

# Smart Water Flow Tracking System

P. Subashini, V. Naga Sumanth, V. Kireeti

**Abstract:** Water is a vital resource for humans, and its management is a key issue. In order to conserve water this project enhances the increased usage of water. Internet of things is system of interrelated computing devices, vehicles, home appliances and other items embedded with electronic chips and sensors. The system is designed using Arduino uno, ESP8266 and sensors. ESP8266 which is a less cost cloud microchip. The system will consist of a water pipe with water flow meter connected to it and an Arduino uno board and ESP8266 connected to it. First we use a water flow meter and collect the data as water flows through it. ESP8266 Wi-Fi module is a low cost microchip that collects and sends the information to the cloud. We use the Arduino uno to coordinate between water flow meter and the ESP 8266 module and then use the Thing speak Internet of things analytics platform to analyze and show the data in visual format. The output of this project will be used for monitoring the water and it can be displayed visually as a graph. The project can be mainly useful for household and agricultural purposes as it helps to minimize the loss of water.

**Index Terms:** Internet of Things (IoT), Embedded systems, Electronic Chips, Wi-Fi module, Sensors.

## I. INTRODUCTION

The drinking water has become very costly and the ground water level is reduced day by day. The fresh water consumption is increased to a large extent over the past few years. All the human beings are facing trouble due to the increased consumption of water. The IOT based sensor project which is a network of physical devices that are embedded with electronics, sensors, and connectivity that enables these devices to connect and exchange data, creating opportunities for more direct unification of the physical world into Cybernetics system. We use the internet of things for monitoring the water. Arduino UNO, ESP8266 are the main components that we use in this system. ESP8266 is a low cost microcontroller that allows Arduino Uno to connect to a Wi-Fi network. The water flowing through a pipe can be measured and monitored using the ThingSpeak IOT analytics where the results are displayed visually.

## II. LITERATURE SURVEY

Water management is a major issue. To use the water efficiently a water monitoring system has to be created. The main aim is to help the people know the amount of water that is sufficient and prevent the wastage of water. Water is non-renewable, so once if it gets

exhausted it cannot be replenished. The study discusses the design and development of the system having low cost to control the monitoring of water. The resolution is of low cost controller which includes system of integrated sensory which permits inner observation for nature of water. Using the internet, we are able to transfer the relevant cloud server and the data will be received by a user terminal which are being owned by users. The water tonnage end result is displayed on cloud storage. The Thingspeak is a segment of alert systems is integrated also. This type of arrangement can give an early alert for system for the portable water quality. The ThingSpeak IOT analytic can be used as a part to demonstrate the values visibly. The hardware such as Arduino uno and ESP8266 are required to check or control the flow of water through a pipe. The system is also cost effective as we use the low cost microchip ESP8266 and Arduino uno. These are the references from where the content has been read.

In 2015, Thinnagan perumal, Md Nasir Sulaiman, Leong presented "Internet of things Enabled water System". They have implemented "Water monitor system by using Internet of things" for the real time scenario. The object is a low cost which involves a integrated sensory system which permits inner observation of the quality of the water. Through internet the relevant waring data are transferred to the cloud servers and this data is received by user incurable which is owned by the consumers. The measurement result of the water is showed in the cloud server. The Thing speak is a segment of the alert system and it is integrated also. This type of resolution can be able to utilize fairly and effectively by residential user or by the industrial user and many more water utilities. By using Internet of Things, this type of resolution can give early and fast alert system for the portable water quality.[7]

In 2013 Saima Maqbool, Nidhi Chandra presented a paper on "Real time Monitoring and control of water system wirelessly using Zigbee 802.15.4" in which the architecture comprises a number of elements performing a particular function of jobs senses the data and the data is transferred to the end tool or machine inverter. The data is sensed and coordinated by the network equipment like router. The Router will be able to gather the data from the end tool like XBee which in turn form sensor and sends this data to the coordinator. In a computer all the information are showed and presented. In the computer, bore water, river, level. From the computer a particular task can be executed such as "SMS" can be forwarded to users system and at alarm can be blows at the desire medium. All the data can be stored and kept in the database. Which can also be utilized to implement "water expert system" through a long term investigation and supervising. [9]

In 2017, Divya C, Nikhil Gowda, Suhas Shastri, Yashwanth J, Achyutha Preksha A presented "IOT BASED WATER SUPPLY MONITORING". It is found that 22 out of 32 cities in the country are facing shortage of water supply every day. This crisis might be because of both natural and human factors, i.e either because of water being wasted by humans in several ways daily or might be due to decreasing rainfall. This system designed by N. Vijay kumara a low cost system for monitoring the quality of water using IOT is proposed. Parameters to determine the quality of water such as pH, conductivity and so on are monitored. This has been carried out with the help of sensors. Raspberry pi is used as controller. Issue here is that only the quality of water is monitored but not its flow control.

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Thinakaran Perumal have proposed IOT based water monitoring system that checks water level in real time. Water level sensor is used to check the level. ATmeg328p is used as a controller. After the water level reaches the desired parameter, a signal is sent to social network like Twitter. But the issue here is that only the water level is monitored but not the quality of water. In this work 5 persons have been worked together to complete the whole work. But some of them have worked on the other project works, but some of them worked on the basis of IOT.so this has been taken as the reference of my project.[6]

In 2018 SUGAPRIYA,RAMYA,RAMYADEVI, RAKSHAYA,RASHMI presented “SMART WATER QUALITY MONITORING SYSTEM some of them helped in this work.“In 2013, Niviti Yadav , “CPCB Real Time Quality water Monitoring Maintenance”. In this the quality of water in Ganges and Yamuna river is tested by using sensor.

