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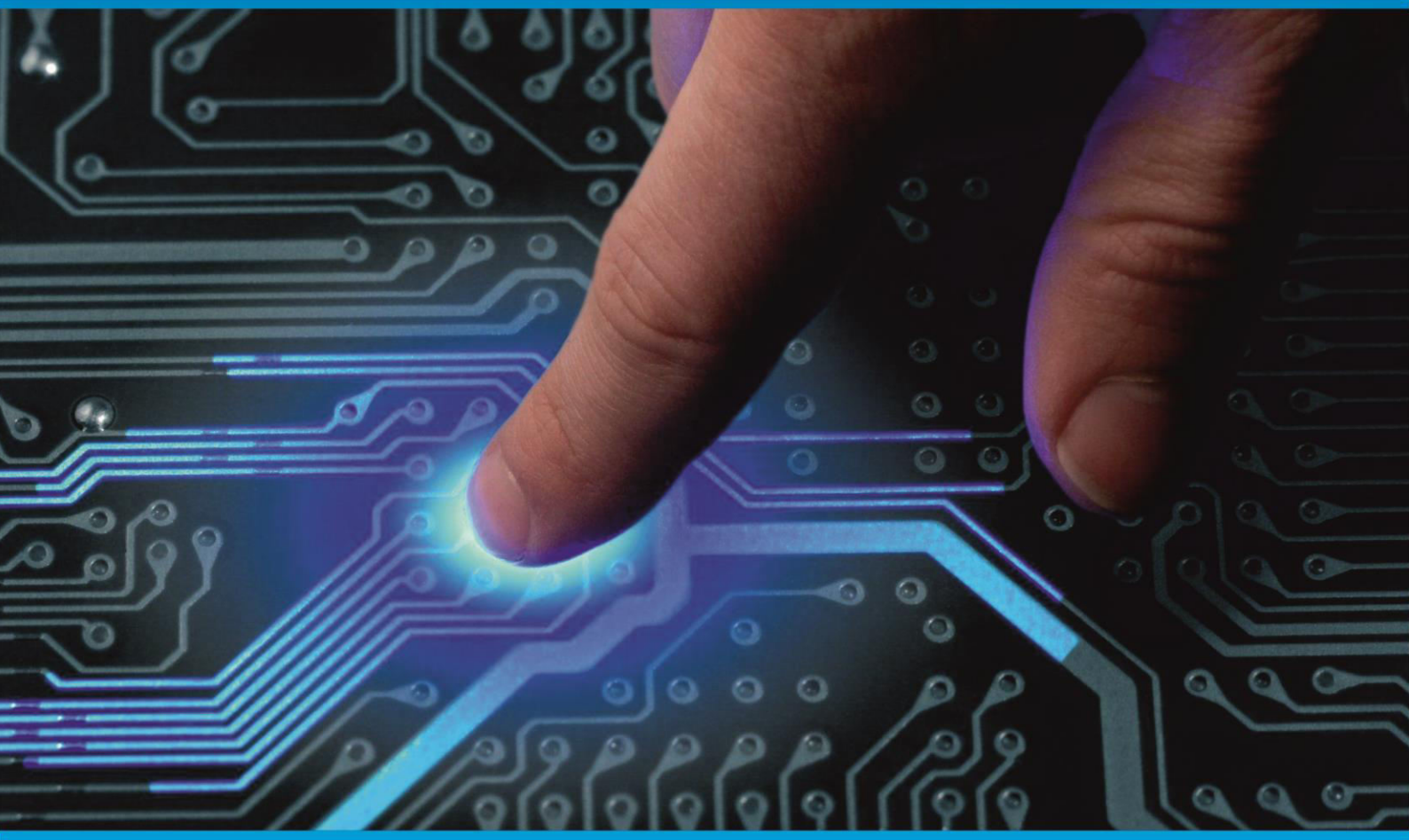

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Smart Water Monitoring System Using IOT

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ABSTRACT: Water is one of the essential parts of life. Water pollution is one of the big problems to the world. In order to ensure the safe supply of the drinking and useful water for different purposes like agricultural, the water should be monitored. This paper presents a design of a low cost system for real time monitoring of the water quality and quantity of water in IOT (internet of things). The system having of several sensors is used to measuring physical of the water. The parameters flow sensor of the water can be measured. The measured values from the sensors can be processed by the controller. The Arduino model can be used as a controller. Finally, the sensor data can be shown on internet using WI-FI system. A cloud server was configured as data saving and analysis. This data can be used in future research and development.

