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Smart Water Leak Controller in Metro Water Supply Lines by Arduino

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ABSTRACT: In the water supply network system, the major problem is water leakage. Undesirable water leakage due to leaky pipelines and underground pipelines always be in effect in drinking water supply networks. This system contains two sections, first part is leakage detection and automatically closest solenoid valve for to prevent the over leakage of water and send SMS to the corporation using GSM module according to sensor information. By using GPS location to detect where the leakage takes place. The second part is that to fill the cistern tank by using an android application. GPRS module enables data logging with the existing cellular network infrastructure. A prototype model of the proposed system was executed, applied, and tested with various scenarios and the results are presented in this paper. Water resource management is one among the key goals so any country within the world as water requirement is increasing steeply; involving automation in such systems will reduce human errors and can increase efficiency and thus decreasing the availability demand gap.

I. INTRODUCTION

Water plays a key role in our day-to-day life. In day-to-day life, people don't realize the scarcity of water. In the water management system, water consumption and water monitoring are efficient mainly in the home or office. Therefore, efficient use and monitoring are potential restraints for home or office water management systems. For the survival of things, water is the most essential one. Surface water will also help for our future needs. Water is synonymous to life, as living things cannot live without it. This information is very useful for better management for farmers to improve their lands and crops. Pipeline networks are the most economic safety, reliability and efficient. If properly maintained, pipelines can last forever without leaks. Pipeline systems are responsible for transport water, oil and gas. The financial losses and environmental damages are caused due to leakage in pipes.

Pipeline networks are the most economic safety, reliability and efficiency. If properly maintained, pipelines can last forever without leaks. Pipeline systems are responsible for transport water, oil and gas. The financial losses and environmental damages are caused due to leakage in pipes. This to detect and prevent the water leakage for the consumption of water in future use. Buried pipelines are currently monitored at the ends, which can be spaced several kilometers apart. The operators provide better network of understanding for higher spatial resolution.

The goal of the system is to design and monitor the location of water leakage sensed by the sensors. The major leakage problem takes place in underground pipelines which are not able to detect. Our idea is to take the necessary action to restore the water leakage in underground pipelines. Based on GSM, the pipe monitoring system is located and then the hardware and software design of the system is analyzed, the real-time monitoring of Leakage-Detection in underground water-pipelines is improved by means of the effective design. At the same time, the modem monitoring system managements easily and flexibly for the requirement of this mode. The real-time monitoring for the traditional detection method by using this technology, the real time monitoring of underground water pipe is detected and overcome the shortcomings can be achieved. It also has advantages like manpower is less, and it promotes the efficiency of the system and locating the leakage pipe timely. These data are sent to a flow sensor and it evaluates the problem if it is a water leak or not. If the water leakage is detected, it alerts the buzzer alarm and sending a short text message (SMS) to the particular concern using a GSM module.

A. Proximity Sensor

A proximity sensor is used to detect nearby objects without any wire contact. The target sensed by a proximity sensor might be suitable for a plastic target.

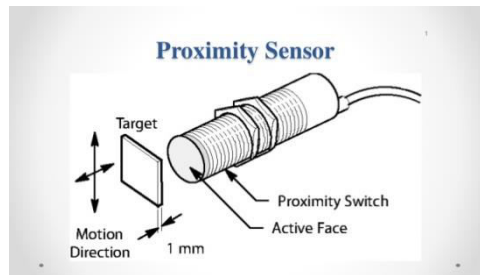


Figure No1: Proximity sensor

B. Acoustic Sensor

Acoustic sensors are used to convert electrical signals into the mechanical signals. By using a physical phenomenon the electrical signal is easily influenced.



Figure No 2:Acoustic Sensor

C. Headphone

Headphones are a pair of small loudspeaker drivers, connection to the ears. They are used to transform a electrical signal to a corresponding sound.



Figure No 3: Headphone

II. EXISTING SYSTEM

We analyzed numerous existing systems built by various researchers in order to construct and improve a model of good quality [1]. During the study of parameters like temperature, pH, and electrical conductivity, pressure different authors proposed differential model to test water quality and water leakage in the various scenarios. We have developed a smart water control system that can perform all these monitoring functions by observing all these details [2].The author indicated that the Internet of Things applications has been rising tremendously in smart homes recently [3]. The wide variety of various IoT systems typically contributes to interoperability needs. Current IoT projects are implemented using physical platforms which lack decision-making intelligence [4].In order to solve management of the heterogeneous IoT in smart home, it is proposed an architecture that implements Event Condition-Action (ECA) process. Developed using a central repository for continuous data on IoT schedules, the constructive architecture has proven perfect for addressing interoperability in clever homes [5].There must also be systems in place that actively test water quality and provide articulated sources to villages, towns, and communities. the rivers, creeks, and shores surrounding our towns and villages used for drinking. [6]. Better water quality is important to avoid waterborne disease



outbreaks as well as to improve the quality of life. Fiji Islands are located in the vast Pacific which demands a frequent water quality monitoring network and the current measurements can be enhanced by IoT and RS. In this system a smart water quality monitoring system for Fiji island, using IoT and remote sensing technology [7].

