A REAL TIME SOLUTION TO WATER MONITORING USING MULTI SENSOR

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Abstract— Clean Water should be a necessity. In this case, Tamil Nadu Government supply water with certain schemes , for the efficient use of water supply an IoT based system to is implement with the message .This system also show the water purity and also control the leakage system . This helps people to efficiently make use of the water supplied by the Government.Nowadays, there is no idea about when drinking water is supplied to the people and water purity will be detected using sensors so there is need to intimate the people who are in the office etc.., Hence we are design this system to inform the people about the water flow and the water PH level and also the water purity level through the notification and the alert message. For that purpose we are going to use the sensors which will helpful to the people to known about the purity of the water. This system provides actual implementation to organization, communities and individuals interest in establishing and operating water monitoring system

***Index Terms*— Wi-Fi connection, nodeMUC8266,water flow sensor, GSM, GPS,esp8266arduino core, flow monitoring sensor, ph sensor.**

I. INTRODUCTION

The of Things (IOT) and Remote Sensing (RS) techniques are used in different areas of research

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Internet of Things (IOT) constitutes a network of devices connected to the internet. Nowadays Internet is used for monitoring, collecting and analysis of data from remote locations. Water management is one of the widely used application which uses IOT to efficiently .Water management system using IOT platform .Drinking water could be terribly precious for all people as water utilities face involves water monitoring and controlling system for conservation more challenges. Because of the drinking non purity water, some of the people are attacked by the viral fever and also some diseases.

The flow of water in the drinking water supply pipe is sensed and the user will get a notification in their mobile so that the user know the availability of water . This system also show the water purity , PHP level of the water and also the automatically stops the leaking of the tap .This system also gives the direct connection to the water tank , if the user or client not available at the time of the water supply it gives supply to the water tank.

The removal of the short coming and providing a efficient and economical solution has been focus of this project.This paper aims at designing a Smart Water Monitoring System (SWMS) [12] for real-time water quality and usage monitoring. It consists of two parts: Smart Water Quantity meter and Smart Water Quality meter. The goal of planning Smart Water Quantity Meter is to guarantee water protection by checking the measure of water devoured by a family, informing the equivalent to the purchaser and the power. A three-section charging framework creates utilization charge as per the amount expended . It will utilized for the individuals to water use .

This paper represents an IOT (Internet of things) based smart water quality monitoring (SWQM) [5] system that aids in continuous measurement of water condition based on four physical parameters i.e., temperature, pH, electric conductivity and turbidity properties. Four sensors are connected with arduino device in discrete way to detect the water parameters.

II.LITERATURE SURVEY

Water level sensor gadget that can identify and control the degree of water in a specific water tank or a comparable water stockpiling system[1].The system firstly senses the amount of water accessible in the tank by the level identifier part and afterward changes the condition of the water.This electronic

design achieves automation through sequential logic implemented using a flip flop. A seven segment display and a relay-based motor pump driving circuit are part of this integrated design. The water siphon consequently turns on and begins filling the tank when the water level is unfilled and killed and quit filling the tank when water level arrives at most extreme level and furthermore screen the water [5].the available water resources are getting depleted and water quality is deteriorated due to the rapid increase in population and need to meet demands of human beings for agriculture, industrial, and personal use. The quality of ground water is also affected by pesticides and insecticidesThe waterways in India are getting contaminated because of modern waste and release of untreated sewage. So as to take out issues related with manual water quality observing.In this section of the paper gives a writing survey of the current water quality checking framework that gives a short clarification of the frameworks that are as underneath: Fiona Regan, Aurdino and Audrey [12] planned savvy water quality monitoring framework. In that system they made water quality splendid sensors so the sensors send data remotely to the device which assembles data from all of the centers. This data is given to the remote server through GPRS framework and customer can see data remotely.

III. EXISTING SYSTEM

The project of water level monitoring as well as controlling with IOT and android app [9] .Wasteage of water in the current scenario merely due to overflowing tanks is not affordable , leading to large amount of wasteage. The need of the removal of the short coming and providing a efficient and economical solution has been focus of this project.This paper aims at designing a Smart Water Monitoring System (SWMS) [12] for real-time water quality and usage monitoring. It consists of two parts: Smart Water Quantity meter and Smart Water Quality meter. The goal of planning Smart Water Quantity Meter is to guarantee water protection by checking the measure of water devoured by a family, informing the equivalent to the purchaser and the power. A three-section charging framework creates utilization charge as per the amount expended . It will utilized for the individuals to water use .
This paper represents an IOT (Internet of things) based smart water quality monitoring (SWQM) [5] system that aids in continuous measurement of water condition based on four physical parameters i.e., temperature, pH, electric conductivity and turbidity properties. Four sensors are connected with arduino device in discrete way to detect the water parameters.