I. INTRODUCTION

Currently drinking water is very prized for all the humans. In recent times water levels are very low and water in the lakes are going down. So its too important to find the solution for water monitoring & control system. IOT is a solution. In recent days, development in computing and electronics technologies have triggered Internet of Things technology.Internet of Things can be describe as the network of electronics devices communicating among them by the help of a controller. The IOT is a collection of devices that work together in order to serve human tasks in a efficient manner. It combine computational power to send data about the environments. These devices can be in form of sensors, appliances, embedded systems, and data analysis microchips. This paper present a low cost water monitoring system, which is a solution for the water wastage and water quality. Micro-controllers and sensors are used for that system. Ultrasonic Sensor is used to measuring water level.

The other parameters like pH, TDS, and Turbidity of the water can calculated using different corresponding sensors. This system use the flow sensor which can measure the water flow and if the necessary quantity of water flow through the pipe then water flow can be stopped automatically. The calculated values from the sensors can be processed by the Micro-controllers and uploaded to the internet through the Wi-Fi module (ESP 8266). Analysis we can do by this process, how much water is used in certain time, in a day or in a month. Alerts messages and data generated by the sensors are transmitted over the Internet to a cloud server and can be received by user terminal owned by consumers. The data which is obtained from the sensors can be shown on the internet and provides facilities for screening the data on mobile phones or web application.

II. EXISTING SYSTEM

Now a day's water is polluted due to many reasons. In this current system, the equipment cost is high, and it takes a lot of time to process. Traditional methods have the drawbacks such as long waiting time for results high cost, low measurement precision, and complicated methodology. So with the implementation in the technology, we use different methods and techniques to check the quality of water. There is a disadvantage in the existing system that the system has high complexity and low performance.

III. METHODOLOGY OF PROPOSED SYSTEM

The proposed system uses four sensors which are pH, turbidity, ultrasonic, DHT-11, micro-controller unit as the main processing module and one data transmission module ESP8266 Wi-Fi module (Node MCU). The micro-controller unit is a significant part of the system developed for water quality measurement because The Arduino Mega consumes low power, and it is a small size, where the size is a good use for a crucial point-of-sale technology criterion. Among four sensors, two of the sensors collect the data in the form of analog signals; the MCU has an on-chip ADC that translates the sensor analog signals into the digital format for further study. So, to get this analog output from the sensor, the sensor's analog output of will be connected to the MCU' s analog pins. Whereas the other two sensors output directly connected to the digital pins of the MCU units. .

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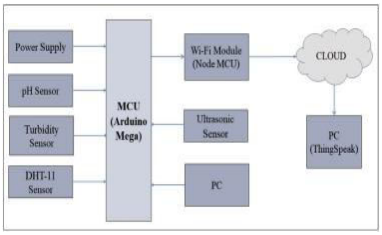

System block diagram

IV. IMPLEMENTATION

Taking about this proposed system, it is clearly shown that it has several component which help to build a water monitoring system. The essential component of the system of smart home automation are:

Arduino UNO: Arduino is a micro-controller 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.

Wi-Fi module: The ESP8266 WiFi Module is a self SOC with integrated TCP/IP protocol s that can give any micro-controller access to your WiFi network. The ESP8266 is capable of hosting an application or offloading all Wi-Fi networking functions from another application processor. Each ESP8266 module come pre -programmed with an AT command set firmware. The ESP8266 module is an extremely cost effective.

