# The Efficient Automatic Water Control Level Management Using Ultrasonic Sensor

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## ABSTRACT
In everyday life, million liters of water are getting wasted by overflowing and also heavy usage. To reduce this ,we have to implement some overflow control techniques to minimize the heavy wastage of water. For this purpose, we propose the Smart water level management system. This system uses an ultrasonic sensor to detect the water level and it is based on the sound made from flow of water it calculates the level of water in percentage and returns the value to the LCD display. It will calculate the level of water up to 100% by the intervals of 10%. After each interval it reaches the value is displayed on the LCD screen. This system is connected with relay switch which will automatically turn OFF and ON based on level of water. When the water level reaches 0% it will automatically turned ON and if it reaches 100% it will automatically turned OFF. We can also control the system online using a WiFi module which connects the system with web application we created. By also using PH sensor we can check the purity of the water. The result of this will be displayed on our web application.

## Keywords
Water component; Automatic formatting, auto water style, Automatic water control.

## 1. INTRODUCTION
Water is an essential and important substance to live for all living organisms in the earth. It is not only for survive but also for the day to day life functioning. Major part of earth is covered with full of water itself but not all that water is for consumption some are for other purpose usage. Likewise water is important to everyone's life and to continue like this we have to reduce the wastage of water and also the heavy usage of water. Wastage of water arises mainly heavy water tanks in houses, industries, offices etc. For every thing to control we have some technology or concept or overcome this. To control the water wastage problem we build the system which is Smart water level management. By using this system we can control the water by indicating level of water and also it works automatically. Existing system of water level indicator is used to indicate the level of water by using some sensor to detect the water level and based on this level LED will glow. If the water is in the level 20% then the second LED will glow likewise they inserted LEDs in every 10% and it will glow based on level the sensor detects. But this system not automated and also not efficient all the time. One person will always maintain this system and that person will switch OFF and ON the system. With the advanced features we proposed this system.

The Proposed system of water management is that it is fully automated and also efficient. We can even control this system in online with some web application we have created. In this system we have inserted ultrasonic sensor which will detects the water level based on the ECHO . The levels of this system is varies by 10% upto 100% and these water level is displayed on the LCD screen we placed in this system. We have used relay switch module to ON and OFF automatically without interfering the person. The all records of these water level is entered in database which will show you the monthly usage of water. By using this system we can control the wastage of water and also maintain the constant usage based on our need.

## 2. LITERATURE SURVEY
Literature survey is the most important step in development process. Before developing the tool, it is necessary to determine the time factor, economy and company strength.

Once these things are satisfied, then next steps are to determine the necessities for developing the system. Once the developer starts building the system they need lot of external support. This support can be obtained from books and from website. Before building the system, the above consideration is taken into account for developing the proposed system.

The Smart wireless water level monitoring and pump controlling system Ultrasonic sensor is used to measure the water level. Basic principle of ultrasonic distance measurement is based on ECHO. When sound waves are transmitted in environment then they return back to the origin as ECHO after striking on any obstacle. So we have to only calculate its traveling time of both sounds means outgoing time and returning time to origin after striking on any obstacle. And after some calculations we can get a result that is the distance. This concept is used in our water management project where the water motor pump is automatically turned on when water

level in the tank becomes low.

Water Level Indicator using Microcontroller elaborates the design of the water level indicator and controller using micro controller 8051. This can be used both for household and commercial purposes. There is also a buzzer and a LCD in this project. LCD is used to show the water level in the tank or reservoir. We make use of port P0 for connecting levels of tanl while port P2 is used for the connecting LCD. Microcontroller also controls the pump which is used to pump water to tank. As the tank reaches the full mark the pump is switched OFF during auto mode while switched ON when the tank reaches empty mark.

The Water Level Management using Ultrasonic sensor Measuring water level is an important task from government and residence side. Thus, existing management systems has to be updated. In this paper, we investigate the water level management using ultrasonic sensor which detects the amount of water present in the tank and returns the percentage of water present in it. This system has an Arduino, motor pump, LCD display, over-head tank, resource tank, buzzer and an LED. All components are interfaced with the Arduino and works by automation as per uploaded code. We divided the over–head tank by mean of percentages likely 10%, 20%...100%. 10% is the condition of the tank where the quantity of water present in it is very less and finally 100% is maximum condition. We have to monitor and maintain the tank when the water in it is getting less, but in this we make use of a buzzer so whenever the water level percentage is about 10% the buzzer, makes sense and automatically the relay based motor starts and standstill up to reach of 100% of the tank. So no one is required to monitor the tank and for switching of the motor. The main thing we employed is echo, which can be easily understood by an example consider you are in a silent cave when you produce sound you will listen the same thing by high intensity and this is called echo. Like example the ultrasonic sensor has two small openings on it. In which one opening sends the high frequency sound pulse called as ultrasonic waves like a small speaker (sender) and other opening receives them like a small microphone (receiver).Water Level Controlling and Monitoring using Bluetooth in Agriculture,The application of wireless sensor network (WSN) for a water quality monitoring is composed of a number of sensor nodes with a networking capability that can be deployed for detecting the water level in land. In this project, we use some sensors for detecting the water level from testing the soil, and report the details to famers mobile phone via wirelessly. The farmer mobile phone related to electricity water pump and sensor device, the electricity water pump is controlled by the farmer on wireless network. The Water level was calculated in digitally and it was displayed on mobile application in the farmer's smart phones. And we can control the electric water pump to set ON/OFF by the mobile app. This paper proposes how such monitoring system can be setup emphasizing on the aspects of low cost, easy ad hoc installation and easy handling and maintenance. In this paper, the fundamental design and implementation of WSN featuring a high-power transmission Bluetooth based technology together with the IEEE 802.15.1 compatible transceiver is proposed. The developed platform is cost-effective and allows easy customization.