IV. PROPOSED SYSTEM

Pipeline networks are the most economically safe, reliable, and efficient. If properly maintained, pipelines can last forever without leaks. Pipeline systems a responsible for transport water, oil, and gas. The financial losses and environmental damages are caused due to leakage in pipes. This to detect and prevent water leakage for the consumption of water in future use. Buried pipelines are currently monitored at the ends, which can be spaced several kilometres apart. The operators provide a better network of understanding for higher spatial resolution.

The system is to design and monitor the location of water leakage sensed by the sensors. In that it has to send the SMS to the authorized concern to identify the leak location. Instead of that for this module to set a LED for to identify the leakage by using the assumption of water flow rate. In that the flow rate is equal in both the LED's then it sends a normal SMS. If there is an any change in the LED's then it also indicates the flow rate of the particular sensor with that it also sends a SMS of leakage is detected in that sensor. Then the buzzer alarm starts alarming to identify the leak location.

In this module, Arduino is interfaced with the GSM module. If LED 3 blinks, then the message will send through the GSM. The flow rate and the leakage also indicated by the message. A module, Arduino is interfaced with the GSM module. If LED 4 blinks, then the flow rate of the LED to be low, so the GSM sends the SMS of leakage is detected. Then the buzzer will start the alarming sound. This water leak detection can readily use to prevent leakage in underground pipelines. To identify the leaks and rectify them by this system. This project aims at reducing leaks which has many benefits for both the corporation as well as the consumer including greater reliability.

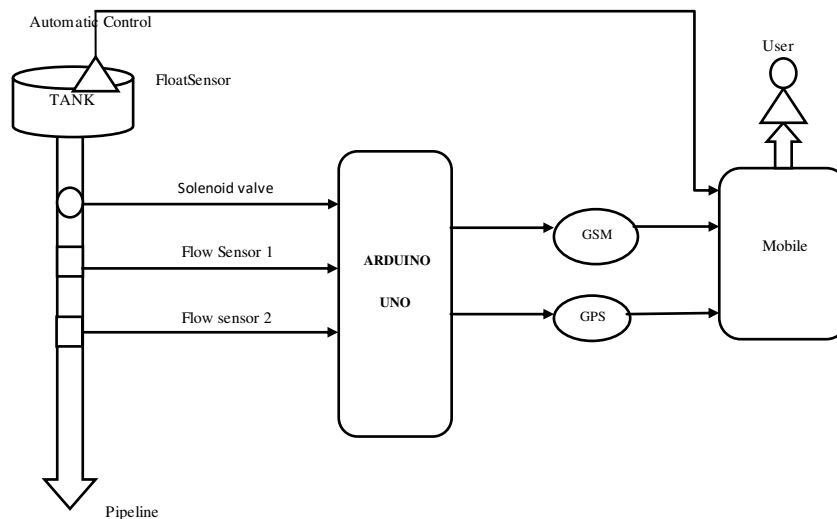


Figure No 4:Proposed Block diagram

These smartphones and tablet computers are designed by the android application. It comes under the technology of the operating system of Linux which is a touch screen mobile device. Smartphones and minicomputers were developed in the last fifteen years start from white and black phones. The mobile OS in recent days which is android is used worldwide. The web browsers are web kit, library libc which is COMES UNDER LINUX KERNEL CALLED AS SET OF LIBRARIES.THE recorded audio and video files are saved n this library. The application data is used for storing and exchange the database through SQ lite. The internet security is also responsible for this library.



V. RESULT

In this result, the system is to design and monitor the location of water leakage sensed by the sensors. In that, it has to send the SMS to the authorized concern to identify the leak location. Instead of that for this module to set a LED to identify the leakage by using the assumption of water flow rate. In that, the flow rate is equal in both the LED's then it sends a normal SMS. If there is any change in the LED's then it also indicates the flow rate of the particular sensor with that it also sends an SMS of leakage is detected in that sensor. Then the buzzer alarm starts alarming to identify the leak location.

