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Real Time Monitoring and Control Water Level Using Internet of Things

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ABSTRACT: Water is the core resource and a vital for life of all species, as it is a limited resource that needs to be utilized efficiently. Monitoring and Controlling leads to a clear understanding of the aspects for a healthy life and to avoid wastage of water. Using Internet of Things (IoT) allows for the integration of real time monitoring and controlling of water. It is very difficult at times to keep a real-time track of every water drop consumed. Moreover, the orientation of the tank hinders the facility of monitoring the water levels. Therefore, using an IoT based solution assists in keeping an accurate record of the water levels. It consists of sensor devices, which automatically detect the level of water inside the tank IoT based water level monitoring provides real-time autonomous detection of water level and takes appropriate action based on the levels including overflowing, water depletion, water usage and leakage control. Deploying an autonomous system to keep a real-time check upon the water levels provides an effective solution to water-related challenges.

KEYWORDS: Real Time, Water Level, IOT, Monitoring

I. INTRODUCTION

Water contamination will be those sullying about water figures. To provide pure water for marine animals, using wireless oxygen sensor network system quality of water can be detected. In order to estimate the pollution content in and amount of oxygen level in the water for future purification of water. At the oxygen centralization surpasses those ordinary extent our convenient oxygen focus identification What's more screen framework will inform the client promptly. This plan is simple will perused Also know the extent to which oxygen centralization will be exhibit buzzing around Many of the electronics that we use today consist ofsome type of circuitry, which most of the time, we overlook this and take many of the devices we use for granted. As such, Water level Indicators employ a simple circuit to detect and indicate the water level in a container or a tank. We will be looking further into water level indicators used in overhead water tanks which can be found in many homes today. The idea of this project is to measure the level of water in a tank without any means of manual measurement. The invented a way to detect the water level in non-transparent coffee makers. Thus the idea came to be useful way to detectthe water level of an overhead tank in homes. There are many different types of water level indicators available on the markets which involve much more complex circuitry and complexity. For instance, automatic water level indicators are an advanced microcontroller based device which can detect not only the level of water, but can also power on and off of the water pump by using a sensing device. When researching daily applications of circuits, we searched for a circuit that will be feasible to build within a month time and incorporate many aspects that we learned in class. After researching many circuits, we decided to look closer into a circuit that measures the water level in a container. Using P-Spice we will be able to design a water level indicator that will use transistors, resistors, a rectifier, a transformer, LEDs, and a sound buzzer. The transistors in our circuit will be used as switches. The resistors in our circuit will be used to lower the voltage going into the transistors and LEDs. The rectifier is used to convert the voltage from the transformer from AC to DC voltage. The LEDs are used to indicate the water level in the tank It is found that much of the water is wasted due to the inefficient and poor water allocation and lack of integrated water management systems So water level management system makes potential significance in home appliances, industries etc…, Water is a limited resource and is essential for agriculture, industry and for creature's existence on earth including human beings. Lots of people don't realize the real importance of drinking enough water every day. More water is wasted by many uncontrolled way. This problem is quietly related to poor water allocation, inefficient use, and lack of adequate and integrated water management. Therefore, efficient use and water monitoring are potential constraint for home or office water management system. Every living thing on earth needs water to

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survive. Humanbodies are made up of more than 60 % water. We use clean water to drink, grow crops for food, operate factories, and for swimming, surfing, fishing and sailing. Water is vitally important to every aspect of our lives. Monitoring the quality of surface water will help protect our waterways from pollution. Farmers can use the information to help better manage their land and crops.

II.EXISTING SYSTEM

In existing system is found that much of the water is wasted due to the inefficient and poor water allocation and lack of integrated water management systems Major problem for industry, home, etc…, in this way manual intervention is not required for continuous water supply Thus, sophisticated and precise water management systems need to be invented. Major problem for industry, home, etc…manual intervention is not required for continuous water supply. The goal of this system is to design and manage a Wireless Sensor Networks (WSN) that helps to monitor the location of water leakage with the help of information sensed by the sensors located above water hoses, so as to keep the water resource within a standard described for domestic usage and to be able to take necessary actions to restore the health of the degraded water quantity. We use Arduino mega2560 microcontroller to design and build a water leakage detection & wireless control system which provides the user with new features such as water leakage detection and water level control in tank by mobile application. The purpose of the system is to bring comfort and energy saving to our lives.