Flow sensor: sensor is used to measure the flow of water.This sensor basically consists of a plastic body, a rotor and a sensor. The pinwheel rotor rotates when water / liquid flows through the pipe and its speed will be directly proportional to the flow rate. The Hall Effect sensor will provide an pulse with every revolution of the pinwheel rotor.

pH Sensor: A pH is an electronic device which is used for measuring the pH level in the water. A pH meter consists of special probes which are connected to an electronic meter that would display the reading. If the pH level is greater than 7 then it Is alkaline in nature, if the pH level is less than 7 then it is acidic in nature, and generally the range of pH is 0-14pH.

CO2 Sensor: The co2 sensor is a device which is used to measure the carbon dioxide in the water. This system uses SKU:SEN0219 to measure the concentration which is an analog infrared co2 sensor. Parts per million (ppm) is the unit which is used for measuring the concentration of co2. The characteristics of this type of co2 sensors are low power consumption, high sensitivity, waterproof, and anti-corrosion, temperature compensation and stability.

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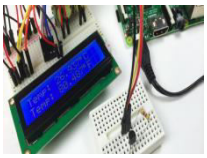
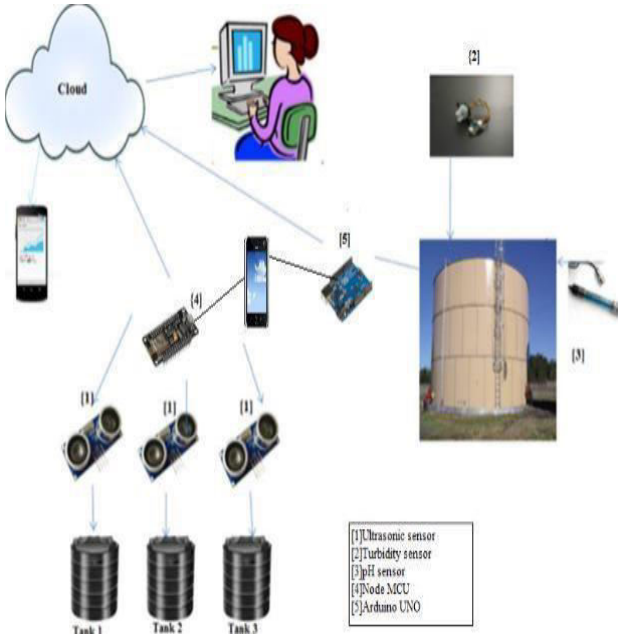
Temperature Sensor : This sensor is an "integrated circuit sensor". The yield voltage is linearly proportional to the Celsius temperature. The "LM35 sensor" is used in this project because the user cannot convert Kelvin to centigrade temperature. It is not suitable for remote applications and directly measures in Celsius. The applications of the temperature sensor are in the microwave, fridges, household devices, and air conditioners. It measures not only the heat but also measures cold temperature.



V. SYSTEM ARCHITECTURE



VI. CONCLUSION

By using a WI-FI module, the interfacing is done between transducers and the sensor network on a single chip solution wirelessly. For the monitoring process, the system is achieved with reliability and feasibility by verifying the four parameters of water. The time interval of monitoring might be changed depending upon the necessity. Ecological environment of water resources is protected in this research. The time is reduced, and the cost is low in this environmental management. In this paper, a prototype water monitoring system using IoT is presented. .For this some sensors are used. The collected data from the all the sensors are used for analysis purpose for better solution of water problems. The data is sends to the cloud server via Wi-Fi module ESP8266. So this application will be the best challenger in real time monitoring & control system and use to solve all the water related problems.

VII. FUTURE SCOPE

A prototype water monitoring system using IOT is presented. .For this some sensors are used. The collected data from the all the sensors are used for analysis purpose for better solution of water problems. The data is sends to the cloud server via Wi-Fi module ESP8266. So this application will be the best challenger in real time monitoring & control system and use to solve all the water related problems.

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