
Water flow monitoring system determining the presence of leakage and Ultrasonic liquid level monitoring system

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ABSTRACT:

One of the basic needs of many people is access to water. They utilize water for a variety of daily tasks. The intended system uses a microcontroller to inform the user of the level of water in the tank and sends notifications via mobile network. The water flow sensor, which measures the flow of water, is used to find leaks. The user gets informed if there is a leak. A flow monitor affixed to the pipe for measuring the flow of water through the pipe is part of a water flow observation system for determining the presence of leaks in plumbing pipes with water flowing through the pipes beneath air mass.

KEYWORDS

Water, monitoring, leakage, depth, ultrasonic sensor, water flow sensor, water level, measuring.

1. INTRODUCTION:

The most vital natural resource for humans is water. The majority of human everyday activities, including washing clothes, cleaning, taking baths, irrigation, and industrial demands, all require water. However, the amount of clean water is dwindling as the global population is steadily growing. Water is a valuable resource that is required everywhere, but due to its excessive consumption, it must be used carefully in order for subsequent generations to experience the fewest negative effects. Excessive water use, whether for personal or professional purposes, is a serious problem that has an impact on the environment's natural resources.

The current global climate change contributes to water shortages or deficiencies through altering weather patterns, such as droughts.

2. EXISTING SYSTEM:

The water employer writes down the meter reading and mails in a postcard with this info to the water department and also uses a phone dial-in system to transfer this information to the water department and also logs into the website of the water supply company, enters the address, meter ID and meter readings a meter reader comes to the premises and enters the meter reading into a handheld computer. Leaks from pipes, plumbing fixtures and fittings are a significant source of water waste for many households. Research has shown

that the standard home will lose a pair of, 000 to 20,000 gallons (7.6 m³ to 76m³) of water per year due to leaks. Some leaks are obvious, like dripping taps and unseaworthy water heaters. Unfortunately, many leaks go undetected for years because the source of the leak is not visible [fig1]

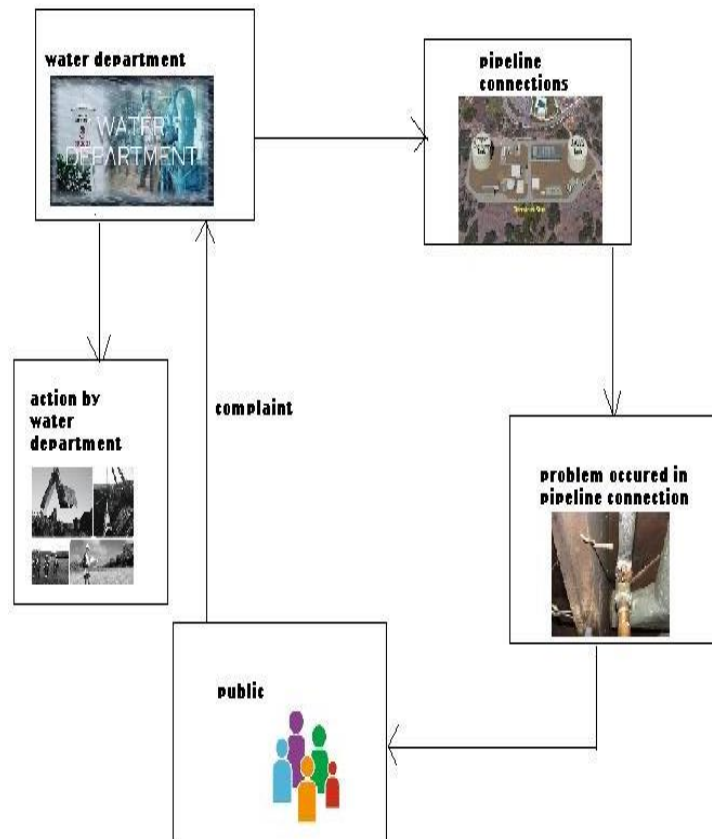


Fig1: water monitoring system (existing system)

3. PROPOSED SYSTEM:

In this project it is proposed to develop an embedded based remote water monitoring the water level in canal [fig5] and detecting the leakage point of water pipe with in short period of time [fig2]. The overall objective of a distribution system is to deliver wholesome water to the actual space and most coverage of reasonable value. To attain this objective the organization has to evolve in operation procedures to make sure that the system is operated satisfactorily, function efficiently and continuously as far as possible at lowest cost. Here we are using Microcontroller and also water flow/water detection sensors are arranged to find the leakage point of pipes, and also to find water level in the canal, the water level is send to the water department by using webpage [fig7]. Another feature of proposed system is Send a message (Area name and time) to the water department person at particular time, so that he can release water for particular area, by this feature they can release water in time to the Particular area. The Internet of Things is that the network of physical objects—devices, vehicles, buildings and alternative things embedded with natural philosophy, software, sensors, and network connectivity—that allows these objects to gather and exchange data.