III.PROPOSED SYSTEM

In this Proposed System we produce a system for detecting the water leakage and control water pump which is related to a domestic use and needs, so we apply this system on a model of a simple home to show and explain how this system can be applicable to be built in of any civil structure. The work focused in this project is using Arduino Board, for measuring the water flow from the pipe which divides the flow of water to every parts of block, will get sense using flow meter YF S201 or using solenoid. This data that is flow rate which is nothing but the usage of water rating in hours/liter, will be sent to cloud through IoT (Internet of things). Then in return getting this data from cloud to web application, the application which can be used by the user or the head of corporation for monitoring and controlling the supply of water.The solenoid valve is also used to restrict the flow of water when the water usage exceeds the limit. We will operate solenoid valve using IoT. Only one member in home can see status of motor On/Off by visiting webpage. We are automatically controlling the solenoid valve from mobile. And in case of any failure system does not work then the valve also control manually. This water usage data would be sent to cloud using the IoT (Internet of things) space. And the data will be send to cloudper sec.

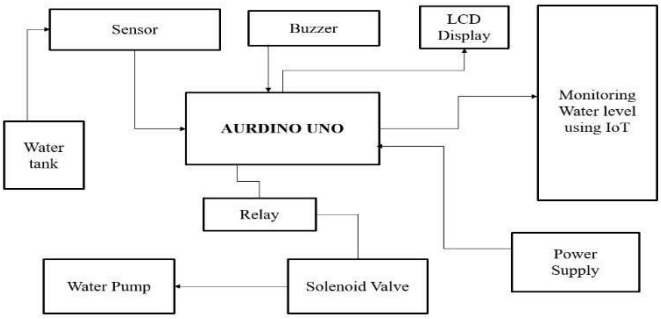

Figure.1. Block Diagram

IV.HARDWARE DESCRIPTION

Hardware requirement analysis is to define and analysis a complete set of functional, operational, performance, interface, quality factors, design, and criticality and test requirements. Water Level uses the Arduino board along with theultrasonic sensors.

ARDUINO CONTROLLER

Arduino UNO controller has 14 digital I/O pins out of which 6 provide PWR output, open-source and provides

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prototype platform and 16MHX crystal oscillator attached to it. In addition to the above features, it also has an USB connection, a power jack, an ICSP, header and reset button. It has everything to support a micro- controller. It can simply be connected to a computer using an USB cable or power it with an AC or a DC adapter.

Figure.2. Arduino UNO Circuit Board

PIR SENSOR

A Passive Infrared (PIR) sensor is a type of electronic sensor that detects motion by measuring changes in infrared radiation levels emitted by objects within its field of view. These sensors are commonly used in security systems, automatic lighting systems, and other applications where motion detection is needed. The basic principle behind PIR sensors is that all objects with a temperature above absolute zero emit infrared radiation. The sensor consists of multiple infrared-sensitive elements, typically arranged in a pyroelectric material. When an object moves within the sensor's field of view, it causes a change in the amount of infrared radiation detected by the sensor elements. This change is then converted into an electrical signal.

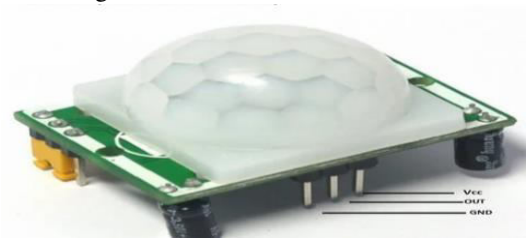

Figure.3. Pin Configurations of PIR Sensor

SOLENOID VALVE

The Solenoid water valve is used to control the water flow in order to change the water flow to the filters or not, according to the received command from the controller. Solenoid valves differ in the characteristics of the electric current they use, the strength of the magnetic field they generate, the mechanism they use to regulate the fluid, and the type and characteristics of fluid they control. The mechanism varies from linear action, plunger-type actuators to pivoted-armature actuators and rocker actuators. The valve can use a two-port design to regulate a flow or use a three or more-port design to switch flows between ports.