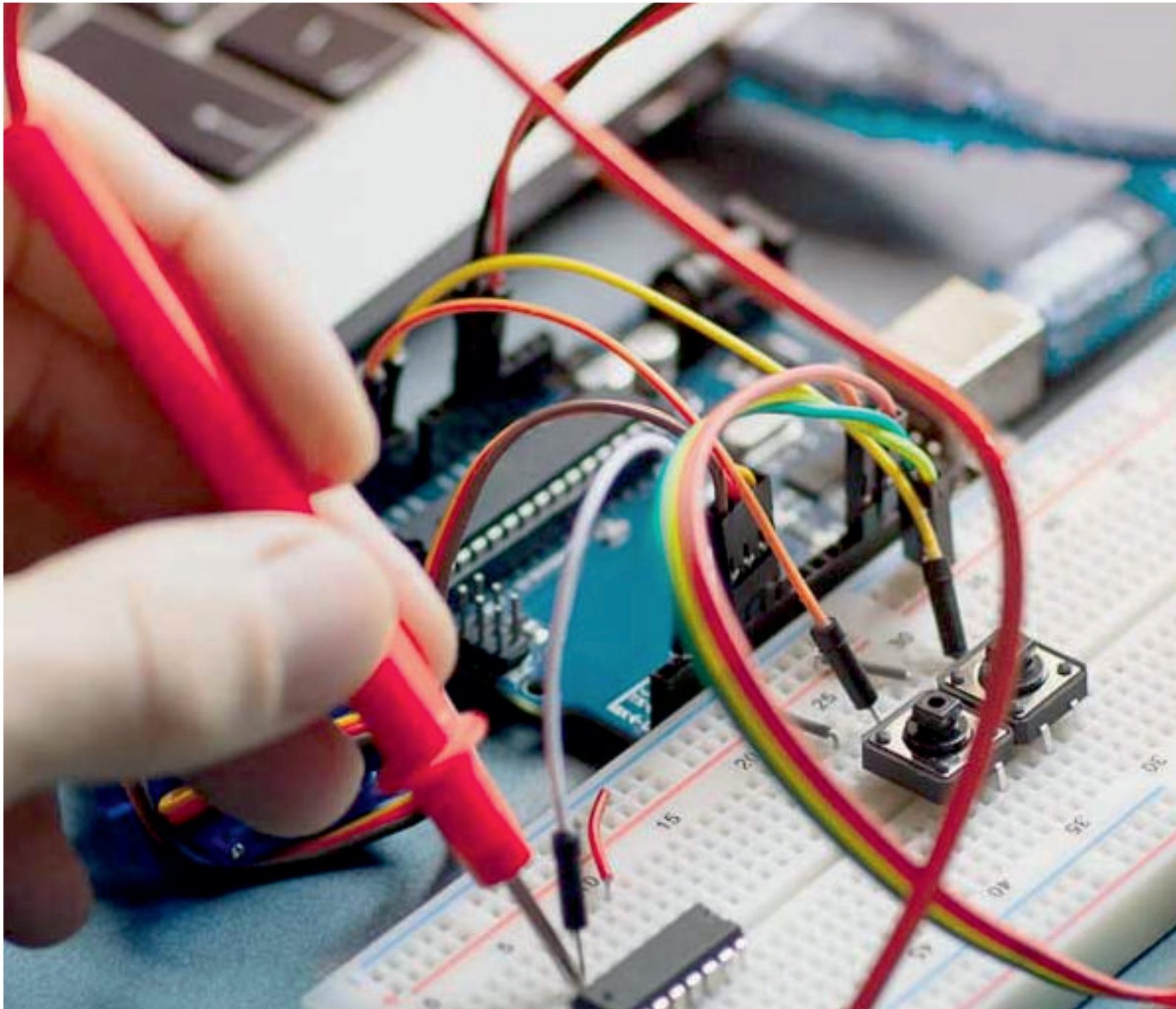
In this module, Arduino UNO is interfaced with the GSM module. If LED 1 or LED blinks, then the message will send through the GSM. The flow rate and the leakage also indicated by the message. A simple output of flow sensor 3 is shown below. In this module, Raspberry Pi is interfaced with the GSM module. If LED 3 blinks, then the message will send through the GSM. The flow rate and the leakage also indicated by the message.

VI. CONCLUSION

This water leakage detection can readily use to prevent the leakage in underground pipelines. To identify the leaks and rectify them by this system. This project aims at reducing leaks which has many benefits for both the corporation as well as the consumer including greater reliability through an efficient water system and also preserving water for future use.

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