V.DRAWBACK OF EXISTING SYSTEM

In IOT based water monitoring system more sensors were used but it won't provide the solution for all problems .it will not intimate the how the water is purifying and how is cleaning. it will not measure the florin content of the water impurity and the same time it will not show the how much the water is polluted. it will also not responsible for the environmental pollution in water. AS sensors are utilized in some devices and obverse and measures the values from the water and their level of ph, those values are defines a purity and ph level of water value which shows the polluted water in our water tank. It doesn't give solutions to protect ourselves from the pollution environment.

VI. PROPOSED SYSTEM

However result in massive loss of life and property factors in technology ,social, politics tangel requriements. Connect various circuit related IOT. Analyse data and uses of artificial intelligents .Water monitoring is one of the major source for everyone in day today life "integrated information system for snowmelt(drown)early warming based on internet of things .It will be detect by observing a water level ,flow levels sensors and humidity by using fuzzy logic we can easily implement the water monitoring system and intimate to the people.

VII. IMPLEMENTATION

The flow of water in the drinking water supply pipe is sensed and the user will get a notification in their mobile so that the user know the availability of water .This system also show the water purity . PHP level of the water and also the automatically stops the leaking of the tap This system also gives the direct connection to the water tank ,if the user or client not available at the time of the water supply ,it gives supply to the water tank.This water flow monitoring system also used to detect the PH value .This system makes use of three sensors (pH, conductivity, temperature), processing module microcontroller, and two data transmission modules Zigbee and GSM (Global system for mobile). The three sensors capture the data in the form of analog signals. The ADC converts these signals into the digital format. These digital signals are sent to the microcontroller via a Zigbee module. The microcontroller will process the digital information, analyze it, and further communication is done by the GSM module, which sends an SMS (short message service) with the water quality parameters onto the smart phone/PC, which also displayed on the LCD (Liquid crystal display) of the micro controller. Fig. 2.4.1 shows the water quality monitoring system. Microcontroller acknowledges and forms the information gathered from the sensors to the Web page by means of Wi-Fi module. This is completed with the assistance of coding. The code is written in Embedded-C and utilizing the KeiluVision programming to reenact the code. We have utilized assessment variant of MDK-ARM v4 for C programming. Streak enchantment is a product apparatus utilized for consuming the .hex documents to NXP Controllers.The water quality monitoring system. employs sensors to collect the data (parameters: pH, temperature, Electric Conductivity (EC). This data is

processed through the LPC2148 microcontroller module and transferred via the ESP8266 Wi-Fi data communication module to the central server. This data can be accessed by the authorized users by logging into their accounts using a User ID and password to view data. The data is collected, processed, analyzed, and transmitted and displayed all in real time. The LPC2148 microcontroller is based on real time emulation and embedded trace support. It supports embedded high speed flash memory. Because of its low force utilization and little size, it is acceptable to utilize where size is a key prerequisite for get to control and retail location applications. It is appropriate for portals and convention converters in correspondence, delicate modem, voice acknowledgment, low goals imaging, and gives high handling power and huge cradle size [11]. The ESP8266 is a minimal effort Wi-Fi module comprises of Wi-Fi chip with full TCP/IP stack and miniaturized scale controller chip made by M/S Espruino [12]. Above module is a WLAN network, which hosts the applications or offload WiFi network functions from other application processor. During hosting the applications it boots up directly from external flash. Performance of the system is improved and memory requirement is also minimized because of its integrated cache. Wireless Internet access can be introduced to any microcontroller based design using CPU AHB bridge interface or UART interface when Wi-Fi module works as Wi-Fi adapter. ESP8266 utilizes sequential handset (Tx/Rx) to send and get information in Ethernet supports, and sequential orders to question and change setups of the Wi-Fi module[8]. It just requires two wires (Tx/Rx) to impart between a microcontroller and Wi-Fi module.It offloads Wi-Fi-related tasks to the module, allowing the microcontroller code to be very light-weighted. Wi-Fi Module is addressable over SPI and UART, making it easy to build an Internet of Things application. We use ATcommands to connect to Wi-Fi networks and open TCP connections without need to have TCP/IP stack running in our own microcontroller.