Figure.4. Solenoid Valve

Solenoid valves are the most frequently used control elements in fluidics. Their tasks are to shut off, release, dose, distribute or mix fluids. They are found in many application areas. Solenoids offer fast and safe switching, high-reliability, long service life, good medium compatibility of the materials used, low control power and compact design.

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RELAY

In order to isolate two circuits electrically and to connect them magnetically relays are used. They are very useful in switching from one circuit to another when they are completely separated. The relays comprise of an input and an output section. The input section has a coil which produces magnetic field when a small voltage from an electrical circuit is applied. This applied voltage is knownas the operating voltage.

Figure.5.Relay

LIQUID CRYSTAL DISPLAY

A Liquid Crystal Display (LCD) is an electronically-modulated optical device shaped into a thin, flat panel made up of any number of colour or monochrome pixels filled with liquid crystals and arrayed in front of a light source (backlight) or reflector. It is often utilized in battery-powered electronic devices because it uses very small amounts of electric power. LCD has material, which continues the properties of both liquids and crystals. Rather than having a melting point, they have a temperature range within which the molecules are almost as mobile as they would be in a liquid, but are grouped together in an ordered from similar to a crystal. They are used in similar applications where LEDs are used. These applications are display of display of numeric and alphanumeric characters in dot matrix and segmental displays.

Figure.6.LCD Display

VI.SIMULATION RESULT

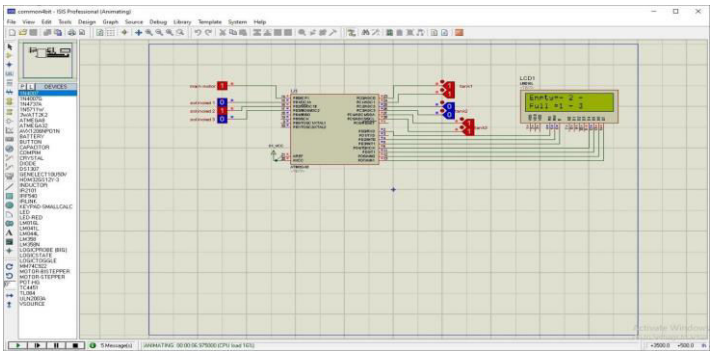

Figure.7. Water Control Reading

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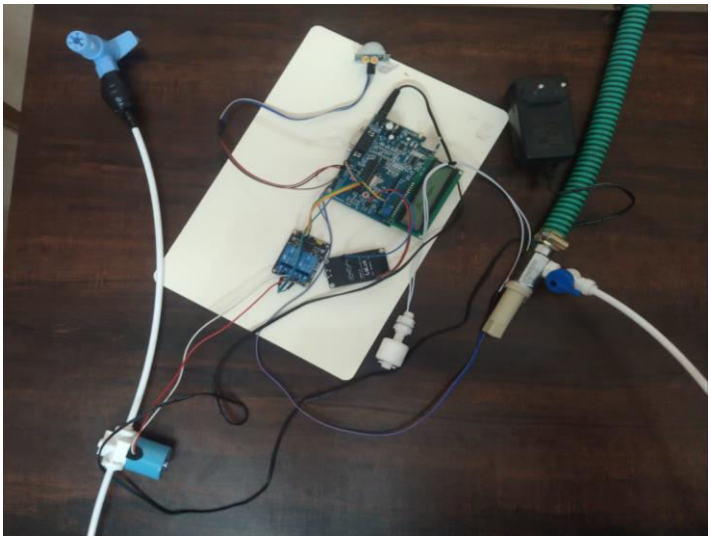

Figure.8. Hardware Implementation

VI. CONCLUSION

Water was the core resource and vital for the life of all species, as it was a limited resource that needed to be utilized efficiently. Monitoring and controlling led to a clear understanding of the aspects for a healthy life and helped avoid wastage of water. Using the Internet of Things (IoT) allowed for the integration of real-time monitoring and controlling of water. It was very difficult at times to keep a real- time track of every water drop consumed or wasted. IoT-based solution assisted in keeping an accurate record of the water levels. It consisted of sensor devices, which automatically detects the level of water inside the tank. IoT-based water level monitoring provided real-time autonomous detection of water levels and took appropriate action based on the levels, including overflowing, water depletion, water usage, and leakage control. The proposed system simulation results are obtained using Proteus software.

