM7.

II. BACKGROUND OF THE PROBLEM/EXISTING SYSTEM

Sewage Overflow is a condition in where untreated wastewater is discharged from a sanitary sewer or drainage system into the environment prior to reaching sewage treatment facilities. It generally caused by heavy rainfall and it is also known as wet weather overflow. It is primarily adequate in developed countries, which have extensive waste water treatment facilities.This overflow water form stagnant pools over the roads. We can see people wading over this overflown road till the municipal services are done. These services are not done immediately because of the delay in passing the information to the municipality corporation.

Frequent causes of sewage system overflow are:

Sewer lines get blocked sometimes.

Inflow of excessive storm water into sewer lines during heavy floods and broken drainage channels.

III. OBJECTIVES OF PROPOSED WORK

The major objectives of the work are listed below:

Smart and Clean cities by efficient management system

Continuous detection of drainage water level and blockages in the sewer lines

Monitor water flow rate continuously, as well as sending automatic mail, display on the LCD

To obtain a low-cost is the main objective and flexible solution for monitoring with a good condition.

IV. DESIGN OF SYSTEM

Smart Sensors and ARM based Drainage monitoring System implantation is discussed below. The core unit of this system is ARM7. The ARM7 processor is programmed to sense the sewage water level and blockage. Attached gas sensors give the early report if any gas leakage by alert message or sound by buzzers.

4.1.Block Diagram Of The Proposed Model

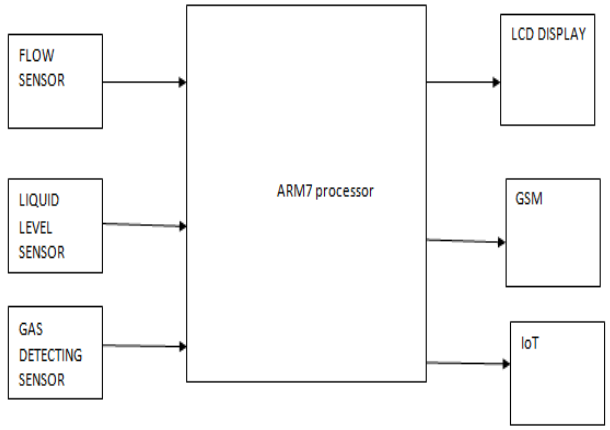

Fig.1: proposed system Block diagram of the

4.2 Algorithm:

- Start the program
- Power up the hardware's.
- Initialize hardware Modules based on the requirement.
- Display on LCD as "**smart sensor and arm based drainage monitoring system".**
- ARM7 will sense Sensor's value.
- When level increases and reaches the threshold value it sends the message through the GSM.
- IOT used for flow sensor related data and will be updated on the web server.
- Detected all information will be display on LCD
- Loop Repeats.
- Stop the program

4.3.*Working*

- This system is implemented to maintaining the proper health, neatness and safety of the city and also in reducing the work of government personnel's.
- Different types of sensors like flow, level and gas detecting sensors are interfaced with microcontroller ARM7 system.
- Particular sensors reach the threshold values, and then the information of that respective sensor is being sent to the microcontroller that is ARM7.
- Further, based on the input received from the different sensors, ARM7 then sends the signal and location of the blocked location of the water channel to the municipal corporation and the officials through GSM could easily locate which blocked channel and could take appropriate steps.
- Sensors which interfaced in different ports are selected by programming
- ARM7 updates the live values of all sensors to the web server using IOT.
- The entire information regarding sensors will also be displayed on the 16*2 LCD.

V. RESULTS AND DISCUSSIONS

When the sensors reach its threshold value then it's values are displayed on the LCD display. When the gas is detected it is displayed on the LCD as well a text message is to the registered number through GSM. The same process is revised when the water level is high. The flow of the waste water can be continuously monitored in the think speak website.

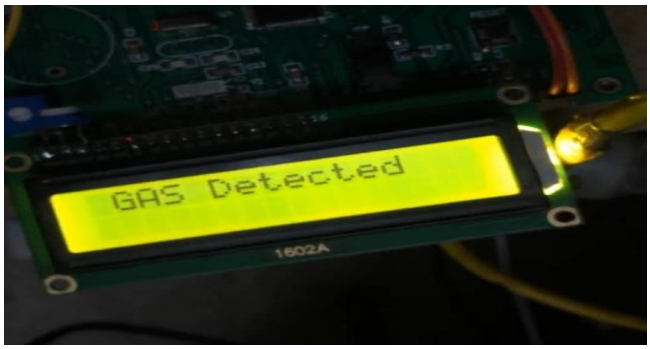

Fig2. Displaying Message on LCD

Fig3a. Sending Message through GS M

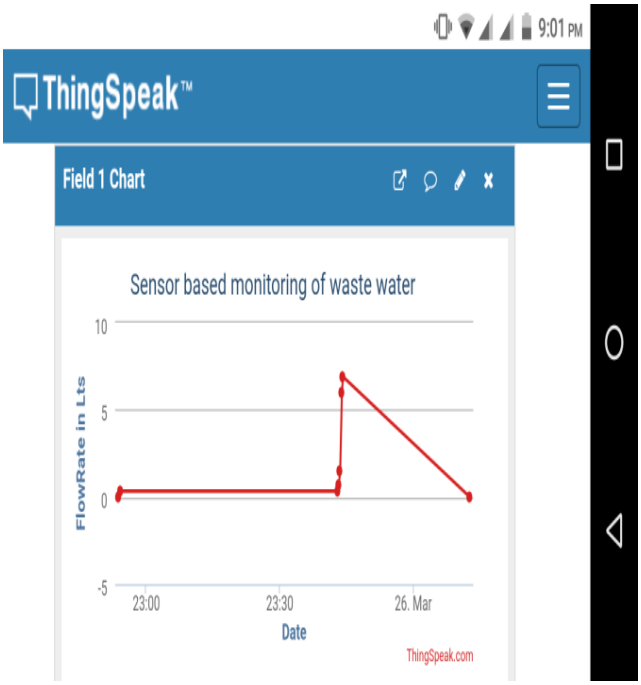

Fig3b.Graph in Website Using IOT

VI. ADVANTAGES

This proposed system may Reduces the number of Road Accidents and control the pollution. Also it consumes only less power. This system provide the Gas leakage alert if any gas effects existing, hence it will save the peoples life. Majorly it will reduce the man power required for this work drastically. If it is efficiently implemented on metro cities, very easy to monitor and manage the urban drainage systems. Implementation cost and maintenance cast also reasonable.

VII. CONCLUSION

The smarter solutions help our world to become smarter and have a secure and bright future ahead. With an optimistic vision our project will help in reduction of known calamities and also the fatal accidents.By monitoring of the waste water many problems faced by the people can be reduced instinctively. It will also increase the scope of betterment, innovation and sophistication in developing solutions to the most common problems faced by mankind. This simple drainage monitoring system will help to maintaining proper health, neatness and safety of the citizen's.

VIII. REFERENCES

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