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Water Quality Analysis and Smart Water Meter Using IOT

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***Abstract*: Now a days water is polluted by factories west chemical. The polluted water can cause various diseases to humans and animals, which in turn affects the life cycle of the ecosystem. To make pure water and the water quality should real time smart solution If water pollution is detected in an early stage, suitable measures can be taken and critical situations can be avoided. water quality meter management system need data regarding water storage present in tank for monitoring of water pollution are getting more and more significant these days with innovation in sensors, communication, and Internet of Things (IoT) technology. Supply of water to the particular area water tank according to water tank it well be informing to the costumer about water level water meter which monitor water uses The paper proposes a cost effective and efficient IoT based smart water quality monitoring system which monitors the quality parameters uninterruptedly. The developed model is tested with three water samples and the parameters are transmitted to the cloud server for further action PH sensor, turbidity sensor, float sensor , buzzer, water flow sensor are used in this project using checking for water quality and how much use water in daily life. Float sensor are used to the water tank are full filed to a buzzer is ON condition.**

***Index Terms*- IoT, water flow meter, pH Sensor, Turbidity, float sensor, water quality**.

I. INTRODUCTION:

The various cities and town, the supply of water has been a major problem as the demand of the water depends on various consumption factor and water distributors have to maintain the water supply in real-time to fill the gap between demand and supply. But, the challenge is to calculate the consumption trend. not wasting water and detecting the overconsumption of water have been practiced a lot to reduce the water consumption around the cities. Fortunately, smart water have been providing the perfect solution for water distributor and consumers to meet the volatile demand for water. Many companies have been coming up with advanced solution using Smart water meter to track water usage of individual house to avoid wastage.

Across the various cities and town, the supply of water has been a major problem as the demand of the water depends on various consumption factor and water distributors have to maintain the water supply in real-time to fill the gap between demand and supply. But, the challenge is to calculate the consumption trend. Various methods like keeping track of water consumption, not wasting water and detecting the overconsumption of water have been practiced a lot to reduce the water consumption around the cities. Fortunately, smart water have been providing the perfect solution for water distributor and consumers to meet the volatile demand for water.

II. LITERATURE

A monitoring system that includes a variety of sensors to measure various quality characteristics, such as turbidity, pH value, water level in the tank, wetness of the surrounding environment, and water temperature was proposed by . We are beginning to develop our "Water Quality Analysis And Smart Water Meter using IoT" by examining various papers and existing methodologies. The following papers were reviewed for literature: [1] The sensors are connected to the Microcontroller Unit (MCU), which does additional processing, using the Personal Computer (PC). Mukta et al. developed an “IoT-based Smart Water Quality Monitoring (SWQM) system”. [2]The proposed model made use of sensors, an FPGA board, and a Zigbee-based wireless communication module. Real-time consideration was given to six different water quality metrics, including turbidity, pH, humidity, water level, water temperature, and carbon dioxide (CO2) on the water's surface. A “solar-powered water quality monitoring system using a wireless sensor” network was proposed by Amruta and Satish.

[3]created a way for a “smart water quality monitoring system” in Fiji. Potential Hydrogen (pH) and Oxidation and Reduction Potential (ORP) are the quality measures used to evaluate water. An early warning system for water pollution will be designed with an entirely implemented system using numerous monitoring stations with effective implementation of this monitoring approach [4]The fundamental part of wireless sensor network (WSN) technology used to “monitor water quality and powered by solar or photovoltaic panels” is the underwater wireless sensor network (UWSN). An extraordinary system design that consists of a base station and distributed sensor nodes

is proposed for monitoring water quality in real-time over multiple places. The Zigbee WSN technology is used to connect every node and base station.

III. PROMBLEM STATEMENT

In many countries, water conservation is becoming increasingly necessary as countries face a widening gap between the ever-decreasing water availability due to climate change and the rising demand for population growth. Water efficiency implies less water consumption and searching for an alternative of conventional water meter to measure the quantity and quality of water. water utilities build daily demand profiles and peaking factors to construct water delivery network infrastructure. The role of smart metering is increasingly recognized by water utilities in demand management. customer service, work optimization and operation efficiency. The data need to be downloaded manually from In many countries, water conservation is becoming increasingly necessary as countries face a widening gap between ever-decreasing water availability due to climate change and the increasing need for population growth. Water efficiency means using less water and finding an alternative to traditional water meters to measure water quantity and quality. Water utilities create daily demand profiles and peak factors to build the infrastructure of the water supply network. The role of smart metering is increasingly being recognized by water utilities in demand management. Customer service, work optimization and operational efficiency.

IV. METHODOLOGY

- Define the project requirements: Determine the scope of the project, including the type of sensors required, data storage options, and user interface.
- Choose the hardware: Select appropriate microcontrollers, sensors, and communication modules based on project requirements and budget.
- Develop the circuit diagram: Create a schematic diagram of the circuit that shows the connections between all the components.
- Develop the code: Write code for the microcontroller that will read the sensor data, perform any necessary calculations, and transmit the data to the user interface.
- Test the circuit: Assemble the circuit and test it to ensure that it works as expected.
- Integrate the user interface: Develop a user interface that allows users to view the sensor data in real-time.
- Install the system: Install the monitoring system in the desired location and ensure that all components are securely connected and functioning properly.
- onitor the system: Monitor the system regularly to ensure that it is working correctly and make any necessary adjustments or repairs.
- Maintain the system: Perform routine maintenance on the system, such as cleaning the sensors and replacing any damaged components
- Overall, the methodology for this project involves careful planning, design, and testing to ensure that the system meets the required specifications and performs reliably over time.