VIII. COMPONENTS

1.NodeMCU ESP8266 WiFi Module:

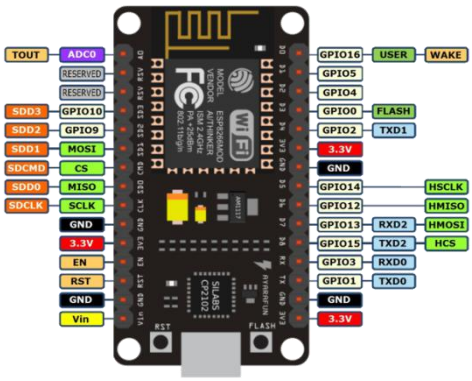

Fig 2.1 ESP8266 Arduino Core

NodeMCU is an open source IoT platform. It incorporates firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and equipment which depends on the ESP-12 module. The expression "NodeMCU" naturally alludes to the firmware as opposed to the dev packs. The firmware utilizes the Lua scripting language. It depends on the eLua venture, and based on the Espressif Non-OS SDK for ESP8266. It utilizes many open source ventures, for example, lua-cjson and spiffs.

NodeMCU was created shortly after the ESP8266 came out. On December 30, 2013, Espressif Systems began production of the ESP8266. The ESP8266 is a Wi-Fi SoC integrated with a TensilicaXtensa LX106 core, widely used in IoT applications. NodeMCU started on 13 Oct 2014, when Hong committed the first file of nodemcu-firmware to GitHub. Two months later, the project expanded to include an open-hardware platform when developer Huang R committed the gerber file of an ESP8266 board, named devkit v0.9. Soon thereafter, Tuan PM ported MQTT customer library from Contiki to the ESP8266 SoC stage, and focused on NodeMCU venture, at that point NodeMCU had the option to help the MQTT IoT convention, utilizing Lua to get to the MQTT specialist. Another significant update was made on 30 Jan 2015, when Devsaurus ported the u8glib to NodeMCU venture empowering NodeMCU to effectively drive LCD, Screen, OLED, even VGA shows.

In summer 2015 the creators abandoned the firmware project and agroup of independent but dedicated contributors took over. By summer 2016 the NodeMCU included more than 40 different modules. Due to resource constraints users need to select the modules relevant for their project and build a firmware tailored to their needs.

1 .ESP8266 Arduino Core

As Arduino.cc began developing new MCU boards based on non-AVR processors like the ARM/SAM MCU and used in the Arduino in. Due, they expected to adjust the Arduino IDE so it would be generally simple to change the IDE to help exchange instrument chains to permit Arduino C/C++ to be ordered down to these new processors. They did this with the presentation of the Board Manager and the SAM Core. A "center" is the assortment of programming parts required by the Board Manager and the Arduino IDE to order an Arduino C/C++ source scrape down to the objective MCU's machine language. Some imaginative ESP8266 aficionados have built up an Arduino center for the ESP8266 WiFi SoC that is accessible at the GitHub ESP8266 Core website page. This is what is popularlycalled the "ESP8266 Core for the Arduino IDE" in fig :3.4.2.1 and it has gotten one of the main programming advancement stages for the different ESP8266 based modules and improvement IoT Module.

NodeMCUs.For more data on all things ESP8266, look at the ESP8266 Community Forum on GitHub.