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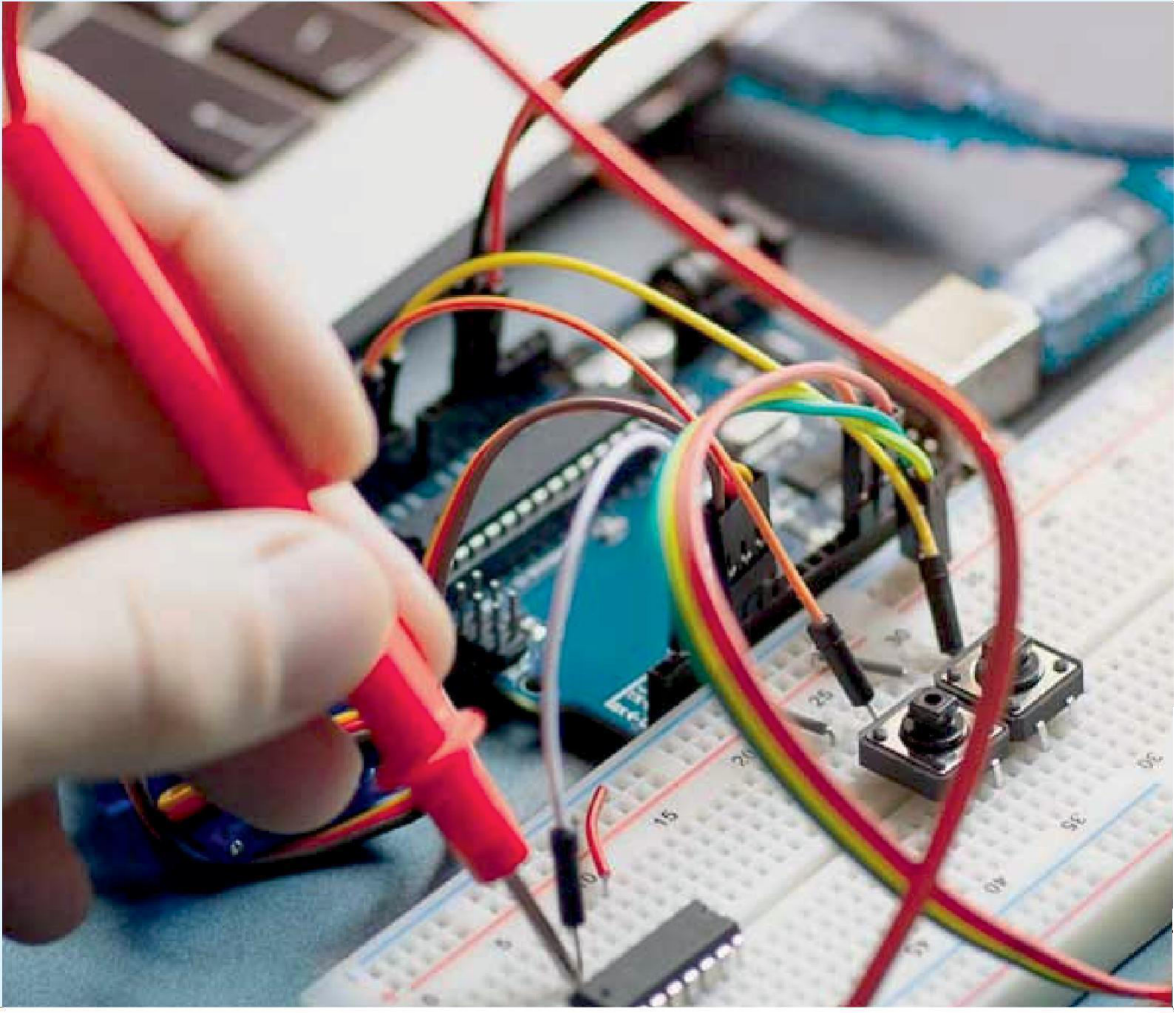

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