In 2011, Satish Turken, Amruta Kulkarni, “ Solar Powered Quality water Monitoring System using Wireless Sensor Network”, This base station has gathered the information at a distant remote area sensors. The Base Station is associated with ZigBee module which is powered by sunlight baseboard [2].

In 2016, M N Barabde, the System is used for determining the physiochemical factors of the quality of water such as motion, conductivity, temperature, PH and oxidation lowering potential using ZigBee.[3]

In 2016, Pavana N R, Dr. M.C. padma composed the water quality factors by investigating Wireless sensor networks(WSN) and by using the raspberry Pi module which is used with the Linux version.[4]

### III. EXISTING SYSTEMS

There are a lot of existing models of smart water monitoring system that are present in the market. Most of these systems mainly focus on controlling small areas via the internet. These system use different types of wireless communication techniques such as Wi-Fi, Bluetooth. Each of these systems have their own unique advantages and disadvantages.

### IV. SYSTEM ARCHITECTURE

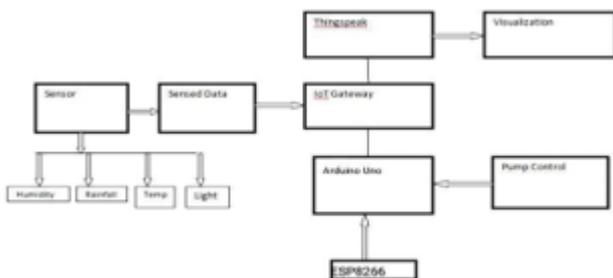


Fig 4.1 System Framework

This figure depicts about connection between modules and the Arduino Uno board where the data is received and sent to the Thingspeak analytics. The system is connected to the internet through ESP8266 wifi module displays the graphical representation on the screen.

### V. PROPOSED SYSTEM

Here the main problem is the water is not helpful for all the resources so for that reason and to get useful for all the resources the system has been introduced. Many of the people gets helpful and the water gets useful too. Using raspberry pi,esp8266 wifi module, ncu mode, sensors like temperature, turbidity, ph sensor.

#### Feature and advantages of the proposed sytem:

1. Water does not gets wasted. Water is not polluted.

2. Decreases the time consumption ,Time efficient.
3. There will be decrease in work.
4. Sensors does not effect any part of the system.

### VI. METHODOLOGY

1. INSERTION OF WATER FLOW SENSOR
2. AURDINO BOARD AND ITS OPERATION
3. INTERFACE TO ESP8266 MODULE
4. THING SPEAK ANALYSIS

#### Module 1: INSERTION OF WATER FLOW SENSOR

**Principle:** The water flow meter is a sensor which is used to sense the rate of flow of water through the pipe and displays the amount of water which has been passed through the pipe. The water flow sensor is fixed inside the pipe to finds the flow and amount of water travelled trough the pipe. This sensor consist of a plastic body and a motor to make the water flow easily through the pipe.



Fig: 6.1.1 Water flow sensor

#### Module 2: AURDINO BOARD AND ITS OPERATION

**Principle:** Arduino is electronic chip based software platform which is able to relate with many types of sensors like temperature, Moisture, etc and communication technology. There are various models of Arduino microcontroller that can be used for different purpose. It main aim is to not only control devices but also able to read data from various types of sensor. A particular software is used to code arduino board to make it work according to the project.



Fig: 6.2.1 Aurdino Uno Board



### Module 3: INTERFACE TO ESP8266 MODULE

**Principle:** The ESP8266 cloud Module is a SOC with TCP/IP protocol stack where it stores all its data in cloud using network to which it is connected, that can give any microcontroller access to your WiFi network. Each ESP8266 builds with AT command set. This is a module which is high of cost and effective towards its work.

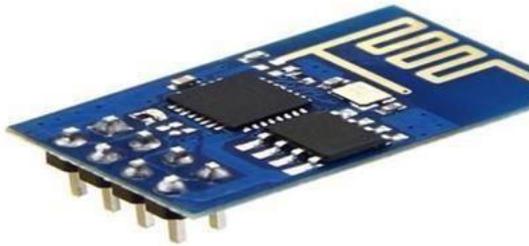


Fig: 6.3.1 ESP8266 Module

### Module 4: THING SPEAK ANALYSIS

**Principle:** Thingspeak is an open source platform which is used in MATLAB process. It was actually launched by ioBridge. It analyzes the data and displays the data in a graphical presentation. The thingspeak analysis receives the data and then it shows the graph in the screen or monitor.

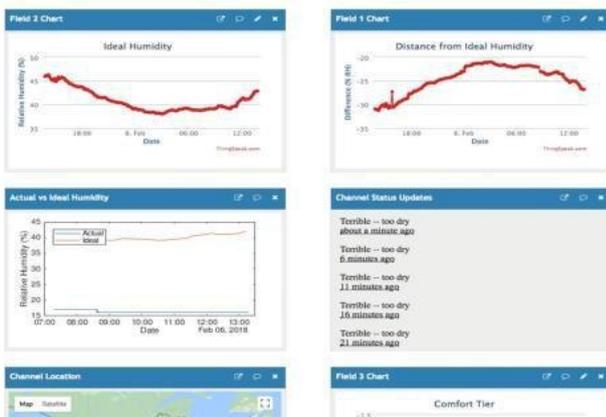


Fig: 6.4.1 Thing speak

## VII. CONCLUSION

To implement the proposed system all we have to do is setup a network using the Raspberry Pi or connect to an existing network such as your Wi-Fi. Once the sensors are interfaced with the Pi.

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