3 USB-to-TTL RS232 Serial Communication Cable:

The USB TTL Serial links are a scope of USB to sequential converter links which give network among USB and sequential UART interfaces. A scope of links are accessible contribution availability at 5V, 3.3V or client determined sign levels with different connector interfaces. All links highlight a FTDI FT232R gadget incorporated inside the link USB appeared in fig:3.4.3 type 'A' connector, which give access to UART Transmit (Tx), Receive (Rx), RTS#, CTS#, VCC (5V) and GND associations. All links are completely RoHS consistent and are FCC/CE affirmed. The link is most straightforward path ever to associate with your microcontroller/Raspberry Pi/WiFi switch sequential comfort port. Inside the huge USB plug is a USB<->Serial change chip and toward the finish of the 36" link are four wire-red force, dark ground, white RX into USB port, and green TX out of the USB port. The force pin gives the 5V @ 500mA direct from the USB port and the RX/TX pins are 3.3V level for interfacing with the most widely recognized 3.3V rationale level chipsets. In light of the isolated pin plugs, this link is perfect for controlling and associating up to the troubleshoot/login reassure on the Raspberry Pi or Beagle Bone Black. Interface the pins as appeared to control the Pi or BBB and build up the RX/TX link.If you are running Windows 7/8/10 and so forth, check this instructional exercise page with connections to drivers for both PL2303 and CP2102.If you are running Mac OS X, check this instructional exercise page with connections to drivers for both PL2303 and CP2012.If you are running Linux, drivers are as of now remembered for the bit, no compelling reason to introduce anything! Likewise helpful for hacking WiFi switches to introduce exchange OS's, or about some other 3.3V rationale sequential port. This is simpler to use than a FTDI link as a rule on the grounds that the wires are isolated. Note that we consider this a "TTL link" (since that is what they're called) yet actually it's CMOS rationale.

Fig 3.1.IOT Module

4.Water Level and Flow Monitoring Sensor :

Knowing the amount of water or water flow in an overhead tank can be one tedious task.

Usually, you'll end up climbing up the stairs to the tank and checking the level manually or you'll you hear the water overflowing from the top. But these days' electronic water level indicators are available to fix this problem, but they often come with a hefty price tag and are usually difficult to install. Most of the available systems use dipped electrodes or float switches, which can be a headache in the long run. We present a different approach to knowing the water level using some advanced water level and flow identification sensor with NodeMCU. The advantage of this method is that it is contactless, so issues like corrosion of the electrodes won't affect this system. Furthermore, this NodeMCU. The flow should be shown in fig:3.4.4 water level and flow monitoring.

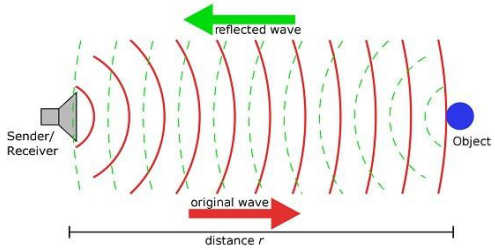

fig4.1 Waterlevel and Flow Monitoring

5.PH Sensor

A pH meter is a logical instrument that gauges the hydrogen-particle action in water-based arrangements, showing its acridity or alkalinity communicated as pH. The pH meter gauges the distinction in electrical potential between a pH cathode and a reference anode, thus the pH meter is at times alluded to as a "potentiometric pH meter". The distinction in electrical potential identifies with the sharpness or pH of the arrangement. The pH meter fig:3.4.5 is utilized in numerous applications extending from lab experimentation to quality control . The rate and result of concoction responses occurring in water regularly relies upon the corrosiveness of the water, and it is subsequently valuable to know the sharpness of the water, normally estimated by methods for a pH meter.

fig 5.1 PH Sensor

VIII. CONCLUSION

A definitive objective of this work is to watch the nature of water tests by structuring at water quality observing gadget actualized in IOT stage that can distinguish three explicit physical parameters: pH, turbidity and conductivity in water, and break down the separated estimation of these parameters utilizing reasonable AI approach. distinctive water tests are tried with the help of ardino based sensors and gathered their estimations of various measurements. Quick woods parallel classifier demonstrates better examining execution to approve the framework's precision and adequacy in anticipating water quality. The water observing framework has demonstrated its significance by giving precise execution distinguishing the water quality dependent on physical parameters. These will likewise show the spillage of the water and demonstrate notice to the client. That message discloses to us that the water is spilling. It additionally consequently controls to water spillage and furthermore naturally shuts the tap. With the overhaul highlight of IOT innovation to recognize compound parameters of water, this framework can be actualized for ongoing water checking arrangement in not so distant future. An average percentage deviations comparison of pH measurement between the proposed system and standalone RFID system shows below than the maximum 10% of acceptable tolerance where each systems average at 2.33% and 2.17% respectively. Therefore, this proposed system is reliable for a real environment deployment. The maximum current consumption from the energy analysis is 32mA with 310mW power consumption at one time per hour usage basis. The maximum WSN read range is up to 6.5km based on the extrapolated data for LoS communication while the NLoS communication is able to transmit at maximum 900m distance in vegetation area. As another decent enhancement, a router can be implemented at each 900m distance for network extending purpose. In addition, the mobile application was successfully installed and ran on Android mobile device.

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