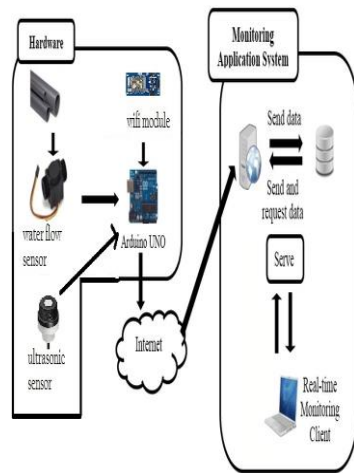


Fig2: water monitoring system (proposed system)

Arduino Uno[fig3]: Arduino is a microcontroller board based on the ATmega328P. It has 14 digital input and output pins, 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button.

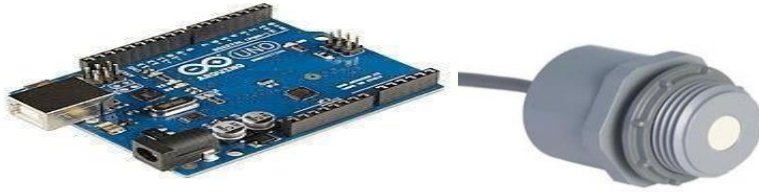


Fig3:ArduinoUno

Wi-fi module [fig4]: The ESP8266 Wi-Fi Module is a self SOC with integrated TCP/IP protocols that can give any microcontroller access to your Wi-Fi network.



Fig4: Wi-Fi module



The sensing element head emits an ultrasonic wave and receives the wave mirrored back from the target. Ultrasonic sensors measure the distance to the target by measuring the time between the emission and reception. A water flow sensing element consists of a plastic valve body, a water rotor, and a hall-effect sensing element. When water flows through the rotor, the rotor rolls. Its speed changes with different rates of flow. The hall-effect sensor outputs the corresponding pulse signal. There are three modules implemented in this project. The first module is water level detection in the tank using an ultrasonic sensor. The second module is water leakage detection in a tank using a water flow meter.

Fig5: ultrasonic sensor

Fig6: water level system



Flow sensor: sensor is used to measure the flow of water.[fig7]

Fig7: Flow sensor

This device primarily consists of a plastic body, a rotor and a sensor. The pinwheel rotor rotates once water / liquid flows through the pipe and its speed are directly proportional to the rate. The Hall result device can offer Associate in Nursing pulse with each revolution of the pinwheel rotor.

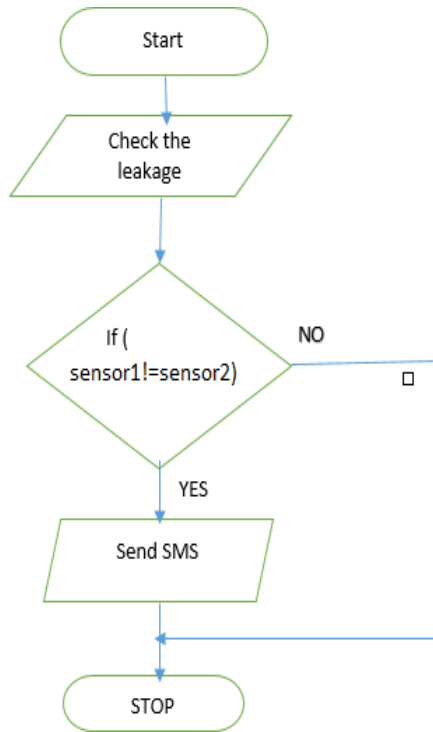


Fig8: water leakage system

4.

5. FUTURE SCOPE:

The proposed system can be made more advance in future, as here we are using mobile for notification purpose to the user, and in future a mobile application can be used. Also in our system we are notifying to one or two users only but in future with the help of satellite we can give preference of number many users and notify only that user which is within the specified area range.

6. CONCLUSION:

This system will detect water level in reservoir and accordingly notify the user by calling on mobile so that user will turn on or off the pump. This will keep the user free. Also discharge system can inform user as presently because it takes place can facilitate to recover additional massive drawback. And analysis of water can facilitate to stay health of user secure. As numerous system use diode or buzzer system for notification purpose that cause noise. Also when there is no one in house then buzzer is of no use. This problem is solved in this system with the help of use of mobile. It facilitate to scale back wastage of water primarily, and electricity too. And takes the care of user's health. The proposed system can be use at various locations like in food factory for various liquid containers, chemical factory, in various industries.

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