## 3. METHADOLOGY

Ultrasonic Sensor In this system we used the sensor called ultrasonic sensor which is used to detect the water level based on the ECHO. This sensor contains two parts echo and trig which acts as a sender and receiver. It works based on the sound made from the water and calculates the level of water.


**Fig 1: Relay Switch**

Relay switch module is a electronic device which is used to break or connect the contact with circuit based on the input given. It is automated switch which automatically ON and OFF the switch without any human involvement. In this system, we used the switch to control the circuit automatically and ON and OFF the switch once the water level reaches its high level.

**Fig 2: Buzzer Module**

Buzzer module is a audio signaling device used to make sound and alert when it reaches its value. In this system, we used this module to get alert when the water reaches its high

level.

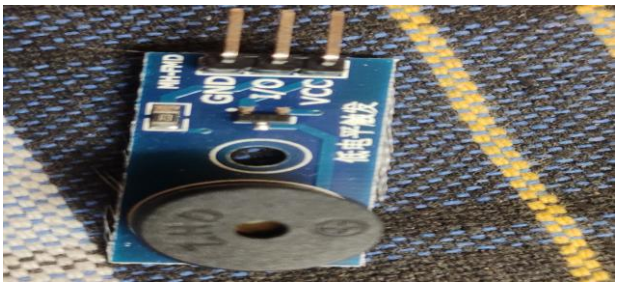


**Fig 3: LCD Display**

LCD display is used to view the result of that system. In this System, we used this display to view the water level and at What percentage it reaches.

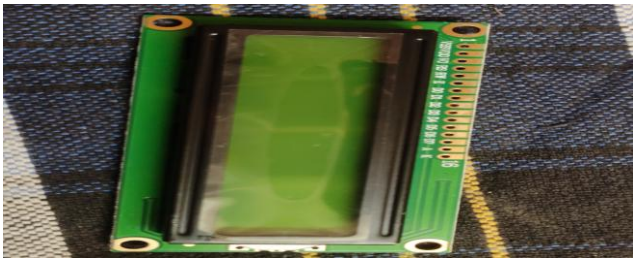

**Fig 4: Arduino Uno Board**

Arduino uno is a microcontroller board which is used to interface the system with the computer and it is easy to load the program into the Arduino board. It has 20 digital input/output

pins (of which 6 can be used as PWM outputs and 6 can be used as analog inputs), a 16 MHz resonator, a USB connection, a power jack, an in-circuit system programming (ICSP) header, and a reset button. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features an ATmega16U2 programmed as a USB-to-serial converter. This auxiliary microcontroller has its own USB bootloader, which allows advanced users to reprogram it.

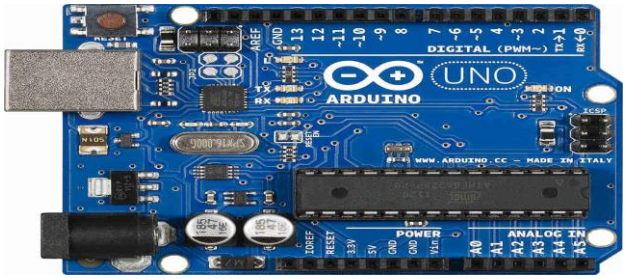


**Fig 5: Wifi Module**

The ESP8266 WiFi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your WiFi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. Each ESP8266 module comes pre-programmed with an AT command set firmware, meaning, you can simply hook this up to your Arduino device and get about as much WiFi-ability as a WiFi Shield offers (and that's just out of the box)! The ESP8266 module is an extremely cost effective board with a huge, and ever growing, community.

**Fig 6: Wifi shield process**

This system works making use of ultrasonic sensor to detect the water level in terms of percentage. As explained before ultrasonic sensor has two apparatus namely trig and echo. Trig is used to emit a sound wave to an object as it is known that when a sound wave strikes an object it bounces back with equal or more intensity which is called as echo. Echo part of ultrasonic sensor detects the reflected sound ray and returns the value according to that . It usually measures the time duration between trig and echo of sound ray. 5V 2 channel Relay is used as external switch for Arduino to power external supply to the DC 12 V pump. Relay is usually in open condition it has continuous supply from Arduino board when a program is given to switch off the supply to relay then external switch is closed which powers external supply to the DC pump which is placed in resource tank. LCD Screen is used to display the value return by the sensor. The whole process from starting to end is powered using power supply which is placed in the system. This system can also control manually using the mobile application which can run whole process without any external factors.

# 4. CONCLUSION

The main aim of this paper to avoid the wastage of water with the system which are very efficient, economical , flexible and most importantly it is portable system. Our proposed system will be useful in both household and commercial usages. In further, the future enhancement can be done by finding the leakage of water and also the quality of water. Automation of the various components around us has been widely increased to reduce human intervention and save time. It is known that improper water management can have harmful effects on both the system and the environment. The main objective of this project is not only to reduce manual labour but also help save water in an efficient manner. Finally, a conclusion can drawn that this project can definitely be useful on a large scale basis due to its minimum requirement of man power and also the installation process being easier making it more compatible for everyone to use.

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