A. BLOCK DIAGRAM

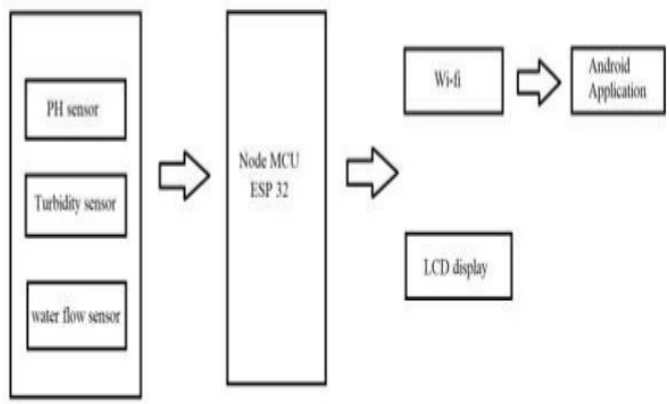

Fig. 1 System Block Diagram

B. WORKING

Water flow meter, PH sensor, Turbidity sensor, Float sensor and buzzer are used in this project . Ph sensor are used to calculating the Ph value of water are ableto drink or not. Turbidity sensor are used to water how much dirty and calculating the water of turbidity . float sensor are used to tank are full for 100% float sensor are upward direction and buzzer is ON . water flow meter are used in how much water are flow in pipe throw the tank. The Node MCU ESP32 are low cost and they are usefully for advance version of Arduino uno. All sensor are connected in ESP32. Blynk IoT has completed the control of the system. By combining the widgets we control with buzzer, we can construct widgets in the Blynk IoT. The sensor's value is shown on an LCD screen.

C. FLOWCHART

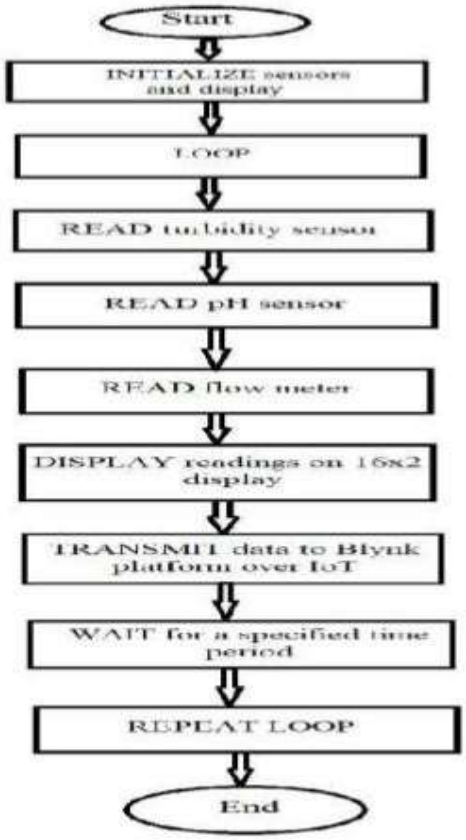

Fig. 2 Flow chart of Water quality analysis and smart water meter using IoT.

D. RESULT

1. LCD display output:

Fig. 3 LCD display output Water quality analysis and smart water meter using IoT.

2. BLYNK APP OUTPUT

Fig. 4 Blynk App output Water quality analysis and smart water meter using IoT.

3. MODEL FIGURE

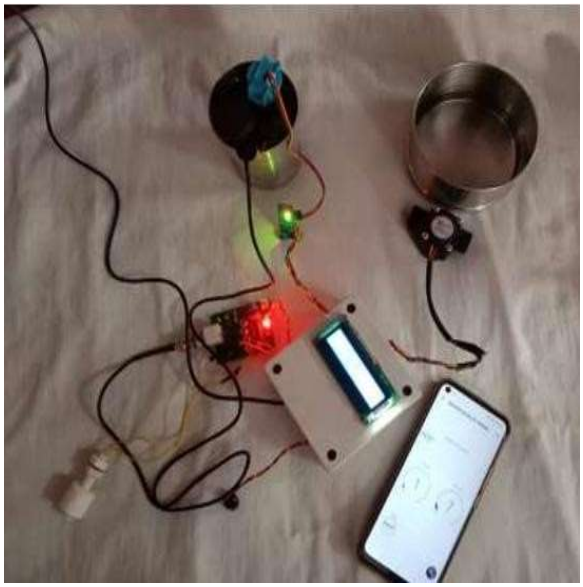

Fig. 4 Model of Water quality analysis and smart water meter using IoT.

IV. FUTURE SCOPE OF PROJECT

As the Internet of Things expands daily and incorporates new technology, new difficulties appear. individuals have been inspired to employ smart technologies as a result of the IoT, which has encouraged individuals to connect to devices via the internet and the proliferation of IoT devices. The distribution system's water quality is a significant aspect that has an impact on public health, and the smart water 5 system offers a user-friendly interface for checking the water quality in homes and, if necessary, taking corrective action. Managing the cost, energy, and efficiency needed for the water distribution system is one of the major difficulties in the development of smart water systems. Another difficulty in the smart water system is choosing the parameters for the quantity, quality, and topology of the water. Therefore, investigation into these issues is necessary. As a future work, we will connect the smart meter with valve to control the water flow. When there is a leak furthermore, system software will be improved to add more featured, such a giving the users the ability to reset their recorded usages of the water in the cloud and uses of water meter and turbidity, chlorine can calculate and sensing.

V. CONCLUSION

Water quality monitoring has become necessary work in environmental protection. Automating monitoring and telemetry is a trend for improving the ability of water quality monitoring system. With the help of sensors, we can check the water quality by use of Wi-Fi module.

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